



## TUALATIN ARCHITECTURAL REVIEW BOARD MEETING

WEDNESDAY, NOVEMBER 30, 2022

TUALATIN SERVICE CENTER  
10699 SW HERMAN ROAD  
TUALATIN, OR 97062

### JOIN ZOOM MEETING

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### CALL TO ORDER & ROLL CALL

### ANNOUNCEMENTS & COMMUNICATION

### COMMUNICATION FROM THE PUBLIC (NOT ON THE AGENDA)

### ACTION ITEMS

1. Consideration of an Architectural Review application (AR 22-0008) for 45 new attached townhome units in an existing multi-family development on a 16.7 acre site in the Medium High Density Residential (RMH) zone at 7800 SW Sagert Street and 20400 SW Martinazzi Avenue (Washington County Tax Lot: 2S125BA00100).
2. Consideration of an Architectural Review application (AR 22-0006) requesting approval of a 120,000 square foot office building development on a 58 acre campus in the Manufacturing Park (MP) zone at 11155 SW Leveton Drive. (Tax Lots: 2S122AA 00500, 00800 and 2S122AB 00100).

### COMMUNICATION FROM CITY STAFF

### ADJOURNMENT





**TO:** Architectural Review Board

**THROUGH:** Steve Koper, AICP, Assistant Community Development Director

**FROM:** Keith Leonard, AICP, Associate Planner

**DATE:** November 30, 2022

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**SUBJECT:**

Consideration of an Architectural Review application (AR 22-0008) for 45 new attached townhome units in an existing multi-family development on a 16.7 acre site in the Medium High Density Residential (RMH) zone at 7800 SW Sagert Street and 20400 SW Martinazzi Avenue (Washington County Tax Lot: 2S125BA00100).

**RECOMMENDATION:**

Based on the analysis and findings, as well as the application materials demonstrating compliance with the applicable review criteria, staff respectfully recommends approval of the subject Architectural Review application (AR 22-0008), subject to the recommended conditions of approval in the attached Analysis and Findings.

**EXECUTIVE SUMMARY:**

- The subject proposal is a Type III land use case, subject to a quasi-judicial hearing before the Architectural Review Board.
- The subject site comprises 16.7 acres of land in the Medium High Density Residential zone, located south of SW Sagert Street, east of SW Martinazzi Avenue, north of SW Avery Street and west of I-5 exit to I-205. The land is currently occupied by 211 multiple family units in 26 buildings and abuts the Methodist Church of Tualatin campus along the western property line of the subject property. There are currently 361 parking spaces for the existing development.
- The applicant proposes to demolish two existing buildings and add an additional 12 buildings that will consist of multi-story townhomes. The proposed development will increase the total number of dwelling units to 240 within 36 buildings. The new units will be two and three bedrooms. The applicant is proposing to add 8 carports with 132 spaces for an overall total of 442 off-street parking spaces to serve the entire apartment community. An existing basketball court and other paved play area will be removed for the proposed construction. An existing swimming pool will remain. There will be 5 outdoor play areas to serve all the residents.
- The applicant has also proposing removal of 49 trees and have submitted a Tree Removal Permit in conjunction with this Architectural Review.
- There are existing City utilities that will adequately serve the site.
- Public comments - No public comments were received as off the date this staff report was drafted.

**OUTCOMES OF DECISION:**

Approval of AR 22-0008 will facilitate construction of the proposed development.

**ALTERNATIVES TO RECOMMENDATION:**

The Architectural Review Board may alternatively:

- Approve AR 22-0008 with conditions of approval and direct staff to provide updated Analysis and Findings;
  - Continue the hearing to a later date for further consideration; or
  - Deny AR 22-0008.
- 

**ATTACHMENTS:**

- Attachment A – Presentation
- Attachment B - Analysis and Findings
- Exhibit A1 - Narrative
- Exhibit A2 – Plan Set and Elevations
- Exhibit A3 – Tree Assessment Report
- Exhibit A4 – Transportation Impact Analysis
- Exhibit A5 – Preliminary Stormwater Report
- Exhibit A6 – Supporting Documents
- Exhibit B – Public Noticing Requirements
- Exhibit C – Tualatin Valley Fire & Rescue Conditions
- Exhibit D – Clean Water Services Memorandum
- Exhibit E – ODOT Response
- Exhibit F – Figure 73-1 Parking Space Design Standards
- Exhibit G – Figure 73-2 Vision Clearance Area
- Exhibit H – Map 8-1 Tualatin Functional Classification Plan
- Exhibit I – Map 8-4 Tualatin Bicycle and Pedestrian Plan
- Exhibit J – Map 8-5 Tualatin Transit Plan
- Attachment C – Final Order



**AR 22-0008**  
**Alden Apartments**  
7800 SW Sagert Street and 20400  
SW Martinazzi Avenue



**AR 22-0008**  
**Alden Apartments**

**ARCHITECTURAL REVIEW BOARD**  
**November 30, 2022**



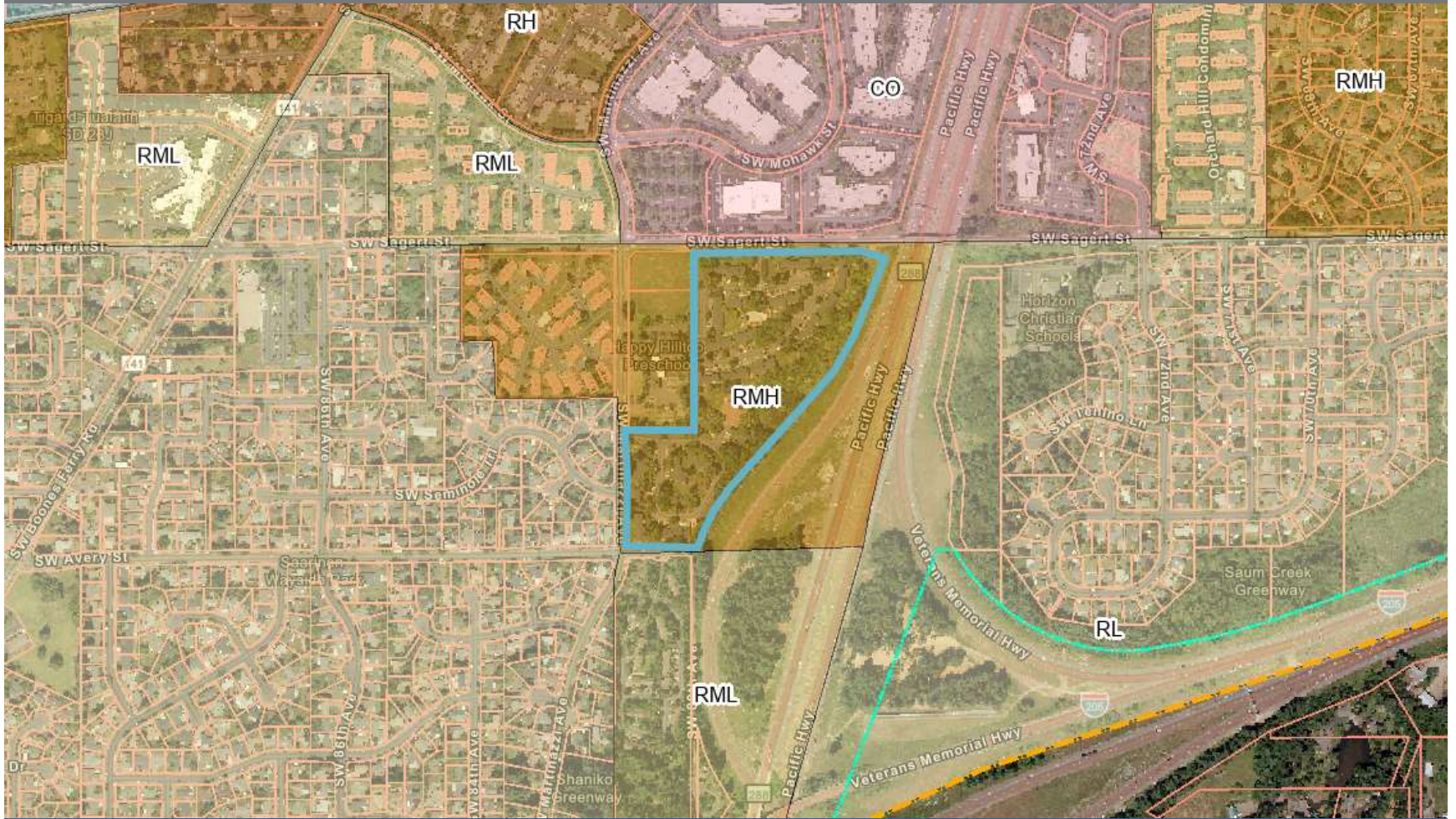
# Tonight's Presentation

1. Site Background
2. Project Overview
3. Applicable Criteria
4. Conclusion





# Site Background

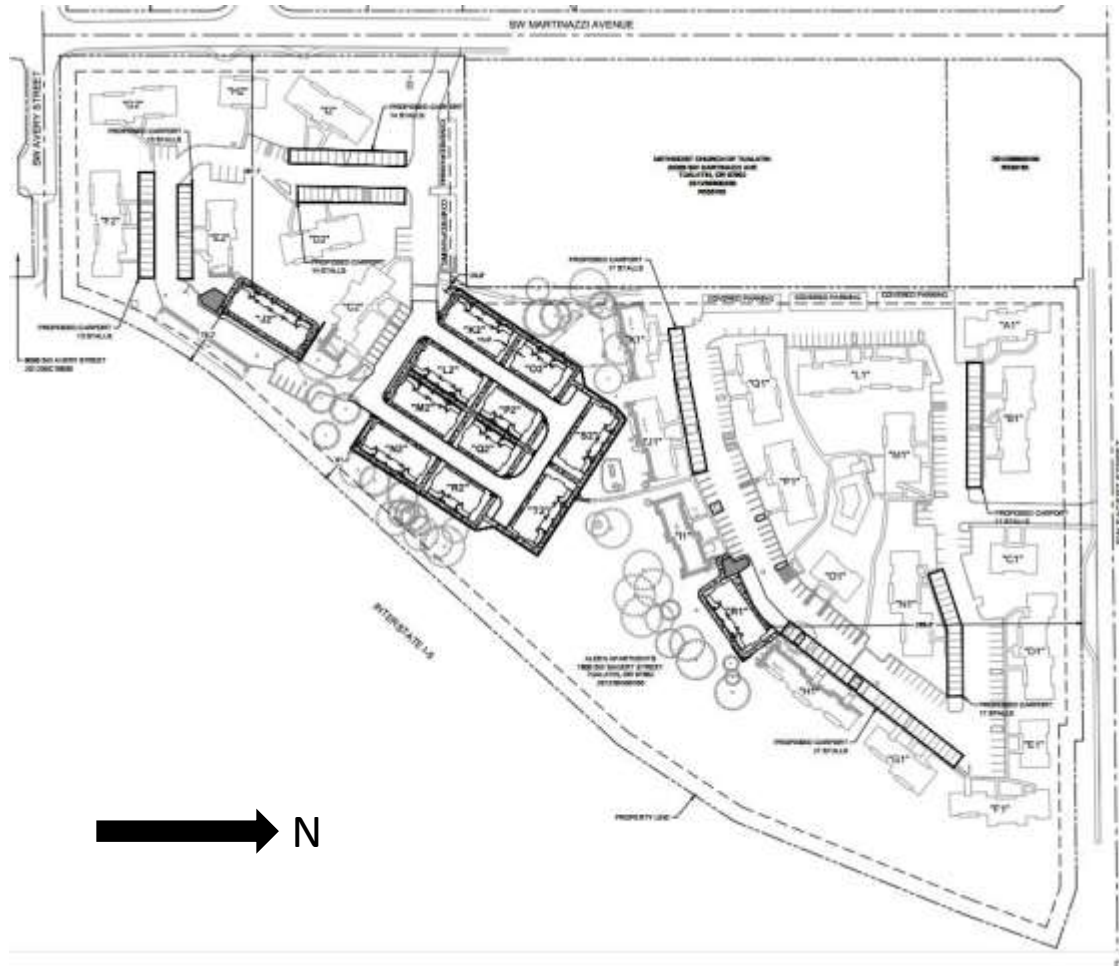


AR 22-0008  
Alden Apartments

ARCHITECTURAL REVIEW BOARD  
November 30, 2022



# Project Overview



AR 22-0008  
Alden Apartments

ARCHITECTURAL REVIEW BOARD  
November 30, 2022



# Procedures (TDC 32.230)

## **Type III Architectural Review:**

- Application 1<sup>st</sup> submitted – September 1, 2022
- Additional Information Submitted on September 27<sup>th</sup>, October 5<sup>th</sup> and October 10<sup>th</sup>
- Deemed complete – September 29, 2022
- Notice of Hearing sent – November 9, 2022
- Public hearing – November 30, 2022
- Final decision required – January 27, 2023





# Architectural Review (TDC 33.020)

## **Architectural Review for Large Multi-family**

**Developments:** Approval criteria listed in Chapter 73A through 73G, including:

- Site Design Standards
- Landscaping Standards
- Parking Standards
- Waste & Recyclable Management Standards

**Conditions of Approval:** may implement identified public facilities and services needed to serve the proposed development through Chapters 74 and 75.



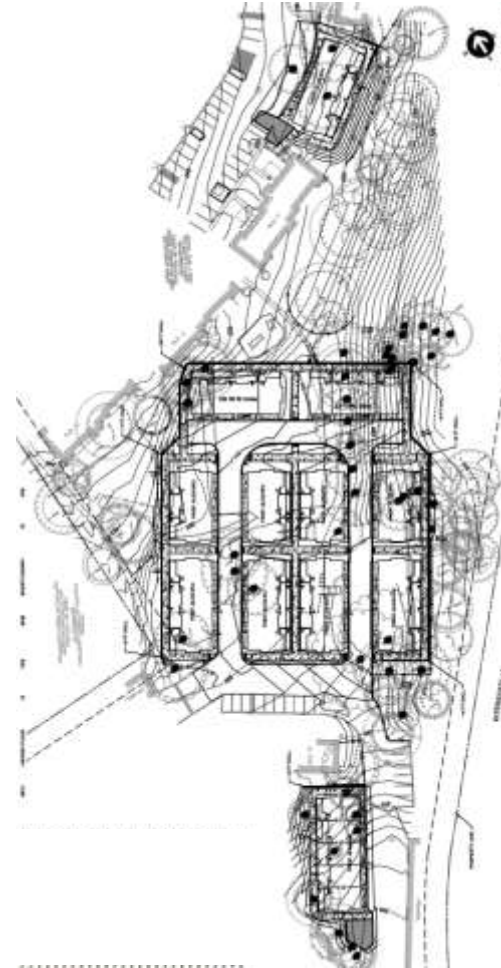


# Tree Removal (TDC 33.110)

**The application includes tree removal:**

Approval Criteria

- The tree is diseased;
- The tree is a hazard;
- Necessary to remove tree to construct proposed improvements





# RMH Zone (TDC 42)

## The proposal complies with zoning:

- Permitted uses
- Setbacks
- Building height

USE CATEGORY	STATUS	
Household Living: Multi-family structure	Permitted	
STANDARD	REQUIREMENT	PROPOSED
<i>Front (Sagert/Matinazzi) (Min.)</i>	35 ft	61.2 ft
<i>Side/Rear (Min.)</i>	12 ft	20 ft
<i>Between Buildings (Min.)</i>	10 ft	15 ft
<i>Parking Buffer (Min)</i>	10 ft	20 ft
<b>Building Height (Max):</b>	35 ft	35 ft

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# Site Design (TDC 73A)

**The proposal complies with requirements for:**

- Private Outdoor Areas
- Entry Areas
- Shared Outdoor Areas
- Children's Play Areas
- Storage
- Walkways/Accessways
- Lighting
- Safety & Security
- Service, Delivery & Screening



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# Proposed Building Design (TDC 73A)



AR 22-0008  
Alden Apartments

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# Building Design (TDC 73A)



Alden Apartment (existing front)



Alden Apartments (existing rear)

AR 22-0008  
Alden Apartments

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# Building Design (TDC 73A)



Martinazzi Village (south)



Office (north)

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# Building Design (TDC 73A)



Tualatin Methodist Church (west)



Single Family Home (west)

AR 22-0008  
Alden Apartments

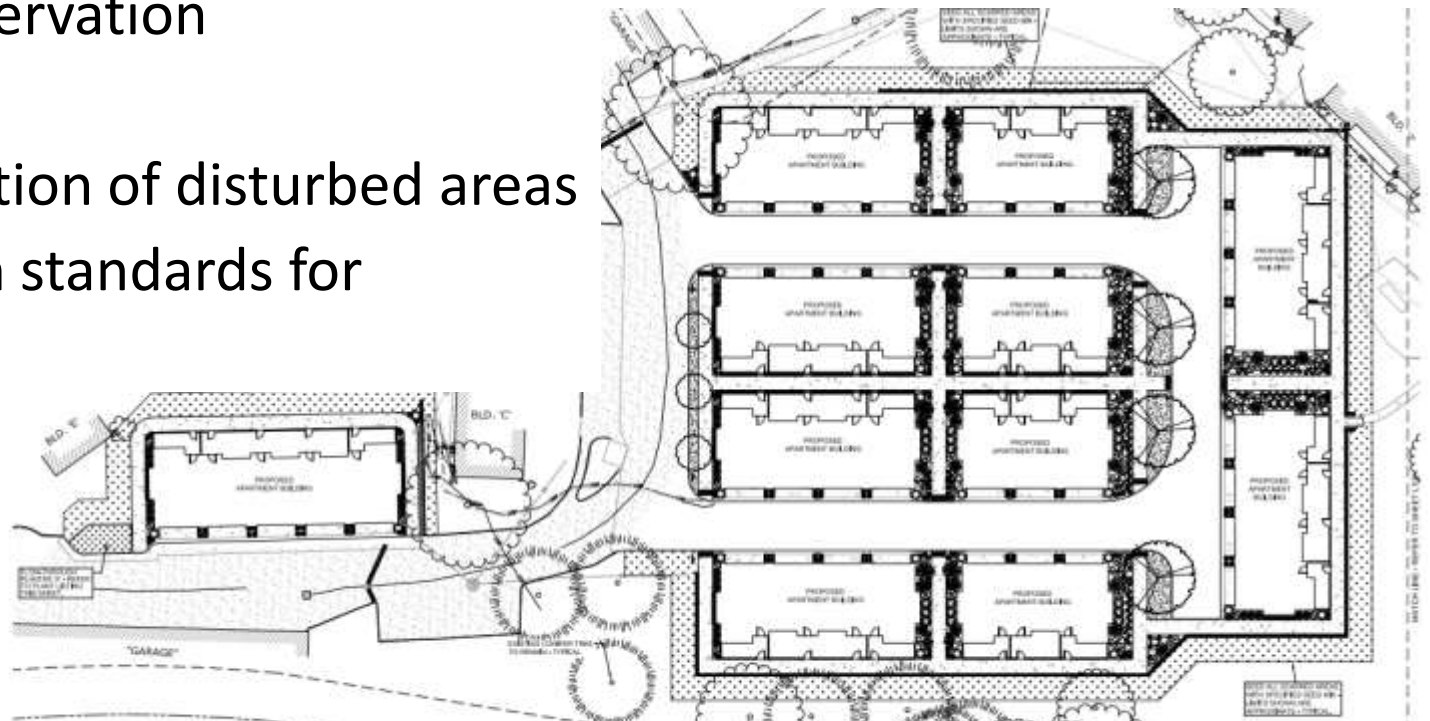
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# Landscaping Standards (TDC 73B)

The application demonstrates the proposal complies with requirements for:

- Tree preservation
- Irrigation
- Revegetation of disturbed areas
- Minimum standards for plantings



AR 22-0008  
Alden Apartments

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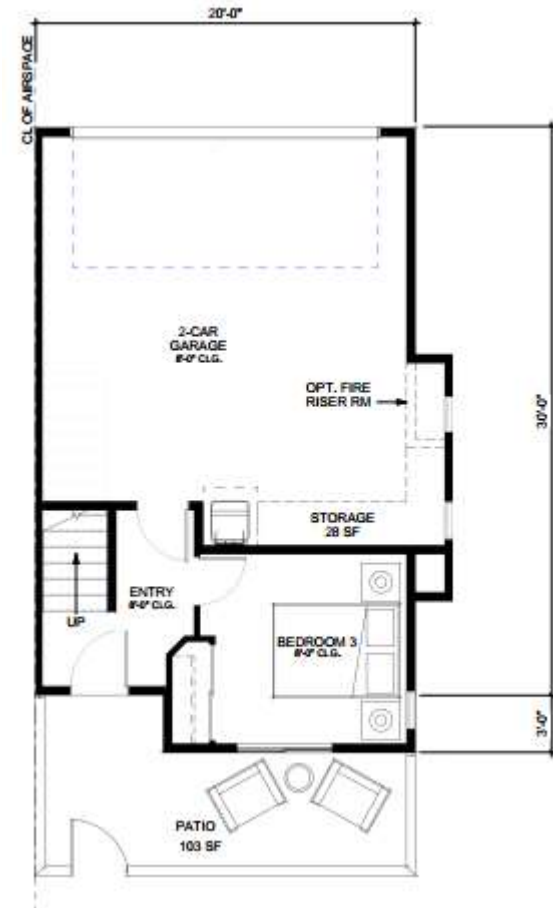




# Parking Standards (TDC 73C)

**The application demonstrates the proposal complies with requirements for:**

- Minimum parking requirements (361 required\* & 442 provided)
- Bike parking (45 units, bicycle parking within each units garages)
- Parking / drive aisle standards
- Parking lot landscaping
- 8 carports are proposed for the existing parking lot

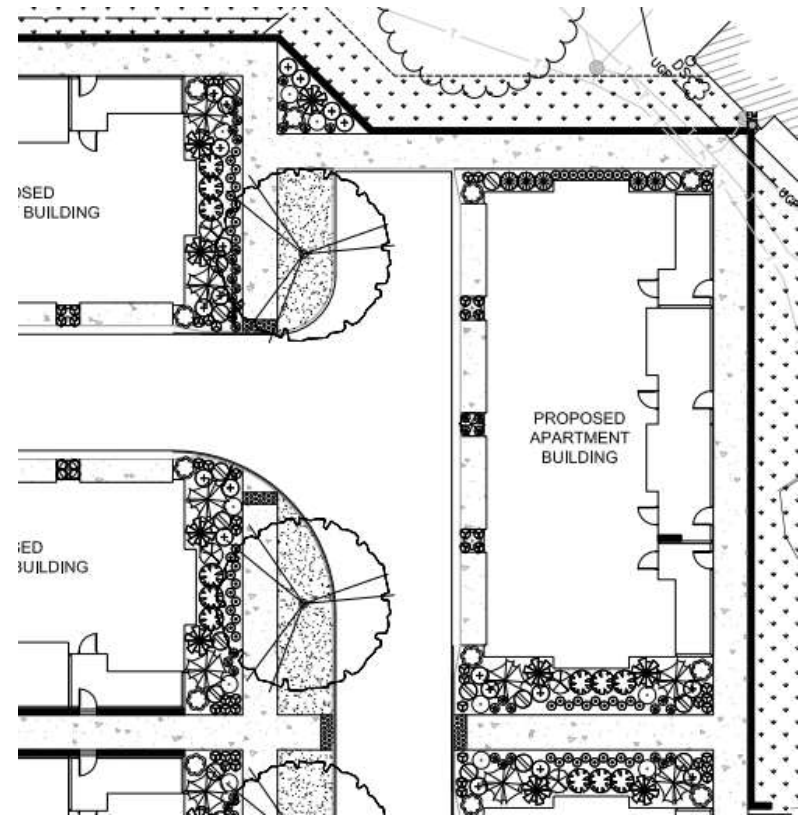




# Parking Standards (TDC 73C)

**With conditions, the proposal complies with TDC 73C.210(2):**

- Clear vision zone must be maintained at ends of on-site drive aisles and at driveway entrances, vertically between a maximum of 30 inches and a minimum of eight feet as measured from the ground level.





# Waste and Recyclables (TDC 73D)

**The application demonstrates the proposal complies with requirements for:**

- Minimum Storage Area
- Per Republic Services, Waste and Recyclables placed at the end of each units driveway for pickup



# Public Improvements (TDC 74) and Access Management (TDC 75)

**With conditions, the proposal complies with public improvement and access management standards.**

- Right-of-Way and easement dedications required
- Street improvements have been conditioned
- Public utility standards met by condition (Water, Sanitary Sewer, Storm Sewer)
- Grading and erosion control standards will apply through construction
- No access location modifications are proposed to SW Martinazzi Avenue or SW Sagert Street.
- Modifications to streets will be required to match existing cross-section



# Conclusion

- The findings demonstrate that the proposal meets the applicable criteria of the Tualatin Development Code with the recommended Conditions of Approval.
- Therefore, staff respectfully recommends approval of the subject Architectural Review application (AR 22-0008), as conditioned.
- Questions?



## ANALYSIS AND FINDINGS ALDEN APARTMENTS

**ARB Hearing: November 30, 2022**

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Case #:	AR 22-0008
Project:	Alden Apartments
Location:	7800 SW Sagert Street and 20400 SW Martinazzi Avenue, Tax Map/Lot: 2S125BA00100
Representative:	Heather Austin, AICP, 3j Consulting, Inc.
Owner:	CR Alden Communities, LLC

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*Arrangements can be made to provide these materials in alternative formats such as large type or audio recording. Please contact the Planning Division at 503.691.3026 and allow as much lead time as possible.*

## I. INTRODUCTION

### A. Applicable Criteria

The following Chapters of the Tualatin Development Code (TDC) are applicable to the subject proposal:

- TDC 32: Procedures
- TDC 33.020: Architectural Review
- TDC 33.110: Tree Removal Permit/Review
- TDC 42: Medium High Density Residential (RH) Zone
- TDC 73A: Site Design Standards
- TDC 73B: Landscaping Standards
- TDC 73C: Parking Standards
- TDC 73D: Waste and Recyclables Management Standards
- TDC 74: Public Improvements
- TDC 75: Access

### B. Site Description

The subject site is a 16.7 acre property with the street addresses of 7800 SW Sagert Street and 20400 SW Martinazzi Avenue (Washington County Tax Lot: 2S125BA00100). As illustrated in Figure 1, the site is zoned Medium High Density Residential (RMH). Access is provided from SW Sagert Street and SW Martinazzi Avenue. SW Avery Street also abuts the site to the south but there is no ingress/egress access. The I-205 eastbound exit ramp from I-5 abuts the property to the east. Alden Apartments currently consists of 26 buildings with 211 dwelling units that are served by 372 off-street parking spaces. The land reaches a high point of 254 feet in elevation near the center of the property and has lower elevations around the perimeter of the property.

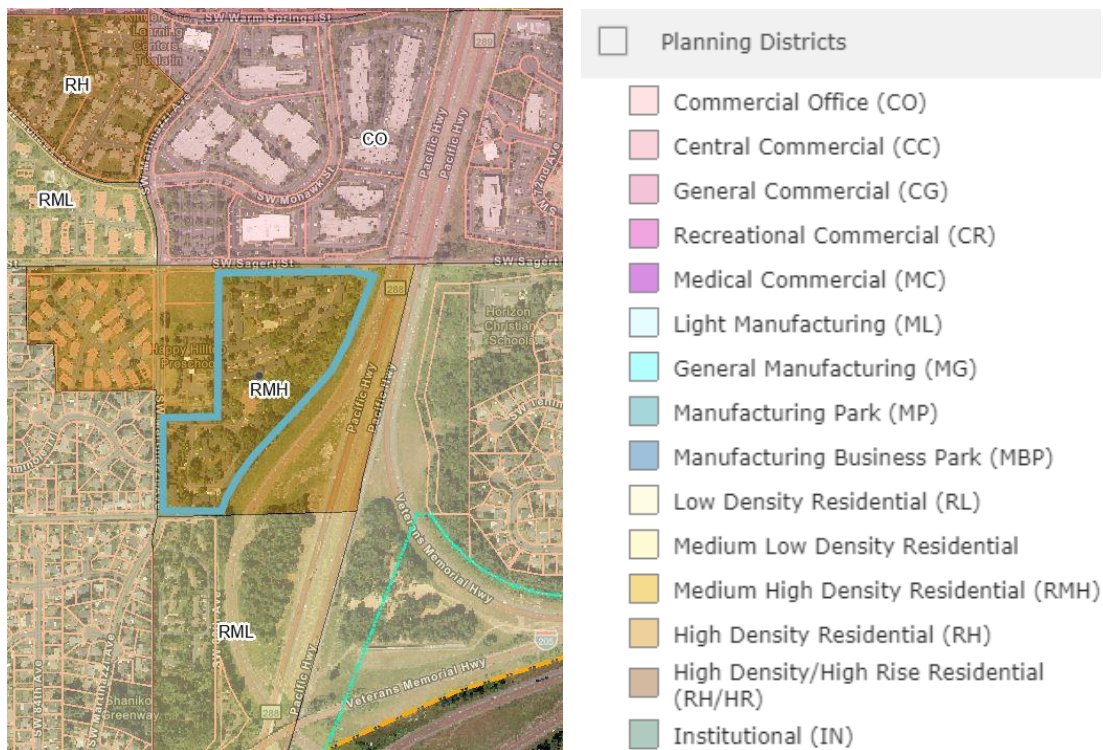


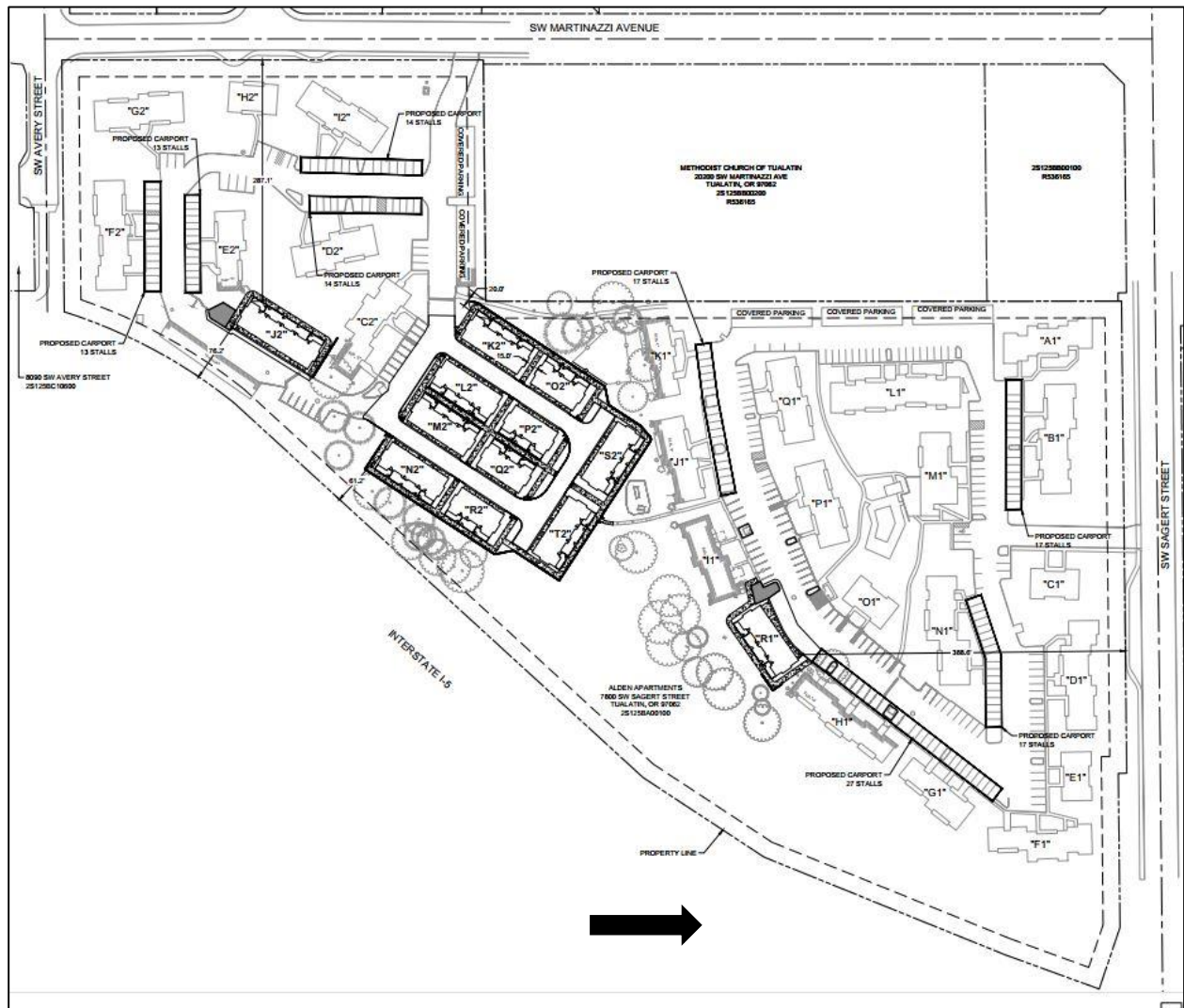
Figure 1: Aerial view of subject site (highlighted)



### C. Proposed Project

As described in the applicant’s narrative and illustrated on their plan set (Exhibit A1 and A2), CR Alden Communities, LLC. proposes to demolish 2 existing buildings and construct 12 new buildings consisting 45 townhouses. There will be four 3-unit buildings, seven 4-unit buildings and one 5-unit building. There are currently 211 dwelling units spread throughout 26 buildings. The proposed development would increase the total number of dwelling units to 240 within 36 buildings (Figure 2). Eight new carports will be constructed within the existing parking lots. A total of 442 parking spaces will be provided for all units within Alden Apartments. An existing basketball court and other paved play areas will be removed for the proposed construction. There will be 5 outdoor play areas to serve the entire development. The existing swimming pool will also remain.

Figure 2: Site Plan (overview)



In conjunction with this Architectural Review application, the applicant has submitted a Tree Removal Permit application. The Arborists’ Tree Assessment Report (Exhibit A3) surveyed 88 trees and recommends the preservation of 37 on-site trees that are over 8” in diameter. There will be a total of 49 trees removed with two other non-regulated trees proposed for removal.



**D. Previous Land Use Actions**

- ANN69-01 Property Annexed into Tualatin
- AR78-03 Phase I Maricopa Hills
- AR78-24 Phase II Maricopa Hills

**E. Surrounding Uses**

Adjacent land uses and zoning includes:

North: Office Commercial Zone (CO)

- Office
- SW Sagert Street

East: Medium High Density Residential Zone (RMH)

- I-205 On Ramp to I-5

South: Medium Low Density Residential Zone (RML)

- Multi-Family Residential
- SW Avery Street

West: Medium High Density Residential Zone (RMH) and Low Density Residential Zone (RL)

- Single Family Residential Property
- Duplex and Triplex Residential Development
- Tualatin United Methodist Church Campus
- Vacant
- SW Martinazzi Avenue

**F. Exhibit List**

Exhibit A1 - Narrative

Exhibit A2 – Plan Set and Elevations

Exhibit A3 – Tree Assessment Report

Exhibit A4 – Transportation Impact Analysis

Exhibit A5 – Preliminary Stormwater Report

Exhibit A6 – Supporting Documents

Exhibit B – Public Noticing Requirements

Exhibit C – Tualatin Valley Fire & Rescue Conditions

Exhibit D – Clean Water Services Memorandum

Exhibit E – ODOT Response

Exhibit F – Figure 73-1 Parking Space Design Standards

Exhibit G – Figure 73-2 Vision Clearance Area

Exhibit H – Map 8-1 Tualatin Functional Classification Plan

Exhibit I – Map 8-4 Tualatin Bicycle and Pedestrian Plan

Exhibit J – Map 8-5 Tualatin Transit Plan

## II. PLANNING FINDINGS

*These findings reference the Tualatin Development Code (TDC), unless otherwise noted.*

### Chapter 32: Procedures

#### Section 32.010 – Purpose and Applicability.

[...]

**(2) Applicability of Review Procedures.** All land use and development permit applications and decisions, will be made by using the procedures contained in this Chapter. The procedure “type” assigned to each application governs the decision-making process for that permit or application. There are five types of permit/application procedures as described in subsections (a) through (e) below. Table 32-1 lists the City’s land use and development applications and corresponding review procedure(s).

[...]

**(c) Type III Procedure (Quasi-Judicial Review – Public Hearing).** Type III procedure is used when the standards and criteria require discretion, interpretation, or policy or legal judgment. Quasi-Judicial decisions involve discretion but implement established policy. Type III decisions are made by the Planning Commission or Architectural Review Board and require public notice and a public hearing, with an opportunity for appeal to the City Council.

[...]

**(3) Determination of Review Type.** Unless specified in Table 32-1, the City Manager will determine whether a permit or application is processed as Type I, II, III, IV-A or IV-B based on the descriptions above. Questions regarding the appropriate procedure will be resolved in favor of the review type providing the widest notice and opportunity to participate. An applicant may choose to elevate a Type I or II application to a higher numbered review type, provided the applicant pays the appropriate fee for the selected review type.

**Table 32-1 – Applications Types and Review Procedures**

Application / Action	Type	Decision Body*	Appeal Body*	Pre-Application Conference Required	Neighborhood /Developer Mtg Required	Applicable Code Chapter
<b>Architectural Review</b>						
Multifamily Housing Projects 100 units and above (or any number of units abutting a single family district) •as requested by the CM	III	ARB	CC	Yes	Yes	TDC 33.020
[...]						
* City Council (CC); Planning Commission (PC); Architectural Review Board (ARB); City Manager or designee (CM); Land Use Board of Appeals (LUBA).						

#### **Finding:**

*Alden Apartments currently has 211 dwelling units. The proposal is requesting an increase of 29 units for a total of 240 units. Additionally, the subject property abuts RL and RML zoned properties. Therefore the proposed project will require a Type III Review according to Table 32-1. The application has been processed according to the applicable code for Type III procedures. This standard is met.*

**Section 32.030 – Time to Process Applications.**

**(1) Time Limit - 120-day Rule.** The City must take final action on all Type II, Type III, and Type IV-A land use applications, as provided by ORS 227.178, including resolution of all local appeals, within 120 days after the application has been deemed complete under TDC 32.160, unless the applicant provides written request or consent to an extension in compliance with ORS 227.178. (Note: The 120-day rule does not apply to Type IV-B (Legislative Land Use) decisions.)

[...]

**Finding:**

*The application was deemed complete on September 29, 2022, while the hearing for AR 22-0008 is scheduled for November 30, 2022. Final action will take place by January 27, 2023 in compliance with ORS 227.178. This standard is met.*

**Section 32.110 – Pre-Application Conference.**

**(1) Purpose of Pre-Application Conferences.** Pre-application conferences are intended to familiarize applicants with the requirements of the TDC; to provide applicants with an opportunity discuss proposed projects in detail with City staff; and to identify approval criteria, standards, and procedures prior to filing a land use application. The pre-application conference is intended to be a tool to assist applicants in navigating the land use process, but is not intended to be an exhaustive review that identifies or resolves all potential issues, and does not bind or preclude the City from enforcing any applicable regulations or from applying regulations in a manner differently than may have been indicated at the time of the pre-application conference.

**(2) When Mandatory.** Pre-application conferences are mandatory for all land use actions identified as requiring a pre-application conference in Table 32-1. An applicant may voluntarily request a pre-application conference for any land use action even if it is not required.

**(3) Timing of Pre-Application Conference.** A pre-application conference must be held with City staff before an applicant submits an application and before an applicant conducts a Neighborhood/Developer meeting.

**(4) Application Requirements for Pre-Application Conference.**

**(a) Application Form.** Pre-application conference requests must be made on forms provided by the City Manager.

**(b) Submittal Requirements.** Pre-application conference requests must include:

**(i)** A completed application form;

**(ii)** Payment of the application fee;

**(iii)** The information required, if any, for the specific pre-application conference sought; and

**(iv)** Any additional information the applicant deems necessary to demonstrate the nature and scope of the proposal in sufficient detail to allow City staff to review and comment.

**(5) Scheduling of Pre-Application Conference.** Upon receipt of a complete application, the City Manager will schedule the pre-application conference. The City Manager will coordinate the involvement of city departments, as appropriate, in the pre-application conference. Pre-application conferences are not open to the general public.

**(6) Validity Period for Mandatory Pre-Application Conferences; Follow-Up Conferences.** A follow-up conference is required for those mandatory pre-application conferences that have previously been held when:

**(a)** An application relating to the proposed development that was the subject of the pre-application conference has not been submitted within six (6) months of the pre-application conference;

**(b)** The proposed use, layout, and/or design of the proposal have significantly changed; or

**(c) The owner and/or developer of a project changes after the pre-application conference and prior to application submittal.**

**Finding:**

*The subject land use action is identified as requiring a pre-application conference in Table 32-1. The applicant participated in a pre-application meeting on March 9, 2022, within the six month deadline for application submittal after the applicant and representative of the property owner attended a preapplication meeting. These standards are met.*

**Section 32.120 – Neighborhood/Developer Meetings.**

**(1) Purpose.** The purpose of this meeting is to provide a means for the applicant and surrounding property owners to meet to review a development proposal and identify issues regarding the proposal so they can be considered prior to the application submittal. The meeting is intended to allow the developer and neighbors to share information and concerns regarding the project. The applicant may consider whether to incorporate solutions to these issues prior to application submittal.

**(2) When Mandatory.** Neighborhood/developer meetings are mandatory for all land use actions identified in Table 32-1 as requiring a neighborhood/developer meeting. An applicant may voluntarily conduct a neighborhood/developer meeting even if it is not required and may conduct more than one neighborhood/developer meeting at their election.

**(3) Timing.** A neighborhood/developer meeting must be held after a pre-application meeting with City staff, but before submittal of an application.

**(4) Time and Location.** Required neighborhood/developer meetings must be held within the city limits of the City of Tualatin at the following times:

(a) If scheduled on a weekday, the meeting must begin no earlier than 6:00 p.m.

(b) If scheduled on a weekend, the meeting must begin between 10:00 a.m. and 6:00 p.m.

**(5) Notice Requirements.**

(a) The applicant must provide notice of the meeting at least 14 calendar days and no more than 28 calendar days before the meeting. The notice must be by first class mail providing the date, time, and location of the meeting, as well as a brief description of the proposal and its location. The applicant must keep a copy of the notice to be submitted with their land use application.

(b) The applicant must mail notice of a neighborhood/developer meeting to the following persons:

(i) All property owners within 1,000 feet measured from the boundaries of the subject property;

(ii) All property owners within a platted residential subdivision that is located within 1,000 feet of the boundaries of the subject property. The notice area includes the entire subdivision and not just those lots within 1,000 feet. If the residential subdivision is one of two or more individually platted phases sharing a single subdivision name, the notice area need not include the additional phases; and

(iii) All designated representatives of recognized Citizen Involvement Organizations as established in TMC Chapter 11-9.

(c) The City will provide the applicant with labels for mailing for a fee.

(d) Failure of a property owner to receive notice does not invalidate the neighborhood/developer meeting proceedings.

**(6) Neighborhood/Developer Sign Posting Requirements.** The applicant must provide and post on the subject property, at least 14 calendar days before the meeting. The sign must conform to the design

and placement standards established by the City for signs notifying the public of land use actions in TDC 32.150.

**(7) Neighborhood/Developer Meeting Requirements.** The applicant must have a sign-in sheet for all attendees to provide their name, address, telephone number, and email address and keep a copy of the sign-in sheet to provide with their land use application. The applicant must prepare meeting notes identifying the persons attending, those commenting and the substance of the comments expressed, and the major points that were discussed. The applicant must keep a copy of the meeting notes for submittal with their land use application.

**Finding:**

*The applicant has provided evidence within Exhibit A6 that they held a Neighborhood/Developer meeting on August 10, 2022, a little over 5 months prior to application submittal. The applicant has provided documentation of sign posting and notification in compliance with this section, as well as a sign-in sheet and notes from the meeting. These standards are met.*

**Section 32.130 – Initiation of Applications.**

**(1) Type I, Type II, Type III, and Type IV-A Applications.** Type I, Type II, Type III, and Type IV-A applications may be submitted by one or more of the following persons:

- (a) The owner of the subject property;
- (b) The contract purchaser of the subject property, when the application is accompanied by proof of the purchaser's status as such and by the seller's written consent;
- (c) A lessee in possession of the property, when the application is accompanied by the owners' written consent; or
- (d) The agent of any of the foregoing, when the application is duly authorized in writing by a person authorized to submit an application by paragraphs (a), (b) or (c) of this subsection, and accompanied by proof of the agent's authority.

[...]

**Finding:**

*The application has been signed by Matthew Moiseve, a representative of Colrich California Construction, LLC., who is the owner of the subject property. Heather Austin of 3j Consulting, Inc. has signed as the applicant representing the property owner. This standard is met.*

**Section 32.140 – Application Submittal.**

**(1) Submittal Requirements.** Land use applications must be submitted on forms provided by the City. A land use application may not be accepted in partial submittals. All information supplied on the application form and accompanying the application must be complete and correct as to the applicable facts. Unless otherwise specified, all of the following must be submitted to initiate completeness review under TDC 32.160:

- (a) A completed application form. The application form must contain, at a minimum, the following information:
  - (i) The names and addresses of the applicant(s), the owner(s) of the subject property, and any authorized representative(s) thereof;
  - (ii) The address or location of the subject property and its assessor's map and tax lot number;
  - (iii) The size of the subject property;
  - (iv) The comprehensive plan designation and zoning of the subject property;
  - (v) The type of application(s);
  - (vi) A brief description of the proposal; and

- (vii) Signatures of the applicant(s), owner(s) of the subject property, and/or the duly authorized representative(s) thereof authorizing the filing of the application(s).
  - (b) A written statement addressing each applicable approval criterion and standard;
  - (c) Any additional information required under the TDC for the specific land use action sought;
  - (d) Payment of the applicable application fee(s) pursuant to the most recently adopted fee schedule;
  - (e) Recorded deed/land sales contract with legal description.
  - (f) A preliminary title report or other proof of ownership.
  - (g) For those applications requiring a neighborhood/developer meeting:
    - (i) The mailing list for the notice;
    - (ii) A copy of the notice;
    - (iii) An affidavit of the mailing and posting;
    - (iv) The original sign-in sheet of participants; and
    - (v) The meeting notes described in TDC 32.120(7).
  - (h) A statement as to whether any City-recognized Citizen Involvement Organizations (CIOs) whose boundaries include, or are adjacent to, the subject property were contacted in advance of filing the application and, if so, a summary of the contact. The summary must include the date when contact was made, the form of the contact and who it was with (e.g. phone conversation with neighborhood association chairperson, meeting with land use committee, presentation at neighborhood association meeting), and the result;
  - (i) Any additional information, as determined by the City Manager, that may be required by another provision, or for any other permit elsewhere, in the TDC, and any other information that may be required to adequately review and analyze the proposed development plan as to its conformance to the applicable criteria;
- (2) Application Intake. Each application, when received, must be date-stamped with the date the application was received by the City, and designated with a receipt number and a notation of the staff person who received the application.
- (3) Administrative Standards for Applications. The City Manager is authorized to establish administrative standards for application forms and submittals, including but not limited to plan details, information detail and specificity, number of copies, scale, and the form of submittal.

**Finding:**

*The applicant submitted the subject application on September 1, 2022. The applicant subsequently submitted additional information on September 27, 2022, October 5, 2022 and October 10, 2022. The application was deemed complete on September 29, 2022. The material submitted after the initial application submittal did not change the development plans that were submitted on September 1, 2022. The general land use submittal requirements were included with this application. These standards are met.*

**Section 32.150 - Sign Posting.**

- (1) When Signs Posted. Signs in conformance with these standards must be posted as follows:
  - (a) Signs providing notice of an upcoming neighborhood/developer meeting must be posted prior to a required neighborhood/developer meeting in accordance with Section 32.120(6); and
  - (b) Signs providing notice of a pending land use application must be posted after land use application has been submitted for Type II, III and IV-A applications.
- (2) Sign Design Requirements. The applicant must provide and post a sign(s) that conforms to the following standards:
  - (a) Waterproof sign materials;

- (b) Sign face must be no less than eighteen (18) inches by twenty-four (24) inches (18" x 24"); and
- (c) Sign text must be at least two (2) inch font.

(3) **On-site Placement.** The applicant must place one sign on their property along each public street frontage of the subject property. (Example: If a property adjoins four public streets, the applicant must place a sign at each of those public street frontages for a total of four signs). The applicant cannot place the sign within public right of way.

(4) **Removal.** If a sign providing notice of a pending land use application disappears prior to the final decision date of the subject land use application, the applicant must replace the sign within forty-eight (48) hours of discovery of the disappearance or of receipt of notice from the City of its disappearance, whichever occurs first. The applicant must remove the sign no later than fourteen (14) days after:

- (a) The meeting date, in the case of signs providing notice of an upcoming neighborhood/developer meeting; or
- (b) The City makes a final decision on the subject land use application, in the case of signs providing notice of a pending land use application.

**Finding:**

*The applicant provided certification within Exhibit A6 that signs were placed on site in accordance with this section. This standard is met.*

**Section 32.160 – Completeness Review.**

(1) **Duration.** Except as otherwise provided under ORS 227.178, the City Manager must review an application for completeness within 30 days of its receipt.

(2) **Considerations.** Determination of completeness will be based upon receipt of the information required under TDC 32.140 and will not be based on opinions as to quality or accuracy. Applications that do not respond to relevant code requirements or standards can be deemed incomplete. A determination that an application is complete indicates only that the application is ready for review on its merits, not that the City will make a favorable decision on the application.

(3) **Complete Applications.** If an application is determined to be complete, review of the application will commence.

(4) **Incomplete Applications.** If an application is determined to be incomplete, the City Manager must provide written notice to the applicant identifying the specific information that is missing and allowing the applicant the opportunity to submit the missing information. An application which has been determined to be incomplete must be deemed complete for purposes of this section upon receipt of:

- (a) All of the missing information;
- (b) Some of the missing information and written notice from the applicant that no other information will be provided; or
- (c) Written notice from the applicant that none of the missing information will be provided.

(5) **Vesting.** If an application was complete at the time it was first submitted, or if the applicant submits additional required information within 180 days of the date the application was first submitted, approval or denial of the application must be based upon the standards and criteria that were in effect at the time the application was first submitted.

(6) **Void Applications.** An application is void if the application has been on file with the City for more than 180 days and the applicant has not provided the missing information or otherwise responded, as provided in subsection (4) of this section.

**Finding:**

*The subject application was submitted on September 1, 2022. The application was deemed complete on September 29, 2022. These standards are met.*

**TDC 32.170. - Revised Applications.**

Revisions or alterations of an application may be made following the determination that an application is complete, provided such revisions or alterations do not render the application incomplete and do address applicable requirements. When revisions or alterations are desired by the applicant or required by the City, the applicant must provide fully revised application materials and clearly identifying those application materials which are revised.

**Finding:**

*The applicant submitted the subject application on September 1, 2022. The applicant submitted additional information on September 27, 2022, October 5, 2022 and October 10, 2022. The application was deemed complete on September 29, 2022. The material submitted after the initial application submittal did not change the development plans or render the application incomplete and do address applicable requirements. This standard is met.*

**Section 32.230 – Type III Procedure (Quasi-Judicial Review – Public Hearing).**

Type III decisions involve the use of discretion and judgment and are made by the Planning Commission or Architectural Review Board after a public hearing with an opportunity for appeal to the City Council. The decision body for each application type is specified in Table 32-1. A hearing under these procedures provides a forum to apply standards to a specific set of facts to determine whether the facts conform to the applicable criteria and the resulting determination will directly affect only a small number of identifiable persons.

**(1) Submittal Requirements.** Type III applications must include the submittal information required by TDC 32.140(1).

**(2) Determination of Completeness.** After receiving an application for filing, the City Manager will review the application will for completeness in accordance with TDC 32.160.

**(3) Written Notice of Public Hearing – Type III.** Once the application has been deemed complete, the City must mail by regular first class mail Notice of a Public Hearing to the following individuals and agencies no fewer than 20 days before the hearing.

**(a) Recipients:**

- (i) The applicant and, the owners of the subject property;**
- (ii) All property owners within 1,000 feet measured from the boundaries of the subject property;**
- (iii) All property owners within a platted residential subdivision that is located within 1,000 feet of the boundaries of the subject property. The notice area includes the entire subdivision and not just those lots within 1,000 feet. If the residential subdivision is one of two or more individually platted phases sharing a single subdivision name, the notice area need not include the additional phases;**
- (iv) All recognized neighborhood associations within 1,000 feet from the boundaries of the subject property;**
- (v) All designated representatives of recognized Citizen Involvement Organizations as established in TMC Chapter 11-9;**
- (vi) Any person who submits a written request to receive a notice;**
- (vii) Any governmental agency that is entitled to notice under an intergovernmental agreement entered into with the City and any other affected agencies, including but not limited to: school districts; fire district; where the project either adjoins or directly affects a**



state highway, the Oregon Department of Transportation; and where the project site would access a County road or otherwise be subject to review by the County, then the County; and Clean Water Services; Tri Met; and, ODOT Rail Division and the railroad company if a railroad-highway grade crossing provides or will provide the only access to the subject property. The failure of another agency to respond with written comments on a pending application does not invalidate an action or permit approval made by the City under this Code;

(viii) Utility companies (as applicable); and,

(ix) Members of the decision body identified in Table 32-1.

(b) The Notice of a Public Hearing, at a minimum, must contain all of the following information:

(i) The names of the applicant(s), any representative(s) thereof, and the owner(s) of the subject property;

(ii) The street address if assigned, if no street address has been assigned then Township, Range, Section, Tax Lot or Tax Lot ID;

(iii) The type of application and a concise description of the nature of the land use action;

(iv) A list of the approval criteria by TDC section for the decision and other ordinances or regulations that apply to the application at issue;

(v) Brief summary of the local decision making process for the land use decision being made and a general explanation of the requirements for submission of testimony and the procedure for conduct of hearings;

(vi) The date, time and location of the hearing;

(vii) Disclosure statement indicating that if any person fails to address the relevant approval criteria with enough detail, he or she may not be able to appeal to the Land Use Board of Appeals on that issue, and that only comments on the relevant approval criteria are considered relevant evidence;

(viii) The name of a City representative to contact and the telephone number where additional information may be obtained; and

(ix) Statement that the application and all documents and evidence submitted to the City are in the public record and available for review, and that copies can be obtained at a reasonable cost from the City; and

(x) Statement that a copy of the staff report will be available for inspection at no cost at least seven days prior to the hearing and will be provided at reasonable cost.

(c) Failure of a person or agency to receive a notice, does not invalidate any proceeding in connection with the application, provided the City can demonstrate by affidavit that required notice was given.

**Finding:**

*After submittal and completeness review as required by this section, notice for the Type III hearing concerning AR 22-0008 was mailed by city staff on November 9, 2022 as Exhibit B, which contained the information required by this section. No public comments were received at the time the Analysis and Findings were drafted. Agency comments were received and are included in Exhibits C, D and E. These standards are met.*

**(4) Conduct of the Hearing - Type III.**

The person chairing the hearing must follow the order of proceedings set forth below. These procedures are intended to provide all interested persons a reasonable opportunity to participate in the hearing process and to provide for a full and impartial hearing on the application before the body. Questions concerning the propriety or the conduct of a hearing will be addressed to the chair with a request for a ruling. Rulings from the chair must, to the extent possible, carry out the stated intention of these procedures. A ruling given by the chair on such question may be modified or

reversed by a majority of those members of the decision body present and eligible to vote on the application before the body. The procedures to be followed by the chair in the conduct of the hearing are as follows:

- (a) At the commencement of the hearing, the person chairing the hearing must state to those in attendance all of the following information and instructions:**
  - (i) The applicable substantive criteria;**
  - (ii) That testimony, arguments and evidence must be directed toward the criteria described in paragraph (i) of this subsection or other criteria in the plan or land use regulation which the person believes to apply to the decision;**
  - (iii) That failure to raise an issue accompanied by statements or evidence sufficient to afford the decision maker and the parties an opportunity to respond to the issue precludes appeal to the State Land Use Board of Appeals based on that issue;**
  - (iv) At the conclusion of the initial evidentiary hearing, the decision body must deliberate and make a decision based on the facts and arguments in the public record; and**
  - (v) Any participant may ask the decision body for an opportunity to present additional relevant evidence or testimony that is within the scope of the hearing; if the decision body grants the request, it will schedule a date to continue the hearing as provided in TDC 32.230(4)(e), or leave the record open for additional written evidence or testimony as provided TDC 32.230(4)(f).**
- (b) The public is entitled to an impartial decision body as free from potential conflicts of interest and pre-hearing ex parte (outside the hearing) contacts as reasonably possible. Where questions related to ex parte contact are concerned, members of the decision body must follow the guidance for disclosure of ex parte contacts contained in ORS 227.180. Where a real conflict of interest arises, that member or members of the decision body must not participate in the hearing, except where state law provides otherwise. Where the appearance of a conflict of interest is likely, that member or members of the decision body must individually disclose their relationship to the applicant in the public hearing and state whether they are capable of rendering a fair and impartial decision. If they are unable to render a fair and impartial decision, they must be excused from the proceedings.**
- (c) Presenting and receiving evidence.**
  - (i) The decision body may set reasonable time limits for oral presentations and may limit or exclude cumulative, repetitious, irrelevant, or personally derogatory testimony or evidence;**
  - (ii) No oral testimony will be accepted after the close of the public hearing. Written testimony may be received after the close of the public hearing only as provided by this section; and**
  - (iii) Members of the decision body may visit the property and the surrounding area, and may use information obtained during the site visit to support their decision, if the information relied upon is disclosed at the beginning of the hearing and an opportunity is provided to dispute the evidence.**
- (d) The decision body, in making its decision, must consider only facts and arguments in the public hearing record; except that it may take notice of facts not in the hearing record (e.g., local, state, or federal regulations; previous City decisions; case law; staff reports). Upon announcing its intention to take notice of such facts in its deliberations, it must allow persons who previously participated in the hearing to request the hearing record be reopened, as necessary, to present evidence concerning the newly presented facts.**
- (e) If the decision body decides to continue the hearing, the hearing must be continued to a date that is at least seven days after the date of the first evidentiary hearing (e.g., next regularly scheduled meeting). An opportunity must be provided at the continued hearing for persons to present and respond to new written evidence and oral testimony. If new written evidence is**

submitted at the continued hearing, any person may request, before the conclusion of the hearing, that the record be left open for at least seven days, so that he or she can submit additional written evidence or arguments in response to the new written evidence. In the interest of time, after the close of the hearing, the decision body may limit additional testimony to arguments and not accept additional evidence.

(f) If the decision body leaves the record open for additional written testimony, the record must be left open for at least seven days after the hearing. Any participant may ask the decision body in writing for an opportunity to respond to new evidence (i.e., information not disclosed during the public hearing) submitted when the record was left open. If such a request is filed, the decision body must reopen the record, as follows:

(i) When the record is reopened to admit new evidence or arguments (testimony), any person may raise new issues that relate to that new evidence or testimony;

(ii) An extension of the hearing or record granted pursuant to this section is subject to the limitations of TDC 32.030, unless the applicant waives his or her right to a final decision being made within the required timeframe; and

(iii) If requested by the applicant, the decision body must grant the applicant at least seven days after the record is closed to all other persons to submit final written arguments, but not evidence, provided the applicant may expressly waive this right.

**Finding:**

*The Architectural Review Board will follow the hearing requirements set forth by this section. These standards will be met.*

**(5) Notice of Adoption of a Type III Decision.**

Notice of Adoption must be provided to the property owner, applicant, and any person who provided testimony at the hearing or in writing. The Type III Notice of Adoption must contain all of the following information:

(a) A description of the applicant's proposal and the City's decision on the proposal, which may be a summary, provided it references the specifics of the proposal and conditions of approval in the public record;

(b) The address or other geographic description of the property proposed for development, including a map of the property in relation to the surrounding area;

(c) A statement that a copy of the decision and complete case file, including findings, conclusions, and conditions of approval, if any, is available for review and how copies can be obtained;

(d) The date the decision becomes final, unless a request for appeal is submitted; and

(e) The notice must include an explanation of rights to appeal the decision to the City Council in accordance with TDC 32.310.

**(6) Appeal of a Type III Decision.** Appeal of an Architectural Review Board or Planning Commission Type III Decision to the City Council may be made in accordance with TDC 32.310.

**(7) Effective Date of a Type III Decision.**

(a) The written order is the final decision on the application.

(b) The mailing date is the date of the order certifying its approval by the decision body.

(c) A decision of the Architectural Review Board or Planning Commission is final unless:

(i) a written appeal is received at the City offices within 14 calendar days of the date notice of the final decision is mailed; or

(ii) The City Manager or a member of the City Council requests a review of the decision within 14 calendar days of the date notice of the final decision is mailed.

**Finding:**

*A final decision and any appeal will follow the requirements of this section. These standards will be met.*

## **Chapter 33: Applications and Approval Criteria**

[...]

### **Section 33.020 Architectural Review**

[...]

#### **(5) Approval Criteria.**

**(c) Large Commercial, Industrial, and Multifamily Development. Applications for Large Commercial, Industrial, and Multifamily Development must comply with the applicable standards and objectives in TDC Chapter 73A through 73G.**

**Finding:**

*The subject application, which is for multi-family development, and must comply with the standards and objectives in TDC 73A through 73G. These standards are met with findings and conditions for the subject application.*

#### **(9) Permit Expiration.**

**Architectural Review decisions (including Minor Architectural Review decisions) expire two (2) years from the effective date unless the applicant has received a building, or grading permit submitted in conjunction with a building permit application, substantial construction has occurred pursuant to the building permit, and an inspection has been performed by a member of the Building Division.**

#### **(10) Extension of Permit Expiration.**

**(a) An Architectural Review approval may be extended if the applicant, or successor interest, submits a written request for an extension of time within two (2) years of the effective date.**

[...]

**(c) Upon receipt of a request for an extension of time, the City will process the extension request as follows:**

**(i) If the City Manager approved the Architectural Review, then the City Manager will decide the extension request under the Type II procedures in TDC 32.220.**

**(ii) If the Architectural Review Board (ARB) approved the Architectural Review, then the ARB will decide the extension request under the Type III quasi-judicial procedures in TDC 32.230.**

**(d) The City must provide notice of the extension request to past recipients of the Architectural Review notice of decision and the applicant must post a sign pursuant to TDC 32.150.**

**(e) The City Manager or Architectural Review Board, as applicable, may grant the extension of time upon finding the following:**

**(i) The applicant submitted a written extension request prior to the expiration date;**

**(ii) There have been no significant changes in any conditions, ordinances, regulations or standards of the City or applicable agencies that affect the previously approved project so as to warrant its resubmittal for Architectural Review;**

**(iii) If the previously approved application included a special study, the applicant provided a status report includes a letter from a recognized professional that states that conditions have not changed after the original approval and that no new study is warranted; and**

**(iv) If the site has been neglected so as to allow the site to become blighted, the deciding party must factor this into its decision.**

**(f) The City Manager or Architectural Review Board, as applicable, may grant or deny the extension request. The decision must be in writing and must be made within sixty (60) days of**

receipt of the request for extension. If the decision is to grant the extension, the extension can be no more than a single one-year extension.

(g) Upon making the decision, the City must provide notice of the extension decision as provided in TDC 32.220 for Type II decisions made by the City Manager and TDC 32.230 for Type III decisions made by the Architectural Review Board.

**Finding:**

*The proposed application is approved subject to compliance with the above criteria. With recommended Condition of Approval A1, these standards are met.*

**Section 33.110 Tree Removal Permit/Review**

(1) Purpose. To regulate the removal of trees within the City limits other than trees within the public right-of-way which are subject to TDC Chapter 74.

(2) Applicability. No person may remove a tree on private property within the City limits, unless the City grants a tree removal permit, consistent with the provisions of this Section.

[...]

(3) Procedure Type. Tree Removal Permit applications are subject to Type II Review in accordance with TDC Chapter 32. Tree Removal Permit applications submitted with an Architectural Review, Subdivision, or Partition application will be processed in conjunction with the Architectural Review, Subdivision, or Partition decision.

**Finding:**

*In conjunction with the Architectural Review, the applicant has submitted a Tree Removal Permit application. The criteria in TDC 33.110, addressed below, are the basis for approval or denial for tree removal as part of this Architectural Review. These standards are met.*

**Section 33.110 Tree Removal Permit/Review Approval Criteria**

**(5) Approval Criteria.**

(a) An applicant must satisfactorily demonstrate that at least one of the following criteria are met:

(i) The tree is diseased and:

(A) The disease threatens the structural integrity of the tree; or

(B) The disease permanently and severely diminishes the esthetic value of the tree; or

(C) The continued retention of the tree could result in other trees being infected with a disease that threatens either their structural integrity or esthetic value.

(ii) The tree represents a hazard which may include but not be limited to:

(A) The tree is in danger of falling; or

(B) Substantial portions of the tree are in danger of falling.

(iii) It is necessary to remove the tree to construct proposed improvements based on Architectural Review approval, building permit, or approval of a Subdivision or Partition Review.

(b) If none of the conditions in TDC 33.110(5)(a) are met, the certified arborist must evaluate the condition of each tree.

(i) Evergreen Trees. An evergreen tree which meets any of the following criteria as determined by a certified arborist will not be required to be retained:

(A) Trunk Condition - extensive decay and hollow; or

(B) Crown Development - unbalanced and lacking a full crown;

(ii) Deciduous Trees. A deciduous tree which meets any of the following criteria as determined by a certified arborist will not be required to be retained:

- (A) Trunk Condition - extensive decay and hollow;**
- (B) Crown Development - unbalanced and lacking a full crown; or**
- (C) Structure - Two or more dead limbs.**

**Finding:**

*The applicant's Arborists' Tree Assessment Report surveyed a total of 88 trees within site development area (Exhibits A2 and A3). Two of the trees planned to be removed had a diameter less than 8 inches. A total of 35 of 49 regulated trees would be removed in order to construct the project. The other 14 regulated trees planned for removal are all deciduous trees with poor crown development or poor structure including 13 invasive species and one 29-inch diameter silver maple. The report recommends the preservation of 37 on-site trees that are over 8" in diameter. There will be a total of 49 trees removed. Of the on-site trees proposed for removal, the majority are to be removed to construct the proposed improvements in accordance with criterion 33.110(5)(a)(iii). There are also eight trees that are either dead or in poor condition, meeting the criterion of 33.110(5)(a)(i).*

*The Arborists' Tree Assessment Report lists the following tree protection specifications.*

- 1. Preconstruction Conference.** *The project arborist shall be on site to discuss methods of tree removal and tree protection prior to any construction.*
- 2. Protection Fencing.** *All trees to be retained shall be protected by 5-foot-tall metal fencing secured to steel posts placed no further than 8-feet apart and shall be installed as depicted on the tree preservation plan. Trees located farther than 30-feet from construction activity do not require tree protection fencing.*
- 3. Tree Protection Zone Maintenance.** *The protection fencing shall not be moved, removed, or entered by equipment except under direction of the project arborist. The contractor shall not store materials or equipment within the TPZ.*
- 4. Erosion Control.** *Beneath the dripline of protected trees, erosion control fencing shall not be trenched in per manufacturer's specifications to avoid root impacts. Instead, alternative means of erosion control are required, such as wrapping the base of silt fencing around a straw wattle and staking the wattle into the ground or using compost socks or straw wattles staked into the ground in lieu of silt fencing.*
- 5. Crown Pruning.** *The project arborist can help identify where crown pruning is necessary to provide construction clearance and remove dead and defective branches for safety once trees planned for removal have been removed and the site is staked and prepared for construction. Pruning shall be performed by a Qualified Tree Service and conducted in accordance with ANSI A300 pruning standards and ISA Best Management Practices for pruning.*

*With recommended Condition of Approval A10.a., which requires the applicant to provide a tree preservation plan that corresponds to the submitted Tree Assessment Report, and recommended Condition of Approval A11 related to tree protection, these standards are met.*

## **CHAPTER 42 – Medium High Density Residential (RMH) Zone**

[...]

### **Section 42.200. - Use Categories.**

**(1) Use Categories.** Table 42-1 lists use categories Permitted Outright (P) or Conditionally Permitted (C) in the RMH zone. Use categories may also be designated as Limited (L) and subject to the limitations listed in Table 42-1 and restrictions identified in TDC 42.210. Limitations may restrict the specific type of use, location, size, or other characteristics of the use category. Use categories which are not listed are prohibited within the zone, except for uses which are found by the City Manager or

appointee to be of a similar character and to meet the purpose of this zone, as provided in TDC 31.070.

(2) **Overlay Zones.** Additional uses may be allowed in a particular overlay zone. See the overlay zone Chapters for additional uses.

**Table 42-1  
 Use Categories in the RMH Zone**

USE CATEGORY	STATUS	LIMITATIONS AND CODE REFERENCES
<b>RESIDENTIAL USE CATEGORIES</b>		
Household Living	P/C	Permitted housing types subject to TDC 43.220.
[...]		

[...]

**Use Category from TDC 39.200:**

(1) **Characteristics.** Household Living is the residential occupancy of an owner-occupied or rented dwelling unit by a family or household. Dwelling units must be self-contained, with cooking, sleeping and bathroom facilities. Occupancy is long-term, 30 days or more, and non-transient.

[...]

**Finding:**

*The proposal would construct 45 self-contained multi-family dwelling units for long-term rental. Refer to housing type discussion below. This standard is met.*

**Section 42.220. - Housing Types.**

Table 42-2 lists Housing Types permitted in the RMH zone. Housing types may be Permitted Outright (P), Conditionally Permitted (C), or Not Permitted (N) in the RMH zone.

**Table 42-2  
 Housing Types in the RMH Zone**

HOUSING TYPE	STATUS	LIMITATIONS AND CODE REFERENCES
[...]		
Multi-Family Structure	P	See TDC definition in 31.060.
[...]		

**Definition from TDC 31.060:**

**Multi-Family Structure.** A structure containing five or more dwelling units on one lot. The land underneath the structure is not divided into separate lots. Multi-Family Structure includes, but is not limited to structures commonly called apartments, condominiums, and garden apartments.

**Finding:**

*The applicant proposes to demolish 2 existing buildings and construct 12 new buildings consisting 45 townhouses. There will be four 3-unit buildings, seven 4-unit buildings and one 5-unit building. There are currently 211 dwelling units spread throughout 26 buildings. The proposed development would increase the total number of dwelling units to 240 within 36 buildings.*

**Section 42.300 – Development Standards.**

Development standards in the RMH zone are listed in Table 42-3. Additional standards may apply to some uses and situations, see TDC 42.310.

**Table 42-3  
 Development Standards in the RH Zone**

	Requirement	Minimum Proposed
<b>MAXIMUM DENSITY</b>		
Household Living Uses	Maximum: 15 units per acre Minimum: 11 units per acre	14.4 dwelling units per acre
<b>MINIMUM SETBACKS</b>		
Front (SW Sagert St. and SW Martinazzi Ave.)	35 feet	61.2 feet
Side	12 feet	20 feet
Rear	12 feet	20 feet
Between Buildings	10 feet	15 feet
Parking and Circulation Areas	10 feet	20 feet
<b>MAXIMUM STRUCTURE HEIGHT</b>		
All uses	35 feet	35 feet
<b>MAXIMUM LOT COVERAGE</b>		
All Other Permitted Uses	40%	12%
<i>Note: Calculations were based on data illustrated on the Applicant’s site plan sheets in Exhibit A2.</i>		

[...]

**Finding:**

*Density, setbacks, parking and circulation areas, and building height are reflected in Exhibits A1 and A2. The applicant is proposing 3-story attached townhomes. The site plan, Sheet C600 of Exhibit A2, illustrates a portion of the patio and fence of building “K2” being located within the setback, which is permitted. No portion of the “K2” building is located within the required setback. As shown in the table above, these standards are met.*

**Section 42.310. - Projections into Required Yards.**

The following architectural features may project into a required front or rear yard setback area not more than three feet, and into a required side yard not more than two feet: cornices, eaves, canopies, decks, sun-shades, gutters, chimneys, flues, belt courses, leaders, sills, pilasters, lintels, ornamental features, and other similar architectural features.

**Finding:**

*No projections into required setbacks are proposed. This provision has not been utilized.*

**Section 42.320. - Density Bonus or Setback Reduction for Developments Adjacent to Greenways and Natural Areas.**



[...]

**Finding:**

*The proposal is not located adjacent to identified greenways or natural areas. This provision is not applicable.*

## **Chapter 73A: Site Design**

### **TDC 73A.010. - Site and Building Design Standards Purpose and Objectives.**

**(1) Purpose.** The purpose of the site and building design objectives and standards found in TDC 73A through TDC 73G is to promote functional, safe, innovative, and attractive sites and buildings that are compatible with the surrounding environment, including, but not limited to:

- (a)** The building form, articulation of walls, roof design, materials, and placement of elements such as windows, doors, and identification features; and
- (b)** The placement, design, and relationship of proposed site elements such as buildings, vehicular parking, circulation areas, bikeways and bike parking, accessways, walkways, buffer areas, and landscaping.

**(2) Objectives.** The objectives of site and building design standards in TDC 73A through TDC 73G are to:

- (a)** Enhance Tualatin through the creation of attractively designed development and streetscapes;
- (b)** Encourage originality, flexibility, and innovation in building design;
- (c)** Create opportunities for, or areas of, visual and aesthetic interest for occupants and visitors to the site;
- (d)** Provide a composition of building elements which responds to function, land form, identity and image, accessibility, orientation and climatic factors;
- (e)** Conserve, protect, and restore fish and wildlife habitat areas, and maintain or create visual and physical corridors to adjacent fish and wildlife habitat areas;
- (f)** Enhance energy efficiency through the use of landscape and architectural elements; and
- (g)** Minimize disruption of natural site features such as topography, trees, and water features.

**Finding:**

*The Architectural Review Board may review the both building and site development designs for compliance with TDC 73A.010 (1) and (2). Additional Conditions of Approval may result after the ARB reviews the project for compliance with these Objectives.*

### **Section 73A.200 – Multi-Family Design Standards.**

The following standards are the minimum standards for all other residential development in all zones that does not meet the definition of single-family dwelling, duplex, townhouse, triplex, quadplex, or cottage cluster or is 5 or more dwelling units. These standards do not apply to development in the Central Design District and Mixed Use Commercial (MUC) zone, which have separate standards and may be less than the minimums provided below.

**(1) Private Outdoor Areas.** Multi-family uses must provide private outdoor area features as follows:

- (a)** A separate outdoor area of not less than 80 square feet must be attached to each ground level dwelling unit; and
- (b)** The private outdoor area must be separated from common outdoor areas with walls, fences or shrubs.

**Finding:**

*Private outdoor areas are proposed for all proposed units, as shown in Exhibit A2. Each of the two-bedroom townhome units have a ground-floor private open area of 157 square feet that includes the required 24 square foot entry area required by subsection (3), below. Each of the three-bedroom townhome units have a ground floor private open area of 103 square feet, including the required 24 square foot entry area required by subsection (3), below. With recommended Condition of Approval A10.b., these standards are met.*

**(2) Balconies, Terraces, and Loggias. Multi-family uses must provide balconies, terraces, and loggias features as follows:**

- (a) A separate outdoor area of not less than 48 square feet in the form of balconies, terraces, or loggias must be provided for each unit located above the ground level.**

**Finding:**

*There will be a total of 45 new townhome units with ground level access and a second story balcony. The two-bedroom units will have 64 square feet and the three-bedroom units will have 75 square feet of second-story balcony area (Exhibits A1 and A2). With recommended Condition of Approval A10.c., these standards are met.*

**(3) Entry Areas. Multi-family uses must provide entry area features as follows:**

- (a) A private main entry area must be provided as a private extension of each dwelling unit;**
- (b) The entry area must be separated from on-site parking areas and public streets with landscaping, change of grade, low fences, or walls;**
- (c) The entry area must be a minimum of 24 square feet in area for each dwelling unit; and**
- (d) The entry area may be combined to serve more than one unit as determined by the City.**

**Finding:**

*The applicant's narrative points to plan sheets A12 and A13 (see Exhibit A1 and A2) to illustrate the proposed floor plans for the two- and three-bedroom units. Although entry areas are illustrated on these drawings there are no specific dimensions provided. With recommended Condition of Approval A10.d., these standards will be met.*

**(4) Shared Outdoor Areas. Multi-family uses must provide shared outdoor area features as follows:**

- (a) Must provide year round shared outdoor areas for both active and passive recreation;**
- (b) The shared outdoor area must be a minimum of:
  - (i) Three hundred square feet per dwelling unit; or**
  - [...]****
- (c) Gazebos and other covered spaces are encouraged to satisfy this requirement;**
- (d) The shared outdoor area must be separated from all entryway and parking areas with a landscaped transition area measuring a minimum of ten feet wide;**
- (e) The shared outdoor area must have controlled access from off-site as well as from on-site parking and entrance areas with a minimum 4-foot high fence, wall, or landscaping; and**
- (f) The shared outdoor area standard does not apply to any development with less than 12 dwelling units.**

**Finding:**

*The existing and proposed development will have a combined total of 240 total units, which requires 72,000 square feet of Shared Outdoor Area. As proposed, the project will provide a total of 83,776*

*square feet of Shared Outdoor Area (Exhibits A1 and A2). Design details of the Shared Outdoor Areas were not provided. With recommended Condition of Approval A10.e., these standards are met.*

**(5) Children's Play Areas. Multi-family uses must provide children's play area features as follows:**

- (a) The children's play area must be a minimum of 150 square feet per dwelling unit;**
  - (b) The children's play area must provide a separation from all entryway and parking areas with a landscaped transition area measuring a minimum of ten feet wide;**
  - (c) The children's play area must have controlled access to shared outdoor areas from off-site as well as from on-site parking and entrance areas with a minimum 4-foot high fence, wall, or landscaping; and**
  - (d) The children's play area must provide a usable floor surface (material such as lawn, decks, wood chips, sand and hard surface materials qualify); and**
- [...]

**Finding:**

*Once constructed there will be a total of 240 dwelling units, which requires 36,000 square feet of Children's Play Area. The applicants site plan (Exhibit A2) illustrates that a total of 36,000 square feet square feet of Children's Play Area will be provided in 5 separate locations spread throughout the site. An existing basketball court and another unidentified paved area is proposed for removal. An existing swimming pool would remain. The actual designs of the Children's Play Areas were not provided. Children's Play Areas are located interior to the site and are separated from vehicular circulation areas by building structures or by landscaped areas. With recommended Condition of Approval A10.f., these standards are met.*

**(6) Storage. Multi-family uses must provide storage features as follows:**

- (a) Enclosed storage areas are required for each unit.**
  - (i) Garages do not satisfy the storage requirements. An enclosed storage area may be located within the garage of the individual unit. Enclosed storage areas may also be located within commonly accessible shared garage.**
- (b) Each storage area must be a minimum of six feet in height and have a minimum floor area of:**
  - (i) 24 square feet for studio and one bedroom units;**
  - (ii) 36 square feet for two bedroom units; and**
  - (iii) 48 square feet for greater than two bedroom units.**

**Finding:**

*As described in Exhibit A1 and shown in Exhibit A2, storage areas for each of the proposed 45 units including 40 square feet for the 2-bedroom units and 49 square feet for the 3-bedroom units. Design details of the storage areas were not provided. With recommended Condition of Approval A10.g., these standards are met.*

**(7) Walkways. Multi-family uses must provide walkways as follows:**

[...]

- (b) All other multi-family development must have walkways of a minimum of six feet in width;**
- (c) Walkways must be constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete. Gravel or bark chips are not acceptable; and**
- (d) The walkways must meet ADA standards applicable at time of construction or alteration.**

**Finding:**

*As shown in Exhibit A2, walkways are located throughout the site and are a minimum of 6-feet wide, constructed of concrete and ADA compliant. With recommended Condition of Approval A10.h., these standards are met.*

**(8) Accessways.**

**(a) When Required.** Accessways are required to be constructed when a multi-family development is adjacent to any of the following:

[...]

**(iv)** Collector or arterial streets where transit stops or bike lanes are provided or designated.

**(b) Design Standard.** Accessways must meet the following design standards:

**(i)** Accessways must be a minimum of eight feet in width;

**(ii)** Public accessways must be constructed in accordance with the Public Works Construction Code;

**(iii)** Private accessways must be constructed of asphalt, concrete, pavers or grasscrete. Gravel or bark chips are not acceptable;

**(iv)** Accessways must meet ADA standards applicable at time of construction or alteration;

**(v)** Accessways must be provided as a connection between the development's walkway and bikeway circulation system;

**(vi)** Accessways must not be gated to prevent pedestrian or bike access;

**(vii)** Outdoor Recreation Access Routes must be provided between the development's walkway and bikeway circulation system and parks, bikeways, and greenways where a bike or pedestrian path is designated; and

**(viii)** Must be constructed, owned and maintained by the property owner.

**(c) Exceptions.** The Accessway standard does not apply to the following:

[...]

**Finding:**

*There are existing bike lanes located along SW Martinazzi Avenue and SW Sagert Street frontages. SW Avery Street is classified as a Local Street, SW Sagert Street is a Minor Arterial and SW Martinazzi Avenue is a Minor Collector (Exhibit K). The SW Avery Street right-of-way east of the SW Martinazzi Avenue Intersection does not have an existing bike lane. Accessways are defined as "...non-vehicular, paved pathway designed for pedestrian and bicycle use and providing convenient linkages between a development and adjacent residential and commercial properties and areas intended for public use, which includes, but is not limited to, schools, parks, and adjacent collector and arterial streets where transit stops or bike lanes are provided or designated. An accessway is not a sidewalk." The narrative states that the existing development has established accessways that will continue to be utilized (Exhibit A1). All accessways must meet current TDC requirements including the design standards under TDC 73A.200.(8)(b) and ADA requirements. Comprehensive Plan Map 8.5 Tualatin Transit Plan and TriMet route maps illustrate the portion of SW Sagert Street that abuts the subject property being on the existing Fixed Route Bus Transit Service for Bus 76. SW Sagert Street along the frontage of the subject property is illustrated as a Potential Future Route Shuttle Service as Demand Grows. Bus 96 has a fixed route on SW Martinazzi Avenue. The applicant is not requesting an exceptions. With recommended Condition of Approval A10.i., these standards are met.*

**(9) Carports and Garages.** Multi-family uses must provide Carports and Garage features as follows:

**(a)** The form, materials, color, and construction must be compatible with the complex they serve.

**Finding:**

The applicant’s overall site plan, Sheet C600 in Exhibit A2, illustrates 8 new carports located throughout the property. Sheet A11 of Exhibit A2 illustrates the proposed carport design. Colors for the proposed carports were noted as “to be determined”. With Condition of Approval A10.j., these standards are met.

**(10) Safety and Security. Multi-family units must provide safety and security features as follows:**

- (a) Private outdoor areas must be separated from shared outdoor areas and children's play areas with a minimum 4-foot high fence, wall, or landscaping;**
- (b) An outdoor lighting system that does not produce direct glare on adjacent properties and without shining into residential units, public rights-of-way, or fish and wildlife habitat areas; and**
- (c) Building identification must be provided consistent with the Oregon Fire Code.**

**Finding:**

Exhibits A1 (Narrative) and A2 (Plan Set), describe and illustrate a 4 foot high fence that will be utilized for the ground floors of each of the proposed townhouse units. A scaled elevation drawing illustrating the fence height was not provided. The applicant has provided an outdoor lighting plan that appears to meet lighting requirements within the development area. The applicant has also stated that the Oregon Fire Code will be met for building identification. With recommended Condition of Approval A14, these standards are met.

**(11) Service, Delivery and Screening. Multi-family uses must provide service, delivery, and screening features as follows:**

- (a) Provisions for postal delivery must be made consistent with US Postal Service regulations conveniently located and efficiently designed for residents;**
- (b) Pedestrian access from unit entries to postal delivery areas, shared activity areas, and parking areas must be provided via accessways; and**
- (c) Above grade and on-grade electrical and mechanical equipment such as transformers, heat pumps and air conditioners must be screened with sight obscuring fences, walls or landscaping.**

**Finding:**

A1 (narrative) states that the location of postal delivery will be coordinated with the US Post Office. Additional information pertaining to the onsite postal delivery location was not provided. Details regarding electrical and mechanical screening will be needed to assess adequacy of screening. With recommended Condition of Approval A10.k., these standards will be met.

**Chapter 73B: Landscaping Standards**

**Section 73B.020 – Landscape Area Standards Minimum Areas by Use and Zone.**

Zone	Minimum Area Requirement*	Minimum Area Requirement with dedication for a fish and wildlife habitat*
(1) RL, RML, RMH, RH and RH/HR zones—Permitted Uses	None	None
[...]		

**Finding:**

*While there is no minimum landscape requirement for the RMH zone, there are minimum landscaping requirements for multifamily housing developments that are addressed below. As stated on Sheet A1 in Exhibit A2, approximately 245,007 square feet (33%) of landscaping is included within the entire site. This standard is not applicable.*

**Section 73B.030 – Additional Minimum Landscaping Requirements for Multi-Family Residential Uses.**

**(1) General.** In addition to requirements in TDC 73B.020, Multi-Family Residential Uses must comply with the following additional standards.

**(a) All areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped.**

**(i) This standard does not apply to areas subject to the Hedges Creek Wetlands Mitigation Agreement.**

**Finding:**

*Landscaping appears to be provided in all areas not otherwise occupied by buildings, vehicle areas, or pedestrian amenity areas. The site is not located adjacent to the Hedges Creek Wetland. With recommended Condition of Approval A15, this standard is met.*

**Section 73B.080 – Minimum Landscaping Standards for All Zones.**

The following are minimum standards for landscaping for all zones.

<p><b>(1) Required Landscape Areas</b></p>	<ul style="list-style-type: none"> <li>• Must be designed, constructed, installed, and maintained so that within three years the ground must be covered by living grass or other plant materials.</li> <li>• The foliage crown of trees cannot be used to meet this requirement.</li> <li>• A maximum of 10% of the landscaped area may be covered with un-vegetated areas of bark chips, rock or stone.</li> <li>• Must be installed in accordance with the provisions of the American National Standards Institute ANSI A300 (Part 1) (Latest Edition).</li> <li>• Must be controlled by pruning, trimming, or otherwise so that:</li> <li>• It will not interfere with designated pedestrian or vehicular access; and</li> <li>• It will not constitute a traffic hazard because of reduced visibility.</li> </ul>
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**Finding:**

*The density of plantings as shown on the Landscape Plans (Exhibit A2) is sufficient to provide full coverage of landscaping within three years. These standards are met.*

<p><b>(2) Fences</b></p>	<p>Landscape plans that include fences must integrate any fencing into the plan to guide wild animals toward animal crossings under, over, or around transportation corridors.</p>
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**Finding:**

*There are no established wildlife crossings in the vicinity and no Metro riparian and upland wildlife areas mapped within the confines of the property. This standard is not applicable.*

<p><b>(3) Tree Preservation</b></p>	<ul style="list-style-type: none"> <li>• Trees and other plant materials to be retained must be identified on the landscape plan and grading plan.</li> </ul> <p><b>During construction:</b></p> <ul style="list-style-type: none"> <li>○ Must provide above and below ground protection for existing trees and plant materials identified to remain;</li> <li>○ Trees and plant materials identified for preservation must be protected by chain link or other sturdy fencing placed around the tree at the drip line;</li> </ul>
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	<ul style="list-style-type: none"> <li>○ If it is necessary to fence within the drip line, such fencing must be specified by a qualified arborist;</li> <li>○ Top soil storage and construction material storage must not be located within the drip line of trees designated to be preserved;</li> <li>○ Where site conditions make necessary a grading, building, paving, trenching, boring, digging, or other similar encroachment upon a preserved tree's drip-line area, such grading, paving, trenching, boring, digging, or similar encroachment must only be permitted under the direction of a qualified arborist. Such direction must assure that the health needs of trees within the preserved area can be met; and</li> <li>○ Tree root ends must not remain exposed.</li> <li>● Landscaping under preserved trees must be compatible with the retention and health of the preserved tree.</li> <li>● When it is necessary for a preserved tree to be removed in accordance with TDC 33.110 (Tree Removal Permit) the landscaped area surrounding the tree or trees must be maintained and replanted with trees that relate to the present landscape plan, or if there is no landscape plan, then trees that are complementary with existing, landscape materials. Native trees are encouraged</li> <li>● 100% of the area preserved under any tree or group of trees (Except for impervious surface areas) retained in the landscape plan must apply directly to the percentage of landscaping required for a development</li> </ul>
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**Finding:**

*The Arborist Report (Exhibit A3) surveyed a total of 88 trees on-site development site area. Two the trees planned to be removed had a diameter less than 8 inches. A total of 35 of 49 regulated trees would be removed in order to construct the project. The other 14 regulated trees planned for removal are all deciduous trees with poor crown development or poor structure including 13 invasive species and one 29-inch diameter silver maple. The report recommends the preservation of 37 on-site tree that are over 8" diameter. There will be a total of 51 trees removed. Of the on-site trees proposed for removal, the majority are to be removed in order to construct the proposed improvements in accordance with criterion 33.110(5)(a)(iii). There are also eight trees that are either dead or in poor condition, meeting the criterion of 33.110(5)(a)(i). The Arborist Report also provided recommendation pertaining protections for trees during construction. Sheet C110, C200 and C300 of Exhibit A2 illustrated tree protection fencing will be utilized. With recommended Conditions of Approval A10.I. and A11, these standards are met.*

<p><b>(4) Grading</b></p>	<ul style="list-style-type: none"> <li>● After completion of site grading, top-soil is to be restored to exposed cut and fill areas to provide a suitable base for seeding and planting.</li> <li>● All planting areas must be graded to provide positive drainage.</li> <li>● Soil, water, plant materials, mulch, or other materials must not be allowed to wash across roadways or walkways.</li> <li>● Impervious surface drainage must be directed away from pedestrian walkways, dwelling units, buildings, outdoor private and shared areas and landscape areas except where the landscape area is a water quality facility.</li> </ul>
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**Finding:**

*The applicant is required to obtain an erosion control and grading permit with the City. With recommended Condition of Approval A2, this standard is met.*

<p><b>(5) Irrigation</b></p>	<ul style="list-style-type: none"> <li>● Landscaped areas must be irrigated with an automatic underground or drip irrigation system</li> </ul>
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	<ul style="list-style-type: none"> <li>• <b>Exceptions: Irrigation requirement does not apply to duplexes and townhouses.</b></li> </ul>
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**Finding:**

*According to the applicant’s narrative (Exhibit A1) all landscaped areas will be irrigated. Details of the irrigation system were not provided. With Condition of Approval A10.m., this standards will be met.*

<p><b>(6) Re-vegetation in Un-landscaped Areas</b></p>	<ul style="list-style-type: none"> <li>• <b>Vegetation must be replanted in all areas where vegetation has been removed or damaged in areas not affected by the landscaping requirements and that are not to be occupied by structures or other improvements,.</b></li> <li>• <b>Plant materials must be watered at intervals sufficient to ensure survival and growth for a minimum of two growing seasons.</b></li> <li>• <b>The use of native plant materials is encouraged to reduce irrigation and maintenance demands.</b></li> <li>• <b>Disturbed soils should be amended to an original or higher level of porosity to regain infiltration and stormwater storage capacity.</b></li> </ul>
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**Finding:**

*The applicant proposes to landscape all areas not otherwise proposed for development. Drought tolerant plants, as well as some natives, have been selected to reduce irrigation and maintenance needs. With recommended Condition of Approval A16, this standard is met.*

**Section 73B.080 – Minimum Standards Trees and Plants.**

**The following minimum standards apply to the types of landscaping required to be installed for all zones.**

<p><b>(1) Deciduous Shade Trees</b></p>	<ul style="list-style-type: none"> <li>• <b>One and on-half inch caliper measured six inches above ground;</b></li> <li>• <b>Balled and burlapped; bare root trees will be acceptable to plant during their dormant season;</b></li> <li>• <b>Reach a mature height of 30 feet or more;</b></li> <li>• <b>Cast moderate to dense shade in summer;</b></li> <li>• <b>Live over 60 years;</b></li> <li>• <b>Do well in urban environments, tolerant of pollution and heat, and resistant to drought;</b></li> <li>• <b>Require little maintenance and mechanically strong;</b></li> <li>• <b>Insect- and disease-resistant;</b></li> <li>• <b>Require little pruning; and</b></li> <li>• <b>Barren of fruit production.</b></li> </ul>
<p><b>(2) Deciduous Ornamental Trees</b></p>	<ul style="list-style-type: none"> <li>• <b>One and on-half inch caliper measured six inches above ground;</b></li> <li>• <b>balled and burlapped; bare root trees will be acceptable to plant during their dormant season; and</b></li> <li>• <b>Healthy, disease-free, damage-free, well-branched stock, characteristic of the species</b></li> </ul>
<p><b>(3) Coniferous Trees</b></p>	<ul style="list-style-type: none"> <li>• <b>5 feet in height above ground;</b></li> <li>• <b>balled and burlapped; bare root trees will be acceptable to plant during their dormant season; and</b></li> <li>• <b>Healthy, disease-free, damage-free, well-branched stock, characteristic of the species.</b></li> </ul>

(4) Evergreen and Deciduous Shrubs	<ul style="list-style-type: none"> <li>• One to five gallon size;</li> <li>• Healthy, disease-free, damage-free, well-branched stock, characteristic of the species; and</li> <li>• Side of shrub with best foliage must be oriented to public view.</li> </ul>
(5) Groundcovers	<ul style="list-style-type: none"> <li>• Fully rooted;</li> <li>• Well branched or leafed;</li> <li>• Healthy, disease-free, damage-free, well-branched stock, characteristic of the species; and</li> <li>• English ivy (<i>Hedera helix</i>) is prohibited.</li> </ul>
(6) Lawns	<ul style="list-style-type: none"> <li>• Consist of grasses, including sod, or seeds of acceptable mix within the local landscape industry;</li> <li>• 100 percent coverage and weed free; and</li> <li>• Healthy, disease-free, damage-free, characteristic of the species.</li> </ul>

**Finding:**

*Per the Plant Schedule provided on the Landscape Plan included in Exhibit A2, the standards for groundcover, shrubs, and trees to be planted are met.*

**Chapter 73C: Parking Standards**

**TDC 73C.010. - Off-Street Parking and Loading Applicability and General Requirements.**

[...]

**(2) General Requirements.** Off-street parking spaces, off-street vanpool and carpool parking spaces, off-street bicycle parking, and off-street loading berths must be as provided as set forth in TDC 73C.100, unless greater requirements are otherwise established by the conditional use permit or the Architectural Review process.

**(a) The following apply to property and/or use with respect to the provisions of TDC 73C.100:**

**(i) The requirements apply to both the existing structure and use, and enlarging a structure or use;**

**(ii) The floor area is measured by gross floor area of the building primary to the function of the particular use of the property other than space devoted to off-street parking or loading;**

[...]

**(iv) Calculations to determine the number of required parking spaces and loading berths must be rounded to the nearest whole number;**

**(v) If the use of a property changes, thereby increasing off-street parking or loading requirements, the increased parking/loading area must be provided prior to commencement of the new use;**

[...]

**(viii) Off-street parking spaces for dwellings must be located on the same lot with the dwelling. Other required parking spaces may be located on a separate parcel, provided the parcel is not greater than five hundred (500) feet from the entrance to the building to be served, measured along the shortest pedestrian route to the building. The applicant must prove that the parking located on another parcel is functionally located and that there is safe vehicular and pedestrian access to and from the site. The parcel upon which parking facilities are located must be in the same ownership as the structure;**

**(ix) Required parking spaces must be available for the parking of operable passenger automobiles of residents, customers, patrons and employees and must not be used for storage of vehicles or materials or for the parking of trucks used in conducting the business;**

**(x) Institution of on-street parking, where none is previously provided, must not be done solely for the purpose of relieving crowded parking lots in commercial or industrial zones; and [...]**

**Finding:**

The parking requirements were reviewed under TDC 73C.100, which found a minimum of 361 spaces with the applicant proposing 442 spaces. All parking spaces are located within the subject property. These standards are met.

**Section 73C.020 – Parking Lot Design Standards.**

**A parking lot, whether an accessory or principal use, intended for the parking of automobiles or trucks, must comply with the following:**

- (1) Off-street parking lot design must comply with the dimensional standards set forth in Figure 73-1; [...]**
- (2) Parking lot drive aisles must be constructed of asphalt, concrete, or pervious concrete;**
- (3) Parking stalls must be constructed of asphalt, concrete, pervious concrete, or a pervious surface such as pavers or grasscrete, but not gravel or woody material. Pervious surfaces, are encouraged for parking stalls in or abutting the Natural Resource Protection Overlay District, Other Natural Areas, or in a Clean Water Services Vegetated Corridor;**
- (4) Parking lots must be maintained adequately for all-weather use and drained to avoid water flow across sidewalks;**
- (5) Parking bumpers or wheel stops or curbing must be provided to prevent cars from encroaching on adjacent landscaped areas, or adjacent pedestrian walkways.**
- (6) Disability parking spaces and accessibility must meet ADA standards applicable at time of construction or alteration;**
- (7) Parking stalls for sub-compact vehicles must not exceed 35 percent of the total parking stalls required by TDC 73C.100. Stalls in excess of the number required by TDC 73C.100 can be sub-compact stalls;**
- (8) Groups of more than 4 parking spaces must be so located and served by driveways that their use will require no backing movements or other maneuvering within a street right-of-way other than an alley;**
- (9) Drives to off-street parking areas must be designed and constructed to facilitate the flow of traffic, provide maximum safety of traffic access and egress, and maximum safety of pedestrians and vehicular traffic on the site;**
- (10) On-site drive aisles without parking spaces, which provide access to parking areas with regular spaces or with a mix of regular and sub-compact spaces, must have a minimum width of 22 feet for two-way traffic and 12 feet for one-way traffic; When 90 degree stalls are located on both sides of a drive aisle, a minimum of 24 feet of aisle is required. On-site drive aisles without parking spaces, which provide access to parking areas with only sub-compact spaces, must have a minimum width of 20 feet for two-way traffic and 12 feet for one-way traffic;**

**Finding:**

*Dimensional and design information pertaining to parking stalls and parking lot driving aisle width were not provided. There are 8 new carports being proposed with a total of 132 stalls. Exhibit A1 (narrative) states that each of the units will have two parking spaces within an attached garage. With Condition of Approval A17, these standards are met.*

- (11) Artificial lighting, must be deflected to not shine or create glare in a residential zones, street right-of-way, a Natural Resource Protection Overlay District, Other Natural Areas, or a Clean Water Services Vegetated Corridor;**
- (12) Parking lot landscaping must be provided pursuant to the requirements of TDC 73C.200; and**
- (13) Except for parking to serve residential uses, parking areas adjacent to or within residential zones or adjacent to residential uses must be designed to minimize disturbance of residents.**

**Finding:**

*The applicant provided a lighting diagram for just the proposed development site, sheet E01 and E02 of Exhibit A2 lists the proposed light fixtures. The applicant indicated on Sheet E02 that the lighting requirements of TDC 63.055 will be met, however this section is applicable to Industrial zoned property. TDC 73A.200 (10) (b) requires lighting systems that do not produce direct glare on adjacent properties and without shining into residential units, public rights-of-way, or fish and wildlife habitat areas. Compliance with TDC 73C.210 is discussed in detail below. The applicant is not proposing on-street parking related to the proposed development. With Condition of Approval A10.n., these standards will be met.*

**Section 73C.050 – Bicycle Parking Requirements and Standards.**

**(1) Requirements. Bicycle parking facilities must include:**

- (a) Long-term parking that consists of covered, secure stationary racks, lockable enclosures, or rooms in which the bicycle is stored;**
  - (i) Long-term bicycle parking facilities may be provided inside a building in suitable secure and accessible locations.**
- (b) Short-term parking provided by secure stationary racks (covered or not covered), which accommodate a bicyclist's lock securing the frame and both wheels.**

**(2) Standards. Bicycle parking must comply with the following:**

- (a) Each bicycle parking space must be at least six feet long and two feet wide, with overhead clearance in covered areas must be at least seven feet;**
- (b) A five (5) foot-wide bicycle maneuvering area must be provided beside or between each row of bicycle parking. It must be constructed of concrete, asphalt, or a pervious hard surface such as pavers or grasscrete, and be maintained;**
- (c) Access to bicycle parking must be provided by an area at least three feet in width. It must be constructed of concrete, asphalt, or a pervious hard surface such as pavers or grasscrete, and be maintained;**
- (d) Bicycle parking areas and facilities must be identified with appropriate signing as specified in the Manual on Uniform Traffic Control Devices (MUTCD) (latest edition). At a minimum, bicycle parking signs must be located at the main entrance and at the location of the bicycle parking facilities;**
- (e) Bicycle parking must be located in convenient, secure, and well-lighted locations approved through the Architectural Review process. Lighting, which may be provided, must be deflected to not shine or create glare into street rights-of-way or fish and wildlife habitat areas;**
- (f) Required bicycle parking spaces must be provided at no cost to the bicyclist, or with only a nominal charge for key deposits, etc. This does not preclude the operation of private for-profit bicycle parking businesses;**
- [...]**
- (h) The City Manager or the Architectural Review Board may approve a form of bicycle parking not specified in these provisions but that meets the needs of long-term and/or short-term parking pursuant to Architectural Review.**

**Finding:**

As described in the Narrative (Exhibit A1), the applicant proposes to provide bicycle parking within attached garages for each proposed unit. Per TDC 73.100 there are no separate bicycle facilities required for the proposed townhouses. Because bicycle parking will be provided within each unit’s garage, these standards do not apply.

**Section 73C.100 – Off-Street Parking Minimum/Maximum Requirements.**

USE	MINIMUM MOTOR VEHICLE PARKING	MAXIMUM MOTOR VEHICLE PARKING	BICYCLE PARKING	PERCENTAGE OF BICYCLE PARKING TO BE COVERED
<b>(a) Residential Uses</b>				
<b>(viii) Multi-family dwellings in complexes with private internal driveways</b>	<b>1.0 space/studio, 1.25 space/1 bedroom, 1.50 space/2 bedroom, 1.75 space/3= bedroom</b>	<b>none</b>	<b>Developments with five or more units; none required if a garage is provided as an integral element of a unit; otherwise 1.00 space per unit</b>	<b>100</b>

**Finding:**

The applicant is proposing 45 new townhouse units that will contain two motor vehicle parking spaces within each units attached garage. The applicant’s narrative (Exhibit A1) states for the entire Alden Apartment property there will be a total of 65 three-bedroom units requiring a total of 114 off-street parking spaces. There will be 111 two-bedroom units requiring a total of 167 off-street parking spaces. There are 64 one-bedroom units requiring a total of 96 off-street parking spaces. Based on the total number of bedrooms in each unit, a total of 361 off-street parking spaces are required and the applicant is proposing 442 parking spaces. Off-street parking space dimensional information was not provided. With Condition of Approval A10.o, these standards will be met.

Table 1: Minimum and Proposed Parking by Use

Use	Total Units	Vehicle Parking Min.	Proposed	Bike Parking Min.*	Proposed**
Multi-family	240	361	<b>442</b>	195	<b>45</b>
* Required for existing units that will remain after construction of new units.					
** Applicant has indicated each of the 45 proposed units will have two parking spaces within each attached garage.					

The applicant is proposing 45 new townhome units that will contain two motor vehicle parking spaces within each units attached garage. The application material states there are 65 three-bedroom units requiring a total of 114 off-street parking spaces. There are 111 two-bedroom units requiring a total of 167 off-street parking spaces. There are 64 one-bedroom units requiring a total of 96 off-street parking spaces. A total of 361 off-street parking spaces are required and the applicant is proposing 442 off-street parking spaces. The applicant has proposed to locate bicycle parking in the garages of the new units. It’s unclear if the existing units are provided with at least one bicycle parking space. With recommended Condition of Approval A18 and A10.p., which will require additional bike parking details, these standards are met.



**(2) In addition to the general parking requirements in subsection (1), the following are the minimum number of off-street vanpool and carpool parking for commercial, institutional, and industrial uses.**  
[...]

**Finding:**

*The proposal is for a residential use development. This standard does not apply.*

**Section 73C.120 – Off-Street Loading Facilities Minimum Requirements.**

**(1) The minimum number of off-street loading berths for commercial, industrial, and institutional uses is as follows:**  
[...]

**Finding:**

*The proposal is for a residential use development. This standard does not apply.*

**Section 73C.130 – Parking Lot Driveway and Walkway Minimum Requirements. Parking lot driveways and walkways must comply with the following requirements:**

**(1) Residential Use. Minimum requirements for residential uses:**  
[...]

**(c) Ingress and egress for multi-family residential uses must not be less than the following:**

Dwelling Units	Minimum Number Required	Minimum Width	Walkways, Etc.
50-499	1 or 2	32 feet  24 feet	6-foot walkway, 1 side only; curbs required

[...]

**Finding:**

*The parking lot driveways, one on SW Sagert Street and a second on SW Martinazzi Avenue, are existing and are not part of the current application. The driveways have existing abutting walkways that appears to be approximately 5 feet in width. Additional findings are provided in Chapter 75. With Condition of Approval A10.q., these standards will be met.*

**(6) Maximum Driveway Widths and Other Requirements.**

[...]

- (d) There must be a minimum distance of 40 feet between any two adjacent driveways on a single property unless a lesser distance is approved by the City Manager.**
- (e) Must comply with the distance requirements for access as provided in TDC 75.**
- (f) Must comply with vision clearance requirements in TDC 75.**

**Finding:**

*The driveways are existing and no modifications are being proposed. These standards are not applicable.*

**Section 73C.210. - Multi-Family Parking Lot Landscaping Requirements. Multi-family residential uses (as defined in TDC 31.060) must comply with the following landscaping requirements for parking lots in all zones:**

**(1) General. Locate landscaping or approved substitute materials in all areas not necessary for vehicular parking and maneuvering.**

**Finding:**

*The applicant is not proposing an expansion or alteration of the existing parking lot landscaping. This standard is met.*

**(2) Clear Zone.** Clear zone must be provided for the driver at ends of on-site drive aisles and at driveway entrances, vertically between a maximum of 30 inches and a minimum of eight feet as measured from the ground level.

[...]

**Finding:**

*The landscaping in the area of the driveways is existing and no changes are proposed. Clear vision triangles were not placed landscaping plans (Sheets L101 and L102 of Exhibit A2). With recommended Condition of Approval A10.r. and A19 related to maintenance, this standard is met.*

**(3) Setback.** Minimum 10-foot landscape setback must be provided between the property lines and parking areas and must comply with the following:

- (a) Must be planted with deciduous trees an average of not more than 30 feet on center and shrubs at least 30 inches in height which provide screening of vehicular headlights; and
- (b) Native trees and shrubs are encouraged.

**Finding:**

*The applicant is not proposing an expansion or alteration of the existing parking lot or parking lot landscaping. This standard is met.*

**(4) Perimeter.** Minimum five feet in width in all off-street parking and vehicular circulation areas, including loading areas and must comply with the following:

- (a) Deciduous trees located not more than 30 feet apart on average as measured on center;
- (b) Shrubs or ground cover, planted so as to achieve 90 percent coverage within three years;
- (c) Plantings which reach a mature height of 30 inches in three years which provide screening of vehicular headlights year round;
- (d) Native trees and shrubs are encouraged; and
- (e) Exceptions: [...]

**Finding:**

*The applicant is not proposing an expansion or alteration of the existing parking lot or parking lot landscaping. This standard is met.*

**(5) Transition.** Minimum 10-foot landscaped transition area between parking and vehicle circulation areas and buildings and shared outdoor areas and must comply with the following:

- (a) Deciduous shade trees located at not less than 30 feet on center must be located in this transition area;
- (b) Groundcover plants mixed with low shrubs must completely cover the remainder of this area within three years;
- (c) Native trees and shrubs are encouraged; and
- (d) Exceptions: [...]

**Finding:**

*The applicant is not proposing an expansion or alteration of the existing parking lot or parking lot landscaping. This standard is met.*

**(6) Landscape Island. Minimum 25 square feet per parking stall must be improved with landscape island areas and must comply with the following:**

- (a) May be lower than the surrounding parking surface to allow them to receive stormwater run-off and function as water quality facilities as well as parking lot landscaping;**
- (b) Must be protected from vehicles by curbs, but the curbs may have spaces to allow drainage into the islands;**
- (c) Landscape separation required for every eight continuous spaces in a row;**
- (d) Must be planted with one deciduous shade trees for every four parking spaces. Required trees must be evenly dispersed throughout the parking lot;**
- (e) Must be planted with groundcover or shrubs;**
- (f) Native plant materials are encouraged;**
- (g) Landscape island areas with trees must be a minimum of five feet in width (from inside of curb to curb);**
- (h) Required plant material in landscape islands must achieve 90 percent coverage within three years; and**
- (i) Exceptions: [...]**

**Finding:**

*The applicant is not proposing an expansion or alteration of the existing parking lot or parking lot landscaping. This standard is met.*

## **Chapter 73D: Waste and Recyclables Management Standards**

### **Section 73D.010 – Applicability and Objectives.**

**(1) Applicability. The requirements of this Chapter apply to all new or expanded:**

- (a) Common wall residential developments containing five or more units;**  
**[...]**

### **Section 73D.020 - Design Methods.**

**An applicant required to provide mixed solid waste and source separated recyclables storage areas must comply with one of following methods:**

- (1) The minimum standards method in TDC 73D.030;**
- (2) The waste assessment method in TDC 73D.040;**
- (3) The comprehensive recycling plan method in TDC 73D.050; or**
- (4) The franchised hauler review method in TDC 73D.060.**

**Finding:**

*The applicant's narrative proposes to use the Minimum Standards Method (TDC 73D.030), which is most appropriate when a use is not known. The use of the project is known and will follow a waste and recycling program that is similar to single-family residential pickup. The process as described in the Republic Services service provider letter, Exhibit A6, states each unit will have separate waste and recycle containers that will be placed at the end of each unit's driveway for automated side-loaded pickup. With there being one 5-unit building, seven 4-unit buildings and four 3-unit buildings, there is no specific method in the TDC that matches to proposed waste and recycling program described by Republic*

*Services. There will be no centralized waste collection for the proposed units. As discussed below, these standards are met.*

**Section 73D.030 – Minimum Standards Method.**

This method specifies a minimum storage area requirement based on the size and general use category of the new or expanded development. This method is most appropriate when specific use of a new or expanded development is not known. It provides specific dimensional standards for the minimum size of storage areas by general use category.

(1) The size and location of the storage area(s) must be indicated on the site plan. Requirements are based on an assumed storage area height of four feet for mixed solid waste and source separated recyclables. Vertical storage higher than four feet, but no higher than 7 feet may be used to accommodate the same volume of storage in a reduced floor space (potential reduction of 43 percent of specific requirements). Where vertical or stacked storage is proposed, submitted plans must include drawings to illustrate the layout of the storage area and dimensions for containers.

(2) The storage area requirement is based on uses. If a building has more than one use and that use occupies 20 percent or less of the gross leasable area (GLA) of the building, the GLA occupied by that use must be counted toward the floor area of the predominant use(s). If a building has more than one use and that use occupies more than 20 percent of the GLA of the building, then the storage area requirement for the whole building must be the sum of the area of each use. Minimum storage area requirements by use is as follows:

(a) Common wall residential five to ten units must provide 50 square feet.

(b) Common wall residential greater than ten units must provide 50 square feet plus an (additional five square feet per unit above ten.

[...]

**Finding:**

*The applicant proposes trash to be picked up via separate trash and recycle cart receptacles. Waste and recyclable pickup will require occupants of each proposed dwelling unit to place the containers at the end of each dwelling unit's driveway in a location accessible for automated side-load service. Republic Service has the franchise agreement to provide waste and recycling services. Republic Services indicated that the proposed method for waste and recycling pick up is acceptable. The proposal includes 45 new residential units and there is no TDC described method that matches the Republic Services approved method. There is one 5-unit building proposed with the others being 3- and 4-unit buildings. Per 73D.020 (b), If all the new units were in one building with a centralized waste and recycling pick up area then a total of 275 square feet would be required. Per TDC 73D.020(a), the one 5-unit building would require 50 square feet with 90 square feet being proposed. The applicant's narrative (Exhibit A1) states that 18 square feet is proposed for each unit which would total 810 square feet and exceed the minimum required area for the minimum standard method. With recommended Condition of Approval A20, these standards are met.*

**Section 73D.070 – Location, Design and Access Standards.**

The following location, design, and access standards are applicable to all storage areas:

**(1) Location Standards.**

(a) The storage area for source separated recyclables may be collocated with the storage area for mixed solid waste.

(b) Storage area space requirements can be satisfied with a single location or multiple locations, and can combine both interior and exterior locations.

(c) Exterior storage areas must:

(i) Be located in central and visible locations on the site to enhance security for users;

- (ii) Be located in a parking area; and
- (iii) Not be located within a required front yard setback or in a yard adjacent to a public or private street.

**(2) Design Standards.**

- (a) The dimensions of the storage area must accommodate containers consistent with current methods of local collection at time of construction or alteration.
- (b) Indoor and outdoor storage areas must comply with Oregon Building and Fire Code requirements.
- (c) Exterior storage areas must be enclosed by a sight obscuring fence or wall at least 6 feet in height.
- (d) Evergreen plants must be placed around the enclosure walls, excluding the gate or entrance openings for common wall, commercial, and institutional developments.
- (e) Gate openings for haulers must be a minimum of 10 feet wide and must be capable of being secured in a closed and open position.
- (f) Horizontal clearance must be a minimum of 10 feet and a vertical clearance of 8 feet is required if the storage area is covered.
- (g) A separate pedestrian access must also be provided in common wall, commercial, and institutional developments.
- (h) Exterior storage areas must have either a concrete or asphalt floor surface.
- (i) Storage areas and containers must be clearly labeled to indicate the type of material accepted.

**Finding:**

*Republic Services has approved a method of waste and recycling storage and pick up which is the same as single-family storage and pickup. All trash and recycle cart receptacles must be placed on a level surface at the end of each unit's driveway, in a location that is accessible for automated side-load service, with a minimum spacing of 2 feet apart for each container and at least 4 feet from any fixed objects including parked vehicles, and with no overhead obstructions. The 41 units accessed by SW Martinazzi Avenue will be accessed by a new 20 foot wide access driveway between the proposed units with a turn radius of 28 feet and beveled curbing on both inside corners of the roadway to allow for truck maneuvering. The remaining 4 units will be accessed by SW Sagert Street with storage and pickup using the existing paved surface. With recommended Condition of Approval A20, these standards are met.*

**(3) Access Standards.**

- (a) Storage areas must be accessible to users at convenient times of the day, and to hauler personnel on the day and approximate time they are scheduled to provide hauler service.
- (b) Storage areas must be designed to be easily accessible to hauler trucks and equipment, considering paving, grade, gate clearance and vehicle access.
- (c) Storage areas must be accessible to hauler trucks without requiring backing out of a driveway onto a public street. If only a single access point is available to the storage area, adequate turning radius must be provided to allow hauler trucks to safely exit the site in a forward motion.
- (d) Storage areas must be located so that pedestrian and vehicular traffic movement are not obstructed on site or on public streets adjacent to the site.
- (e) The following is an exception to the access standard:
  - (i) Access may be limited for security reasons.

**Finding:**

*As shown in the applicant's submittal, Republic Services, the applicable waste hauler, has indicated that the dimensions and accessibility of the collection containers are acceptable (Exhibit A6). These standards are met.*

## **Chapter 74: Public Improvement Requirements**

[...]

### **TDC 74.120 Public Improvements.**

**(1) Except as specially provided, all public improvements must be installed at the expense of the applicant. All public improvements installed by the applicant must be constructed and guaranteed as to workmanship and material as required by the Public Works Construction Code prior to acceptance by the City. Work must not be undertaken on any public improvement until after the construction plans have been approved by the City Manager and a Public Works Permit issued and the required fees paid.**

**Finding:**

*All public improvements will be installed by the applicant at their expense after approval of plans and issued Erosion Control, Water Quality, and Public Works Permits. With recommended Conditions of Approval A9 and A12, this standard is met.*

### **TDC 74.130 Private Improvements.**

**All private improvements must be installed at the expense of the applicant. The property owner must retain maintenance responsibilities over all private improvements.**

**Finding:**

*All private improvements will be installed by the applicant at their expense and will require prior approval of plans and building permits. With recommended Conditions of Approval A9 and A12, this standard is met.*

### **TDC 74.140 Construction Timing.**

**(1) All the public improvements required under this chapter must be completed and accepted by the City prior to the issuance of a Certificate of Occupancy.**

**(2) All private improvements required under this Chapter must be approved by the City prior to the issuance of a Certificate of Occupancy.**

**Finding:**

*All public and private improvements proposed and modified by conditions of approval will be completed and accepted by the City prior to receiving a Certificate of Occupancy. With recommended Conditions of Approval A9 and A12, this standard is met.*

[...]

### **TDC 74.210 Minimum Street Right-of-Way Widths.**

**The width of streets in feet shall not be less than the width required to accommodate a street improvement needed to mitigate the impact of a proposed development. In cases where a street is required to be improved according to the standards of the TDC, the width of the right-of-way shall not be less than the minimums indicated in TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G.**



**(2) For development applications other than subdivisions and partitions, wherever existing or future streets adjacent to property proposed for development are of inadequate right-of-way width, the additional right-of-way necessary to comply with TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G of the Tualatin Community Plan must be dedicated to the City for use by the public prior to issuance of any building permit for the proposed development. This right-of-way dedication must be for the full width of the property abutting the roadway and, if required by the City Manager, additional dedications must be provided for slope and utility easements if deemed necessary.**

**Finding:**

*The proposal is adjacent to SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street. Required dedication of right-of-way and construction of public street surface infrastructure will benefit this development's expected addition of bicycle, pedestrian, and vehicular trips utilizing streets and sidewalks. This includes dedication to enable construction of a sidewalk with planter strip on SW Avery Street, a parking strip on SW Martinazzi Avenue, and widening SW Sagert Street to enable a center-turn lane serving the subject property's driveway and sidewalk to the east. Final plans will include a minimum of half-street right-of-way dedications to preferred cross-sections along with improvements within SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street meeting the requirements of the City of Tualatin. With recommended Conditions of Approval A3 and A8, this standard is met.*

**TDC 74.320. - Slope Easements.**

**(1) The applicant must obtain and convey to the City any slope easements determined by the City Manager to be necessary adjacent to the proposed development site to support the street improvements in the public right-of-way or accessway or utility improvements required to be constructed by the applicant.**

[...]

**(3) For all other development applications, a slope easement dedication must be submitted to the City Manager; building permits must not be issued for the development prior to acceptance of the easement by the City.**

**Finding:**

*Any required slope easements necessary to support SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street will be granted to the City. With recommended Conditions of Approval A3 and A8, this standard is met.*

**TDC 74.330. - Utility Easements.**

**(1) Utility easements for water, sanitary sewer and storm drainage facilities, telephone, television cable, gas, electric lines and other public utilities must be granted to the City.**

[...]

**(4) For development applications other than subdivisions and partitions, and for both on-site and off-site easement areas, a utility easement must be granted to the City; building permits must not be issued for the development prior to acceptance of the easement by the City. The City may elect to exercise eminent domain and condemn necessary off-site public utility easements at the applicant's request and expense. The City Council must determine when condemnation proceedings are to be used.**

**(5) The width of the public utility easement must meet the requirements of the Public Works Construction Code. All subdivisions and partitions must have a 6-foot public utility easement adjacent**

**to the street and a 5-foot public utility easement adjacent to all side and rear lot lines. Other easements may be required as determined by the City Manager.**

**Finding:**

*Any required public utility easement will be granted to the City. The public utility easement width will be 8-feet-wide adjacent to the final dedicated right-of-way of SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street. Additional width of public utility easement will include accommodation of water system meters and vaults to meet the Public Works Construction Code. With recommended Conditions of Approval A3 and A8, these standards are met.*

[...]

**TDC 74.420 Street Improvements.**

**When an applicant proposes to develop land adjacent to an existing or proposed street, including land which has been excluded under TDC 74.220, the applicant should be responsible for the improvements to the adjacent existing or proposed street that will bring the improvement of the street into conformance with the Transportation Plan (TDC Chapter 11), TDC 74.425 (Street Design Standards), and the City's Public Works Construction Code, subject to the following provisions:**

**(1) For any development proposed within the City, roadway facilities within the right-of-way described in TDC 74.210 must be improved to standards as set out in the Public Works Construction Code.**

**(2) The required improvements may include the rebuilding or the reconstruction of any existing facilities located within the right-of-way adjacent to the proposed development to bring the facilities into compliance with the Public Works Construction Code.**

**(3) The required improvements may include the construction or rebuilding of off-site improvements which are identified to mitigate the impact of the development.**

**(4) Where development abuts an existing street, the improvement required must apply only to that portion of the street right-of-way located between the property line of the parcel proposed for development and the centerline of the right-of-way, plus any additional pavement beyond the centerline deemed necessary by the City Manager to ensure a smooth transition between a new improvement and the existing roadway (half-street improvement). Additional right-of-way and street improvements and off-site right-of-way and street improvements may be required by the City to mitigate the impact of the development. The new pavement must connect to the existing pavement at the ends of the section being improved by tapering in accordance with the Public Works Construction Code.**

**(5) If additional improvements are required as part of the Access Management Plan of the City, TDC Chapter 75, the improvements must be required in the same manner as the half-street improvement requirements.**

**(6) All required street improvements must include curbs, sidewalks with appropriate buffering, storm drainage, street lights, street signs, street trees, and, where designated, bikeways and transit facilities.**

[...]

**(8) For development applications other than subdivisions and partitions, all street improvements required by this section must be completed and accepted by the City prior to the issuance of a Certificate of Occupancy.**

[...]

**(10) Streets within, or partially within, a proposed development site must be graded for the entire right-of-way width and constructed and surfaced in accordance with the Public Works Construction Code.**

**(11) Existing streets which abut the proposed development site must be graded, constructed, reconstructed, surfaced or repaired as necessary in accordance with the Public Works Construction Code and TDC Chapter 11, Transportation Plan, and TDC 74.425 (Street Design Standards).**

**(12) Sidewalks with appropriate buffering must be constructed along both sides of each internal street and at a minimum along the development side of each external street in accordance with the Public Works Construction Code.**

**(13) The applicant must comply with the requirements of the Oregon Department of Transportation (ODOT), Tri-Met, Washington County and Clackamas County when a proposed development site is adjacent to a roadway under any of their jurisdictions, in addition to the requirements of this chapter.**

**(14) The applicant must construct any required street improvements adjacent to parcels excluded from development, as set forth in TDC 74.220 of this chapter.**

[...]

**(17) Intersections should be improved to operate at a level of service of at least D and E for signalized and unsignalized intersections, respectively.**

[...]

**Finding:**

*A Trip Generation Letter from Kittelson & Associates was submitted with plans focused on onsite redevelopment. City staff have reviewed the proposal against the above requirements. Required dedication of right-of-way and construction of public street surface infrastructure will benefit this development's expected addition of bicycle, pedestrian, and vehicular trips utilizing streets and sidewalks. This includes dedication to enable construction of a sidewalk with planter strip on SW Avery Street, a parking strip on SW Martinazzi Avenue, and widening SW Sagert Street to enable a center-turn lane serving the subject property's driveway and sidewalk to the east. With recommended Conditions of Approval A3, A8, A9 and A12, these standards are met.*

**TDC 74.425 Street Design Standards.**

**(1) Street design standards are based on the functional and operational characteristics of streets such as travel volume, capacity, operating speed, and safety. They are necessary to ensure that the system of streets, as it develops, will be capable of safely and efficiently serving the traveling public while also accommodating the orderly development of adjacent lands.**

**(2) The proposed street design standards are shown in Figures 72A through 72G. The typical roadway cross sections comprise the following elements: right-of-way, number of travel lanes, bicycle and pedestrian facilities, and other amenities such as landscape strips. These figures are intended for planning purposes for new road construction, as well as for those locations where it is physically and economically feasible to improve existing streets.**

[...]

**(4) All streets must be designed and constructed according to the preferred standard. The City Manager may reduce the requirements of the preferred standard based on specific site conditions, but in no event will the requirement be less than the minimum standard. The City Manager must take into consideration the following factors when deciding whether the site conditions warrant a reduction of the preferred standard:**

**(a) Arterials:**

**(i) Whether adequate right-of-way exists;**

**(ii) Impacts to properties adjacent to right-of-way;**

- (iii) Current and future vehicle traffic at the location; and
- (iv) Amount of heavy vehicles (buses and trucks).

**(b) Collectors:**

- (i) Whether adequate right-of-way exists;
- (ii) Impacts to properties adjacent to right-of-way;
- (iii) Amount of heavy vehicles (buses and trucks); and
- (iv) Proximity to property zoned manufacturing or industrial.

[...]

**Finding:**

*The proposal is adjacent to SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street. These are designated on Tualatin Comprehensive Plan Map 8-1: Tualatin Functional Classification Plan and Traffic Signal Plan as a Local, Minor Collector, and Minor Arterial classifications, respectively. A Transportation Impact Analysis from Kittelson & Associates did not recommend additional improvements greater than the preferred cross-sections. With recommended Conditions of Approval A3 and A8, these standards are met.*

**TDC 74.440 Streets, Traffic Study Required.**

**(1) The City Manager may require a traffic study to be provided by the applicant and furnished to the City as part of the development approval process as provided by this Code, when the City Manager determines that such a study is necessary in connection with a proposed development project in order to:**

- (a) Assure that the existing or proposed transportation facilities in the vicinity of the proposed development are capable of accommodating the amount of traffic that is expected to be generated by the proposed development, and/or**
- (b) Assure that the internal traffic circulation of the proposed development will not result in conflicts between on-site parking movements and/or on-site loading movements and/or on-site traffic movements, or impact traffic on the adjacent streets.**

**(2) The required traffic study must be completed prior to the approval of the development application.**

**(3) The traffic study must include, at a minimum:**

- (a) an analysis of the existing situation, including the level of service on adjacent and impacted facilities.**
- (b) an analysis of any existing safety deficiencies.**
- (c) proposed trip generation and distribution for the proposed development.**
- (d) projected levels of service on adjacent and impacted facilities.**
- (e) recommendation of necessary improvements to ensure an acceptable level of service for roadways and a level of service of at least D and E for signalized and unsignalized intersections respectively, after the future traffic impacts are considered.**
- (f) The City Manager will determine which facilities are impacted and need to be included in the study.**
- (g) The study must be conducted by a registered engineer.**

**(4) The applicant must implement all or a portion of the improvements called for in the traffic study as determined by the City Manager.**

**Finding:**

*A Trip Generation Letter from Kittelson & Associates did not recommend any improvements. Their summary included:*

*ColRich (property owner) is proposing to redevelop a portion of the Alden Apartments located in the southeast corner of the SW Martinazzi Avenue/SW Sagert Street intersection in Tualatin. The development plan proposes to remove 15 apartment units and construct 45 townhome units and associated amenities. Access to the townhomes will be provided by the existing driveways to the Alden Apartments on SW Sagert Street and SW Martinazzi Avenue. No new driveways are proposed nor modifications to off-site intersections.*

*This letter provides trip generation and trip distribution/assignment estimates for the proposed redevelopment in accordance with Tualatin Development Code Section 74.440. As documented herein, the proposed redevelopment is estimated to generate fewer than 500 daily trips and fewer than 60 morning and evening peak hour trips. In addition, the proposed redevelopment is expected to generate fewer than 20 large truck trips per day. Therefore, a full transportation impact analysis is not expected to be required per Tualatin Development Code Section 74.440 and the following trip generation and trip distribution estimates are expected to satisfy the requirements of the Tualatin Development Code.*

*City staff have reviewed the subject analysis and have determined that it meets the requirements above. This standard is met.*

[...]

**TDC 74.485. - Street Trees.**

[...]

**(2) In nonresidential subdivisions and partitions street trees must be planted by the owners of the individual lots as development occurs.**

**(3) The Street Tree Ordinance specifies the species of tree which is to be planted and the spacing between trees.**

**Finding:**

*The applicant will plant street trees as shown within approved permit plans. With recommended Conditions of Approval A3, A9, and A12, this standard is met.*

**TDC 74.610 Water Service.**

**(1) Water lines must be installed to serve each property in accordance with the Public Works Construction Code. Water line construction plans must be submitted to the City Manager for review and approval prior to construction.**

[...]

**(3) As set forth in TDC Chapter 12, Water Service, the City has three water service levels. All development applicants must be required to connect the proposed development site to the service level in which the development site is located. If the development site is located on a boundary line between two service levels the applicant must be required to connect to the service level with the higher reservoir elevation. The applicant may also be required to install or provide pressure reducing valves to supply appropriate water pressure to the properties in the proposed development site.**

**Finding:**

*Existing services will be improved as needed to meet current code. Separate laterals will serve domestic and fire services. A gate valve will be located near the main for each water lateral. Water meters and fire vaults will be located adjacent to right-of-way. A public utility easement will surround the water meter*

*and fire vault by five feet. With recommended Conditions of Approval A4, A8, A9 and A12, these standards are met.*

**TDC 74.620 Sanitary Sewer Service.**

**(1) Sanitary sewer lines must be installed to serve each property in accordance with the Public Works Construction Code. Sanitary sewer construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.**

**Finding:**

*Existing services will be improved as needed to meet current code including a cleanout will be installed adjacent to right-of-way. With recommended Conditions of Approval A5, A9, and A12, this standard is met.*

**TDC 74.630 Storm Drainage System.**

**(1) Storm drainage lines must be installed to serve each property in accordance with City standards and Clean Water Services standards. Storm drainage construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.**

**(2) The storm drainage calculations must confirm that adequate capacity exists to serve the site. The discharge from the development must be analyzed in accordance with the City's Storm and Surface Water Regulations and Clean Water Services standards.**

[...]

**TDC 74.640 Grading.**

**(1) Development sites must be graded to minimize the impact of storm water runoff onto adjacent properties and to allow adjacent properties to drain as they did before the new development.**

**(2) A development applicant must submit a grading plan showing that all lots in all portions of the development will be served by gravity drainage from the building crawl spaces; and that this development will not affect the drainage on adjacent properties. The City Manager may require the applicant to remove all excess material from the development site.**

**TDC 74.650 Water Quality, Storm Water Detention and Erosion Control.**

**The applicant must comply with the water quality, storm water detention and erosion control requirements in the Surface Water Management Ordinance. If required:**

[...]

**(2) On all other development applications, prior to issuance of any building permit, the applicant must arrange to construct a permanent on-site water quality facility and storm water detention facility and submit a design and calculations indicating that the requirements of the Surface Water Management Ordinance will be met and obtain a Stormwater Connection Permit from Clean Water Services.**

**(3) For on-site private and regional non-residential public facilities, the applicant must submit a stormwater facility agreement, which will include an operation and maintenance plan provided by the City, for the water quality facility for the City's review and approval. The applicant must submit an erosion control plan prior to issuance of a Public Works Permit. No construction or disturbing of the site must occur until the erosion control plan is approved by the City and the required measures are in place and approved by the City.**

**Finding:**



*The Utility Plan illustrates capturing stormwater runoff from the sites developed areas with conveyance discharging to an existing vegetated channel. The channel conveys flow to storm drain infrastructure within the ODOT right-of-way which conveys flow easterly for approximately 0.5 miles and discharges to Saum Creek. The submitted Preliminary Stormwater Report prepared by 3J Consulting includes modifying existing and construction of new onsite stormwater facilities to provide treatment, hydromodification, and detention for all private impervious areas including an Underground Infiltration Facility. ODOT submitted a response dated November 14, 2022 requiring a design meeting the ODOT Hydraulics Manual specifications and to obtain an ODOT Miscellaneous Permit. Modified impervious areas within SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street right-of-ways will be addressed by construction of public LIDA street swales as approved by the City Engineer.*

*Final plans and stormwater calculations will demonstrate that the development has direct access by gravity to public stormwater systems with adequate infiltration and/or downstream capacity in accordance with City of Tualatin, Clean Water Services, DEQ, and ODOT Hydraulics Manual.*

*The site disturbance is approximately 1.85 acres. Erosion and sediment control plans and permit applications conforming to the requirements of the City of Tualatin, CWS, and Oregon Department of Environmental Quality will be provided with the construction permit submittal documents. The applicant will obtain an erosion control permit from the City of Tualatin for disturbance greater than 500 square feet. In addition these plans must be sufficient to obtain a National Pollution Discharge Elimination System (NPDES) 1200-CN Stormwater Discharge Permit from Clean Water Services as an agent of Oregon Department of Environmental Quality if between 1 and 5 acres of disturbance or a National Pollution Discharge Elimination System (NPDES) 1200-C Construction Erosion Control permit from Oregon DEQ for over 5 acres.*

*A Clean Water Services' Service Provider Letter and Memorandum were received. After land use decision issuance the applicant will submit final plans complying with the Service Provider Letter conditions and CWS Memorandum that are sufficient to obtain a Stormwater Connection Permit Authorization Letter from Clean Water Services in accordance with TDC 74.650(2) and CWS D&CS 3.01.2(d). With recommended Conditions of Approval A6, A7, A9, and A12 these standards are met.*

[...]

## **Chapter 75 Access Management**

[...]

### **TDC 75.020. - Permit for New Driveway Approach**

- (1) Applicability.** A driveway approach permit must be obtained prior to constructing, relocating, reconstructing, enlarging, or altering any driveway approach.
- (2) Exceptions.** A driveway approach permit is not required for:
  - (a)** The construction, relocation, reconstruction, enlargement, or alteration of any driveway approach that requires a state highway access permit; or
  - (b)** The construction, relocation, reconstruction, enlargement or alteration of any driveway approach that is part of the construction of a publicly or privately engineered public improvement project.

[...]

- (4) Submittal Requirements.** In addition to the application materials required by TDC 32.140, the following application materials are also required:

**(a) A site plan, of a size and form and in the number of copies meeting the standards established by the City Manager, containing the following information:**

- (i) The location and dimensions of the proposed driveway approach;**
- (ii) The relationship to nearest street intersection and adjacent driveway approaches;**
- (iii) Topographic conditions;**
- (iv) The location of all utilities;**
- (v) The location of any existing or proposed buildings, structures, or vehicular use areas;**
- (vi) The location of any trees and vegetation adjacent to the location of the proposed driveway approach that are required to be protected pursuant to TDC Chapter 73B or 73C; and**
- (vii) The location of any street trees adjacent to the location of the proposed driveway approach.**

**(b) Identification of the uses or activities served, or proposed to be served, by the driveway approach; and**

**(c) Any other information, as determined by the City Manager, which may be required to adequately review and analyze the proposed driveway approach for conformance with the applicable criteria.**

**(5) Criteria. A Driveway Approach Permit must be granted if:**

**(a) The proposed driveway approach meets the standards of this Chapter and the Public Works Construction Code;**

**(b) No site conditions prevent placing the driveway approach in the required location;**

**(c) The number of driveway approaches onto an arterial are minimized;**

**(d) The proposed driveway approach, where possible:**

**(i) Is shared with an adjacent property; or**

**(ii) Takes access from the lowest classification of street abutting the property;**

**(e) The proposed driveway approach meets vision clearance standards;**

**(f) The proposed driveway approach does not create traffic hazards and provides for safe turning movements and access;**

**(g) The proposed driveway approach does not result in significant adverse impacts to the vicinity;**

**(g) The proposed driveway approach minimizes impact to the functionality of adjacent streets and intersections; and**

**(i) The proposed driveway approach balances the adverse impacts to residentially zoned property and the functionality of adjacent streets.**

**(6) Effective Date. The effective date of a Driveway Approach Permit approval is the date the notice of decision is mailed.**

**(7) Permit Expiration. A Driveway Approach Permit approval expires one year from the effective date, unless the driveway approach is constructed within the one-year period in accordance with the approval decision and City standards.**

[...]

#### **TDC 75.040. - Driveway Approach Requirements**

**(1) The provision and maintenance of driveway approaches from private property to the public streets as stipulated in this Code are continuing requirements for the use of any structure or parcel of real property in the City of Tualatin. No building or other permit may be issued until scale plans are presented that show how the driveway approach requirement is to be fulfilled. If the owner or occupant of a lot or building changes the use to which the lot or building is put, thereby increasing driveway approach requirements, it is unlawful and a violation of this code to begin or maintain such altered use until the required increase in driveway approach is authorized by the City.**

[...]

**(4) Requirements for Development on Less than the Entire Site.**

**(a) To promote unified access and circulation systems, lots and parcels under the same ownership or consolidated for the purposes of development and comprised of more than one building site must be reviewed as one unit in relation to the access standards. The number of access points permitted must be the minimum number necessary to provide reasonable access to these properties, not the maximum available for that frontage. All necessary easements, agreements, and stipulations must be met. This must also apply to phased development plans. The owner and all lessees within the affected area must comply with the access requirements.**

**(b) All access must be internalized using the shared circulation system of the principal commercial development or retail center. Driveways should be designed to avoid queuing across surrounding parking and driving aisles.**

**(5) Lots that front on more than one street may be required to locate motor vehicle accesses on the street with the lower functional classification as determined by the City Manager.**

**(6) Except as provided in TDC 53.100, all driveway approach must connect directly with public streets.**

**(7) To afford safe pedestrian access and egress for properties within the City, a sidewalk must be constructed along all street frontage, prior to use or occupancy of the building or structure proposed for said property. The sidewalks required by this section must be constructed to City standards, except in the case of streets with inadequate right-of-way width or where the final street design and grade have not been established, in which case the sidewalks must be constructed to a design and in a manner approved by the City Manager. Sidewalks approved by the City Manager may include temporary sidewalks and sidewalks constructed on private property; provided, however, that such sidewalks must provide continuity with sidewalks of adjoining commercial developments existing or proposed. When a sidewalk is to adjoin a future street improvement, the sidewalk construction must include construction of the curb and gutter section to grades and alignment established by the City Manager.**

[...]

**(9) Minimum driveway approach width for uses are as provided in Table 75-1 (Driveway Approach Width):**

<b>TABLE 75-1 Driveway Approach Width</b>		
<b>Use</b>	<b>Minimum Driveway Approach Width</b>	<b>Maximum Driveway Approach Width</b>
<b>Multi-family</b>	5-49 Units = 24 feet 50-499 = 32 feet Over 500 = as required by the City Manager	May provide two 16 foot one-way driveways instead of one 24-foot driveway May provide two 24-foot one-way driveways instead of one 32-foot driveway

**(10) Driveway Approach Separation. There must be a minimum distance of 40 feet between any two adjacent driveways on a single property unless a lesser distance is approved by the City Manager.**

**(11) Distance between Driveways and Intersections. Except for single-family dwellings, duplexes, townhouses, triplexes, quadplexes, and cottage clusters, the minimum distance between driveways and intersections must be as provided below. Distances listed must be measured from the stop bar at the intersection.**

**(a) At the intersection of collector or arterial streets, driveways must be located a minimum of 150 feet from the intersection.**

[...]

**(12) Vision Clearance Area.**

**(a) Local Streets.** A vision clearance area for all local street intersections, local street and driveway intersections, and local street or driveway and railroad intersections must be that triangular area formed by the right-of-way lines along such lots and a straight line joining the right-of-way lines at points which are ten feet from the intersection point of the right-of-way lines, as measured along such lines (see Figure 73-2 for illustration).

**(b) Collector Streets.** A vision clearance area for all collector/arterial street intersections, collector/arterial street and local street intersections, and collector/arterial street and railroad intersections must be that triangular area formed by the right-of-way lines along such lots and a straight line joining the right-of-way lines at points which are 25 feet from the intersection point of the right-of-way lines, as measured along such lines. Where a driveway intersects with a collector/arterial street, the distance measured along the driveway line for the triangular area must be ten feet (see Figure 73-2 for illustration).

**(c) Vertical Height Restriction.** Except for items associated with utilities or publicly owned structures such as poles and signs and existing street trees, no vehicular parking, hedge, planting, fence, wall structure, or temporary or permanent physical obstruction must be permitted between 30 inches and eight feet above the established height of the curb in the clear vision area (see Figure 73-2 for illustration).

[...]

**TDC 75.120. - Collector Streets Access Standards.**

[...]

**(2) Minor Collectors.** Residential, commercial and industrial driveways where the frontage is greater or equal to 70 feet are permitted. Minimum spacing at 100 feet. Uses with less than 50 feet of frontage shall use a common (joint) access where available.

[...]

**TDC 75.140. - Existing Streets Access Standards.**

The following list describes in detail the freeways and arterials as defined in TDC 75.050 with respect to access. Recommendations are made for future changes in accesses and location of future accesses. These recommendations are examples of possible solutions and shall not be construed as limiting the City's authority to change or impose different conditions if additional studies result in different recommendations from those listed below.

[...]

**(1) INTERSTATE 5 (I-5).** I-5 is a State facility and access is controlled by the State.

[...]

**(14) SAGERT STREET.**

**(a) Martinazzi Avenue to 65th Avenue.** No new driveways or streets shall be allowed,

[...]

**Finding:**

*No modification to existing and no new accesses are proposed. Modifications to the existing streets to match preferred cross-sections will meet vision clearance requirements. With recommended Conditions of Approval A3, A8, A9, and A12, these standards are met.*

### III. RECOMMENDATION

Based on the application materials and analysis and findings presented above, staff finds that the applicable criteria have been met relative to AR 22-0001, and therefore recommend approval of this application with the following conditions of approval:

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**GENERAL:**

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- A1. This Architectural Review approval shall expire after two years unless a building, or grading permit submitted in conjunction with a building permit application, has been issued and substantial construction pursuant thereto has taken place and an inspection performed by a member of the Building Division, or an extension is granted under TDC 33.020(10).

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**PRIOR TO EROSION CONTROL, PUBLIC WORKS, AND WATER QUALITY PERMIT ISSUANCE:**

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*Submit to [eTrakit](#) for review and approval:*

- A2. The applicant must apply for applicable Engineering Erosion Control, Water Quality, and Public Works permits:
- a. Apply using [eTrakit](#). With the initial Engineering permit(s) application(s) include:
    - i. One combined set of 24"x36" plans including all applicable Engineering permits attached to one Engineering permit. Include a note on other Engineering permits stating which application includes the set; and,
    - ii. Payment for an Erosion Control permit fee per the [fee schedule](#); and,
    - iii. Engineering estimate and deposit for each Water Quality or Public Works permit per the [fee schedule](#); and,
  - b. Deliver two 24"x36" hard copies of the combined Engineering permit plan sets to:

**City of Tualatin**  
**Attn: Engineering Division c/o Principal Engineer**  
**10699 SW Herman Road**  
**Tualatin, OR 97062**

- A3. The applicant must submit Final Street Improvement Plans for SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street adjacent to the lot in accordance with applicable sections of Tualatin Development Code (TDC) 74 and 75 and Public Works Construction Code (PWCC) that show:
- a. Dedication of half-street right-of-way from centerline totaling:
    - i. 25 feet for SW Avery Street; and,
    - ii. 38 feet for SW Martinazzi Avenue; and,
    - iii. 37 feet for SW Sagert Street; and,
  - b. Any additional dedication needed for SW Avery Street and SW Martinazzi Avenue and construction:
    - i. On the north side of SW Avery Street to the Shaniko Greenway Trail:
      - 1. A 4-foot-wide planter strip; and,
      - 2. Street trees; and,
      - 3. Widened to accommodate any required LIDA street swales for public stormwater to meet current CWS requirements; and,

4. A 5-foot-wide public sidewalk; and,
    5. Street lighting improvements as necessary to meet Tualatin standards.
  - ii. Ramps at the northeast corner of the intersection of SW Avery Street and SW Martinazzi Avenue; and,
- c. Ramp replacement at the intersection of SW Avery Street and SW Martinazzi:
  - i. For the northeast and southeast corners crossing the east side of the intersection; and,
  - ii. For the northwest and northeast corners crossing the north side of the intersection with curb extensions; and,
- d. Continental striping of all four crosswalks of the intersection of SW Avery Street and SW Martinazzi Avenue.
- e. SW Martinazzi Avenue on the east side including:
  - i. Preferred half-street improvements including on-street parallel parking along Martinazzi. This section may be adjusted as necessary (as determined by the City Engineer) to preserve existing large mature trees; and,
  - ii. Street lighting improvements as necessary to meet City Engineer standards including PGE's Option A.
  - iii. A planter strip with street trees:
    6. With a minimum 6-foot width where possible; and,
    7. Widened to preserve street and private trees or accommodate any required LIDA street swales for public stormwater to meet current CWS requirements; and,
  - iv. A 6-foot-wide sidewalk meandered as needed for topography, tree preservation, and to match the planter strip; and,
- f. SW Sagert Street with:
  - i. Preferred half-street improvements including a center turn lane extending from the existing center turn lane (near the western edge of the property) east serving the Alden driveway and tapering to meet the existing SW Sagert Street structure at ODOT's bridge over I-5 at the eastern edge of the subject property. and,
  - ii. Street lighting improvements as necessary to meet City Engineer standards including PGE's Option A.
  - iii. A planter strip with street trees adjacent to locations of adequate lengths new or replaced sidewalk as determined by the City Engineer:
    8. With a minimum 6-foot width where possible; and,
    9. Widened to preserve existing mature trees, match existing topography, or accommodate any required LIDA street swales for public stormwater to meet current CWS requirements; and,
  - iv. A 6-foot-wide sidewalk extended as far east towards the bridge as possible; and,
- g. An 8-foot-wide public utility easement and any required slope easement, or existing equivalent approved by the City Engineer, adjacent to SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street including:
  - i. Five feet of public utility easement surrounding water meter, backflow protection, and fire vault; and,



- ii. Any proposed private retaining walls must be outside of public utility and slope easements; and,
      - iii. The City Engineer may allow existing right-of-way in excess of the Preferred half-street to equivalently reduce the required easement width; and,
    - h. Bring into compliance of ADA standards:
      - i. All public sidewalks adjacent to the lot; and,
      - ii. Driveways serving the lot; and,
      - iii. All ramps adjacent to the lot including receiving ramps at the northwest and southeast corner at the intersection of SW Avery Street and SW Martinazzi Avenue.
- A4. The applicant must submit Final Water System Plans in accordance with Tualatin Development Code (TDC) 74.610, Tualatin Municipal Code (TMC) 3-3, and Public Works Construction Code (PWCC) that show:
  - a. Separate laterals for domestic and fire services; and,
  - b. A gate valve at the main for both domestic and fire service laterals; and
  - c. Adjacent to public right-of-way:
    - i. Reduced pressure backflow prevention for the domestic lateral; and,
    - ii. Water meter(s) behind the curb within the planter strip, and
    - iii. If within final plans, irrigation after a domestic meter and reduced pressure backflow device; and,
    - iv. Fire vault(s) surrounded by a five foot public utility easement.
- A5. The applicant must submit Final Sanitary Sewer System Plans in accordance with Tualatin Development Code (TDC) 74.620, Tualatin Municipal Code (TMC) 3-2, and Public Works Construction Code (PWCC) that show location of the lines, grade, materials, and other details including cleanout at right-of-way.
- A6. The applicant must submit:
  - a. Proof from DEQ of approval of construction of the Underground Infiltration Facility or accommodation of associated stormwater infiltration volume within detention facilities approvable under City of Tualatin codes and Clean Water Services' Design and Construction Standards; and,
  - b. Final Stormwater System Calculations and Plans in accordance with Tualatin Development Code (TDC) 74.630 and 74.650, Tualatin Municipal Code (TMC) 3-5-200 through 3-5-430, Public Works Construction Code (PWCC), and Clean Water Services' (CWS) Design & Construction Standards (D&CS) Chapter 4 stamped by an Oregon registered, professional engineer in accordance with TMC 3-5-390(1) that:
    - i. Provide a downstream analysis, including but not limited to erosion, and include solutions within final plans for ¼ mile downstream from the release from the private development through the public stormwater system, in accordance with TMC 3-5-210(4); and,
    - ii. Accommodate up to a 25-year storm event within the City of Tualatin's public stormwater system with a maximum capacity of 82% for Tualatin's lines in accordance with TDC 74.640, CWS D&CS 5.05.2.d, and the City Engineer; and,
    - iii. Evaluate the 100-year check storm for any release directly or indirectly to ODOT's stormwater system in accordance with the ODOT Hydraulics Manual; and

- iv. Address runoff from all new and modified private and public impervious areas; and,
  - v. Prove gravity flow five feet from the outside of the established line of the building to the public stormwater system or as otherwise approved by the City Engineer, in accordance with CWS D&CS 1.03.39 and 5.09.3(a) (1) and (4); and,
  - vi. Discharge to an approved public system; and,
  - vii. Treat new and modified impervious areas in accordance with CWS D&CS 4.08.1.d meeting phosphorous removal in accordance with TMC 3-5-350 per the design storm in accordance with TMC 3-5-360 and CWS D&CS 4.08.2; and,
  - viii. Prove infiltration rates in accordance with CWS D&CS 4.08.03; and,
  - ix. Detain as required for conveyance with the City of Tualatin’s stormwater system and up to the 50-year storm event for release to ODOTs stormwater system in accordance with the ODOT Hydraulics Manual, TMC 3-5-220, TMC 3-5-230, and CWS D&CS 4.08; and,
  - x. Accommodate hydromodification including post-development runoff rates not exceeding pre-development runoff rates for ½ the 2-year storm event and the 5-year and 10-year storm events for proposed new and modified impervious areas in accordance with CWS D&CS 4.03.5; and,
  - xi. In accordance with TDC 74.650(2) and CWS D&CS 3.01.2(d), comply with:
    - 10. The submitted Clean Water Services’ Service Provider Letter CWS File Number dated July 19, 2022 conditions to obtain a Stormwater Connection Permit Authorization Letter, and,
    - 11. Requirements stated within the Clean Water Services’ Memorandum dated November 10, 2022; and,
  - c. Financial assurance for construction performance in accordance with TMC 3-390(3), PWCC 102.14.00, and amount per CWS D&CS 2.07 Table 2-1; and,
  - d. A copy of the recorded private stormwater maintenance agreement in accordance with TMD 3-5-390(4). The agreement must assure the owner as responsible for maintenance of the constructed portions of private stormwater systems within their lot. The identified system must include all conveyance, detention, hydromodification, and treatment.
- A7. The applicant must submit Final Erosion Control Plans in accordance with Tualatin Development Code (TDC) 74.640, Tualatin Municipal Code (TMC) 3-5-050 and 3-5-060, Public Works Construction Code (PWCC), and Clean Water Services’ (CWS) Design & Construction Standards (D&CS) Chapters 2 and 6 that:
- a. Minimize the impact of stormwater from the development to adjacent properties; and,
  - b. Are sufficient to obtain a National Pollution Discharge Elimination System (NPDES) 1200-CN Stormwater Discharge Permit from Clean Water Services as an agent of Oregon Department of Environmental Quality if disturbance is between 1 and 5 acres.

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**PRIOR TO BUILDING PERMIT ISSUANCE:**

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- A8. The applicant must submit copies of recorded deeds of right-of-way dedication along with public utility and slope easements, as approved by the City Engineer, in accordance with Tualatin Development Code (TDC) 74.210 and 74.330 which show:

- a. Right-of-way dedication including:
    - i. A half-street from centerline for a total of:
      - 1. 25 feet for SW Avery Street; and,
      - 2. 38 feet for SW Martinazzi Avenue; and,
      - 3. 37 feet for SW Sagert Street; and,
    - ii. Any additional at the intersection of SW Avery Street and SW Martinazzi Avenue to construct a 5-foot-wide public sidewalk and 4-foot-wide planter strip along with ramps at the northeast corner of the intersection; and,
    - iii. Any additional to accommodate and any final public street improvements or stormwater LIDA facilities; and,
  - b. 8-foot-wide public utility and any necessary slope easements, adjacent to SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street including:
    - i. A 10-foot-wide public utility easement centered on any water lateral extending onsite past the public utility easement adjacent to right-of-way; and,
    - ii. Five feet of public utility easement surrounding water meters, backflow protection, and fire vaults; and
    - iii. Reduced width of easements from standard due to existing right-of-way in excess of the Preferred half-street width as determined by the City Engineer; and,
- A9. The applicant must obtain:
- a. A National Pollution Discharge Elimination System (NPDES) 1200-CN Stormwater Discharge Permit from Clean Water Services as an agent of Oregon Department of Environmental Quality, and,
  - b. ODOT Miscellaneous Permit
  - c. Erosion Control, Public Works, and Water Quality Permits from the City of Tualatin.
- A10. The applicant must submit a Final Site Plan Set (in PDF format) to the Planning Division that is in substantial conformance to the submitted site plans and includes:
- a. Tree Preservation Plan that corresponds to the Tree Assessment Report (submitted as Exhibit A3) that is drawn to scale that includes the location of all trees proposed for removal and preservation that are eight inches or more in diameter, all existing and proposed structures, all existing and proposed public and private improvements, and all existing public and private easements in accordance with TDC 33.110(4)(a).
  - b. Private outdoor areas of 80 square feet or greater attached to each ground level unit, consistent with TDC 73A.200(1).
  - c. Balcony areas of 48 square feet or greater provided for each above-ground unit, consistent with TDC 73A.200(2).
  - d. Entry areas of 24 square feet or greater provided for each unit, or a minimum combined area of 1,392 square feet or greater for each multi-family building, consistent with TDC 73A.200(3).
  - e. Shared outdoor area of 72,000 square feet or greater with features consistent with TDC 73A.200(4).
  - f. Children’s play area of 36,000 square feet or greater with design features consistent with TDC 73A.200(5).
  - g. Storage areas for each unit that are a minimum of: 36 square feet for two-bedroom units, and 48 square feet for three-bedroom or greater units, consistent with TDC 73A.200(6).

- f. Walkways that are a minimum of 6 feet in width; constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete; and meet ADA standards at time of construction, consistent with TDC 73A.200(7).
- g. An accessway that is a minimum 8 feet in width; constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete; meets ADA standards at time of construction; and connects the private on-site walkways to the public sidewalk or multiuse path on Boones Ferry Road, consistent with TDC 73A.200(7). The width may be reduced, as needed to accommodate right-of-way improvements and/or constraints, subject to approval by the City Engineer.
- h. The applicant shall provide detailed information including materials and colors proposed for the carports in compliance with TDC 73A.200(9).
- i. The applicant or property owner must submit scaled elevations illustrating that demonstrates compliance with TDC 73A.200(11).
- j. Trees identified for retention in Tree Assessment Report (Exhibit A3) must be identified on the grading plan, consistent with TDC 73B.080(3) and reflect the applicants Arborist report recommendations. Tree protection fencing and other preservation measures recommended by the Arborist should also be specified on the grading plan.
- k. The applicant shall provide and irrigation plan in compliance with 73B.080(5).
- l. The applicant must provide information that demonstrates compliance with site lighting requirements of TDC 73A.200(10)(b) and parking lot landscaping requirements of TDC 73C.020(11).
- m. Parking space dimensional information conforming to TDC Appendix B Figure 73-1 must be provided.
- n. Where bicycle parking spaces are not located within a garage of a dwelling unit, the applicant must provide information that demonstrates compliance with 73.050 (2).
- o. The applicant shall provide additional information that demonstrates the abutting sidewalk to the existing driveways are at least 6-feet in width in compliance with TDC 73C.130 (c).
- p. The applicant shall provide landscaping plans that illustrate clear vision requirements of TDC 73C.210 (2) are met.

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**DURING CONSTRUCTION ACTIVITY:**

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- A11. The applicant must install the tree protection fencing consistent with the Tree Assessment Report submitted as Exhibit A3 and Section 73B.080(3). Please contact the Planning Division to schedule an inspection with a minimum of 48 hours' notice. Where site conditions make grading or other similar encroachment upon a preserved tree's drip-line area, such grading or similar encroachment must only be permitted under the direction of a qualified arborist.

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**PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY AND/OR CERTIFICATE OF COMPLETION:**

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- A12. The applicant must complete all the private stormwater and public improvements as shown on the approved permit plans. All improvements must also be accepted by the City in accordance with Tualatin Development Code (TDC) 74.120.
- A13. The applicant must submit paper and electronic as-builts of the Engineering permits along with maintenance bonds and any final fees for public and water quality improvements.
- A14. The applicant shall provide information that demonstrates compliance with TDC 73A.200 (10).
- A15. Areas impacted by grading and all areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped, pursuant to TDC 73B.030(1).
- A16. Areas impacted by grading and all areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped, pursuant to TDC 73B.030(1).
- A17. The applicant shall provide information that demonstrates compliance with parking lot design standards and construct any required improvements per TDC 73C.020.
- A18. The applicant shall provide information that demonstrates the entire development meets the parking requirements 73C.100.
- A19. No vehicular parking, hedge, planting, fence, wall structure, or temporary/permanent physical obstruction is permitted between 30 inches and eight feet above the established height of the curb in the vision clearance area specified in TDC Figure 73-2 (Exhibit G).
- A20. The applicant shall follow the method of waste and recycling storage and pickup as described in the letter dated September 2, 2022 from Republic Services.

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**THE FOLLOWING ITEMS APPLY TO THE SITE IN AN ON-GOING MANNER:**

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- A21. All mechanical equipment must be screened in accordance with TDC 73A.200(11)(c). Prior to approval of a mechanical permit, the applicant or property owner must submit scaled elevations illustrating that above-grade or on-grade equipment will be screened by parapet, sight-obscuring fence, landscaping, or other method.
- A22. All sign permits require separate sign permit approval per TDC Chapter 38. This approval does not constitute sign permit approval.
- A23. All site, building exterior, and landscaping improvements approved through the AR process must be continually maintained, so as to remain substantially similar to original approval through the AR process, except as permitted under TDC 33.020(7) (Modifications to Previously Approved Final Architectural Review Decisions).
- A24. All parking spaces shall be continuously maintained in compliance with the dimensional standards specified in TDC Figure 73-1 (Exhibit F).
- A25. No vehicular parking, hedge, planting, fence, wall structure, or temporary/permanent physical obstruction is permitted between 30 inches and eight feet above the established height of the curb in the vision clearance area specified in TDC Figure 73-2 (Exhibit G).

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**GENERAL INFORMATION**

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**SITE INFORMATION**

Parcel Number:

2S125BA00100

Address:

7800 SW Sagert Street and 20400 SW Martinazzi Avenue

Gross Site Area:

17.09 acres

Zoning Designation:

RMH (Medium High Density Residential)

Existing Use:

Apartment Complex

Surrounding Zoning:

The properties to the north are zoned CO (Commercial Office). The properties to the south are zoned RML (Medium Low Density Residential). The properties to the east are zoned RMH (I-205 Freeway is along the eastern boundary of the site). The properties to the west are zoned RMH and RL (Low Density Residential).

Street Classification:

SW Sagert Street is classified as a minor arterial. SW Martinazzi Avenue is classified as a minor collector. SW Avery Street is classified as a local street.

## **INTRODUCTION**

### **APPLICANT'S REQUEST**

Colrich California Construction, LLC (“the Applicant”) proposes an addition to the existing Alden Apartments site and seeks approval of a Type III Architectural Review Application. In conjunction with the architectural review, the Applicant requests a Tree Removal Permit. This narrative has been prepared to describe the proposed development and to document compliance with the relevant sections of Tualatin’s Development Code (TDC) and Municipal Code (TMC). This narrative describes the proposed development and demonstrates compliance with the relevant approval standards of the TDC and TMC.

Architectural Reviews are evaluated under the Type III decision process. Tree Removal Permits require a Type II decision process that are processed concurrently with the Architectural Review process. The Architectural Review Board will render the Type III decision after a public hearing on the application is held.

### **SITE DESCRIPTION/SURROUNDING LAND USE**

The site is located at 7800 SW Sagert Street in the City of Tualatin. The tax lot ID is 2S125BA00100. The zoning of the property is RMH (Medium High Density Residential). The site is just over 17 acres in size and has frontage on SW Sagert Street (minor arterial), SW Martinazzi Avenue (minor collector) and SW Avery Street (local). The site is developed with the Alden Apartments Complex site topography, surrounding zoning and uses, etc.

### **PROPOSAL**

This land use application proposes a site addition to the existing Alden Apartments site. The addition includes 45 new townhome units in 12 new buildings. Two existing buildings are proposed for removal for a net gain of 10 buildings on the site. The removal of 49 trees is proposed as part of the development application as described in the tree removal permit application.

### **NEIGHBORHOOD MEETING**

The Applicant conducted a neighborhood meeting on August 10, 2022, to explain the proposed development and answer questions from the surrounding property owners. The submitted materials include the required documentation in Appendix F-Neighborhood Meeting Materials.



## **APPLICABLE ZONING CODE CRITERIA**

The following sections of the Tualatin Development Code and Tualatin Municipal Code have been extracted as they have been deemed to be applicable to the proposal. Following each **bold** applicable criteria or design standard, the Applicant has provided a series of draft findings. The intent of providing code and detailed responses and findings is to document, with absolute certainty, that the proposed development has satisfied the approval criteria for Architectural Review and Tree Permit applications.

### **CHAPTER 32 - PROCEDURES**

#### **TDC 32.010. - Purpose and Applicability. *[City code text omitted for brevity]***

**Finding:** This proposal includes a Multifamily Housing Project abutting a single-family district and therefore requires a Type III architectural review with the Architectural Review Board as the decision authority. The proposed tree removal permit is a Type II but will be reviewed and decided by the Architectural Review Board in conjunction with the multifamily redevelopment. This standard is met.

#### **TDC 32.110. - Pre-Application Conference. *[City code text omitted for brevity]***

**Finding:** A pre-application conference was held with City staff on March 9, 2022, in advance of the Neighborhood/Development Meeting and the application submittal. This application is being submitted within 6 months of the pre-application conference. The pre-application notes are included as Appendix E-Pre-Application Notes. This standard is met.

#### **TDC 32.120. - Neighborhood/Developer Meetings. *[City code text omitted for brevity]***

**Finding:** A Neighborhood/Developer Meeting was held on August 10, 2022, at the Tualatin Public Library at 6pm (weekday). Notice of the meeting was posted at the site's driveways on Sagert and Martinazzi and on Avery adjacent to the site and mailed 14 calendar days prior to the meeting. The Notice, sign-in sheet and meeting notes are included with this submittal in Appendix F- Neighborhood Meeting Materials. This standard is met.

#### **TDC 32.130. - Initiation of Applications. *[City code text omitted for brevity]***

**Finding:** This application is being initiated by the property owner. This standard is met.

#### **TDC 32.140. - Application Submittal. *[City code text omitted for brevity]***

**Finding:** This submittal is on forms provided by the City and includes all required items, including Appendix A-Land Use Application and Title Report. This standard is met.

**TDC 32.150. - Sign Posting. [City code text omitted for brevity]**

**Finding:** The Neighborhood/Developer Meeting sign was posted on all 3 public rights-of-way adjacent to the property and was designed to meet city standards, as shown the pictures included with Appendix F- Neighborhood Meeting Materials. The land use action sign will be similarly designed and posted once the application is submitted. This standard is met.

**TDC 32.160. - Completeness Review.**

**Finding:** The Applicant acknowledges the completeness review timeframes and process. This standard is met.

**TDC 32.230. - Type III Procedure (Quasi-Judicial Review—Public Hearing).**

**Finding:** The Applicant acknowledges the Type III Procedure. This standard is met.

**CHAPTER 33 - APPLICATIONS AND APPROVAL CRITERIA**

**TDC 33.020. - Architectural Review.**

**(2) Applicability.**

**(a) The following types of development are subject to Architectural Review:**

- (i) Any exterior modifications to improved or unimproved real property;**
- (ii) Any remodeling that changes the exterior appearance of a building;**
- (iii) Any site alteration which alters the topography, appearance or function of the site; and**
- (iv) Any change in occupancy from single family use to commercial or industrial use.**

**Finding:** Architectural review is applicable to the proposed site addition. This standard is met.

**(3) Types of Architectural Review Applications—Procedure Type.**

**(g) Large Commercial, Industrial, and Multifamily Development. Development applications that propose any of the following are subject to Type III Review by the Architectural Review Board as the hearing body:**

- (i) New Commercial Buildings 50,000 square feet and larger;**
- (ii) New Industrial Buildings 150,000 square feet and larger; and**
- (iii) New Multifamily Housing Projects with 100 units or more units (or any number of units abutting a single family district).**

**Finding:** The new multifamily units are within a project that has over 100 units and is abutting a single-family district and, therefore, the Type III Review by the Architectural Review Board is applicable. This standard is met.

**(4) Application Materials.** *The application must be on forms provided by the City. In addition to the application materials required by TDC 32.140 (Application Submittal), the following application materials are also required:*

- (a) The project name and the names, addresses, and telephone numbers of the architect, landscape architect, and engineer on the project;*
- (b) Existing conditions plan, site plan, grading plan, utility plan, landscape plan, and lighting plan all drawn to scale;*
- (c) A building materials plan that includes a written description and image representation of facade, windows, trim, and roofing materials, colors, and textures;*
- (d) Title report; and*
- (e) A Service Provider Letter from Clean Water Services.*

**Finding:** This land use application includes all required submittal materials. This standard is met.

**(5) Approval Criteria.**

- (c) General Development. Applications for General Development must comply with the applicable standards and objectives in TDC Chapter 73A through 73G.*
- (d) Large Commercial, Industrial, and Multifamily Development. Applications for Large Commercial, Industrial, and Multifamily Development must comply with the applicable standards and objectives in TDC Chapter 73A through 73G.*

**Finding:** This land use application includes all required submittal materials. Compliance with applicable standards is addressed further in this narrative. This standard is met.

**(6) Conditions of Approval.**

- (a) Architectural Review decisions may include conditions of approval that apply restrictions and conditions that:*
  - (i) Implement identified public facilities and services needed to serve the proposed development;*
  - (ii) Implement identified public facilities and services needed to be altered or increased attributable to the impacts of the proposed development; and*
  - (iii) Implement the requirements of the Tualatin Development Code.*
- (b) Types of conditions of approval that may be imposed include, but are not limited to:*
  - (i) Development Schedule. A reasonable time schedule placed on construction activities associated with the proposed development, or portion of the development.*
  - (ii) Dedications, Reservation. Dedication or reservation of land, or the granting of an easement for park, open space, rights-of-way, bicycle or pedestrian paths, Greenway, Natural Area, Other Natural Area, riverbank, the conveyance of title or easements to the City or a non-profit conservation organization, or a homeowners' association.*
  - (iii) Construction and Maintenance Guarantees. Security from the property owners in such an amount that will assure compliance with approval granted.*
  - (iv) Plan Modifications. Changes in the design or intensity of the proposed development, or in proposed construction methods or practices, necessary to assure compliance with this chapter.*

*(v) Other Approvals. Evaluation, inspections or approval by other agencies, jurisdictions, public utilities, or consultants, may be required for all or any part of the proposed development.*

*(vi) Access Limitation. The number, location and design of street accesses to a proposed development may be limited or specified where necessary to maintain the capacity of streets to carry traffic safely, provided that sufficient access to the development is maintained.*

**Finding:** The Applicant acknowledges that an Architectural Review decision may include conditions of approval. This standard is met.

**TDC 33.110. - Tree Removal Permit/Review.**

**(3) Procedure Type.** Tree Removal Permit applications are subject to Type II Review in accordance with TDC Chapter 32. Tree Removal Permit applications submitted with an Architectural Review, Subdivision, or Partition application will be processed in conjunction with the Architectural Review, Subdivision, or Partition decision.

**Finding:** This architectural review submittal includes application for a tree removal permit. This standard is met.

**(4) Specific Submittal Requirements.** In addition to the general submittal requirements in TDC 32.140 (Application Submittal), an applicant must submit the following:

**(a) Tree Preservation Plan.** A tree preservation plan drawn to scale must include:

**(i) The location, size, species, and tag identification number of all trees on-site eight inches or more in diameter;**

**(ii) All trees proposed for removal and all trees proposed to be preserved;**

**(iii) All existing and proposed structures;**

**(iv) All existing and proposed public and private improvements; and**

**(v) All existing public and private easements.**

**(b) Tree Assessment Report.** A tree assessment prepared by a certified arborist must include:

**(i) An analysis as to whether trees proposed for preservation may be preserved in light of the development proposed, are healthy specimens, and do not pose an imminent hazard to persons or property if preserved;**

**(ii) An analysis as to whether any trees proposed for removal could reasonably be preserved in light of the development proposed and health of the tree;**

**(iii) a statement addressing the approval criteria set forth in TDC 33.110(5);**

**(iv) the name, contact information, and signature of the arborist preparing the report; and**

**(v) The tree assessment report must have been prepared and dated no more than one calendar year preceding the date the development or Tree Removal Permit application is deemed complete by the City.**

**(c) Tree Tags.** All trees on-site must be physically identified and numbered in the field with an arborist-approved tagging system that corresponds to the Tree Preservation Plan and Tree Assessment Report.

**Finding:** This land use application includes a tree preservation plan and tree assessment report, included in Appendix D.1- Arborist Report and meeting the criteria of this section. This standard is met.

**(5) Approval Criteria.**

**(a) An applicant must satisfactorily demonstrate that at least one of the following criteria are met:**

**(i) The tree is diseased and:**

**(A) The disease threatens the structural integrity of the tree; or**

**(B) The disease permanently and severely diminishes the esthetic value of the tree; or**

**(C) The continued retention of the tree could result in other trees being infected with a disease that threatens either their structural integrity or esthetic value.**

**(ii) The tree represents a hazard which may include but not be limited to:**

**(A) The tree is in danger of falling; or**

**(B) Substantial portions of the tree are in danger of falling.**

**(iii) It is necessary to remove the tree to construct proposed improvements based on Architectural Review approval, building permit, or approval of a Subdivision or Partition Review.**

**(b) If none of the conditions in TDC 33.110(5)(a) are met, the certified arborist must evaluate the condition of each tree.**

**(i) *Evergreen Trees.* An evergreen tree which meets any of the following criteria as determined by a certified arborist will not be required to be retained:**

**(A) Trunk Condition—extensive decay and hollow; or**

**(B) Crown Development—unbalanced and lacking a full crown;**

**(ii) *Deciduous Trees.* A deciduous tree which meets any of the following criteria as determined by a certified arborist will not be required to be retained:**

**(A) Trunk Condition—extensive decay and hollow;**

**(B) Crown Development—unbalanced and lacking a full crown; or**

**(C) Structure—Two or more dead limbs.**

**Finding:** Removal of 35 of the 49 regulated trees planned for removal is necessary to construct proposed improvements. The tree preservation plan included in Appendix D.1-Arborist Report of this submittal, shows that these trees are within the footprint of proposed buildings, drive aisles, sidewalks and retaining walls or within areas of required grading with severe impacts within critical root zones. The other 14 regulated trees planned for removal are all deciduous trees with poor crown development or poor structure including 13 invasive species trees and one 29-inch diameter silver maple, tree #1122, which is in poor condition with very poor structure including multiple upright leaders, a history of branch failure and numerous epicormic sprouts. The following table provides a summary of the number of inventoried trees planned for retention and removal. This standard is met.

Treatment	Total	Percent
Retain	37	42%
Remove	51	58%
Remove to Construct Proposed Improvements (criteria a-iii)	35	40%
Remove for Poor Crown Development (criteria b-ii-B)	8	9%
Remove for Poor Structure (criteria b-ii-C)	6	7%
Trees <8" DBH Planned for Removal Two or more dead limbs	2	2%
<b>Percent of Total</b>	<b>88</b>	<b>100%</b>

**(6) Emergencies. [City code text omitted for brevity]**

**Finding:** There are no tree emergencies identified with this submittal and therefore this standard is not applicable.

**(7) Conditions of Approval. Any tree required to be retained must be protected in accordance with the TDC 73B and 73C.**

**Finding:** All retained trees will be protected as identified in Appendix D.1-Arborist Report, and the Tree Inventory and Protection Plan, Sheet C110 of Appendix C- Land Use Plans-Civil. This standard is met.

**(8) Permit Expiration. A Tree Removal Permit is valid for one year from the date of issue. A Tree Removal Permit approved in conjunction with an Architectural Review, Subdivision, or Partition decision is valid as provided in the terms of the Architectural Review, Subdivision, or Partition decision.**

**Finding:** The Applicant acknowledges the approval timeline. This standard is met.

**(9) Tree removal in violation of Zone Standards. [City code text omitted for brevity]**

**Finding:** This proposal does not include tree removal in violation of Zone Standards and therefore this standard is not applicable.

**CHAPTER 42 - MEDIUM HIGH DENSITY RESIDENTIAL ZONE (RMH)**

**TDC 42.200. - Use Categories.**

**(1) Use Categories. Table 42-1 lists use categories Permitted Outright (P) or Conditionally Permitted (C) in the RMH zone. Use categories may also be designated as Limited (L) and subject to the limitations listed in Table 42-1 and restrictions identified in TDC 42.210. Limitations may restrict the specific type of use, location, size, or other characteristics of the use category. Use categories which are not listed are prohibited within the zone, except for uses which are found by the City Manager or appointee to be of a similar character and to meet the purpose of this zone, as provided in TDC 31.070.**

**TDC 42.220. - Housing Types.**

**Table 42-2 lists Housing Types permitted in the RMH zone. Housing types may be Permitted Outright (P), Conditionally Permitted (C), or Not Permitted (N) in the RMH zone.**

**Finding:** This application proposes multi-family structures, which are permitted outright in the RMH zoning district. This standard is met.

**TDC 42.300. - Development Standards.**

**Development standards in the RMH zone are listed in Table 42-3. Additional standards may apply to some uses and situations, see TDC 42.310.**

**Table 42-3 Development Standards in the RMH Zone**

STANDARD	REQUIREMENT	LIMITATIONS AND CODE REFERENCES
Maximum Density- Household Living Uses	Maximum: 15 units per acre Minimum: 11 units per acre	
Min. Lot Size- Multi-Family Structure and Duplex (1+ acre site)	2,904 square feet per unit	
Mini. Avg. Lot Width Multi-Family Structure	75 feet	May be 40 feet on a cul-de-sac street.
Min. Front Setback		Minimum setback to a garage door must be 20 feet.
<ul style="list-style-type: none"> <li>• 1 story structure</li> <li>• 1.5 story structure</li> <li>• 2 story structure</li> <li>• 2.5 story structure</li> </ul>	20 feet 25 feet 30 feet 35 feet	
Min. Side and Rear Setback		Where living spaces face a side yard, the minimum setback must be 20 feet
<ul style="list-style-type: none"> <li>• 1 story structure</li> <li>• 1.5 story structure</li> <li>• 2 story structure</li> <li>• 2.5 story structure</li> </ul>	5 feet 7 feet 10 feet 12 feet	
Min. Distance Between Buildings w/in One Development	10 feet	For Townhouses (or Rowhouse), determined through the Architectural Review process.
Parking and Vehicle Circulation Areas	10 feet	
Max. height- All Uses	35 feet	May be increased to a maximum of 50 feet with a conditional use permit, if all setbacks are not less than 1½ times the height of the building.
Max. Lot Coverage	40%	



**Finding:** The addition of 30 dwelling units on this site will result in a total number of 240 dwelling units on 17.09 acres, or 14.04 dwelling units per acre, falling between the minimum of 11 and maximum of 15. The 3,102 square feet per dwelling unit on this site exceeds the minimum of 2,904 square feet per unit. As demonstrated on the submitted site plan, Sheet C601 of Appendix C- Land Use Plans-Civil, all required setbacks are met. The new structures will be 35 feet in height, not exceeding the maximum. As shown on Sheet A1 Appendix B- Land Use Plans-Architectural, total lot coverage is 12%, below the maximum of 40%. This standard is met.

**TDC 42.310. - Projections Into Required Yards.**

***The following architectural features may project into a required front or rear yard setback area not more than three feet, and into a required side yard not more than two feet: cornices, eaves, canopies, decks, sun-shades, gutters, chimneys, flues, belt courses, leaders, sills, pilasters, lintels, ornamental features, and other similar architectural features.***

**TDC 42.320. - Density Bonus or Setback Reduction for Developments Adjacent to Greenways and Natural Areas.**

**Finding:** This application does not propose any projections into required yards. This application does not include a request for density bonus or setback reduction for developments adjacent to Greenways and Natural Areas. As such, these standards are not applicable.

**CHAPTER 73A - SITE DESIGN STANDARDS**

**TDC 73A.200. - Multi-Family Design Standards**

***The following standards are the minimum standards for all other residential development in all zones that does not meet the definition of single-family dwelling, duplex, townhouse, triplex, quadplex, or cottage cluster or is 5 or more dwelling units. These standards do not apply to development in the Central Design District and Mixed Use Commercial (MUC) zone, which have separate standards and may be less than the minimums provided below.***

- (1) Private Outdoor Areas. Multi-family uses must provide private outdoor area features as follows:***
- (a) A separate outdoor area of not less than 80 square feet must be attached to each ground level dwelling unit; and***
  - (b) The private outdoor area must be separated from common outdoor areas with walls, fences or shrubs.***

**Finding:** Each of the two-bedroom townhome units includes a ground-floor, private open area of 157 square feet, including the required 24 square foot entry area required by subsection (3), below. Each of the three-bedroom townhome units includes a ground-floor, private open area of 103 square feet, including the required 24 square foot entry area required by subsection (3), below. These ground-floor private open areas are shown on Sheets A12 and A13 of Appendix B- Land Use Plans-Architectural. This standard is met.



**(2) Balconies, Terraces, and Loggias. Multi-family uses must provide balconies, terraces, and loggias features as follows:**

**(a) A separate outdoor area of not less than 48 square feet in the form of balconies, terraces, or loggias must be provided for each unit located above the ground level.**

**Finding:** Though each of the 45 proposed units are ground-level, they do include second-story decks. Two-bedroom unit decks are 64 square feet and three-bedroom unit decks are 75 square feet, as shown on Sheets A12 and A13 of Appendix B- Land Use Plans-Architectural. This standard, although not strictly applicable, is met.

**(3) Entry Areas. Multi-family uses must provide entry area features as follows:**

**(a) A private main entry area must be provided as a private extension of each dwelling unit;**

**(b) The entry area must be separated from on-site parking areas and public streets with landscaping, change of grade, low fences, or walls;**

**(c) The entry area must be a minimum of 24 square feet in area for each dwelling unit; and**

**(d) The entry area may be combined to serve more than one unit as determined by the City.**

**Finding:** As discussed above, entry areas meeting this standard are shown on Sheets A12 and A13 of Appendix B- Land Use Plans-Architectural. This standard is met.

**(4) Shared Outdoor Areas. Multi-family uses must provide shared outdoor area features as follows:**

**(a) Must provide year round shared outdoor areas for both active and passive recreation;**

**(b) The shared outdoor area must be a minimum of:**

**(i) Three hundred square feet per dwelling unit; or**

**(ii) Four hundred fifty square feet per dwelling unit for 55 and older communities.**

**(c) Gazebos and other covered spaces are encouraged to satisfy this requirement;**

**(d) The shared outdoor area must be separated from all entryway and parking areas with a landscaped transition area measuring a minimum of ten feet wide;**

**(e) The shared outdoor area must have controlled access from off-site as well as from on-site parking and entrance areas with a minimum 4-foot high fence, wall, or landscaping; and**

**(f) The shared outdoor area standard does not apply to any development with less than 12 dwelling units.**

**Finding:** The existing Alden Apartments development has shared outdoor areas meeting these criteria that will be maintained. The 240 total units requires 72,000 square feet of outdoor area. At build out, Alden Apartments will provide 83,776 square feet of shared outdoor areas in compliance with these criteria, as shown on Sheet A1 of Appendix B- Land Use Plans-Architectural. This standard is met.

**(5) Children's Play Areas. Multi-family uses must provide children's play area features as follows:**

**(a) The children's play area must be a minimum of 150 square feet per dwelling unit;**

**(b) The children's play area must provide a separation from all entryway and parking areas with a landscaped transition area measuring a minimum of ten feet wide;**

**(c) The children's play area must have controlled access to shared outdoor areas from off-site as well as from on-site parking and entrance areas with a minimum 4-foot high fence, wall, or landscaping; and**

- (d) The children's play area must provide a usable floor surface (material such as lawn, decks, wood chips, sand and hard surface materials qualify); and***
- (e) The children's play area standard does not apply to:***
  - (i) Duplexes and townhouses;***
  - (ii) Fifty-five and older communities; and***
  - (iii) Any development with less than 12 dwelling units.***

**Finding:** As shown on Sheet A1 of Appendix B- Land Use Plans-Architectural, a minimum of 36,000 square feet of children's play area meeting these design standards will be provided at full build out. This standard is met.

***(6) Storage. Multi-family uses must provide storage features as follows:***

- (a) Enclosed storage areas are required for each unit.***
  - (i) Garages do not satisfy the storage requirements. An enclosed storage area may be located within the garage of the individual unit. Enclosed storage areas may also be located within commonly accessible shared garage.***
- (b) Each storage area must be a minimum of six feet in height and have a minimum floor area of:***
  - (i) 24 square feet for studio and one bedroom units;***
  - (ii) 36 square feet for two bedroom units; and***
  - (iii) 48 square feet for greater than two bedroom units.***

**Finding:** Each of the proposed 45 units is provided with enclosed storage, 40 square feet for the 2-bedroom units and 49 square feet for the 3-bedroom units, as shown on Sheets A12 and A13 of Appendix B- Land Use Plans-Architectural. This standard is met.

***(7) Walkways. Multi-family uses must provide walkways as follows:***

- (a) Walkways for duplexes and townhouses must be a minimum of three feet in width;***
- (b) All other multi-family development must have walkways of a minimum of six feet in width;***
- (c) Walkways must be constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete. Gravel or bark chips are not acceptable; and***
- (d) The walkways must meet ADA standards applicable at time of construction or alteration.***

**Finding:** As shown on Sheet C601 of Appendix C- Land Use Plans-Civil, the walkways are a minimum of 6 feet in width, are constructed of concrete and meet ADA standards. This standard is met.

***(8) Accessways.***

- (a) When Required. Accessways are required to be constructed when a multi-family development is adjacent to any of the following:***
  - (i) Residential property;***
  - (ii) Commercial property;***
  - (iii) Areas intended for public use, such as schools and parks; and***
  - (iv) Collector or arterial streets where transit stops or bike lanes are provided or designated.***

**(b) Design Standard. Accessways must meet the following design standards:**

- (i) Accessways must be a minimum of eight feet in width;**
- (ii) Public accessways must be constructed in accordance with the Public Works Construction Code;**
- (iii) Private accessways must be constructed of asphalt, concrete, pavers or grasscrete. Gravel or bark chips are not acceptable;**
- (iv) Accessways must meet ADA standards applicable at time of construction or alteration;**
- (v) Accessways must be provided as a connection between the development's walkway and bikeway circulation system;**
- (vi) Accessways must not be gated to prevent pedestrian or bike access;**
- (vii) Outdoor Recreation Access Routes must be provided between the development's walkway and bikeway circulation system and parks, bikeways, and greenways where a bike or pedestrian path is designated; and**
- (viii) Must be constructed, owned and maintained by the property owner.**

**(c) Exceptions. [City code text omitted for brevity]**

**Finding:** The additional structures being added to this site are internal to the Alden Apartments and do not impact any areas where accessways would be required. As such, this standard is not applicable.

**(9) Carports and Garages. Multi-family uses must provide Carports and Garage features as follows:**

- (a) The form, materials, color, and construction must be compatible with the complex they serve.**

**Finding:** Carports are shown on the Overall Site Plan, Sheet C600 of Appendix C-Land Use Plans-Civil, adjacent to some of the existing apartment units. The design is shown on Sheet A11 of Appendix B-Land Use Plans-Architectural. The carports are compatible with the complex in that the form matches the modern townhouse/multi-family design, materials and color reflect those utilized on the multi-family buildings and construction will occur concurrently for the townhomes and carports. This standard is met.

**(10) Safety and Security. Multi-family units must provide safety and security features as follows:**

- (a) Private outdoor areas must be separated from shared outdoor areas and children's play areas with a minimum 4-foot high fence, wall, or landscaping;**
- (b) An outdoor lighting system that does not produce direct glare on adjacent properties and without shining into residential units, public rights-of-way, or fish and wildlife habitat areas; and**
- (c) Building identification must be provided consistent with the Oregon Fire Code.**

**Finding:** As shown on Sheets A2, A3, A5 and A10 of Appendix B-Land Use Plans-Architectural, the private outdoor areas are separated by a minimum 4-foot-high wall. Photometrics demonstrating that outdoor lighting will be directed at pathways and other appropriate areas and will not produce direct glare on adjacent properties or shine into residential units, public right-of-way or fish and wildlife habitat areas are included as Appendix D.2-

Photometrics. Building identification will be provided consistent with the Oregon Fire Code, as reviewed, approved and inspected with the building permit. This standard is met.

***(11) Service, Delivery and Screening. Multi-family uses must provide service, delivery, and screening features as follows:***

- (a) Provisions for postal delivery must be made consistent with US Postal Service regulations conveniently located and efficiently designed for residents;***
- (b) Pedestrian access from unit entries to postal delivery areas, shared activity areas, and parking areas must be provided via accessways; and***
- (c) Above grade and on-grade electrical and mechanical equipment such as transformers, heat pumps and air conditioners must be screened with sight obscuring fences, walls or landscaping.***

**Finding:** Provisions for postal delivery will be coordinated with the US Postal Service. Pedestrian access from each unit entry to the postal delivery areas, shared activity areas and parking areas is provided via accessways, as shown on Sheet C601 of Appendix C-Land Use Plans-Civil. All equipment will be screened from view by being located on the side or rear of the buildings and with landscaping, as shown on Sheets A6 and A7 of Appendix B-Land Use Plans-Architectural. This standard is met.

**CHAPTER 73B - LANDSCAPING STANDARDS**

**TDC 73B.020. - Landscape Area Standards Minimum Areas by Use and Zone.**

***The following are the minimum areas required to be landscaped for each use and zone:***

**Finding:** There is no minimum area requirement in the RMH zone for permitted uses, including this multi-family development. This standard is met.

**TDC 73B.030. - Additional Minimum Landscaping Requirements for Multi-Family Residential Uses.**

***(1) General. In addition to requirements in TDC 73B.020, Multi-Family Residential Uses must comply with the following additional standards.***

- (a) All areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped.***
  - (i) This standard does not apply to areas subject to the Hedges Creek Wetlands Mitigation Agreement.***

**Finding:** All areas of the Alden Apartments site that are not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas are or will be landscaped at the conclusion of construction of this site addition in a way similar to the existing site, as demonstrated in Appendix D.3-Landscaping Plans. This standard is met.

**TDC 73B.080. - Minimum Landscaping Standards for All Zones.**

***The following are minimum standards for landscaping for all zones.***

***[City code text omitted for brevity]***

**Finding:** Appendix D.3-Landscaping Plans, demonstrates compliance with the landscaping requirements. The landscaping is planned and will be installed so as to be fully ground-covering in 3 years, of appropriate materials and maintainable as directed. Tree preservation is identified in Appendix D.1-Arborist Report. The landscape plan does not include fences. Grading, irrigation and re-vegetation area all proposed to meet these criteria. This standard is met.

**TDC 73B.090. - Minimum Standards Trees and Plants.**

***The following minimum standards apply to the types of landscaping required to be installed for all zones. [City code text omitted for brevity]***

**Finding:** Appendices D.1-Arborist Report and D.3-Landscaping Plans demonstrate compliance with the minimum standards for installation of trees, shrubs, groundcover and lawns. This standard is met.

**CHAPTER 73C - PARKING STANDARDS**

**TDC 73C.010. - Off-Street Parking and Loading Applicability and General Requirements.**

***Applicability. Off-street parking and loading is required to be provided by the owner and/or developer, in all zones, whenever the following occurs:***

- (a) Establishment of a new structure or use;***
- (b) Change in use; or***
- (c) Change in use of an existing structure.***

***(2) General Requirements. Off-street parking spaces, off-street vanpool and carpool parking spaces, off-street bicycle parking, and off-street loading berths must be as provided as set forth in TDC 73C.100, unless greater requirements are otherwise established by the conditional use permit or the Architectural Review process.***

- (a) The following apply to property and/or use with respect to the provisions of TDC 73C.100:***
  - (i) The requirements apply to both the existing structure and use, and enlarging a structure or use;***
  - (ii) The floor area is measured by gross floor area of the building primary to the function of the particular use of the property other than space devoted to off-street parking or loading;***
  - (iii) Where employees are specified, the term applies to all persons, including proprietors, working on the premises during the peak shift;***
  - (iv) Calculations to determine the number of required parking spaces and loading berths must be rounded to the nearest whole number;***
  - (v) If the use of a property changes, thereby increasing off-street parking or loading requirements, the increased parking/loading area must be provided prior to commencement of the new use;***
  - (vi) Parking and loading requirements for structures not specifically listed herein must be determined by the City Manager, based upon requirements of comparable uses listed;***

- (vii) When several uses occupy a single structure, the total requirements for off-street parking may be the sum of the requirements of the several uses computed separately or be computed in accordance with TDC 73.370(1)(m), Joint Use Parking;*
- (viii) Off-street parking spaces for dwellings must be located on the same lot with the dwelling. Other required parking spaces may be located on a separate parcel, provided the parcel is not greater than five hundred (500) feet from the entrance to the building to be served, measured along the shortest pedestrian route to the building. The applicant must prove that the parking located on another parcel is functionally located and that there is safe vehicular and pedestrian access to and from the site. The parcel upon which parking facilities are located must be in the same ownership as the structure;*
- (ix) Required parking spaces must be available for the parking of operable passenger automobiles of residents, customers, patrons and employees and must not be used for storage of vehicles or materials or for the parking of trucks used in conducting the business;*
- (x) Institution of on-street parking, where none is previously provided, must not be done solely for the purpose of relieving crowded parking lots in commercial or industrial zones;*
- (xi) Required vanpool and carpool parking must meet the 9-foot parking stall standards in Figure 73-1 and be identified with appropriate signage;*
- (xii) Where uses are mixed in a single building, parking must be a blend of the ratio required less ten percent for the minimum number of spaces. The maximum number of spaces must be ten percent less than the total permitted maximum for each use; and*
- (xiii) If the applicant demonstrates that too many or too few parking spaces are required, applicant may seek a variance from the minimum or maximum by providing evidence that the particular use needs more or less than the amount specified in this Code.*

**Finding:** The total amount of parking proposed at full build-out meets the code requirement for the entire site, the existing apartments and the new townhouse-style apartments. No joint-use parking is proposed. Parking calculations are rounded up to the nearest whole. Required parking spaces will be available for operable passenger vehicles, as ensured by the property management team. These parking-related standards are met.

**TDC 73C.020. - Parking Lot Design Standards.**

*A parking lot, whether an accessory or principal use, intended for the parking of automobiles or trucks, must comply with the following: [City code text omitted for brevity]*

**Finding:** There are no new parking lots proposed with this site re-development. Each of the units will have two parking spaces within an attached garage. This standard is not applicable to the proposed addition to this site.

**TDC 73C.050. - Bicycle Parking Requirements and Standards.**

*(1) Requirements. Bicycle parking facilities must include: [City code text omitted for brevity]*

**Finding:** TDC 73C.100 exempts multi-family dwellings where garages are provided as an integral element of a unit from providing bicycle parking and as such, no bicycle parking is required.

**TDC 73C.100. - Off-Street Parking Minimum/Maximum Requirements.**

**(1) The following are the minimum and maximum requirements for off-street motor vehicle parking in the City, except these standards do not apply in the Core Area Parking District. The Core Area Parking District standards are in TDC 73C.110.**

USE	MINIMUM MOTOR VEHICLE PARKING	MAXIMUM MOTOR VEHICLE PARKING	BICYCLE PARKING	PERCENTAGE OF BICYCLE PARKING TO BE COVERED
<b>(a) Residential Uses</b>				
<i>(viii) Multi-family dwellings in complexes with private internal driveways</i>	<i>1.0 space/studio, 1.25 space/1 bedroom, 1.50 space/2 bedroom, 1.75 space/3= bedroom</i>	<i>None</i>	<i>Developments with five or more units; none required if a garage is provided as an integral element of a unit; otherwise 1.00 space per unit</i>	<b>100</b>

**Finding:** Each of the 45 proposed townhome units contain two motor vehicle parking spaces in an attached garage. At full build-out, as identified on Sheet A1 of Appendix B-Land Use Plans-Architectural, the Alden Apartments site will contain 442 parking spaces, far exceeding the code requirement of 361:

$$65 \text{ 3br units} * 1.75 + 111 \text{ 2br units} * 1.5 + 64 \text{ 1br units} * 1.25 = 113.75 (114) + 166.5 (167) + 80 = 361 \text{ required parking spaces.}$$

The proposal meets the parking requirement for the additional townhouse-style units and meets the overall parking requirements for the site. This standard is met.

**TDC 73C.130. - Parking Lot Driveway and Walkway Minimum Requirements.**

***Parking lot driveways and walkways must comply with the following requirements:***

***(1) Residential Use. Minimum requirements for residential uses:***

***(c) Ingress and egress for multi-family residential uses must not be less than the following: [City code text omitted for brevity]***

**Finding:** No changes are proposed to the two existing driveways, one to Martinazzi and one to Sagert. The proposed units will utilize the same driveways utilized by the current residents. This standard is met.

**PARKING LOT LANDSCAPING**



TDC 73C.200. - Parking Lot Landscaping Standards

TDC 73C.210. - Multi-Family Parking Lot Landscaping Requirements.

**Multi-family residential uses (as defined in TDC 31.060) must comply with the following landscaping requirements for parking lots in all zones:**

**[City code text omitted for brevity]**

**Finding:** No parking lots are proposed with the addition of these units as all new parking is provided in attached garages. This standard is not applicable.

#### CHAPTER 73D - WASTE AND RECYCLABLES MANAGEMENT STANDARDS

TDC 73D.020. - Design Methods.

**An applicant required to provide mixed solid waste and source separated recyclables storage areas must comply with one of following methods:**

**(1) The minimum standards method in TDSC 73D.030;**

**(2) The waste assessment method in TDC 73D.040;**

**(3) The comprehensive recycling plan method in TDC 73D.050; or**

**(4) The franchised hauler review method in TDC 73D.060.**

**Finding:** This proposal provides mixed solid waste and source separated recyclables storage areas in compliance with the minimum standards method, as detailed below and supported by Appendix D.4-Republic Services Service Provider Letter. This standard is met.

TDC 73D.030. - Minimum Standards Method.

**This method specifies a minimum storage area requirement based on the size and general use category of the new or expanded development. This method is most appropriate when specific use of a new or expanded development is not known. It provides specific dimensional standards for the minimum size of storage areas by general use category.**

**(1) The size and location of the storage area(s) must be indicated on the site plan. Requirements are based on an assumed storage area height of four feet for mixed solid waste and source separated recyclables. Vertical storage higher than four feet, but no higher than seven feet may be used to accommodate the same volume of storage in a reduced floor space (potential reduction of 43 percent of specific requirements). Where vertical or stacked storage is proposed, submitted plans must include drawings to illustrate the layout of the storage area and dimensions for containers.**

**(2) The storage area requirement is based on uses. If a building has more than one use and that use occupies 20 percent or less of the gross leasable area (GLA) of the building, the GLA occupied by that use must be counted toward the floor area of the predominant use(s). If a building has more than one use and that use occupies more than 20 percent of the GLA of the building, then the storage area requirement for the whole building must be the sum of the area of each use. Minimum storage area requirements by use is as follows:**

**(a) Common wall residential five to ten units must provide 50 square feet.**

**(b) Common wall residential greater than ten units must provide 50 square feet plus an (additional five square feet per unit above ten.**

**(3) Mixed solid waste and source separated recyclables storage areas for multiple tenants on a single site may be combined and shared.**



**Finding:** Appendix D.4-Republic Services Service Provider Letter demonstrates that storage is proposed for each individual dwelling unit. An 18-square-foot storage area is proposed for each unit. Therefore, for a 3-unit building, the total size of storage is 54 square feet and for a 4-unit building, the total size of storage is 72 square feet, both of which exceed the 50 square foot minimum for common wall residential. This standard is met.

**TDC 73D.070. - Location, Design and Access Standards.**

***The following location, design, and access standards are applicable to all storage areas:***

***(1) Location Standards.***

***(a) The storage area for source separated recyclables may be collocated with the storage area for mixed solid waste.***

***(b) Storage area space requirements can be satisfied with a single location or multiple locations, and can combine both interior and exterior locations.***

***(c) Exterior storage areas must:***

***(i) Be located in central and visible locations on the site to enhance security for users;***

***(ii) Be located in a parking area; and***

***(iii) Not be located within a required front yard setback or in a yard adjacent to a public or private street.***

***(2) Design Standards.***

***(a) The dimensions of the storage area must accommodate containers consistent with current methods of local collection at time of construction or alteration.***

***(b) Indoor and outdoor storage areas must comply with Oregon Building and Fire Code requirements.***

***(c) Exterior storage areas must be enclosed by a sight obscuring fence or wall at least six feet in height.***

***(d) Evergreen plants must be placed around the enclosure walls, excluding the gate or entrance openings for common wall, commercial, and institutional developments.***

***(e) Gate openings for haulers must be a minimum of ten feet wide and must be capable of being secured in a closed and open position.***

***(f) Horizontal clearance must be a minimum of ten feet and a vertical clearance of eight feet is required if the storage area is covered.***

***(g) A separate pedestrian access must also be provided in common wall, commercial, and institutional developments.***

***(h) Exterior storage areas must have either a concrete or asphalt floor surface.***

***(i) Storage areas and containers must be clearly labeled to indicate the type of material accepted.***

***(3) Access Standards.***

***(a) Storage areas must be accessible to users at convenient times of the day, and to hauler personnel on the day and approximate time they are scheduled to provide hauler service.***

***(b) Storage areas must be designed to be easily accessible to hauler trucks and equipment, considering paving, grade, gate clearance and vehicle access.***

***(c) Storage areas must be accessible to hauler trucks without requiring backing out of a driveway onto a public street. If only a single access point is available to the storage area, adequate turning radius must be provided to allow hauler trucks to safely exit the site in a forward motion.***

***(d) Storage areas must be located so that pedestrian and vehicular traffic movement are not obstructed on site or on public streets adjacent to the site.***

**(e) The following is an exception to the access standard:**

**(i) Access may be limited for security reasons.**

**Finding:** Appendix D.4-Republic Services Service Provider Letter, identifies the size and location of the storage areas. Storage is proposed for each individual dwelling unit. An 18-square-foot storage area is proposed for each unit. Therefore, for a 3-unit building, the total size of storage is 54 square feet and for a 4-unit building, the total size of storage is 72 square feet, both of which exceed the 50 square foot minimum for common wall residential. In addition, Republic Services provided a Service Provider Letter supporting this proposal. This standard is met.

## **CHAPTER 74 - PUBLIC IMPROVEMENT REQUIREMENTS**

### **TDC 74.210. - Minimum Street Right-of-Way Widths.**

*The width of streets in feet must not be less than the width required to accommodate a street improvement needed to mitigate the impact of a proposed development. In cases where a street is required to be improved according to the standards of the TDC, the width of the right-of-way must not be less than the minimums indicated in TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G.*

*(2) For development applications other than subdivisions and partitions, wherever existing or future streets adjacent to property proposed for development are of inadequate right-of-way width, the additional right-of-way necessary to comply with TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G must be dedicated to the City for use by the public prior to issuance of any building permit for the proposed development. This right-of-way dedication must be for the full width of the property abutting the roadway and, if required by the City Manager, additional dedications must be provided for slope and utility easements if deemed necessary.*

*(3) For development applications that will impact existing streets not adjacent to the applicant's property, and to construct necessary street improvements to mitigate those impacts would require additional right-of-way, the applicant must be responsible for obtaining the necessary right-of-way from the property owner. A right-of-way dedication deed form must be obtained from the City Manager and upon completion returned to the City Manager for acceptance by the City. On subdivision and partition plats the right-of-way dedication must be accepted by the City prior to acceptance of the final plat by the City. On other development applications the right-of-way dedication must be accepted by the City prior to issuance of building permits. The City may elect to exercise eminent domain and condemn necessary off-site right-of-way at the applicant's request and expense. The City Council must determine when condemnation proceedings are to be used.*

*(4) If the City Manager deems that it is impractical to acquire the additional right-of-way as required in subsections (1)—(3) of this section from both sides of the center-line in equal amounts, the City Manager may require that the right-of-way be dedicated in a manner that would result in unequal dedication from each side of the road. This requirement will also apply to slope and utility easements as discussed in TDC 74.320 and 74.330. The City Manager's recommendation must be presented to the City Council in the preliminary plat approval for subdivisions and partitions, and in the recommended decision on all other development applications, prior to finalization of the right-of-way dedication requirements.*

*(5) Whenever a proposed development is bisected by an existing or future road or street that is of inadequate right-of-way width according to TDC Chapter 74, Public Improvement*

**Requirements, Figures 74-2A through 74-2G, additional right-of-way must be dedicated from both sides or from one side only as determined by the City Manager to bring the road right-of-way in compliance with this section.**

**(6) When a proposed development is adjacent to or bisected by a street proposed in the Transportation System Plan and no street right-of-way exists at the time the development is proposed, the entire right-of-way as shown in TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G must be dedicated by the applicant. The dedication of right-of-way required in this subsection must be along the route of the road as determined by the City.**

**Finding:** The three streets abutting this property are developed and as stated in Appendix D.5-Trip Generation Letter, additional improvements are not needed to accommodate the additional units on this existing multi-family residential site. The existing access points will continue to operate at acceptable levels as will nearby street intersections. The addition of 30 residential units (45 new, 15 to be removed) does not warrant right-of-way improvements beyond what was originally completed with the initial 210 multi-family residential units. This standard is met.

#### **TDC 74.330. - Utility Easements.**

**(1) Utility easements for water, sanitary sewer and storm drainage facilities, telephone, television cable, gas, electric lines and other public utilities must be granted to the City.**

**(2) For subdivision and partition applications, the on-site public utility easement dedication area must be shown to be dedicated to the City on the final subdivision or partition plat prior to approval of the plat by the City; and**

**(3) For subdivision and partition applications which require off-site public utility easements to serve the proposed development, a utility easement must be granted to the City prior to approval of the final plat by the City. The City may elect to exercise eminent domain and condemn necessary off-site public utility easements at the applicant's request and expense. The City Council must determine when condemnation proceedings are to be used.**

**(4) For development applications other than subdivisions and partitions, and for both on-site and off-site easement areas, a utility easement must be granted to the City; building permits must not be issued for the development prior to acceptance of the easement by the City. The City may elect to exercise eminent domain and condemn necessary off-site public utility easements at the applicant's request and expense. The City Council must determine when condemnation proceedings are to be used.**

**(5) The width of the public utility easement must meet the requirements of the Public Works Construction Code. All subdivisions and partitions must have a 6-foot public utility easement adjacent to the street and a 5-foot public utility easement adjacent to all side and rear lot lines. Other easements may be required as determined by the City Manager.**

**Finding:** Appendix E-Pre-Application Notes identifies an 8-foot public utility easement to be provided along all street frontages. The Applicant will provide this PUE prior to issuance of building permits. This standard is met.

#### **TDC 74.420. - Street Improvements.**

***When an applicant proposes to develop land adjacent to an existing or proposed street, including land which has been excluded under TDC 74.220, the applicant should be responsible for the improvements to the adjacent existing or proposed street that will bring the improvement of the street into conformance with the Transportation Plan (TDC Chapter 11), TDC 74.425 (Street Design Standards), and the City's Public Works Construction Code, subject to the following provisions:***

***(1) For any development proposed within the City, roadway facilities within the right-of-way described in TDC 74.210 must be improved to standards as set out in the Public Works Construction Code.***

***(2) The required improvements may include the rebuilding or the reconstruction of any existing facilities located within the right-of-way adjacent to the proposed development to bring the facilities into compliance with the Public Works Construction Code.***

***(3) The required improvements may include the construction or rebuilding of off-site improvements which are identified to mitigate the impact of the development.***

***(4) Where development abuts an existing street, the improvement required must apply only to that portion of the street right-of-way located between the property line of the parcel proposed for development and the centerline of the right-of-way, plus any additional pavement beyond the centerline deemed necessary by the City Manager to ensure a smooth transition between a new improvement and the existing roadway (half-street improvement). Additional right-of-way and street improvements and off-site right-of-way and street improvements may be required by the City to mitigate the impact of the development. The new pavement must connect to the existing pavement at the ends of the section being improved by tapering in accordance with the Public Works Construction Code.***

***(5) If additional improvements are required as part of the Access Management Plan of the City, TDC Chapter 75, the improvements must be required in the same manner as the half-street improvement requirements.***

***(6) All required street improvements must include curbs, sidewalks with appropriate buffering, storm drainage, street lights, street signs, street trees, and, where designated, bikeways and transit facilities.***

***(7) For subdivision and partition applications, the street improvements required by TDC Chapter 74 must be completed and accepted by the City prior to signing the final subdivision or partition plat, or prior to releasing the security provided by the applicant to assure completion of such improvements or as otherwise specified in the development application approval.***

***(8) For development applications other than subdivisions and partitions, all street improvements required by this section must be completed and accepted by the City prior to the issuance of a Certificate of Occupancy.***

***(9) In addition to land adjacent to an existing or proposed street, the requirements of this section must apply to land separated from such a street only by a railroad right-of-way.***

***(10) Streets within, or partially within, a proposed development site must be graded for the entire right-of-way width and constructed and surfaced in accordance with the Public Works Construction Code.***

***(11) Existing streets which abut the proposed development site must be graded, constructed, reconstructed, surfaced or repaired as necessary in accordance with the Public Works Construction Code and TDC Chapter 11, Transportation Plan, and TDC 74.425 (Street Design Standards).***

***(12) Sidewalks with appropriate buffering must be constructed along both sides of each internal street and at a minimum along the development side of each external street in accordance with the Public Works Construction Code.***

**(13) The applicant must comply with the requirements of the Oregon Department of Transportation (ODOT), Tri-Met, Washington County and Clackamas County when a proposed development site is adjacent to a roadway under any of their jurisdictions, in addition to the requirements of this chapter.**

**(14) The applicant must construct any required street improvements adjacent to parcels excluded from development, as set forth in TDC 74.220 of this chapter.**

**(15) Except as provided in TDC 74.430, whenever an applicant proposes to develop land with frontage on certain arterial streets and, due to the access management provisions of TDC Chapter 75, is not allowed direct access onto the arterial, but instead must take access from another existing or future public street thereby providing an alternate to direct arterial access, the applicant must be required to construct and place at a minimum street signage, a sidewalk, street trees and street lights along that portion of the arterial street adjacent to the applicant's property. The three certain arterial streets are S.W. Tualatin-Sherwood Road, S.W. Pacific Highway (99W) and S.W. 124th Avenue. In addition, the applicant may be required to construct and place on the arterial at the intersection of the arterial and an existing or future public non-arterial street warranted traffic control devices (in accordance with the Manual on Uniform Traffic Control Devices, latest edition), pavement markings, street tapers and turning lanes, in accordance with the Public Works Construction Code.**

**(16) The City Manager may determine that, although concurrent construction and placement of the improvements in (14) and (15) of this section, either individually or collectively, are impractical at the time of development, the improvements will be necessary at some future date. In such a case, the applicant must sign a written agreement guaranteeing future performance by the applicant and any successors in interest of the property being developed. The agreement must be subject to the City's approval.**

**(17) Intersections should be improved to operate at a level of service of at least D and E for signalized and unsignalized intersections, respectively.**

**(18) Pursuant to requirements for off-site improvements as conditions of development approval, proposed multi-family residential, commercial, or institutional uses that are adjacent to a major transit stop will be required to comply with the City's Mid-Block Crossing Policy.**

**Finding:** As identified in Appendix D.5-Trip Generation Letter, the added units (minus the units being removed) are anticipated to add an additional 16 AM Peak trips and 18 PM Peak trips to the site. The other, existing 295 apartment units account for approximately 78 AM Peak trips and 104 PM Peak Trips, demonstrating that the increased trips are not anticipated to create a significant impact on the surrounding roadway system and therefore street improvements are not warranted as part of this site re-development. This standard is not applicable.

#### **TDC 74.430. - Streets, Modifications of Requirements in Cases of Unusual Conditions.**

**(1) When, in the opinion of the City Manager, the construction of street improvements in accordance with TDC 74.420 would result in the creation of a hazard, or would be impractical, or would be detrimental to the City, the City Manager may modify the scope of the required improvement to eliminate such hazardous, impractical, or detrimental results. Examples of conditions requiring modifications to improvement requirements include but are not limited to horizontal alignment, vertical alignment, significant stands of trees, fish and wildlife habitat areas, the amount of traffic generated by the proposed development, timing of the development or other conditions creating hazards for pedestrian, bicycle or motor vehicle traffic. The City Manager may determine that,**



*although an improvement may be impractical at the time of development, it will be necessary at some future date. In such cases, a written agreement guaranteeing future performance by the applicant in installing the required improvements must be signed by the applicant and approved by the City.*

*(2) When the City Manager determines that modification of the street improvement requirements in TDC 74.420 is warranted pursuant to subsection (1) of this section, the City Manager must prepare written findings of modification. The City Manager must forward a copy of said findings and description of modification to the applicant, or his authorized agent, as part of the Utility Facilities Review for the proposed development, as provided by TDC Chapter 32 (Procedures). The decision of the City Manager may be appealed to the City Council in accordance with TDC Chapter 32 (Procedures).*

*(3) To accommodate bicyclists on streets prior to those streets being upgraded to the full standards, an interim standard may be implemented by the City. These interim standards include reduction in motor vehicle lane width to ten feet (the minimum specified in AASHTO's A Policy on Geo-metric Design of Highways and Streets (1990)), a reduction of bike lane width to 4-feet (as measured from the longitudinal gutter joint to the centerline of the bike lane stripe), and a paint-striped separation two to four feet wide in lieu of a center turn lane. Where available roadway width does not provide for these minimums, the roadway can be signed for shared use by bicycle and motor vehicle travel. When width constraints occur at an intersection, bike lanes should terminate 50 feet from the intersection with appropriate signing.*

**Finding:** TDC 74.430 grants the City Manager the ability to “modify the scope of the required improvement to eliminate such hazardous, impractical or detrimental results” based on “the amount of traffic generated by the proposed development”. It is the Applicant’s understanding based on Appendix D.5-Trip Generation Letter, that the amount of traffic that will be generated by the site redevelopment will not be significant enough to warrant right-of-way improvements adjacent to (or off-site from) this development, thus meeting this standard.

#### **TDC 74.440. - Streets, Traffic Study Required.**

*(1) The City Manager may require a traffic study to be provided by the applicant and furnished to the City as part of the development approval process as provided by this Code, when the City Manager determines that such a study is necessary in connection with a proposed development project in order to:*

*(a) Assure that the existing or proposed transportation facilities in the vicinity of the proposed development are capable of accommodating the amount of traffic that is expected to be generated by the proposed development; and/or*

*(b) Assure that the internal traffic circulation of the proposed development will not result in conflicts between on-site parking movements and/or on-site loading movements and/or on-site traffic movements, or impact traffic on the adjacent streets.*

*(2) The required traffic study must be completed prior to the approval of the development application.*

*(3) The traffic study must include, at a minimum:*

*(a) An analysis of the existing situation, including the level of service on adjacent and impacted facilities.*

*(b) An analysis of any existing safety deficiencies.*

- (c) Proposed trip generation and distribution for the proposed development.*
- (d) Projected levels of service on adjacent and impacted facilities.*
- (e) Recommendation of necessary improvements to ensure an acceptable level of service for roadways and a level of service of at least D and E for signalized and unsignalized intersections respectively, after the future traffic impacts are considered.*
- (f) The City Manager will determine which facilities are impacted and need to be included in the study.*
- (g) The study must be conducted by a registered engineer.*

**(4) The applicant must implement all or a portion of the improvements called for in the traffic study as determined by the City Manager.**

**Finding:** Appendix D.5-Trip Generation Letter finds that a full traffic study is not warranted with this site redevelopment application. This standard is met.

**TDC 74.450. - Bikeways and Pedestrian Paths.**

*(1) Where proposed development abuts or contains an existing or proposed bikeway, pedestrian path, or multi-use path, as set forth in TDC Chapter 11, Transportation Figure 11-4, the City may require that a bikeway, pedestrian path, or multi-use path be constructed, and an easement or dedication provided to the City.*

*(2) Where required, bikeways and pedestrian paths must be provided as follows:*

- (a) Bike and pedestrian paths must be constructed and surfaced in accordance with the Public Works Construction Code.*
- (b) The applicant must install the striping and signing of the bike lanes and shared roadway facilities, where designated.*

**Finding:** The Applicant is not aware of bikeways or pedestrian paths abutting or within this site and as such, this standard is not applicable.

**TDC 74.470. - Street Lights.**

*(1) Street light poles and luminaries must be installed in accordance with the Public Works Construction Code.*

*(2) The applicant must submit a street lighting plan for all interior and exterior streets on the proposed development site prior to issuance of a Public Works Permit.*

**TDC 74.485. - Street Trees.**

*(1) Prior to approval of a residential subdivision or partition final plat, the applicant must pay the City a non-refundable fee equal to the cost of the purchase and installation of street trees. The location, placement, and cost of the trees must be determined by the City. This sum must be calculated on the interior and exterior streets as indicated on the final subdivision or partition plat.*

*(2) In nonresidential subdivisions and partitions street trees must be planted by the owners of the individual lots as development occurs.*

*(3) The Street Tree Ordinance specifies the species of tree which is to be planted and the spacing between trees.*

**Finding:** As stated above, right-of-way improvements are not warranted with this site redevelopment and therefore, neither are street lights or street trees. These standards are not applicable.

**TDC 74.610. - Water Service.**

*(1) Water lines must be installed to serve each property in accordance with the Public Works Construction Code. Water line construction plans must be submitted to the City Manager for review and approval prior to construction.*

*(2) If there are undeveloped properties adjacent to the subject site, public water lines must be extended by the applicant to the common boundary line of these properties. The lines must be sized to provide service to future development, in accordance with the City's Water System Master Plan, TDC Chapter 12.*

*(3) As set forth is TDC Chapter 12, Water Service, the City has three water service levels. All development applicants must be required to connect the proposed development site to the service level in which the development site is located. If the development site is located on a boundary line between two service levels the applicant must be required to connect to the service level with the higher reservoir elevation. The applicant may also be required to install or provide pressure reducing valves to supply appropriate water pressure to the properties in the proposed development site.*

**TDC 74.620. - Sanitary Sewer Service.**

*(1) Sanitary sewer lines must be installed to serve each property in accordance with the Public Works Construction Code. Sanitary sewer construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.*

*(2) If there are undeveloped properties adjacent to the proposed development site which can be served by the gravity sewer system on the proposed development site, the applicant must extend public sanitary sewer lines to the common boundary line with these properties. The lines must be sized to convey flows to include all future development from all up stream areas that can be expected to drain through the lines on the site, in accordance with the City's Sanitary Sewer System Master Plan, TDC Chapter 13.*

**Finding:** Sheet C400 Utility Plan of Appendix C-Land Use Plans-Civil identifies water and sanitary sewer serving each unit and meeting city standards. This standard is met.

**TDC 74.630. - Storm Drainage System.**

*(1) Storm drainage lines must be installed to serve each property in accordance with City standards. Storm drainage construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.*

*(2) The storm drainage calculations must confirm that adequate capacity exists to serve the site. The discharge from the development must be analyzed in accordance with the City's Storm and Surface Water Regulations.*

*(3) If there are undeveloped properties adjacent to the proposed development site which can be served by the storm drainage system on the proposed development site, the applicant must extend storm drainage lines to the common boundary line with these properties. The lines must be sized to convey expected flows to include all future development from all up stream areas that will drain through the lines on the site, in accordance with the Tualatin Drainage Plan in TDC Chapter 14.*



**Finding:** The Applicant proposes a storm drainage system meeting city standards. The plans currently identify a combination of infiltration planters and underground stormwater storage. However, Sheet C400 Utility Plan, of Appendix C-Land Use Plans-Civil identifies a potential stormwater facility at ground level that may be utilized (identified as “Stormwater Alternative: Infiltration Rain Garden”). The Applicant proposes to establish the final storm drainage system configuration at time of engineering review. The application includes Appendix D.6-Preliminary Stormwater Report, demonstrating compliance with city standards. This standard is met.

**TDC 74.640. - Grading.**

***(1) Development sites must be graded to minimize the impact of storm water runoff onto adjacent properties and to allow adjacent properties to drain as they did before the new development.***

***(2) A development applicant must submit a grading plan showing that all lots in all portions of the development will be served by gravity drainage from the building crawl spaces; and that this development will not affect the drainage on adjacent properties. The City Manager may require the applicant to remove all excess material from the development site.***

**Finding:** Sheet C500 of Appendix C-Land Use Plans-Civil identifies site grading meeting all applicable standards. This standard is met.

**TDC 74.650. - Water Quality, Storm Water Detention and Erosion Control.**

***The applicant must comply with the water quality, storm water detention and erosion control requirements in the Surface Water Management Ordinance. If required:***

***(2) On all other development applications, prior to issuance of any building permit, the applicant must arrange to construct a permanent on-site water quality facility and storm water detention facility and submit a design and calculations indicating that the requirements of the Surface Water Management Ordinance will be met and obtain a Stormwater Connection Permit from Clean Water Services.***

***(3) For on-site private and regional non-residential public facilities, the applicant must submit a stormwater facility agreement, which will include an operation and maintenance plan provided by the City, for the water quality facility for the City's review and approval. The applicant must submit an erosion control plan prior to issuance of a Public Works Permit. No construction or disturbing of the site must occur until the erosion control plan is approved by the City and the required measures are in place and approved by the City.***

**Finding:** As stated above, the Applicant intends to arrange to construct a permanent on-site water quality facility and storm water detention facility prior to issuance of any building permit. This standard is met.

**TDC 74.660. - Underground.**

***(1) All utility lines including, but not limited to, those required for gas, electric, communication, lighting and cable television services and related facilities must be placed underground. Surface-mounted transformers, surface-mounted connection boxes and meter cabinets may be placed above ground. Temporary utility service facilities, high capacity electric and communication feeder lines, and utility transmission lines operating at 50,000 volts or above may be placed above ground. The***

**applicant must make all necessary arrangements with all utility companies to provide the underground services. The City reserves the right to approve the location of all surface-mounted transformers.**

**(2) Any existing overhead utilities may not be upgraded to serve any proposed development. If existing overhead utilities are not adequate to serve the proposed development, the applicant must, at their own expense, provide an underground system. The applicant must be responsible for obtaining any off-site deeds and/or easements necessary to provide utility service to this site; the deeds and/or easements must be submitted to the City Manager for acceptance by the City prior to issuance of the Public Works Permit.**

**Finding:** All utilities located within the disturbance area of this site will be placed underground. No existing overhead utilities will be upgraded to serve the redevelopment. This standard is met.

#### **TDC 74.670. - Existing Structures.**

**(1) Any existing structures requested to be retained by the applicant on a proposed development site must be connected to all available City utilities at the expense of the applicant.**

**(2) The applicant must convert any existing overhead utilities serving existing structures to underground utilities, at the expense of the applicant.**

**(3) The applicant must be responsible for continuing all required street improvements adjacent to the existing structure, within the boundaries of the proposed development site.**

**Finding:** The existing apartments on site are connected to all available City utilities. All utilities serving the apartments are underground. The adjacent street improvements are complete. This standard is met.

#### **TDC 74.720. - Protection of Trees During Construction.**

**(1) During the erection, repair, alteration or removal of a building or structure, it is unlawful for the person in charge of such erection, repair, alteration or removal to leave a tree in or upon a public right-of-way in the vicinity of the building or structure without a good and sufficient guard or protectors to prevent injury to the tree arising out of or by reason of such erection, repair, alteration or removal.**

**(2) Excavations and driveways must not be placed within six feet of a tree in or upon a public right-of-way without written permission from the City Manager. During excavation or construction, the person must guard the tree within six feet and all building material or other debris must be kept at least four feet from any tree.**

**Finding:** Sheet C110 of Appendix C-Land Use Plans-Civil details the tree protection plan that is consistent with Appendix D.1-Arborist Report. This standard is met.

#### **TDC 74.725. - Maintenance Responsibilities.**

**Trees, shrubs or plants standing in or upon a public right-of-way, on public or private grounds that have branches projecting into the public street or sidewalk must be kept trimmed by the owner of the property adjacent to or in front of where such trees, shrubs or plants are growing so that:**

**(1) The lowest branches are not less than 12 feet above the surface of the street, and are not be less than 14 feet above the surface of streets designated as state highways.**

***(2) The lowest branches are not less than eight feet above the surface of a sidewalk or footpath.***

***(3) A plant, tree, bush or shrub must not be more than 24 inches in height in the triangular area at the street or highway corner of a corner lot, or the alley-street intersection of a lot, such an area defined by a line across the corner between the points on the street right-of-way line measured ten feet back from the corner, and extending the line to the street curbs or, if there are no curbs, then to that portion of the street or alley used for vehicular traffic.***

***(4) Newly planted trees may remain untrimmed if they do not interfere with street traffic or persons using the sidewalk or obstruct the light of a street electric lamp.***

***(5) Maintenance responsibilities of the property owner include repair and upkeep of the sidewalk in accordance with the City Sidewalk Maintenance Ordinance.***

**Finding:** The Applicant acknowledges responsibility for maintenance of trees, shrubs and plants that stand or project into a public right-of-way. This standard is met.

## **CHAPTER 75 - ACCESS MANAGEMENT**

***[City code text omitted for brevity]***

**Finding:** As discussed previously, no changes are proposed to the existing access points to the site and as such, this standard is not applicable.

### **TDC 75.070. - Existing Driveways and Street Intersections.**

***(1) Existing driveways with access onto arterials on the date this chapter was originally adopted are allowed to remain. If additional development occurs on properties with existing driveways with access onto arterials then this Chapter applies and the entire site must be made to conform with the requirements of this chapter.***

***(2) The City Manager may restrict existing driveways and street intersections to right-in and right-out by construction of raised median barriers or other means.***

**Finding:** No changes are proposed to the existing driveways. No additional driveways are proposed. This standard is met.

### **TDC 75.120. - Collector Streets Access Standards.**

***(1) Major Collectors. Direct access from newly constructed single family homes, duplexes or triplexes are not permitted. As major collectors in residential areas are fully improved, or adjacent land redevelops, direct access should be relocated to the nearest local street where feasible.***

***(2) Minor Collectors. Residential, commercial and industrial driveways where the frontage is greater or equal to 70 feet are permitted. Minimum spacing at 100 feet. Uses with less than 50 feet of frontage shall use a common (joint) access where available.***

***(3) If access is not able to be relocated to the nearest local street, the City Manager may allow interim access in accordance with [75.060](#) of this chapter to provide for the eventual implementation of the overall access plan.***

**Finding:** This site has existing access onto Martinazzi, a minor collector at this location. The site has greater than 70 feet of frontage and the existing access is a minimum of 100 feet from the nearest access. This standard is met.

**TDC 75.140. - Existing Streets Access Standards.**

*The following list describes in detail the freeways and arterials as defined in TDC 75.050 with respect to access. Recommendations are made for future changes in accesses and location of future accesses. These recommendations are examples of possible solutions and shall not be construed as limiting the City's authority to change or impose different conditions if additional studies result in different recommendations from those listed below.*

**(14) SAGERT STREET.**

*(a) Martinazzi Avenue to 65th Avenue. No new driveways or streets shall be allowed, except the City Manager may allow one driveway from the SE corner lot of Sagert and Martinazzi. This driveway may be restricted to right-in, right-out.*

**Finding:** This site has existing access onto Sagert Street. No new access is proposed to this portion of Sagert Street. This standard is met.

**TUALATIN MUNICIPAL CODE**

**TITLE 3- UTILITIES AND WATER QUALITY**

**CHAPTER 3-02 – SEWER REGULATIONS; RATES**

**TMC 3-2-020 - Application, Permit and Inspection Procedure. [City code text omitted for brevity]**

**TMC 3-2-030 - Materials and Manner of Construction. [City code text omitted for brevity]**

**TMC 3-2-040 - Restrictions As to Use of Sanitary Sewer System. [City code text omitted for brevity]**

**TMC 3-2-060 - Use of Public Sewers Required. [City code text omitted for brevity]**

**TMC 3-2-160 - Construction Standards. [City code text omitted for brevity]**

**Finding:** Compliance with the applicable City of Tualatin and Clean Water Services standards for sanitary sewer will be demonstrated at the time of building and construction permit applications. The applicable standards will be met. Refer to the TDC 74.620 response and utility drawings in the application, as well as Appendix D.7-Clean Water Services Service Provider Letter, for additional information. This standard is met.

**CHAPTER 3-03 - WATER SERVICE**

**TMC 3-3-040 - Separate Services Required. [City code text omitted for brevity]**

**TMC 3-3-050 - Regular Service. [City code text omitted for brevity]**

**TMC 3-3-080 - Fire Protection Service. [City code text omitted for brevity]**

**TMC 3-3-100 - Meters. [City code text omitted for brevity]**

**TMC 3-3-110 - Construction Standards. [City code text omitted for brevity]**

**TMC 3-3-120 - Backflow Prevention Devices and Cross Connections.** *[City code text omitted for brevity]*

**TMC 3-3-130 - Control Valves.** *[City code text omitted for brevity]*

**TMC 3-3-240 - Construction.** *[City code text omitted for brevity]*

**Finding:** Compliance with the applicable City of Tualatin standards for water service will be demonstrated at the time of building and construction permit applications. Refer to the TDC 74.610 response and utility drawings in the application, Sheet FS-1 of Appendix C-Land Use Plans-Civil and Appendix D.8-TVF&R Service Provider Letter for additional information. This standard is met.

#### **CHAPTER 3-05 - SOIL EROSION, SURFACE WATER MANAGEMENT, WATER QUALITY FACILITIES, AND BUILDING AND SEWERS**

**TMC 3-5-040 - Erosion Prohibited.** *[City code text omitted for brevity]*

**TMC 3-5-050 - Erosion Control Permits.** *[City code text omitted for brevity]*

**TMC 3-5-060 - Permit Process.** *[City code text omitted for brevity]*

**TMC 3-5-090 - Physical Erosion.** *[City code text omitted for brevity]*

**TMC 3-5-110 - Air Pollution—Dust, Fumes, Smoke and Odors.** *[City code text omitted for brevity]*

**TMC 3-5-120 - Maintaining Water Quality.** *[City code text omitted for brevity]*

**TMC 3-5-130 - Fish and Wildlife Habitat.** *[City code text omitted for brevity]*

**TMC 3-5-140 - Control of Noise Levels.** *[City code text omitted for brevity]*

**TMC 3-5-150 - Natural Vegetation.** *[City code text omitted for brevity]*

**TMC 3-5-160 - Historical and Archeological Areas.** *[City code text omitted for brevity]*

**TMC 3-5-170 - Pesticides, Fertilizers.** *[City code text omitted for brevity]*

**TMC 3-5-180 - Contaminated Soils.** *[City code text omitted for brevity]*

**TMC 3-5-190 - Soil Erosion Control Matrix and Methods.** *[City code text omitted for brevity]*

**Finding:** Compliance with the applicable City of Tualatin standards for erosion control will be demonstrated at the time of building and construction permit applications. Refer to Sheet C310 of Appendix C-Land Use Plans-Civil for further details. This standard is met.

## ADDITIONAL SURFACE WATER MANAGEMENT STANDARDS

TMC 3-5-200 - Downstream Protection Requirement. *[City code text omitted for brevity]*

TMC 3-5-210 - Review of Downstream System. *[City code text omitted for brevity]*

TMC 3-5-220 - Criteria for Requiring On-Site Detention to be Constructed. *[City code text omitted for brevity]*

TMC 3-5-230 - On-Site Detention Design Criteria. *[City code text omitted for brevity]*

TMC 3-5-240 - On-Site Detention Design Method. *[City code text omitted for brevity]*

TMC 3-5-250 - Floodplain Design Standards. *[City code text omitted for brevity]*

TMC 3-5-260 - Floodway Design Standards. *[City code text omitted for brevity]*

TMC 3-5-280 - Placement of Water Quality Facilities. *[City code text omitted for brevity]*

**Finding:** Compliance with the applicable City of Tualatin standards for surface water management will be demonstrated at the time of building and construction permit applications. This standard is met.

## PERMANENT ON-SITE WATER QUALITY FACILITIES

TMC 3-5-330 - Permit Required. *[City code text omitted for brevity]*

TMC 3-5-340 - Facilities Required. *[City code text omitted for brevity]*

TMC 3-5-345 - Inspection Reports. *[City code text omitted for brevity]*

TMC 3-5-350 - Phosphorous Removal Standard. *[City code text omitted for brevity]*

TMC 3-5-360 - Design Storm. *[City code text omitted for brevity]*

TMC 3-5-370 - Design Requirements. *[City code text omitted for brevity]*

TMC 3-5-390 - Facility Permit Approval. *[City code text omitted for brevity]*

TMC 3-5-430 - Placement of Water Quality Facilities. *[City code text omitted for brevity]*

**Finding:** Compliance with the applicable City of Tualatin standards for on-site water quality facilities will be demonstrated at the time of building and construction permit applications. As stated previously in this narrative in TDC 74.630, the Applicant is considering below surface and above ground water quality treatment and storage. This standard is met.

## STANDARD SPECIFICATIONS FOR BUILDING AND SIDE SEWERS

**TMC 3-5-440 - General Provisions.** *[City code text omitted for brevity]*

**TMC 3-5-450 - Building Sewers.** *[City code text omitted for brevity]*

**TMC 3-5-460 - Installation of Side Sewers.** *[City code text omitted for brevity]*

**Finding:** All sewers will be built and installed to city standards as demonstrated at the time of building and construction permit applications. This standard is met.

## SUMMARY AND CONCLUSION

Based upon the materials submitted herein, the Applicant respectfully requests approval from the Tualatin Architectural Review Board for this Type III Architectural Review application and associated Tree Removal Permit.



# TYPE III ARCHITECTURAL REVIEW DRAWINGS

FOR

## ALDEN APARTMENTS

PREPARED FOR  
COLRICH



PUBLISH DATE

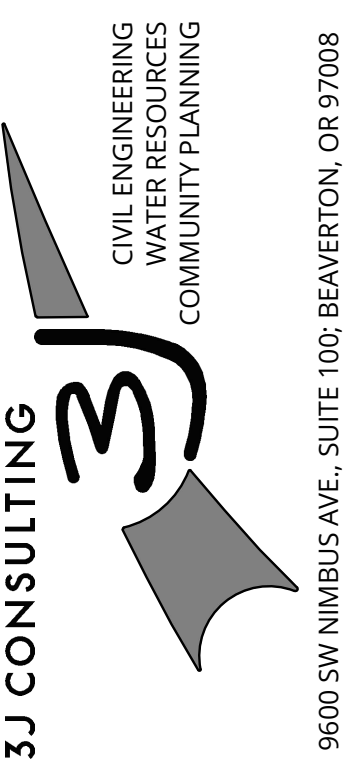
09/01/2022

ISSUED FOR

LAND USE

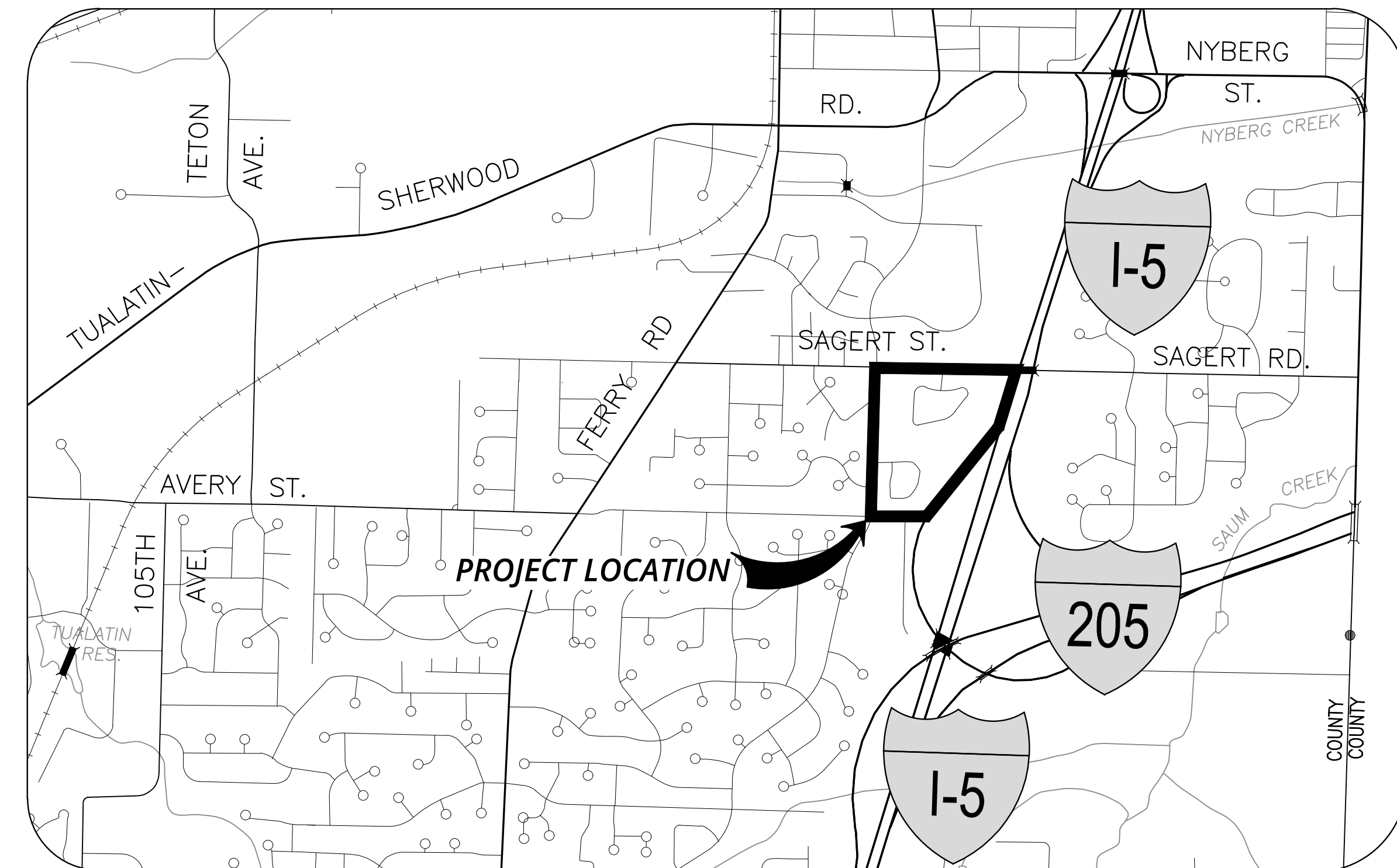
REVISIONS

**COVER SHEET**  
**ALDEN APARTMENTS**  
 7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
 TUALATIN, OR 97062

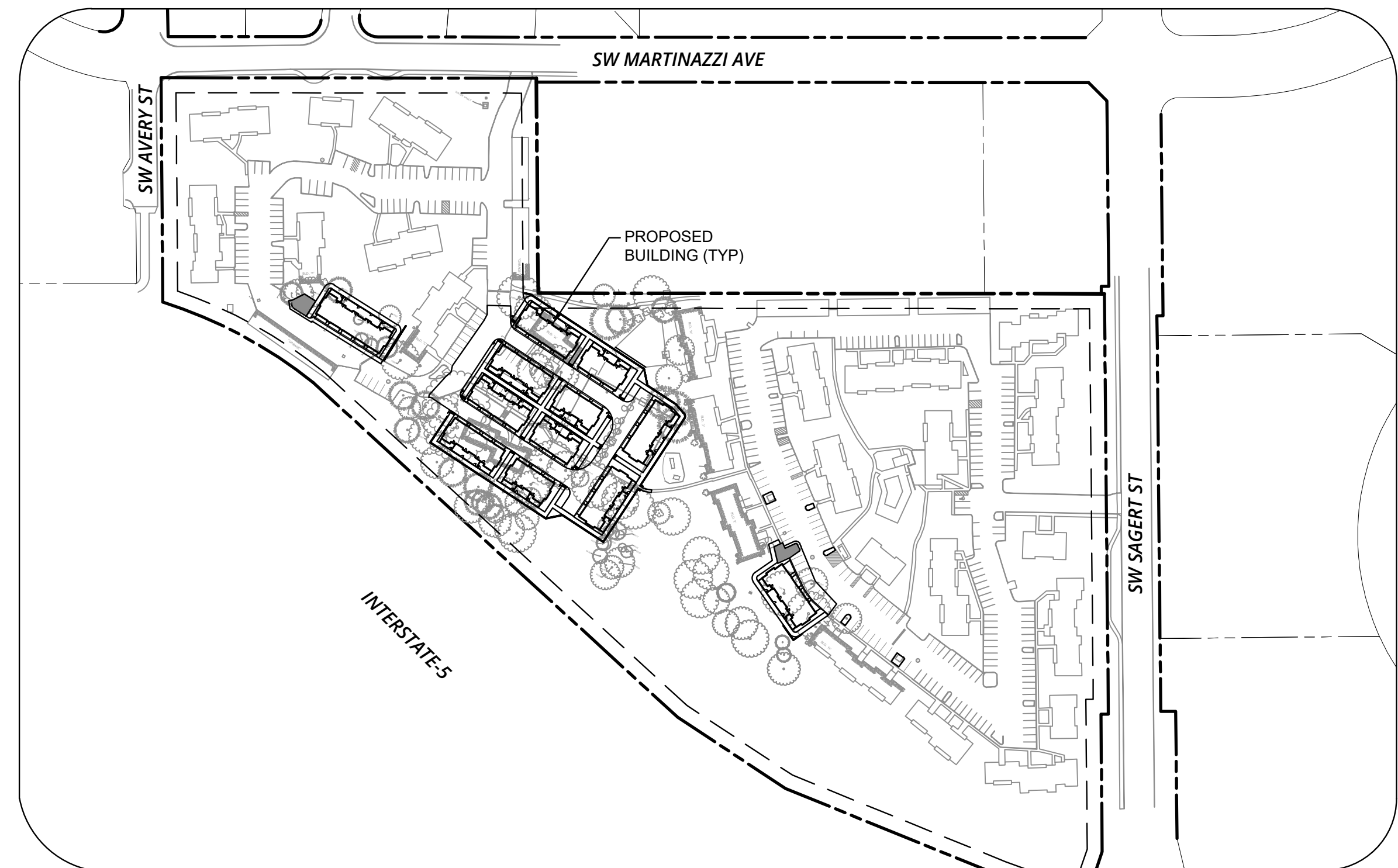


PROJECT INFORMATION  
 3J PROJECT # | 22791  
 TAX LOT(S) | 2S125BA00100  
 LAND USE # | 22-0004  
 DESIGNED BY | KMK  
 CHECKED BY | BMO

SHEET NUMBER  
**C000**



**VICINITY MAP**  
NOT TO SCALE



**SITE MAP**  
NOT TO SCALE

INDEX OF SHEETS	
SHEET NO.	SHEET TITLE
C000	COVER SHEET
C100	OVERALL EXISTING CONDITIONS PLAN
C101	EXTG CONDITIONS PLAN
C110	TREE INVENTORY AND PROTECTION PLAN
C200	DEMOLITION PLAN
C300	EROSION AND SEDIMENT CONTROL PLAN
C310	EROSION AND SEDIMENT CONTROL DETAILS
C400	UTILITY PLAN
C500	GRADING PLAN
C600	OVERALL SITE PLAN
C601	SITE PLAN
C700	FIRE ACCESS PLAN

### SITE INFORMATION

#### SITE ADDRESS

7800 SW SAGERT STREET &  
20400 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062

#### JURISDICTION

CITY OF TUALATIN

#### FLOOD HAZARD

MAP NUMBERS: 41067C0607E  
ZONE X (UNSHADED)

#### LOCATION

N.W. 1/4 OF SECTION 25,  
T.2S., R.1W., W.M., WASHINGTON  
COUNTY, OR

#### HORIZONTAL DATUM (BASIS OF BEARINGS)

OREGON COORDINATE REFERENCE SYSTEM O.C.R.S. (PORTLAND ZONE),  
INTERNATIONAL FEET.

#### VERTICAL DATUM

NAVD 88.

### PROJECT TEAM

#### OWNER

COLRICH  
444 WEST BEECH ST, SUITE 300  
SAN DIEGO, CA 92101  
CONTACT: MATHEW MOISEVE  
PHONE: 858-490-2300  
EMAIL: matm@colrich.com

#### LAND SURVEYOR

CESINW  
13190 SW 68TH PARKWAY, SUITE 150  
TIGARD, OR 97223  
CONTACT: PAUL KOHN, PLS  
PHONE: (503) 968-6655  
EMAIL: pkohn@cesinw.com

#### CIVIL ENGINEER

3J CONSULTING, INC.  
9600 SW NIMBUS AVE, SUITE 100  
BEAVERTON, OR 97008  
CONTACT: BRIAN O'ROURKE, P.E.  
PHONE: (503) 946-9365  
EMAIL: brian.orourke@3j-consulting.com

#### ARCHITECT

DAHLIN GROUP  
10900 NE 8TH ST, SUITE 1120  
BELLEVUE, WA 98004  
CONTACT: CAMILA GARRIDO, AIA  
PHONE: (858) 602-2376  
EMAIL: camila.garrido@dahlingroup.com

### UTILITIES & SERVICES

#### STORM WATER

CITY OF TUALATIN  
18880 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062  
PHONE: (503) 692-2000

#### WATER

CITY OF TUALATIN  
18880 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062  
PHONE: (503) 692-2000

#### GAS

NORTHWEST NATURAL  
NW AMBERWOOD DRIVE  
HILLSBORO, OR 97124  
PHONE: (800) 422-4102

#### GARBAGE

REPUBLIC SERVICES  
PHONE: (503)-981-1278

#### SANITARY SEWER

CITY OF TUALATIN  
18880 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062  
PHONE: (503) 692-2000

#### POWER

PORTLAND GENERAL ELECTRIC  
PHONE: (800) 743-5000

#### FIRE

TUALATIN VALLEY FIRE & RESCUE  
STATION NUMBER 34  
19365 SW 90TH COURT  
TUALATIN, OR 97062  
PHONE: (503) 649-8577



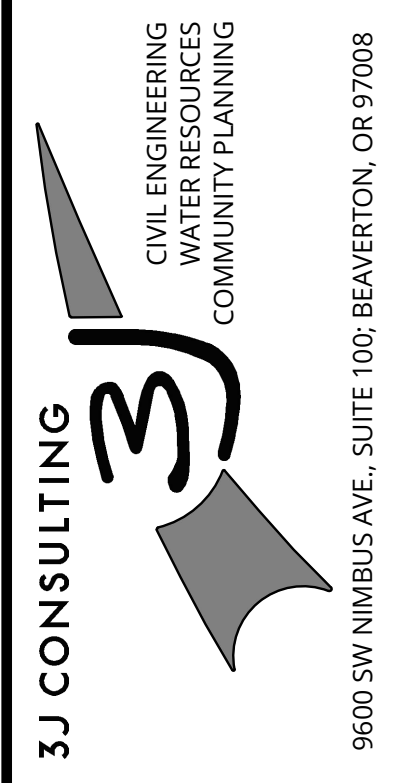
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PUBLISH DATE  
09/01/2022  
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LAND USE  
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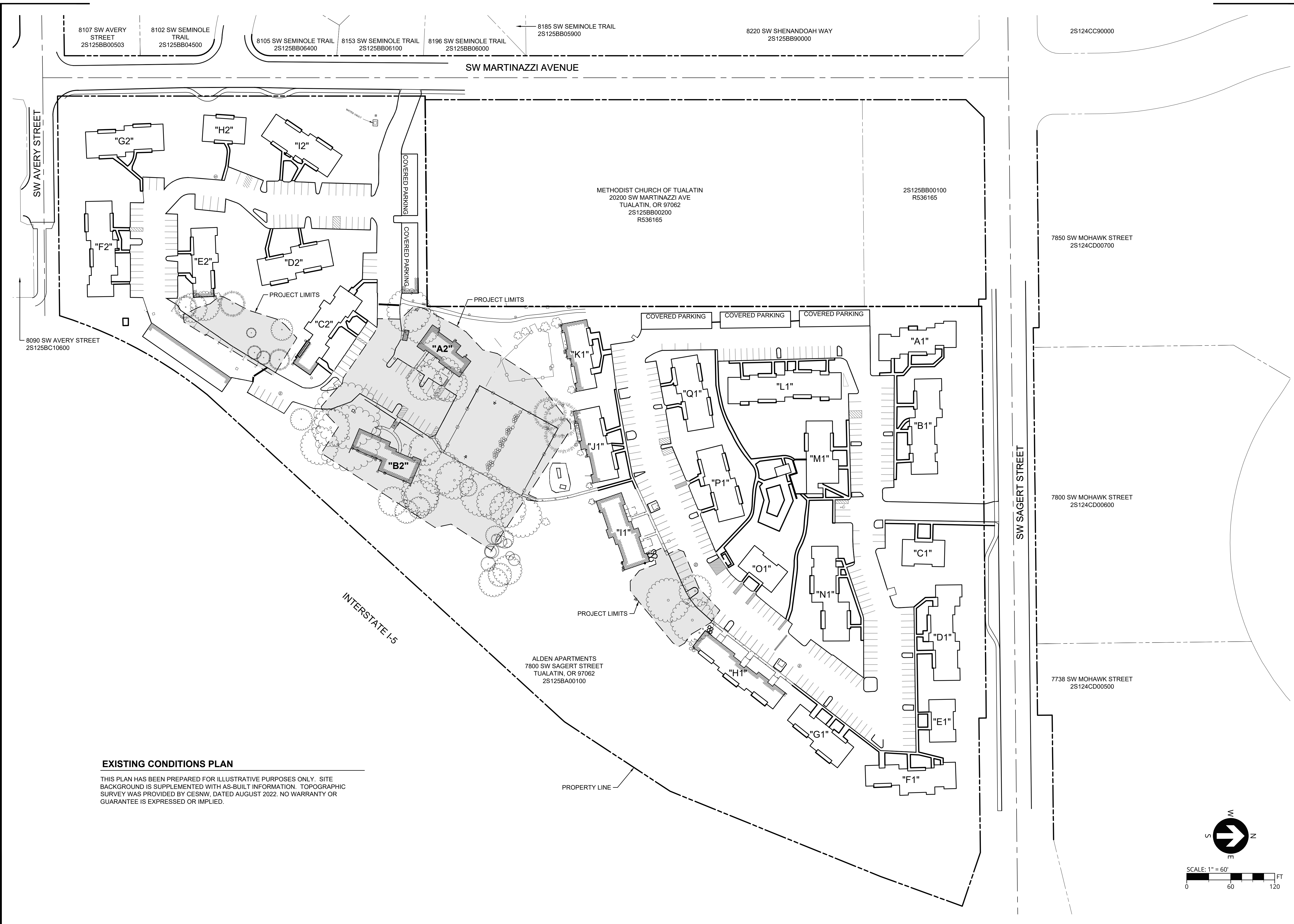
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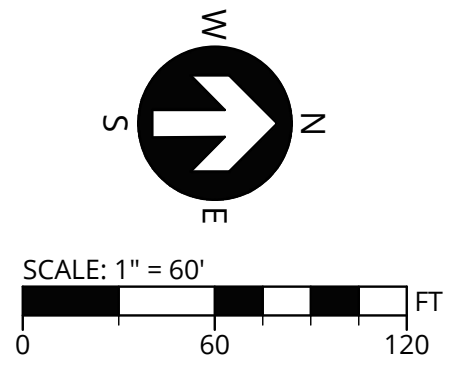
PROJECT INFORMATION  
3J PROJECT # | 22791  
TAX LOT(S) | 2S125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | KMK  
CHECKED BY | BMO

SHEET NUMBER  
**C100**



**EXISTING CONDITIONS PLAN**

THIS PLAN HAS BEEN PREPARED FOR ILLUSTRATIVE PURPOSES ONLY. SITE BACKGROUND IS SUPPLEMENTED WITH AS-BUILT INFORMATION. TOPOGRAPHIC SURVEY WAS PROVIDED BY CESNW, DATED AUGUST 2022. NO WARRANTY OR GUARANTEE IS EXPRESSED OR IMPLIED.

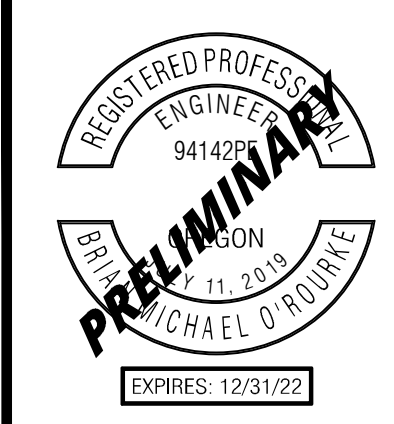


**EXISTING CONDITIONS PLAN**

THIS PLAN HAS BEEN PREPARED FOR ILLUSTRATIVE PURPOSES ONLY. SITE BACKGROUND INFORMATION AND FEATURES HAVE BEEN GENERATED FROM A COMBINATION OF PUBLIC GIS DATA SOURCES, AERIAL PHOTOS, TAX ASSESSOR MAPS AND PHYSICAL SITE OBSERVATIONS. TOPOGRAPHIC SURVEY WAS PROVIDED BY CESNW, DATED AUGUST 2022. PROPOSED SITE FEATURES ARE PRELIMINARY IN NATURE AND SUBJECT TO CHANGE. NO WARRANTY OR GUARANTEE IS EXPRESSED OR IMPLIED.

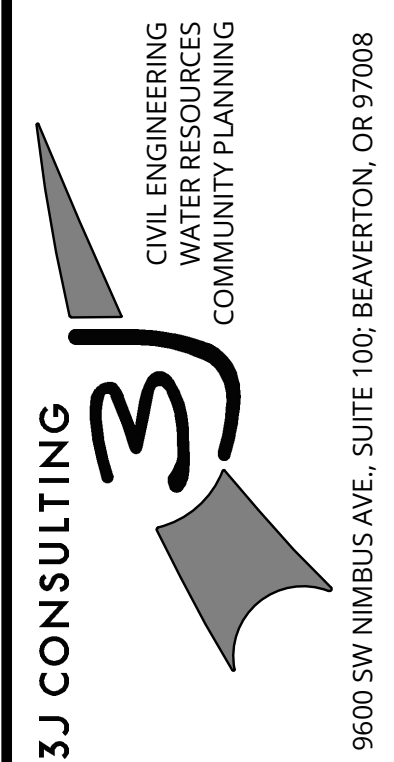
**EXISTING LEGEND**

	PROPERTY LINE		STORM MANHOLE
	RIGHT-OF-WAY LINE		CATCH BASIN
	STORM LINE		CLEANOUT/ROOF DRAIN
	SEWER LINE		SANITARY MANHOLE
	WATER LINE		WATER METER
	GAS LINE		IRRIGATION VALVE
	UNDERGROUND POWER LINE		ELECTRIC TRANSFORMER
	OVERHEAD POWER LINE		ELECTRIC METER
	COMMUNICATIONS LINE		ELECTRIC JUNCTION BOX
	FENCE		LIGHT POLE
	MAJOR CONTOUR		UTILITY POLE ANCHOR
	MINOR CONTOUR		COMM JUNCTION BOX
	CURB		COMM RISER
	EDGE OF BUILDING		CONIFEROUS TREE
	BUILDING EAVE		DECIDUOUS TREE
	WALL		
	ASPHALT		
	CONCRETE		



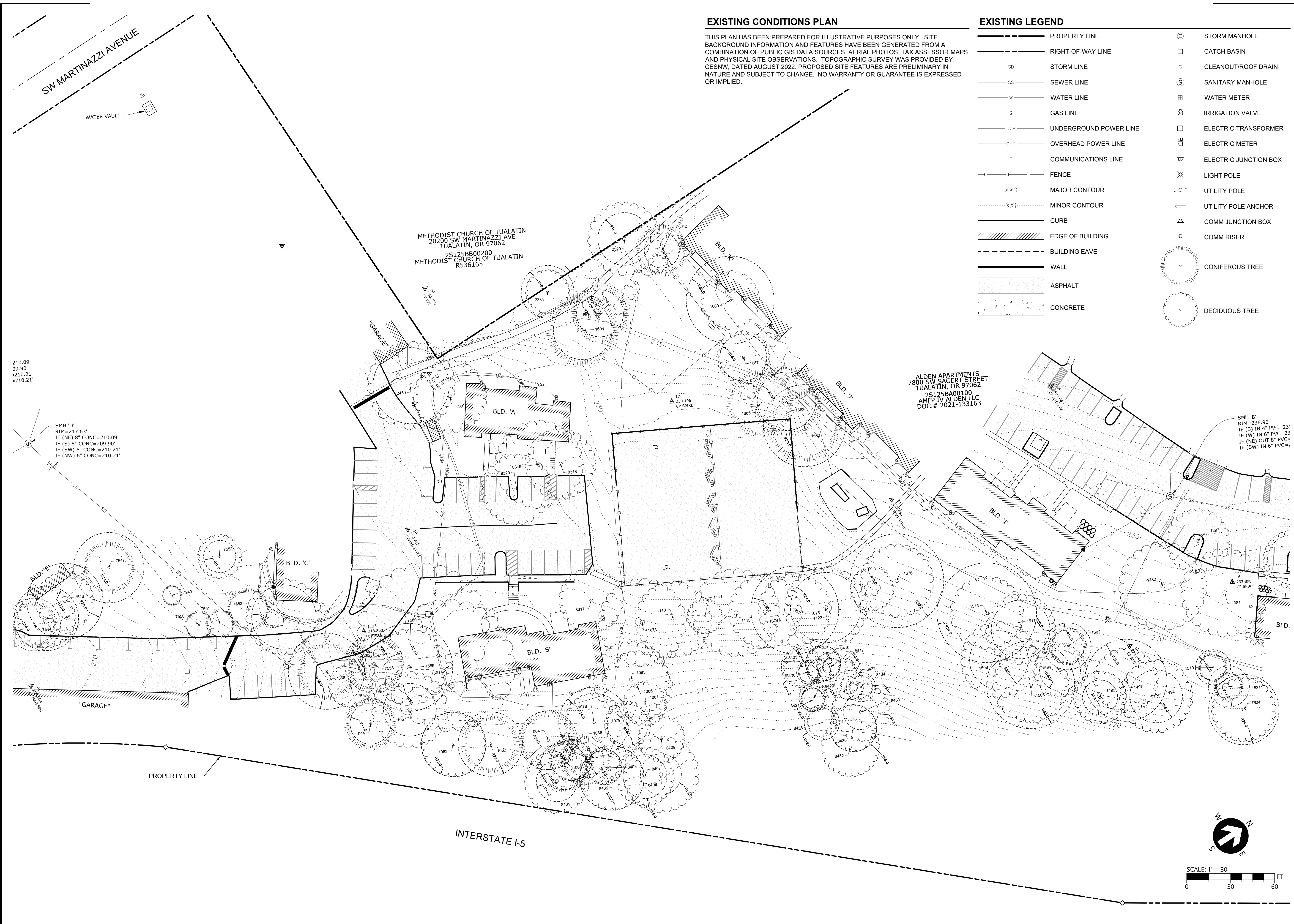
PUBLISH DATE  
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**EXTG CONDITIONS PLAN**  
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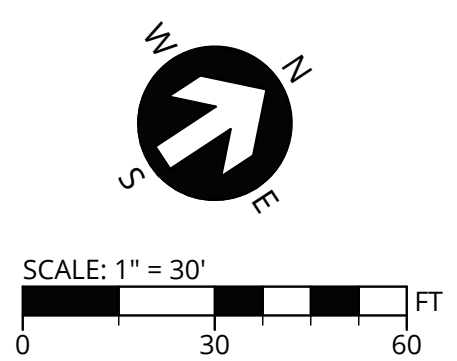
SHEET NUMBER  
**C101**



210.09'  
09.90'  
-210.21'  
-210.21'

SMH 'D'  
RIM=217.63'  
IE (NE) 8" CONC=210.09'  
IE (S) 8" CONC=209.90'  
IE (SW) 6" CONC=210.21'  
IE (NW) 6" CONC=210.21'

SMH 'B'  
RIM=236.96'  
IE (S) IN 4" PVC=231  
IE (W) IN 6" PVC=23  
IE (NE) OUT 8" PVC=  
IE (SW) IN 6" PVC=2



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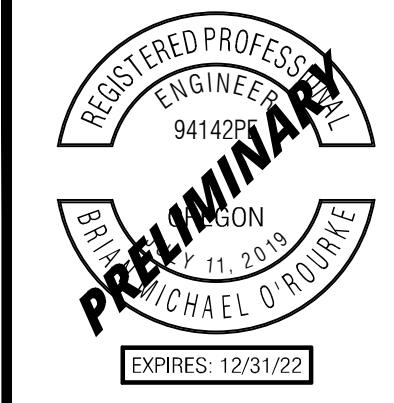
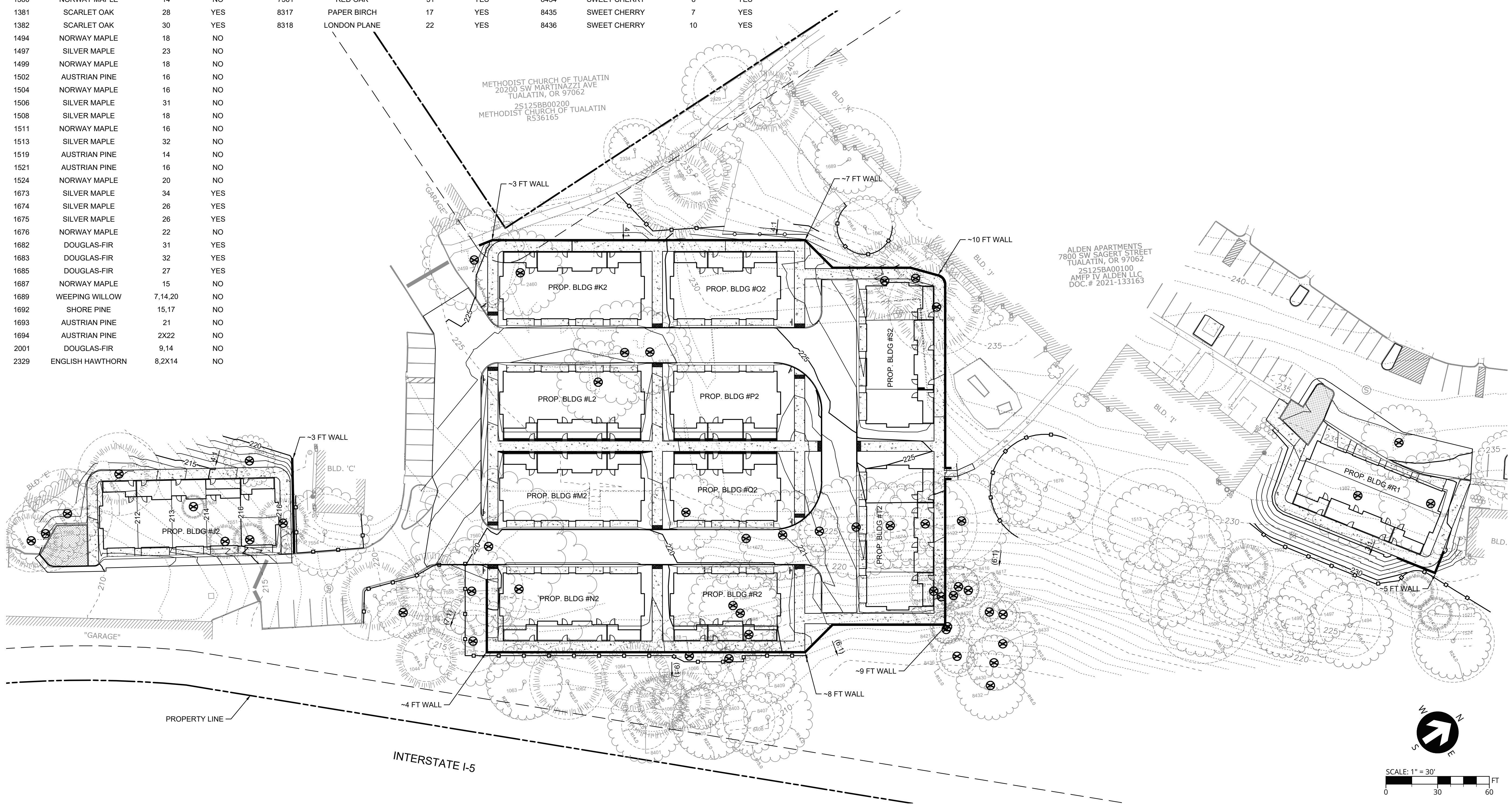


**TREE INVENTORY**

TREE #	TREE SPECIES	DBH (IN)	REMOVED?	2334	SERVICEBERRY	7.8,12	NO	8319	LONDON PLANE	29	YES
1044	AUSTRIAN PINE	18	NO	2459	LONDON PLANE	32	YES	8320	NORWAY MAPLE	22	YES
1057	RED OAK	28	YES	2460	PAPER BIRCH	22	YES	8401	RED OAK	2X22	NO
1062	DOUGLAS-FIR	26	NO	7544	SHORE PINE	13	YES	8403	SWEET CHERRY	8	NO
1063	RED OAK	20	NO	7545	NORWAY MAPLE	17	YES	8405	RED OAK	25	NO
1064	DOUGLAS-FIR	21	NO	7546	NORWAY MAPLE	18	YES	8407	RED OAK	25	NO
1065	DOUGLAS-FIR	22	NO	7547	DOUGLAS-FIR	31	YES	8408	RED OAK	24	NO
1066	DOUGLAS-FIR	24	NO	7549	DOUGLAS-FIR	10	YES	8411	NORWAY MAPLE	32	NO
1078	NORWAY MAPLE	19	YES	7550	SHORE PINE	15	YES	8416	ENGLISH HAWTHORN	7.8	YES
1079	NORWAY MAPLE	10	YES	7551	SHORE PINE	15	YES	8417	SWEET CHERRY	7	YES
1081	NORWAY MAPLE	15	YES	7552	NORWAY MAPLE	13	YES	8418	SWEET CHERRY	10	YES
1085	SCARLET OAK	32	YES	7553	DOUGLAS-FIR	22	YES	8419	SWEET CHERRY	10	YES
1086	SCARLET OAK	29	YES	7554	NORWAY MAPLE	26	NO	8420	SWEET CHERRY	12	YES
1110	SILVER MAPLE	40	YES	7556	AUSTRIAN PINE	24	NO	8421	SWEET CHERRY	10	YES
1111	SILVER MAPLE	14	YES	7557	SWEET CHERRY	22	YES	8422	SWEET CHERRY	7.8	YES
1115	SILVER MAPLE	28	YES	7558	AUSTRIAN PINE	20	NO	8430	SWEET CHERRY	16	YES
1122	SILVER MAPLE	29	YES	7559	RED OAK	25	YES	8432	SWEET CHERRY	22	YES
1297	NORWAY MAPLE	19	YES	7560	RED OAK	39	YES	8433	SWEET CHERRY	14	YES
1380	NORWAY MAPLE	14	NO	7561	RED OAK	31	YES	8434	SWEET CHERRY	8	YES
1381	SCARLET OAK	28	YES	8317	PAPER BIRCH	17	YES	8435	SWEET CHERRY	7	YES
1382	SCARLET OAK	30	YES	8318	LONDON PLANE	22	YES	8436	SWEET CHERRY	10	YES
1494	NORWAY MAPLE	18	NO								
1497	SILVER MAPLE	23	NO								
1499	NORWAY MAPLE	18	NO								
1502	AUSTRIAN PINE	16	NO								
1504	NORWAY MAPLE	16	NO								
1506	SILVER MAPLE	31	NO								
1508	SILVER MAPLE	18	NO								
1511	NORWAY MAPLE	16	NO								
1513	SILVER MAPLE	32	NO								
1519	AUSTRIAN PINE	14	NO								
1521	AUSTRIAN PINE	16	NO								
1524	NORWAY MAPLE	20	NO								
1673	SILVER MAPLE	34	YES								
1674	SILVER MAPLE	26	YES								
1675	SILVER MAPLE	26	YES								
1676	NORWAY MAPLE	22	NO								
1682	DOUGLAS-FIR	31	YES								
1683	DOUGLAS-FIR	32	YES								
1685	DOUGLAS-FIR	27	YES								
1687	NORWAY MAPLE	15	NO								
1689	WEeping WILLOW	7,14,20	NO								
1692	SHORE PINE	15,17	NO								
1693	AUSTRIAN PINE	21	NO								
1694	AUSTRIAN PINE	2X22	NO								
2001	DOUGLAS-FIR	9,14	NO								
2329	ENGLISH HAWTHORN	8,2X14	NO								

**LEGEND**

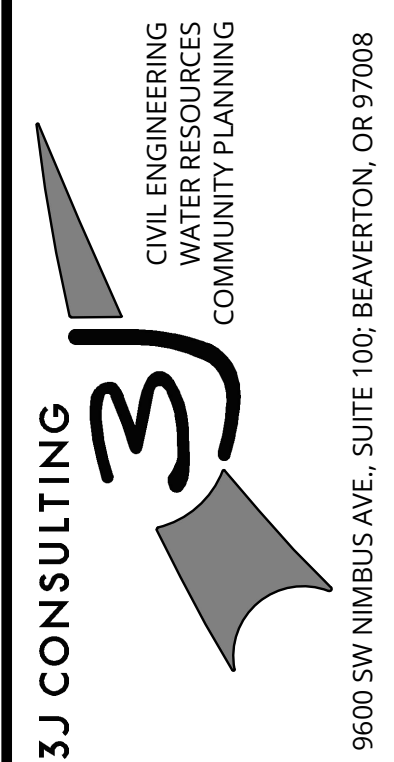
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- 110--- PROPOSED MAJOR CONTOUR
- 108--- PROPOSED MINOR CONTOUR
- - - XX0 - - - EXISTING MAJOR CONTOUR
- - - XX1 - - - EXISTING MINOR CONTOUR
- TREE PROTECTION FENCING
- ⊗ PROPOSED TREE REMOVAL
- ⊙ CONIFEROUS TREE
- ⊙ DECIDUOUS TREE



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**TREE INVENTORY AND PROTECTION PLAN**  
**ALDEN APARTMENTS**

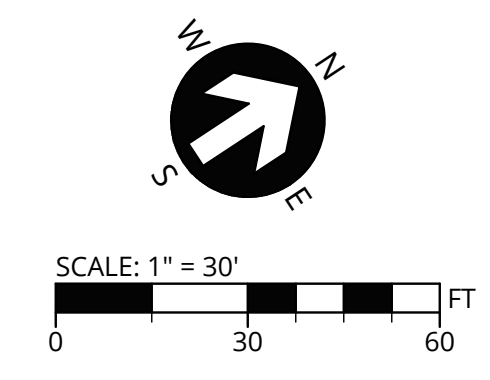
7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062



PROJECT INFORMATION  
3J PROJECT # | 22791  
TAX LOT(S) | 25125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | KMK  
CHECKED BY | BMO

SHEET NUMBER  
**C110**

P:\22791-ALDEN APARTMENTS\CAD\SHEETS\DDC\10 - TREE PLAN.DWG









**LEGEND**

- PROPERTY LINE
- PROPOSED SILT FENCING
- PROPOSED TREE PROTECTION FENCING
- PROPOSED HIGH VISIBILITY FENCING
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED PLASTIC SHEETING
- PROPOSED INLET PROTECTION
- PROPOSED SURFACE RUN-OFF FLOW ARROW
- EXISTING SURFACE RUN-OFF FLOW ARROW

**KEY NOTES**

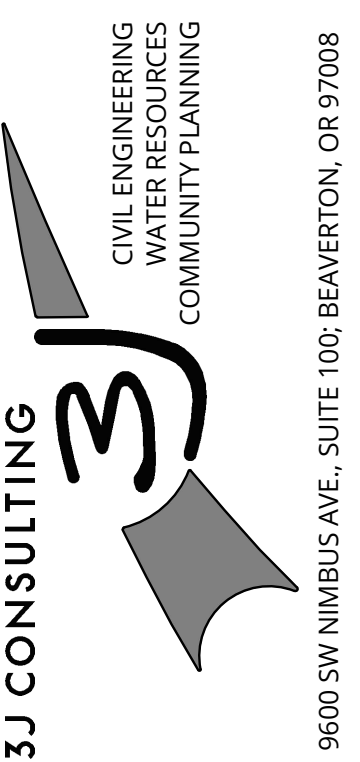
- 1 CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE PER DETAIL ON SHEET C310. MAINTAIN THROUGHOUT CONSTRUCTION AS NEEDED.
- 2 INSTALL SEDIMENT FENCING PER DETAIL ON SHEET C310. MAINTAIN THROUGHOUT CONSTRUCTION.
- 3 INSTALL INLET PROTECTION PER DETAIL ON SHEET C310. MAINTAIN THROUGHOUT CONSTRUCTION.
- 4 INSTALL HIGH VISIBILITY ORANGE CONSTRUCTION FENCING. MAINTAIN THROUGHOUT CONSTRUCTION.
- 5 INSTALL TREE PROTECTION FENCING PER DETAIL ON SHEET C310. MAINTAIN THROUGHOUT CONSTRUCTION. SEE EROSION CONTROL NOTE 3.
- 6 STOCKPILE AREA. PROTECT WITH PLASTIC SHEETING PER DETAIL ON SHEET C310.



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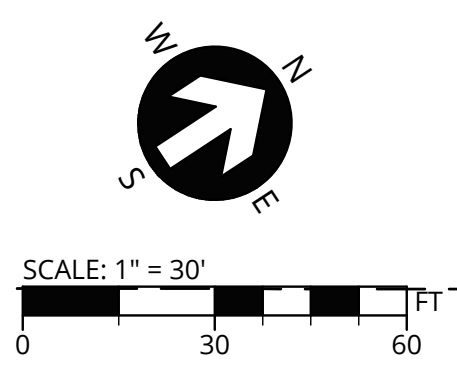
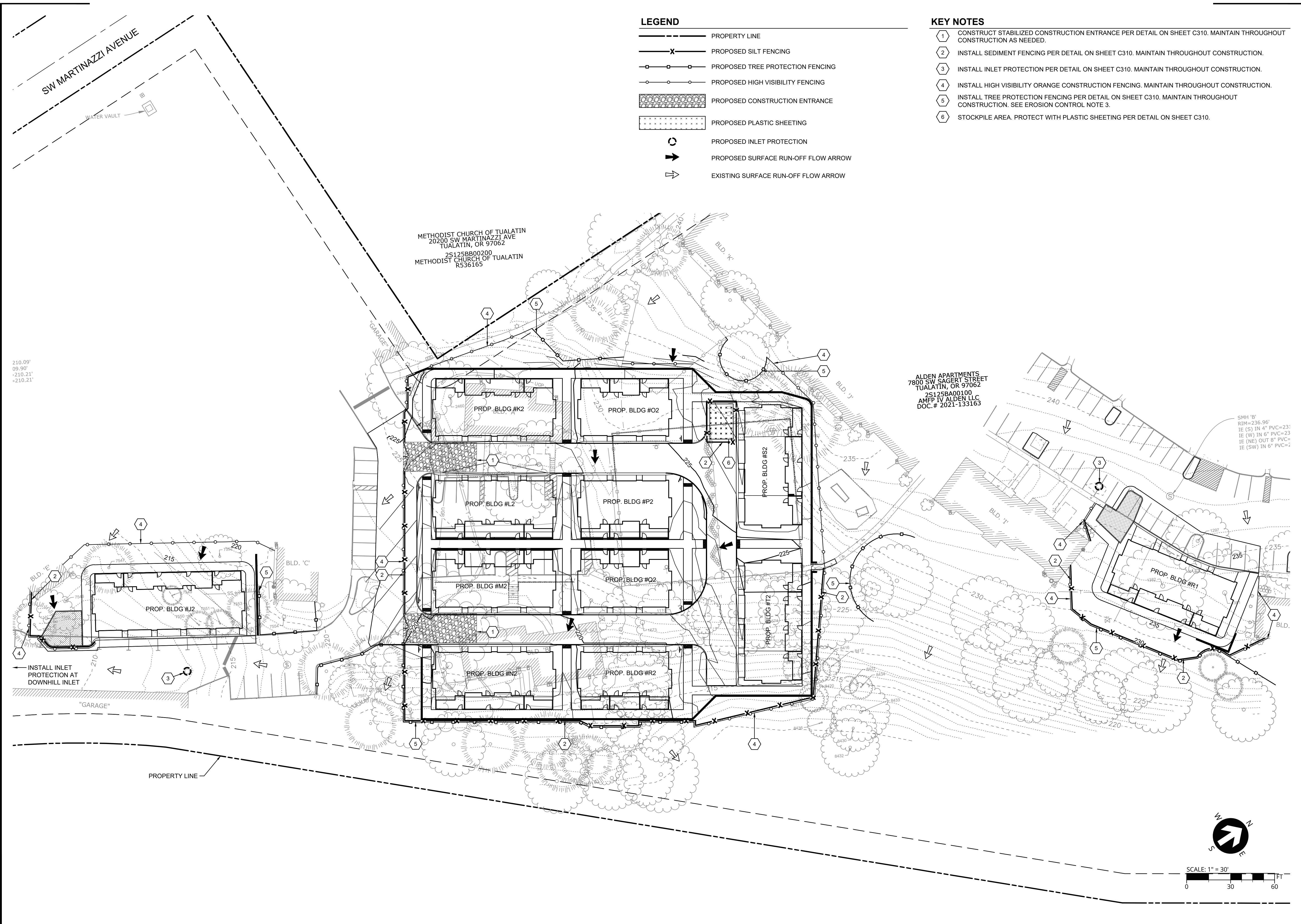
**EROSION AND SEDIMENT CONTROL PLAN**  
**ALDEN APARTMENTS**

7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062



PROJECT INFORMATION  
3J PROJECT # | 22791  
TAX LOT(S) | 2S125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | KMK  
CHECKED BY | BMO

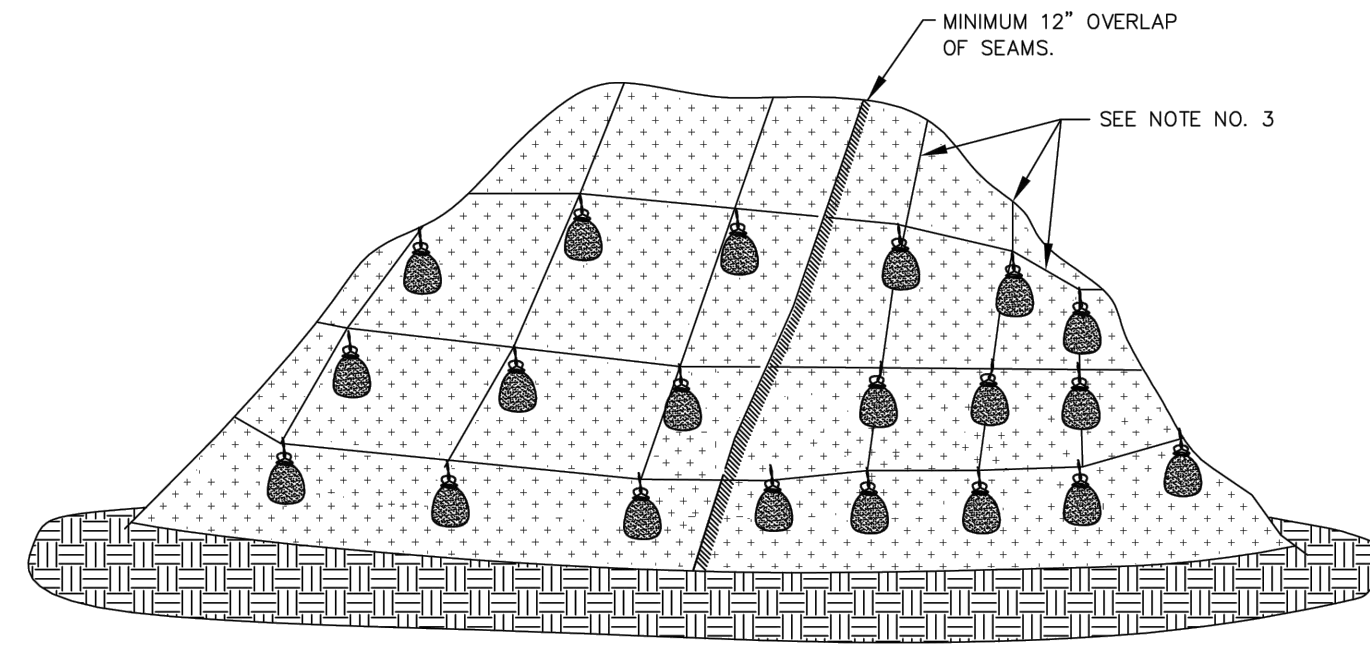
SHEET NUMBER  
**C300**



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P:\22791-ALDEN APARTMENTS\CAD\SHEETS\DDC310 - ESC DETAILS.DWG

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



PLASTIC SHEETING

NOTES:

1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. PERIMETER SEDIMENT CONTROL BMP TO BE INSTALLED A MINIMUM OF 3' FROM TOE OF STOCKPILE
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR APPROVED EQUAL ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.
4. PLASTIC TO EXTEND MINIMUM 1' BEYOND TOE OF SLOPE.
5. AS APPROPRIATE, BMP'S SHALL BE INSTALLED TO CONVEY WATER DISCHARGE FROM STOCKPILE AREAS.

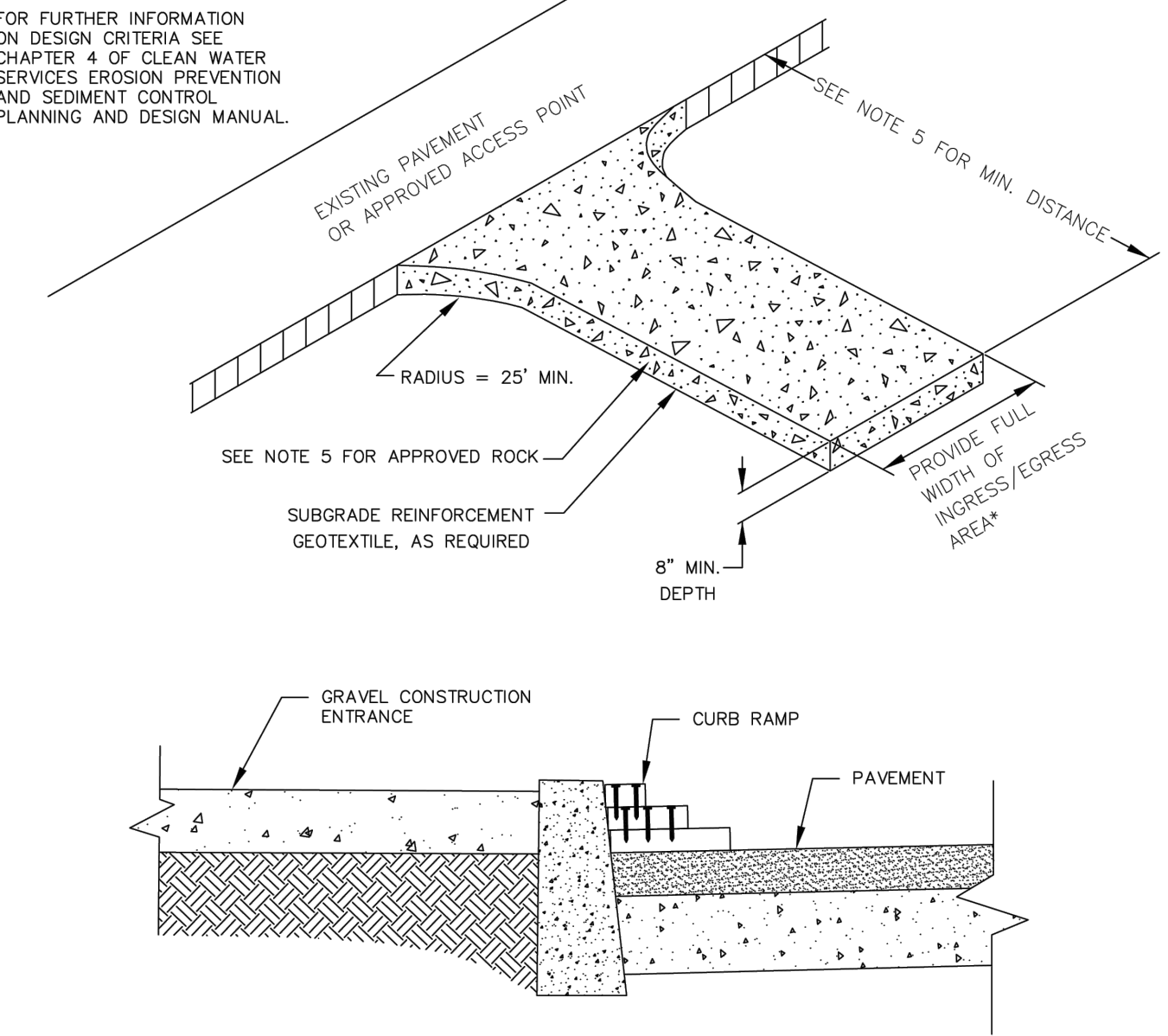
PLASTIC SHEETING

DRAWING NO. 810

REVISED 10-31-19



FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



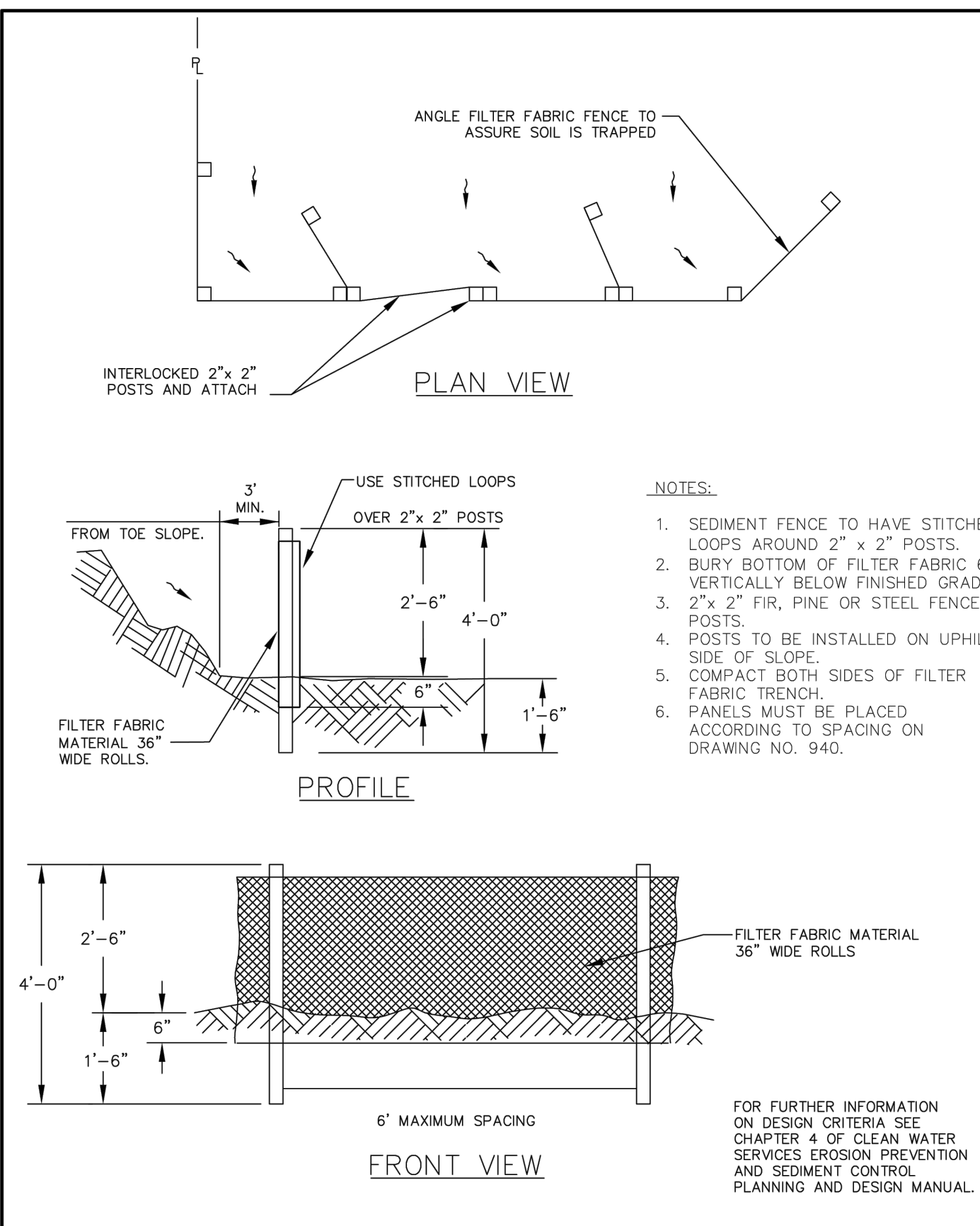
NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS  
SINGLE FAMILY  
20' LONG BY 20' WIDE 8" DEEP OF 3/4" MINUS CLEAN ROCK.  
COMMERCIAL/SITE DEVELOPMENT  
50' LONG BY 20' WIDE 3-6" CLEAN ROCK, GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.

CONSTRUCTION ENTRANCE

DRAWING NO. 855

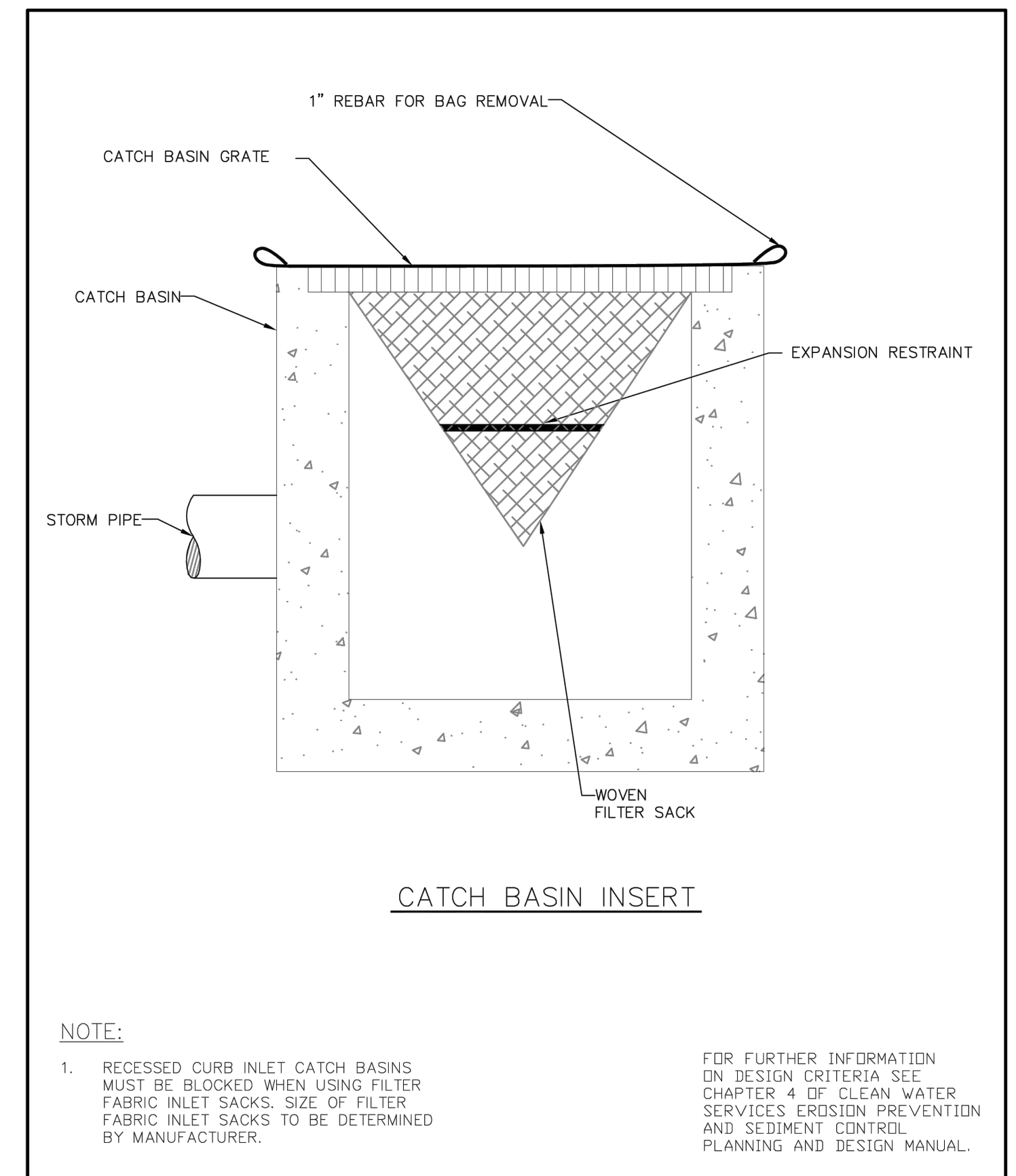
REVISED 10-31-19



SEDIMENT FENCE

DRAWING NO. 875

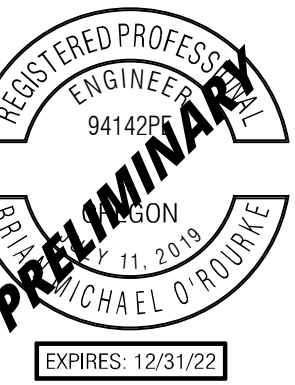
REVISED 10-31-19



INLET PROTECTION TYPE 5

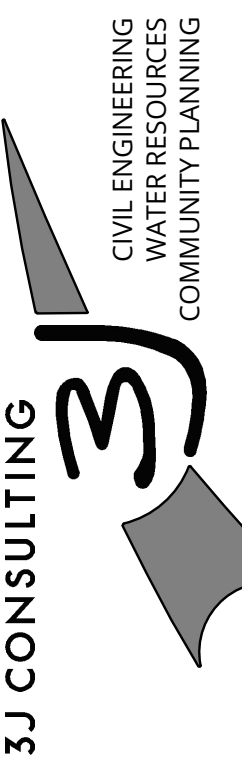
DRAWING NO. 920

REVISED 10-31-19



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EROSION AND SEDIMENT CONTROL DETAILS  
**ALDEN APARTMENTS**  
7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062



PROJECT INFORMATION  
3J PROJECT # | 22791  
TAX LOT(S) | 2S125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | KMK  
CHECKED BY | BMO

SHEET NUMBER  
**C310**

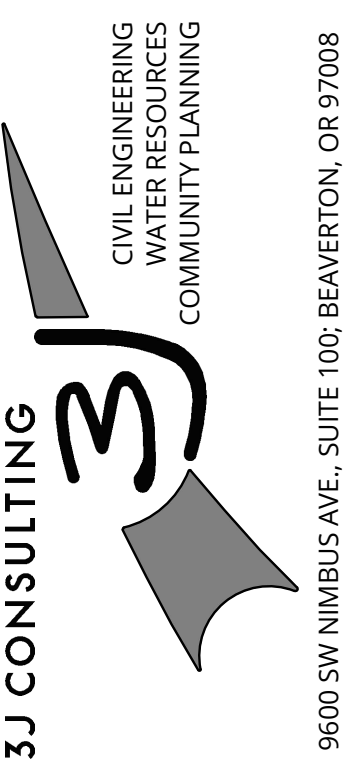
9600 SW NIMBUS AVE., SUITE 100, BEAVERTON, OR 97008





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UTILITY PLAN  
**ALDEN APARTMENTS**  
7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062



PROJECT INFORMATION  
3J PROJECT # | 22791  
TAX LOT(S) | 2S125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | KMK  
CHECKED BY | BMO

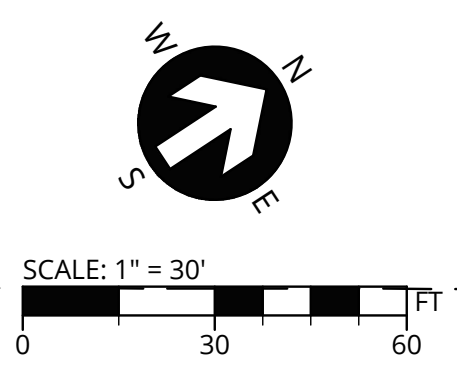
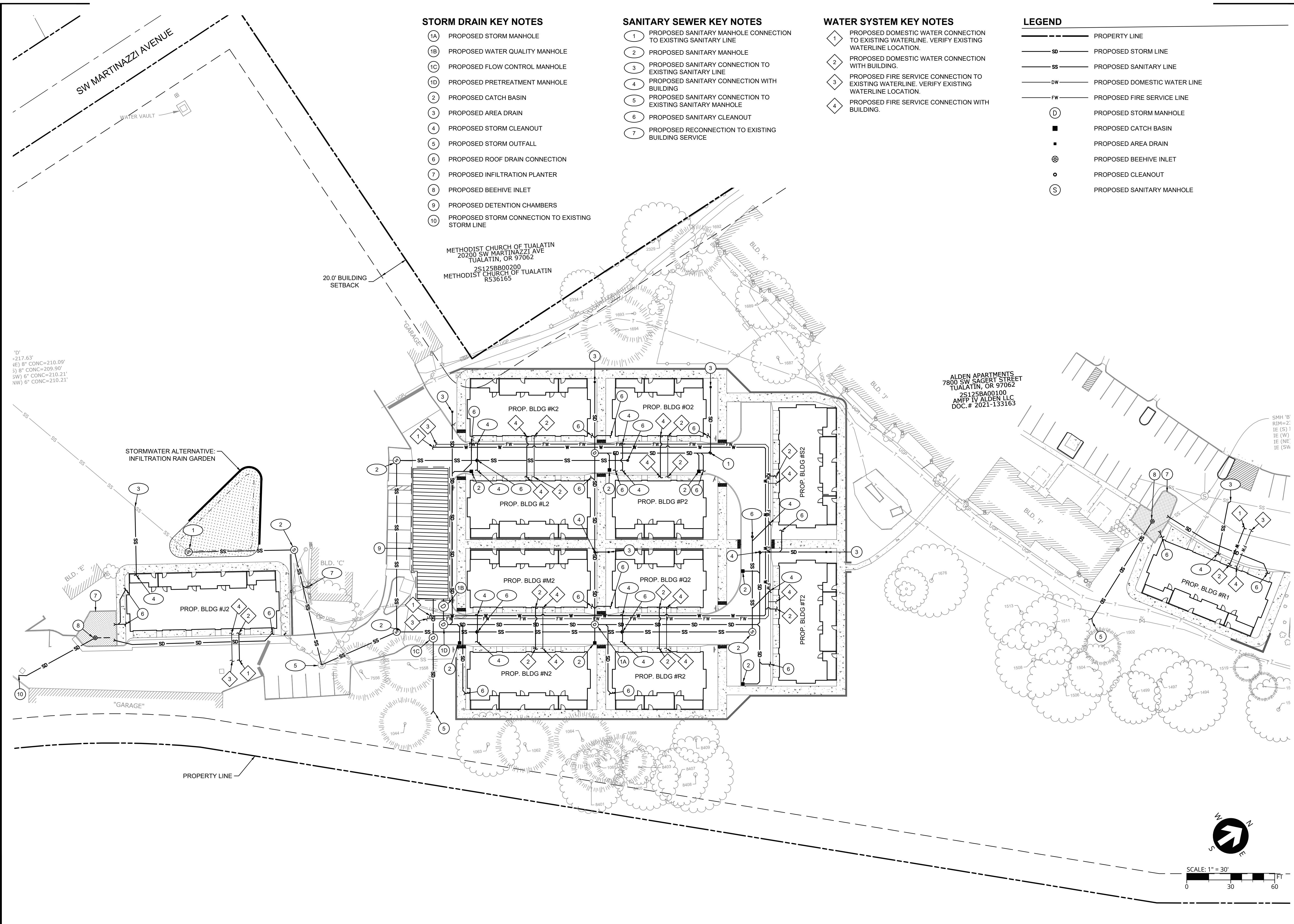
SHEET NUMBER  
**C400**

- LEGEND**
- PROPERTY LINE
  - SD --- PROPOSED STORM LINE
  - SS --- PROPOSED SANITARY LINE
  - DW --- PROPOSED DOMESTIC WATER LINE
  - FW --- PROPOSED FIRE SERVICE LINE
  - (D) PROPOSED STORM MANHOLE
  - PROPOSED CATCH BASIN
  - PROPOSED AREA DRAIN
  - ⊕ PROPOSED BEEHIVE INLET
  - PROPOSED CLEANOUT
  - (S) PROPOSED SANITARY MANHOLE

- WATER SYSTEM KEY NOTES**
- 1 PROPOSED DOMESTIC WATER CONNECTION TO EXISTING WATERLINE. VERIFY EXISTING WATERLINE LOCATION.
  - 2 PROPOSED DOMESTIC WATER CONNECTION WITH BUILDING.
  - 3 PROPOSED FIRE SERVICE CONNECTION TO EXISTING WATERLINE. VERIFY EXISTING WATERLINE LOCATION.
  - 4 PROPOSED FIRE SERVICE CONNECTION WITH BUILDING.

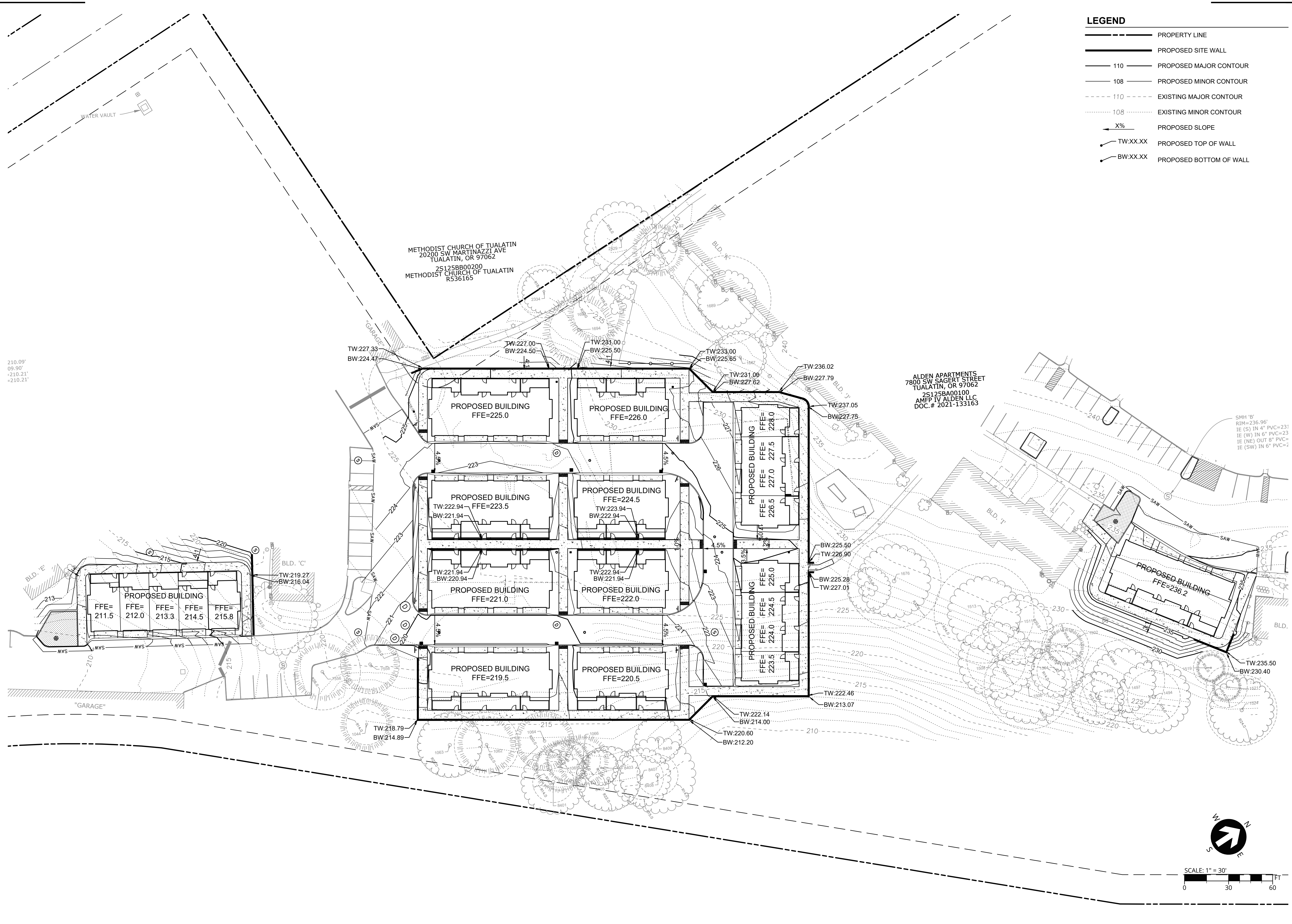
- SANITARY SEWER KEY NOTES**
- 1 PROPOSED SANITARY MANHOLE CONNECTION TO EXISTING SANITARY LINE
  - 2 PROPOSED SANITARY MANHOLE
  - 3 PROPOSED SANITARY CONNECTION TO EXISTING SANITARY LINE
  - 4 PROPOSED SANITARY CONNECTION WITH BUILDING
  - 5 PROPOSED SANITARY CONNECTION TO EXISTING SANITARY MANHOLE
  - 6 PROPOSED SANITARY CLEANOUT
  - 7 PROPOSED RECONNECTION TO EXISTING BUILDING SERVICE

- STORM DRAIN KEY NOTES**
- 1A PROPOSED STORM MANHOLE
  - 1B PROPOSED WATER QUALITY MANHOLE
  - 1C PROPOSED FLOW CONTROL MANHOLE
  - 1D PROPOSED PRETREATMENT MANHOLE
  - 2 PROPOSED CATCH BASIN
  - 3 PROPOSED AREA DRAIN
  - 4 PROPOSED STORM CLEANOUT
  - 5 PROPOSED STORM OUTFALL
  - 6 PROPOSED ROOF DRAIN CONNECTION
  - 7 PROPOSED INFILTRATION PLANTER
  - 8 PROPOSED BEEHIVE INLET
  - 9 PROPOSED DETENTION CHAMBERS
  - 10 PROPOSED STORM CONNECTION TO EXISTING STORM LINE



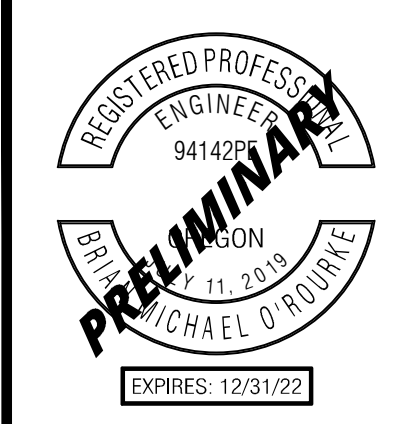
P:\22791-ALDEN APARTMENTS\CAD\SHEETS\DDIC400 - UTILITY PLAN.DWG

P:\22791-ALDEN APARTMENTS\CAD\SHEETS\DD\C500 - GRADING PLAN.DWG



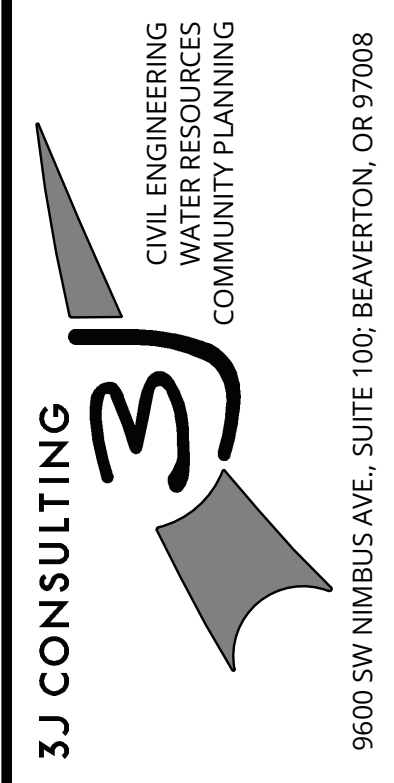
**LEGEND**

---	PROPERTY LINE
---	PROPOSED SITE WALL
---	110 PROPOSED MAJOR CONTOUR
---	108 PROPOSED MINOR CONTOUR
---	110 EXISTING MAJOR CONTOUR
---	108 EXISTING MINOR CONTOUR
X%	PROPOSED SLOPE
TW:XX.XX	PROPOSED TOP OF WALL
BW:XX.XX	PROPOSED BOTTOM OF WALL



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REVISIONS

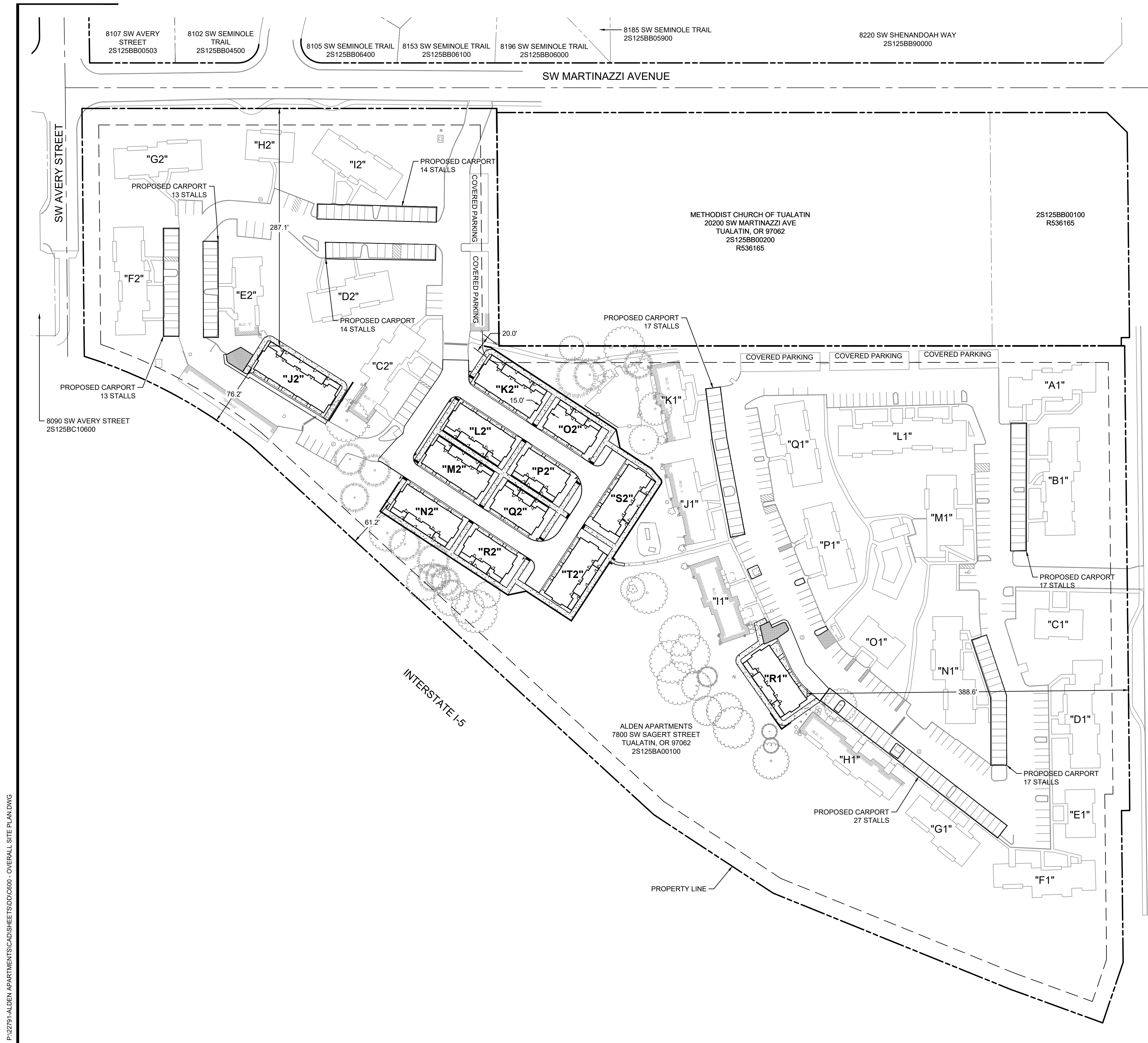
**GRADING PLAN**  
**ALDEN APARTMENTS**  
7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062



PROJECT INFORMATION  
3J PROJECT # | 22791  
TAX LOT(S) | 2S125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | KMK  
CHECKED BY | BMO

SHEET NUMBER  
**C500**



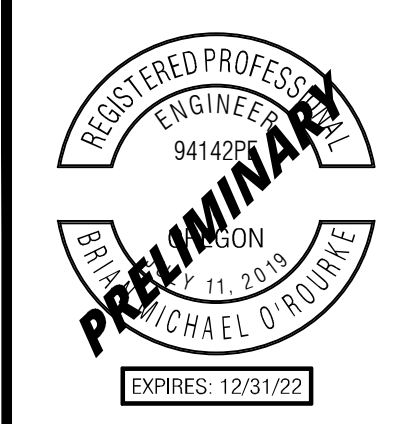


**SITE INFORMATION**

<b>SITE ADDRESS</b> 7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE TUALATIN, OREGON 97062	<b>TAX LOT</b> 2S125BA00100
<b>JURISDICTION</b> CITY OF TUALATIN	<b>FLOOD HAZARD</b> MAP NUMBERS: 41067C0607E ZONE X (UNSHADED)
<b>ZONING</b> EXISTING = RMH PROPOSED = RMH	<b>GROSS SITE AREA</b> 16.74 ACRES

**BUILDING STANDARDS**  
TUALATIN MUNICIPAL CODE (TMC) CHAPTER 42

	REQUIRED	PROPOSED
FRONT SETBACK	35'	281'
SIDE AND REAR SETBACK	20'	20'
MINIMUM DISTANCE BETWEEN BUILDINGS	10'	15'

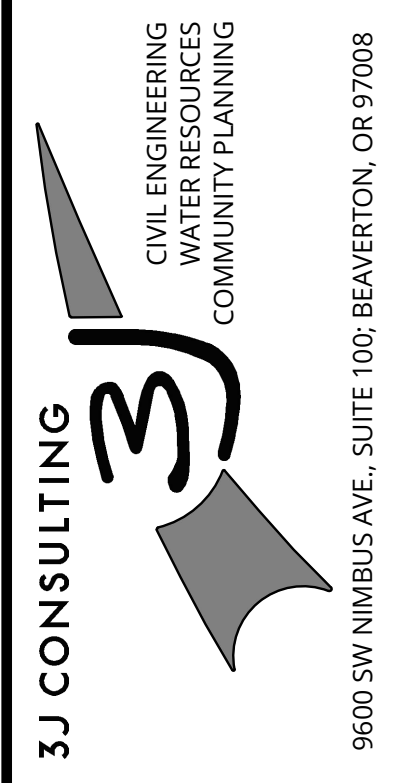


PUBLISH DATE  
09/01/2022

ISSUED FOR  
LAND USE

REVISIONS

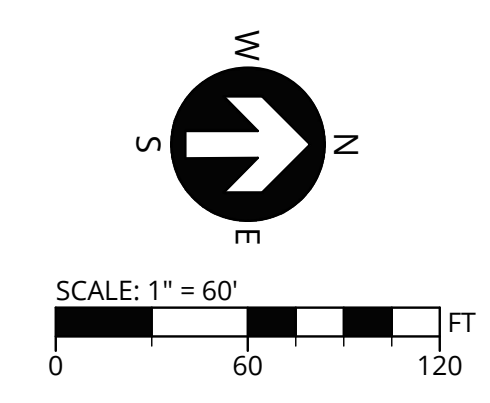
**OVERALL SITE PLAN**  
**ALDEN APARTMENTS**  
 7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
 TUALATIN, OR 97062



**PROJECT INFORMATION**

3J PROJECT # | 22791  
 TAX LOT(S) | 2S125BA00100  
 LAND USE # | 22-0004  
 DESIGNED BY | KMK  
 CHECKED BY | BMO

SHEET NUMBER  
**C600**



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**TYPICAL PAVEMENT SECTION**

PAVEMENT SECTIONS REFERENCED FROM PROJECT GEOTECHNICAL REPORT

	ASPHALT THICKNESS (IN)	CRUSHED ROCK BASE THICKNESS (IN)
MINIMUM DRY-WEATHER PAVEMENT SECTION: PRIVATE (20 YEARS)	3	12

**LEGEND**

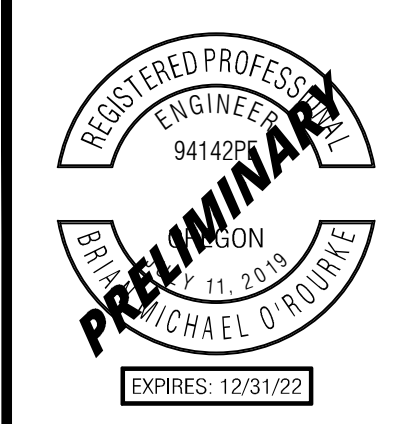
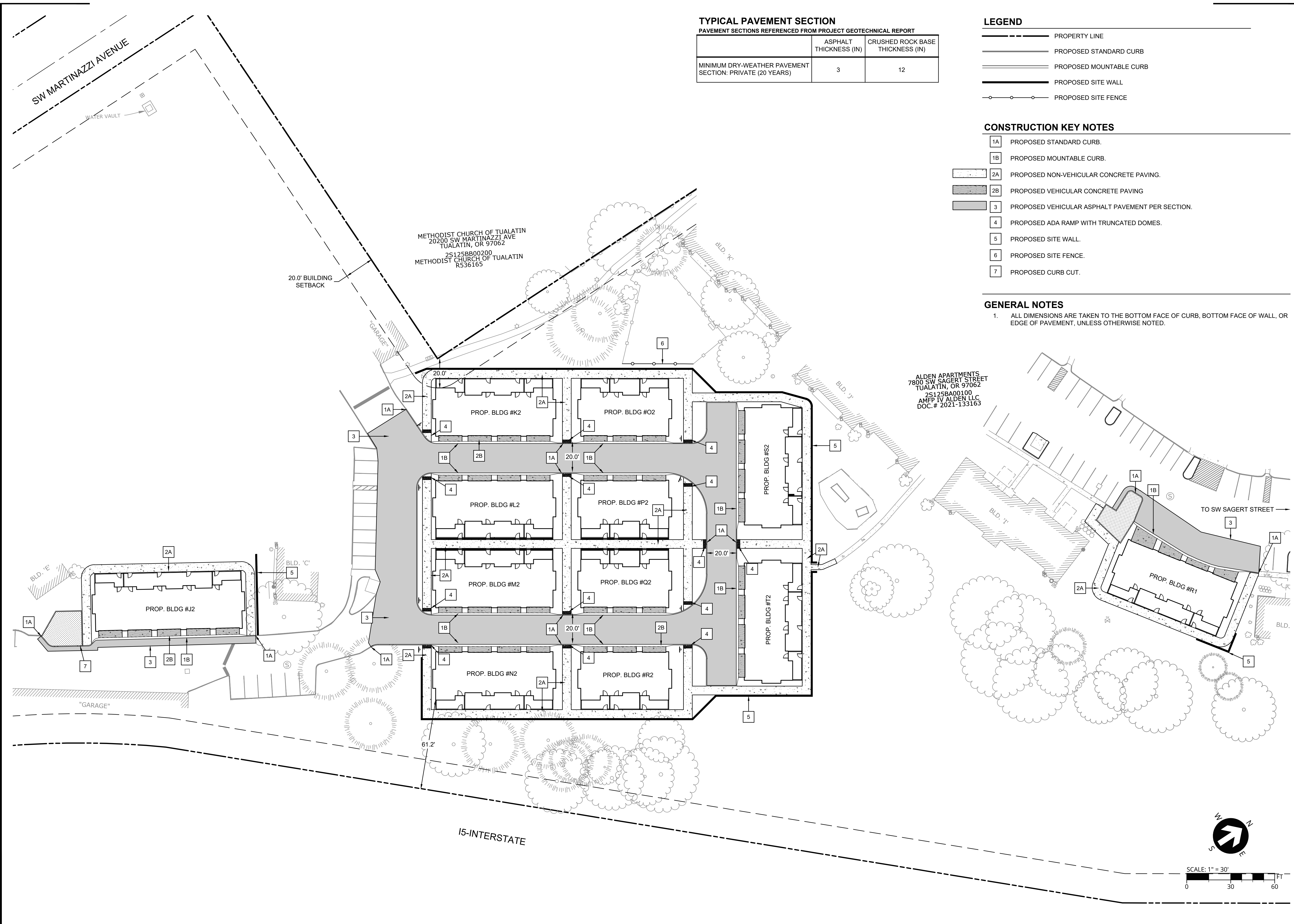
- PROPERTY LINE
- PROPOSED STANDARD CURB
- PROPOSED MOUNTABLE CURB
- PROPOSED SITE WALL
- PROPOSED SITE FENCE

**CONSTRUCTION KEY NOTES**

- 1A PROPOSED STANDARD CURB.
- 1B PROPOSED MOUNTABLE CURB.
- 2A PROPOSED NON-VEHICULAR CONCRETE PAVING.
- 2B PROPOSED VEHICULAR CONCRETE PAVING
- 3 PROPOSED VEHICULAR ASPHALT PAVEMENT PER SECTION.
- 4 PROPOSED ADA RAMP WITH TRUNCATED DOMES.
- 5 PROPOSED SITE WALL.
- 6 PROPOSED SITE FENCE.
- 7 PROPOSED CURB CUT.

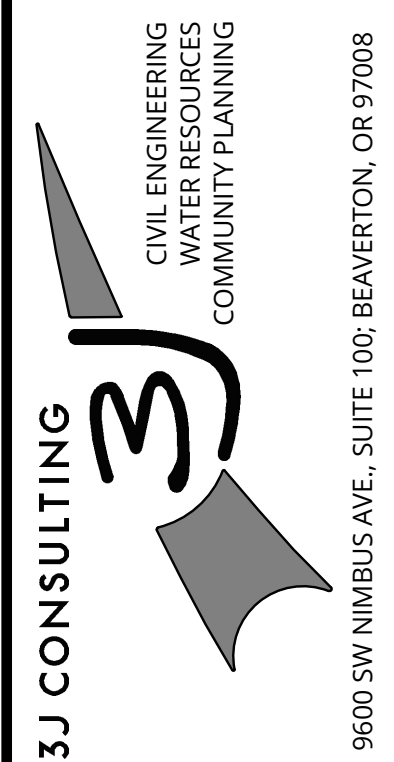
**GENERAL NOTES**

1. ALL DIMENSIONS ARE TAKEN TO THE BOTTOM FACE OF CURB, BOTTOM FACE OF WALL, OR EDGE OF PAVEMENT, UNLESS OTHERWISE NOTED.



PUBLISH DATE  
09/01/2022  
ISSUED FOR  
LAND USE  
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**SITE PLAN**  
**ALDEN APARTMENTS**  
 7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
 TUALATIN, OR 97062



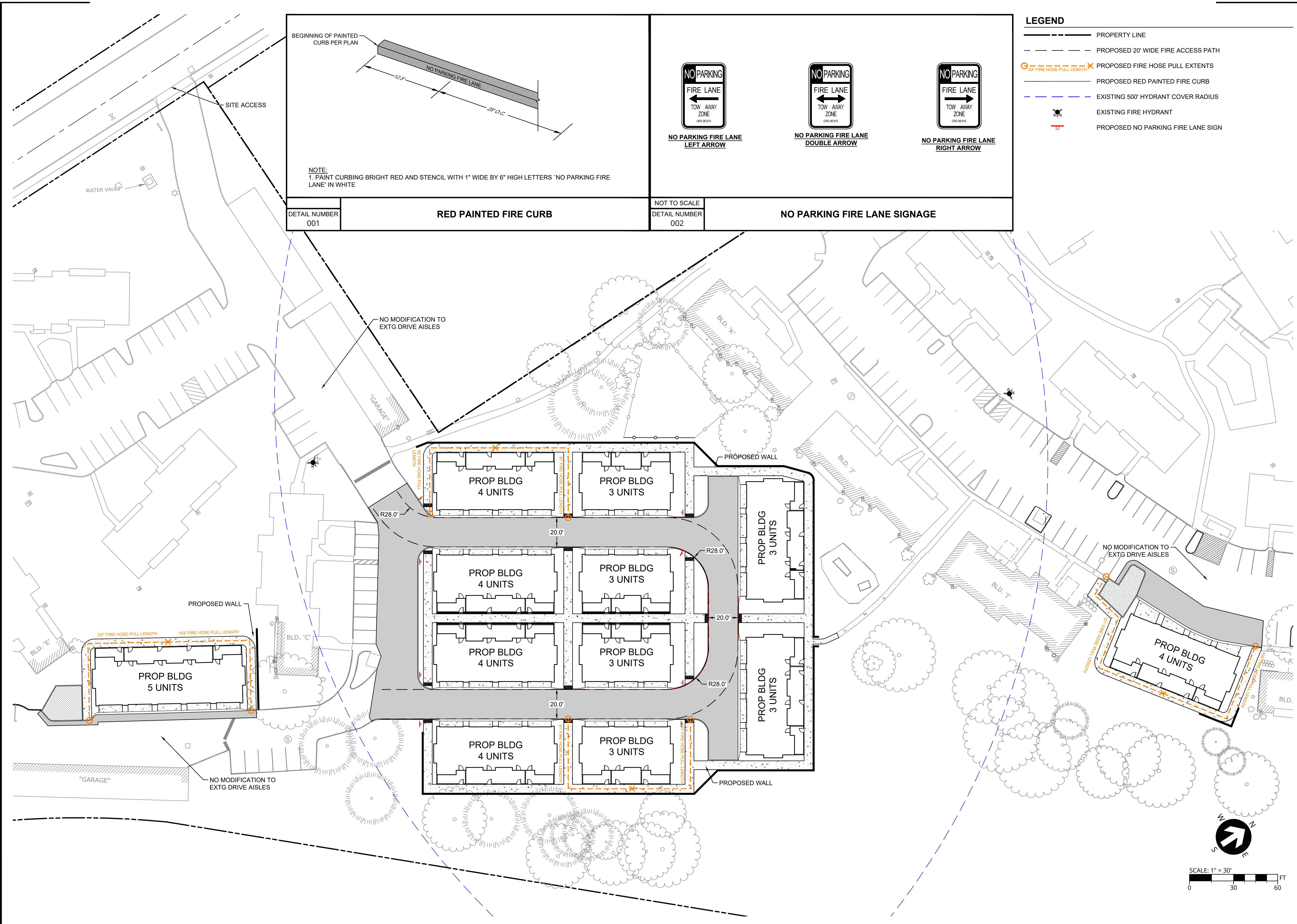
PROJECT INFORMATION  
 3J PROJECT # | 22791  
 TAX LOT(S) | 2S125BA00100  
 LAND USE # | 22-0004  
 DESIGNED BY | KMK  
 CHECKED BY | BMO

SHEET NUMBER  
**C601**

P:\22791-ALDEN APARTMENTS\CAD\SHETS\DD\C601 - SITE PLAN.DWG



P:\22791-ALDEN APARTMENTS\CAD\SHEETS\DDC700 - FIRE ACCESS PLAN.DWG

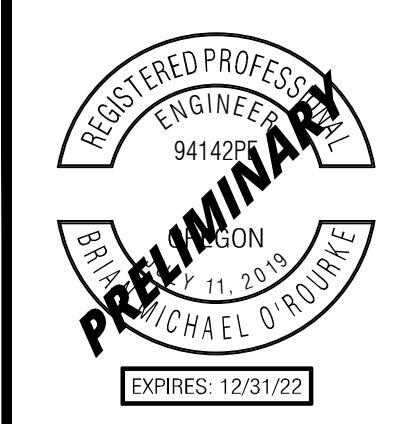


LEGEND

- PROPERTY LINE
- PROPOSED 20' WIDE FIRE ACCESS PATH
- PROPOSED FIRE HOSE PULL EXTENTS
- PROPOSED RED PAINTED FIRE CURB
- EXISTING 500' HYDRANT COVER RADIUS
- EXISTING FIRE HYDRANT
- PROPOSED NO PARKING FIRE LANE SIGN

NOTE:  
1. PAINT CURBING BRIGHT RED AND STENCIL WITH 1" WIDE BY 6" HIGH LETTERS 'NO PARKING FIRE LANE' IN WHITE

DETAIL NUMBER 001	RED PAINTED FIRE CURB	NOT TO SCALE	DETAIL NUMBER 002	NO PARKING FIRE LANE SIGNAGE
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PUBLISH DATE  
09/01/2022

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**FIRE ACCESS PLAN**

**ALDEN APARTMENTS**

7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062

**3J CONSULTING**

CIVIL ENGINEERING  
WATER RESOURCES  
COMMUNITY PLANNING

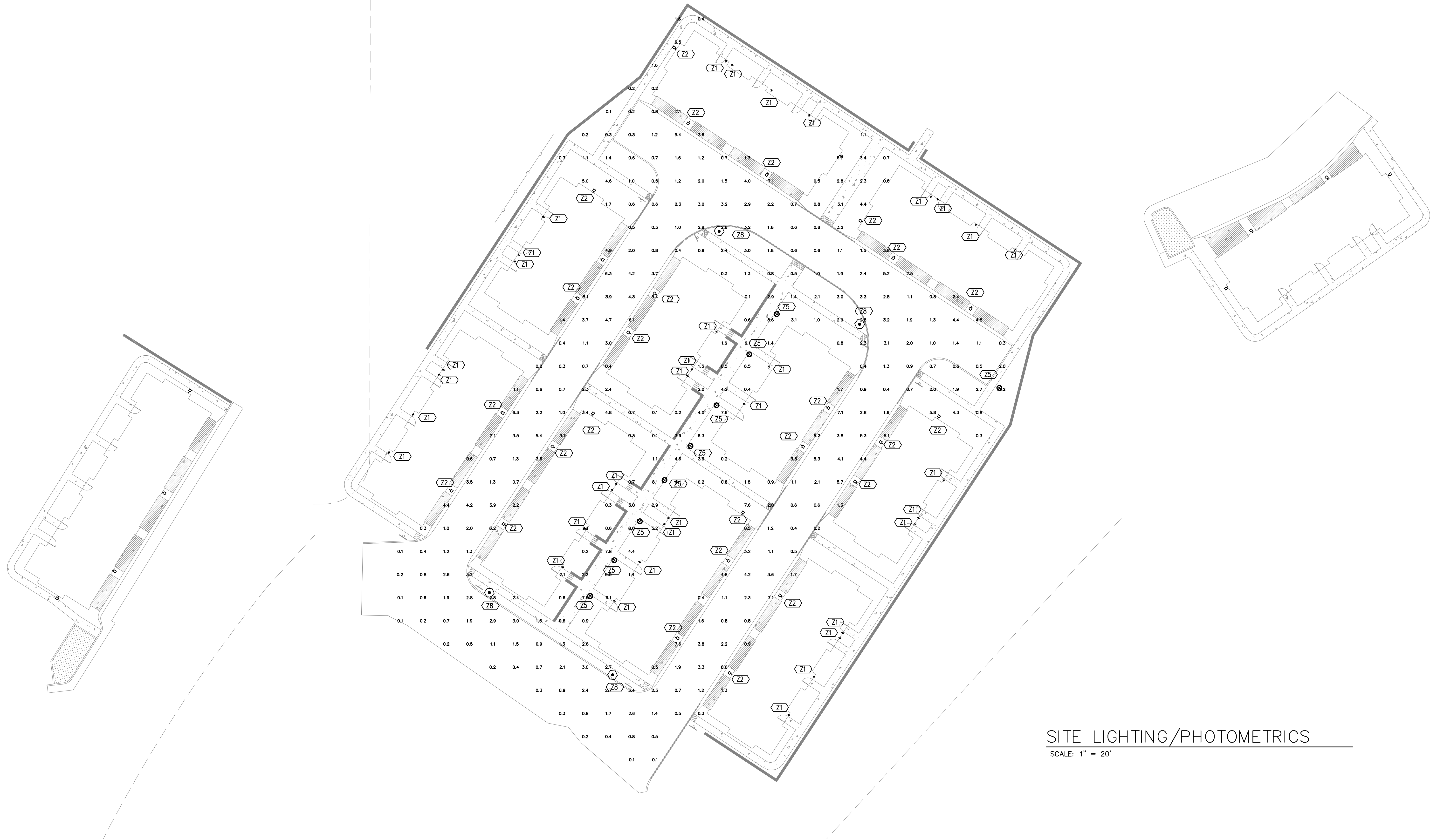
9600 SW NIMBUS AVE., SUITE 100, BEAVERTON, OR 97008

PROJECT INFORMATION

3J PROJECT # | 22791  
TAX LOT(S) | 2S125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | KMK  
CHECKED BY | BMO

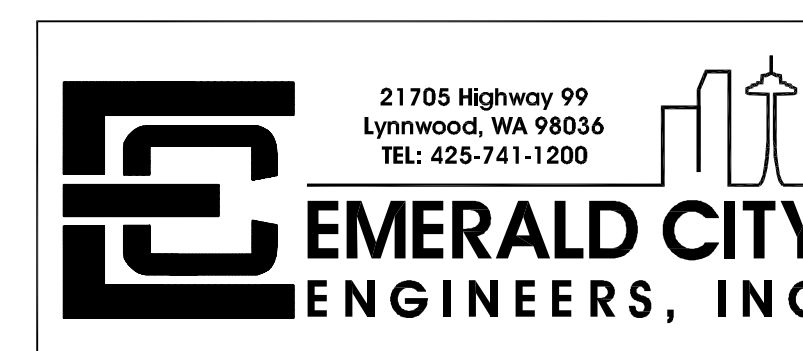
SHEET NUMBER  
**FS-1**



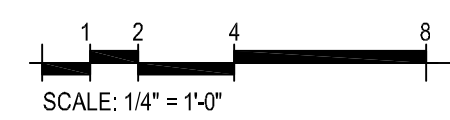


SITE LIGHTING/PHOTOMETRICS  
 SCALE: 1" = 20'

**ALDEN APARTMENTS - TUALATIN, OREGON**  
 COLRICH COMMUNITIES



21705 Highway 99  
 Lynnwood, WA 98036  
 TEL: 425-741-1200

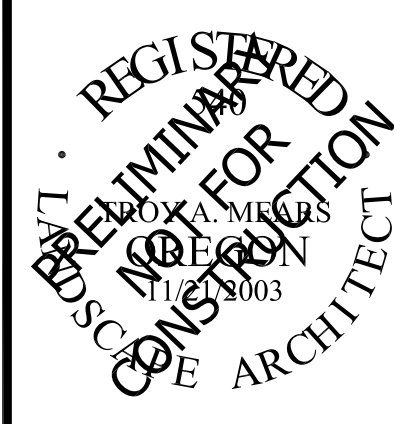


JOB NO. **0727-013**  
 DATE **12/08/17**

**E01**







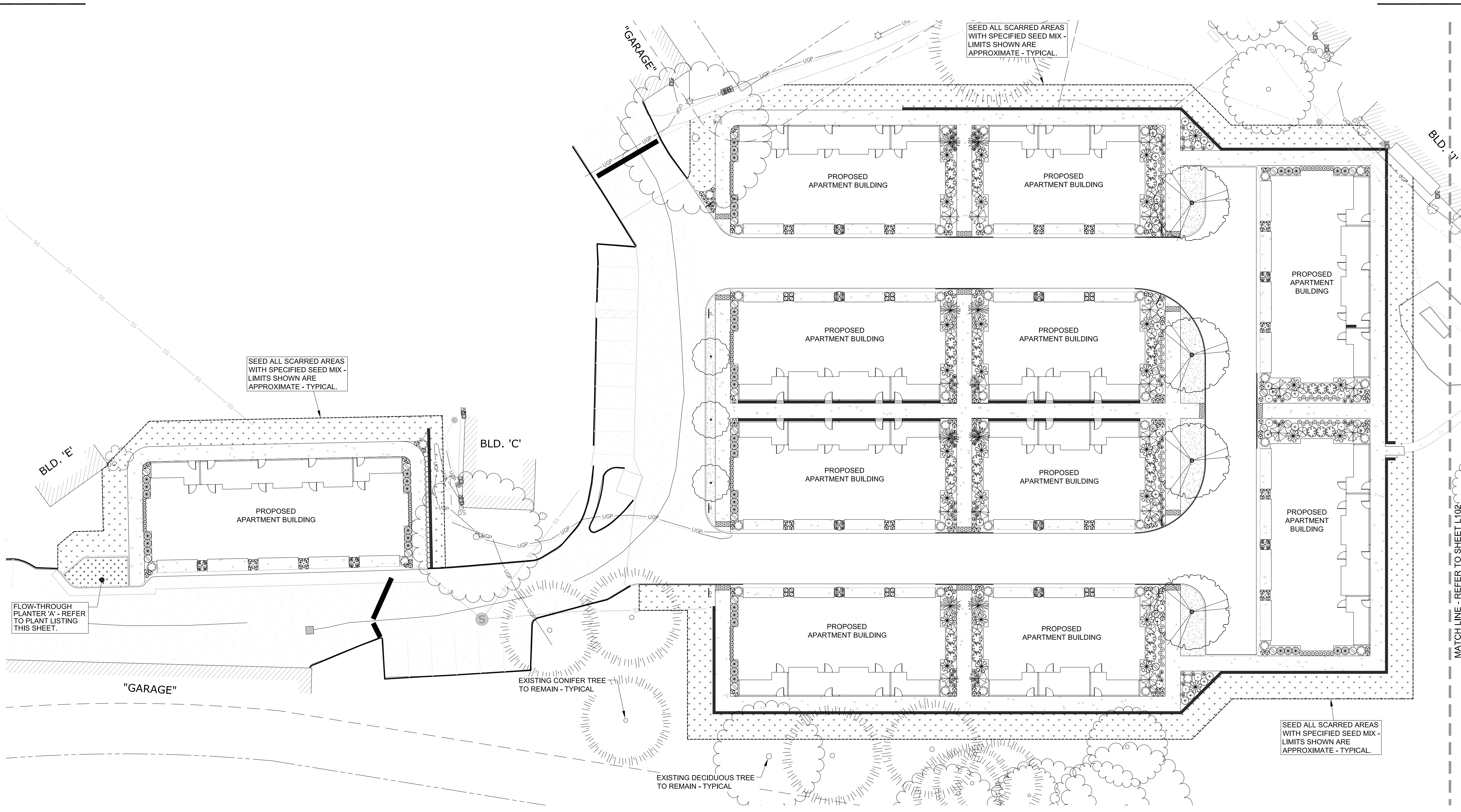
PUBLISH DATE  
09/01/2022  
ISSUED FOR  
LAND USE  
REVISIONS  
10/10/2022

**PLANTING PLAN**  
**ALDEN APARTMENTS**  
7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062



PROJECT INFORMATION  
MDG PROJECT # | 2223  
TAX LOT(S) | 2S125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | TAM  
CHECKED BY | TAM

SHEET NUMBER  
**L101**



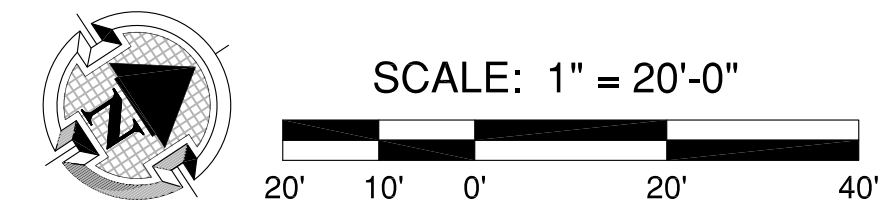
**PLANT LISTING FOR FLOW-THROUGH PLANTER**

FLOW-THROUGH PLANTER 'A'	Minimum Species Quantity	Plant Category	Zone	Minimum Plant Height	Condition (size)	Wetland Indicator Status	Spacing Format
TREATMENT AREA 253 sq. ft.							
Scientific Name Common Name							
Carex obnupta Slough Sedge	97	Herb	Moist	6"	1/2 Gal.	OBL	1 / sq.ft.
Carex deweyana Dewey's Sedge	97	Herb	Dry	6"	1/2 Gal.	FAC	1 / sq.ft.
Juncus patens Spreading Rush	97	Herb	Moist	6"	1/2 Gal.	FACW	1 / sq.ft.
HERBACEOUS PLANT TOTAL:	291						

**APPROXIMATE LANDSCAPE AREA**

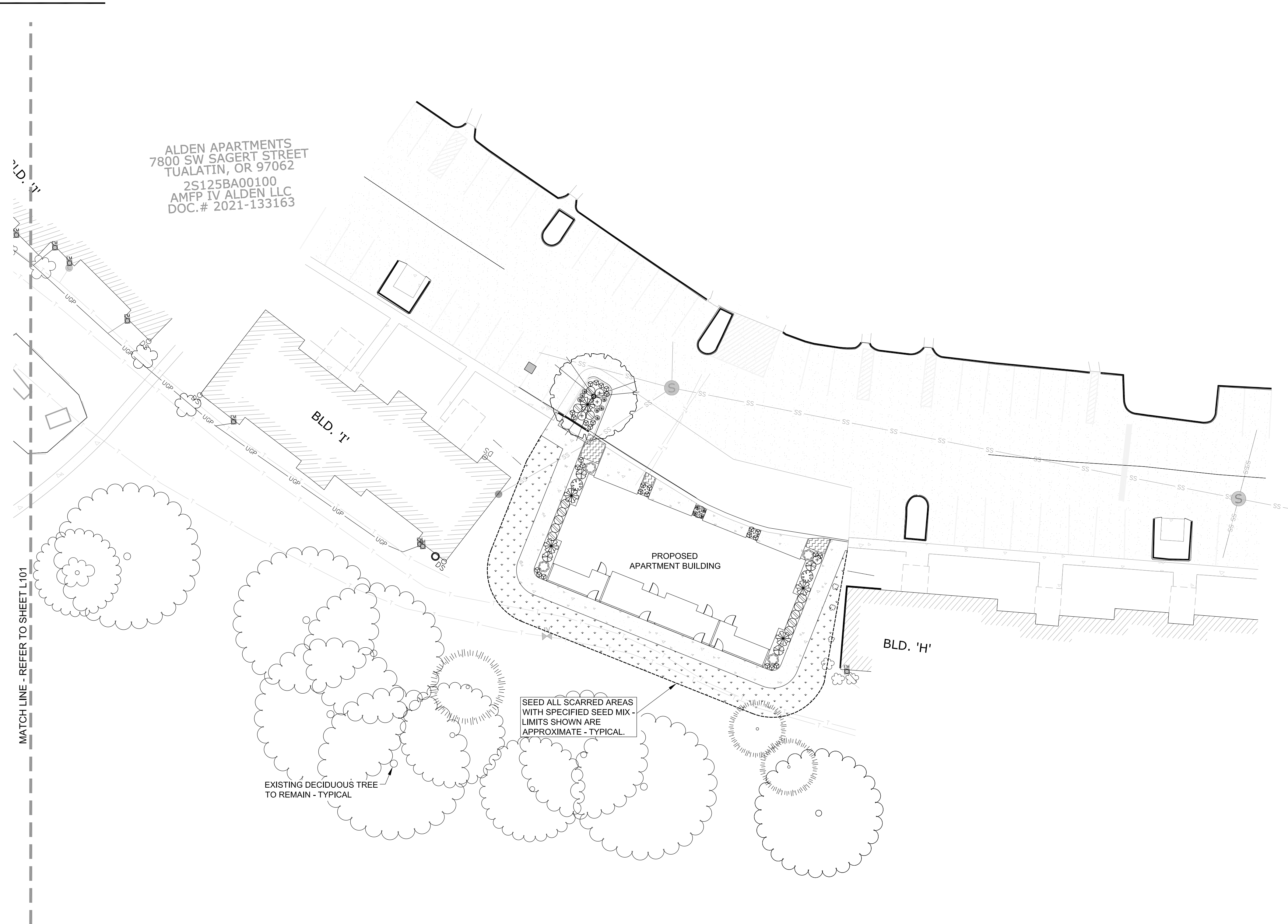
PLANTING BED AREA:	7,056 SF
LAWN AREA:	1,405 SF
LAWN AREA (RESTORATION):	12,280 SF
WATER QUALITY PLANTER:	253 SF
TOTAL LANDSCAPE AREA:	20,994 SF

REFER TO SHEET L102 FOR PLANTING MATERIAL LISTING  
REFER TO SHEET L103 FOR PLANTING DETAILS AND NOTES



F:\MDG-1\FILE SYNC\DWGS\2022\3\JALDEN APTS\ALDENAPTS\_LA1.DWG

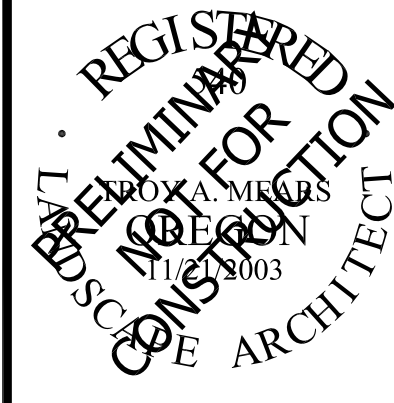




PLANT MATERIAL LISTING:					
TREES		Quantity	Planted Size	Condition	Mature size
SYMBOL	Botanical name Common Name				
	Acer platanoides 'Crimson King' Crimson King Maple	5	1.5" Cal.	B&B	30-40' tall, 20-40' wide
	Pinus flexilis 'Vanderwolf's Pyramid' Vanderwolf's Pyramid Limber Pine	20	6-7'	B&B	20-30' tall, 10-15' wide
	Carpinus betulus 'Frans Fontaine' Frans Fontaine Hornbeam	3	1.5" Cal.	B&B	40' tall, 15' wide
	Picea pungens 'Baby Blue Eyes' Baby Blue Eyes Spruce	8	6-7'	B&B	12-15' tall, 6-7' wide
Total Trees		36			

PLANT MATERIAL LISTING:					
SHRUBS & GRASSES		Quantity	Planted Size	Condition	Mature size
SYMBOL	Botanical name Common Name				
	Azalea x 'Hino-Crimson' Hino-Crimson Azalea	46	1 Gal	Can	2-4' tall, 3-5' wide
	Berberis thunbergii 'Crimson Pygmy' Crimson Pygmy Barberry	41	1 Gal	Can	2' tall, 3' wide
	Berberis thunbergii 'Gold Pillar' Gold Pillar Barberry	23	1 Gal	Can	3-4' tall, 2' wide
	Chamaecyparis obtusa 'Confucius' Confucius Hinoki Cypress	12	5 Gal	Can	4-6' tall 3-4' wide
	Choisya ternata 'Sundance' Sundance Mexican Orange	35	5 Gal	Can	5-6' tall & wide
	Euonymus japonicus 'Silver King' Silver King Euonymus	46	5 Gal	Can	6' tall, 3' wide
	Hakonechloa macro 'All Gold' All Gold Japanese Forest Grass	162	1 gal	Can	18" tall & wide
	Hemerocallis 'Stella d'oro' Stella d'oro Daylily	24	1 gal	Can	1' tall & wide
	Hydrangea paniculata 'Littlelime' Littlelime Hydrangea	4	2 Gal	Can	3-5' tall & wide
	Imperata cylindrica 'Rubra' Japanese Blood Grass	150	1 Gal	Can	1' tall 18" wide
	Nandina domestica 'Gulf Stream' Gulf Stream Heavenly Bamboo	51	2 Gal	Can	3' tall & wide
	Rhododendron 'P.J.M. Elite' P.J.M. Elite Rhododendron	14	18-24"	B&B	4-5' tall 3-5' wide
	Rudbeckia 'Little Goldstar' Little Goldstar Daisy	215	1 Gal	Can	18" tall & wide
	Viburnum tinus 'Spring Bouquet' Spring Bouquet Viburnum	44	5 Gal	Can	4-6' tall & wide
	Weigela florida 'Bokraspiwi' Spilled Wine Weigela	35	1 Gal	Can	1-2' tall 2-3' wide
Total Shrubs		902			

SYM	GROUND COVER	QTY.	SIZE	CONDITION	REMARKS
	Vinca minor 'Bowles' Bowles Common Periwinkle	45	4"	Pots	18" O.C.
	Lawn (Hydro-seed)				1,405 SF
	Lawn RESTORATION (Hydro-seed)				12,280 SF (approximate)



PUBLISH DATE  
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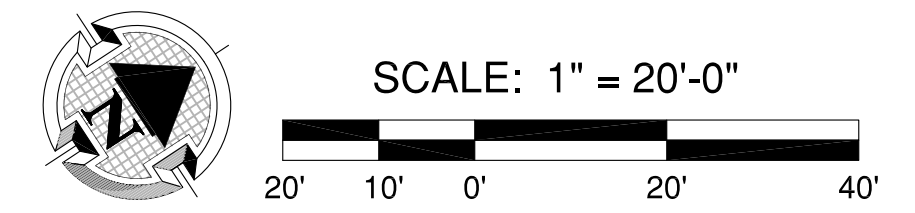
PLANTING PLAN  
**ALDEN APARTMENTS**  
7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062

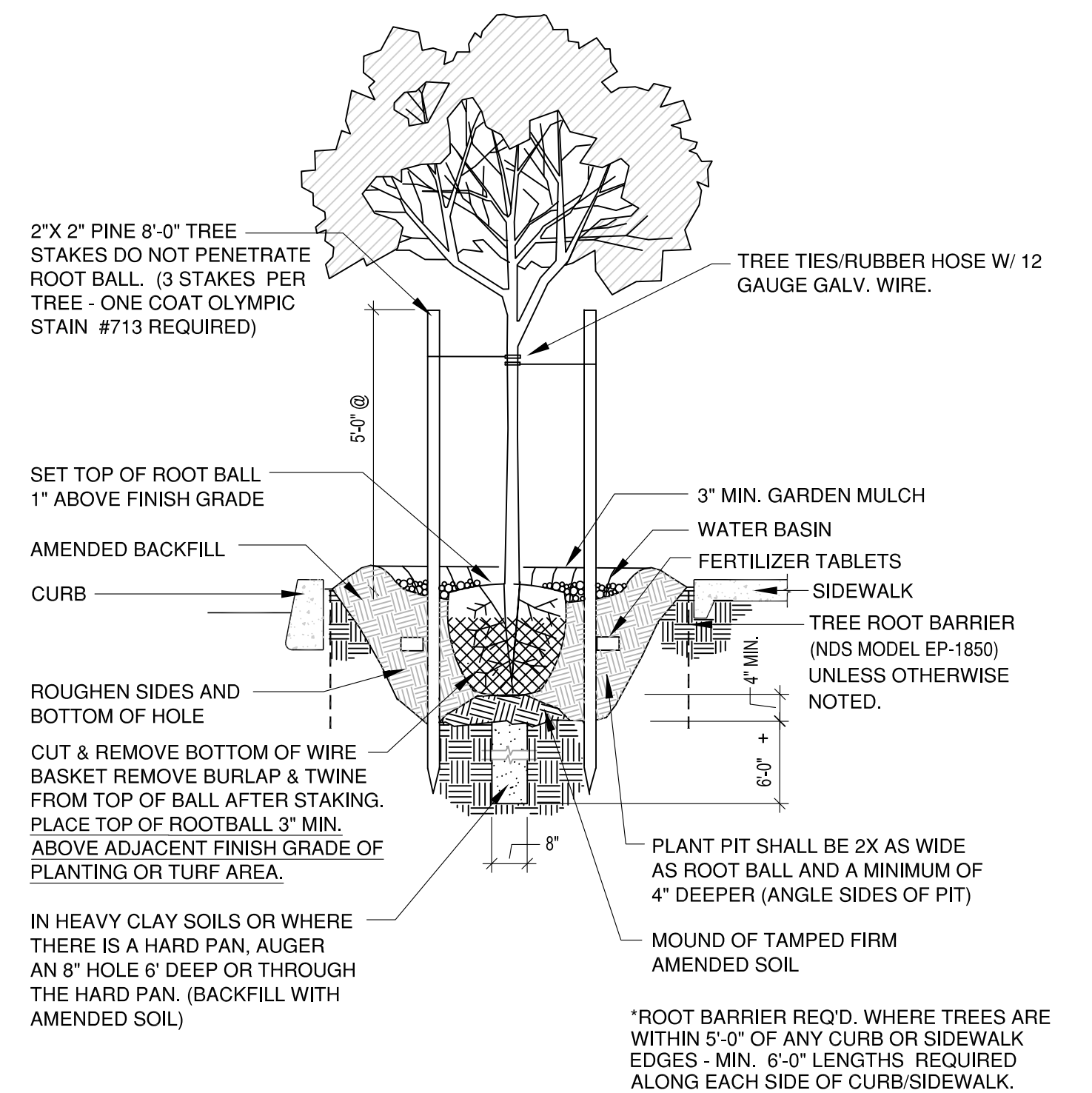


PROJECT INFORMATION  
MDG PROJECT # | 2223  
TAX LOT(S) | 2S125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | TAM  
CHECKED BY | TAM

SHEET NUMBER  
**L102**

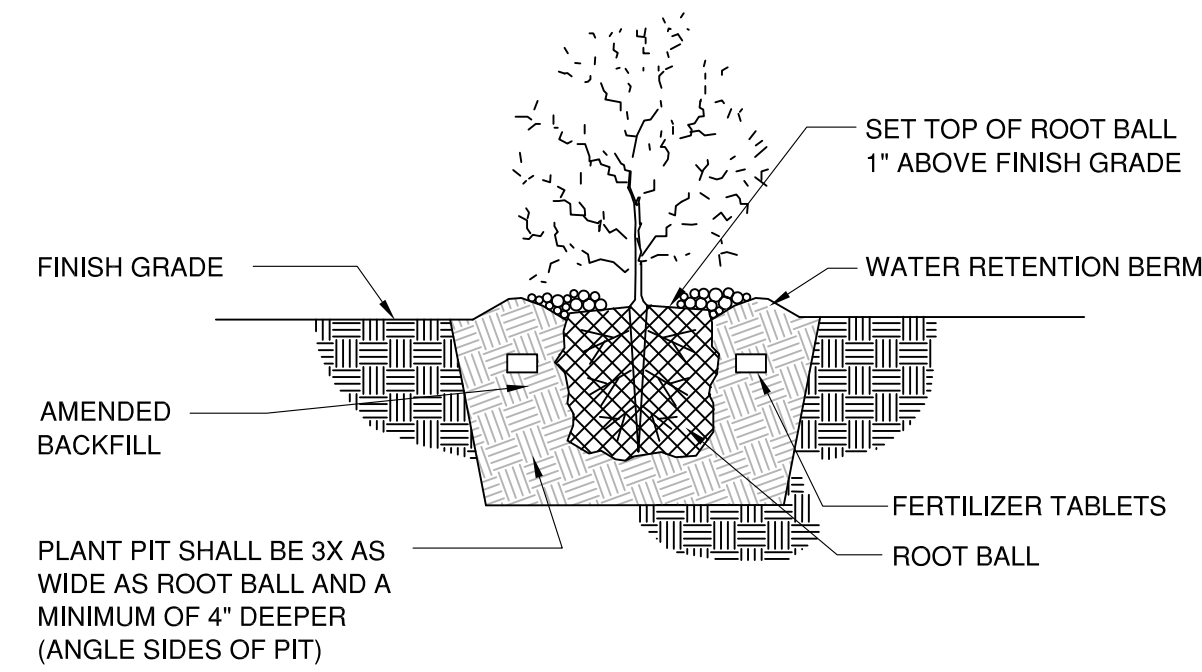
REFER TO SHEET L103 FOR PLANTING DETAILS AND NOTES





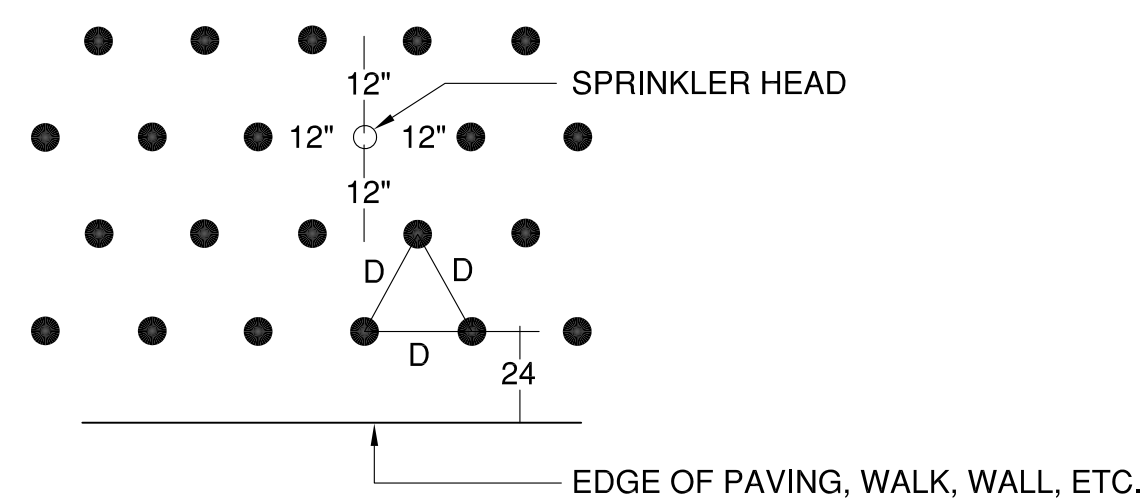
**TREE PLANTING DETAIL**

N.T.S.

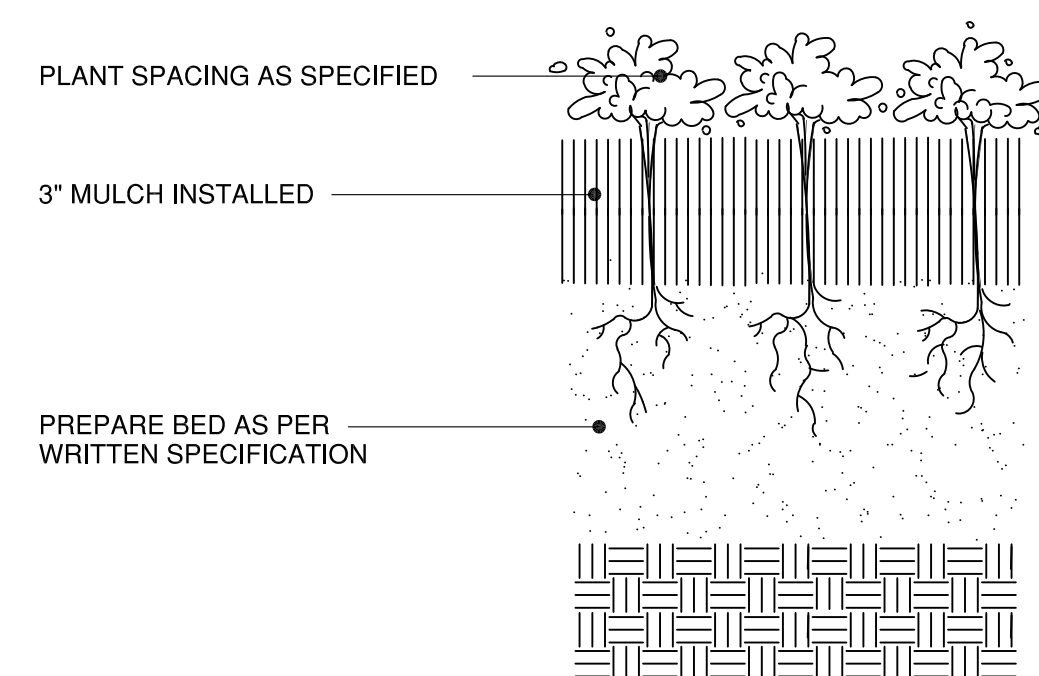


**SHRUB PLANTING DETAIL**

N.T.S.



NOTE:  
LOCATE PLANTS SPACED EQUAL DISTANCE (D)  
FROM EACH OTHER AS SPECIFIED AND  
MINIMUM OF 12" FROM SPRINKLER HEAD

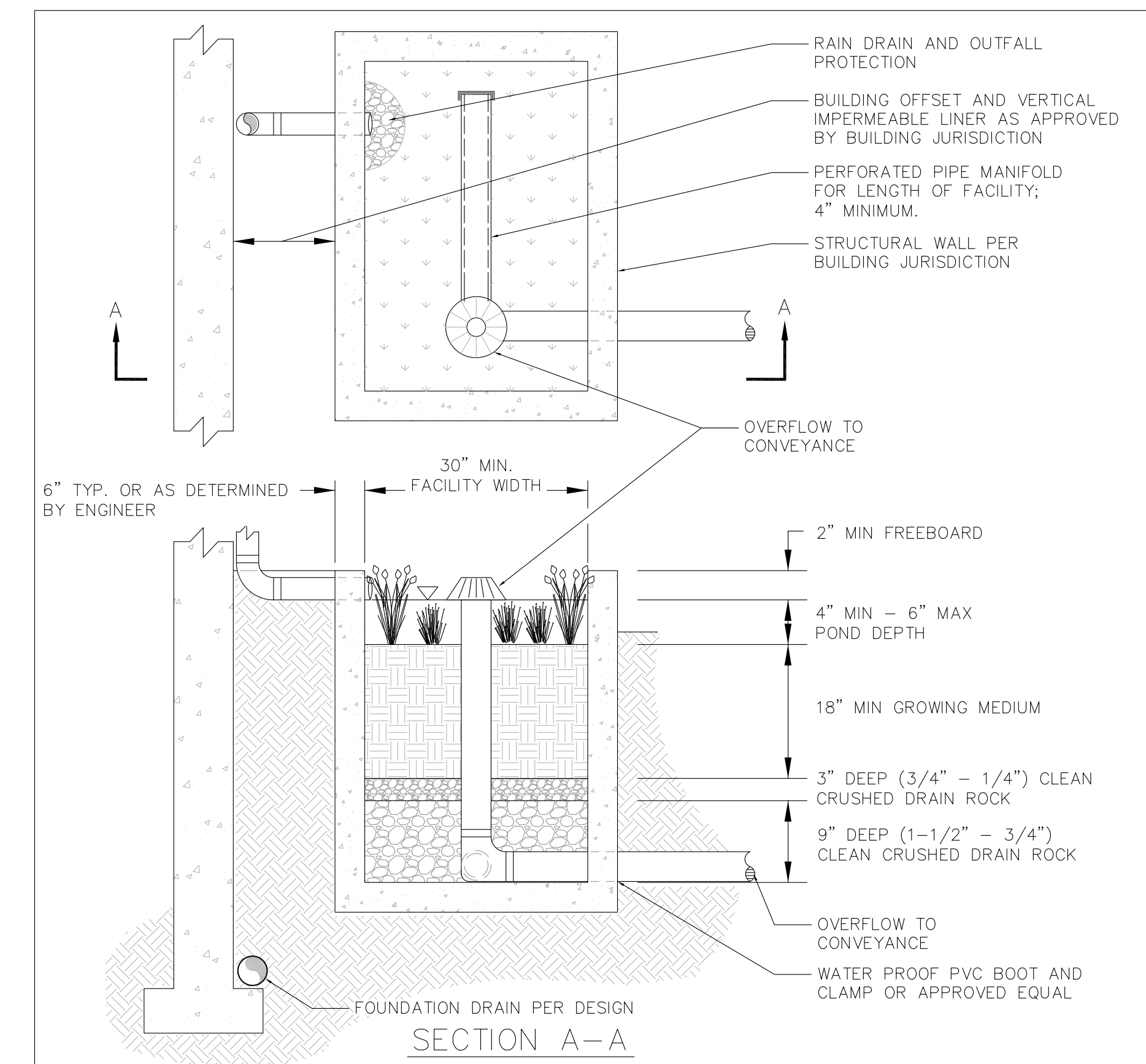


**GROUNDCOVER PLANTING DETAIL**

N.T.S.

**TYPICAL PLANTING NOTES:**

- B&B stock may be substituted with container stock of equal grade.
- Container stock may be substituted with B&B stock of equal grade.
- Plant material shall conform with American Standard for Nursery Stock, ANSI Z60.1, 2004 edition.
- All trees shall be branched.
- Refer to project technical specification for topsoil requirement. All planting beds shall have a minimum of 18 inches topsoil. Re-use of existing topsoil is recommended, but must meet specifications.
- Garden mulch all planting beds with 3" min. Layer of specified garden mulch.
- In the event of a discrepancy between this material listing and the drawings, the drawings shall govern the plant species and quantities required.
- In the event of question or lack of clarity on drawings, Landscape Contractor is to call Landscape Architect before proceeding.
- Landscape contractor is to notify Landscape Architect prior to installation of plant material to approve final placement.
- Landscape Contractor to verify plant material quantities.
- Contractor will provide a one year warranty on all provided & installed plant material from date of final approval by owner's representative.
- Automatic irrigation to be installed for all new planted areas.



LOT# \_\_\_\_\_  
BOX SIZE (SF.) \_\_\_\_\_  
# OF PLANTS \_\_\_\_\_  
TYPE OF PLANTS \_\_\_\_\_  
SIZE OF PLANTS \_\_\_\_\_

NOTES:

- PRIVATE WATER QUALITY TREATMENT.
- 30" MIN WIDTH - FACILITY LENGTH TO BE CALCULATED BASED ON INCOMING FLOWS.
- VEGETATION: SEE PLANT LIST IN LIDA HANDBOOK.
- I.E. OF RAIN DRAINS MUST MATCH THE ELEVATION OF THE OVERFLOW STRUCTURE.
- RAIN DRAINS AND OVERFLOW TO MAINTAIN MAXIMUM LINEAR SEPARATION.
- OUTFALL PROTECTION SIZED PER FLOW CALCULATIONS.
- BUILDING JURISDICTION APPROVAL REQUIRED WHEN DEPTH OF FACILITY IS BELOW BUILDING FOOTING.

**FLOW THROUGH PLANTER**

DRAWING NO. 730

REVISED 10-31-19



PUBLISH DATE  
09/01/2022  
ISSUED FOR  
LAND USE  
REVISIONS  
10/10/2022

**PLANTING DETAILS & NOTES**  
**ALDEN APARTMENTS**

7800 SW SAGERT STREET & 20400 SW MARTINAZZI AVENUE  
TUALATIN, OR 97062



PROJECT INFORMATION  
MDG PROJECT # | 2223  
TAX LOT(S) | 2S1258A00100  
LAND USE # | 22-0004  
DESIGNED BY | TAM  
CHECKED BY | TAM

SHEET NUMBER  
**L103**



SW MARTINAZZI AVENUE



New multi-family units proposed in existing vacant area

New multi-family units proposed, removing two existing buildings

15  
I 205  
Interchange

New multi-family units proposed in existing vacant area

## PROJECT SUMMARY

Approximate Lot Area: **727,859 sq.ft.** | 16.7 acres

Zoning Designation: **RMH (Medium High Density)**

Maximum Density: **250 units** (at 15 units/acre)  
 Minimum Density: **183 units** (at 11 units/acre)  
 Maximum Coverage: **291,144 sq.ft.** (at 40%)  
 Minimum Open Space Requirements: **450 sq.ft./dwelling unit**  
*breakdown-*  
 Common Space Required: **300 sq.ft./d.u.**  
 Children Play Area Required: **150 sq.ft./d.u.**  
 - does not apply to duplexes/townhomes

*\*the following numbers are estimates\**

### As Built Project Stats:

Number of Units: **211**  
 Number of Buildings: **26**  
 Number of Parking Spaces: **372**  
 Coverage Provided: **85,251 sq.ft. (12%)**  
 Common Space Required: **87,750 sq.ft.**  
 All Open Space (including landscape): **~246,473 sq.ft.**

### Proposal Project Stats:

*\*proposing to demolish two existing buildings*

Number of Units: **240**  
 Number of Buildings: **36**  
 Number of Parking Spaces: **442**  
 Coverage Provided: **90,223 sq.ft. (12%)**

Shared Outdoor Area Required: **108,000 sq.ft.**  
*breakdown-*  
 -Common Space Required: **72,000 sq.ft.**  
 -Children Play Area Required: **36,000 sq.ft.**

Shared Outdoor Area Provided: **122,521 sq.ft.**  
*breakdown-*  
 -Common Space Provided: **83,776 sq.ft.**  
 -Children Play Area Provided: **36,000 sq.ft.**

Approximate Landscaping Area: **245,007 sq.ft. (33%)**

### key

- Landscaping
- Common Space
- Children Play Area
- Bluff

SW SAGERT STREET

**ALDEN APARTMENTS - TUALATIN, OREGON**  
**COLRICH COMMUNITIES**



## SITE PLAN

0 20 40 80  
 NORTH

DATE 09.01.2022  
 JOB NO. 727.013

505 W, Broadway, Ste 1080  
 San Diego, CA 92101  
 858.350.0544

**A1**





**ALDEN APARTMENTS - TUALATIN, OREGON**  
**COLRICH COMMUNITIES**

**SITE AERIAL**

SCALE: N.T.S.

DATE 09.01.2022  
JOB NO. 727.013

505 W, Broadway, Ste 1080  
San Diego, CA 92101  
858.350.0544



**A2**





SITE  
PERSPECTIVE

ALDEN APARTMENTS - TUALATIN, OREGON  
COLRICH COMMUNITIES

SCALE: N.T.S.

DATE 09.01.2022  
JOB NO. 727.013

505 W, Broadway, Ste 1080  
San Diego, CA 92101  
858.350.0544



A3





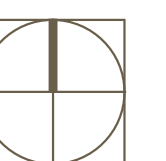
SITE  
PERSPECTIVE

ALDEN APARTMENTS - TUALATIN, OREGON  
COLRICH COMMUNITIES

SCALE: N.T.S.

DATE 09.01.2022  
JOB NO. 727.013

505 W, Broadway, Ste 1080  
San Diego, CA 92101  
858.350.0544



A4





FRONT  
PERSPECTIVE

ALDEN APARTMENTS - TUALATIN, OREGON  
COLRICH COMMUNITIES

SCALE: N.T.S.

DATE 09.01.2022  
JOB NO. 727.013



505 W, Broadway, Ste 1080  
San Diego, CA 92101  
858.350.0544



A5





REAR  
PERSPECTIVE

SCALE: N.T.S.

DATE 09.01.2022  
JOB NO. 727.013

505 W, Broadway, Ste 1080  
San Diego, CA 92101  
858.350.0544



A6

ALDEN APARTMENTS - TUALATIN, OREGON  
COLRICH COMMUNITIES







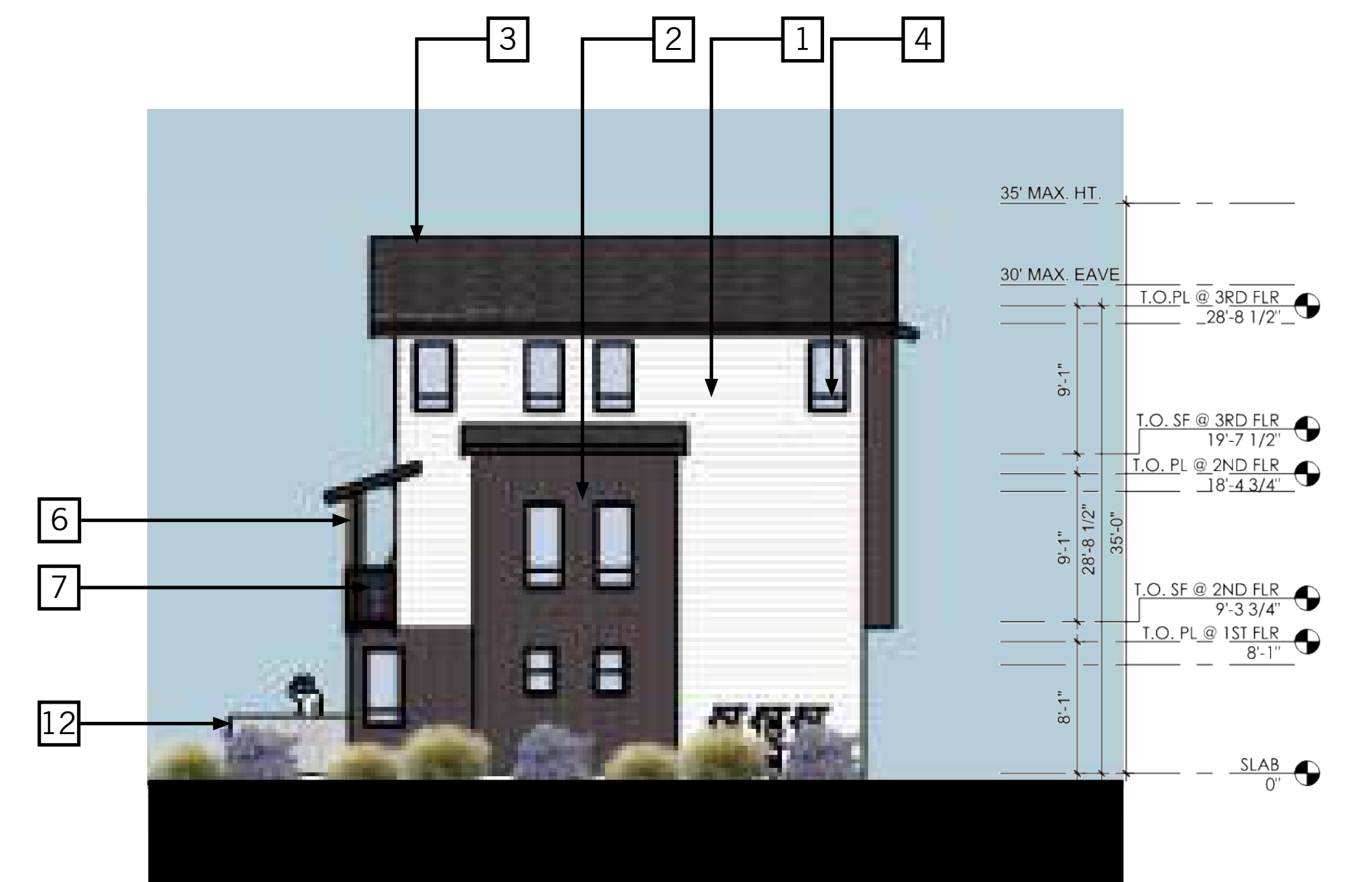
**A** FRONT EXTERIOR ELEVATION



**B** LEFT EXTERIOR ELEVATION



**C** REAR EXTERIOR ELEVATION



**D** RIGHT EXTERIOR ELEVATION

**KEYNOTES:**

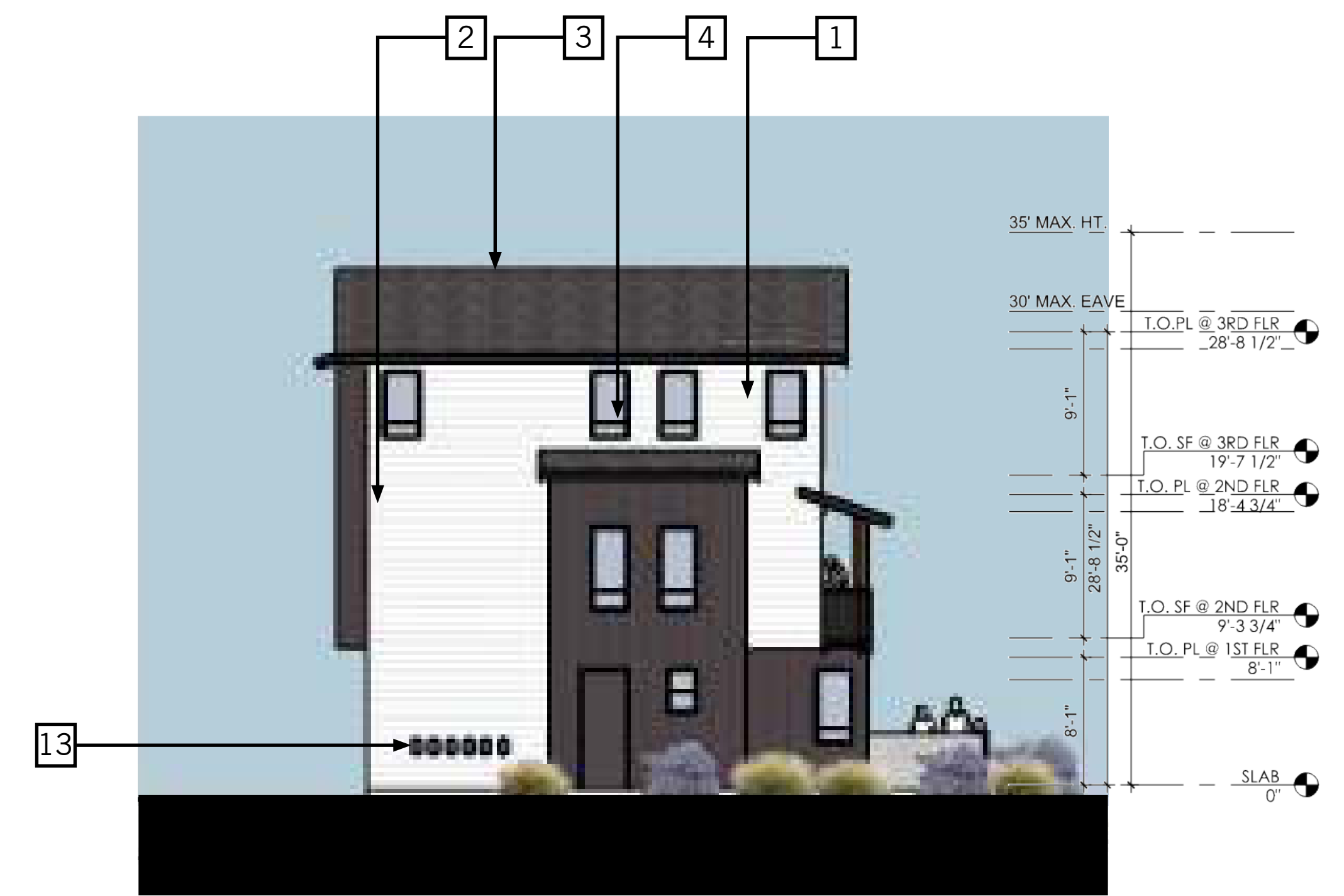
- 1. FIBER CEMENT LAP SIDING – 6” EXPOSURE
- 2. FIBER CEMENT BOARD AND BATTEN SIDING – 16” O.C.
- 3. COMPOSITION ASPHALT SHINGLE ROOFING
- 4. VINYL WINDOW
- 5. ORNAMENTAL WOOD KICKER
- 6. WOOD POST
- 7. METAL DECK RAILING
- 8. METAL ENTRY AWNING
- 9. METAL SECTIONAL GARAGE DOOR
- 10. FIBERGLASS ENTRY DOOR
- 11. DECORATIVE ENTRY LIGHT
- 12. PATIO WALL WITH METAL GATE
- 13. UTILITIES

**BUILDING TYPE A -  
3-PLEX ELEVATIONS**





**A** FRONT EXTERIOR ELEVATION



**B** LEFT EXTERIOR ELEVATION



**C** REAR EXTERIOR ELEVATION



**D** RIGHT EXTERIOR ELEVATION

**KEYNOTES:**

- 1. FIBER CEMENT LAP SIDING – 6” EXPOSURE
- 2. FIBER CEMENT BOARD AND BATTEN SIDING – 16” O.C.
- 3. COMPOSITION ASPHALT SHINGLE ROOFING
- 4. VINYL WINDOW
- 5. ORNAMENTAL WOOD KICKER
- 6. WOOD POST
- 7. METAL DECK RAILING
- 8. METAL ENTRY AWNING
- 9. METAL SECTIONAL GARAGE DOOR
- 10. FIBERGLASS ENTRY DOOR
- 11. DECORATIVE ENTRY LIGHT
- 12. PATIO WALL WITH METAL GATE
- 13. UTILITIES

**BUILDING TYPE B -  
4-PLEX ELEVATIONS**

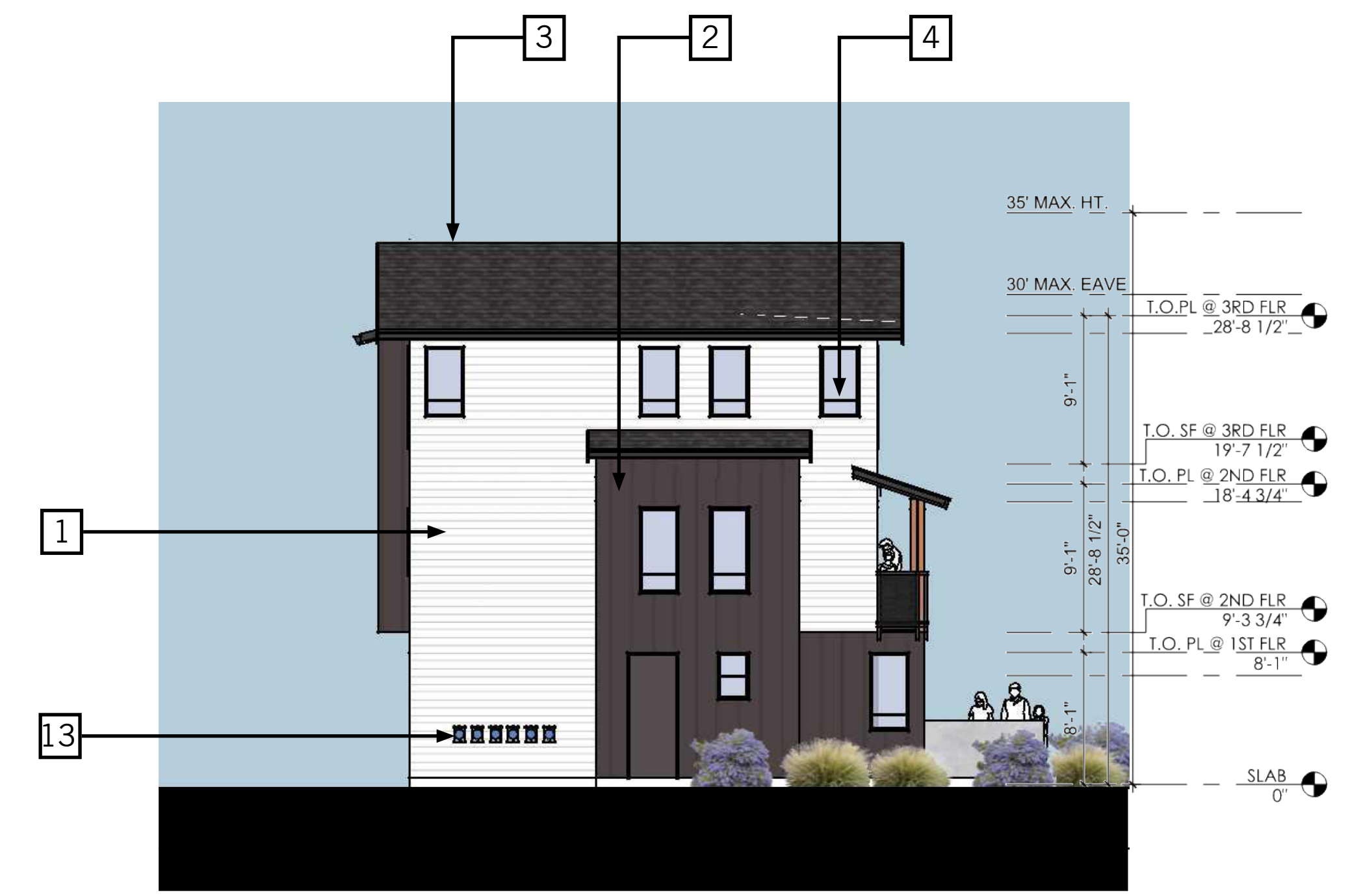


DATE 09.01.2022  
JOB NO. 727.013





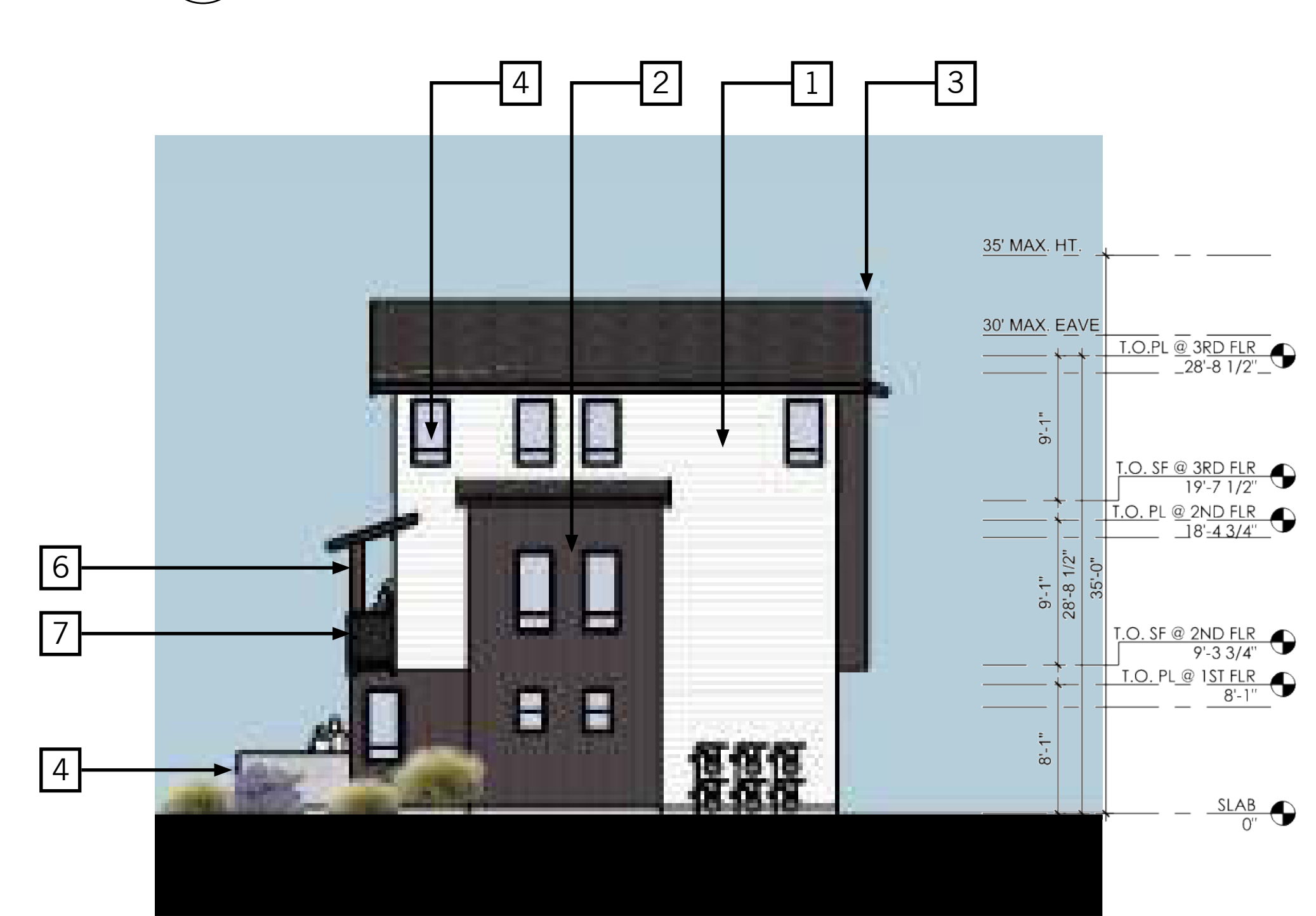
**A** FRONT EXTERIOR ELEVATION



**B** LEFT EXTERIOR ELEVATION



**C** REAR EXTERIOR ELEVATION



**D** RIGHT EXTERIOR ELEVATION

**KEYNOTES:**

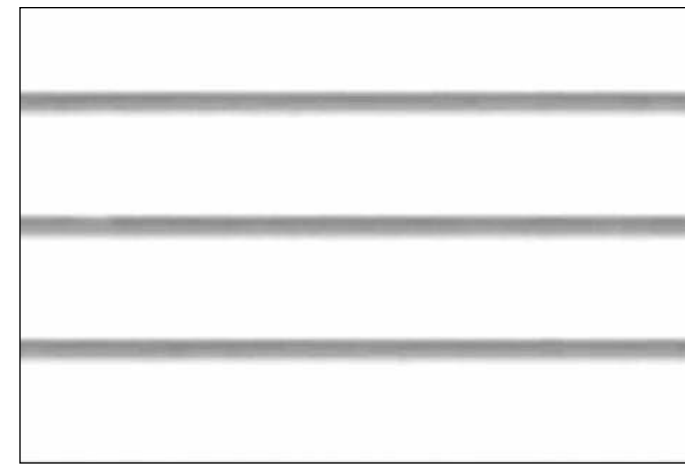
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- 2. FIBER CEMENT BOARD AND BATTEN SIDING – 16” O.C.
- 3. COMPOSITION ASPHALT SHINGLE ROOFING
- 4. VINYL WINDOW
- 5. ORNAMENTAL WOOD KICKER
- 6. WOOD POST

- 7. METAL DECK RAILING
- 8. METAL ENTRY AWNING
- 9. METAL SECTIONAL GARAGE DOOR
- 10. FIBERGLASS ENTRY DOOR
- 11. DECORATIVE ENTRY LIGHT
- 12. PATIO WALL WITH METAL GATE
- 13. UTILITIES

**BUILDING TYPE C -  
5-PLEX ELEVATIONS**



# COLORS + MATERIALS



**1** EXTERIOR SIDING 1  
**SMOOTH FIBER CEMENT SIDING - 6" REVEAL**  
*Extra White SW 7006 by Sherwin Williams*



**2** EXTERIOR SIDING 2  
**SMOOTH FIBER CEMENT SIDING - BOARD AND BATTEN**  
*Iron Ore SW 7069 by Sherwin Williams*



**3** EXTERIOR SIDING 3  
**CEDARMILL FIBER CEMENT SIDING - 6" REVEAL**  
*Mountain Cedar by Woodtone*



**4** ACCENT COLOR 1  
**ENTRY DOOR**  
*Seaworthy SW 7620 by Sherwin Williams*



**5** ROOFING  
**COMPOSITION SHINGLE ROOF**  
*Driftwood by Owens Corning*



## COLORS + MATERIALS

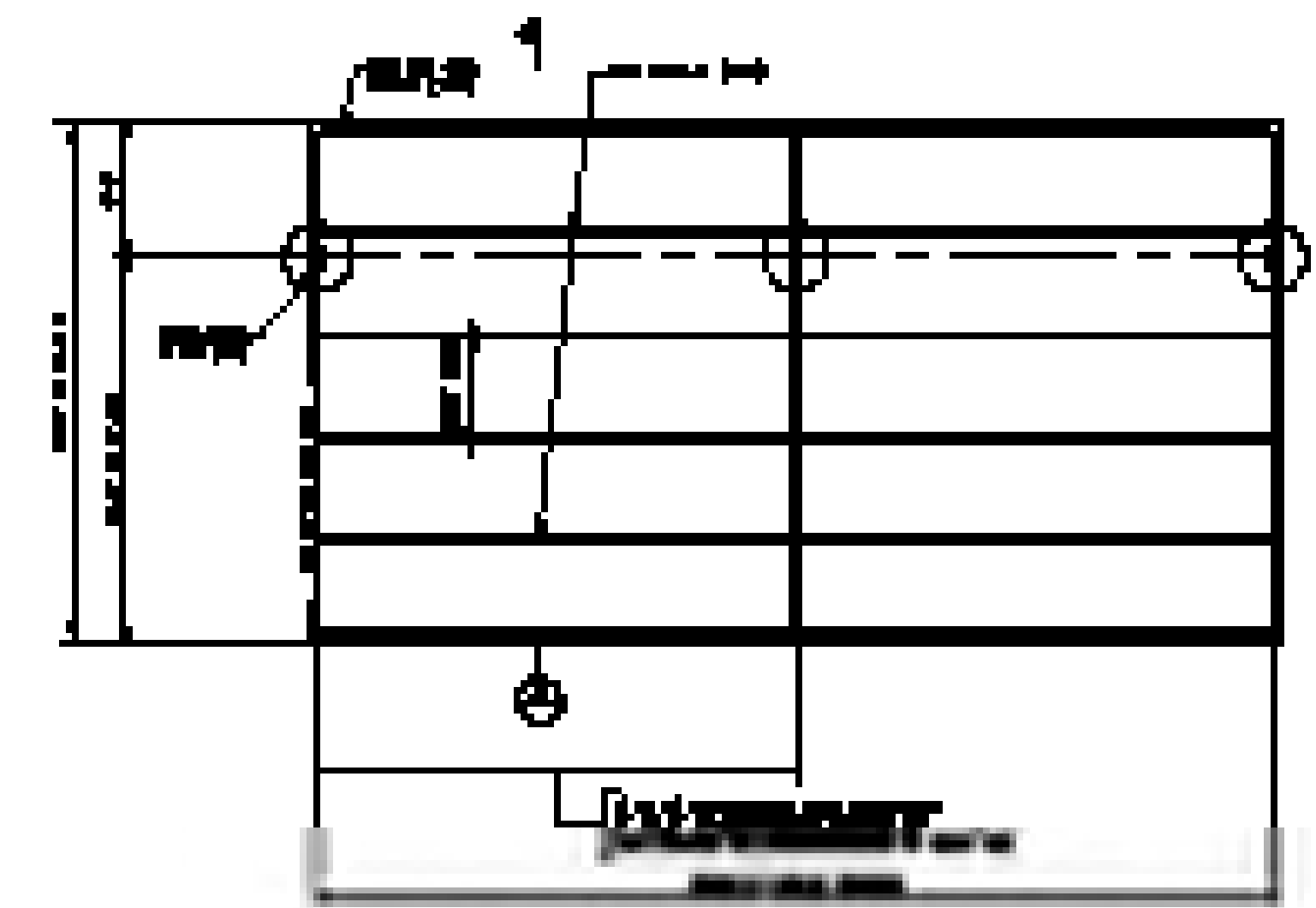




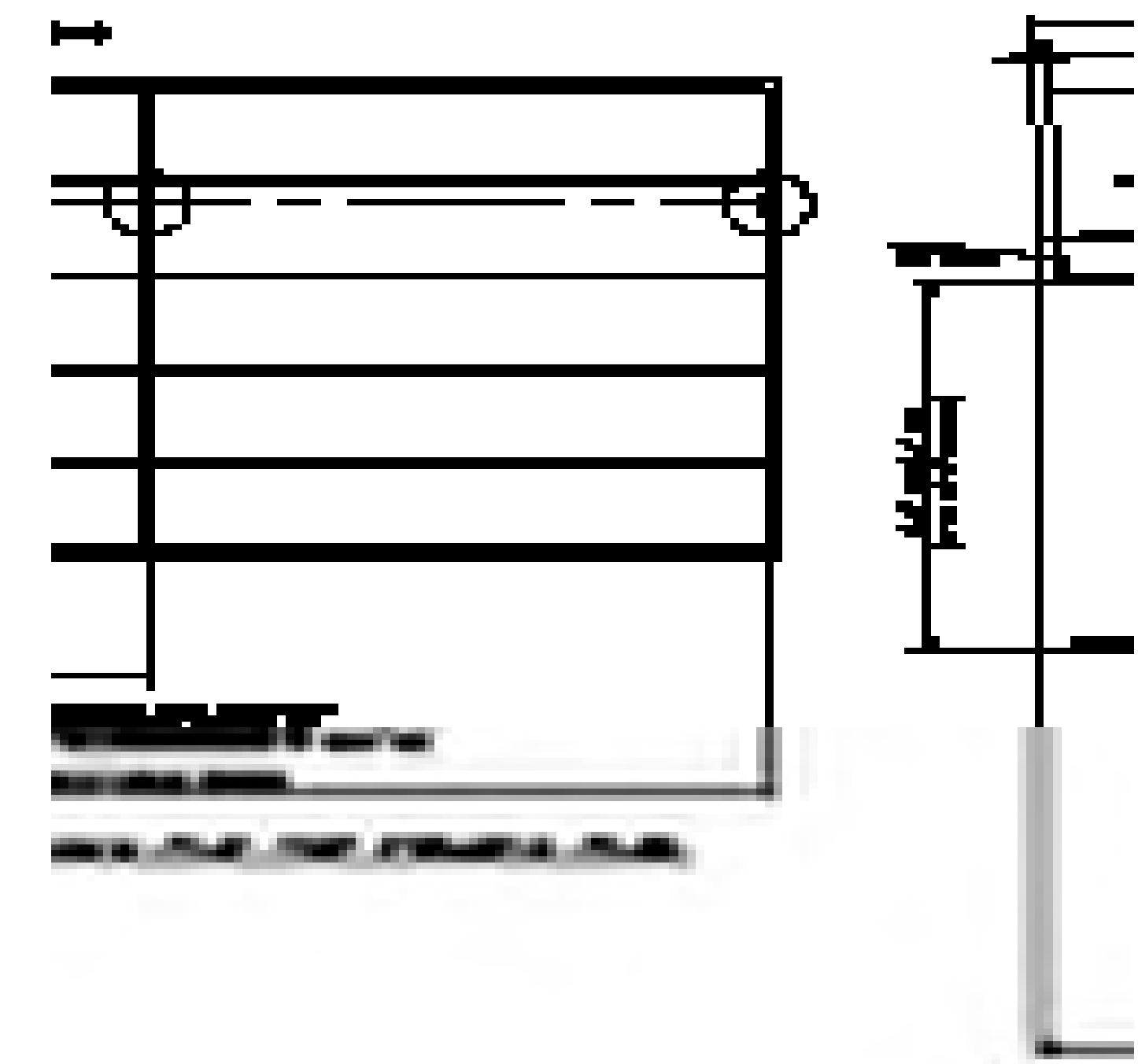
**A** PERSPECTIVE AT BUILDINGS J1 & K1

**KEYNOTES:**

- 1. EXISTING LANDSCAPE AND HARDSCAPE TO REMAIN
- 2. EXISTING BUILDINGS TO REMAIN
- 3. NEW CARPORT STRUCTURE BY OTHERS, STANDING SEAM METAL ROOF O/ ROOF DECK, PAINT COLOR T.B.D.
- 4. EXISTING PARKING TO BE RESTRIPE



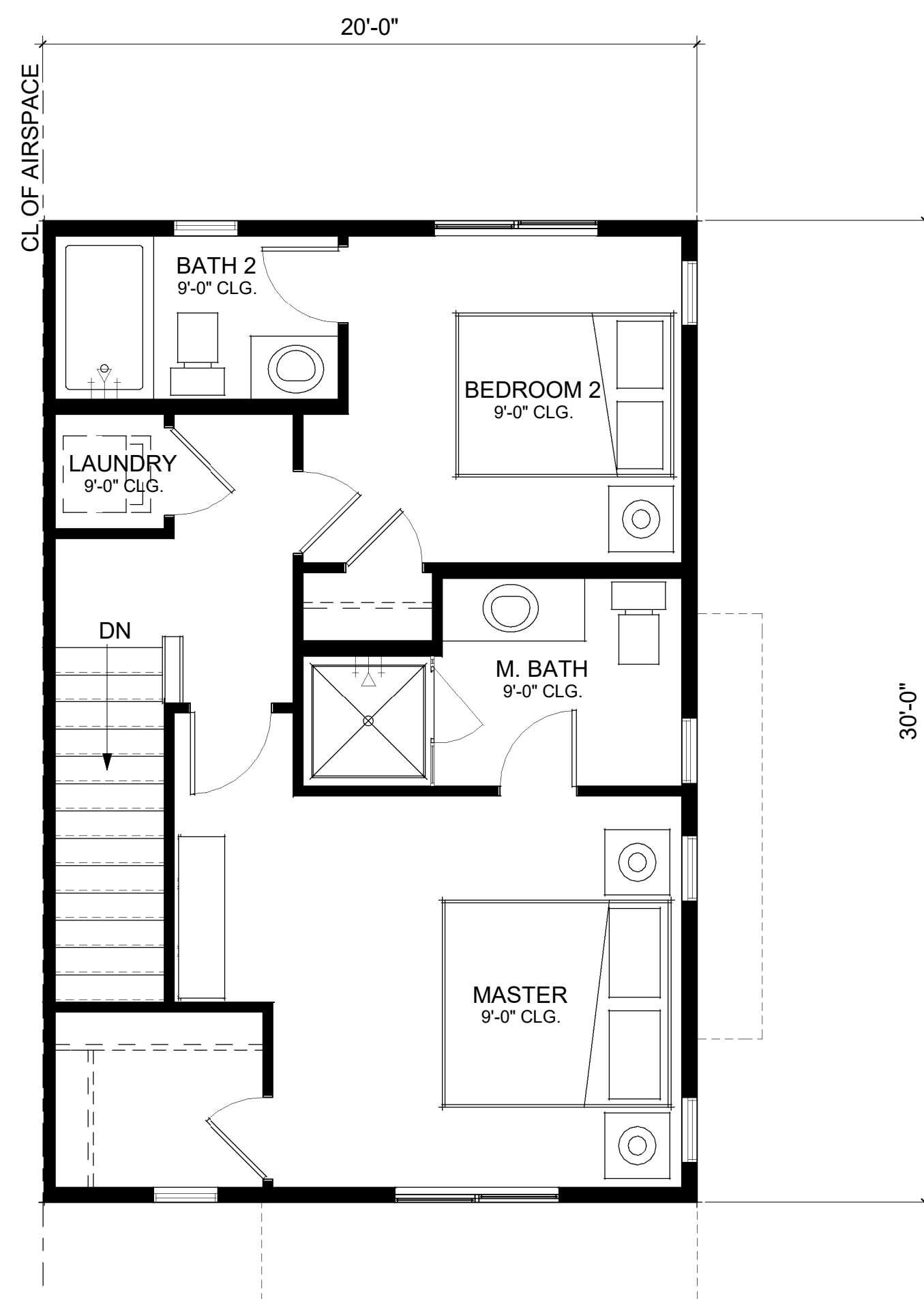
**C** ROOF PLAN PER MANUF.



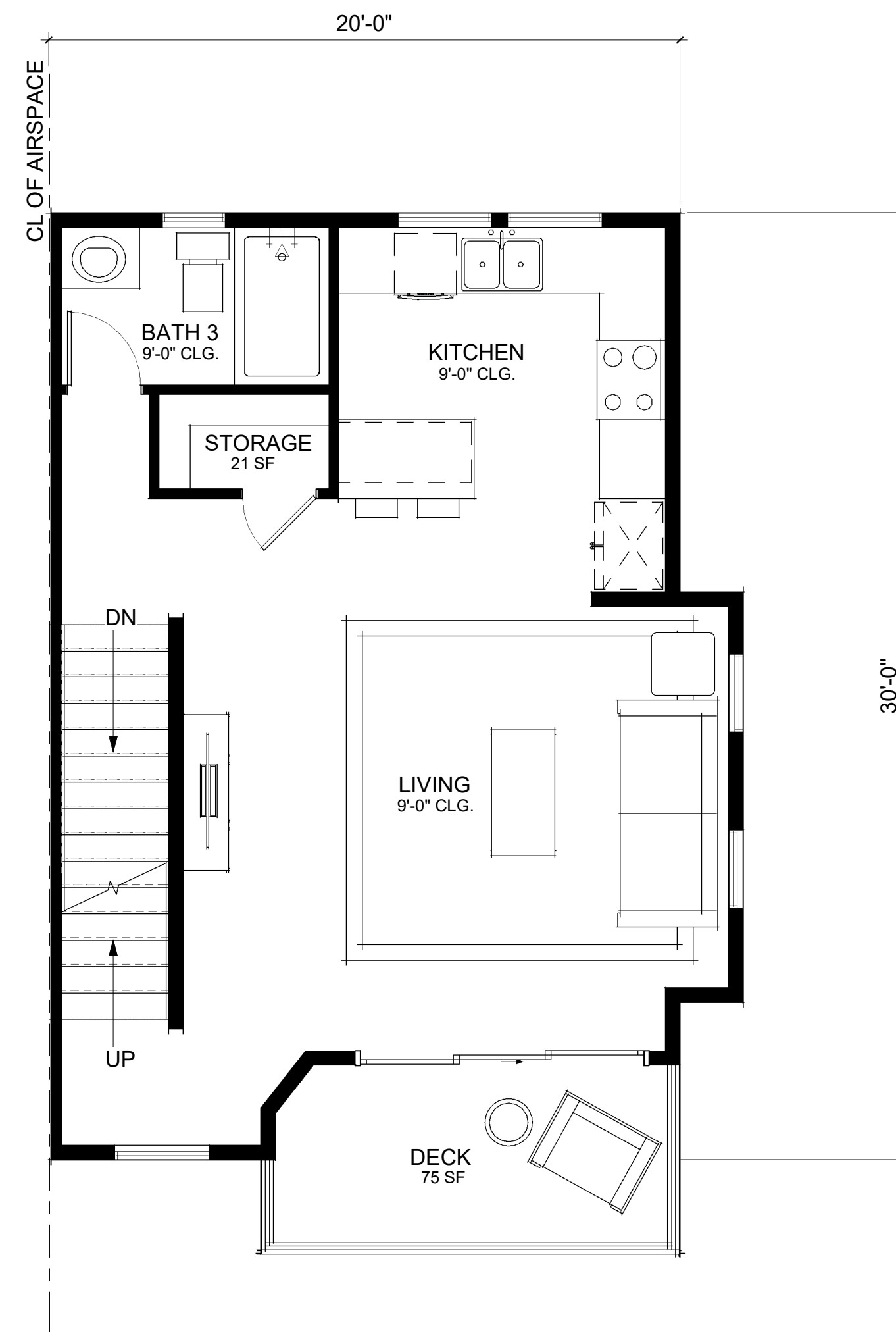
**B** SECTION PER MANUF.

**SITE CARPORT**

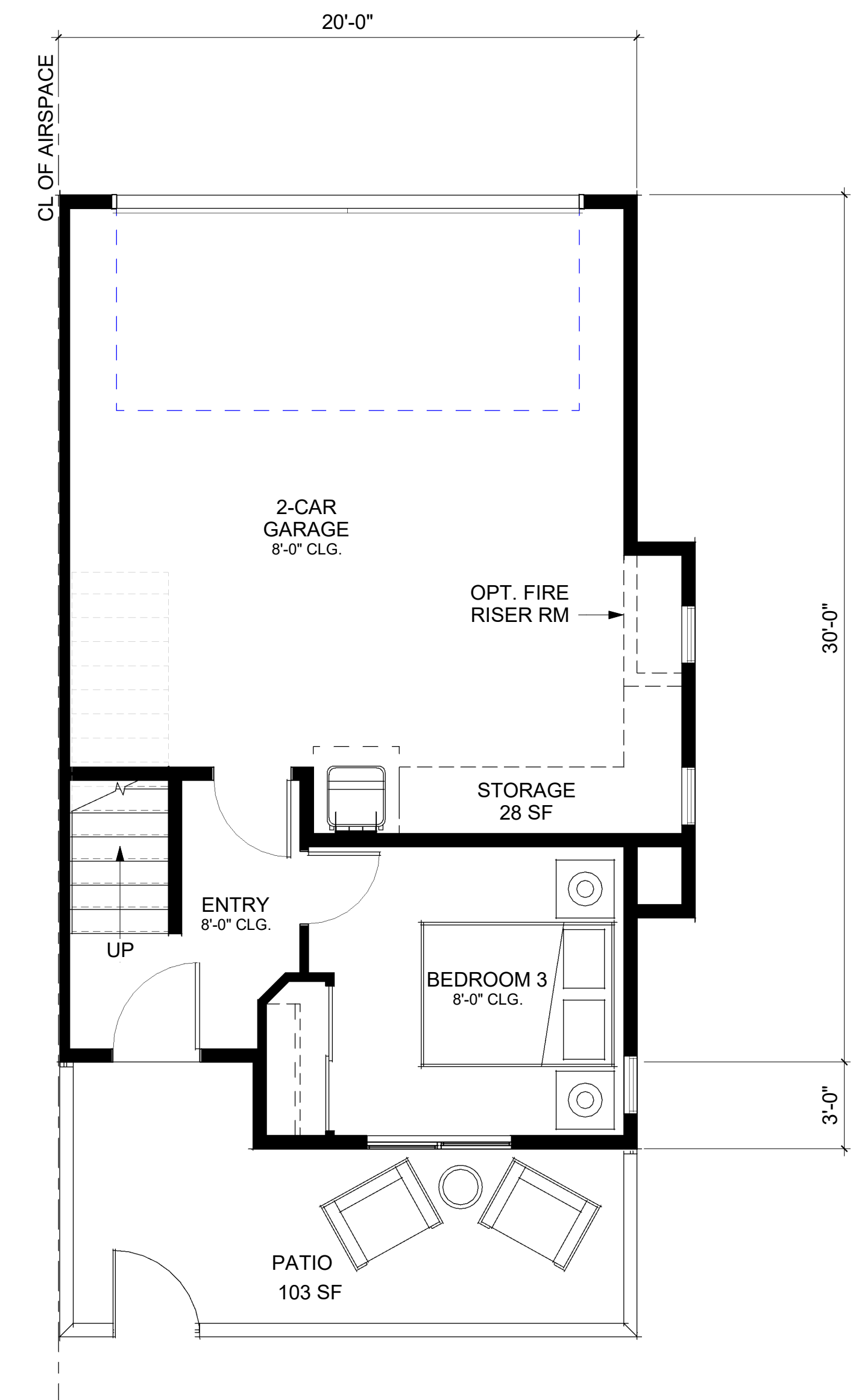




3 UNIT PLAN A - THIRD FLOOR  
1/4" = 1'-0"



2 UNIT PLAN A - SECOND FLOOR  
1/4" = 1'-0"



1 UNIT PLAN A - FIRST FLOOR  
1/4" = 1'-0"

UNIT PLAN A - 3 BR / 3 BA	
NAME	Area
FIRST FLOOR	217 SF
SECOND FLOOR	583 SF
THIRD FLOOR	559 SF
TOTAL LIVING AREA	1,359 SF
2-CAR GARAGE	414
DECK	75
PATIO	103
STORAGE 1ST LEVEL	28
STORAGE 2ND LEVEL	21

### UNIT FLOOR PLANS

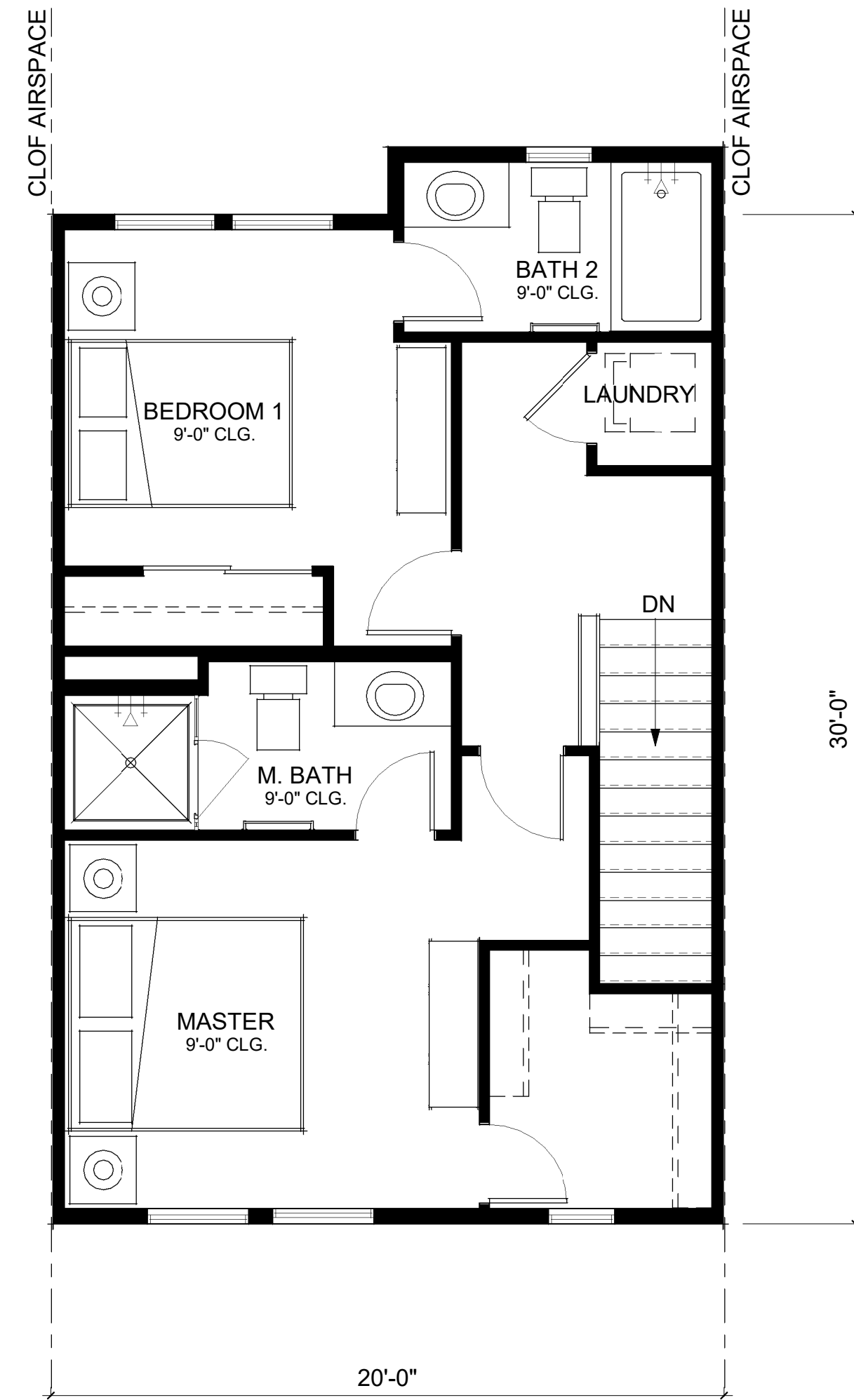


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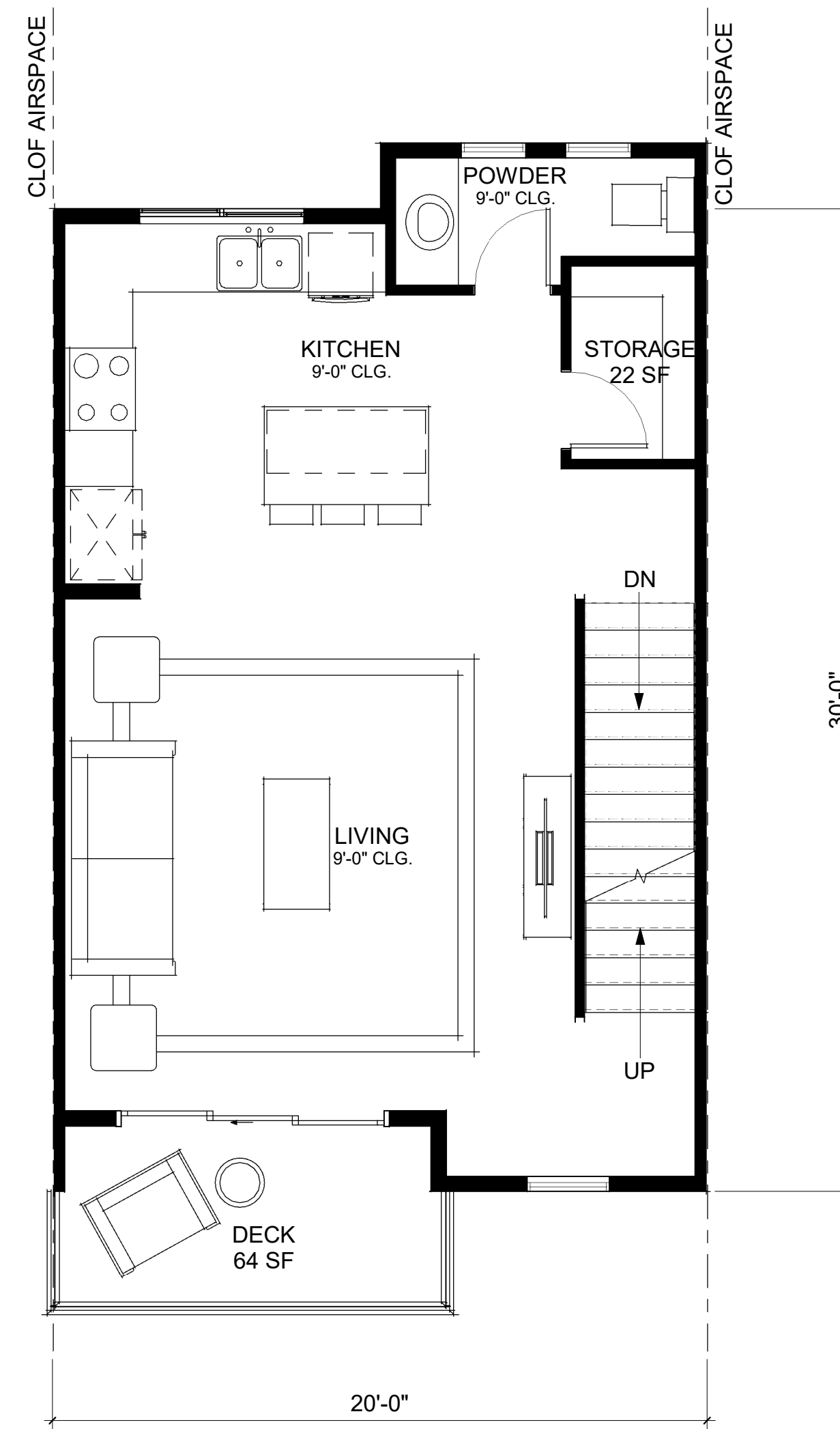
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San Diego, CA 92101  
858.350.0544



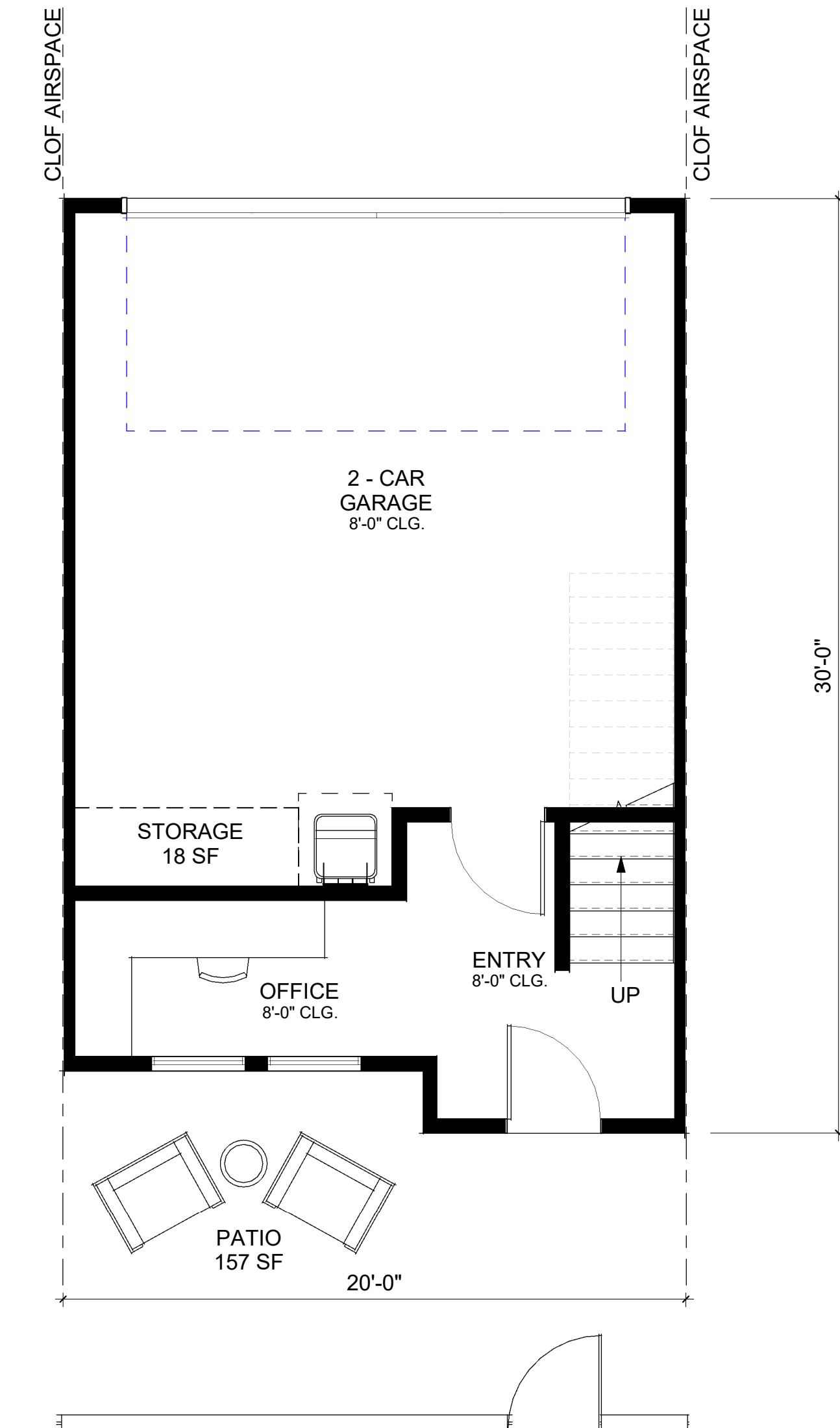
A12



3 UNIT PLAN B - THIRD FLOOR  
1/4" = 1'-0"



2 UNIT PLAN B - SECOND FLOOR  
1/4" = 1'-0"



1 UNIT PLAN B - FIRST FLOOR  
1/4" = 1'-0"

UNIT PLAN B - 2 BR / 2.5 BA	
NAME	Area
FIRST FLOOR	159 SF
SECOND FLOOR	589 SF
THIRD FLOOR	577 SF
TOTAL LIVING AREA	1,325 SF
2-CAR GARAGE	398 SF
DECK	64 SF
PATIO	157 SF
STORAGE 1ST LEVEL	18 SF
STORAGE 2ND LEVEL	22 SF

UNIT FLOOR PLANS



DATE 09.01.2022  
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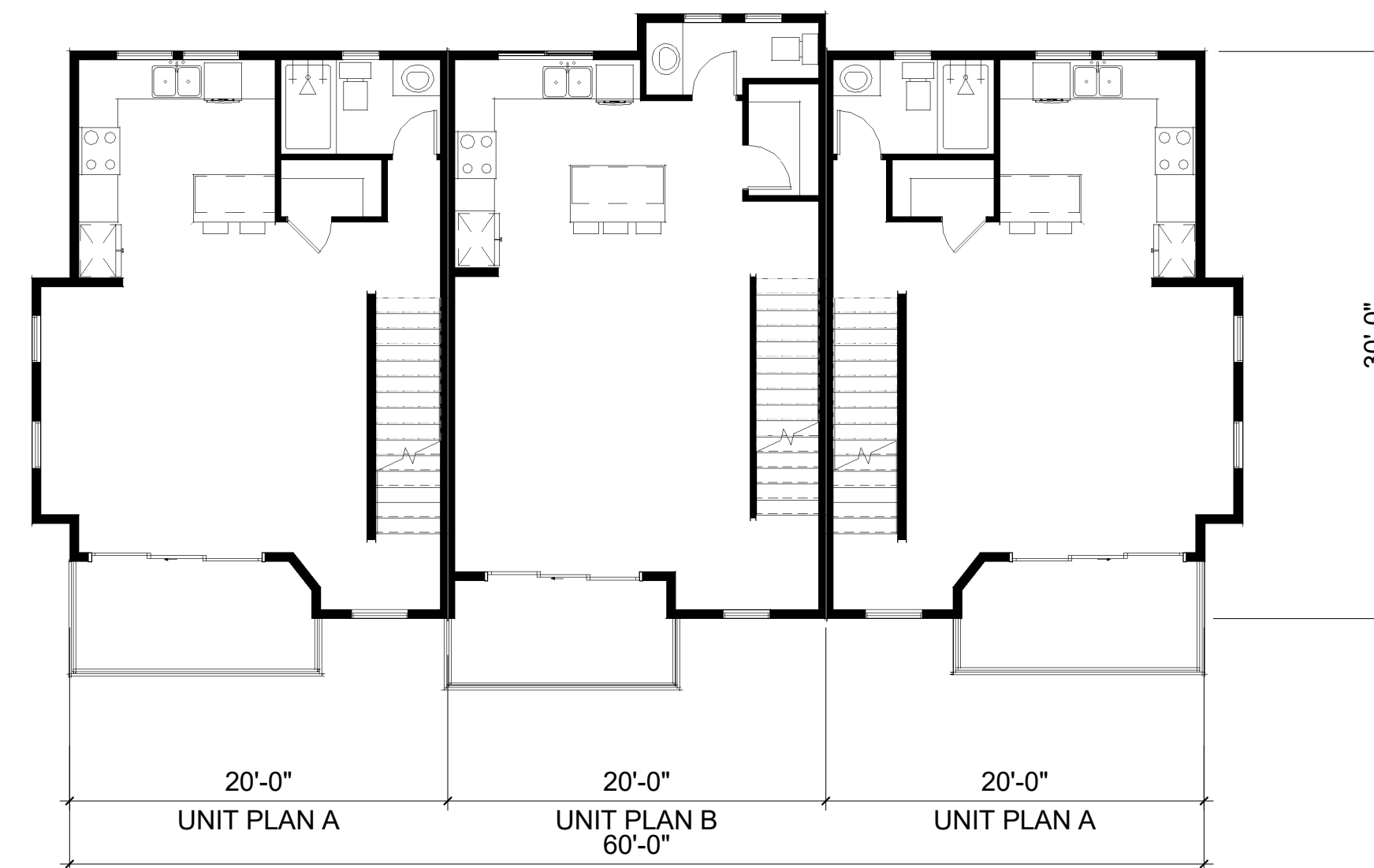
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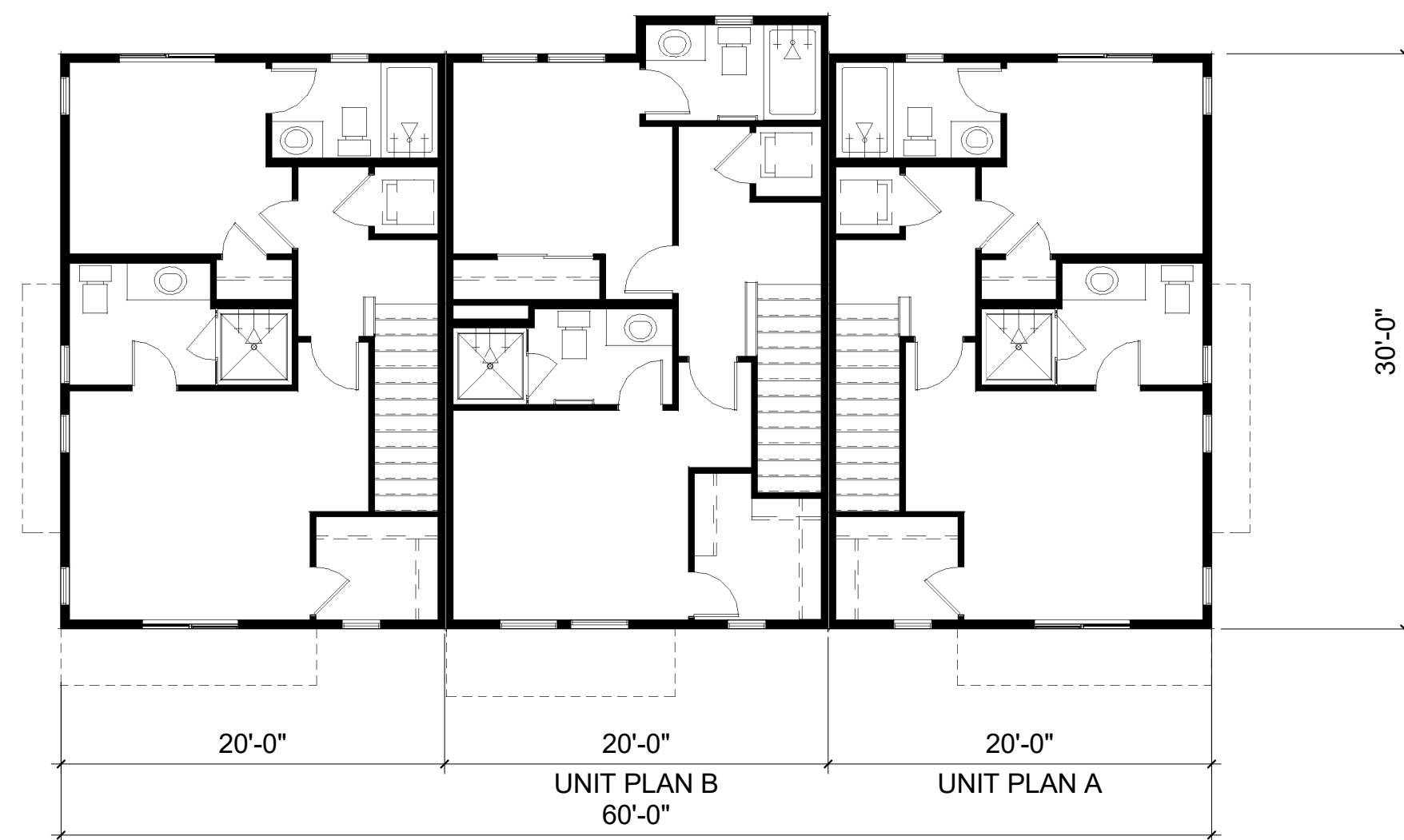
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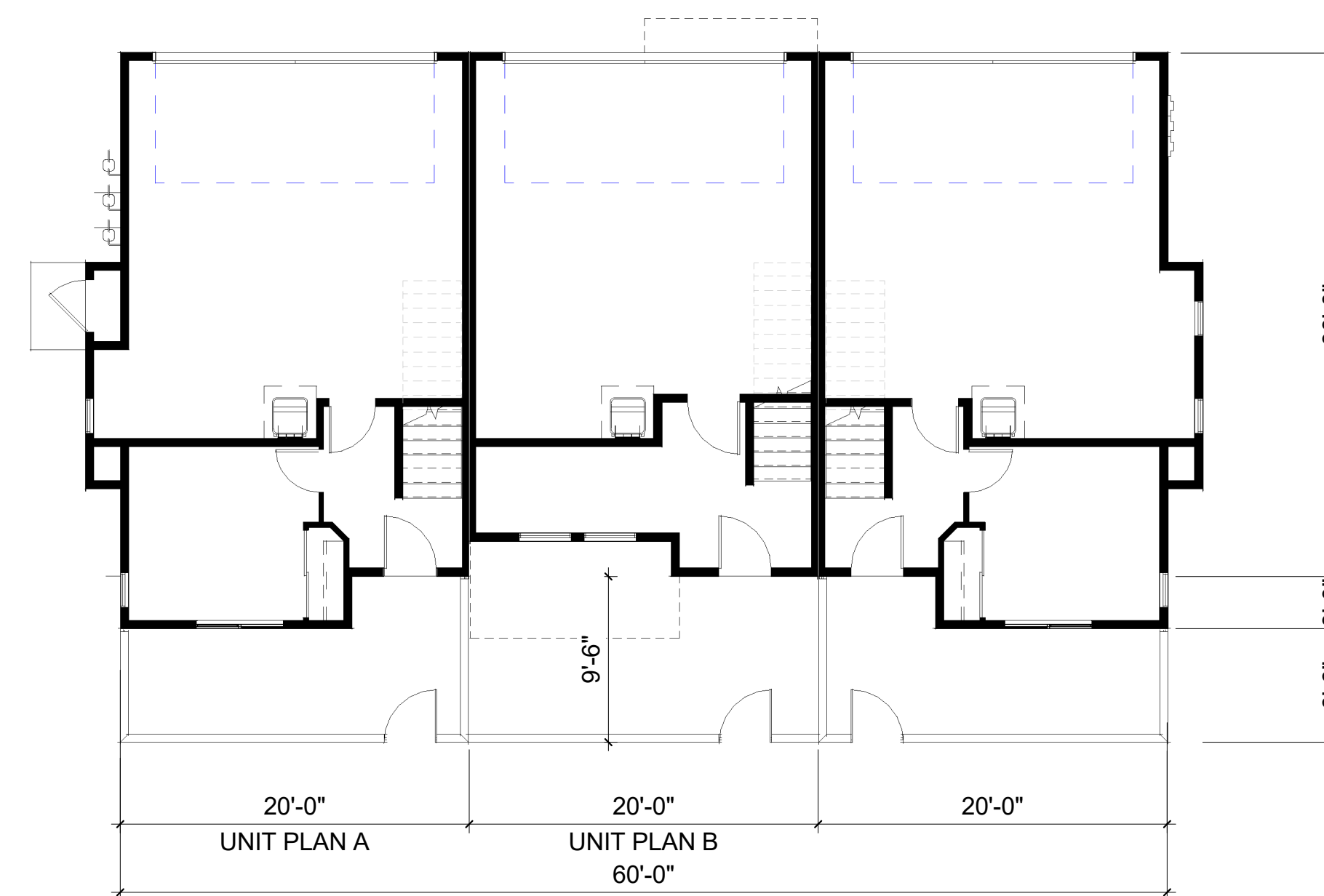




2 BUILDING TYPE A - 3-PLEX - FIRST FLOOR  
1/8" = 1'-0"

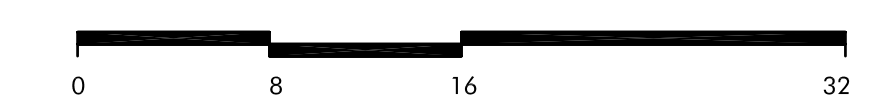


3 BUILDING TYPE A - 3-PLEX - THIRD FLOOR  
1/8" = 1'-0"



1 BUILDING TYPE A - 3-PLEX - SECOND FLOOR  
1/8" = 1'-0"

BUILDING TYPE A -  
3-PLEX (BLDGS O2,  
P2, Q2, R2)



SCALE: 1/8" = 1'-0"

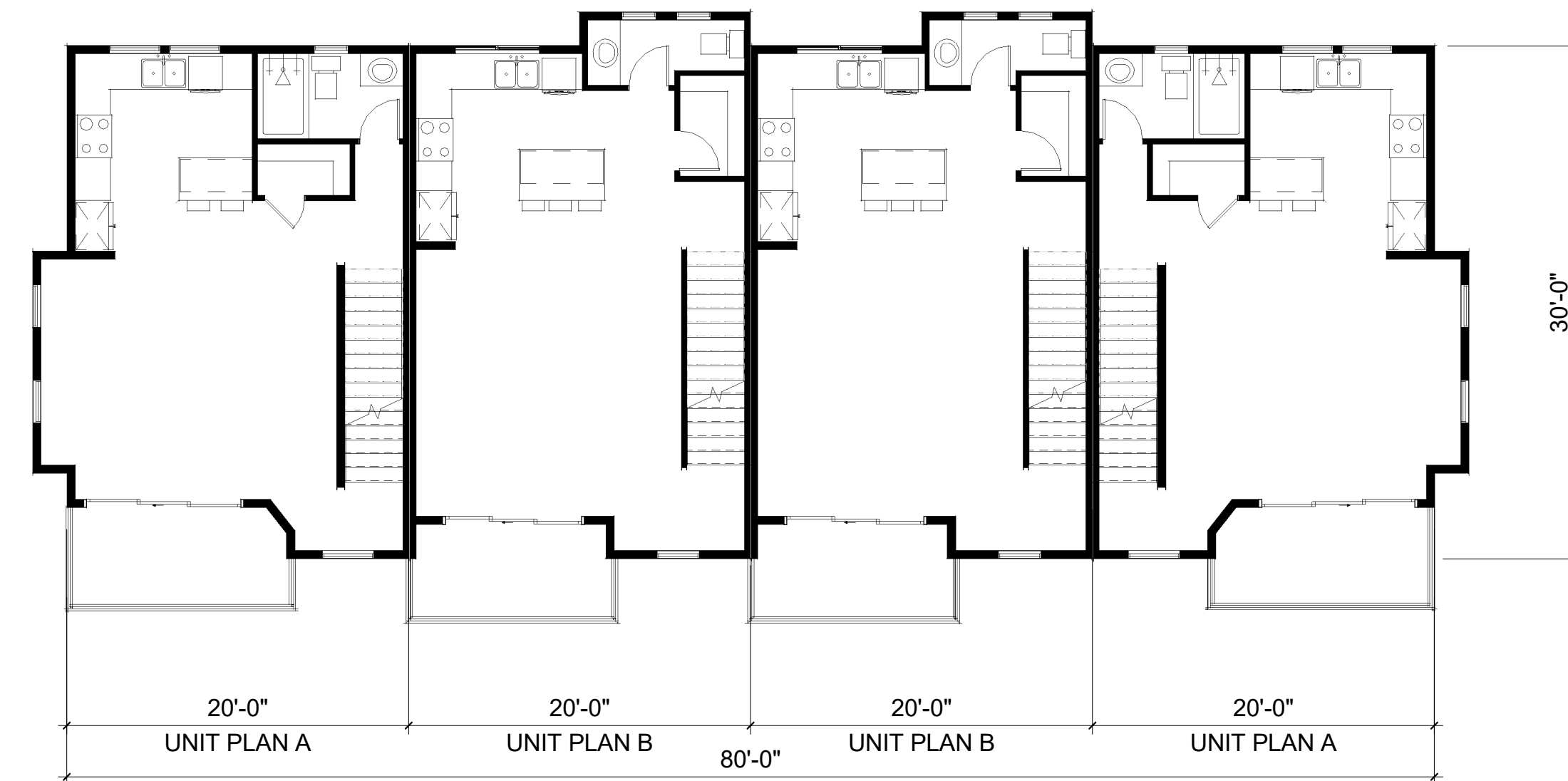
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San Diego, CA 92101  
858.350.0544



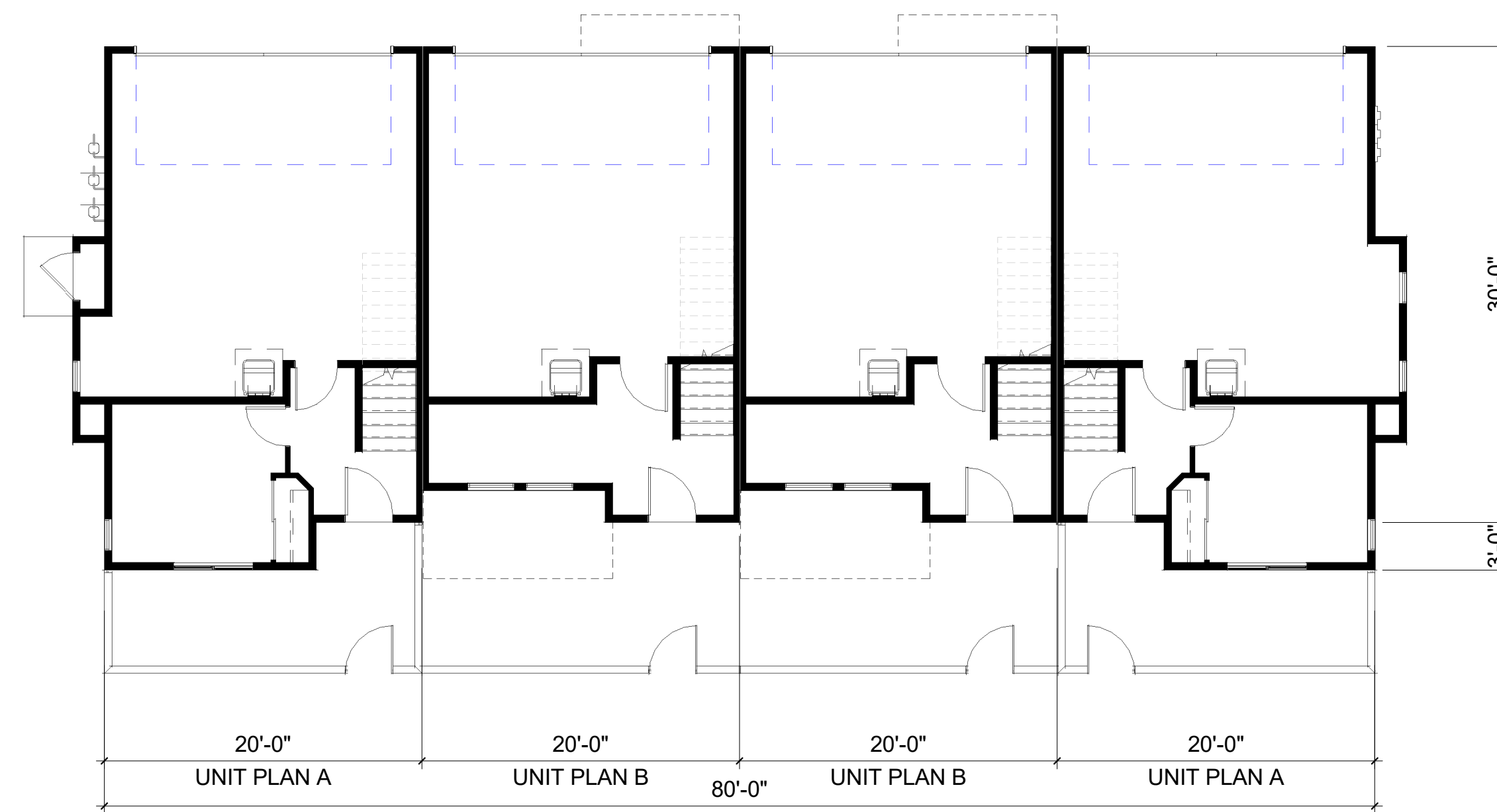
A14



2 BUILDING TYPE B - 4-PLEX - SECOND FLOOR  
1/8" = 1'-0"



3 BUILDING TYPE B - 4-PLEX - THIRD FLOOR  
1/8" = 1'-0"



1 BUILDING TYPE B - 4-PLEX - FIRST FLOOR  
1/8" = 1'-0"

BUILDING TYPE B -  
4-PLEX (BLDGS K2,  
L2, M2, N2, R1, S2,  
T2)



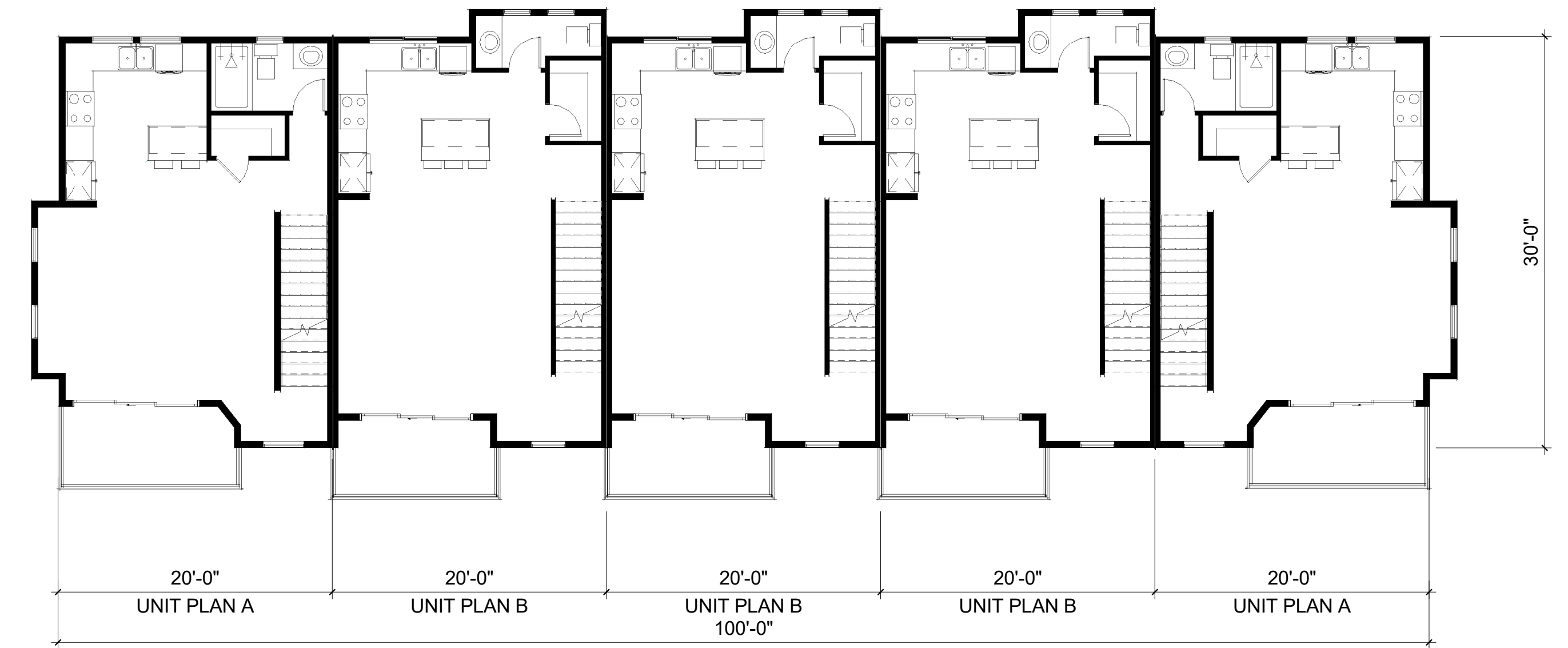
SCALE: 1/8" = 1'-0"

DATE 09.01.2022  
JOB NO. 727.013

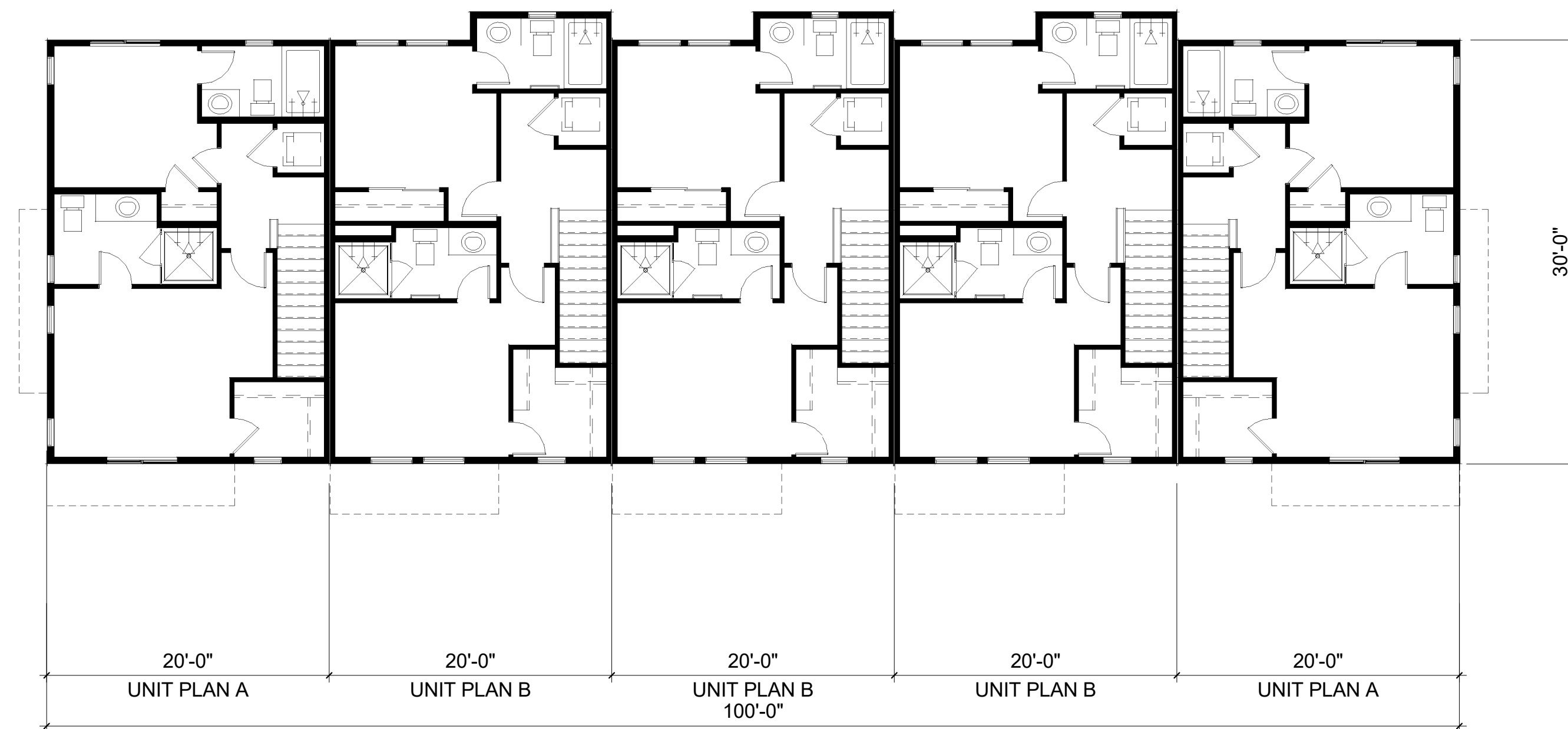
505 W, Broadway, Ste 1080  
San Diego, CA 92101  
858.350.0544



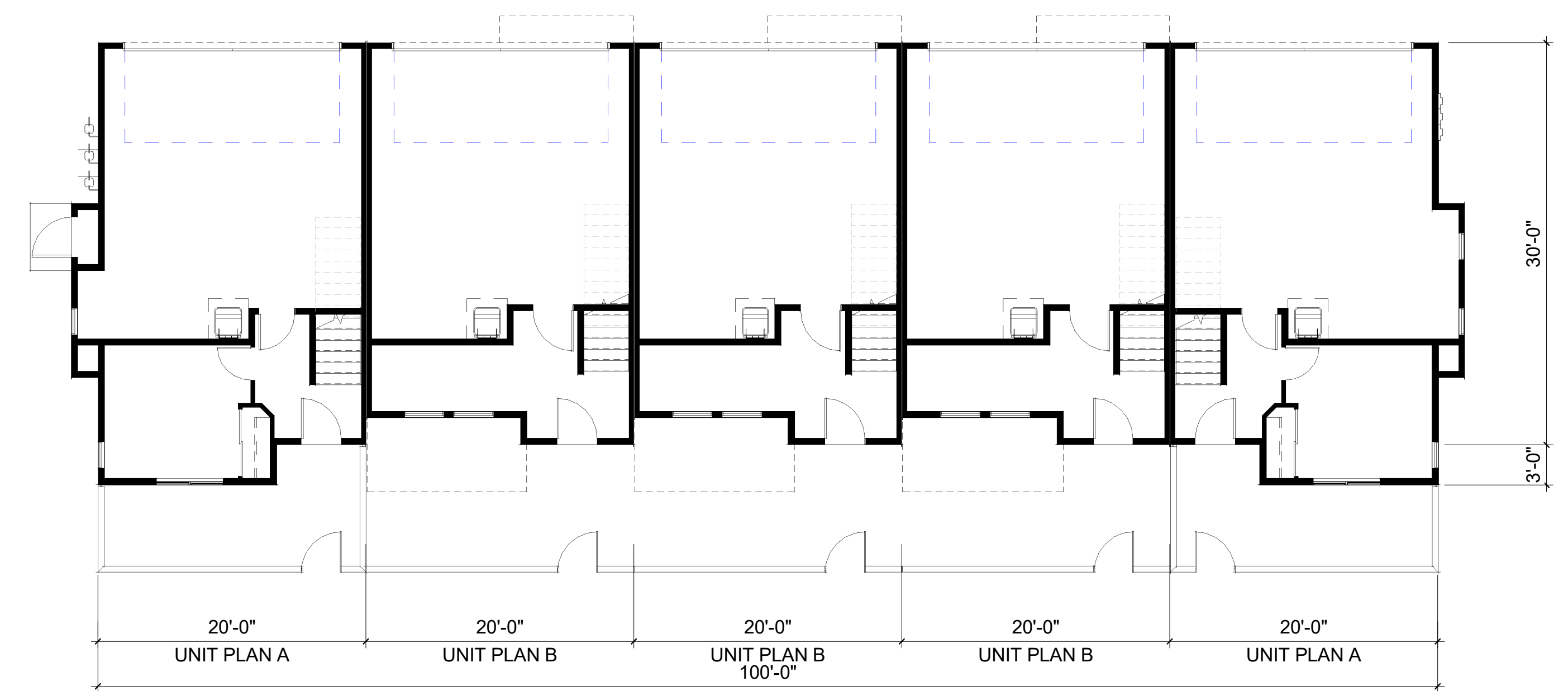
A15



2 BUILDING TYPE C - 5-PLEX - FIRST FLOOR  
1/8" = 1'-0"



3 BUILDING TYPE C - 5-PLEX - THIRD FLOOR  
1/8" = 1'-0"



1 BUILDING TYPE C - 5-PLEX - SECOND FLOOR  
1/8" = 1'-0"





**Alden Apartments – Tualatin, Oregon**  
**Tree Assessment Report**  
**August 24, 2022**

MHA22026

**Purpose**

This Tree Assessment Report for the Alden Apartments project site located at 7800 SW Sagert Street in Tualatin, Oregon, is provided pursuant to City of Tualatin Development Code (TDC) Chapter 33.110. This report describes the existing trees located on the project site, as well as recommendations for tree removal, retention and protection during construction. This report is based on observations made by International Society of Arboriculture (ISA) Board Certified Master Arborist (PN-6145B) and Qualified Tree Risk Assessor Morgan Holen during a site visit conducted on July 27, 2022 and subsequent coordination with the design team.

**Scope of Work and Limitations**

Morgan Holen & Associates, LLC, was contracted by 3J Consulting to collect tree inventory data, assist 3J Consulting in developing the tree preservation plan drawing, and prepare this tree assessment report.

Prior to our fieldwork, an existing conditions survey was provided by 3J Consulting illustrating the location of existing trees and tree survey point numbers. The survey crew physically marked the existing trees with numbered aluminum tree tags corresponding with each survey point number. We performed Visual Tree Assessment (VTA) on each surveyed tree. VTA is the standard process whereby the inspector visually assesses the tree from a distance and up close, looking for defect symptoms and evaluating overall condition and vitality of individual trees. Trees were evaluated in terms of species, size, general condition and potential construction impacts. This level of assessment does not constitute a tree risk assessment.

Following our fieldwork, the tree inventory data was submitted to 3J Consulting to develop the proposed tree preservation plan. The driplines of individual trees are plotted to scale on the drawing based on our crown radius data in order to identify the critical root zone of each tree. We coordinated with 3J Consulting to review and comment on several iterations of the tree preservation plan; this coordination included recommendations for tree removal and protection, as well as site plan modifications to allow for tree protection. The final plan is described in this report.

The client may choose to accept or disregard the recommendations contained herein, or seek additional advice. Neither this author nor Morgan Holen & Associates, LLC, have assumed any responsibility for liability associated with the trees on or adjacent to this site.

**General Description**

The site is an existing apartment complex with trees scattered around parking lots, buildings, and small open space areas. Most of the trees appear to have been planted for landscaping purposes. The project proposes the addition of 12 new apartment buildings with drive aisles and sidewalks.

In all, 88 trees were inventoried, including two trees measuring smaller than eight inches in diameter (#8417 and #8435) and 86 trees measuring eight inches and larger in diameter, the City’s threshold diameter for regulated trees. Thirteen different tree species were identified. Table 1 provides a summary of the number of inventoried trees by species.

**Table 1. Number of Inventoried Trees by Species – Alden Apartments, Tualatin.**

Common Name	Species Name	Total	Percent
Austrian pine	<i>Pinus nigra</i>	2	9%
Douglas-fir	<i>Pseudotsuga menziesii</i>	11	13%
English hawthorn	<i>Crataegus monogyna</i>	2	2%
London plane	<i>Platanus x acerifolia</i>	3	3%
Norway maple	<i>Acer platanoides</i>	18	20%
paper birch	<i>Betula papyrifera</i>	2	2%
red oak	<i>Quercus rubra</i>	9	10%
scarlet oak	<i>Quercus coccinea</i>	8	5%
serviceberry	<i>Amelanchier alnifolia</i>	1	1%
shore pine	<i>Pinus contorta</i>	4	5%
silver maple	<i>Acer saccharinum</i>	11	13%
sweet cherry	<i>Prunus avium</i>	14	16%
weeping willow	<i>Salix babylonica</i>	1	1%
<b>Total</b>		<b>88</b>	<b>100%</b>

Trees widely accepted as being invasive species in our region were most common, accounting for 34 (39%) of the inventoried trees, including: two English hawthorns (*Crataegus monogyna*) and 14 sweet cherries (*Prunus avium* – including the two trees smaller than eight inches) that appear to have sprouted from natural regeneration; and, 18 Norway maples (*Acer platanoides*) that appear to have been planted for landscaping purposes. The other 54 (61%) trees include a diverse mix of species that appear to have been planted for landscaping purposes. In terms of general condition, 64 (73%) trees are in fair condition, while two (2%) are dead, 10 (11%) are in poor condition, and 12 (14%) are in good condition.

A complete description of individual trees is provided in the enclosed tree data.

**Tree Plan Recommendations**

Prior to preparation of this report we coordinated with 3J Consulting, Inc. in regard to the best existing trees and potential construction impacts, and reviewed and considered the approval criteria identified in the Tualatin Development Code Section 33.110.5 which requires a detailed justification for proposed tree removal. The enclosed tree data and this written report address the relevant criteria.

The two invasive sweet cherries smaller than eight inches in diameter are both planned for removal because of poor structure including extensive ivy and unbalanced crowns; however, these trees are too small to be regulated by the City’s tree removal requirements.

Of the 86 regulated trees, 37 are planned for retention with tree protection measures. The tree preservation plan depicts the location of tree protection fencing and tree protection specifications are provided at the end of this report. The other 49 trees are planned for removal with the proposed development. Note that there are numerous other existing trees located on the Alden Apartments property which are well beyond the limits of proposed work and unaffected by the project.

Individual trees recommended for removal were assigned a reason for removal (shown for each tree to be removed under “criteria” in the enclosed tree inventory data) based on the City’s tree removal criteria as follows:

**Approval Criteria for Tree Removal per TDC 33.110.5:**

- (a) An applicant must satisfactorily demonstrate that at least one of the following criteria are met:
  - (i) The tree is diseased and:
    - (A) The disease threatens the structural integrity of the tree; or
    - (B) The disease permanently and severely diminishes the esthetic value of the tree; or
    - (C) The continued retention of the tree could result in other trees being infected with a disease that threatens either their structural integrity or esthetic value.
  - (ii) The tree represents a hazard which may include but not be limited to:
    - (A) The tree is in danger of falling; or
    - (B) Substantial portions of the tree are in danger of falling.
  - (iii) It is necessary to remove the tree to construct proposed improvements based on Architectural Review approval, building permit, or approval of a Subdivision or Partition Review.
- (b) If none of the conditions in TDC 33.110(5)(a) are met, the certified arborist must evaluate the condition of each tree.
  - (i) *Evergreen Trees*. An evergreen tree which meets any of the following criteria as determined by a certified arborist will not be required to be retained:
    - (A) Trunk Condition—extensive decay and hollow; or
    - (B) Crown Development—unbalanced and lacking a full crown;
  - (ii) *Deciduous Trees*. A deciduous tree which meets any of the following criteria as determined by a certified arborist will not be required to be retained:
    - (A) Trunk Condition—extensive decay and hollow;
    - (B) Crown Development—unbalanced and lacking a full crown; or
    - (C) Structure—Two or more dead limbs.

Removal of 35 of the 49 regulated trees planned for removal is necessary to construct proposed improvements. The tree preservation plan shows that these trees are within the footprint of proposed buildings, drive aisles, sidewalks and retaining wall or within areas of required grading with severe impacts within critical root zones. The other 14 regulated trees planned for removal are all deciduous trees with poor crown development or poor structure including 13 invasive species trees and one 29-inch diameter silver maple (*Acer saccharinum*), tree #1122. Tree #1122 is in poor condition and with very poor structure including multiple upright leaders, a history of branch failure, and numerous epicormic sprouts; it is not suitable for preservation with removal of the row of trees to the south which are all well within the proposed building footprint.

Table 2 provides a summary of the number of inventoried trees planned for retention and removal.



**Table 2. Number of Inventoried Trees by Proposed Treatment – Alden Apartments, Tualatin.**

Treatment	Total	Percent
<b>Retain</b>	<b>37</b>	<b>42%</b>
<b>Remove</b>	<b>51</b>	<b>58%</b>
Remove to Construct Proposed Improvements (criteria a-iii)	35	40%
Remove for Poor Crown Development (criteria b-ii-B)	8	9%
Remove for Poor Structure (criteria b-ii-C)	6	7%
Trees <8" DBH Planned for Removal Two or more dead limbs	2	2%
<b>Percent of Total</b>	<b>88</b>	<b>100%</b>

**Tree Protection Recommendations**

Trees recommended for preservation will need special consideration to assure their protection during construction. We coordinated with 3J Consulting to specify the proposed location of tree protection fencing, which is proposed at the dripline of protected trees where feasible and with very minor encroachments at the outer edges of critical root zones otherwise. The following tree protection specifications are consistent with the tree preservation standards provided in TDC 73B.080 and should be copied onto construction documents as direction to the contractor.

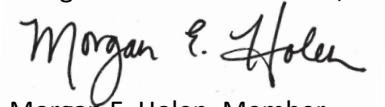
**Tree Protection Specifications**

1. **Preconstruction Conference.** The project arborist shall be on site to discuss methods of tree removal and tree protection prior to any construction.
2. **Protection Fencing.** All trees to be retained shall be protected by 5-foot-tall metal fencing secured to steel posts placed no further than 8-feet apart and shall be installed as depicted on the tree preservation plan. Trees located farther than 30-feet from construction activity do not require tree protection fencing.
3. **Tree Protection Zone Maintenance.** The protection fencing shall not be moved, removed, or entered by equipment except under direction of the project arborist. The contractor shall not store materials or equipment within the TPZ.
4. **Erosion Control.** Beneath the dripline of protected trees, erosion control fencing shall not be trenched in per manufacturer’s specifications to avoid root impacts. Instead, alternative means of erosion control are required, such as wrapping the base of silt fencing around a straw wattle and staking the wattle into the ground or using compost socks or straw wattles staked into the ground in lieu of silt fencing.
5. **Crown Pruning.** The project arborist can help identify where crown pruning is necessary to provide construction clearance and remove dead and defective branches for safety once trees planned for removal have been removed and the site is staked and prepared for construction. Pruning shall be performed by a Qualified Tree Service and conducted in accordance with ANSI A300 pruning standards and ISA Best Management Practices for pruning.

6. **Excavation.** Excavation beneath protected tree driplines shall be avoided if alternatives are available. If excavation is unavoidable, the project arborist shall evaluate the proposed excavation to determine methods to minimize impacts to trees. Root pruning shall be directed and documented by the project arborist.
7. **Landscaping.** Following construction and where landscaping is desired, apply approximately 3-inches of mulch beneath the dripline of protected trees, but not directly against tree trunks. If irrigation is used, use drip irrigation installed at native grade only (no trenching) beneath the driplines of protected trees.

Please contact us if you have questions or need any additional information. Thank you for choosing Morgan Holen & Associates, LLC, to provide consulting arborist services for the Alden Apartments project in Tualatin.

Thank you,  
Morgan Holen & Associates, LLC



Morgan E. Holen, Member  
ISA Board Certified Master Arborist, PN-6145B  
ISA Tree Risk Assessment Qualified  
Forest Biologist

Enclosures: MHA22026 Alden Apartments – Tree Data 07-27-2022

No.	Sheet	Common Name	Species Name	DBH <sup>1</sup>	C-Rad <sup>2</sup>	Cond <sup>3</sup>	Comments	Treatment	Criteria <sup>4</sup>
1044	1	Austrian pine	<i>Pinus nigra</i>	18	14	F	Codominant stems with included bark, ivy	Retain	
1057	1	red oak	<i>Quercus rubra</i>	28	18	F	Multiple leaders, upright crown, numerous epicormic sprouts	Remove	a-iii
1062	1	Douglas-fir	<i>Pseudotsuga menziesii</i>	26	22	F	Dead branches	Retain	
1063	1	red oak	<i>Quercus rubra</i>	20	22	F	Codominant leaders, dead branches, epicormic sprouts	Retain	
1064	1	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	20	F	Lower trunk swelling, crown asymmetry	Retain	
1065	1	Douglas-fir	<i>Pseudotsuga menziesii</i>	22	16	F	Crown asymmetry	Retain	
1066	1	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	12	F	Crook in lower trunk, high live crown	Retain	
1078	1	Norway maple	<i>Acer platanoides</i>	19	24	F	Codominant leaders, one-sided crown with lean west	Remove	b-ii-B
1079	1	Norway maple	<i>Acer platanoides</i>	10	14	F	Small and high live crown	Remove	b-ii-B
1081	1	Norway maple	<i>Acer platanoides</i>	15	16	F	Mostly one-sided crown to north	Remove	a-iii
1085	1	scarlet oak	<i>Quercus coccinea</i>	32	30	F	History of branch failure, dead branches, high live crown, large diameter scaffold leaders, numerous epicormic sprouts, extensive ivy	Remove	a-iii
1086	1	scarlet oak	<i>Quercus coccinea</i>	29	22	F	History of branch failure, dead branches, high live crown, large diameter scaffold leaders, numerous epicormic sprouts, extensive ivy	Remove	a-iii
1110	2	silver maple	<i>Acer saccharinum</i>	40	35	F	History of large branch failure, poor crown structure, numerous epicormic sprouts, expansive surface roots	Remove	a-iii
1111	2	silver maple	<i>Acer saccharinum</i>	14	6	P	Small and high live crown	Remove	a-iii



No.	Sheet	Common Name	Species Name	DBH <sup>1</sup>	C-Rad <sup>2</sup>	Cond <sup>3</sup>	Comments	Treatment	Criteria <sup>4</sup>
1115	2	silver maple	<i>Acer saccharinum</i>	28	42	F	Multiple attachments, included bark, numerous epicormic sprouts, expansive surface roots	Remove	a-iii
1122	2	silver maple	<i>Acer saccharinum</i>	29	24	P	Multiple upright leaders, history of branch failure, numerous epicormic sprouts; not suitable for retention with adjacent tree removal	Remove	b-ii-B
1297	3	Norway maple	<i>Acer platanoides</i>	19	22	G	Crimson King variety	Remove	a-iii
1380	3	Norway maple	<i>Acer platanoides</i>	14	17	F	Crook in lower trunk, self-correcting lean, some twig dieback and small broken branches	Retain	
1381	3	scarlet oak	<i>Quercus coccinea</i>	28	32	F	History of large branch failure, numerous epicormic sprouts	Remove	a-iii
1382	3	scarlet oak	<i>Quercus coccinea</i>	30	18	F	Codominant leaders with included bark and tight attachment	Remove	a-iii
1494	2	Norway maple	<i>Acer platanoides</i>	18	18	F	Crimson King variety, surrounded by dense invasive vegetation	Retain	
1497	2	silver maple	<i>Acer saccharinum</i>	23	28	F	Multiple leaders, history of branch failure, surrounded by dense invasive vegetation	Retain	
1499	2	Norway maple	<i>Acer platanoides</i>	18	12	F		Retain	
1502	2	Austrian pine	<i>Pinus nigra</i>	16	16	F	Multiflora rose infesting crown	Retain	
1504	2	Norway maple	<i>Acer platanoides</i>	16	14	F	Codominant stems with included bark	Retain	
1506	2	silver maple	<i>Acer saccharinum</i>	31	30	F	History of branch failure, multiple upright leaders with included bark	Retain	
1508	2	silver maple	<i>Acer saccharinum</i>	18	20	F	History of branch failure, poor crown structure	Retain	
1511	2	Norway maple	<i>Acer platanoides</i>	16	20	F	Crimson King variety, self-correcting lean	Retain	



No.	Sheet	Common Name	Species Name	DBH <sup>1</sup>	C-Rad <sup>2</sup>	Cond <sup>3</sup>	Comments	Treatment	Criteria <sup>4</sup>
1513	2	silver maple	<i>Acer saccharinum</i>	32	34	F	Multiple stems and leaders with included bark	Retain	
1519	3	Austrian pine	<i>Pinus nigra</i>	14	12	F	Dead and broken branches, surrounded by dense invasive vegetation, multiflora rose growing up trunk	Retain	
1521	3	Austrian pine	<i>Pinus nigra</i>	16	14	F	Surrounded by dense invasive vegetation, multiflora rose growing up trunk	Retain	
1524	3	Norway maple	<i>Acer platanoides</i>	20	24	G		Retain	
1673	2	silver maple	<i>Acer saccharinum</i>	34	18	F	History of large branch failure, poor crown structure, numerous epicormic sprouts	Remove	a-iii
1674	2	silver maple	<i>Acer saccharinum</i>	26	32	F	Multiple attachments, history of branch failure, mostly one-sided crown to west with excessive lean and crown weight	Remove	a-iii
1675	2	silver maple	<i>Acer saccharinum</i>	26	30	F	Codominant stems, one failed leaving large torn wound, other with codominant leaders	Remove	a-iii
1676	2	Norway maple	<i>Acer platanoides</i>	22	32	F	Multiple leaders	Retain	
1682	2	Douglas-fir	<i>Pseudotsuga menziesii</i>	31	28	G		Remove	a-iii
1683	2	Douglas-fir	<i>Pseudotsuga menziesii</i>	32	20	G	Trunk is off-center at about 25' a.g.l.	Remove	a-iii
1685	2	Douglas-fir	<i>Pseudotsuga menziesii</i>	27	18	G		Remove	a-iii
1687	2	Norway maple	<i>Acer platanoides</i>	15	16	F	Some dieback	Retain	
1689	2	weeping willow	<i>Salix babylonica</i>	7,14,20	30	F	Codominant stems, one-sided with lean south, crossing and rubbing branches	Retain	
1692	2	shore pine	<i>Pinus contorta</i>	15,17	12	F	Codominant stems and leaders, one with previous top failure, sequoia pitch moth	Retain	
1693	2	Austrian pine	<i>Pinus nigra</i>	21	16	F	Codominant stems and leaders with included bark and tight attachments	Retain	

No.	Sheet	Common Name	Species Name	DBH <sup>1</sup>	C-Rad <sup>2</sup>	Cond <sup>3</sup>	Comments	Treatment	Criteria <sup>4</sup>
1694	2	Austrian pine	<i>Pinus nigra</i>	2x22	20	F	Codominant stems with included bark	Retain	
2001	add	Douglas-fir	<i>Pseudotsuga menziesii</i>	9,14	14	F	Suppressed spur leader, crown asymmetry	Retain	
2329	2	English hawthorn	<i>Crataegus monogyna</i>	8,2x14	18	F	Codominant stems	Retain	
2334	2	serviceberry	<i>Amelanchier alnifolia</i>	7,8,12	18	F	Multiple stems, surrounded by dense invasive vegetation, ivy up trunks	Retain	
2459	1	London plane	<i>Platanus × acerifolia</i>	32	26	G	Expansive surface roots	Remove	a-iii
2460	1	paper birch	<i>Betula papyrifera</i>	22	28	G		Remove	a-iii
7544	1	shore pine	<i>Pinus contorta</i>	13	18	F	One-sided crown to south	Remove	a-iii
7545	1	Norway maple	<i>Acer platanoides</i>	17	22	G		Remove	a-iii
7546	1	Norway maple	<i>Acer platanoides</i>	18	26	G		Remove	a-iii
7547	1	Douglas-fir	<i>Pseudotsuga menziesii</i>	31	24	F	Self-correcting lean, spur leader, history of branch failure, reduced vigor	Remove	a-iii
7549	1	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	7	F		Remove	a-iii
7550	1	shore pine	<i>Pinus contorta</i>	15	10	F	Codominant leaders, dead lower branches	Remove	a-iii
7551	1	shore pine	<i>Pinus contorta</i>	14	10	F	Dead branches, small and high live crown	Remove	a-iii
7552	1	Norway maple	<i>Acer platanoides</i>	13	11	F	Self-correcting lean, spur leader, history of branch failure, reduced vigor	Remove	a-iii
7553	1	Douglas-fir	<i>Pseudotsuga menziesii</i>	22	16	F	Crown asymmetry	Remove	a-iii
7554	1	Norway maple	<i>Acer platanoides</i>	26	22	F	Missing bark 0-5' south face, codominant leaders, large and expansive surface roots	Retain	
7556	1	Austrian pine	<i>Pinus nigra</i>	24	26	F	Crown asymmetry, crooked leader	Retain	
7557	1	sweet cherry	<i>Prunus avium</i>	22	0	D	Dead	Remove	b-ii-C
7558	1	Austrian pine	<i>Pinus nigra</i>	20	20	F	Codominant stems with included bark, codominant leaders	Retain	
7559	1	red oak	<i>Quercus rubra</i>	25	30	F	Numerous epicormic sprouts	Remove	a-iii
7560	1	red oak	<i>Quercus rubra</i>	39	44	G	Codominant stems with included bark	Remove	a-iii
7561	1	red oak	<i>Quercus rubra</i>	31	22	G	Crown asymmetry	Remove	a-iii



No.	Sheet	Common Name	Species Name	DBH <sup>1</sup>	C-Rad <sup>2</sup>	Cond <sup>3</sup>	Comments	Treatment	Criteria <sup>4</sup>
8317	1	paper birch	<i>Betula papyrifera</i>	17	22	P	Twig dieback, poor crown structure with leaning over-extended lateral limbs	Remove	a-iii
8318	2	London plane	<i>Platanus × acerifolia</i>	22	22	F	Reduced vigor, expansive surface roots	Remove	a-iii
8319	2	London plane	<i>Platanus × acerifolia</i>	29	23	F	Codominant stems, one topped leader	Remove	a-iii
8320	1	Norway maple	<i>Acer platanoides</i>	22	24	G	Codominant leaders, very large and expansive surface root extending west	Remove	a-iii
8401	1	red oak	<i>Quercus rubra</i>	2x22	14	F	Codominant stems, upright crown, numerous epicormic sprouts	Retain	
8403	1	sweet cherry	<i>Prunus avium</i>	8	12	F	One-sided crown with lean east	Retain	
8405	1	red oak	<i>Quercus rubra</i>	25	22	F	Codominant leaders, numerous epicormic sprouts	Retain	
8407	1	red oak	<i>Quercus rubra</i>	25	15	F	Upright crown, numerous epicormic sprouts	Retain	
8408	1	red oak	<i>Quercus rubra</i>	24	14	F	Self-correcting lean, numerous epicormic sprouts	Retain	
8411	1	Norway maple	<i>Acer platanoides</i>	32	18	F	Self-correcting lean, crown asymmetry	Retain	
8416	2	English hawthorn	<i>Crataegus monogyna</i>	7,8	12	F	Invasive species; extensive ivy	Remove	b-ii-B
8417	2	sweet cherry	<i>Prunus avium</i>	7	10	F	Invasive species; small and high live crown, ivy	Remove	b-ii-B
8418	2	sweet cherry	<i>Prunus avium</i>	10	8	F	Invasive species; small and high live crown, ivy	Remove	b-ii-B
8419	2	sweet cherry	<i>Prunus avium</i>	10	14	F	Invasive species	Remove	a-iii
8420	2	sweet cherry	<i>Prunus avium</i>	12	8	P	Invasive species; mostly dead	Remove	b-ii-C
8421	2	sweet cherry	<i>Prunus avium</i>	10	8	P	Invasive species; mostly dead	Remove	b-ii-C
8422	2	sweet cherry	<i>Prunus avium</i>	7,8	10	P	Invasive species; very extensive ivy infestation	Remove	b-ii-B

No.	Sheet	Common Name	Species Name	DBH <sup>1</sup>	C-Rad <sup>2</sup>	Cond <sup>3</sup>	Comments	Treatment	Criteria <sup>4</sup>
8430	2	sweet cherry	<i>Prunus avium</i>	16	16	P	Invasive species; very extensive ivy infestation, dead and broken branches	Remove	b-ii-C
8432	2	sweet cherry	<i>Prunus avium</i>	22	0	D	Invasive species; Dead	Remove	b-ii-C
8433	2	sweet cherry	<i>Prunus avium</i>	14	12	P	Invasive species; very extensive ivy infestation, dead and broken branches	Remove	b-ii-C
8434	2	sweet cherry	<i>Prunus avium</i>	8	10	P	Invasive species; very extensive ivy infestation	Remove	b-ii-B
8435	2	sweet cherry	<i>Prunus avium</i>	7	8	F	Invasive species; extensive ivy	Remove	b-ii-B
8436	2	sweet cherry	<i>Prunus avium</i>	10	12	P	Invasive species; very extensive ivy infestation	Remove	b-ii-B

<sup>1</sup>DBH is tree diameter measured at 4.5-feet above the ground level, in inches.

<sup>2</sup>C-Rad is crown radius measured in feet.

<sup>3</sup>Cond is an arborist assigned rating to generally describe the condition of individual trees as follows- Dead; Poor; Fair; Good; or, Excellent.

<sup>4</sup>Criteria identifies the applicable approval criteria for proposed tree removal per TDC 33.110(5):

(a) An applicant must satisfactorily demonstrate that at least one of the following criteria are met:

(i) The tree is diseased and:

(A) The disease threatens the structural integrity of the tree; or

(B) The disease permanently and severely diminishes the esthetic value of the tree; or

(C) The continued retention of the tree could result in other trees being infected with a disease that threatens either their

(ii) The tree represents a hazard which may include but not be limited to:

(A) The tree is in danger of falling; or

(B) Substantial portions of the tree are in danger of falling.

(iii) It is necessary to remove the tree to construct proposed improvements based on Architectural Review approval, building permit,

(b) If none of the conditions in TDC 33.110(5)(a) are met, the certified arborist must evaluate the condition of each tree.

(i) *Evergreen Trees*. An evergreen tree which meets any of the following criteria as determined by a certified arborist will not be

(A) Trunk Condition-extensive decay and hollow; or

(B) Crown Development-unbalanced and lacking a full crown;

(ii) *Deciduous Trees*. A deciduous tree which meets any of the following criteria as determined by a certified arborist will not be

(A) Trunk Condition-extensive decay and hollow;

(B) Crown Development-unbalanced and lacking a full crown; or

(C) Structure-Two or more dead limbs.

October 4, 2022

Project #: 27813.0

Tony Doran  
 City of Tualatin  
 18880 SW Martinazzi Avenue  
 Tualatin, OR 97206

RE: Alden Apartments Townhome Redevelopment – Trip Generation and Distribution/Assignment Letter

Dear Tony:

ColRich (applicant) is proposing to redevelop a portion of the Alden Apartments located in the southeast corner of the SW Martinazzi Avenue/SW Sagert Street intersection in Tualatin. The development plan proposes to remove 15 apartment units and construct 45 townhome units and associated amenities. Access to the townhomes will be provided by the existing driveways to the Alden Apartments on SW Sagert Street and SW Martinazzi Avenue. No new driveways are proposed nor modifications to off-site intersections.

This letter provides trip generation and trip distribution/assignment estimates for the proposed redevelopment in accordance with Tualatin Development Code Section 74.440. As documented herein, the proposed redevelopment is estimated to generate fewer than 500 daily trips and fewer than 60 morning and evening peak hour trips. In addition, the proposed redevelopment is expected to generate fewer than 20 large truck trips per day. Therefore, a full transportation impact analysis is not expected to be required per Tualatin Development Code Section 74.440 and the following trip generation and trip distribution estimates are expected to satisfy the requirements of the Tualatin Development Code.

## TRIP GENERATION

Trip generation estimates were prepared for the proposed redevelopment based on information provided in the standard reference, *Trip Generation Manual, 11<sup>th</sup> Edition*, published by the Institute of Transportation Engineers (ITE, Reference 1). ITE land use code 220 (multi-family housing) was used as a basis for the existing apartments and ITE land use code 215 (single-family attached housing) was used as a basis for the proposed townhomes. Table 1 summarizes the vehicle trip generation estimates for the daily, weekday AM, and weekday PM peak hours.

**Table 1: Vehicle Trip Generation Estimates**

Land Use	ITE Code	Size (Units)	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
<b>Existing Use</b>									
Apartments	220	15	101	6	1	5	8	5	3
<b>Proposed Use</b>									
Townhomes	215	45	324	22	7	15	26	15	11
<b>Net New Trips (Proposed – Existing)</b>			<b>223</b>	<b>16</b>	<b>6</b>	<b>10</b>	<b>18</b>	<b>10</b>	<b>8</b>

As shown in Table 1, the proposed redevelopment is expected to result in a net increase of 223 daily trips, including 16 trips (6 inbound, 10 outbound) during the AM peak hour and 18 trips (10 inbound, 8 outbound) during the PM peak hour.



Table 2 summarizes the walk + bike + transit trip generation estimates for the daily, weekday AM, and weekday PM peak hours.

**Table 2: Walk + Bike + Transit Trip Generation Estimates**

Land Use	ITE Code	Size (Units)	Daily Trips <sup>1</sup>	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Existing Use									
Apartments	220	15	-	0	0	0	0	0	0
Proposed Use									
Townhomes	215	45	-	5	4	1	8	3	5
<b>Net New Trips (Proposed – Existing)</b>			<b>-</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>8</b>	<b>3</b>	<b>5</b>

1. ITE does not provide daily walk + bike + transit trip rates for ITE land use code 220 or 215.

## TRIP DISTRIBUTION/ASSIGNMENT

The net new vehicle trips shown in Table 1 were distributed onto the study area roadways based on a review of major trip origins and destinations in the study area. Figure 1 shows the estimated trip distribution pattern for the proposed redevelopment. Figure 1 also shows assignment of the net new vehicle trips at the existing driveways and the SW Martinazzi Avenue/SW Sagert Street intersection during the weekday AM and PM peak hours.

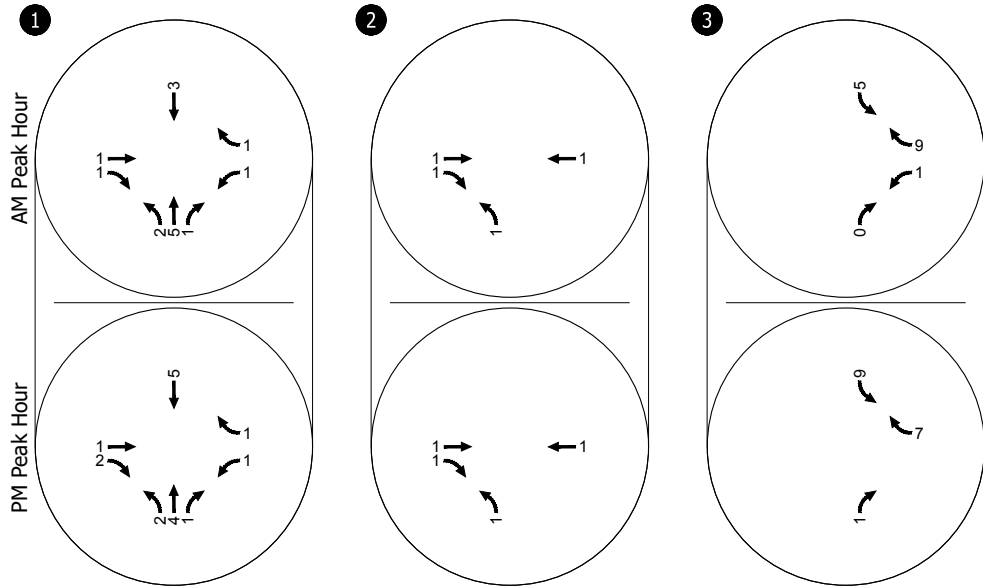
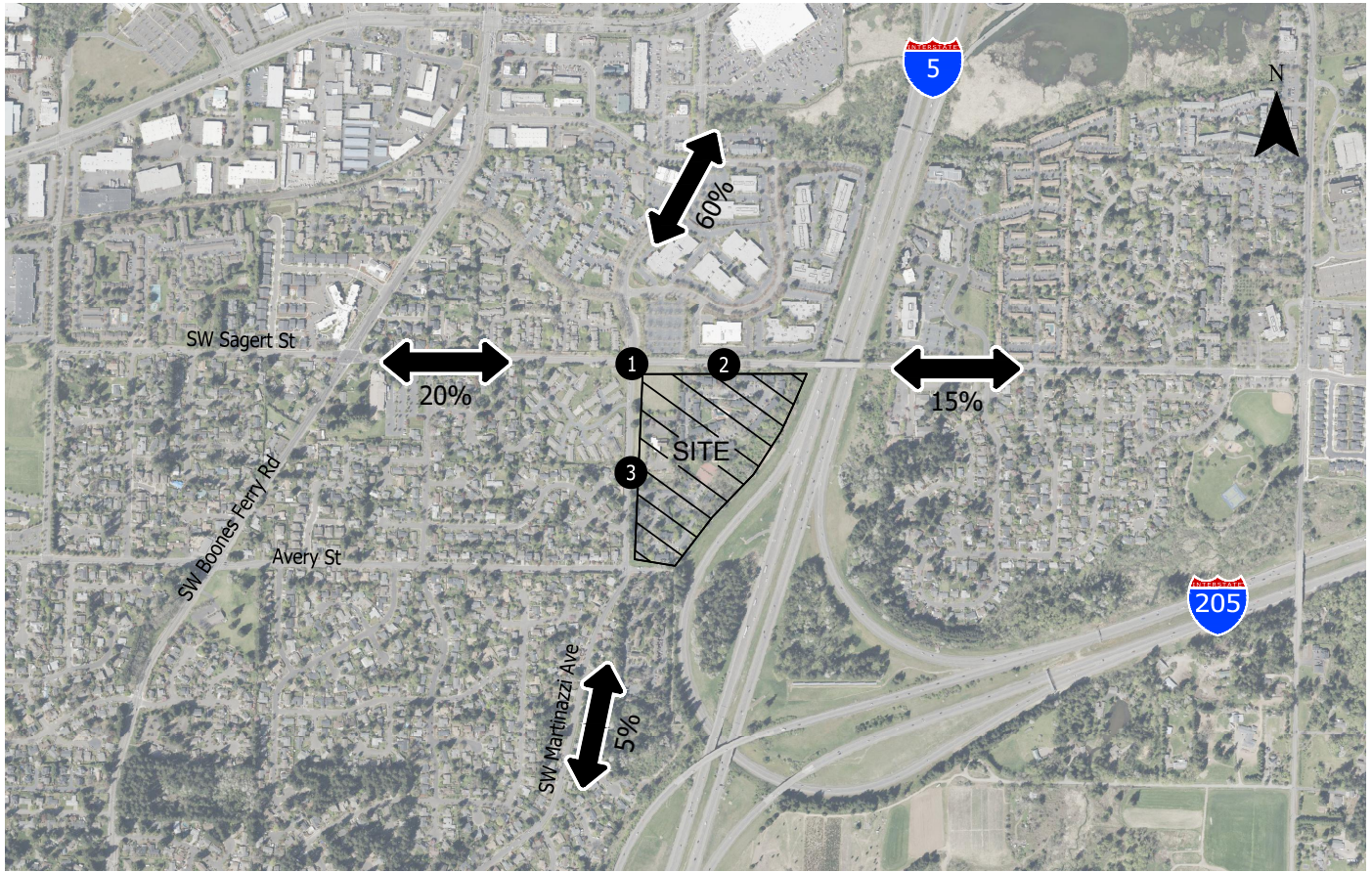
## SIGHT DISTANCE EVALUATION

A sight distance evaluation was conducted at the existing site-access driveways on SW Martinazzi Avenue and SW Sagert Street based on guidance provided in *A Policy on Geometric Design of Highways and Streets* (AASHTO, Reference 2). Per AASHTO, minimum intersection sight distance (ISD) recommendations are determined by several factors, including the design speed of the respective roadways. The posted speed limit on SW Martinazzi Avenue is 25 miles per hour (mph) and the posted speed limit on SW Sagert Street is 35 mph. Table 3 summarizes the minimum ISD recommendations for the site-access driveways based on the posted speed limit.

**Table 3: Sight Distance Evaluation Summary**

Intersection	Posted Speed Limit	AASHTO Minimum ISD Recommendations		Field Measurements	Met?
		Case B1, Left Turn from the Minor Road	Case B2, Right Turn from Stop		
SW Martinazzi Avenue/ Site-Access Driveway	25 MPH	280 Feet	240 Feet	450 feet (north) 280 feet (south)	Yes
SW Sagert Street/ Site-Access Driveway	35 MPH	390 Feet	335 Feet	390 Feet (east) 390 Feet (west)	Yes

ISD was measured at the site-access driveways in July 2022. Per AASHTO, ISD was measured 14.5 feet from the edge of the nearest travel lane, from a driver's eye height of 3.5 feet, to an object height of 3.5 feet above the roadway surface. As shown in Table 3, field measurements indicate that the minimum ISD requirements are met at both site-access driveways. The following photographs illustrate ISD at the existing site-access driveways.



Estimated Trip Distribution Pattern & Net New Site-Generated Trips  
 Weekday AM and PM Peak Hours  
 Tualatin, Oregon

Figure  
 1





SW Martinazzi Avenue (Facing North)



SW Martinazzi Avenue (Facing South)



SW Sagert Street (Facing West)



SW Sagert Street (Facing East)

## NEXT STEPS

We trust this letter provides you with sufficient information on the trip generation and distribution/assignment estimates associated with the proposed redevelopment and sight distance at the existing site-access driveways. Based on the findings herein, Tualatin Development Code Section 74.440 appears to be met. Please confirm that this letter satisfies applicable code criteria and that a full transportation impact analysis is not required.

Sincerely,  
**KITTELSON & ASSOCIATES, INC.**

Matt Bell  
Associate Planner  
503.535.7435  
[mbell@kittelson.com](mailto:mbell@kittelson.com)



## REFERENCES

1. Institute of Transportation Engineers. *Trip Generation Manual, 11<sup>th</sup> Edition*, 2021.
2. American Association of State Highway and Transportation Officials. *A Policy on Geometric Design of Highways and Streets, 7<sup>th</sup> Edition*. 2018

# 3J CONSULTING

CIVIL ENGINEERING | WATER RESOURCES | COMMUNITY PLANNING

# PRELIMINARY STORMWATER REPORT

Alden Apartments  
7800 SW Sagert Street & 20400 SW Martinazzi Avenue  
Tualatin, OR 97062

September 1, 2022

Prepared For:

Mathew Moiseve  
Colrich Multifamily  
444 West Beech Street, Suite 300  
San Diego, CA 92101



Prepared By:

3J Consulting, Inc.  
9600 SW Nimbus Avenue, Suite 100  
Beaverton, Oregon 97008  
Project No: 22791  
PJP

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## **DESIGNER'S CERTIFICATION & STATEMENT**

I hereby certify that this Preliminary Stormwater Management Report for the Alden Apartments development has been prepared by me or under my supervision and meets minimum standards of the City of Tualatin, Clean Water Services, ODOT, and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me.



## EXECUTIVE SUMMARY

The Alden Apartments project is proposed at 7800 SW Sagert Street & 20400 SW Martinazzi Avenue (tax lot 2S125BA0100), Tualatin, Washington County, Oregon. The property is 16.53 ac in size. This project is within the jurisdictions of City of Tigard and CWS. The project discharges to storm drain infrastructure within ODOT ROW.

This project proposes to redevelop 1.85 acres of the 16.53-ac lot. Proposed improvements include twelve (12) new apartment buildings, parking lots, other hardscaping, landscaping, and appurtenant utility improvements. Due to the amount of impervious area modified/created, stormwater management approaches must be proposed and will be addressed as follows:

- Water Quality Treatment
  - Two (2) Infiltration Planters are proposed to treat runoff from post-developed basins in the northern and southern portions of the site.
  - A Proprietary Treatment Device (BayFilter Manhole) is proposed to treat runoff from the post-developed basin consisting of the centrally located, main redevelopment area.
- Hydromodification Management
  - The proposed Infiltration Planters mentioned above will provide hydromodification management for their contributing basins.
  - A 10,500-cf Underground Infiltration Facility is proposed to provide hydromodification management for its contributing basin (main redevelopment area).
- Water Quantity Management
  - A Downstream Analysis will be included in the Final Stormwater Report. If downstream deficiencies exist, proposed detention/retention facilities will be designed to mitigate the 25-yr storm.
  - Since the project discharges to ODOT storm drain infrastructure, proposed detention/retention facilities will be designed to mitigate the 50-yr storm.

An Operations & Maintenance Plan will be provided in the Final Stormwater Report for all stormwater management facilities.

A Conveyance Analysis will be provided in the Final Stormwater Report demonstrating sufficient flow capacity in the proposed private storm drain systems.

Please refer to this project's Construction Plans for locations and construction details of all stormwater management facilities.

The purpose of this report is to accomplish the following.

- Describe pre- and post-developed basins and drainage;
- Describe the design and analysis of the proposed stormwater management facilities; and,
- Demonstrate compliance with City of Tualatin, Clean Water Services, and ODOT standards pertaining to stormwater management.





## PROJECT DESCRIPTION

The Alden Apartments project is proposed at 7800 SW Sagert Street & 20400 SW Martinazzi Avenue, Tualatin, Oregon. The property is 16.53 ac in size. This project is within the jurisdictions of City of Tigard and Clean Water Services (CWS). The project will also discharge to storm drain infrastructure within ODOT right-of-way (ROW).

This project proposes to redevelop 1.85 acres of the 16.53-ac lot. Proposed improvements include new apartment buildings, parking lots, other hardscaping, landscaping, and appurtenant utility improvements. Due to the amount of impervious area modified/created, stormwater management approaches must be proposed. Runoff from the project site ultimately discharges to Saum Creek.

The design and analysis of required stormwater management approaches will be per City of Tualatin standards, CWS' *Design & Construction Standards for Sanitary Sewer & Surface Water Management* (CWS D&C; 2019), and ODOT's *Hydraulics Design Manual* (Apr 2014).

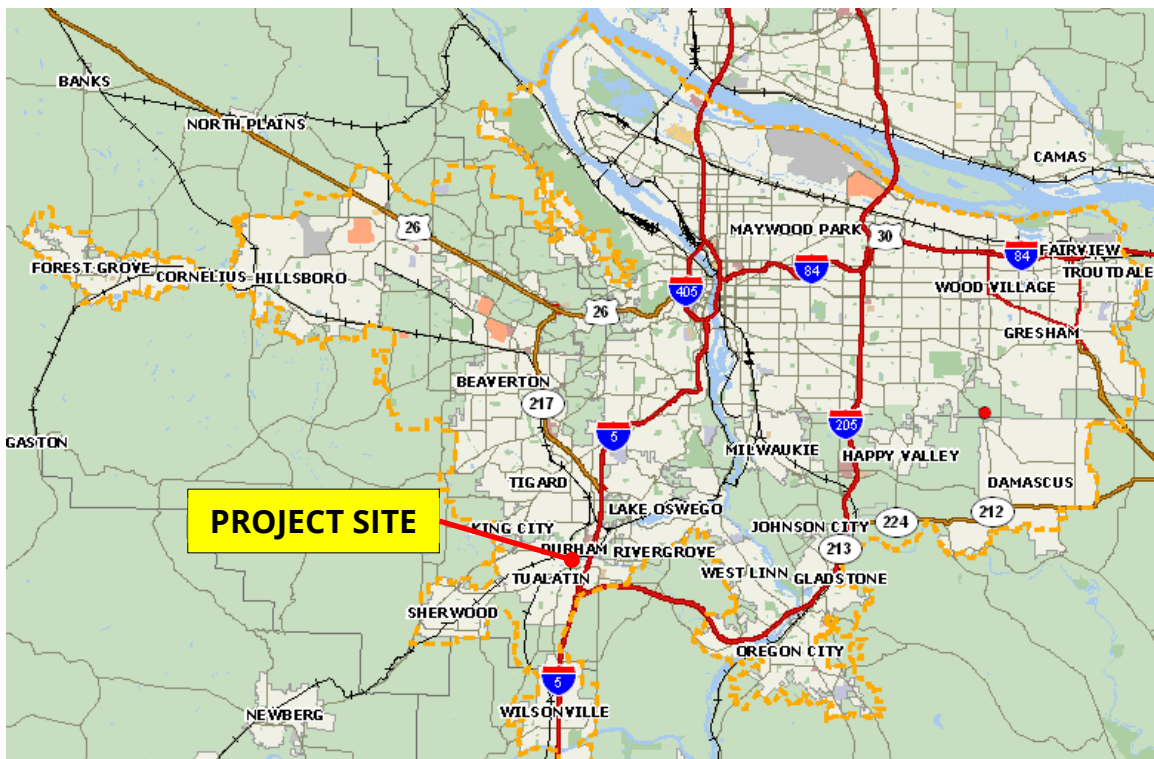


Figure 1 - Vicinity Map

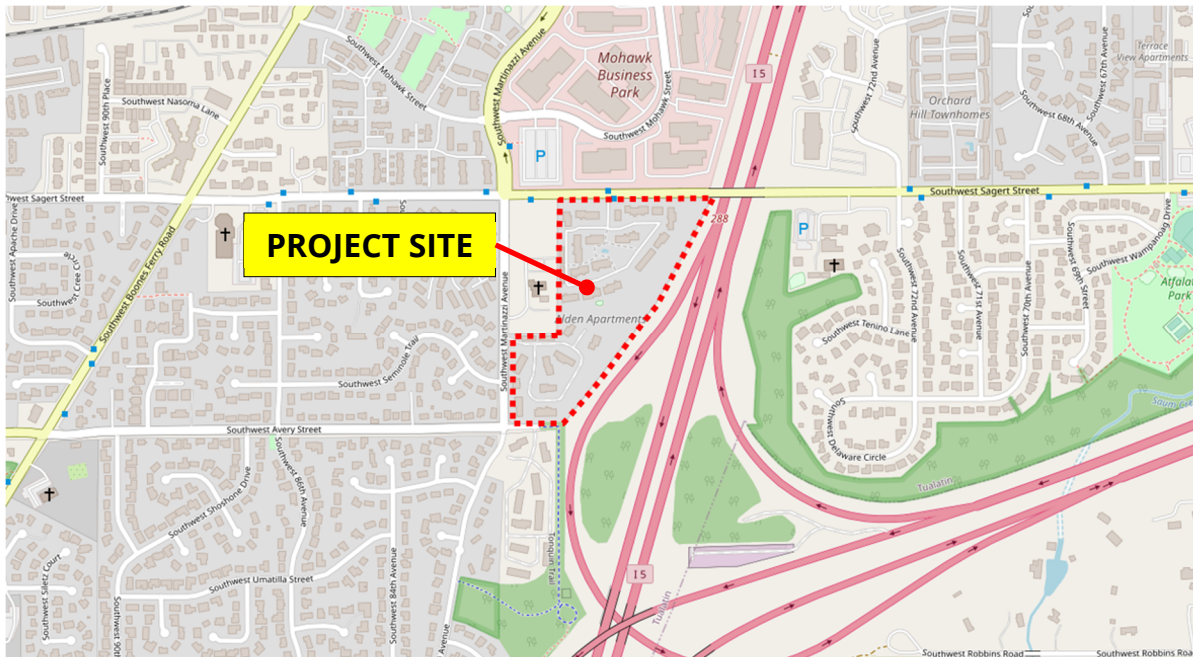


Figure 2 – Site Location

## EXISTING CONDITIONS

### Site

In existing conditions, the project site is occupied by The Alden apartment complex, consisting of multiple apartment buildings, parking lots, driveways, other hardscaping, and landscaping. The property has a size of 16.53 ac; however, this project will result in redeveloping 1.85 acres onsite (project site). The two onsite basketball courts, two adjacent apartment buildings, and the parking lot nearest the court will be demolished for this redevelopment.

The project site is noncontiguous and was divided into three (3) basins for design and analysis (see Technical Appendix: Exhibits – Existing Conditions). The basins were denoted as North Basin, Main Basin, and South Basin.

### Flood Map

The site is located within Zone X (unshaded) per flood insurance rate map (FIRM) community-panel number 41067C0607E (See Technical Appendix: Exhibits – FIRMette). FEMA's definition of Zone X (un-shaded) is an area of minimal flood hazard.

### Soil Type & Infiltration

USDA Web Soil Survey indicates that the project site is underlain with Hillsboro Loam, which is categorized as hydrologic soil group B (See Technical Appendix: Exhibits – Hydrologic Soil Group). Per CWS D&C, Hillsboro Loam is expected to have an infiltration rate of approximately 2 in/hr; therefore, infiltration-based facilities will be modeled with this design rate for preliminary sizing. Infiltration rates will be confirmed with further testing.

### Drainage

The project site either drains directly to the existing vegetated channel to the east or to the southeast corner of the property to two (2) existing catch basins, which proceed to discharge to the vegetated channel. The channel conveys flow to storm drain infrastructure within the ODOT right-of-way, which conveys flow easterly for approximately 0.5 miles and discharges to Saum Creek.

### Basin Areas

Table 1 shows the existing impervious and pervious areas for each basin (See Technical Appendix: Exhibits – Existing Conditions). All existing impervious areas in the basins are expected to be modified.

Basin	Impervious Area		Pervious Area		Subtotal Area	
	sf	ac	sf	ac	sf	ac
North	967	0.02	5,921	0.14	6,888	0.16
Main	30,356	0.70	35,260	0.81	65,616	1.51
South	1,907	0.04	6,000	0.14	7,907	0.18
Total	33,230	0.76	47,181	1.08	80,411	1.85

**Table 1 – Existing Basin Areas**

## POST-DEVELOPED CONDITIONS

### Site & Drainage

This project proposes twelve (12) new apartment buildings, parking lots, other hardscaping, landscaping, and appurtenance utilities. The project also proposes storm drain infrastructure to capture and convey runoff from the post-developed basins to stormwater management facilities before discharging to the vegetated channel to the east as in existing conditions (see Technical Appendix: Exhibits – Post-Developed Conditions).

### Basin Areas

Table 2 shows the post-developed impervious and pervious areas for each basin (See Technical Appendix: Exhibits – Post-Developed Conditions).

Basin	Impervious Area		Pervious Area		Subtotal Area	
	sf	ac	sf	ac	sf	ac
North	6,428	0.15	460	0.01	6,888	0.16
Main	58,146	1.33	7,470	0.17	65,616	1.51
South	6,836	0.16	1,071	0.02	7,907	0.18
Total	71,410	1.64	9,001	0.21	80,411	1.85

**Table 2 – Post-Developed Basin Areas**

When comparing Tables 1 & 2, the project proposes 38,180 sf (i.e., 71,410 – 33,230) of new impervious area.

## HYDROLOGIC ANALYSIS

### Design Guidelines

The site is located within the jurisdictions of the City of Tualatin and Clean Water Services (CWS), and discharges to storm drain infrastructure under ODOT jurisdiction. The guidelines used for the design of this project reflect current City of Tualatin standards, CWS D&C, and ODOT *Hydraulics Design Manual*.

### Hydrograph Method

Naturally occurring rainstorms dissipate over long periods of time. An effective way of estimating storm rainfall is by using the hydrograph method. The Santa Barbara Urban Hydrograph (SBUH) method was used to develop runoff rates, which follows City, CWS, and ODOT standards. The computer software XPSTORM was used to perform SBUH calculations to compare predeveloped and post-developed runoff responses.





## Design Storms

The Type 1A rainfall distribution (24-hr duration) was used in conjunction with the SBUH. Table 3 shows total precipitation depths referenced from the CWS D&C, which were used as multipliers for the Type 1A distribution to develop the rainfall distribution for each recurrence interval.

Recurrence Interval (yr)	Precipitation Depth (in)
2	2.50
5	3.10
10	3.45
25	3.90
50	4.20

**Table 3 – Design Storms**

## Curve Number

The curve number represents runoff potential from the ground. The major factors for determining runoff curve numbers (CN) are hydrologic soil group, cover type, treatment, hydrologic condition, and antecedent runoff condition. Table 2-2a from the TR-55 *Urban Hydrology for Small Watersheds* manual was used to determine the appropriate curve numbers (See Technical Appendix: Exhibits – Curve Numbers).

As indicated previously, the site is underlain by soil type B. In predeveloped conditions, pervious areas were modeled with a CN of 55, which is associated with woods in good condition. Per CWS D&C, modified impervious areas were modeled with a CN of 75. In post-developed conditions, pervious areas were modeled with a CN of 61, which is associated with lawn in good condition. Impervious areas were modeled with a CN of 98.

## Time of Concentration

In accordance with the CWS D&C, the predeveloped time of concentration (Tc) was evaluated per the USDA's TR-55 manual. The Tc's for North, Main, and South Basins were calculated to be 9, 7, and 8 minutes, respectively (See Technical Appendix: Calculations – Time of Concentration). For conservativeness, a Tc of 10 minutes was assumed for all predeveloped basins. The post-developed Tc for all basins was assumed to be 5 minutes.

## Basin Runoff

Pre- and post-developed peak runoff rates for each basin, evaluated using SBUH, are shown in Table 4 (See Technical Appendix: Hydrographs).

Recurrence Interval (yr)	North Basin Peaks (cfs)			Main Basin Peaks (cfs)			South Basin Peaks (cfs)		
	Pre	Post	Incr.	Pre	Post	Incr.	Pre	Post	Incr.
2	0.004	0.090	0.086	0.063	0.769	0.706	0.002	0.085	0.083
5	0.008	0.113	0.105	0.125	0.964	0.839	0.004	0.107	0.103
10	0.010	0.127	0.117	0.166	1.079	0.913	0.005	0.120	0.115
25	0.014	0.145	0.001	0.222	1.232	1.010	0.007	0.136	0.129
50	0.018	0.157	0.139	0.271	1.335	1.064	0.010	0.147	0.137

**Table 4 – Peak Runoff Rates**



# WATER QUALITY TREATMENT

## Design Criteria

Per CWS D&C, stormwater treatment facilities are required to be designed to treat all runoff produced during the water quality storm event. CWS defines this event as 0.36" of precipitation falling over 4 hours with a return period of 96-hours.

## Required Treatment Area

Per CWS D&C, the impervious area requiring water quality treatment is evaluated as the new impervious area plus three times the modified impervious area; the calculation is shown below. It was previously indicated that the project results in 38,180 and 33,230 sf of new and modified impervious area, respectively.

$$\begin{aligned} \text{Required Treatment Area} &= \text{New Impervious Area} + 3 \times \text{Modified Impervious Area} \\ &= 38,180 \text{ sf} + 3 \times 33,230 \text{ sf} = 137,870 \text{ sf} \end{aligned}$$

The calculated treatment area exceeds the post-developed impervious area (i.e., 71,410 sf); therefore, the required treatment area is 71,410 sf.

## LIDA Feasibility

Per Section 4.05 of the CWS D&C, new development shall reduce its hydrologic impacts through Low Impact Development Approaches (LIDA) unless the criteria in 4.05.2 apply.

## Water Quality Approaches

### Infiltration Planters

Infiltration Planters are proposed to treat runoff from North & South Basins (see Technical Appendix: Exhibits – Post-Developed Conditions). The facilities were modeled in XPSTORM to demonstrate that all runoff produced during the water quality storm will be filtered through the growing medium with no overflow bypass.

Each Planter will consist of 18" of surface ponding, 18" of growing medium, and 18" of drain rock. Overflow will be managed by an 18"-diameter beehive structure with RIM 12" above the bottom of the surface pond; this provides 6" of freeboard. The infiltration rate for the growing medium is assumed to be 2 in/hr. The porosity of the drain rock is assumed to be 40%. Table 5 outlines the resulting ponding depths within the Planters.

Post-Dev. Basin	CIA (sf)	Infiltration Planters	
		Area (sf)	WQ Ponding (in) <sup>(1)</sup>
North	6,428	520	0.6
South	6,836	500	0.6

**Table 5 – Infiltration Planters (WQ Compliance)**

<sup>(1)</sup>Ponding during WQ storm (see Technical Appendix: Hydrographs – Stage Hydrographs)

The table above demonstrates that all runoff during the water quality storm is expected to infiltrate through the growing medium without bypass.

### Proprietary Treatment Device

Due to site constraints, a BayFilter Manhole (Proprietary Treatment Device) is proposed to treat runoff from the Main Basin prior to discharging to an Underground Infiltration Facility (see Technical Appendix: Exhibits – Post-Developed Conditions). The treatment manhole will be equipped with BayFilter 545 cartridges, which have a treatment capacity of 45 gpm (0.10 cfs). The following equation was used in conjunction with the water quality storm event to determine the water quality flow rate for the treatment manhole.



$$\text{Water Quality Flow (WQF)} = (\text{Required Treatment Area, sf}) \times 0.36'' \times (1 \text{ ft}/12 \text{ in}) / (4 \text{ hr} \times 3600 \text{ sec}/1 \text{ hr})$$

$$= (58,146 \text{ sf}) \times 0.36'' \times (1 \text{ ft}/12 \text{ in}) / (4 \text{ hr} \times 3600 \text{ sec}/1 \text{ hr}) = \underline{0.12 \text{ cfs}}$$

Two (2) BayFilter 545 cartridges can be implemented to treat the WQF above. The treatment capacity of this facility is 0.20 cfs.

Summary of Approaches

Table 6 summarizes the provided treatment by each proposed approach.

Post-Dev. Basin	Water Quality Approach	Impervious Area (sf)
North	Infiltration Planter	6,428
Main	Proprietary Treatment Device	58,146
South	Infiltration Planter	6,836
Total	-	71,410

**Table 6 - Summary of Approaches**

The table indicates that the proposed water quality approaches are expected to sufficiently treat the Required Treatment Area.

Pretreatment Manhole

A pretreatment manhole, per CWS Standard Dwg. No. 250, is proposed upstream of the BayFilter Manhole. Inline pretreatment manholes are sized using the 25-year post-developed runoff rate for the contributing drainage area. As indicated in Table 4, the 25-yr peak flow for Main Basin was evaluated to be 1.23 cfs. Per CWS D&C, the following equation was used to size the manhole.

$$\text{Sump Volume} = (20 \text{ cf}/1 \text{ cfs}) \times (25\text{-yr Peak Flow}) = (20 \text{ cf}/1 \text{ cfs}) \times 1.23 \text{ cfs} = 24.6 \text{ cf}$$

Assuming a 60" manhole, this sump volume results in a required sump depth of 1.25 ft. The sump depth will be rounded up to minimum 3 ft, which will be proposed below the invert of the snout.

**HYDROMODIFICATION MANAGEMENT**

**Hydromodification Assessment**

Per the CWS D&C, a Hydromodification Assessment was performed to determine the Project Category of the project site. It was established previously that runoff from the project site ultimately discharges to Saum Creek. The assessment was based on the following factors.

- Reach-Specific Risk Level – The CWS Hydromod Planning Tool indicates that the receiving reach within Saum Creek has a “Moderate” Risk Level.
- Development Class – The CWS Hydromod Planning Tool indicates that the entire project site has a Development Class of “Developed”.
- Project Size – Project Size is based on the new & modified impervious areas created by the project. The total new and modified impervious area results in a “Medium” Project Size.

Based on the contributing factors above, this project is considered to be Category 2.

**Hydromodification Approaches**

Infiltration Planters

Infiltration LIDA Facilities will be implemented to the maximum extent practicable. The two (2) Infiltration Planters per Table 5 will also serve as hydromodification approaches and be designed per Standard Sizing. Each Planter will capture runoff generated from the 10-yr, 24-hr storm from its contributing basin and





infiltrate the volume within 36 hours. Table 7 shows the evaluated peak ponding depths during the 10-yr storm for each Planter.

Post-Dev. Basin	CIA (sf)	Infiltration Planters	
		Area (sf)	10-yr Ponding (in) <sup>(1)</sup>
North	6,428	520	10.1
South	6,836	500	9.6

**Table 7 - Infiltration Planters (Hydromod Compliance)**

<sup>(1)</sup>Ponding during 10-yr storm (see Technical Appendix: Hydrographs – Stage Hydrographs)

The table above demonstrates that there is no expected overflow bypass during 10-yr storm in each Planter; all flow is expected to infiltrate through the growing medium and into the underlying soil

Underground Infiltration Facility

Runoff from Main Basin will be managed by a proposed Underground Infiltration Facility. Assuming a design infiltration rate of 2 in/hr for the native soil, it was demonstrated that a facility with an area of 2,100 sf and maximum depth of 5 ft (i.e., 10,500-cf storage capacity) would sufficiently detain the 10-yr runoff volume and infiltrate it within 36 hours. The 10-yr peak ponding depth within this facility was evaluated to be 3.90 ft (see Technical Appendix: Hydrographs – Stage Hydrographs).

**DOWNSTREAM ANALYSIS**

Per TMC 3-5-210, a Review of the Downstream System must be performed to demonstrate public storm lines flowing at a maximum 82% full. The analysis will extend downstream to a point at which the runoff from the development in a build out condition is less than 10% of the total runoff of the basin in its current development status; the analysis will extend downstream for at least 1/4-mile. The downstream system will be analyzed for the 2-, 5-, 10- and 25-yr storm events.

Data on the downstream system has been requested and the Review of the Downstream System will be provided in the Final Stormwater Report. If downstream deficiencies exist, onsite detention/retention facilities will be sized to mitigate the 25-yr, 24-hr peak flow in addition to other water quantity management requirements.

**WATER QUANTITY MANAGEMENT**

All runoff for up to and including the 10-yr storm event is expected to be infiltrated in the Planters and Underground Infiltration Facility to comply with hydromodification requirements. Results of the Downstream Analysis may require detention of the 25-yr, 24-hr storm event. Furthermore, since the project is discharging to ODOT storm drain infrastructure, the post-developed 50-yr, 24-hr peak flow must be mitigated to predeveloped levels.

Table 8 outlines the required release rates for each basin (or cumulatively if over-detention is needed). Full details of the detention/retention facilities will be provided in the Final Stormwater Report.



Post-Dev. Basin	Predev. Runoff Rates (cfs)	
	25-yr	50-yr
North	0.014	0.018
Main	0.222	0.271
South	0.007	0.010
Total	0.243	0.299

**Table 8 – Required Release Rates**

## CONVEYANCE ANALYSIS

Conveyance calculations will be provided in the Final Stormwater Report that demonstrates sufficient flow capacity in proposed private storm drain systems during the 25-yr storm and overland flow to the public stormwater system during the 100-yr storm in accordance with City and CWS standards.

## OPERATIONS & MAINTENANCE

An Operations & Maintenance (O&M) Plan will be prepared and provided in the Final Stormwater Report for any proposed privately maintained stormwater management facilities. The O&M Plan will be prepared per CWS D&C.

## REFERENCES

1. *Design & Construction Standards for Sanitary Sewer & Surface Water Management*. December 2019, Clean Water Services
2. *Urban Hydrology for Small Watersheds (Technical Release 55)*. June 1986, U.S. Department of Agriculture

## TECHNICAL APPENDIX

### Exhibits

- FIRMette
- Hydrologic Soil Group
- Curve Numbers
- Existing Conditions
- Post-Developed Conditions

### Calculations

- Time of Concentration

### Hydrographs

- Runoff Hydrographs
- Stage Hydrographs

**Downstream Analysis** (Will be included in Final Stormwater Report)

**Operations & Maintenance Plan** (Will be included in Final Stormwater Report)



# EXHIBITS



# National Flood Hazard Layer FIRMette



122°45'56"W 45°22'42"N



Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

122°45'18"W 45°22'17"N

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- |                                    |  |  |
|------------------------------------|--|--|
| <b>SPECIAL FLOOD HAZARD AREAS</b>  |  | Without Base Flood Elevation (BFE)<br><i>Zone A, V, A99</i>  |
|                                    |  | With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>   |
|                                    |  | Regulatory Floodway  |
| <b>OTHER AREAS OF FLOOD HAZARD</b> |  | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i> |
|                                    |  | Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>  |
|                                    |  | Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>  |
|                                    |  | Area with Flood Risk due to Levee <i>Zone D</i>  |
| <b>OTHER AREAS</b>                 |  | NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>   |
|                                    |  | Effective LOMRs  |
| <b>GENERAL STRUCTURES</b>          |  | Area of Undetermined Flood Hazard <i>Zone D</i>  |
|                                    |  | Channel, Culvert, or Storm Sewer   |
|                                    |  | Levee, Dike, or Floodwall  |
| <b>OTHER FEATURES</b>              |  | 20.2 Cross Sections with 1% Annual Chance  |
|                                    |  | 17.5 Water Surface Elevation   |
|                                    |  | Coastal Transect   |
|                                    |  | Base Flood Elevation Line (BFE)  |
|                                    |  | Limit of Study   |
| <b>MAP PANELS</b>                  |  | Jurisdiction Boundary  |
|                                    |  | Coastal Transect Baseline  |
|                                    |  | Profile Baseline   |
|                                    |  | Hydrographic Feature   |
|                                    |  | Digital Data Available   |
|                                    |  | No Digital Data Available  |
|                                    |  | Unmapped   |
|                                    |  | The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.                                     |



This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **7/5/2022 at 5:23 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

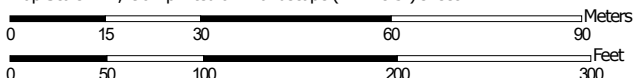
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



Hydrologic Soil Group—Washington County, Oregon



Map Scale: 1:1,190 if printed on A landscape (11" x 8.5") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84



### MAP LEGEND

**Area of Interest (AOI)**









 Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

**Soil Rating Lines**

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

**Soil Rating Points**






-  A
-  A/D
-  B
-  B/D

-  C
-  C/D
-  D
-  Not rated or not available

**Water Features**

 Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

**Warning:** Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, Oregon  
 Survey Area Data: Version 21, Oct 27, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 16, 2021—Apr 18, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
21B	Hillsboro loam, 3 to 7 percent slopes	B	0.9	12.3%
21C	Hillsboro loam, 7 to 12 percent slopes	B	6.5	87.7%
<b>Totals for Area of Interest</b>			<b>7.4</b>	<b>100.0%</b>

### Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

### Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule: Higher*

**Table 2-2a** Runoff curve numbers for urban areas <sup>1/</sup>

Cover description	Average percent impervious area <sup>2/</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
Open space (lawns, parks, golf courses, cemeteries, etc.) <sup>3/</sup> :					
Poor condition (grass cover < 50%) .....		68	79	86	89
Fair condition (grass cover 50% to 75%) .....		49	69	79	84
Good condition (grass cover > 75%) .....		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way) .....		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way) .....		98	98	98	98
Paved; open ditches (including right-of-way) .....		83	89	92	93
Gravel (including right-of-way) .....		76	85	89	91
Dirt (including right-of-way) .....		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) <sup>4/</sup> .....		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders) .....		96	96	96	96
Urban districts:					
Commercial and business .....	85	89	92	94	95
Industrial .....	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses) .....	65	77	85	90	92
1/4 acre .....	38	61	75	83	87
1/3 acre .....	30	57	72	81	86
1/2 acre .....	25	54	70	80	85
1 acre .....	20	51	68	79	84
2 acres .....	12	46	65	77	82

**Developing urban areas**

Newly graded areas  
(pervious areas only, no vegetation) <sup>5/</sup> .....

	77	86	91	94
--	----	----	----	----

Idle lands (CN's are determined using cover types  
similar to those in table 2-2c).

<sup>1</sup> Average runoff condition, and  $I_a = 0.2S$ .

<sup>2</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4</sup> Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

<sup>5</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.



**Table 2-2c** Runoff curve numbers for other agricultural lands <sup>1/</sup>

Cover description	Hydrologic condition	Curve numbers for hydrologic soil group			
		A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. <sup>2/</sup>	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. <sup>3/</sup>	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 <sup>4/</sup>	48	65	73
Woods—grass combination (orchard or tree farm). <sup>5/</sup>	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. <sup>6/</sup>	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 <sup>4/</sup>	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

<sup>1</sup> Average runoff condition, and  $I_a = 0.2S$ .

<sup>2</sup> **Poor:** <50% ground cover or heavily grazed with no mulch.

**Fair:** 50 to 75% ground cover and not heavily grazed.

**Good:** > 75% ground cover and lightly or only occasionally grazed.

<sup>3</sup> **Poor:** <50% ground cover.

**Fair:** 50 to 75% ground cover.

**Good:** >75% ground cover.

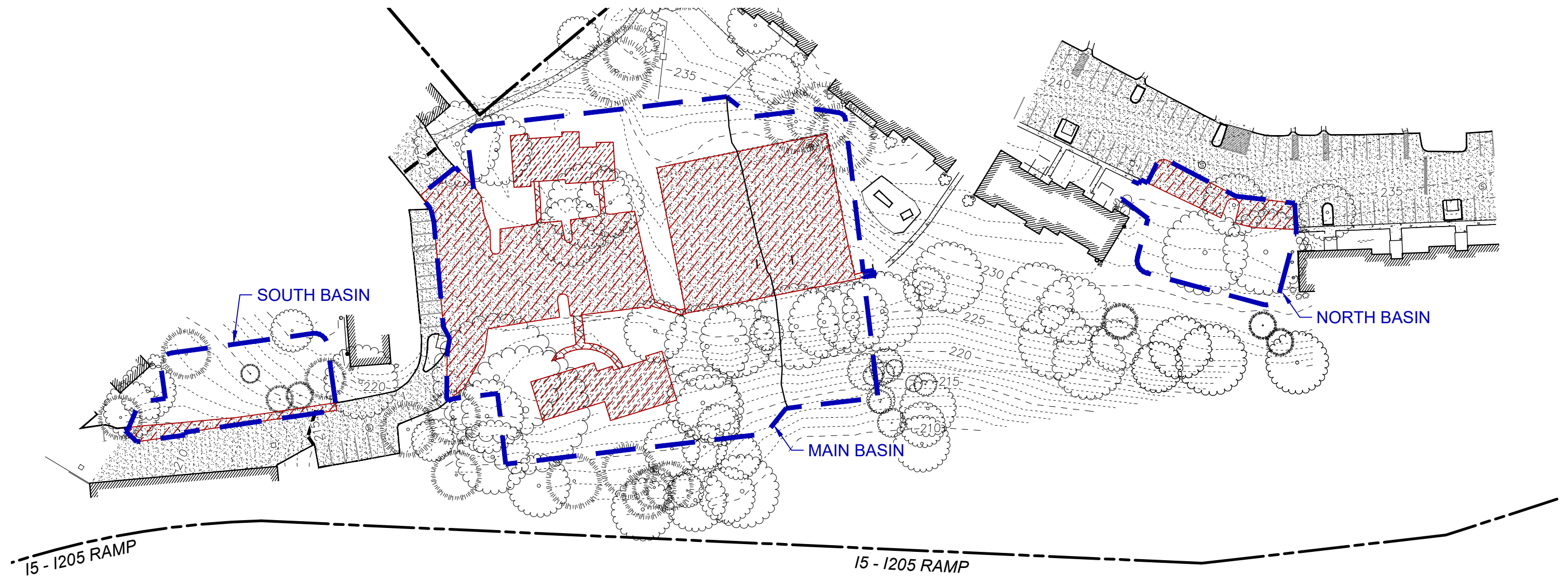
<sup>4</sup> Actual curve number is less than 30; use CN = 30 for runoff computations.

<sup>5</sup> CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

<sup>6</sup> **Poor:** Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

**Fair:** Woods are grazed but not burned, and some forest litter covers the soil.

**Good:** Woods are protected from grazing, and litter and brush adequately cover the soil.

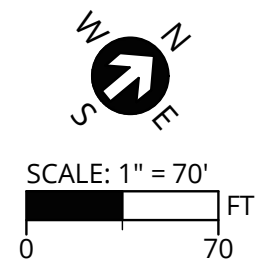


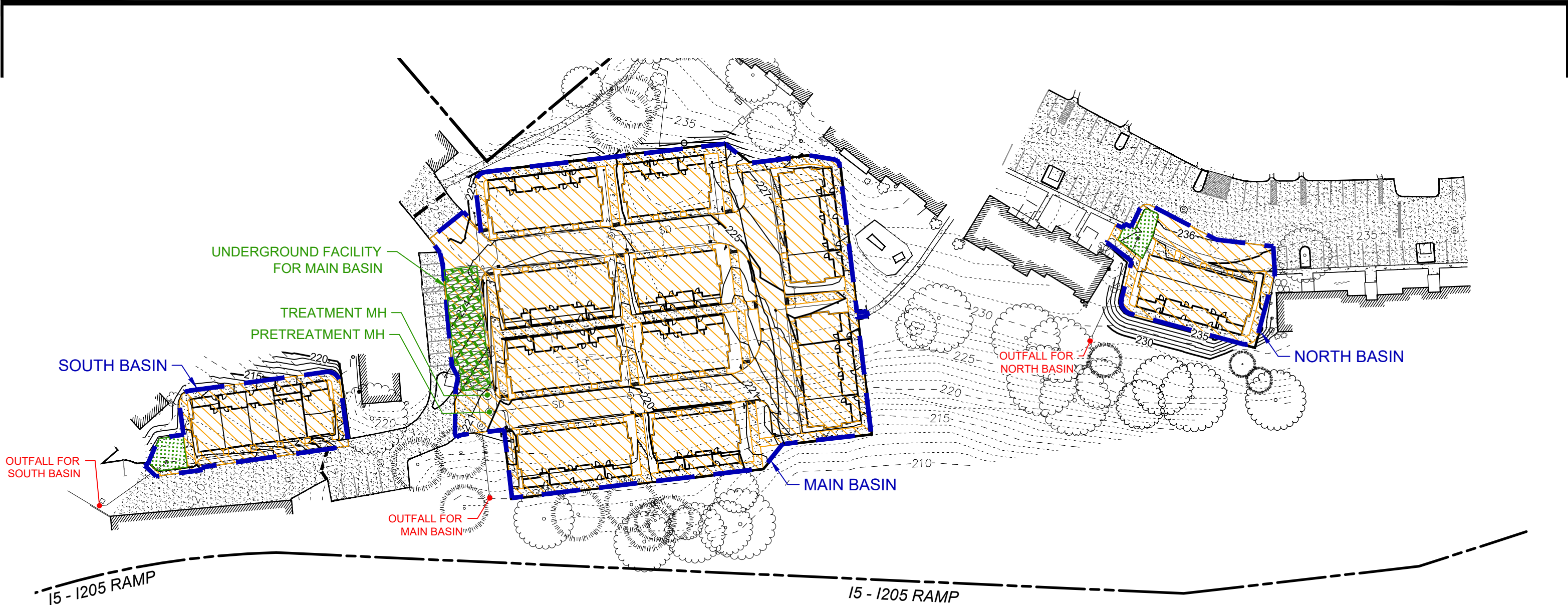
**LEGEND**

- - - - BASIN BOUNDARY
- / / / / MODIFIED IMPERVIOUS AREA





**EXISTING BASIN AREAS**

	Impervious		Pervious		Total	
	sf	ac	sf	ac	sf	ac
South	967	0.02	5,921	0.14	6,888	0.16
Main	30,356	0.70	35,260	0.81	65,616	1.51
North	1,907	0.04	6,000	0.14	7,907	0.18
<b>Total</b>	<b>33,230</b>	<b>0.76</b>	<b>47,181</b>	<b>1.08</b>	<b>80,411</b>	<b>1.85</b>



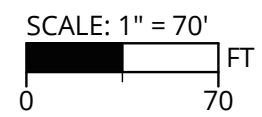


**LEGEND**

-  BASIN BOUNDARY
-  IMPERVIOUS AREA
-  INFILTRATION PLANTER
-  UNDERGROUND INFILTRATION FACILITY

**POST-DEVELOPED BASIN AREAS**

	Impervious		Pervious		Total	
	sf	ac	sf	ac	sf	ac
South	6,428	0.15	460	0.01	6,888	0.16
Main	58,146	1.33	7,470	0.17	65,616	1.51
North	6,836	0.16	1,071	0.02	7,907	0.18
<b>Total</b>	<b>71,410</b>	<b>1.64</b>	<b>9,001</b>	<b>0.21</b>	<b>80,411</b>	<b>1.85</b>





# CALCULATIONS



# TIME OF CONCENTRATION

PROJECT NO. <span style="color: red;">22791</span>	BY PJP	DATE 9/1/2022
--	--------	---------------

## SHEET FLOW

INPUT	Predev. North Basin	Predev. Main Basin	Predev. South Basin
Surface Description	Type <span style="color: red;">9</span> Woods (light_underbrush)	Type <span style="color: red;">9</span> Woods (light_underbrush)	Type <span style="color: red;">9</span> Woods (light_underbrush)
Manning's "n"	0.4	0.4	0.4
Flow Length, L	<span style="color: red;">50</span> ft	<span style="color: red;">50</span> ft	<span style="color: red;">50</span> ft
2-Yr 24 Hour Rainfall, P <sub>2</sub>	<span style="color: red;">2.5</span> in	<span style="color: red;">2.5</span> in	<span style="color: red;">2.5</span> in
Land Slope, s	<span style="color: red;">0.070</span> ft/ft	<span style="color: red;">0.120</span> ft/ft	<span style="color: red;">0.110</span> ft/ft
OUTPUT			
Travel Time	0.14 hr	0.11 hr	0.12 hr

## SHALLOW CONCENTRATED FLOW

INPUT	VALUE	VALUE	VALUE
Surface Description	<span style="color: red;">Unpaved</span>	<span style="color: red;">Unpaved</span>	<span style="color: red;">Unpaved</span>
Flow Length, L	<span style="color: red;">26</span> ft	<span style="color: red;">175</span> ft	<span style="color: red;">120</span> ft
Watercourse Slope*, s	<span style="color: red;">0.090</span> ft/ft	<span style="color: red;">0.080</span> ft/ft	<span style="color: red;">0.050</span> ft/ft
OUTPUT			
Average Velocity, V	4.84 ft/s	4.56 ft/s	3.61 ft/s
Travel Time	0.001 hr	0.011 hr	0.009 hr

## CHANNEL FLOW

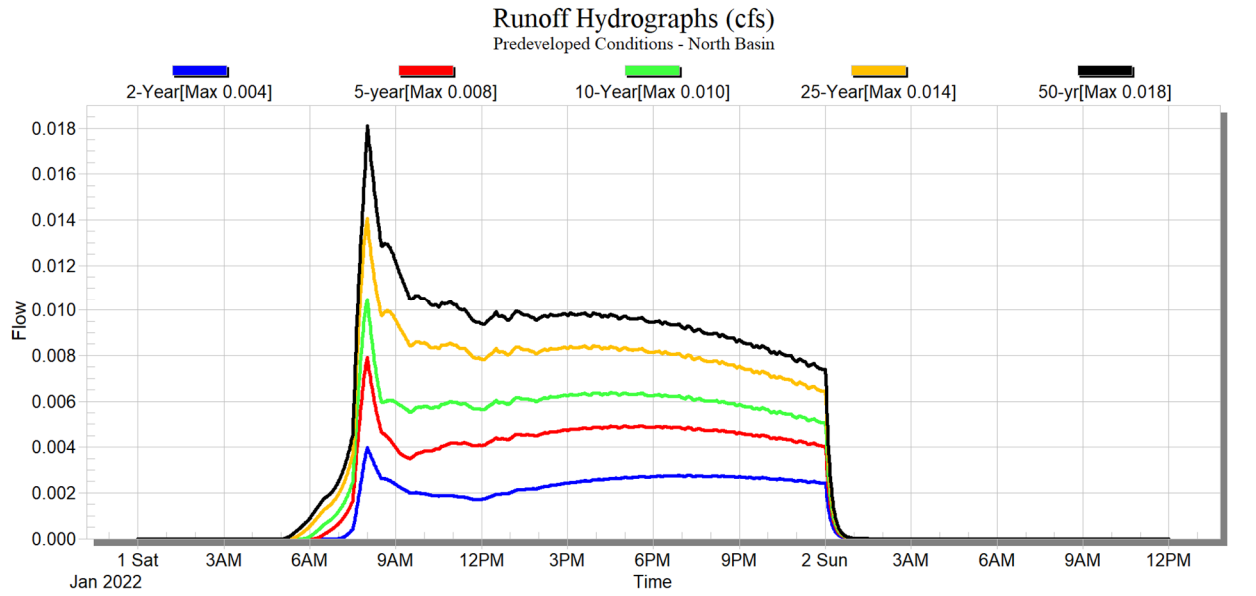
INPUT	VALUE	VALUE	VALUE
Cross Sectional Flow Area, a	<span style="color: red;">0</span> ft <sup>2</sup>	<span style="color: red;">0</span> ft <sup>2</sup>	<span style="color: red;">0</span> ft <sup>2</sup>
Wetted Perimeter, P <sub>w</sub>	<span style="color: red;">0</span> ft	<span style="color: red;">0</span> ft	<span style="color: red;">0</span> ft
Channel Slope, s	<span style="color: red;">0</span> ft/ft	<span style="color: red;">0</span> ft/ft	<span style="color: red;">0</span> ft/ft
Manning's "n"	<span style="color: red;">0.24</span>	<span style="color: red;">0.24</span>	<span style="color: red;">0.24</span>
Flow Length, L	<span style="color: red;">0</span> ft	<span style="color: red;">0</span> ft	<span style="color: red;">0</span> ft
OUTPUT			
Average Velocity	0.00 ft/s	0.00 ft/s	0.00 ft/s
Hydraulic Radius, r = a / P <sub>w</sub>	1.00 ft	1.00 ft	1.00 ft
Travel Time	0.00 hr	0.00 hr	0.00 hr
Watershed or Subarea T <sub>c</sub> =	<span style="color: red;">0.14</span> hr	<span style="color: red;">0.12</span> hr	<span style="color: red;">0.13</span> hr
Watershed or Subarea T <sub>c</sub> =	<span style="color: red;">9</span> minutes	<span style="color: red;">7</span> minutes	<span style="color: red;">8</span> minutes

# HYDROGRAPHS

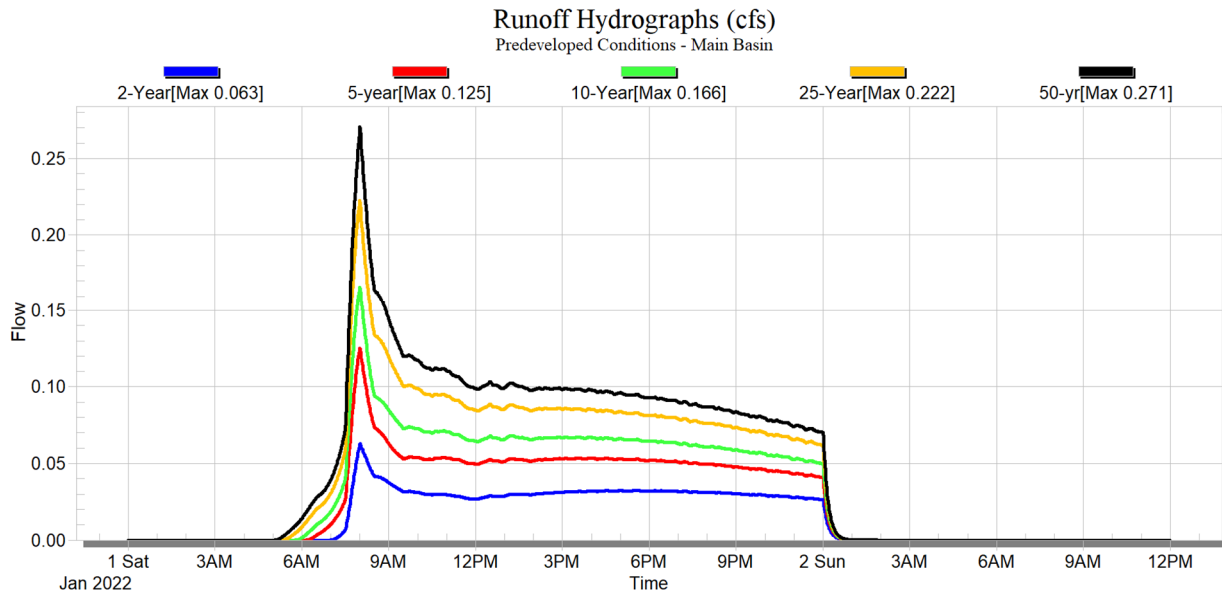


# Predeveloped Runoff Hydrographs

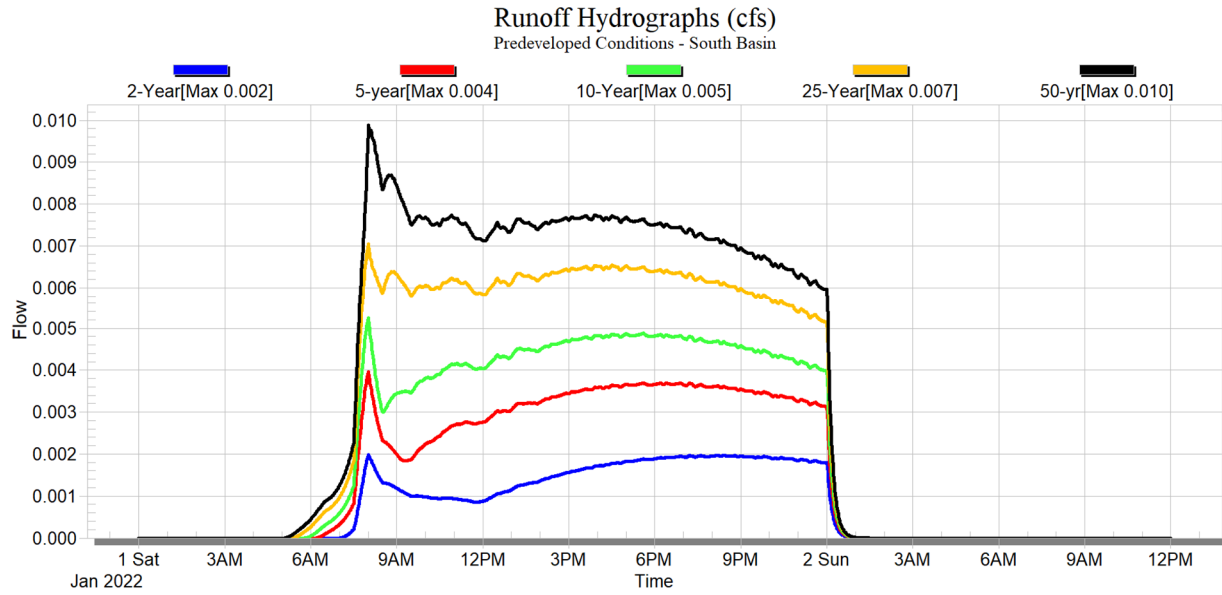
## North Basin



## Main Basin

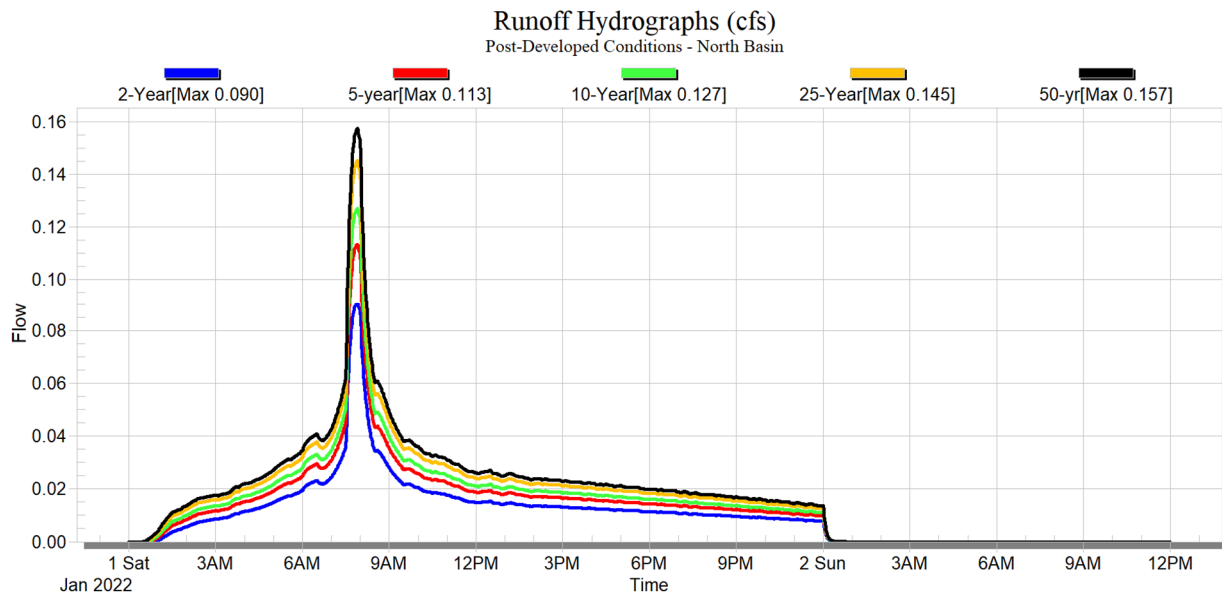


South Basin

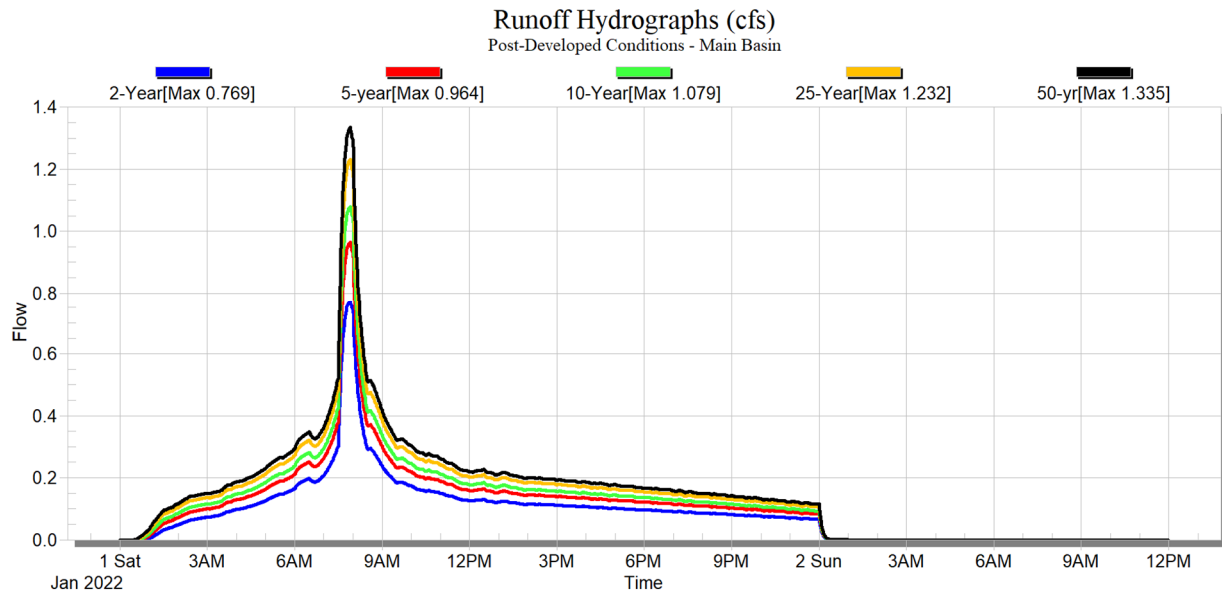


Post-Developed Runoff Hydrographs

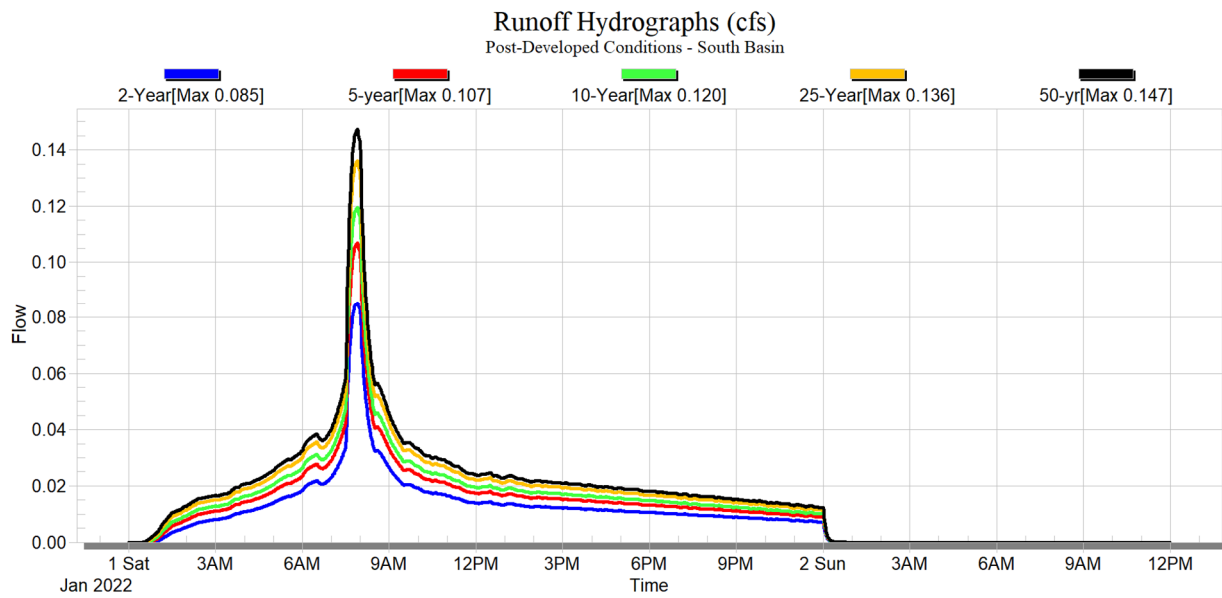
North Basin



## Main Basin



## South Basin





## Stage Hydrographs

A design infiltration rate of 2 in/hr is assumed for both growing medium (in Planters) and native soil.

The Infiltration Planters for the North & South Basins assume:

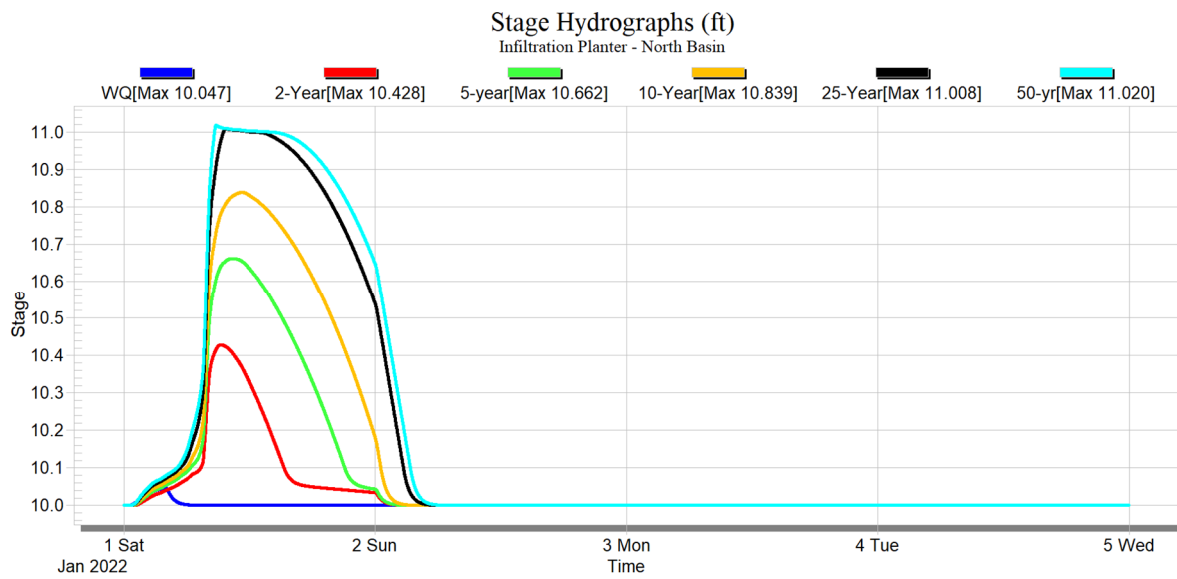
- Elevation of bottom of surface ponding is 10 ft as reference for modeling purposes.
- 18" each for surface ponding, growing medium, and drain rock depths.
- Overflow Beehive RIM is 12" above bottom of surface ponding providing 6" of freeboard.
- Drain rock has a porosity of 40%.

The Underground Infiltration Facility for Main Basin assumes:

- Elevation of bottom of facility is 0 ft
- Maximum depth of 5 ft.

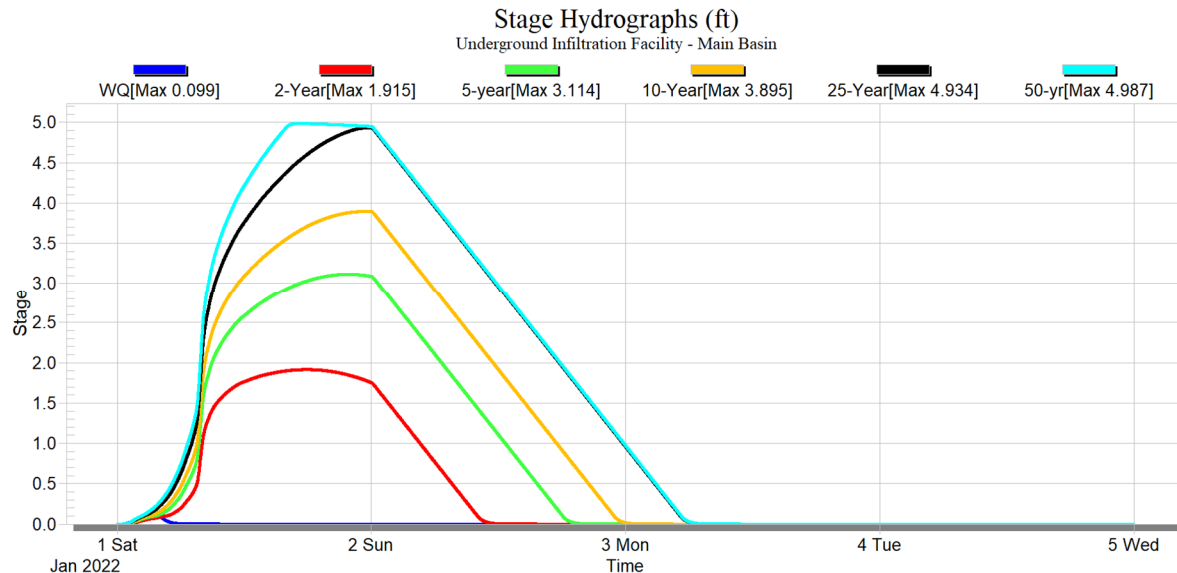
### Infiltration Planter – North Basin

Planter Area = 520 sf



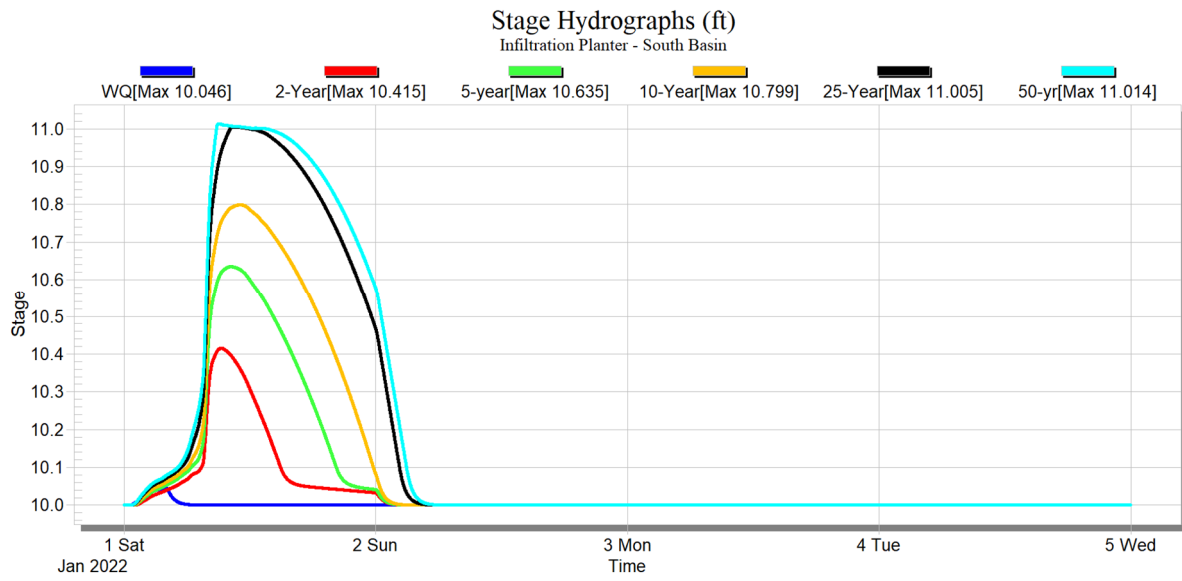
### Underground Infiltration Facility – Main Basin

Facility Area = 2,100 sf; Facility Volume = 10,500 cf



# Infiltration Planter - South Basin

Planter Area = 500 sf



# DOWNSTREAM ANALYSIS

(Will be included in Final Stormwater Report)



# OPERATIONS & MAINTENANCE PLAN

(Will be included in Final Stormwater Report)







## Land Use Application

<b>Project Information</b>		
Project Title: Alden Apartments Site Re-Development		
Brief Description: The Applicant proposes to remove 15 apartment units and construct 45 townhouse-style multi-family units on the existing Alden Apartments site.		
<b>Property Information</b>		
Address: 7800 SW Sagert Street and 20400 SW Martinazzi Avenue		
Assessor's Map Number and Tax Lots: Map Number 2S125BA00 Tax Lot 00100		
<b>Applicant/Primary Contact</b>		
Name: Heather Austin, AICP	Company Name: 3J Consulting, Inc.	
Address: 9600 SW Nimbus Avenue, Suite 100		
City: Beaverton	State: OR	ZIP: 97008
Phone: 503-946-9365 ext. 206	Email: heather.austin@3j-consulting.com	
<b>Property Owner</b>		
Name: CR Alden Communities, LLC		
Address: 444 West Beech Street, Suite 300		
City: San Diego	State: CA	ZIP: 92101
Phone: 858-255-9006	Email: matm@colrich.com	
Property Owner's Signature: 		Date: 9-1-2022
<i>(Note: Letter of authorization is required if not signed by owner)</i>		
AS THE PERSON RESPONSIBLE FOR THIS APPLICATION, I HEREBY ACKNOWLEDGE THAT I HAVE READ THIS APPLICATION AND STATE THAT THE INFORMATION IN AND INCLUDED WITH THIS APPLICATION IN ITS ENTIRETY IS CORRECT. I AGREE TO COMPLY WITH ALL APPLICABLE CITY AND COUNTY ORDINANCES AND STATE LAWS REGARDING BUILDING CONSTRUCTION AND LAND USE.		
Applicant's Signature:	Date:	

**Land Use Application Type:**

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Annexation (ANN)                          | <input type="checkbox"/> Historic Landmark (HIST)             | <input type="checkbox"/> Minor Architectural Review (MAR) |
| <input checked="" type="checkbox"/> Architectural Review (AR)      | <input type="checkbox"/> Industrial Master Plan (IMP)         | <input type="checkbox"/> Minor Variance (MVAR)            |
| <input type="checkbox"/> Architectural Review—Single Family (ARSF) | <input type="checkbox"/> Plan Map Amendment (PMA)             | <input type="checkbox"/> Sign Variance (SVAR)             |
| <input type="checkbox"/> Architectural Review—ADU (ARADU)          | <input type="checkbox"/> Plan Text Amendment (PTA)            | <input type="checkbox"/> Variance (VAR)                   |
| <input type="checkbox"/> Conditional Use (CUP)                     | <input checked="" type="checkbox"/> Tree Removal/Review (TCP) |   |

<b>Office Use</b>		
Case No:	Date Received:	Received by:
Fee:	Receipt No:	



## Land Use Application

### Project Information

Project Title: [Alden Apartments Site Re-Development](#)

**Brief Description:**

The Applicant proposes to remove 15 apartment units and construct 45 townhouse-style multi-family units on the existing Alden Apartments site.

### Property Information

Address: [7800 SW Sagert Street and 20400 SW Martinazzi Avenue](#)

Assessor's Map Number and Tax Lots: [Map Number 2S125BA00](#) [Tax Lot 00100](#)

### Applicant/Primary Contact

Name: [Heather Austin, AICP](#)

Company Name: [3J Consulting, Inc.](#)

Address: [9600 SW Nimbus Avenue, Suite 100](#)

City: [Beaverton](#)

State: [OR](#)

ZIP: [97008](#)

Phone: [503-946-9365 ext. 206](#)

Email: [heather.austin@3j-consulting.com](mailto:heather.austin@3j-consulting.com)

### Property Owner

Name: [Colrich California Construcion, LLC \(Matthew Moiseve\)](#)

Address: [444 West Beech Street, Suite 300](#)

City: [San Diego](#)

State: [CA](#)

ZIP: [92101](#)

Phone: [858-255-9006](#)

Email: [matm@colrich.com](mailto:matm@colrich.com)

Property Owner's Signature:

Date:

*(Note: Letter of authorization is required if not signed by owner)*

**AS THE PERSON RESPONSIBLE FOR THIS APPLICATION, I HEREBY ACKNOWLEDGE THAT I HAVE READ THIS APPLICATION AND STATE THAT THE INFORMATION IN AND INCLUDED WITH THIS APPLICATION IN ITS ENTIRETY IS CORRECT. I AGREE TO COMPLY WITH ALL APPLICABLE CITY AND COUNTY ORDINANCES AND STATE LAWS REGARDING BUILDING CONSTRUCTION AND LAND USE.**

Applicant's Signature:

*Heather M Austin*

Date: [September 27, 2022](#)

### Land Use Application Type:

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Annexation (ANN)                          | <input type="checkbox"/> Historic Landmark (HIST)             | <input type="checkbox"/> Minor Architectural Review (MAR) |
| <input checked="" type="checkbox"/> Architectural Review (AR)      | <input type="checkbox"/> Industrial Master Plan (IMP)         | <input type="checkbox"/> Minor Variance (MVAR)            |
| <input type="checkbox"/> Architectural Review—Single Family (ARSF) | <input type="checkbox"/> Plan Map Amendment (PMA)             | <input type="checkbox"/> Sign Variance (SVAR)             |
| <input type="checkbox"/> Architectural Review—ADU (ARADU)          | <input type="checkbox"/> Plan Text Amendment (PTA)            | <input type="checkbox"/> Variance (VAR)                   |
| <input type="checkbox"/> Conditional Use (CUP)                     | <input checked="" type="checkbox"/> Tree Removal/Review (TCP) |   |

### Office Use

Case No:	Date Received:	Received by:
Fee:	Receipt No:	

# SENSITIVE AREA PRE-SCREENING SITE ASSESSMENT

Clean Water Services File Number 22-001989

1. **Jurisdiction:** Tualatin

2. **Property Information** (example: 1S234AB01400)

Tax lot ID(s): \_\_\_\_\_  
2S125BA00100

**OR Site Address:** 20400 SW MARTINAZZI AVE

City, State, Zip: Tualatin, OR, 97062

Nearest cross street: \_\_\_\_\_

4. **Development Activity** (check **all** that apply)

- Addition to single family residence (rooms, deck, garage)  
 Lot line adjustment       Minor land partition  
 Residential condominium     Commercial condominium  
 Residential subdivision       Commercial subdivision  
 Single lot commercial       Multi lot commercial  
 Other \_\_\_\_\_

3. **Owner Information**

Name: Mathew Moiseve

Company: ColRich California Construction, INC.

Address: 444 West Beech Street, Ste. 300

City, State, Zip: San Diego, CA, 92101

Phone/fax: (858)490-2300

Email: \_\_\_\_\_

4. **Applicant Information**

Name: Heather Austin

Company: 3J Consulting

Address: 9600 SW Nimbus Ave, Suite 100

City, State, Zip: Beaverton, OR, 97008

Phone/fax: (503)946-9365 x206

Email: heather.austin@3j-consulting.com

6. **Will the project involve any off-site work?**  Yes  No  Unknown

Location and description of off-site work: \_\_\_\_\_

7. **Additional comments or information that may be needed to understand your project:** \_\_\_\_\_

**This application does NOT replace Grading and Erosion Control Permits, Connection Permits, Building Permits, Site Development Permits, DEQ 1200-C Permit or other permits as issued by the Department of Environmental Quality, Department of State Lands and/or Department of the Army COE. All required permits and approvals must be obtained and completed under applicable local, state, and federal law.**

By signing this form, the Owner or Owner's authorized agent or representative, acknowledges and agrees that employees of Clean Water Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site. I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Print/type name Heather Austin

Print/type title Senior Planner

Signature ONLINE SUBMITTAL

Date 7/19/2022

## FOR DISTRICT USE ONLY

- Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO ISSUANCE OF A SERVICE PROVIDER LETTER.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.
- Based on review of the submitted materials and best available information sensitive areas do not appear to exist on site or within 200' of the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider Letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, State and federal law.
- Based on review of the submitted materials and best available information the above referenced project will not significantly impact the existing or potentially sensitive area(s) found near the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect additional water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider Letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, state and federal law.
- THIS SERVICE PROVIDER LETTER IS NOT VALID UNLESS \_\_\_\_\_ CWS APPROVED SITE PLAN(S) ARE ATTACHED.**
- The proposed activity does not meet the definition of development or the lot was platted after 9/9/95 ORS 92.040(2). **NO SITE ASSESSMENT OR SERVICE PROVIDER LETTER IS REQUIRED.**

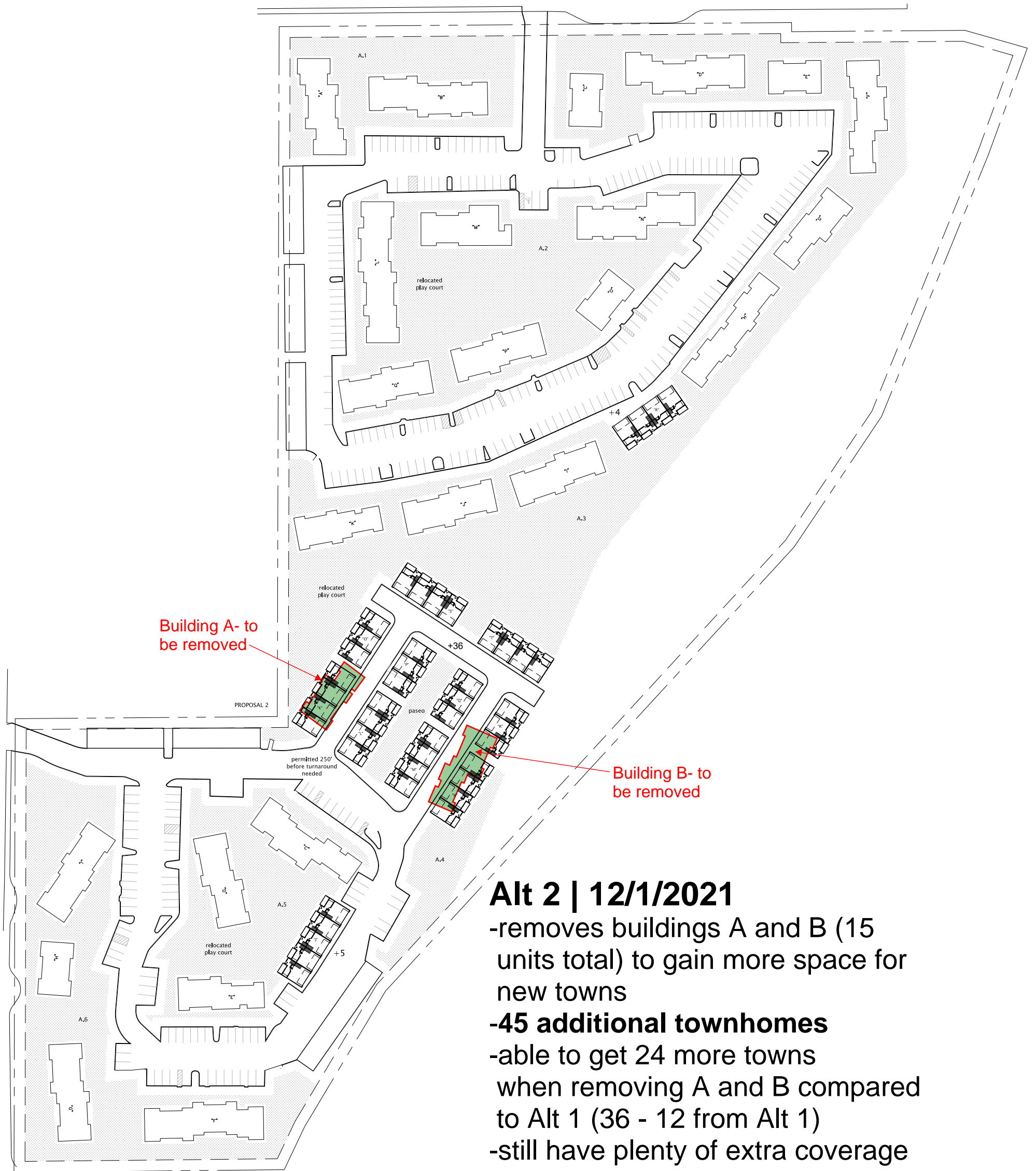
Reviewed by Mila Gonzalez Lima

Date September 27, 2022

Once complete, email to: [SPLReview@cleanwaterservices.org](mailto:SPLReview@cleanwaterservices.org) • Fax: **(503) 681-4439**

**OR** mail to: SPL Review, Clean Water Services, 2550 SW Hillsboro Highway, Hillsboro, Oregon 97123





Building A- to be removed

Building B- to be removed

### Alt 2 | 12/1/2021

- removes buildings A and B (15 units total) to gain more space for new towns
- 45 additional townhomes**
- able to get 24 more towns when removing A and B compared to Alt 1 (36 - 12 from Alt 1)
- still have plenty of extra coverage and open space available
- both existing courts removed

	Code	Existing	Proposal 2
Density (units):	250 max.	195	<b>240</b>
Parking (spots):	***	352	<b>442</b>
Coverage (sq.ft.):	291,144 max.	80,323	<b>90,223</b>
Open Space( sq.ft.):	108,000 min.	246,473	<b>203,912</b>

\*with Buildings A & B demolished in South Lot



**FIRE CODE / LAND USE / BUILDING REVIEW  
APPLICATION**



**North Operating Center**  
11945 SW 70<sup>th</sup> Avenue  
Tigard, OR 97223  
Phone: 503-649-8577

**South Operating Center**  
8445 SW Elligsen Rd  
Wilsonville, OR 97070  
Phone: 503-649-8577

REV 6-30-20

**Project Information**

Applicant Name: Brian O'Rourke  
Address: 9600 SW Nimbus Ave, Suite 100  
Phone: 503-946-9365 x209  
Email: brian.orourke@3i-consulting.com  
Site Address: 7800 SW Sagert St & 20400 SW Martinazzi Ave  
City: Tualatin  
Map & Tax Lot #: 2S125BA00100  
Business Name: Alden Apartments  
Land Use/Building Jurisdiction: City of Tualatin  
Land Use/ Building Permit # Pre-App 22-0004

Choose from: Beaverton, Tigard, Newberg, **Tualatin**, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

**Project Description**

Removal of two existing apartment buildings and associated site features. Addition of 12 buildings (45 total townhome style apartment units) including associated roads, pedestrian paths, and site utilities.

**Permit/Review Type (check one):**

- Land Use / Building Review - Service Provider Permit
- Emergency Radio Responder Coverage Install/Test
- LPG Tank (Greater than 2,000 gallons)
- Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)
  - \* Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.
- Explosives Blasting (Blasting plan is required)
- Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)
- Tents or Temporary Membrane Structures (in excess of 10,000 square feet)
- Temporary Haunted House or similar
- OLCC Cannabis Extraction License Review
- Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

**For Fire Marshal's Office Use Only**

TVFR Permit # 2022-0097  
Permit Type: SPP  
Submittal Date: 8/30/22  
Assigned To: ORourke  
Due Date: \_\_\_\_\_  
Fees Due: \_\_\_\_\_  
Fees Paid: \_\_\_\_\_

**Approval/Inspection Conditions**  
(For Fire Marshal's Office Use Only)

**This section is for application approval only**

[Signature] ORourke 8/30/22  
Fire Marshal or Designee Date

Conditions:

**X PLEASE SUBMIT FIRE FLOW RESULTS ASAP.**

See Attached Conditions:  Yes  No

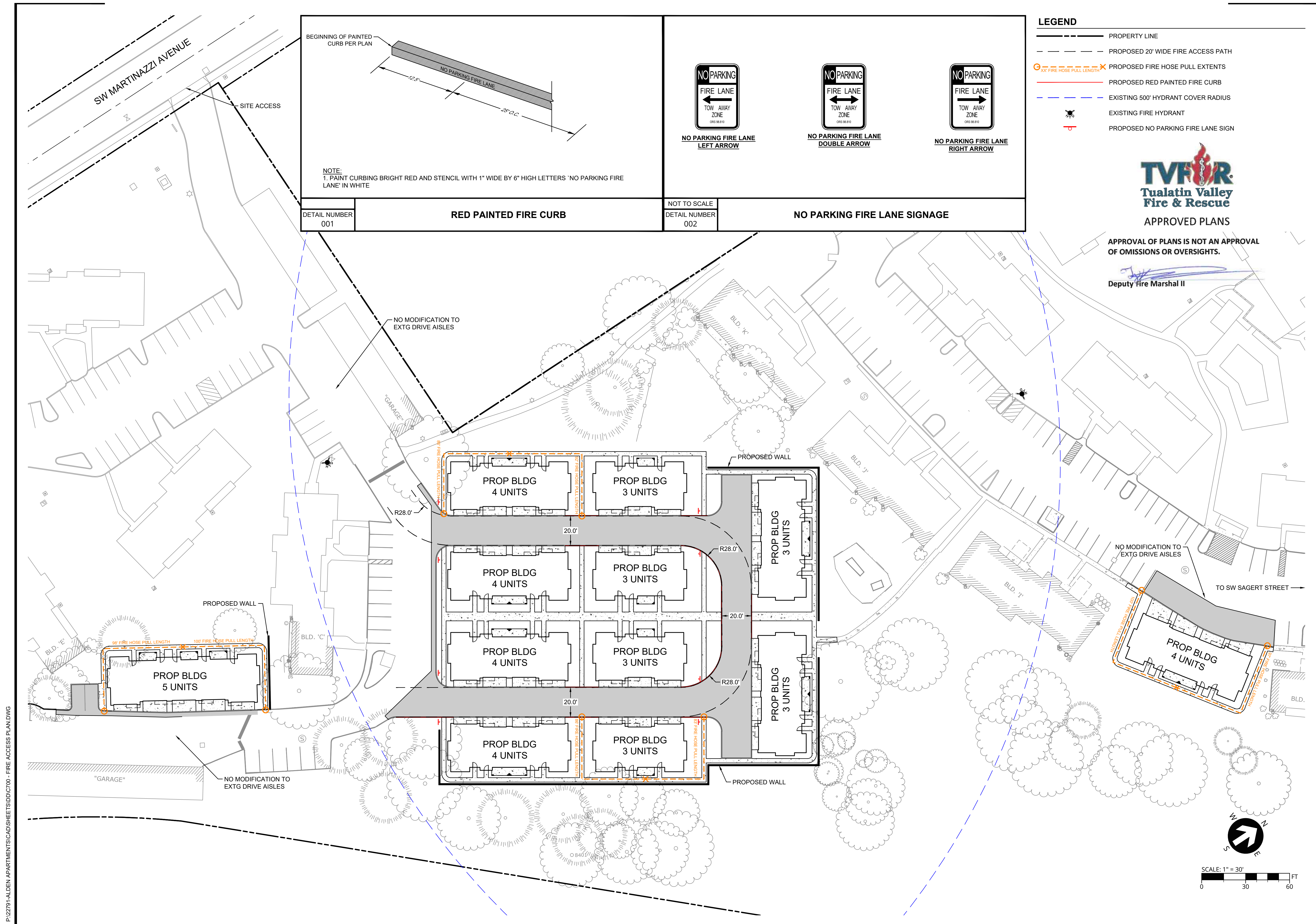
Site Inspection Required:  Yes  No

**This section used when site inspection is required**

Inspection Comments:

Final TVFR Approval Signature & Emp ID Date





LEGEND

- PROPERTY LINE
- PROPOSED 20' WIDE FIRE ACCESS PATH
- PROPOSED FIRE HOSE PULL EXTENTS
- PROPOSED RED PAINTED FIRE CURB
- EXISTING 500' HYDRANT COVER RADIUS
- EXISTING FIRE HYDRANT
- PROPOSED NO PARKING FIRE LANE SIGN

NOTE:  
1. PAINT CURBING BRIGHT RED AND STENCIL WITH 1" WIDE BY 6" HIGH LETTERS 'NO PARKING FIRE LANE' IN WHITE

DETAIL NUMBER 001      **RED PAINTED FIRE CURB**

NOT TO SCALE  
DETAIL NUMBER 002      **NO PARKING FIRE LANE SIGNAGE**

NO PARKING FIRE LANE LEFT ARROW      NO PARKING FIRE LANE DOUBLE ARROW      NO PARKING FIRE LANE RIGHT ARROW

**TVALR**  
Tualatin Valley  
Fire & Rescue

APPROVED PLANS

APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.

Deputy Fire Marshal II

PUBLISH DATE  
#####  
ISSUED FOR  
DD  
REVISIONS

**FIRE ACCESS PLAN**  
**ALDEN APARTMENTS**

7800 SW SAGERT STREET  
TUALATIN, OR 97062

**3J CONSULTING**

CIVIL ENGINEERING  
WATER RESOURCES  
COMMUNITY PLANNING

9600 SW NIMBUS AVE., SUITE 100, BEAVERTON, OR 97008

PROJECT INFORMATION  
3J PROJECT # | 22791  
TAX LOT(S) | 2S125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | KMK  
CHECKED BY | BMO

SHEET NUMBER  
**FS-1**

P:\22791-ALDEN APARTMENTS\CAD\SHEETS\DD\0700 - FIRE ACCESS PLAN.DWG





10,295 Southwest Bidder Road, Wilsonville, OR 97070  
p 503 570 0626 f 503 582 9407 republicservices.com

September 2, 2022

Ashley Doty  
Re: Alden Apartments  
7800 SW Sagert St. & 20400 SW Martinazzi Ave.  
Tualatin, OR 97062

Dear Ashley,

Thank you, for sending us the preliminary site plans for this proposed development in Tualatin, Oregon.

My Company: Republic Services of Clackamas and Washington Counties has the franchise agreement to service this area with the City of Tualatin. We will provide complete waste and commingle recycling removal services one time per week for this planned development. Service day will be determined by Republic Services at its sole discretion and in accordance with the City of Tualatin franchise agreement. Landscape service and yard debris removal at this site is provided by a third-party contractor and there will not be a need for residential yard debris cart service for this development.

All residential trash and recycle cart receptacles must be placed on a level surface of each unit's driveway, in a location that is accessible for automated side-load service, with minimum spacing of 2'Ft. apart and at least 4'Ft. from any fixed objects including parked vehicles, and with no overhead obstructions. The access road must be free of any vehicles or other obstructions that would prevent safe passage of Republic Services collection vehicles

SW Martinazzi Ave. - 41 livable units, will be serviced by automated side load collection vehicles using the paved alley, which will have a width of 20'Ft. with a turn radius of 28.0' Ft. and will include beveled curbing on both inside corners of the roadway to allow our trucks to safely navigate this development.

SW Sagert St. - 4 livable, units will be serviced by automated side load collection vehicles using the existing paved driveway.

Thanks Ashley, for your help and concerns for our services prior to this project being developed.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kelly Herrod", written over a horizontal line.

Kelly Herrod  
Operations Supervisor  
Republic Services Inc.



## PRELIMINARY REPORT

In response to the application for a policy of title insurance referenced herein Chicago Title Company of Oregon hereby reports that it is prepared to issue, or cause to be issued, as of the specified date, a policy or policies of title insurance describing the land and the estate or interest hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an exception herein or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations or Conditions of said policy forms.

The printed Exceptions and Exclusions from the coverage of said policy or policies are set forth in Exhibit One. Copies of the policy forms should be read. They are available from the office which issued this report.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby.

The policy(s) of title insurance to be issued hereunder will be policy(s) of Chicago Title Insurance Company, a/an Florida corporation.

**Please read the exceptions shown or referred to herein and the Exceptions and Exclusions set forth in Exhibit One of this report carefully. The Exceptions and Exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.**

**It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects and encumbrances affecting title to the land.**

This preliminary report is for the exclusive use of the parties to the contemplated transaction, and the Company does not have any liability to any third parties nor any liability until the full premium is paid and a policy is issued. Until all necessary documents are placed of record, the Company reserves the right to amend or supplement this preliminary report.

*Countersigned*

A handwritten signature in cursive script that reads "Maggie Metcalf".





1433 SW 6th Avenue, Portland, OR 97201  
(503)646-4444 FAX (503)469-4198

**PRELIMINARY REPORT**

**TITLE OFFICER:** Tony Schadle  
tony.schadle@titlegroup.fntg.com  
(503)469-4150

**ORDER NO.:** 472521006912  
**Supplement - No. 1 (update)**

**TO:** Chicago Title Insurance Company  
Siu Y. Cheung  
711 Third Avenue, 8th Floor  
New York, NY 10017

**OWNER/SELLER:** AMFP IV Alden LLC

**BUYER/BORROWER:** TBD

**PROPERTY ADDRESS:** 20323 SW Martinazzi Avenue, Tualatin, OR 97062

**EFFECTIVE DATE: October 19, 2021, 08:00 AM**

1. THE POLICY AND ENDORSEMENTS TO BE ISSUED AND THE RELATED CHARGES ARE:

	<u>AMOUNT</u>	<u>PREMIUM</u>
ALTA Owner's Policy 2006	\$ 61,150,000.00	\$ 82,731.00
Owner's Extended Coverage Policy - (Short Term Rate) std ptn \$48,909.00 & ext ptn \$33,822.00		
OTIRO 203.1-06 - *M* - Zoning - Improved Land (ALTA 3.1-06)		\$ 1,000.00
OTIRO 208.2-06 - Commercial Environmental Protection Lien (ALTA 8.2-06)		\$ 1,000.00
OTIRO 209.2-06 - Covenants, Conditions and Restrictions - Improved Land (ALTA 9.2-06)		\$ 1,500.00
OTIRO 209.9-06 - Private Rights (ALTA 9.9-06)		\$ 250.00
OTIRO 217.2-06 - Utility Access (ALTA 17.2-06)		\$ 275.00
OTIRO 217-06 - Access and Entry (ALTA 17-06)		\$ 125.00
OTIRO 218-06 - Single Tax Parcel (ALTA 18-06)		\$ 50.00
OTIRO 225-06 - *M* - Same as Survey (ALTA 25-06)		\$ 100.00
OTIRO 228.1-06 - Encroachments - Boundaries and Easements (ALTA 28.1-06)		\$ 1,000.00
OTIRO 228-06 - Easement - Damage or Enforced Removal (ALTA 28-06)		\$ 100.00
OTIRO 239-06 - Policy Authentication (ALTA 39-06)		\$ 0.00
Government Lien Search		\$ 30.00

2. THE ESTATE OR INTEREST IN THE LAND HEREINAFTER DESCRIBED OR REFERRED TO COVERED BY THIS REPORT IS:

Fee Simple

3. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:

AMFP IV Alden LLC, a Delaware limited liability company

## **PRELIMINARY REPORT**

(continued)

4. THE LAND REFERRED TO IN THIS REPORT IS SITUATED IN THE CITY OF TUALATIN, COUNTY OF WASHINGTON, STATE OF OREGON, AND IS DESCRIBED AS FOLLOWS:

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

**EXHIBIT "A"**  
Legal Description

A tract of land situated in Section 25, Township 2 South, Range 1 West of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon, described as follows:

Beginning at a point in the North line of said Section 25, Township 2 South, Range 1 West, North 89° 32' 40" East 1010.00 feet from the Northwest corner of said Section 25; thence South 0° 08' 52" West along the center line of a 40.0 foot County Road, 1,319.60 feet; thence North 89° 25' 20" East, 798.61 feet to an iron pipe in the Northwesterly right-of-way line of the Baldock Freeway; thence North 15° 55' East along said Northwesterly right-of-way 1,294.5 feet to an iron rod; thence North 74° 00' West 160.28 feet to an iron rod; thence North 0° 27' 20" West 30.41 feet to the North line of said Section 25; thence South 89° 32' 40" West along said North line of Section 25 and the center line of County Road No. 327, a distance of 995.89 feet to the point of beginning.

EXCEPT those Parcels conveyed by deeds to the State of Oregon, by and through its State Highway Commission, and Recorded January 22, 1952 in Volume 328, Page 431 and Recorded December 5, 1952 in Volume 339, Page 375, Deed Records of Washington County, Oregon.

AND ALSO EXCEPTING that Parcel conveyed by deed to the State of Oregon, by and through its State Highway Commission and Recorded September 24, 1968 in Volume 717, Page 82, Deed Records of Washington County, Oregon.

AND ALSO EXCEPTING those Parcels conveyed by deed to Diamond Investment Co., a Corporation, by deeds Recorded May 24, 1961 in Volume 444, Page 517 and Recorded January 15, 1965 in Volume 537, Page 487, Deed Records of Washington County, Oregon.

AND ALSO EXCEPTING that portion as dedicated for street and utility purposes to the City of Tualatin by Resolution No. 389 78, Recorded June 14, 1978, as Fee No. 78 26691, Deed Records of Washington County, Oregon.

**AS OF THE DATE OF THIS REPORT, ITEMS TO BE CONSIDERED AND EXCEPTIONS TO COVERAGE IN ADDITION TO THE PRINTED EXCEPTIONS AND EXCLUSIONS IN THE POLICY FORM WOULD BE AS FOLLOWS:**

**GENERAL EXCEPTIONS:**

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests or claims, which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, which are not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
4. Any encroachment (of existing improvements located on the Land onto adjoining land or of existing improvements located on adjoining land onto the subject Land), encumbrance, violation, variation or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the subject Land.
5. Any lien or right to a lien for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the Public Records.

**SPECIFIC ITEMS AND EXCEPTIONS:**

6. **\*\*\* AMENDED \*\*\***  
Unpaid Real Property Taxes for the fiscal year 2021-2022. as follows:

Levied Amount:     \$209,547.12  
Levy Code:         023.76  
Account No.:       R536076  
Map No.:           2S125BA00100

Prior to close of escrow, please contact the Tax Collector's Office to confirm all amounts owing, including current fiscal year taxes, supplemental taxes, escaped assessments and any delinquencies.

7. City Liens, if any, in favor of the City of Tualatin. None found as of September 17, 2021 posted to the main account addressed as 7800 SW Sagert Street.

We find an additional 212 accounts- no inquiry has been directed to the City Clerk, and a fee of \$30.00 per lien account will be charged if an inquiry is to be made.

8. Limited access provisions contained in Deed to the State of Oregon, by and through its State Highway Commission, which provides that no right or easement of right of access to, from or across the State Highway other than expressly therein provided for shall attach to the abutting property:  
Recording Date: January 22, 1952  
Recording No.: Book: 328 Page: 431

Excepted Portion from legal description as shown on ALTA/NSPS Land Title Survey, prepared by Duryea Associates as Job No. 12-1685 dated November 2017, last revised February 15, 2018.



9. Limited access provisions contained in Deed to the State of Oregon, by and through its State Highway Commission, which provides that no right or easement of right of access to, from or across the State Highway other than expressly therein provided for shall attach to the abutting property:  
Recording Date: September 24, 1968  
Recording No.: Book: 717 Page: 82

Excepted Portion from legal description as shown on ALTA/NSPS Land Title Survey, prepared by Duryea Associates as Job No. 12-1685 dated November 2017, last revised February 15, 2018.

10. An easement created by instrument, including the terms and provisions thereof:  
Dated: March 31, 1978  
Recording Date: June 14, 1978  
Recording No.: 78-026690  
In Favor Of: City of Tualatin  
For: Public Utility Lines  
Affects: The Northerly portion

Said easement was re-recorded:  
Recording Date: September 11, 1978  
Recording No.: 78-040450

As shown on ALTA/NSPS Land Title Survey, prepared by Duryea Associates as Job No. 12-1685 dated November 2017, last revised February 15, 2018.

11. An easement created by instrument, including the terms and provisions thereof:  
Dated: February 5, 1979  
Recording Date: September 6, 1979  
Recording No.: 79-036431  
In Favor Of: City of Tualatin  
For: Public Utility Lines

As shown on ALTA/NSPS Land Title Survey, prepared by Duryea Associates as Job No. 12-1685 dated November 2017, last revised February 15, 2018.

12. An easement created by instrument, including the terms and provisions thereof:  
Dated: October 11, 1979  
Recording Date: November 20, 1979  
Recording No.: 79-047980  
In Favor Of: City of Tualatin  
For: Sidewalk  
Affects: The Southwesterly portion adjacent to SW Martinazzi Avenue

As shown on ALTA/NSPS Land Title Survey, prepared by Duryea Associates as Job No. 12-1685 dated November 2017, last revised February 15, 2018.

13. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:  
Granted to: Comcast of Tualatin Valley, Inc.,  
Purpose: Broadband communications system  
Recording Date: April 24, 2015  
Recording No.: 2015-029996

14. Any rights, interests, or claims which may exist or arise by reason of the following matters disclosed by survey,  
Job No.: 12-1685  
Dated: November 2017, last revised February 15, 2018  
Prepared by: Duryea & Associates, P.S.  
Matters shown:  
A.) Right-of-way Fence overlaps 0.2' onto subject property  
B.) Right-of-way Fence overlaps 0.8' onto subject property  
C.) Asphalt Path overlaps 1.8' onto adjoining property

15. Multifamily Deed of Trust, Assignment of Rents and Security Agreement , including the terms and provisions thereof, given to secure an indebtedness with interest thereon and such future advances as may be provided therein;

Dated as of: December 29, 2020  
Recording Date: December 30, 2020  
Recording No.: 2020-135353  
Amount: \$30,660,000.00  
Grantor: AMFP IV ALDEN LLC, a Delaware limited liability company  
Trustee: Chicago Title Company of Oregon  
Beneficiary: Grandbridge Real Estate Capital LLC

An assignment of the beneficial interest under said deed of trust which names:

Assignee: Federal Home Loan Mortgage Corporation  
Recording Date: December 30, 2020  
Recording No.: 2020-135415

An assignment of the beneficial interest under said deed of trust which names:

Assignee: U.S. Bank National Association, as Trustee For The Registered Holders of GS Mortgage Securities Corporation II, Multifamily Mortgage Pass-Through Certificates, Series 2021-KF107  
Recording Date: April 26, 2021  
Recording No.: 2021-050051

16. A UCC financing statement as follows:

Debtor: AMFP IV ALDEN LLC  
Assignee Secured Party: Federal Home Loan Mortgage Corporation  
Assignor Secured Party: Grandbridge Real Estate Capital LLC  
Recording Date: December 30, 2020  
Recording No.: 2020-135354

Said Financing Statement was assigned by instrument,

Assignee: U.S. Bank National Association, as Trustee For The Registered Holders of GS Mortgage Securities Corporation II, Multifamily Mortgage Pass-Through Certificates, Series 2021-KF107  
Recording Date: April 26, 2021  
Recording No.: 2021-050052

17. Rights of tenants, as tenants only, in unrecorded leaseholds.
18. The Company has on file a copy of the Operating Agreement for AMFP IV Alden LLC, a Delaware limited liability company, dated February 14, 2017. A copy of any amendments subsequent to the date of said Operating Agreement should be furnished for review prior to closing.

The Company reserves the right to add additional items or make further requirements after review of the requested documentation.

19. The transaction contemplated in connection with this Report is subject to the review and approval of the Company's Corporate Underwriting Department. The Company reserves the right to add additional items or make further requirements after such review.
20. If requested to issue an extended coverage ALTA loan policy, the following matters must be addressed:
  - a) The rights of tenants holding under unrecorded leases or tenancies
  - b) Matters disclosed by a statement as to parties in possession and as to any construction, alterations or repairs to the Land within the last 75 days. The Company must be notified in the event that any funds are to be used for construction, alterations or repairs.
  - c) Any facts which would be disclosed by an accurate survey of the Land

**ADDITIONAL REQUIREMENTS/NOTES:**

- A. In addition to the standard policy exceptions, the exceptions enumerated above shall appear on the final 2006 ALTA Policy unless removed prior to issuance.
- B. Note: The name(s) of the proposed insured(s) furnished with this application for title insurance is/are:  
  
No names were furnished with the application. Please provide the name(s) of the buyers as soon as possible.
- C. Note: No utility search has been made or will be made for water, sewer or storm drainage charges unless the City/Service District claims them as liens (i.e. foreclosable) and reflects them on its lien docket as of the date of closing. Buyers should check with the appropriate city bureau or water service district and obtain a billing cutoff. Such charges must be adjusted outside of escrow.
- D. Note: Effective January 1, 2008, Oregon law (ORS 314.258) mandates withholding of Oregon income taxes from sellers who do not continue to be Oregon residents or qualify for an exemption. Please contact your Escrow Closer for further information.
- E. Notice: Please be aware that due to the conflict between federal and state laws concerning the cultivation, distribution, manufacture or sale of marijuana, the Company is not able to close or insure any transaction involving Land that is associated with these activities.
- F. THE FOLLOWING NOTICE IS REQUIRED BY STATE LAW: YOU WILL BE REVIEWING, APPROVING AND SIGNING IMPORTANT DOCUMENTS AT CLOSING. LEGAL CONSEQUENCES FOLLOW FROM THE SELECTION AND USE OF THESE DOCUMENTS. YOU MAY CONSULT AN ATTORNEY ABOUT THESE DOCUMENTS. YOU SHOULD CONSULT AN ATTORNEY IF YOU HAVE QUESTIONS OR CONCERNS ABOUT THE TRANSACTION OR ABOUT THE DOCUMENTS. IF YOU WISH TO REVIEW TRANSACTION DOCUMENTS THAT YOU HAVE NOT SEEN, PLEASE CONTACT THE ESCROW AGENT.
- G. Note: This map/plat is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances or acreage shown thereon.

H. NOTE: IMPORTANT INFORMATION REGARDING PROPERTY TAX PAYMENTS

Fiscal Year:	July 1 <sup>st</sup> through June 30 <sup>th</sup>
Taxes become a lien on real property, but are not yet payable:	July 1 <sup>st</sup>
Taxes become certified and payable (approximately on this date):	October 15 <sup>th</sup>
First one third payment of taxes is due:	November 15 <sup>th</sup>
Second one third payment of taxes is due:	February 15 <sup>th</sup>
Final payment of taxes is due:	May 15 <sup>th</sup>

Discounts: If two thirds are paid by November 15<sup>th</sup>, a 2% discount will apply.  
If the full amount of the taxes are paid by November 15<sup>th</sup>, a 3% discount will apply.

Interest: Interest accrues as of the 15<sup>th</sup> of each month based on any amount that is unpaid by the due date. No interest is charged if the minimum amount is paid according to the above mentioned payment schedule.

I. Recording Charge (Per Document) is the following:

County	First Page	Each Additional Page
Multnomah	\$86.00	\$5.00
Washington	\$81.00	\$5.00
Clackamas	\$93.00	\$5.00
Yamhill	\$81.00	\$5.00

Note: When possible the company will record electronically. An additional charge of \$5.00 applies to each document that is recorded electronically.

Note: Please send any documents for recording to the following address:

Portland Title Group  
Attn: Recorder  
1433 SW 6th Ave.  
Portland, OR. 97201



## EXHIBIT ONE

### 2006 AMERICAN LAND TITLE ASSOCIATION LOAN POLICY (06-17-06) EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses that arise by reason of:

- (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning) restricting, regulating, prohibiting or relating to
  - the occupancy, use, or enjoyment of the Land;
  - the character, dimensions or location of any improvement erected on the land;
  - the subdivision of land; or
  - environmental protection;or the effect of any violation of these laws, ordinances or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
- Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
- Defects, liens, encumbrances, adverse claims, or other matters
  - created, suffered, assumed or agreed to by the Insured Claimant;
  - not known to the Company, not recorded in the Public Records at Date of Policy, but known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;

- resulting in no loss or damage to the Insured Claimant;
  - attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
  - resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
- Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with the applicable doing-business laws of the state where the Land is situated.
  - Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.
  - Any claim, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
    - a fraudulent conveyance or fraudulent transfer, or
    - a preferential transfer for any reason not stated in the Covered Risk 13(b) of this policy.
  - Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage.

#### SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

- Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
- Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
- Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof, water rights, claims or title to water.
- Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
- Any lien for services, labor or material heretofore or hereafter furnished, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, imposed by law and not shown by the Public Records.

### 2006 AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY (06-17-06) EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses that arise by reason of:

- (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning) restricting, regulating, prohibiting or relating to
  - the occupancy, use, or enjoyment of the Land;
  - the character, dimensions or location of any improvement erected on the land;
  - the subdivision of land; or
  - environmental protection;or the effect of any violation of these laws, ordinances or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
- Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
- Defects, liens, encumbrances, adverse claims, or other matters
  - created, suffered, assumed or agreed to by the Insured Claimant;

- not known to the Company, not recorded in the Public Records at Date of Policy, but known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
  - resulting in no loss or damage to the Insured Claimant;
  - attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
  - resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
- Any claim, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
    - a fraudulent conveyance or fraudulent transfer, or
    - a preferential transfer for any reason not stated in the Covered Risk 9 of this policy.
  - Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage.

#### SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

- Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
- Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
- Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof, water rights, claims or title to water.
- Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
- Any lien for services, labor or material heretofore or hereafter furnished, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, imposed by law and not shown by the Public Records.



Inquire before you wire!

## WIRE FRAUD ALERT

This Notice is not intended to provide legal or professional advice.  
If you have any questions, please consult with a lawyer.

All parties to a real estate transaction are targets for wire fraud and many have lost hundreds of thousands of dollars because they simply relied on the wire instructions received via email, without further verification. **If funds are to be wired in conjunction with this real estate transaction, we strongly recommend verbal verification of wire instructions through a known, trusted phone number prior to sending funds.**

In addition, the following non-exclusive self-protection strategies are recommended to minimize exposure to possible wire fraud.

- **NEVER RELY** on emails purporting to change wire instructions. Parties to a transaction rarely change wire instructions in the course of a transaction.
- **ALWAYS VERIFY** wire instructions, specifically the ABA routing number and account number, by calling the party who sent the instructions to you. DO NOT use the phone number provided in the email containing the instructions, use phone numbers you have called before or can otherwise verify. **Obtain the number of relevant parties to the transaction as soon as an escrow account is opened.** DO NOT send an email to verify as the email address may be incorrect or the email may be intercepted by the fraudster.
- **USE COMPLEX EMAIL PASSWORDS** that employ a combination of mixed case, numbers, and symbols. Make your passwords greater than eight (8) characters. Also, change your password often and do NOT reuse the same password for other online accounts.
- **USE MULTI-FACTOR AUTHENTICATION** for email accounts. Your email provider or IT staff may have specific instructions on how to implement this feature.

For more information on wire-fraud scams or to report an incident, please refer to the following links:

**Federal Bureau of Investigation:**

<http://www.fbi.gov>

**Internet Crime Complaint Center:**

<http://www.ic3.gov>

## **FIDELITY NATIONAL FINANCIAL PRIVACY NOTICE**

Effective January 1, 2021

Fidelity National Financial, Inc. and its majority-owned subsidiary companies (collectively, "FNF," "our," or "we") respect and are committed to protecting your privacy. This Privacy Notice explains how we collect, use, and protect personal information, when and to whom we disclose such information, and the choices you have about the use and disclosure of that information.

A limited number of FNF subsidiaries have their own privacy notices. If a subsidiary has its own privacy notice, the privacy notice will be available on the subsidiary's website and this Privacy Notice does not apply.

### **Collection of Personal Information**

FNF may collect the following categories of Personal Information:

- contact information (e.g., name, address, phone number, email address);
- demographic information (e.g., date of birth, gender, marital status);
- identity information (e.g. Social Security Number, driver's license, passport, or other government ID number);
- financial account information (e.g. loan or bank account information); and
- other personal information necessary to provide products or services to you.

We may collect Personal Information about you from:

- information we receive from you or your agent;
- information about your transactions with FNF, our affiliates, or others; and
- information we receive from consumer reporting agencies and/or governmental entities, either directly from these entities or through others.

### **Collection of Browsing Information**

FNF automatically collects the following types of Browsing Information when you access an FNF website, online service, or application (each an "FNF Website") from your Internet browser, computer, and/or device:

- Internet Protocol (IP) address and operating system;
- browser version, language, and type;
- domain name system requests; and
- browsing history on the FNF Website, such as date and time of your visit to the FNF Website and visits to the pages within the FNF Website.

Like most websites, our servers automatically log each visitor to the FNF Website and may collect the Browsing Information described above. We use Browsing Information for system administration, troubleshooting, fraud investigation, and to improve our websites. Browsing Information generally does not reveal anything personal about you, though if you have created a user account for an FNF Website and are logged into that account, the FNF Website may be able to link certain browsing activity to your user account.

### **Other Online Specifics**

**Cookies.** When you visit an FNF Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. Information gathered using cookies helps us improve your user experience. For example, a cookie can help the website load properly or can customize the display page based on your browser type and user preferences. You can choose whether or not to accept cookies by changing your Internet browser settings. Be aware that doing so may impair or limit some functionality of the FNF Website.

**Web Beacons.** We use web beacons to determine when and how many times a page has been viewed. This information is used to improve our websites.

**Do Not Track.** Currently our FNF Websites do not respond to "Do Not Track" features enabled through your browser.

Links to Other Sites. FNF Websites may contain links to unaffiliated third-party websites. FNF is not responsible for the privacy practices or content of those websites. We recommend that you read the privacy policy of every website you visit.

### **Use of Personal Information**

FNF uses Personal Information for three main purposes:

- To provide products and services to you or in connection with a transaction involving you.
- To improve our products and services.
- To communicate with you about our, our affiliates', and others' products and services, jointly or independently.

### **When Information Is Disclosed**

We may disclose your Personal Information and Browsing Information in the following circumstances:

- to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to nonaffiliated service providers who provide or perform services or functions on our behalf and who agree to use the information only to provide such services or functions;
- to nonaffiliated third party service providers with whom we perform joint marketing, pursuant to an agreement with them to jointly market financial products or services to you;
- to law enforcement or authorities in connection with an investigation, or in response to a subpoena or court order; or
- in the good-faith belief that such disclosure is necessary to comply with legal process or applicable laws, or to protect the rights, property, or safety of FNF, its customers, or the public.

The law does not require your prior authorization and does not allow you to restrict the disclosures described above. Additionally, we may disclose your information to third parties for whom you have given us authorization or consent to make such disclosure. We do not otherwise share your Personal Information or Browsing Information with nonaffiliated third parties, except as required or permitted by law. We may share your Personal Information with affiliates (other companies owned by FNF) to directly market to you. Please see "Choices with Your Information" to learn how to restrict that sharing.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of bankruptcy, reorganization, insolvency, receivership, or an assignment for the benefit of creditors. By submitting Personal Information and/or Browsing Information to FNF, you expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings.

### **Security of Your Information**

We maintain physical, electronic, and procedural safeguards to protect your Personal Information.

### **Choices With Your Information**

If you do not want FNF to share your information among our affiliates to directly market to you, you may send an "opt out" request as directed at the end of this Privacy Notice. We do not share your Personal Information with nonaffiliates for their use to direct market to you without your consent.

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you.

For California Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties, except as permitted by California law. For additional information about your California privacy rights, please visit the "California Privacy" link on our website (<https://fnf.com/pages/californiaprivacy.aspx>) or call (888) 413-1748.



For Nevada Residents: You may be placed on our internal Do Not Call List by calling (888) 934-3354 or by contacting us via the information set forth at the end of this Privacy Notice. Nevada law requires that we also provide you with the following contact information: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: BCPINFO@ag.state.nv.us.

For Oregon Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes.

For Vermont Residents: We will not disclose information about your creditworthiness to our affiliates and will not disclose your personal information, financial information, credit report, or health information to nonaffiliated third parties to market to you, other than as permitted by Vermont law, unless you authorize us to make those disclosures.

### **Information From Children**

The FNF Websites are not intended or designed to attract persons under the age of eighteen (18). We do not collect Personal Information from any person that we know to be under the age of thirteen (13) without permission from a parent or guardian.

### **International Users**

FNF's headquarters is located within the United States. If you reside outside the United States and choose to provide Personal Information or Browsing Information to us, please note that we may transfer that information outside of your country of residence. By providing FNF with your Personal Information and/or Browsing Information, you consent to our collection, transfer, and use of such information in accordance with this Privacy Notice.

### **FNF Website Services for Mortgage Loans**

Certain FNF companies provide services to mortgage loan servicers, including hosting websites that collect customer information on behalf of mortgage loan servicers (the "Service Websites"). The Service Websites may contain links to both this Privacy Notice and the mortgage loan servicer or lender's privacy notice. The sections of this Privacy Notice titled When Information is Disclosed, Choices with Your Information, and Accessing and Correcting Information do not apply to the Service Websites. The mortgage loan servicer or lender's privacy notice governs use, disclosure, and access to your Personal Information. FNF does not share Personal Information collected through the Service Websites, except as required or authorized by contract with the mortgage loan servicer or lender, or as required by law or in the good-faith belief that such disclosure is necessary: to comply with a legal process or applicable law, to enforce this Privacy Notice, or to protect the rights, property, or safety of FNF or the public.

### **Your Consent To This Privacy Notice; Notice Changes; Use of Comments or Feedback**

By submitting Personal Information and/or Browsing Information to FNF, you consent to the collection and use of the information in accordance with this Privacy Notice. We may change this Privacy Notice at any time. The Privacy Notice's effective date will show the last date changes were made. If you provide information to us following any change of the Privacy Notice, that signifies your assent to and acceptance of the changes to the Privacy Notice.

### **Accessing and Correcting Information; Contact Us**

If you have questions, would like to correct your Personal Information, or want to opt-out of information sharing for affiliate marketing, visit FNF's [Opt Out Page](#) or contact us by phone at (888) 934-3354 or by mail to:

Fidelity National Financial, Inc.  
601 Riverside Avenue,  
Jacksonville, Florida 32204  
Attn: Chief Privacy Officer

**From:** Heather Austin <heather.austin@3j-consulting.com>  
**Sent:** Tuesday, September 27, 2022 2:58 PM  
**To:** Keith Leonard <kleonard@tualatin.gov>  
**Subject:** RE: Check-in on Alden Apartments

Hi Keith-

Attached you will find a copy of the land use application with applicant's (my) signature (sorry about that!). Also attached is our affidavit of posting and pictures of the 3 signs. And below is a statement regarding TDH 32.140(1)(h).

**TDC 32.140(1)(h), "A statement as to whether any City-recognized Citizen Involvement Organizations (CIOs) whose boundaries include, or are adjacent to, the subject property were contacted in advance of filing the application and, if so, a summary of the contact. The summary must include the date when contact was made, the form of the contact and who it was with (e.g. phone conversation with neighborhood association chairperson, meeting with land use committee, presentation at neighborhood association meeting), and the result;"**

*Finding: The applicant contacted the Martinazzi Woods CIO, a City-recognized Citizen Involvement Organizations (CIO) whose boundaries include, or are adjacent to, the subject property. The applicant e-mailed a notice to the Martinazzi Woods CIO on July 29, 2022, announcing the August 10, 2022 neighborhood meeting, via the following e-mail addresses:*

To: [martinazziwoodscio@gmail.com](mailto:martinazziwoodscio@gmail.com)

Cc: [solson.1827@gmail.com](mailto:solson.1827@gmail.com); [delmoore@frontier.com](mailto:delmoore@frontier.com); [jamison.l.shields@gmail.com](mailto:jamison.l.shields@gmail.com);  
[claudiasterling68@gmail.com](mailto:claudiasterling68@gmail.com); [janet7531@gmail.com](mailto:janet7531@gmail.com); [roydloop@gmail.com](mailto:roydloop@gmail.com)

*No response was received. This standard is met.*

Please let me know if you need anything else, or if you'd like me to update the narrative with the finding above (to keep things cleaner).

Thanks!  
Heather

**Heather Austin, AICP** | Senior Planner | **3J Consulting**  
she/her | O: 503.946.9365 x206 | C: 503.887.2130

**AFFIDAVIT OF MAILING NOTICE**

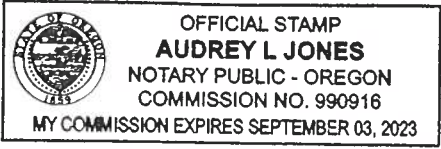
STATE OF OREGON            )  
  ) SS  
COUNTY OF WASHINGTON )

I, Samuel Huck being first duly sworn, depose and say:

That on the 27 day of July, 2022, I served upon the persons shown on Exhibit "A" (Mailing Area List), attached hereto and by this reference incorporated herein, a copy of the Notice of Neighborhood/Developer Meeting marked Exhibit "B," attached hereto and by this reference incorporated herein, by mailing to them a true and correct copy of the original hereof. I further certify that the addresses shown on said Exhibit "A" are their regular addresses as determined from the books and records of the Washington County and/or Clackamas County Departments of Assessment and Taxation Tax Rolls, and that said envelopes were placed in the United States Mail with postage fully prepared thereon.

Samuel Huck  
Signature

SUBSCRIBED AND SWORN to before me this 27<sup>th</sup> day of July, 2022.



Audrey Jones  
Notary Public for Oregon  
My commission expires:

RE: September 03, 2023

<b>Introduction</b>	<b>Address</b>	<b>City</b>	<b>State</b>
To Our Neighbors at	8390 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	20222 Sw 72Nd Ave.	Tigard	OR
To Our Neighbors at	8320 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8489 Sw Umatilla St.	Tualatin	OR
To Our Neighbors at	21110 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	20873 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	20150 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	8105 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	20980 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	20905 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	20973 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	8153 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8310 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8330 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20249 Sw 85Th Ct.	Tualatin	OR
To Our Neighbors at	8235 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8312 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8447 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8304 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20104 Sw Tillamook Ct.	Tualatin	OR
To Our Neighbors at	8370 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	21125 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	20016 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	9801 Ranch Hand Ave.	Las Vegas	NV
To Our Neighbors at	8485 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8404 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20208 Sw 85Th Ct.	Tualatin	OR
To Our Neighbors at	8540 Sw Modoc Ct.	Tualatin	OR
To Our Neighbors at	5185 Carman Dr.	Lake Oswego	OR
To Our Neighbors at	8368 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8360 Sw Chelan St.	Tualatin	OR
To Our Neighbors at	8332 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8332 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8336 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20351 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	8565 Sw Modoc Ct.	Tualatin	OR
To Our Neighbors at	7392 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	8446 Sw Umatilla St.	Tualatin	OR
To Our Neighbors at	8228 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8700 Sw Comanche Way.	Tualatin	OR
To Our Neighbors at	7313 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	20335 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	8487 Sw Huron Ct.	Tualatin	OR
To Our Neighbors at	8456 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20176 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	8380 Se Shenandoah Way.	Tualatin	OR
To Our Neighbors at	20601 Sw Colville Ct.	Tualatin	OR
To Our Neighbors at	8740 Sw Comanche Way.	Tualatin	OR
To Our Neighbors at	8408 Sw Umatilla St.	Tualatin	OR
To Our Neighbors at	7476 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	7288 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8462 Sw Umatilla St.	Tualatin	OR
To Our Neighbors at	8448 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8344 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8486 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	21233 Sw Iroquis Dr.	Tualatin	OR
To Our Neighbors at	8472 Sw Nestucca Ct.	Tualatin	OR
To Our Neighbors at	20577 Sw Colville Ct.	Tualatin	OR
To Our Neighbors at	22350 Sw 102Nd Pl.	Tualatin	OR
To Our Neighbors at	20350 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	3809 Ne 73Rd Ave.	Portland	OR





To Our Neighbors at	8160 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8315 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8252 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8522 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at			OR
To Our Neighbors at	Po Box 230698.	Portland	OR
To Our Neighbors at	Po Box 230698.	Portland	OR
To Our Neighbors at	18880 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	18880 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	18880 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	18880 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	18880 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	18880 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	8372 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	710 Holladay St.	Portland	OR
To Our Neighbors at	10735 Sw Bannoch St.	Tualatin	OR
To Our Neighbors at	20222 Sw Tillamook Ct.	Tualatin	OR
To Our Neighbors at	8375 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	9500 Sw Barbur Blvd Ste 300.	Portland	OR
To Our Neighbors at	9500 Sw Barbur Blvd Ste 300.	Portland	OR
To Our Neighbors at	6195 Sw 150Th Ave.	Beaverton	OR
To Our Neighbors at	21199 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	21233 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	20222 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	8175 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	7321 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8464 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8685 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8535 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	1220 Sw 3Rd Ave Rm 1616.	Portland	OR
To Our Neighbors at	19775 Sw Taposa Pl.	Tualatin	OR
To Our Neighbors at	8510 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	7251 Sw Delaware Cir.	Beaverton	OR
To Our Neighbors at	8105 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8240 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8450 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	7311 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	8274 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20628 Sw 84Th Ct.	Tualatin	OR
To Our Neighbors at	20917 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	8334 Sw Mowhawk St.	Tualatin	OR
To Our Neighbors at	8178 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	20948 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	21306 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	20569 Sw 84Th Ct.	Tualatin	OR
To Our Neighbors at	7401 Sw Washo Ct #200.	Tualatin	OR
To Our Neighbors at	2982 Winkel Way.	West Linn	OR
To Our Neighbors at	21285 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	8280 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8685 Sw Comanche Way.	Tualatin	OR
To Our Neighbors at	8384 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8501 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8278 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20270 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	7991 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	1930 16Th Ave.	Forest Grove	OR
To Our Neighbors at	8201 Sw Seminole Trail.	Tualatin	OR
To Our Neighbors at	8475 Sw Avery St.	Tualatin	OR
To Our Neighbors at	19800 Spring Ridge Dr.	West Linn	OR
To Our Neighbors at	7343 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	19760 Sw Boones Ferry Rd.	Tualatin	OR
To Our Neighbors at	8400 Sw Seminole Trl.	Tualatin	OR



To Our Neighbors at	28686 Sw Paris Ave.	Wilsonville	OR
To Our Neighbors at	20487 Sw 69Th Ave.	Tualatin	OR
To Our Neighbors at	8121 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	20779 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	7401 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	20445 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	8500 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	20527 Sw 84Th Ct.	Tualatin	OR
To Our Neighbors at	Po Box 824.	Tualatin	OR
To Our Neighbors at	7375 Sw Tenino.	Tualatin	OR
To Our Neighbors at	20173 Sw Tenino Ct.	Tualatin	OR
To Our Neighbors at	20028 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	21250 Sw Makah St.	Tualatin	OR
To Our Neighbors at	8520 Sw Modoc Ct.	Tualatin	OR
To Our Neighbors at	180 Calico Lake Dr.	Brevard	NC
To Our Neighbors at	14595 Sw 144Th Ave.	Tigard	OR
To Our Neighbors at	8735 Sw Avery St.	Tualatin	OR
To Our Neighbors at	8455 Sw Seminole Trail.	Tualatin	OR
To Our Neighbors at	22082 Oak Grove.	Mission Viejo	CA
To Our Neighbors at	8210 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	20100 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	8520 Sw Sagert St.	Tualatin	OR
To Our Neighbors at	8488 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20682 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	8454 Sw Chelan Ct.	Tualatin	OR
To Our Neighbors at	8675 Sw Avery St.	Tualatin	OR
To Our Neighbors at	21198 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8460 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	20182 Sw Tillamook Ct.	Tualatin	OR
To Our Neighbors at	8354 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8204 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	7455 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	4214 Woodside Cir.	Lake Oswego	OR
To Our Neighbors at	8451 Sw Umatilla St.	Tualatin	OR
To Our Neighbors at	.		OR
To Our Neighbors at	21267 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	20935 Sw 90Th Ave.	Tualatin	OR
To Our Neighbors at	18840 Sw Boones Ferry Rd Ste 216.	Tualatin	OR
To Our Neighbors at	18840 Sw Boones Ferry Rd Ste 216.	Tualatin	OR
To Our Neighbors at	18840 Sw Boones Ferry Rd Ste 216.	Tualatin	OR
To Our Neighbors at	20164 Sw 85Th Ct.	Tualatin	OR
To Our Neighbors at	8137 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	2843 Sw Plum Ct.	Portland	OR
To Our Neighbors at	61690 Summer Shade Dr.	Bend	OR
To Our Neighbors at	8305 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	20124 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	7275 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8665 Sw Seminole Trail.	Tualatin	OR
To Our Neighbors at	8172 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8715 Sw Comanche Way.	Tualatin	OR
To Our Neighbors at	7242 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8520 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	20248 Sw Tenino Ct.	Tualatin	OR
To Our Neighbors at	20475 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	20221 Sw Tenino Ct.	Tualatin	OR
To Our Neighbors at	8550 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	20553 Sw Colville Ct.	Tualatin	OR
To Our Neighbors at	15253 Se Pebble Beach Dr.	Happy Valley	OR
To Our Neighbors at	8398 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20480 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	17477 N 101St Way.	Scottsdale	AZ
To Our Neighbors at	8515 Sw Seminole Trl.	Tualatin	OR





To Our Neighbors at	8375 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	7296 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	8374 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8535 Sw Avery St.	Tualatin	OR
To Our Neighbors at	20148 Sw Tenino Ct.	Tualatin	OR
To Our Neighbors at	20196 Sw Tenino Ct.	Tualatin	OR
To Our Neighbors at	20834 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	20300 Sw Nancy Ln.	Beaverton	OR
To Our Neighbors at	10335 Sw Hoodview Dr.	Tigard	OR
To Our Neighbors at	10335 Sw Hoodview Dr.	Tigard	OR
To Our Neighbors at	21274 Sw Makah St.	Tualatin	OR
To Our Neighbors at	20390 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	121 Sw Salmon St.	Portland	OR
To Our Neighbors at	8442 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	19740 Sw Boones Ferry Rd.	Tualatin	OR
To Our Neighbors at	21216 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	12801 Nw 40Th Ave.	Vancouver	WA
To Our Neighbors at	8302 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20084 Sw Tillamook Ct.	Tualatin	OR
To Our Neighbors at	8137 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8196 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8245 Sw Avery St.	Tualatin	OR
To Our Neighbors at	23662 Stafford Hill Dr.	West Linn	OR
To Our Neighbors at	8224 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8670 Sw Comanche Way.	Tualatin	OR
To Our Neighbors at	21207 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	21012 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	8328 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	Po Box 1632.	Tualatin	OR
To Our Neighbors at	28916 La Carreterra.	Laguna Niguel	CA
To Our Neighbors at	20167 Sw 85Th Ct.	Tualatin	OR
To Our Neighbors at	8300 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	19745 Sw 49Th Ave.	Tualatin	OR
To Our Neighbors at	8335 Sw Seminole Trail.	Tualatin	OR
To Our Neighbors at	5167 Metolius Ave Se.	Salem	OR
To Our Neighbors at	20036 Sw Tillamook Ct.	Tualatin	OR
To Our Neighbors at	8295 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	7415 Sw 37Th Ave.	Portland	OR
To Our Neighbors at	8164 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8428 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8480 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8524 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8388 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	4040 Fairview Industrial Dr Se Ms #2.	Salem	OR
To Our Neighbors at	8476 Sw Huron Ct.	Tualatin	OR
To Our Neighbors at	20753 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	20012 Sw Tillamook Ct.	Tualatin	OR
To Our Neighbors at	8235 Sw Avery St.	Tualatin	OR
To Our Neighbors at	8440 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	7768 Sw Red Hawk Ct.	Durham	OR
To Our Neighbors at	8416 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8492 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8352 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8208 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	21224 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8320 Sw Chelan St.	Tualatin	OR
To Our Neighbors at	8625 Sw Comanche Way.	Tualatin	OR
To Our Neighbors at	8488 Sw Huron Ct.	Tualatin	OR
To Our Neighbors at	8464 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	601 Quail Dr.	Newberg	OR
To Our Neighbors at	8290 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8700 Sw Seminole Trl.	Tualatin	OR

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To Our Neighbors at	1619 Se 176Th Ave.	Portland	OR
To Our Neighbors at	32590 Sw Arbor Lake Dr.	Wilsonville	OR
To Our Neighbors at	8512 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8435 Sw Umatilla St.	Tualatin	OR
To Our Neighbors at	Po Box 733.	Beaverton	OR
To Our Neighbors at	8462 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8264 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20995 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	Po Box 730.	Tualatin	OR
To Our Neighbors at	8525 Sw 165Th Ave.	Beaverton	OR
To Our Neighbors at	2121 Rosecrans Ave Ste 4325.	El Segundo	CA
To Our Neighbors at	2121 Rosecrans Ave Ste 4325.	El Segundo	CA
To Our Neighbors at	2121 Rosecrans Ave Ste 4325.	El Segundo	CA
To Our Neighbors at	2121 Rosecrans Ave Ste 4325.	El Segundo	CA
To Our Neighbors at	8490 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8414 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8278 Sw Chelan St.	Tualatin	OR
To Our Neighbors at	4849 Waylon St.	Eau Claire	WI
To Our Neighbors at	8460 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20400 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	8120 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	7448 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	20200 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	8346 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	21268 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8376 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8488 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	19165 Sw 51St Ave.	Tualatin	OR
To Our Neighbors at	21521 Sw 91St Ave.	Tualatin	OR
To Our Neighbors at	Po Box 2862.	Hillsboro	OR
To Our Neighbors at	8472 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8451 Sw Nestucca Ct.	Tualatin	OR
To Our Neighbors at	20708 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	8498 Sw Santiam Dr.	Tualatin	OR
To Our Neighbors at	8430 Sw Avery St.	Tualatin	OR
To Our Neighbors at	8280 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8436 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8344 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8630 Sw Comanche Way.	Tualatin	OR
To Our Neighbors at	8518 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8266 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8345 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8275 Sw Avery St.	Tualatin	OR
To Our Neighbors at	8320 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8355 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	9500 Sw Barbur Blvd Ste 300.	Portland	OR
To Our Neighbors at	20653 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	17367 Lake Haven Dr.	Lake Oswego	OR
To Our Neighbors at	17367 Lake Haven Dr.	Lake Oswego	OR
To Our Neighbors at	8064 Sw Woody End St.	Portland	OR
To Our Neighbors at	9839 Sw Siuslaw Ln.	Tualatin	OR
To Our Neighbors at	8311 Sw Chelan St.	Tualatin	OR
To Our Neighbors at	8348 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	26951 S Bolland Rd.	Canby	OR
To Our Neighbors at	20154 Sw Tillamook Ct.	Tualatin	OR
To Our Neighbors at	20578 Sw Colville Ct.	Tualatin	OR
To Our Neighbors at	8331 Sw Avery St.	Tualatin	OR
To Our Neighbors at	20244 Sw Tenino Ct.	Tualatin	OR
To Our Neighbors at	20086 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	8129 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8151 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8386 Sw Mohawk St.	Tualatin	OR





To Our Neighbors at	20062 Sw Tillamook Ct.	Tualatin	OR
To Our Neighbors at	8340 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8505 Sw Avery St.	Tualatin	OR
To Our Neighbors at	6941 Sw 148Th Ct.	Beaverton	OR
To Our Neighbors at	20737 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	1532 Sunlight Dr.	Fairbanks	AK
To Our Neighbors at	8336 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8365 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8245 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8555 Sw Seminole Trail.	Tualatin	OR
To Our Neighbors at	7424 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	8410 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	1481 Nw 13Th Ave Apt 732.	Portland	OR
To Our Neighbors at	8660 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	14919 Ne Lawnview Cir.	Aurora	OR
To Our Neighbors at	19738 Sw Boones Ferry Rd.	Tualatin	OR
To Our Neighbors at	19770 Sw Boones Ferry Rd.	Tualatin	OR
To Our Neighbors at	20817 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	21762 Sw Mountain Home Rd.	Sherwood	OR
To Our Neighbors at	8360 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8444 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20602 Sw Colville Ct.	Tualatin	OR
To Our Neighbors at	8452 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8220 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	21044 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	8125 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8499 Sw Huron Ct.	Tualatin	OR
To Our Neighbors at	8552 Sw Santiam Dr.	Tualatin	OR
To Our Neighbors at	8477 Sw Nestucca Ct.	Tualatin	OR
To Our Neighbors at	8214 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	7367 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8347 Sw Avery St.	Tualatin	OR
To Our Neighbors at	20947 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	8298 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8350 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	20044 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	8165 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	20551 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	20211 Sw 85Th Ct.	Tualatin	OR
To Our Neighbors at	20292 Sw Tenino Ct.	Tualatin	OR
To Our Neighbors at	4218 Ne 41St Ave.	Portland	OR
To Our Neighbors at	11970 Sw Hazelwood Loop.	Tigard	OR
To Our Neighbors at	7414 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8268 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	7328 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	7293 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8138 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8680 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8520 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8408 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	7439 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	8325 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8466 Sw Chelan Ct.	Tualatin	OR
To Our Neighbors at	20350 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	8395 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8325 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	21711 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	8265 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8392 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	3468 Ala Haukulu.	Honolulu	HI
To Our Neighbors at	21265 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8545 Sw Modoc Ct.	Tualatin	OR



To Our Neighbors at	8364 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8420 Sw Umatilla St.	Tualatin	OR
To Our Neighbors at	7327 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	17547 N Somerset Dr.	Surprise	AZ
To Our Neighbors at	8355 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	7205 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	10 Goodrich Trl.	Carmel	CA
To Our Neighbors at	2305 W I20 Ste 140 #172.	Grand Prairie	TX
To Our Neighbors at	8490 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	20532 Sw 84Th Ct.	Tualatin	OR
To Our Neighbors at	8452 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8400 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	Po Box 2690.	Tualatin	OR
To Our Neighbors at	7355 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8503 Sw Santiam Dr.	Tualatin	OR
To Our Neighbors at	20564 Sw 84Th Ct.	Tualatin	OR
To Our Neighbors at	8492 Sw Umatilla St.	Tualatin	OR
To Our Neighbors at	8246 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8474 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20276 72Nd Ave.	Tualatin	OR
To Our Neighbors at	7223 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	7407 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	21333 Sw Makah St.	Tualatin	OR
To Our Neighbors at	21885 Ne Alton St.	Fairview	OR
To Our Neighbors at	8410 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20376 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	20750 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	12424 Se Winter Creek Ct.	Happy Valley	OR
To Our Neighbors at	20124 Sw Tillamook Ct.	Tualatin	OR
To Our Neighbors at	8485 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	20002 Sw 86Th St.	Tualatin	OR
To Our Neighbors at	20922 Sw Winema Ct.	Tualatin	OR
To Our Neighbors at	20679 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	20795 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	7456 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	8484 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	7229 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	5223 Ne 47Th Ave.	Portland	OR
To Our Neighbors at	8625 Sw Seminole Trail.	Tualatin	OR
To Our Neighbors at	8645 Sw Avery St.	Tualatin	OR
To Our Neighbors at	8119 Sw Avery St.	Tualatin	OR
To Our Neighbors at	4800 Sw Meadows Rd Ste 300.	Lake Oswego	OR
To Our Neighbors at	8360 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	104 South Aspen Ct.	Chandler	AZ
To Our Neighbors at	8514 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8426 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	4914 E Quien Sabe Way.	Cave Creek	AZ
To Our Neighbors at	8690 Sw Comanche Way.	Tualatin	OR
To Our Neighbors at	21183 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	20776 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	19767 Sw 72Nd Ave Ste 100.	Tualatin	OR
To Our Neighbors at	21313 Sw Makah St.	Tualatin	OR
To Our Neighbors at	476 Sw Brookwood Ave.	Hillsboro	OR
To Our Neighbors at	14510 Sw Chesterfield Ln.	Tigard	OR
To Our Neighbors at	20052 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	8415 Sw Avery St.	Tualatin	OR
To Our Neighbors at	8487 Sw Chelan Ct.	Tualatin	OR
To Our Neighbors at	8487 Sw Chelan Ct.	Tualatin	OR
To Our Neighbors at	7345 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	16745 Sw Stellar Dr.	Sherwood	OR
To Our Neighbors at	20532 Sw 84Th Ct.	Tualatin	OR
To Our Neighbors at	20230 Sw Tillamook Ct.	Tualatin	OR





To Our Neighbors at	7426 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8385 Sw Avery St.	Tualatin	OR
To Our Neighbors at	8316 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8500 Sw Modoc Ct.	Tualatin	OR
To Our Neighbors at	8380 Sw Mohawk St.	Tualatin	OR
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To Our Neighbors at	34580 Ne Wilsonville Rd.	Newberg	OR
To Our Neighbors at	20621 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	200 Granada Dr.	Corte Madera	CA
To Our Neighbors at	8260 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8402 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8233 Sw Seminole Tr.	Tualatin	OR
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To Our Neighbors at	16543 S Harding Rd.	Oregon City	OR
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To Our Neighbors at	8465 Sw Chelan Ct.	Tualatin	OR
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To Our Neighbors at	2875 Marylhurst Dr.	West Linn	OR
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To Our Neighbors at	20076 Sw 72Nd Ave.	Tualatin	OR
To Our Neighbors at	4856 Sw Wembley Pl.	Beaverton	OR
To Our Neighbors at	8390 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	4165 Imperial Dr.	West Linn	OR
To Our Neighbors at	8418 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20771 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	7335 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	7007 Sw 7Th Ave.	Portland	OR



To Our Neighbors at	8448 Sw Chelan Ct.	Tualatin	OR
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To Our Neighbors at	20821 Sw 84Th Ave.	Tualatin	OR
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To Our Neighbors at	20579 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	21150 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	8270 Sw Shenandoah Way.	Tualatin	OR
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To Our Neighbors at	10345 W Olympic Blvd.	Los Angeles	CA
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To Our Neighbors at	8510 Sw Sagert St.	Tualatin	OR
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To Our Neighbors at	7224 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	678 Gemstone Dr.	San Marcos	CA
To Our Neighbors at	19030 Sw Chesapeake Dr.	Tualatin	OR
To Our Neighbors at	21265 S Makah St.	Tualatin	OR
To Our Neighbors at	8270 Sw Mohawk St.	Tualatin	OR
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To Our Neighbors at	15650 Sw 133Rd Ave.	Tigard	OR
To Our Neighbors at	20603 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	20168 Sw Tillamook Ct.	Tualatin	OR
To Our Neighbors at	8660 Sw Comanche Way.	Tualatin	OR
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To Our Neighbors at	20726 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	8430 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8425 Sw Seminole Trail.	Tualatin	OR



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To Our Neighbors at	8441 Sw Chelan Ct.	Tualatin	OR
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To Our Neighbors at	20212 Sw 86Th Ave.	Tualatin	OR
To Our Neighbors at	8324 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	20846 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	7201 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	8680 Sw Comanche Way.	Tualatin	OR
To Our Neighbors at	7468 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	10440 Sw Susquehanna Dr.	Tualatin	OR
To Our Neighbors at	8422 Sw Chelan Ct.	Tualatin	OR
To Our Neighbors at	8485 Sw Nestucca Ct.	Tualatin	OR
To Our Neighbors at	160 Mckenzie Creek Rd.	Scotts Valley	CA
To Our Neighbors at	20692 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	5100 Sw Greenwood Cir.	Tualatin	OR
To Our Neighbors at	8366 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	7247 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	8185 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	8390 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	16840 Sw Parrett Mountain Rd.	Sherwood	OR
To Our Neighbors at	8192 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	22760 Sw 87Th Ave.	Tualatin	OR
To Our Neighbors at	20939 Sw Martinazzi Ave.	Tualatin	OR
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To Our Neighbors at	8710 Sw Comanche Way.	Tualatin	OR
To Our Neighbors at	7456 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8295 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	61690 Summer Shade Dr.	Bend	OR
To Our Neighbors at	8434 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8256 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8350 Sw Mohawk St.	Tualatin	OR
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To Our Neighbors at	8385 Sw Iroquois Dr.	Tualatin	OR
To Our Neighbors at	7306 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	8490 Sw Chelan Ct.	Tualatin	OR
To Our Neighbors at	8264 Sw Seminole Trl.	Tualatin	OR
To Our Neighbors at	Po Box 3923.	Tualatin	OR
To Our Neighbors at	8478 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8424 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	7471 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	7380 Sw Delaware Cir.	Tualatin	OR
To Our Neighbors at	Po Box 1790.	Tualatin	OR
To Our Neighbors at	8470 Sw Avery St.	Tualatin	OR
To Our Neighbors at	20820 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	7266 Sw Delaware Circle.	Tualatin	OR
To Our Neighbors at	8306 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8255 Sw Avery St.	Tualatin	OR
To Our Neighbors at	20916 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	8685 Sw Sagert St.	Tualatin	OR
To Our Neighbors at	8494 Sw Mohawk.	Tualatin	OR
To Our Neighbors at	8295 Sw Avery St.	Tualatin	OR
To Our Neighbors at	7279 Sw Tenino Ln.	Tualatin	OR
To Our Neighbors at	19790 Sw Boones Ferry Rd.	Tualatin	OR
To Our Neighbors at	8342 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	8533 Sw Santiam Dr.	Tualatin	OR
To Our Neighbors at	8182 Sw Shenandoah Way.	Tualatin	OR
To Our Neighbors at	8468 Sw Mohawk St.	Tualatin	OR
To Our Neighbors at	20852 Sw 84Th Ave.	Tualatin	OR
To Our Neighbors at	4585 Sw Trail Rd.	Tualatin	OR
To Our Neighbors at	Po Box 1567.	Lake Oswego	OR
To Our Neighbors at	21234 Sw Martinazzi Ave.	Tualatin	OR
To Our Neighbors at	8300 Sw Mohawk St.	Tualatin	OR



To Our Neighbors at  
To Our Neighbors at  
To Our Neighbors at  
To Our Neighbors at

8565 Sw Avery St.  
18725 Sw Boones Ferry Rd.  
8324 Sw Maxine Ln Unit #46.

Tualatin  
Tualatin  
Wilsonville

OR  
OR  
OR



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# 3J CONSULTING

9600 SW NIMBUS AVENUE, SUITE 100  
BEAVERTON, OREGON 97008  
PH: (503) 946.9365  
WWW.3JCONSULTING.COM

July 27, 2022

## **Alden Apartments Neighborhood Meeting**

To Our Neighbors at  
8390 Sw Seminole Trl.  
Tualatin, OR 97062

3J Consulting acts on behalf of Colrich California Construction, INC. regarding a proposal for the development of an additional 45 townhomes in Tualatin. The site is 16.53 acres in size and is located at 7800 SW Sagert St, Tualatin, OR 97062. The cross streets are SW Sagert St. and SW Martinazzi Ave. The site consists of one tax lot, identified as 2S125BA00100. The site is zoned Medium High Density Residential (RMH). The site location of the proposed project is shown on the attached vicinity map. The proposal includes applications for an Architectural Review.

Prior to applying to the City of Tualatin for the necessary land use approvals, I would like to discuss the proposal in more detail with the surrounding property owners and residents.

You are cordially invited to attend an In-person Neighborhood Meeting:

**Wednesday, August 10<sup>th</sup>, 2022 at 6:00pm**

**The meeting will be held at the Tualatin Public Library in the Community Room.**

18878 SW Martinazzi Ave. Tualatin, OR 97062

Please note that this will be an informational meeting on preliminary plans. These plans may be altered prior to the submittal of the application to the City. The purpose of this meeting is to provide a forum for the applicant and surrounding property owners/residents to review and consider the proposal. The meeting gives you the opportunity to share with us any special information you know about the property.

I look forward to more specifically discussing the proposal with you. If you have any questions on how to participate in the proposed meeting, please contact us at [ashley.doty@3j-consulting.com](mailto:ashley.doty@3j-consulting.com) or (503) 946.9365 x.223.

Sincerely,



Ashley Doty  
Project Manager  
3J Consulting, Inc.





**CERTIFICATION OF SIGN POSTING**

<p><b>NOTICE</b></p> <p><b>NEIGHBORHOOD / DEVELOPER MEETING</b></p> <p>__/__/2010 __:__.m.</p> <p>SW _____</p> <p>503-__-__</p>
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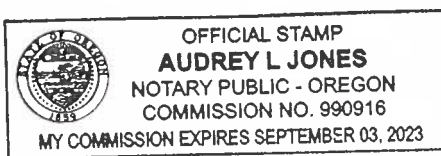
In addition to the requirements of TDC 32.150, the 18" x 24" sign must display the meeting date, time, and address as well as a contact phone number. The block around the word "NOTICE" must remain orange composed of the RGB color values Red 254, Green 127, and Blue 0. A PowerPoint template of this sign is available at: <https://www.tualatinoregon.gov/planning/land-use-application-sign-templates>.

As the applicant for the Alden Apartments project, I hereby certify that on this day, 3 sign(s) was/were posted on the subject property in accordance with the requirements of the Tualatin Development Code and the Community Development Division.

Applicant's Name: Samuel Huck - 3J consulting

Applicant's Signature: *Samuel Huck*  
(Please Print)

Date: 07/27/2022



*Audrey Jones*









## Neighborhood Meeting Notes – Alden Apartments

Date: August 10<sup>th</sup>, 2022  
 Project: Alden Apartments  
 3J No.: 22791

Presenters: Heather Austin, 3J Consulting, Inc.  
 Ashley Doty, 3J Consulting, Inc.

In compliance with the requirements for the submission of a land use application for Architectural Review for the development of a Multifamily Housing project, the applicant conducted a neighborhood meeting with notice provided to neighboring property owners within 1,000 feet of the subject site, designated Citizen Involvement Organization representatives, and the Tualatin Community Development Department.

3J Consulting hosted the meeting in the Community Room of the Tualatin Public Library located at 18878 SW Martinazzi Ave. The meeting began at 6:00 PM on August 10, 2022. A sign in sheet was provided for attendees to provide their name, address, telephone number, and email address. The presentation included an overview of the proposed development, zoning requirements and land use process. A site plan, various renderings, and floor plans of the proposed development were available for attendees to view. The following is a list of questions which were asked during the meeting. Names of attendees with comments/questions are included per Tualatin Development Code section 32.120.

Question	Answer
Bob Kern: What will the heights of the buildings be? Code used to be 45'.	The building heights will be maximum 35', which is the maximum height allowed by City code.
Is the church next door staying?	Yes. The proposed development is completely within the current Alden Apartments site.
What is the design of the landscaping going to be?	The proposal does not yet have a landscape designed. The renderings just show concept landscaping.
Linda Weland: How many units will be removed?	15 units are being removed (two buildings total). 45 units are being added.
Wes Davis: Will there be 2 cars per units? What will the street access be? Will cars be exiting on Sagert? Is it right turn out only?	The units each have a 2 car garage. Most units are on the loop drive that access the property from Martinazzi. One new building (4 units) will have access from Sagert. Currently there are no proposed restrictions to turning movements into or out of the property.
Bob: Are there any new entrances to the site?	There are no new proposed vehicular accesses to the site at this time. The existing a vehicular access to the site will remain.





Bob: How many units will there be per acre?	The overall property site is 17.09 acres. There will be 240 units total after construction. density. The maximum density per code is 250 units. This meets the City code for density requirements.
Tim: Are the new units townhomes? Are the current ones staying on the site?	The proposed new buildings are townhomes. The development would remove two existing buildings that are apartments, but no other changes to the existing apartments will occur.
Tim: Are there any traffic impacts? Where will new units be accessing from?	There are no expected major traffic impacts. This was already looked at by the consulting team.  <a href="#">Additional info: A trip generation study has been conducted by the consulting traffic engineer, Kittelson &amp; Associates. The proposed development is expected to generate fewer than 500 daily drips, fewer than 60 morning and evening peak trips, and fewer than 20 large truck trips per day, and therefore a full transportation impact analysis is not expected for Tualatin Development Code Section 74.440. This report will be included in the land use application.</a>
Gayle: Will there be overflow parking for guests?	The proposed development will be meeting City code requirements for off-street parking.
Linda: Will there be play areas or open spaces for the new units?	These areas have not been finalized but the intent is to meet City code requirements for site design standards.
Gayle: When is the estimated completion date?	Spring/Summer 2024
Linda: Are these townhomes going to be to own or to rent?	All of the new townhome style apartments will be for rent from the same property managements company as the rest of the complex. No private ownership of individual units.
Wally: Are the common areas public or just for the residents? Are there any public funds involved?	The common areas will be private and just for the use of residents and guests. There is no public funding involved for the common areas.
Linda: Will there be affordable housing?	No, the new units will not be considered Affordable Housing per the State definition of "regulated affordable housing". New units will be market rate set by the property owner.
Bob: Are there low cost units on site? What is the current market rate of the units now?	Current rates for existing units are unknown to the consultant team. Please contact the property management company for more information on unit rates.
Wes: What is the different between townhomes and apartments? The project is called Alden Apartments but these are townhomes?	The property is called Alden Apartments and contains various sized apartment units each on individual floors. The proposed units will be townhome style apartments, with



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	each units spread across 3 vertical floors, separated by shared walls between units.
Wally: What are the targeted demographics of the new units? Will there be multi-generational style units with bedrooms on the first floor? Can multiple levels be accessed from outside or are there stairs inside to each level.	The units will all only have access from the ground floor. There are currently two proposed unit floorplans. Floorplan A has a bedroom on the first floor. Floorplans are available to view at this meeting.
Linda: What will the unit layouts be? How many bedrooms?	There are currently two different proposed floorplans. Floorplan A has 3 bedrooms and 3 bathrooms. Floorplan B has 2 bedrooms and 2.5 bathrooms.
Barb: How many car spaces will the garages be?	All units are proposed to have a 2 car garage.

The meeting concluded at approximately 6:30 PM.



Appendix F. Neighborhood Meeting Materials

Signs posted along property's frontage on Sagert, Martinazzi and Avery, and close-up of sign designed to city standards.



CERTIFICATION OF SIGN POSTING



The applicant must provide and post a sign pursuant to Tualatin Development Code (TDC 32.150). The block around the word "NOTICE" must remain yellow composed of the RGB color values Red 255, Green 255, and Blue 0. A template is available at:

<https://www.tualatinoregon.gov/planning/land-use-application-sign-templates>

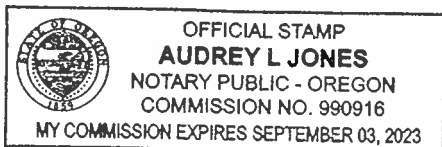
**NOTE:** For larger projects, the Community Development Department may require the posting of additional signs in conspicuous locations.

As the applicant for the Alden Apartments AR-22-0008 project, I hereby certify that on this day, 3 sign(s) was/were posted on the subject property in accordance with the requirements of the Tualatin Development Code and the Community Development Division.

Applicant's Name: Sam Huck (Please Print)

Applicant's Signature: [Handwritten Signature]

Date: 09/02/2022



[Handwritten Signature: Audrey Jones]









 **NOTICE**  
**ARCHITECTURAL  
REVIEW AR-22-0008**  
For more information call  
503-691-3026 or visit  
[www.tualatinoregon.gov](http://www.tualatinoregon.gov)





**NOTICE**  
ARCHITECTURAL  
REVIEW AR-22-4006  
For more information call  
503-691-3026 or visit  
[www.clatsopregion.gov](http://www.clatsopregion.gov)





## ALDEN APARTMENTS

7800 SW Sagert Street and 20400 SW Martinazzi Avenue  
Pre-Application Meeting Summary

Thank you for discussing your proposed multiple family development project. Below you will find a summary of our discussion points. If there is anything else from our meeting that you wish to document, please respond with your notes as well. Thank you.

### Required Land Use Reviews

Submit electronically via eTrakit: <https://permits.ci.tualatin.or.us/eTrakit/>.

#### Neighborhood/Developer meeting

- Holding a Neighborhood/Developer meeting is required for the Annexation, Plan Map Amendment (Zone Change), and Architectural Review applications. The same meeting may be used for both applications.
- Neighborhood/Developer meetings should generally be held no more than six months prior to application. More detailed information about this meeting, is online here: <https://www.tualatinoregon.gov/planning/neighborhood-developer-meetings>
- Applicants are responsible for mailing and posting notice of your Neighborhood Developer meeting. The City can provide a list of addresses for your notice letters. This mailing list includes neighboring property owners. Please email us at [planning@tualatin.gov](mailto:planning@tualatin.gov) to request a Mailing List for a \$32 fee.

#### Architectural Review Application:

Type III Land Use Decision – See [TDC 33.020\(3\)](#)

[https://www.tualatinoregon.gov/sites/default/files/fileattachments/planning/page/5081/ar\\_instructions\\_2019\\_withforms.pdf](https://www.tualatinoregon.gov/sites/default/files/fileattachments/planning/page/5081/ar_instructions_2019_withforms.pdf)

Type III AR applications and examples for industrial development found here:

<https://www.tualatinoregon.gov/planning/ar-19-0008-tualatin-industrial-park>

Criteria to address for your AR narrative includes:

- **Tualatin Municipal Code:**
  - [03-02: Sewer Regulations;](#)
  - [03-03: Water Service;](#)
  - [03-05: Soil Erosion, Surface Water Management, Water Quality Facilities, and Building & Sewers;](#)
- **Tualatin Development Code:**



- [32: Procedures;](#)
- [33.020: Architectural Review;](#)
- [33.110: Tree Removal Permit/Review;](#)
- [42: Medium High Density Residential Zone \(RMH\);](#)
- [73A, 73B, 73C and 73D: Design Standards;](#)
- [74: Public Improvements](#)
- [75: Access Management](#)

#### **Type III Timeline:**

- Decided by Architectural Review Board, meets as needed on Wednesdays: <https://www.tualatinoregon.gov/arb>
  - 30 day Completeness Review.
    - Hearing typically scheduled within 60 days of complete application
  - Notice of Hearing:
    - 20 day prior to hearing
    - Those who comment gain standing for potential appeal
    - Notice of Decision:
      - 14 day appeal period – opportunity to appeal decision to City Council
      - Decision is good for two years ([TDC33.020\(9\)](#)) with an opportunity to request a one-time decision extension ([TDC 33.020\(8\)](#)) of one (1) additional year, if approved. Extensions require a Type II review process.

#### **Required Service Provider Letters**

Clean Water Services will comment on additional natural resource, through their Review process. The Service Provider Letter from CWS is a requirement of a complete land use or Engineering permit submittal. For more information, see <http://www.cleanwaterservices.org/permits-development/step-by-step-process/environmental-review/> This letter will specify any required wetland and buffer mitigation.

Coordination with Republic Services, the City’s waste disposal service, is required as part of the Architectural Review process. To obtain a service provider letter for proposed development, please work directly with John Olivares, Operations Manager: [jolivares@republicservices.com](mailto:jolivares@republicservices.com) and (503) 826-7139.

Coordination with TVF&R, the City’s emergency and fire protection service, is required as part of the Architectural Review process. To obtain a service provider letter for proposed development, please work directly with TVF&R: <https://www.tvfr.com/FormCenter/Public-Records-7/Service-provider-permit-for-Tualatin-73>

#### **Highlighted Site Design Standards**

- Ordinance [1463-21](#): The Middle Housing ordinance is effective but the online development code may not have been updated at this time.
- [TDC 73A.200\(1\) Common Wall Design Standards:](#)
- Walkways must be provided between the main building entrances and other on-site buildings, accessways, and sidewalks along the public right-of-way;
- Phasing of Improvements – Phasing of required improvements are regulated in

### **Tree Removal:**

Four or fewer trees may be removed within a single calendar year from a single parcel of property or contiguous parcels of property under the same ownership without a permit. Tree is defined as: a living, standing, woody plant having a trunk eight inches or more in diameter, widest cross section, at a point four feet above mean ground level.

If required, tree removal is reviewed under the Architectural Review application. A tree preservation plan and a tree assessment report prepared by a certified arborist are required to address the approval criteria for tree removal found in [TDC 33.110\(5\)](#).

### **Public Utilities and Other Site Development**

- Request available public utility as-builts by emailing [tdoran@tualatin.gov](mailto:tdoran@tualatin.gov). Washington County can provide public as-builts adjacent to your site.
- Apply for Hydraulic Modeling and Tualatin Erosion Control, Public Works, and Water Quality Permits electronically via eTrakit: <https://permits.ci.tualatin.or.us/eTrakit/>.
- An Erosion Control permit is required from Tualatin for projects disturbing over 500 square feet.
  - Additionally, if between one and five acres are disturbed, a 1200CN is needed from CWS.
  - If over five acres are disturbed, a 1200C is needed from DEQ.
- A Water Quality Permit is needed for construction and modification of public and private impervious areas. The permit will include wetland mitigation/revegetation required by CWS SPL in addition to treatment, detention as required for conveyance, and hydromodification per CWS D&CS Ch 4.
  - Any additional permits from regulating agencies such as CWS Environmental Services
  - Include all private stormwater treatment and conveyance within a maintenance agreement including existing facilities.
  - For water quality permit application completeness submit stormwater plans and calculations certified by an Oregon registered, professional engineer in accordance with TMC 3-5-390(1) proving proposed systems:
    - In accordance with TMC 3-5-200 through 3-5-430, TDC 74.630 and 74.650, Public Works Construction Code (PWCC), and Clean Water Services' (CWS) Design and Construction Standards (D&CS) Chapter 4.
    - Show onsite facilities for proposed new and modified impervious areas.
    - Address runoff from all new and modified private impervious areas.
    - Treat new and modified impervious areas in accordance with CWS D&CS 4.08.1.d meeting phosphorous removal in accordance with TMC 3-5-350 per the design storm in accordance with TMC 3-5-360 and CWS D&CS 4.08.2.
    - Detain as needed TMC 3-5-220, TMC 3-5-230, and CWS D&CS 4.08.
    - Accommodate hydromodification in accordance with CWS D&CS 4.03.5.
    - Include conveyance calculations that accommodates up to a 25-year storm event with 100-year overland flow to the public stormwater system in accordance with TDC 74.640 and CWS D&CS 5.05.2.d.
      - Downstream evaluation with a maximum of 82% capacity within public lines per [TMC 3-5-210 - Review of Downstream System](#)
    - Demonstrate compliance with the Clean Water Services' Service Provider Letter CWS conditions sufficient to obtain a Stormwater Connection Permit Authorization Letter in accordance with TDC 74.650(2) and CWS D&CS 3.01.2(d).

- If the proposed water quality facility includes infiltration in the design, a Geotech/soil/infiltration report will need to be submitted to Engineering for a complete land use application.
- A Public Works Permit is needed for any sanitary sewer, stormwater, or water line work within right-of-way or public easements.
- Record an 8-foot wide public utility easement adjacent to right-of-way. Underground utilities unless over 50kv (then associated existing utilities may remain above).
  - Work directly with PGE regarding any existing lines and poles vs what they will require to serve your site.
  - Your conversations with PGE may result in their request of special circumstances to the City. Please provide us PGE's response early so we can provide any needed input.
  - Private retaining walls must be located outside of the public utility easement.
  - The maximum allowed slope within the public utility easement is per:
    - Washington County standards for SW Grahams Ferry Road.
    - Tualatin [Public Works Construction Code](#) 203.2.07 Slope Design 3:1 standard for local streets.
- Hydraulic Modeling is required for over 48,300 square footage of new building area, 870 gallons/acre/day use, and/or more than 49 residential units. Hydraulic Modeling may be requested in advance of application for a land use to confirm availability and requirements, but may need to be updated depending on changes due to conditions of approval. When submitting a modeling application include:
  - Requirements/alternatives allowed by TVF&R. Apply for a TVF&R service provider letter via <https://www.tvfr.com/FormCenter/Public-Records-7/Service-provider-permit-for-Tualatin-73>.
  - Hydrant flow test results. Request testing via <https://www.tualatinoregon.gov/publicworks/hydrant-flow-tests>. For questions contact Terrance Leahy, Water Division Manager, (503) 691-3095; [tleahy@tualatin.gov](mailto:tleahy@tualatin.gov).
  - After submittal Staff will coordinate with you regarding payment of the fee per the current [fee schedule](#). The fee is currently \$300/building.

### Transportation and Site Access

- Your transportation engineer must email Mike McCarthy, Principal Traffic Engineer, [mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov) (please also copy [tdoran@tualatin.gov](mailto:tdoran@tualatin.gov)) to confirm proposed Traffic Impact Analysis scope including site plan, building sizes, etc. and estimated trip generation. Staff will coordinate with any other applicable agencies and jurisdictions. Mike may also be reached at (503) 691-3674.
- Additional ROW may be required to permit the construction of public transportation improvements (Traffic Impact Analysis will identify mitigation measures).

### Fire

- Drew Dubois, TVF&R (503) 259-1404; [drew.debois@tvfr.com](mailto:drew.debois@tvfr.com)
- Flow testing: Terrance Leahy, Water Division Manager, (503) 691-3095; [tleahy@tualatin.gov](mailto:tleahy@tualatin.gov)

### Building

- At the conclusion of the AR appeal period, please contact Building Services at (503) 691-3044 to schedule a pre-submittal meeting to discuss the permit process with Building Division staff.

- Current fee schedule: <https://www.tualatinoregon.gov/finance/fee-schedule>
- For calculating SDC fees, please work with Lauren Gonzalez, [lgonzalez@tualatin.gov](mailto:lgonzalez@tualatin.gov)





# AFFIDAVIT OF MAILING

STATE OF OREGON                    )  
  ) ss  
COUNTY OF WASHINGTON        )

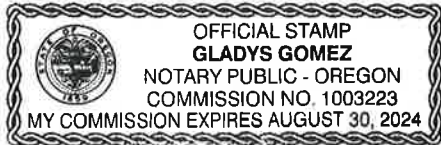
I, Pamala Nold, being first duly sworn, depose and say:

That on the 9th day of November 2022, I served upon the persons shown on Exhibit A, attached hereto and by this reference incorporated herein, a copy of a Notice of Hearing marked Exhibit B, attached hereto and by this reference incorporated herein, by mailing to them a true and correct copy of the original hereof. I further certify that the addresses shown on said Exhibit A are their regular addresses as determined from the books and records of the Washington County and/or Clackamas County Departments of Assessment and Taxation Tax Rolls, and that said envelopes were placed in the United States Mail at Tualatin, Oregon, with postage fully prepared thereon.

Dated this 9th of November, 2022

*Pamala J. Nold*  
Signature

SUBSCRIBED AND SWORN to before me this 9th day of November, 2022.



*Gladys Gomez*  
Notary Public for Oregon

My commission expires: 8/30/24

RE: AR 22-0008 – ALDEN APARTMENTS



**NOTICE OF HEARING AND OPPORTUNITY TO COMMENT  
CASE FILE: AR 22-0008— ALDEN APARTMENTS**

**NOTICE IS HEREBY GIVEN** that a public hearing before the Architectural Review Board will be held:

**Wednesday, November 30, 2022 at 6:30 pm**

**Location:** Tualatin Service Center

10699 SW Herman Road, Tualatin, OR 97062

**Zoom Teleconference:** Link with log-in instructions available  
[www.tualatinoregon.gov/meetings](http://www.tualatinoregon.gov/meetings)

**AR 22-0008  
Alden Apartments**

*3j Consulting, on behalf of CR Alden Communities, LLC., is requesting approval to construct 45 new townhome units in 12 new buildings. The 16.7 acre property is located in the Medium High Density Residential Zone (RMH). Two existing buildings are proposed for removal for a net gain of 10 buildings on the site.*

To view the application materials, visit  
[www.tualatinoregon.gov/projects](http://www.tualatinoregon.gov/projects)

**Comments and questions may be submitted to:**  
[kleonard@tualatin.gov](mailto:kleonard@tualatin.gov) and 503-691-3029

**Located at:** 7800 SW Sagert Street and 20400 SW Martinazzi Avenue with the **Tax Map/Lot:** 2S125BA00100



- **Type III Architectural Review Criteria:** Tualatin Development Code Chapters: 32, 33, 42, 73A-D, 74, 75
- **Staff report** will be available at least seven days before the hearing for inspection at no cost, and copies will be provided at a reasonable cost.
- **Print copies** of the application are available at a reasonable cost.
- **Individuals wishing to comment on the application** must do so in writing to the Planning Division prior to the hearing, or in writing and/or orally at the hearing. Materials must be received by **November 16, 2022**, to be included in the hearing packet.

- **The public hearing will begin** with a staff presentation, followed by testimony by proponents, testimony by opponents, and rebuttal. The time of individual testimony may be limited. If a participant requests, before the hearing is closed, the record shall remain open for at least 7 days after the hearing.
- **All citizens are invited to attend and be heard:** Failure of an issue to be raised in the hearing, in person, or by letter, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond to the issue precludes appeal to the State Land Use Board of Appeals (LUBA) based on that issue. The failure of the applicant to raise constitutional or other issues relating to the proposed conditions of approval with sufficient specificity to the decision maker to respond to the issue precludes an action for damages in circuit court.
- **Notice of the Decision** will only be provided to those who submit written comments regarding that application or testify at the hearing.

*You received this mailing because you own property within 1,000 feet (ft) of the site or within a residential subdivision which is partly within 1,000 ft.*

For additional information contact:

Keith Leonard, Associate Planner, [kleonard@tualatin.gov](mailto:kleonard@tualatin.gov) and 503-691-3029

«OWNER1»  
«OWNERADDR»  
«OWNERCITY», «OWNERSTATE»  
«OWNERZIP»

8292 MOHAWK LLC  
8324 SW MAXINE LN UNIT #46  
WILSONVILLE, OR 97070

~~8292 MOHAWK LLC  
8324 SW MAXINE LN UNIT #46  
WILSONVILLE, OR 97070~~

~~8292 MOHAWK LLC  
8324 SW MAXINE LN UNIT #46  
WILSONVILLE, OR 97070~~

~~8482 MOHAWK LLC  
18725 SW BOONES FERRY RD  
TUALATIN, OR 97062~~

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TRUST  
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MARIA F  
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MANNING  
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AMINI MITRA  
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BAILEY KEVIN RYAN  
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YERANIA & GALEANA MARIA NANCY  
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MACEDONIO DEJESUS BARRAGAN  
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BAYERN LLC  
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SHERWOOD, OR 97140

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BARTLETT CARLI JAYNE  
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COLLINSWORTH MATTHEW JAMES  
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TUALATIN, OR 97062

CRISMON RACHEL  
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TUALATIN, OR 97062

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448 TENNEY DR  
ROGUE RIVER, OR 97537

CATHERWOOD ARTHUR FRANKLYN &  
MERCEDES ANN REV TRUST  
21265 S MAKAH ST  
TUALATIN, OR 97062

CHAO ANDY  
678 GEMSTONE DR  
SAN MARCOS, CA 90278

~~CHONG CHRIS & CHONG KIRSTEN  
5870 SW WICHITA ST  
TUALATIN, OR 97062~~

CIRA FAMILY TRUST  
2823 SAN ARDO  
BELMONT, CA 94002

COLE SAMUEL J & MARY GAYLE  
FURLOW-COLE LIV TRUST  
20126 SW TENINO CT  
TUALATIN, OR 97062

COOK KENNETH & COOK LETA M  
8131 SW AVERY ST  
TUALATIN, OR 97062

COPE ERIN M & COPE BARBARA J  
20788 SW 84TH AVE  
TUALATIN, OR 97062

CORREIA KELLY  
8475 SW HURON CT  
TUALATIN, OR 97062

CROWELL MARGARITA  
7237 SW DELAWARE CIR  
TUALATIN, OR 97062

DALLAL CLAIRE Y  
8340 SW MOHAWK ST  
TUALATIN, OR 97062

DANIELS MARK L  
21180 SW MARTINAZZI AVE  
TUALATIN, OR 97062

~~DANIELS MARK L  
21180 SW MARTINAZZI AVE  
TUALATIN, OR 97062~~

~~DANIELS MARK L  
21180 SW MARTINAZZI AVE  
TUALATIN, OR 97062~~

DARLING STACY  
8248 SW SHENANDOAH WAY  
TUALATIN, OR 97062

DAVEY JOSEPH & HOWE SOPHIA N  
8300 SW CHELAN ST  
TUALATIN, OR 97062

DAVIDSON FRANCES M  
8270 SW SHENANDOAH WAY  
TUALATIN, OR 97062

DAVIDSON SHANNON P & DAVIDSON  
JONATHAN G  
8285 SW CHELAN ST  
TUALATIN, OR 97062

DAVIS ROBERT M & DAVIS BARBARA K  
18264 HOLLY LN  
OREGON CITY, OR 97045

DAVIS WESLEY L & DAVIS JOYCE F  
20579 SW MARTINAZZI AVE  
TUALATIN, OR 97062

DAVIS WILLIAM B  
21150 SW IROQUOIS DR  
TUALATIN, OR 97062

DAY WILLIAM R  
7488 SW DELAWARE CIR  
TUALATIN, OR 97062

DELANEY JAMES W & CRESTA-DELANEY  
KIMBERLY MARIE  
8325 SW AVERY ST  
TUALATIN, OR 97062

DENOVA YOANDA CELINA GUTIERREZ  
8232 SW SHENANDOAH WAY  
TUALATIN, OR 97062

DESSAUER SUZANNA COLVIN &  
DESSAUER RICHARD KENNETH  
8143 SW SHENANDOAH WAY  
TUALATIN, OR 97062

DEVAULT MOIRA  
20821 SW 84TH AVE  
TUALATIN, OR 97062

DEXTER ROBERT W & DEXTER  
CATHERINE M  
20055 SW TILLAMOOK CT  
TUALATIN, OR 97062

DICKERSON HARRY L & DICKERSON  
DIANA R  
7365 SW DELAWARE CIR  
TUALATIN, OR 97062

DIGGS ROSA  
20317 SW TENINO CT  
TUALATIN, OR 97062

~~DIGGS ROSA  
20317 SW TENINO CT  
TUALATIN, OR 97062~~

DIGIOVANNA KENNETH J  
8448 SW CHELAN CT  
TUALATIN, OR 97062

DIGREGORIO RICHARD C  
7007 SW 7TH AVE  
PORTLAND, OR 97219

DISSMORE CHARLOTTE  
7335 SW DELAWARE CIR  
TUALATIN, OR 97062

DIVINE GERALD & DIVINE PATRICIA  
20771 SW MARTINAZZI AVE  
TUALATIN, OR 97062

DOBBINS 1998 FAMILY TRUST  
8418 SW MOHAWK ST  
TUALATIN, OR 97062

DONALDSON AMY L  
4165 IMPERIAL DR  
WEST LINN, OR 97068

DORAN YVONNE REV LIV TRUST  
4856 SW WEMBLEY PL  
BEAVERTON, OR 97005

DORAN YVONNE REV LIV TRUST  
8390 SW SHENANDOAH WAY  
TUALATIN, OR 97062

DOUGLASS ERIC A  
20076 SW 72ND AVE  
TUALATIN, OR 97062

DOYLE TREVOR & DOYLE ELIZABETH  
4641 FIRTREE LN  
SPARKS, NV 89436

DRUSE STEPHEN E & DRUSE ANNA  
BAIOCCO  
20101 SW TENINO CT  
TUALATIN, OR 97062



DULL DAVID & DULL JORDAN  
8239 CAHMPOEG RD NE  
SAINT PAUL, OR 97137

~~DULL DAVID & DULL JORDAN  
8239 CAHMPOEG RD NE  
SAINT PAUL, OR 97137~~

~~DULL DAVID & DULL JORDAN  
8239 CAHMPOEG RD NE  
SAINT PAUL, OR 97137~~

DUMMER BRIAN G & DUMMER  
MICHELLE M  
21246 SW IROQUOIS DR  
TUALATIN, OR 97062

DUNCAN COLLEEN & DUNCAN IAN  
ROBERT MICHAEL  
8490 SW NESTUCCA CT  
TUALATIN, OR 97062

DUNIGAN SHAWN P & DUNIGAN  
CHRISTINE A  
20624 SW MARTINAZZI AVE  
TUALATIN, OR 97062

DUNNING ROWAN KATHERINE WALKER  
8296 SW MOHAWK ST  
TUALATIN, OR 97062

DUSEK RONALD E  
2875 MARYLHURST DR  
WEST LINN, OR 97068

DVORAK DALE R  
8705 SW SEMINOLE TRL  
TUALATIN, OR 97062

DWIGHT JOSEPH D & DWIGHT PAULA  
SUE  
7190 SW DELAWARE ST  
TUALATIN, OR 97062

ECONE WADE & ECONE LINDSAY  
8465 SW CHELAN CT  
TUALATIN, OR 97062

EDISON LINDAY NOELLE & EDISON  
CHRISTOPHER MARTIN  
20969 SW 84TH AVE  
TUALATIN, OR 97062

EISERT CLARK L & EISERT STEPHANIE  
10685 SW CLAY  
SHERWOOD, OR 97140

EISERT STEPHANIE  
10685 SW CLAY ST  
SHERWOOD, OR 97140

ELLIOTT RAYMOND  
8458 SW MOHAWK ST  
TUALATIN, OR 97062

ELLIOT RACHEL R  
8212 SW SHENANDOAH WAY  
TUALATIN, OR 97062

ESQUIVEL GUADALUPE PENA &  
MIRANDA ANDRES SALCEDO  
8300 SW SEMINOLE TRL  
TUALATIN, OR 97062

FABRYCKI HAL  
16543 S HARDING RD  
OREGON CITY, OR 97045

~~FABRYCKI HAL  
16543 S HARDING RD  
OREGON CITY, OR 97045~~

FAGERQUIST AMBRE  
8470 SW MOHAWK ST  
TUALATIN, OR 97062

FAIRCHILD DENA  
8500 SW MOHAWK ST  
TUALATIN, OR 97062

FANTA CAROL C  
8406 SW MOHAWK ST  
TUALATIN, OR 97062

FARNSWORTH STEVEN L &  
FARNSWORTH BEVERLY J  
20015 SW TILLAMOOK CT  
TUALATIN, OR 97062

FASTENAU NATHAN & FASTENAU  
JORDAN  
20724 SW 84TH AVE  
TUALATIN, OR 97062

FECHNER ROBERT J  
8438 SW MOHAWK ST  
TUALATIN, OR 97062

FEHLMAN STEVEN D & FEHLMAN  
MELISSA J  
8358 SW MOHAWK ST  
TUALATIN, OR 97062

FIDURA MATTHEW F & FIDURA TRACI S  
7281 SW DELAWARE CIR  
TUALATIN, OR 97062

FINDTNER ROBERT & FINDTNER LEAH  
8705 SW AVERY ST  
TUALATIN, OR 97062

FISHER ROBIN L & LINDA L TRUST  
8147 SW SHENANDOAH WAY  
TUALATIN, OR 97062

FLANNERY FAMILY TRUST  
8314 SW MOHAWK ST  
TUALATIN, OR 97062

~~FODGE JEANINE~~  
8228 SW SHENANDOAH WAY  
TUALATIN, OR 97062

~~FODGE JEANINE~~  
8228 SW SHENANDOAH WAY  
TUALATIN, OR 97062

~~FODGE JEANINE~~  
8228 SW SHENANDOAH WAY  
TUALATIN, OR 97062

FOLEY KERRY  
8640 SW SEMINOLE TRL  
TUALATIN, OR 97062

FOX WILLIAM N & SANDRA P FOX  
TRUST  
8476 SW IROQUOIS DR  
TUALATIN, OR 97062

FRANKS JONNIE A JR  
8402 SW MOHAWK ST  
TUALATIN, OR 97062

FRANK REVOCABLE TRUST  
8233 SW SEMINOLE TR  
TUALATIN, OR 97062

FREITAS KATHERINE L LIV TRUST  
8260 SW SHENANDOAH WAY  
TUALATIN, OR 97062

FRICK PROPERTIES INVESTMENTS LLC  
200 GRANADA DR  
CORTE MADERA, CA 94925

FROHBERG DALE Q  
20621 SW MARTINAZZI AVE  
TUALATIN, OR 97062

FUCHS NADINE K  
34580 NE WILSONVILLE RD  
NEWBERG, OR 97132

FUENTES ROLANDO FERRER & FERRER  
LUCRECIA MARTINEZ  
7305 SW DELAWARE CIR  
TUALATIN, OR 97062

FULTZ ANDRIA T  
20300 SW 72ND AVE  
TUALATIN, OR 97062

FURTNEY JOSEPH C  
8446 SW MOHAWK ST  
TUALATIN, OR 97062

GALLAGHER RONALD A & GALLAGHER  
KATIE L  
8412 SW MOHAWK ST  
TUALATIN, OR 97062

GALLETTA TRACY  
20269 SW TENINO CT  
TUALATIN, OR 97062

GAMBEE ERICA  
7434 SW DELAWARE CIR  
TUALATIN, OR 97062

GANNON JONATHAN M & GANNON  
JENNIFER A  
20705 SW MARTINAZZI AVE  
TUALATIN, OR 97062

~~GANNON JONATHAN M & GANNON~~  
~~JENNIFER A~~  
~~20705 SW MARTINAZZI AVE~~  
~~TUALATIN, OR 97062~~

GARNER SYLVIA E  
8380 SW MOHAWK ST  
TUALATIN, OR 97062

GAVIC SCOT R & GAVIC CAROL  
8500 SW MODOC CT  
TUALATIN, OR 97062

GEARHART JASON D  
8316 SW SHENANDOAH WAY  
TUALATIN, OR 97062

GEER VINCENT LYNN  
8385 SW AVERY ST  
TUALATIN, OR 97062

GIBSON KAREN  
7426 SW DELAWARE CIR  
TUALATIN, OR 97062

GIRARDI WESLEY THOMAS & GIRARDI  
MARGARET  
20230 SW TILLAMOOK CT  
TUALATIN, OR 97062

GLASS SARAH P  
20532 SW 84TH CT  
TUALATIN, OR 97062

GODARD JIMMY J & GODARD STA'CEE  
A  
16745 SW STELLAR DR  
SHERWOOD, OR 97140

GOFF SEAN J & GOFF HEATHER D  
7345 SW DELAWARE CIR  
TUALATIN, OR 97062

GOLDSBY KATHLEEN M  
8487 SW CHELAN CT  
TUALATIN, OR 97062

GOLDSBY GARY L & GOLDSBY  
KATHLEEN M  
8487 SW CHELAN CT  
TUALATIN, OR 97062

GOLPHENEER RONALD B & GOLPHENEER  
CAROL D  
20052 SW 72ND AVE  
TUALATIN, OR 97062

GORDON JEREMIAH D & GORDON  
AMBER R  
14510 SW CHESTERFIELD LN  
TIGARD, OR 97224

GRANDJEAN BRANDO & GRANDJEAN  
LINDA  
20776 SW MARTINAZZI AVE  
TUALATIN, OR 97062

GRUEN MARY M  
8426 SW MOHAWK ST  
TUALATIN, OR 97062

GUPTA SAMIR  
104 SOUTH ASPEN CT  
CHANDLER, AZ 85226

HAAG CONNIE G  
8119 SW AVERY ST  
TUALATIN, OR 97062

HALL JOSHUA A & HALL CASSANDRA R  
5223 NE 47TH AVE  
PORTLAND, OR 97218

HAMILTON MARY A  
8484 SW MOHAWK ST  
TUALATIN, OR 97062

HARLEY CHRISTOPHER I & HARLEY  
TEENA  
20679 SW MARTINAZZI AVE  
TUALATIN, OR 97062

HASKIN KEVIN A & HASKIN EMMA K  
8485 SW SEMINOLE TRL  
TUALATIN, OR 97062

GOLPHENEER RONALD B & GOLPHENEER  
CAROL D  
20052 SW 72ND AVE  
TUALATIN, OR 97062

GOTCHA COVERED RENTALS LLC  
476 SW BROOKWOOD AVE  
HILLSBORO, OR 97123

GRANT NORMAN R & GRANT LORETTA  
21183 SW MARTINAZZI AVE  
TUALATIN, OR 97062

GRUEN HARDY & GRUEN INGE  
4914 E QUIEN SABE WAY  
CAVE CREEK, AZ 85311

GUTIERREZ DAVID & GUTIERREZ  
NORMA  
8360 SW MOHAWK ST  
TUALATIN, OR 97062

HALBERG SADIE M & HALBERG  
NICHOLAS R  
8645 SW AVERY ST  
TUALATIN, OR 97062

HALL JONATHAN A & HALL KATIE M  
8625 SW SEMINOLE TRAIL  
TUALATIN, OR 97062

HANNA RAHWA  
7456 SW TENINO LN  
TUALATIN, OR 97062

HARNSBERGER DAVID & HARNSBERGER  
ARIN K  
20922 SW WINEMA CT  
TUALATIN, OR 97062

HASTIN MICHAEL CRAIG & HASTIN  
PATRICIA ANNE  
20124 SW TILLAMOOK CT  
TUALATIN, OR 97062

GOLPHENEER RONALD B & GOLPHENEER  
CAROL D  
20052 SW 72ND AVE  
TUALATIN, OR 97062

GOTLIB CYNTHIA L  
21313 SW MAKAH ST  
TUALATIN, OR 97062

GREEN CYNTHIA B  
8690 SW COMANCHE WAY  
TUALATIN, OR 97062

GUDEKUNST ELAINE  
8514 SW MOHAWK ST  
TUALATIN, OR 97062

H E PROPERTIES INC  
4800 SW MEADOWS RD STE 300  
LAKE OSWEGO, OR 97035

HALL JOSHUA A & HALL CASSANDRA R  
5223 NE 47TH AVE  
PORTLAND, OR 97218

HALME TIMOTHY  
7229 SW DELAWARE CIR  
TUALATIN, OR 97062

HANVICHID SAM & HANVICHID TRACY  
20795 SW MARTINAZZI AVE  
TUALATIN, OR 97062

HARROW JAMES C & HARROW LINDA J  
20002 SW 86TH ST  
TUALATIN, OR 97062

HAVEN HOMES II LLC  
12424 SE WINTER CREEK CT  
HAPPY VALLEY, OR 97086

HAZELETT NARY & HAZELETT STEVEN  
20376 SW 72ND AVE  
TUALATIN, OR 97062

HAZELETT NARY & HAZELETT STEVEN  
20376 SW 72ND AVE  
TUALATIN, OR 97062

HAZELETT NARY & HAZELETT STEVEN  
20376 SW 72ND AVE  
TUALATIN, OR 97062

HEATH LORI L  
8410 SW MOHAWK ST  
TUALATIN, OR 97062

HEBERT GERALD & HEBERT HUNG  
CHEN  
21885 NE ALTON ST  
FAIRVIEW, OR 97024

HEGEDUS ZOLTAN & HEGEDUS ENIKO  
21333 SW MAKAH ST  
TUALATIN, OR 97062

HELZER KIRK D & HELZER KRISTI L  
7407 SW TENINO LN  
TUALATIN, OR 97062

HENRY MICHAEL H & HENRY DEBORAH  
A  
7223 SW TENINO LN  
TUALATIN, OR 97062

HENSON WENDY J  
20276 72ND AVE  
TUALATIN, OR 97062

HERKOMER TAMMI  
8474 SW MOHAWK ST  
TUALATIN, OR 97062

HERNANDEZ BERNARDO DELACRUZ  
8246 SW SEMINOLE TRL  
TUALATIN, OR 97062

HINKLE MELISSA & HINKLE ANDREW  
8492 SW UMATILLA ST  
TUALATIN, OR 97062

HODSON DAVID M  
20564 SW 84TH CT  
TUALATIN, OR 97062

HOLTGRAVES VICTORIA C  
8503 SW SANTIAM DR  
TUALATIN, OR 97062

HOPKINS DANIEL E & HOPKINS EMELYN  
C  
7355 SW DELAWARE CIR  
TUALATIN, OR 97062

HORIZON COMMUNITY CHURCH  
PO BOX 2690  
TUALATIN, OR 97062

HORN MARTHA JENEANE  
8400 SW MOHAWK ST  
TUALATIN, OR 97062

HOTCHKISS DEREK M & HOTCHKISS  
CANDICE D  
8452 SW IROQUOIS DR  
TUALATIN, OR 97062

HOTCHKISS DEREK M & HOTCHKISS  
CANDICE D  
8452 SW IROQUOIS DR  
TUALATIN, OR 97062

HOUSTON BRENDA L  
20532 SW 84TH CT  
TUALATIN, OR 97062

HUANG CHEN & KAN-HUANG LYNDA L  
8490 SW SEMINOLE TRL  
TUALATIN, OR 97062

HUETHER TANYA LEILANI & HUETHER  
JERRY DEAN  
2305 W I20 STE 140 #172  
GRAND PRAIRIE, TX 75052

HUEY DAVID G & CARLA S HUDSON REV  
TRUST  
10 GOODRICH TRL  
CARMEL, CA 93923

HUFFMAN RUSSELL T & MOORE  
REBECCA A  
7205 SW DELAWARE CIR  
TUALATIN, OR 97062

HUNT JAYSON & HUNT AMBER  
8355 SW SEMINOLE TRL  
TUALATIN, OR 97062

HUTCHINS CALVIN & LARAYNE REV LIV  
TRUST  
17547 N SOMERSET DR  
SURPRISE, AZ 85374

HYLANDS SHELLI D  
7327 SW DELAWARE CIR  
TUALATIN, OR 97062

IMBACH TERRI A  
8420 SW UMATILLA ST  
TUALATIN, OR 97062

INGMAN SCOTT M  
8364 SW MOHAWK ST  
TUALATIN, OR 97062

INKENS BEVERLY M REV LIV TRUST  
8545 SW MODOC CT  
TUALATIN, OR 97062



IWASAKI RANDOLPH I  
3468 ALA HAUKULU  
HONOLULU, HI 96818

~~IWASAKI RANDOLPH I  
3468 ALA HAUKULU  
HONOLULU, HI 96818~~

IWASAKI RANDOLPH I  
3468 ALA HAUKULU  
HONOLULU, HI 96818

JACKSON KRYSTAL L  
8392 SW MOHAWK ST  
TUALATIN, OR 97062

JACOBSEN AMY BETH  
8265 SW SEMINOLE TRL  
TUALATIN, OR 97062

JAMES TYLER & JAMES KELSEY  
21711 SW MARTINAZZI AVE  
TUALATIN, OR 97062

JANSEN JOSEPH JAMES & BOWMAN  
ELISE DAWN  
8395 SW SEMINOLE TRL  
TUALATIN, OR 97062

JANSEN MATTHEW I & JANSEN  
ELIZABETH A  
8325 SW SEMINOLE TRL  
TUALATIN, OR 97062

JENISON KATIE  
20350 SW 86TH AVE  
TUALATIN, OR 97062

JENKINS MICHAEL T & JENKINS TRACY L  
8466 SW CHELAN CT  
TUALATIN, OR 97062

JOHNSON SCOTT GLENN & JOHNSON  
SHELLEY L  
8520 SW MOHAWK ST  
TUALATIN, OR 97062

JOHNSON JAMIE A & DRAKE DAVID A  
8408 SW MOHAWK ST  
TUALATIN, OR 97062

JOHNSON BRANDON D & JOHNSON  
GRETCHEN S  
7439 SW TENINO LN  
TUALATIN, OR 97062

JOHNSON MICHAEL  
8325 SW SHENANDOAH WAY  
TUALATIN, OR 97062

JONES KAREN J REV TRUST  
8680 SW SEMINOLE TRL  
TUALATIN, OR 97062

JUDD STEVEN W & MALONEY  
KATHERINE E  
8138 SW SEMINOLE TRL  
TUALATIN, OR 97062

KABLI MOHAMED & KABLI HEATHER  
ANN  
7293 SW DELAWARE CIR  
TUALATIN, OR 97062

KARAPONDO KATHLEEN ANN  
7328 SW TENINO LN  
TUALATIN, OR 97062

KARAPONDO KATHLEEN ANN  
7328 SW TENINO LN  
TUALATIN, OR 97062

KAUFFMAN SHAWNA DAY  
8268 SW MOHAWK ST  
TUALATIN, OR 97062

KEARNEY RONALD R & KEARNEY  
CAROLE J  
7414 SW DELAWARE CIR  
TUALATIN, OR 97062

KEEN ANNETTE M  
11970 SW HAZELWOOD LOOP  
TIGARD, OR 97223

KERN ROBERT G & KERN BARBARA L  
4218 NE 41ST AVE  
PORTLAND, OR 97211

KHAN SHAD  
20292 SW TENINO CT  
TUALATIN, OR 97062

KINDER JAMES W & PEDROJA TERRI J  
20211 SW 85TH CT  
TUALATIN, OR 97062

KING SHERRI D  
20551 SW MARTINAZZI AVE  
TUALATIN, OR 97062

KIRKPATRICK ELIZABETH C  
8165 SW SHENANDOAH WAY  
TUALATIN, OR 97062

KISER DAVID R & KISER MARCEY A  
20044 SW 86TH AVE  
TUALATIN, OR 97062

KITCH TIMOTHY B & KITCH SUZANN P  
LIVING TRUST  
8350 SW SEMINOLE TRL  
TUALATIN, OR 97062

KLUPENGER MORGAN WATKINS  
8298 SW MOHAWK ST  
TUALATIN, OR 97062

KNOLL DOREEN LIVING TRUST  
8347 SW AVERY ST  
TUALATIN, OR 97062

KNOLL DOREEN LIVING TRUST  
8347 SW AVERY ST  
TUALATIN, OR 97062

KNOLL DOREEN LIVING TRUST  
8347 SW AVERY ST  
TUALATIN, OR 97062

KOBA DENNIS  
7367 SW DELAWARE CIR  
TUALATIN, OR 97062

KOCHHEIM COURTNEY  
8214 SW SHENANDOAH WAY  
TUALATIN, OR 97062

KOHLER GRANT & KOHLER SHELBY  
8477 SW NESTUCCA CT  
TUALATIN, OR 97062

KOLB MICHAEL E & KOLB LAURA B  
8552 SW SANTIAM DR  
TUALATIN, OR 97062

KORNBERG ERIC DALE & KORNBERG  
DEBRA PERKO  
8499 SW HURON CT  
TUALATIN, OR 97062

KOTILA CHERYL A  
8125 SW SHENANDOAH WAY  
TUALATIN, OR 97062

KOVACH BRIAN  
21044 SW 84TH AVE  
TUALATIN, OR 97062

KOYFMAN GENRIKH & KOYFMAN  
LYUBOV & KOYFMAN IGOR  
8220 SW SHENANDOAH WAY  
TUALATIN, OR 97062

KRAUSE DERALD E  
8452 SW MOHAWK ST  
TUALATIN, OR 97062

KRONSER FAMILY TRUST  
20602 SW COLVILLE CT  
TUALATIN, OR 97062

KRUSINSKI JANICE L  
8444 SW MOHAWK ST  
TUALATIN, OR 97062

KURTTI REBECCA  
8360 SW SHENANDOAH WAY  
TUALATIN, OR 97062

LANDAU AUSTIN JENS  
21762 SW MOUNTAIN HOME RD  
SHERWOOD, OR 97140

LANE ADAM THOMAS  
20817 SW MARTINAZZI AVE  
TUALATIN, OR 97062

LARSEN MARIO K & LARSEN REBECCA L  
19738 SW BOONES FERRY RD  
TUALATIN, OR 97062

LARSEN MARIO K & LARSEN REBECCA L  
19738 SW BOONES FERRY RD  
TUALATIN, OR 97062

LARSEN DWAYNE L & LARSEN KAREN G  
ESTATE OF  
19770 SW BOONES FERRY RD  
TUALATIN, OR 97062

LARSON ROBERT F & LARSON ASHLEY N  
14919 NE LAWNVIEW CIR  
AURORA, OR 97002

LATSHAW DEBBIE M  
8660 SW SEMINOLE TRL  
TUALATIN, OR 97062

LAZAR GABRIEL  
1481 NW 13TH AVE APT 732  
PORTLAND, OR 97209

LEBOEUF PATRICK & LEBOEUF  
COURTNEY  
8410 SW SEMINOLE TRL  
TUALATIN, OR 97062

LEE ELSA MARIA  
7424 SW TENINO LN  
TUALATIN, OR 97062

LEIGH ASHLEY & LEIGH PETER  
8555 SW SEMINOLE TRAIL  
TUALATIN, OR 97062

LEMME RONALD  
8245 SW SEMINOLE TRL  
TUALATIN, OR 97062

LEMON KIRK D  
8365 SW SHENANDOAH WAY  
TUALATIN, OR 97062

LEQUIN MICHELLE  
8336 SW SHENANDOAH WAY  
TUALATIN, OR 97062

LEWIS SANDRA  
1532 SUNLIGHT DR  
FAIRBANKS, AK 99709

LIBERTY HILL LLC  
6941 SW 148TH CT  
BEAVERTON, OR 97007

LIBERTY HILL LLC  
6941 SW 148TH CT  
BEAVERTON, OR 97007

LIBERTY HILL LLC  
6941 SW 148TH CT  
BEAVERTON, OR 97007

LIPMAN THOMAS HAWLEY & LIPMAN  
HILARY JANE  
8505 SW AVERY ST  
TUALATIN, OR 97062

LIPTAU KURT IVAN EDWARD & LIPTAU  
CYNTHIA JOANN  
8340 SW SHENANDOAH WAY  
TUALATIN, OR 97062

LLOYD HOLLY  
20062 SW TILLAMOOK CT  
TUALATIN, OR 97062

LOCKHART JANET L  
8386 SW MOHAWK ST  
TUALATIN, OR 97062

LORENZO ELDER ALCOGER  
8151 SW SHENANDOAH WAY  
TUALATIN, OR 97062

LOUIS JR REV LIV TRUST  
8129 SW SHENANDOAH WAY  
TUALATIN, OR 97062

LUCAS JAMES VANCE EDWARD &  
LUCAS Nanci G  
20086 SW 86TH AVE  
TUALATIN, OR 97062

LUCE JANINE R & LUCE KERRY  
20244 SW TENINO CT  
TUALATIN, OR 97062

LYONS ANDREW J & JENNY F REV LIV  
TRUST  
8331 SW AVERY ST  
TUALATIN, OR 97062

MADLEM MEAGAN K  
20578 SW COLVILLE CT  
TUALATIN, OR 97062

MALDONADO EMILY K & MALDONADO  
JONATHAN S  
20154 SW TILLAMOOK CT  
TUALATIN, OR 97062

MALONEY SAUNDRA E  
26951 S BOLLAND RD  
CANBY, OR 97013

MALOS NORINE E  
8348 SW MOHAWK ST  
TUALATIN, OR 97062

MANN KEITH D & MANN MARIANNE R  
8311 SW CHELAN ST  
TUALATIN, OR 97062

MAR MAR PROPERTIES LLC  
9839 SW SIUSLAW LN  
TUALATIN, OR 97062

MAR MAR PROPERTIES LLC  
9839 SW SIUSLAW LN  
TUALATIN, OR 97062

MARSDEN DARREN B  
8064 SW WOODY END ST  
PORTLAND, OR 97224

MARSH JASON & MARSH TAWNYA  
20653 SW 84TH AVE  
TUALATIN, OR 97062

MARSH CHRISTOPHER L REV TRUST  
17367 LAKE HAVEN DR  
LAKE OSWEGO, OR 97035

MARSH CHRISTOPHER L REV TRUST  
17367 LAKE HAVEN DR  
LAKE OSWEGO, OR 97035

MARTINSON ALAN & MARTINSON  
MARY  
8320 SW SHENANDOAH WAY  
TUALATIN, OR 97062

MARTINSON MELANIE A  
8355 SW SHENANDOAH WAY  
TUALATIN, OR 97062

MARTINAZZI VILLAGE 95 LLC  
9500 SW BARBUR BLVD STE 300  
PORTLAND, OR 97219

MASSAAD JOINT REV TRUST  
8275 SW AVERY ST  
TUALATIN, OR 97062

MAY TIMOTHY M  
8345 SW SEMINOLE TRL  
TUALATIN, OR 97062

MCCAUSLAND MAUREEN E  
8266 SW MOHAWK ST  
TUALATIN, OR 97062

MCCLANAHAN MATTHEW E  
8518 SW MOHAWK ST  
TUALATIN, OR 97062

MCDUFFEE JAMES F  
8344 SW SHENANDOAH WAY  
TUALATIN, OR 97062

MCDUFFEE JAMES F  
8344 SW SHENANDOAH WAY  
TUALATIN, OR 97062

MCDUFFEE JAMES F  
8344 SW SHENANDOAH WAY  
TUALATIN, OR 97062

MCGEORGE JO ANN REV TRUST  
8436 SW MOHAWK ST  
TUALATIN, OR 97062

MCGRAW KATHLEEN M  
8280 SW SHENANDOAH WAY  
TUALATIN, OR 97062

MCHUGH TIMOTHY  
8430 SW AVERY ST  
TUALATIN, OR 97062

MCKENZIE SHAWN G & MCKENZIE  
KELSIE H  
8498 SW SANTIAM DR  
TUALATIN, OR 97062

MCKILLIP MICHAEL LEE & MCKILLIP  
HEATHER H  
20708 SW MARTINAZZI AVE  
TUALATIN, OR 97062

MCPAHAN MARY L  
8451 SW NESTUCCA CT  
TUALATIN, OR 97062

MCSWAIN DAVID CORNELL II  
8472 SW MOHAWK ST  
TUALATIN, OR 97062

MEHARRY DEE ANN & MEHARRY JOHN  
M  
PO BOX 2862  
HILLSBORO, OR 97123

MELHEM SAMER M  
21521 SW 91ST AVE  
TUALATIN, OR 97062

MELLAND MICHELE M  
19165 SW 51ST AVE  
TUALATIN, OR 97062

MELLINGER MATTHEW & MELLINGER  
HEATHER  
8488 SW IROQUOIS DR  
TUALATIN, OR 97062

MERCADO GUILLERMINA  
8376 SW MOHAWK ST  
TUALATIN, OR 97062

MERKLIN DANIEL J & MERKLIN KELLY J  
21268 SW IROQUOIS DR  
TUALATIN, OR 97062

MERRIMAN KEVIN LEE  
8346 SW MOHAWK ST  
TUALATIN, OR 97062

METHODIST CHURCH OF TUALATIN  
20200 SW MARTINAZZI AVE  
TUALATIN, OR 97062

METHODIST CHURCH OF TUALATIN  
20200 SW MARTINAZZI AVE  
TUALATIN, OR 97062

MICHAELS JOSEPH & MICHAELS ALENE  
7448 SW DELAWARE CIR  
TUALATIN, OR 97062

MISSAU MARCHELL M & MISSAU  
LENNY L  
8120 SW SEMINOLE TRL  
TUALATIN, OR 97062

MILLER DAVID JOHN  
4849 WAYLON ST  
EAU CLAIRE, WI 54703

MILLER SANDRA K & HOLT TROY M  
8460 SW MOHAWK ST  
TUALATIN, OR 97062

MILLER JEREMY WAYNE & MILLER  
ROBIN RENEE  
20400 SW 72ND AVE  
TUALATIN, OR 97062

MILLS SANDRA M  
8414 SW MOHAWK ST  
TUALATIN, OR 97062

MILLS JORDAN & MILLS BRIAN  
8278 SW CHELAN ST  
TUALATIN, OR 97062

MITSVOTAI MELANIE E  
8490 SW MOHAWK ST  
TUALATIN, OR 97062

MOHAWK ST PROPERTY LLC  
2121 ROSECRANS AVE STE 4325  
EL SEGUNDO, CA 90245

MOHAWK ST PROPERTY LLC  
2121 ROSECRANS AVE STE 4325  
EL SEGUNDO, CA 90245

MOHAWK ST PROPERTY LLC  
2121 ROSECRANS AVE STE 4325  
EL SEGUNDO, CA 90245



MOMARLS LLC  
8525 SW 165TH AVE  
BEAVERTON, OR 97007

MOMARLS LLC  
8525 SW 165TH AVE  
BEAVERTON, OR 97007

MOMARLS LLC  
8525 SW 165TH AVE  
BEAVERTON, OR 97007

MOORE RONALD D & MOORE CHRIS M  
PO BOX 730  
TUALATIN, OR 97062

MORALES DANNY M & CURTIS  
JONATHAN R  
20995 SW MARTINAZZI AVE  
TUALATIN, OR 97062

MORGAN MICHAEL  
8462 SW MOHAWK ST  
TUALATIN, OR 97062

MORGAN JAY C & MORGAN AIKO  
8264 SW MOHAWK ST  
TUALATIN, OR 97062

MORTON REAL ESTATE LLC  
PO BOX 733  
BEAVERTON, OR 97075

MOSES PAISLEY & LEAF JARED  
8435 SW UMATILLA ST  
TUALATIN, OR 97062

MOTA MIGUEL JAQUIZ  
8512 SW MOHAWK ST  
TUALATIN, OR 97062

MREEN JAMES R & AVIS M REV TRUST  
32590 SW ARBOR LAKE DR  
WILSONVILLE, OR 97070

MUILENBURG SCOTT E & MUILENBURG  
MARILYN  
1619 SE 176TH AVE  
PORTLAND, OR 97223

MURPHY BYRON K & WIKSTROM  
SAMANTHA A  
601 QUAIL DR  
NEWBERG, OR 97132

MURPHY JOYCE I  
8290 SW SHENANDOAH WAY  
TUALATIN, OR 97062

MURPHEY WILLIAM H & MURPHEY  
EDWINA D  
8700 SW SEMINOLE TRL  
TUALATIN, OR 97062

NAN-BELIGRAD MARIANA  
8464 SW MOHAWK ST  
TUALATIN, OR 97062

NASH LARKIN & NASH ARMISTEAD &  
WILLIS ELIZABETH D  
8488 SW HURON CT  
TUALATIN, OR 97062

NAUGLE CHAD & JANA NAUGLE-WONG  
LIV TRUST  
8625 SW COMANCHE WAY  
TUALATIN, OR 97062

NAUGLE CHAD & JANA NAUGLE-WONG  
LIV TRUST  
8625 SW COMANCHE WAY  
TUALATIN, OR 97062

NERSKI JOHN L & NERSKI PATRICIA D  
8320 SW CHELAN ST  
TUALATIN, OR 97062

NEWBERRY STEPHEN B & NEWBERRY  
DEBRA L  
21224 SW IROQUOIS DR  
TUALATIN, OR 97062

NICHOLSON DEBRA M  
8208 SW SHENANDOAH WAY  
TUALATIN, OR 97062

NIELSON CRYSTAL DAWN  
8492 SW MOHAWK ST  
TUALATIN, OR 97062

NIELSON DARCY  
8352 SW MOHAWK ST  
TUALATIN, OR 97062

NOEL CAROL MARIE  
8416 SW IROQUOIS DR  
TUALATIN, OR 97062

NORLIN FAMILY TRUST  
7768 SW RED HAWK CT  
DURHAM, OR 97224

NOTTINGHAM RAYMOND H &  
NOTTINGHAM MARDI D  
8440 SW MOHAWK ST  
TUALATIN, OR 97062

OJEDA ANA IRIS URIOSTEGUI &  
CASARRUBIAS LUIS ALBERTO RADILLA  
8235 SW AVERY ST  
TUALATIN, OR 97062

OLGUIN JUAN CARLOS & OLGUIN  
YAZMIN  
20012 SW TILLAMOOK CT  
TUALATIN, OR 97062

OLMEDO JORGE E & MARIA A F LIV  
TRUST  
20753 SW MARTINAZZI AVE  
TUALATIN, OR 97062

OREGON DEPT OF TRANSPORTATION  
4040 FAIRVIEW INDUSTRIAL DR SE MS  
#2  
SALEM, OR 97302

OREGON DEPT OF TRANSPORTATION  
4040 FAIRVIEW INDUSTRIAL DR SE MS  
#2  
SALEM, OR 97302

OREGON DEPT OF TRANSPORTATION  
4040 FAIRVIEW INDUSTRIAL DR SE MS  
#2  
SALEM, OR 97302

ORSBURN ANITA  
8524 SW MOHAWK ST  
TUALATIN, OR 97062

ORSBURN ANITA J & GARRIETY SUSAN J  
8388 SW MOHAWK ST  
TUALATIN, OR 97062

OSBORNE JUDITH E  
8428 SW MOHAWK ST  
TUALATIN, OR 97062

OSBORNE NOELLE  
8480 SW MOHAWK ST  
TUALATIN, OR 97062

OSLER DAVID & OSLER DEBRA D  
8164 SW SHENANDOAH WAY  
TUALATIN, OR 97062

OSMOSYS LLC  
7415 SW 37TH AVE  
PORTLAND, OR 97219

OSTRANDER JANNA K TRUST & COFFEY  
VICKI L TRUST  
8295 SW SEMINOLE TRL  
TUALATIN, OR 97062

OTIS JULIE ROSE  
20036 SW TILLAMOOK CT  
TUALATIN, OR 97062

OUSTERHOUT SALLY M & OUSTERHOUT  
GERALD C  
5167 METOLIUS AVE SE  
SALEM, OR 97306

PALMER-DUPRAU TABITHA & DUPRAU  
JEFFREY  
8335 SW SEMINOLE TRAIL  
TUALATIN, OR 97062

PALUMBIS JASON N TRUST &  
KARAMBELAS GEORGE & KARAMBELAS  
MARI-FAYE  
19745 SW 49TH AVE  
TUALATIN, OR 97062

PARSONS FAMILY REV TRUST  
20167 SW 85TH CT  
TUALATIN, OR 97062

PARSONS SUSAN J  
8300 SW SHENANDOAH WAY  
TUALATIN, OR 97062

PATEL REV TRUST  
28916 LA CARRETERA  
LAGUNA NIGUEL, CA 92677

PATTON CHARLES S & PATTON  
JENNIFER R  
PO BOX 1632  
TUALATIN, OR 97062

PATTON CHARLES S & PATTON  
JENNIFER R  
PO BOX 1632  
TUALATIN, OR 97062

PAUL IRENE E  
8328 SW SHENANDOAH WAY  
TUALATIN, OR 97062

PAULINO JORDAN N & PAULINO DANA  
R  
21012 SW 84TH AVE  
TUALATIN, OR 97062

PAULY JONI C & PAULY EDWARD G  
21207 SW IROQUOIS DR  
TUALATIN, OR 97062

PAYNE JEFFERY LEE  
8670 SW COMANCHE WAY  
TUALATIN, OR 97062

PERKINS SHELLY KAY & LANGE VERA  
MAXINE  
23662 STAFFORD HILL DR  
WEST LINN, OR 97068

PERKINS EDWARD G TRUST  
8224 SW SHENANDOAH WAY  
TUALATIN, OR 97062

PERRY SCOTT B & PERRY CHARISSA J  
8245 SW AVERY ST  
TUALATIN, OR 97062

PETERSON MARTHA K  
8302 SW MOHAWK ST  
TUALATIN, OR 97062

PETERSEN JOSHUA A & PETERSEN  
REBECCA A  
20084 SW TILLAMOOK CT  
TUALATIN, OR 97062

PETERSON KATHY J  
8137 SW SHENANDOAH WAY  
TUALATIN, OR 97062

PETERSON BARBARA  
8196 SW SHENANDOAH WAY  
TUALATIN, OR 97062

PHUONG THAO & PHUONG KHANG  
21216 SW MARTINAZZI AVE  
TUALATIN, OR 97062

PHUONG THAO & PHUONG KHANG  
21216 SW MARTINAZZI AVE  
TUALATIN, OR 97062

PHUONG THAO & PHUONG KHANG  
21216 SW MARTINAZZI AVE  
TUALATIN, OR 97062

PLAGGMIER JOHN R JR TRUST  
19740 SW BOONES FERRY RD  
TUALATN, OR 97062

POOLE KIMBELRY K  
8442 SW MOHAWK ST  
TUALATIN, OR 97062

PORTLAND GENERAL ELECTRIC CO  
121 SW SALMON ST  
PORTLAND, OR 97204

POTTS DALE GREGORY & MARIANNE  
REV LIV TRUST  
20390 SW 86TH AVE  
TUALATIN, OR 97062

PRECI JOSEPH H & PRECI CONNIE E  
21274 SW MAKAH ST  
TUALATIN, OR 97062

PRESLEY TIMOTHY RYAN & PRESLEY  
TEMARA ELIZABETH  
10335 SW HOODVIEW DR  
TIGARD, OR 97224

PRESLEY TIM R & PRESLEY TEMARA E  
10335 SW HOODVIEW DR  
TIGARD, OR 97224

PRESTON WILLIAM M & WOOD  
CLINTON A  
20300 SW NANCY LN  
BEAVERTON, OR 97007

PRICE SHIRLEY M & PRICE ROGER D  
20148 SW TENINO CT  
TUALATIN, OR 97062

PRICE MOIRA & WILSON WILLIAM E &  
LYNDA T  
20196 SW TENINO CT  
TUALATIN, OR 97062

PRICE NOLAN  
20834 SW MARTINAZZI AVE  
TUALATIN, OR 97062

PRIES FAMILY TRUST  
8535 SW AVERY ST  
TUALATIN, OR 97062

RADANOVIC DIANNE M  
8374 SW MOHAWK ST  
TUALATIN, OR 97062

RADFORD JOHN J & RADFORD LEAH E  
7296 SW TENINO LN  
TUALATIN, OR 97062

RAMIREZ MIRNA Z & RIVERA JESUS  
RAMIREZ  
8375 SW SHENANDOAH WAY  
TUALATIN, OR 97062

RAMIREZ MIRNA Z & RIVERA JESUS  
RAMIREZ  
8375 SW SHENANDOAH WAY  
TUALATIN, OR 97062

REAMES BRIAN & REAMES KATELYN  
8515 SW SEMINOLE TRL  
TUALATIN, OR 97062

REED BRENT GRANT & REED KRISTA  
ANNE  
17477 N 101ST WAY  
SCOTTSDALE, AZ 85255

REESE DOUGLAS & COFFMAN NICOLE  
20480 SW 86TH AVE  
TUALATIN, OR 97062

REID MICHAEL ALLEN & REID KRISTI R  
8398 SW MOHAWK ST  
TUALATIN, OR 97062

REKSOPURO MARJONO & NAGARIA  
JULIANTI  
15253 SE PEBBLE BEACH DR  
HAPPY VALLEY, OR 97086

RENWICK JEAN C  
20553 SW COLVILLE CT  
TUALATIN, OR 97062

REPP SCOTT T & REPP SHARISSE M  
8550 SW SEMINOLE TRL  
TUALATIN, OR 97062

REUTHER ERIC J  
20221 SW TENINO CT  
TUALATIN, OR 97062

REYES MANOLO B & REYES CARLOTA F  
DE LOS  
20475 SW 86TH AVE  
TUALATIN, OR 97062

RHAY PATRICIA C  
20248 SW TENINO CT  
TUALATIN, OR 97062

RICHARDS AHREN & RICHARDS  
KIMBERLY  
8520 SW SEMINOLE TRL  
TUALATIN, OR 97062

ROBSON MARILYN ELIZABETH LIVING TRUST  
8715 SW COMANCHE WAY  
TUALATIN, OR 97062

ROBSON MARILYN ELIZABETH LIVING TRUST  
8715 SW COMANCHE WAY  
TUALATIN, OR 97062

ROBSON MARILYN ELIZABETH LIVING TRUST  
8715 SW COMANCHE WAY  
TUALATIN, OR 97062

ROLFE CHARLENE C  
8172 SW SHENANDOAH WAY  
TUALATIN, OR 97062

ROLLINS CHARLIE K & LATSHAW JANICE K  
8665 SW SEMINOLE TRAIL  
TUALATIN, OR 97062

ROSHAN RAKESH & PRASAD BENITA D  
7275 SW DELAWARE CIR  
TUALATIN, OR 97062

ROSSOL KATHY S  
20124 SW 72ND AVE  
TUALATIN, OR 97062

ROTH GARY L  
8305 SW SHENANDOAH WAY  
TUALATIN, OR 97062

RUDOLF WOLFGANG  
61690 SUMMER SHADE DR  
BEND, OR 97702

RUMPF JESSICA  
2843 SW PLUM CT  
PORTLAND, OR 97219

RYAN ROBERT COLIN & RYAN STEPHANIE R  
8137 SW SEMINOLE TRL  
TUALATIN, OR 97062

SAECHAO KATIE & SAECHAO CHIOFOU  
20164 SW 85TH CT  
TUALATIN, OR 97062

SAGERT PLAZA LLC  
18840 SW BOONES FERRY RD STE 216  
TUALATIN, OR 97062

SALDIVAR ANGELICA  
20935 SW 90TH AVE  
TUALATIN, OR 97062

SALTER ZACHERY ELWIN  
21267 SW MARTINAZZI AVE  
TUALATIN, OR 97062

SANDALWOOD CONDO COMMUNITY UNIT OWNERS  
, OR 00000

SANDER ALEX J  
8451 SW UMATILLA ST  
TUALATIN, OR 97062

SANTA GYORGYI  
4214 WOODSIDE CIR  
LAKE OSWEGO, OR 97035

SANTA GYORGYI  
4214 WOODSIDE CIR  
LAKE OSWEGO, OR 97035

SARDAM VINCENT ROSS & DYSON KAITLYNN RAE  
7455 SW DELAWARE CIR  
TUALATIN, OR 97062

SARGENT JOAN ALICE  
8204 SW SHENANDOAH WAY  
TUALATIN, OR 97062

SCHEER HILARY JANAYE  
8354 SW MOHAWK ST  
TUALATIN, OR 97062

SCHMITZ MATTHEW D & SCHMITZ KRISTA J  
20182 SW TILLAMOOK CT  
TUALATIN, OR 97062

SCHNEIDER BRENT & SCHNEIDER TRACY A  
8460 SW SEMINOLE TRL  
TUALATIN, OR 97062

SCHRIEVER LISA A  
21198 SW IROQUOIS DR  
TUALATIN, OR 97062

SCHWEITZER LESLIE ANNE  
8675 SW AVERY ST  
TUALATIN, OR 97062

SCOTT LIVING TRUST  
8454 SW CHELAN CT  
TUALATIN, OR 97062

SEBASTIAN THEODORE ANDREW  
20682 SW MARTINAZZI AVE  
TUALATIN, OR 97062

SEED LEVI P & SEED KIMBERLEY A  
8488 SW MOHAWK ST  
TUALATIN, OR 97062

SEFRANEK ROBERT & SEFRANEK REIKO  
8520 SW SAGERT ST  
TUALATIN, OR 97062



SHAFFER JIMMY WAYNE & SHAFFER  
AMANDA GAIL  
8210 SW SEMINOLE TRL  
TUALATIN, OR 97062

SHANAHAN KENNETH D & SHIRLEY A  
REV TRUST  
8455 SW SEMINOLE TRAIL  
TUALATIN, OR 97062

SHUMWAY DEAN & SHUMWAY LAURA  
180 CALICO LAKE DR  
BREVARD, NC 28712

SILLIMAN DAVID J & SILLIMAN  
SHANNON L  
20028 SW 72ND AVE  
TUALATIN, OR 97062

SIMPSON SHELLEY  
PO BOX 824  
TUALATIN, OR 97062

SLOAN EUPHEMIA M R  
20445 SW 86TH AVE  
TUALATIN, OR 97062

~~SMITH MEGHAN LACY & SMITH JOHN  
PAUL  
8121 SW SEMINOLE TRL  
TUALATIN, OR 97062~~

SNYDER STEVEN A  
28686 SW PARIS AVE  
WILSONVILLE, OR 97070

SORRENTINO MARIA LAURA  
7343 SW TENINO LN  
TUALATIN, OR 97062

SPRAIN MICHELLE ANN  
8201 SW SEMINOLE TRAIL  
TUALATIN, OR 97062

~~SHAFFER JIMMY WAYNE & SHAFFER  
AMANDA GAIL  
8210 SW SEMINOLE TRL  
TUALATIN, OR 97062~~

SHELDON WILLIAM C  
8735 SW AVERY ST  
TUALATIN, OR 97062

SIKSTROM MARY ANN & SIKSTROM  
DAVID C  
8520 SW MODOC CT  
TUALATIN, OR 97062

SIMNITT MAXIMILIAN  
20173 SW TENINO CT  
TUALATIN, OR 97062

SIVAM SATYA & VASUKI  
20527 SW 84TH CT  
TUALATIN, OR 97062

SMALL JASON ALAN  
7401 SW DELAWARE CIR  
TUALATIN, OR 97062

SMITH JASON  
20779 SW 84TH AVE  
TUALATIN, OR 97062

SOLL KAREN  
8400 SW SEMINOLE TRL  
TUALATIN, OR 97062

SOUTHARDS CLIFFORD J & SOUTHARDS  
CARLA M  
19800 SPRING RIDGE DR  
WEST LINN, OR 97068

SPRATTLER SUE I LIVING TRUST  
1930 16TH AVE  
FOREST GROVE, OR 97116

~~SHAFFER JIMMY WAYNE & SHAFFER  
AMANDA GAIL  
8210 SW SEMINOLE TRL  
TUALATIN, OR 97062~~

SHOLES RANDY & SHOLES KELLY  
14595 SW 144TH AVE  
TIGARD, OR 97224

SILJEG STEPHANIE M  
21250 SW MAKAH ST  
TUALATIN, OR 97062

SIMONSEN JAMES A  
7375 SW TENINO  
TUALATIN, OR 97062

SKEEN DELORIS J  
8500 SW IROQUOIS DR  
TUALATIN, OR 97062

SMITH MEGHAN LACY & SMITH JOHN  
PAUL  
8121 SW SEMINOLE TRL  
TUALATIN, OR 97062

SNELL SUSAN E  
20487 SW 69TH AVE  
TUALATIN, OR 97062

SOLTERO ALFONSO & SANCHEZ  
FRANCISCO SOLTERO  
19760 SW BOONES FERRY RD  
TUALATIN, OR 97062

SOWA DARLA  
8475 SW AVERY ST  
TUALATIN, OR 97062

ST PAUL PROPERTIES INC  
7991 SW MOHAWK ST  
TUALATIN, OR 97062

STANLEY MATTHEW E  
8278 SW MOHAWK ST  
TUALATIN, OR 97062

~~STANLEY MATTHEW E  
8278 SW MOHAWK ST  
TUALATIN, OR 97062~~

~~STANLEY MATTHEW E  
8278 SW MOHAWK ST  
TUALATIN, OR 97062~~

STANSFIELD MICHAEL  
8501 SW IROQUOIS DR  
TUALATIN, OR 97062

STARK MYLON K  
8384 SW MOHAWK ST  
TUALATIN, OR 97062

STATON HELEN M  
8685 SW COMANCHE WAY  
TUALATIN, OR 97062

STELL THOMAS C & STELL DAWN R  
8280 SW MOHAWK ST  
TUALATIN, OR 97062

STENEK TERESA C  
21285 SW MARTINAZZI AVE  
TUALATIN, OR 97062

STEWART BRANDON J & STEWART  
VIVIANA P  
2982 WINKEL WAY  
WEST LINN, OR 97068

STONE JOANNA & STONE JOSHUA  
20569 SW 84TH CT  
TUALATIN, OR 97062

STORKSON NICHOLAS  
21306 SW IROQUOIS DR  
TUALATIN, OR 97062

STUTEVOSS FRANKLIN G  
20948 SW 84TH AVE  
TUALATIN, OR 97062

SULLIVAN WILLIAM S  
8178 SW SHENANDOAH WAY  
TUALATIN, OR 97062

SWANSON LEGACY IRREV TRUST  
8334 SW MOHAWK ST  
TUALATIN, OR 97062

SWEARINGEN THOMAS R &  
SWEARINGEN CARLA E  
20917 SW MARTINAZZI AVE  
TUALATIN, OR 97062

TAAFFE WILLIAM PATRICK & COE  
AMBER  
20628 SW 84TH CT  
TUALATIN, OR 97062

TAFUA COLETTE L  
8274 SW MOHAWK ST  
TUALATIN, OR 97062

TAMURA LINDA GAYLE  
7311 SW TENINO LN  
TUALATIN, OR 97062

TAMURA LINDA GAYLE  
7311 SW TENINO LN  
TUALATIN, OR 97062

TAUTENHAN DANIEL C  
8450 SW MOHAWK ST  
TUALATIN, OR 97062

TAYLOR EMILY HAVEN  
7251 SW DELAWARE CIR  
BEAVERTON, OR 97062

TAYLOR STERLING D  
8105 SW SEMINOLE TRL  
TUALATIN, OR 97062

TAYLOR STEVEN MICHAEL & STROM  
DIANA & BURT AMY LYNN  
8240 SW SHENANDOAH WAY  
TUALATIN, OR 97062

TEEL SHELLEY A  
8510 SW MOHAWK ST  
TUALATIN, OR 97062

TENCE DAVID A & TENCE IVANA B  
19775 SW TAPOSA PL  
TUALATIN, OR 97062

TEWINPAGTI ITTI  
1220 SW 3RD AVE RM 1616  
PORTLAND, OR 97204

THIEL PHILIP & THIEL CATHERINE  
8535 SW SEMINOLE TRL  
TUALATIN, OR 97062

THIRDGILL AMY  
8685 SW SEMINOLE TRL  
TUALATIN, OR 97062

THOMAS JENEVA TRUST  
7321 SW DELAWARE CIR  
TUALATIN, OR 97062

THOMAS JOSEPH & MOSS AMY  
8464 SW IROQUOIS DR  
TUALATIN, OR 97062

THOMPSON ANITA L  
8175 SW SHENANDOAH WAY  
TUALATIN, OR 97062

THOMPSON ANITA L  
8175 SW SHENANDOAH WAY  
TUALATIN, OR 97062

THOMPSON ANITA L  
8175 SW SHENANDOAH WAY  
TUALATIN, OR 97062

THORSON SHARON M  
21233 SW MARTINAZZI AVE  
TUALATIN, OR 97062

TOBIE GENE A & TOBIE TAMMY J  
21199 SW MARTINAZZI AVE  
TUALATIN, OR 97062

TOBIN ROGER PAUL & TOBIN KAREN  
BRAUCHER & TOBIN ELIZABETH LI BAI  
6195 SW 150TH AVE  
BEAVERTON, OR 97007

TODD VILLAGE-285 LLC  
9500 SW BARBUR BLVD STE 300  
PORTLAND, OR 97219

TODD VILLAGE-285 LLC  
9500 SW BARBUR BLVD STE 300  
PORTLAND, OR 97219

TONE CASEY J & TONE LISA K  
8375 SW SEMINOLE TRL  
TUALATIN, OR 97062

TOW DAVID F & TOW DAWN M  
20222 SW TILLAMOOK CT  
TUALATIN, OR 97062

TREMAIN JUNE E & HUPPERTZ NANCY I  
10735 SW BANNOCH ST  
TUALATIN, OR 97062

TRI-COUNTY METROPOLITAN  
TRANSPORTATION DISTRICT OF  
OREGON  
710 HOLLADAY ST  
PORTLAND, OR 97232

TRYSIL MAYA & FLANAGAN  
CHRISTOPHER  
8372 SW MOHAWK ST  
TUALATIN, OR 97062

TUALATIN VILLAGE CONDO PH II  
OWNERS OF UNITS  
, OR 00000

TUALATIN CITY OF  
18880 SW MARTINAZZI AVE  
TUALATIN, OR 97062

TUALATIN CITY OF  
18880 SW MARTINAZZI AVE  
TUALATIN, OR 97062

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TUALATIN, OR 97062

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TUALATIN, OR 97062

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TUALATIN, OR 97062

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18880 SW MARTINAZZI AVE  
TUALATIN, OR 97062

TUALATIN CITY OF  
18880 SW MARTINAZZI AVE  
TUALATIN, OR 97062

TUCKER SHERRY D  
8522 SW MOHAWK ST  
TUALATIN, OR 97062

TURNER JAMES W  
8252 SW SHENANDOAH WAY  
TUALATIN, OR 97062

UJAKOVICH MEGAN B  
8315 SW SHENANDOAH WAY  
TUALATIN, OR 97062

VALENTIN RODOLFO  
3809 NE 73RD AVE  
PORTLAND, OR 97213

VALENTINE FRIDAY  
8160 SW SHENANDOAH WAY  
TUALATIN, OR 97062

VALO VALORIE L  
20350 SW 72ND AVE  
TUALATIN, OR 97062

VANCE JAMES D & VANCE DONNA L  
22350 SW 102ND PL  
TUALATIN, OR 97062

VANDERHEIDEN STEVEN M &  
VANDERHEIDEN SHERYL D  
20577 SW COLVILLE CT  
TUALATIN, OR 97062

VANNORTWICK JOHN E JR &  
VANNORTWICK MARY JO  
8472 SW NESTUCCA CT  
TUALATIN, OR 97062

VENTI KATHERINE M  
8486 SW MOHAWK ST  
TUALATIN, OR 97062

VENTI KATHERINE M  
8486 SW MOHAWK ST  
TUALATIN, OR 97062

VENTI KATHERINE M  
8486 SW MOHAWK ST  
TUALATIN, OR 97062

VITERITTI TRACY A  
8344 SW MOHAWK ST  
TUALATIN, OR 97062

VONTUNGEIN RITA K  
8448 SW MOHAWK ST  
TUALATIN, OR 97062

WADE DIANA  
8462 SW UMATILLA ST  
TUALATIN, OR 97062

WAGNER DANIELLE R & WAGNER  
JARED  
7288 SW DELAWARE CIR  
TUALATIN, OR 97062

WAHED WALI & WAHED CHRISTI  
7476 SW DELAWARE CIR  
TUALATIN, OR 97062

WALKER-LIDDELL JENNIFER JEAN  
8408 SW UMATILLA ST  
TUALATIN, OR 97062

WALSH JAMES ROBERT REV LIV TRUST  
8740 SW COMANCHE WAY  
TUALATIN, OR 97062

WALTER KENNETH L  
20601 SW COLVILLE CT  
TUALATIN, OR 97062

WARD JUSTIN C & WARD TIFFANY L  
8380 SE SHENANDOAH WAY  
TUALATIN, OR 97062

WARN RICHARD & SUZANNE TINKER  
WARN LIV TRUST  
20176 SW 72ND AVE  
TUALATIN, OR 97062

WARNEKE SPENCER  
8456 SW MOHAWK ST  
TUALATIN, OR 97062

WAXENFELTER ROYCE & WAXENFELTER  
BESS  
8487 SW HURON CT  
TUALATIN, OR 97062

WEAVER JOSHUA M & WEAVER EMMA  
C  
20335 SW 86TH AVE  
TUALATIN, OR 97062

WEBBER MICHELE A & WEBBER  
GREGORY S  
7313 SW DELAWARE CIR  
TUALATIN, OR 97062

WECKERT WENDELL W II & WECKERT  
VIVIAN I  
8700 SW COMANCHE WAY  
TUALATIN, OR 97062

WECKERT WENDELL W II & WECKERT  
VIVIAN I  
8700 SW COMANCHE WAY  
TUALATIN, OR 97062

WEGENER LOIS M  
8228 SW SEMINOLE TRL  
TUALATIN, OR 97062

WEGNER WILLIAM DAVID & WEGNER  
LINDA  
8446 SW UMATILLA ST  
TUALATIN, OR 97062

WEILAND LINDA A  
7392 SW TENINO LN  
TUALATIN, OR 97062

WELLS JONAH & KIEU CHRISTINE  
20351 SW 72ND AVE  
TUALATIN, OR 97062

WELLS BARBARA J TRUST  
8565 SW MODOC CT  
TUALATIN, OR 97062

WENDT GLADYS T LIVING TRUST  
8336 SW MOHAWK ST  
TUALATIN, OR 97062

WEST TREVOR M  
8332 SW MOHAWK ST  
TUALATIN, OR 97062

WESTFALL SANDRA C  
8332 SW SHENANDOAH WAY  
TUALATIN, OR 97062

WESTON BENJAMIN R & WESTON TARA  
E  
8360 SW CHELAN ST  
TUALATIN, OR 97062

WHITEMAN BETTY J  
5185 CARMAN DR  
LAKE OSWEGO, OR 97035

WHITE SUZANNE B LIVING TRUST  
8368 SW MOHAWK ST  
TUALATIN, OR 97062



WILBOURN SAMUEL R & WILBOURN  
LAURA N  
20208 SW 85TH CT  
TUALATIN, OR 97062

WILBOURN SAMUEL R & WILBOURN  
LAURA N  
20208 SW 85TH CT  
TUALATIN, OR 97062

WILBOURN SAMUEL R & WILBOURN  
LAURA N  
20208 SW 85TH CT  
TUALATIN, OR 97062

WILENT SHERRI LYNN & WILENT  
STEVEN WILLIAM  
8404 SW MOHAWK ST  
TUALATIN, OR 97062

WILHELM MICHAEL S & WILHELM  
MARGARITA R  
8485 SW IROQUOIS DR  
TUALATIN, OR 97062

WILLIAMS-ANDERSON NICOLE D &  
ANDERSON KYLE CA  
20016 SW 86TH AVE  
TUALATIN, OR 97062

WILLIAMS JOAN E TRUST  
9801 RANCH HAND AVE  
LAS VEGAS, NV 89117

WILSON BYRON  
8370 SW MOHAWK ST  
TUALATIN, OR 97062

WILSON NANCY SILLER & WILSON  
GREG H  
21125 SW MARTINAZZI AVE  
TUALATIN, OR 97062

WINN REVOCABLE TRUST  
20104 SW TILLAMOOK CT  
TUALATIN, OR 97062

WINTERS TERRY M  
8304 SW MOHAWK ST  
TUALATIN, OR 97062

WOLL ANNA & WOLL JAMES  
8447 SW IROQUOIS DR  
TUALATIN, OR 97062

WOOD SHARON F  
8235 SW SHENANDOAH WAY  
TUALATIN, OR 97062

WOOD KATHRYN A REV TRUST  
8312 SW SHENANDOAH WAY  
TUALATIN, OR 97062

WOODS KEITH A  
20249 SW 85TH CT  
TUALATIN, OR 97062

WOOLFE JANIE L  
8330 SW MOHAWK ST  
TUALATIN, OR 97062

WOOTEN SHAWN  
8310 SW MOHAWK ST  
TUALATIN, OR 97062

WRAY MATHEW E & WRAY ASHLEY D  
8153 SW SEMINOLE TRL  
TUALATIN, OR 97062

WRAY MATHEW E & WRAY ASHLEY D  
8153 SW SEMINOLE TRL  
TUALATIN, OR 97062

WRIGHT JENNIFER A  
20973 SW MARTINAZZI AVE  
TUALATIN, OR 97062

WURGLER CATHALYN C  
20905 SW 84TH AVE  
TUALATIN, OR 97062

WYLAND DANIEL J & WYLAND SHARLA  
L  
PO BOX 2268  
TUALATIN, OR 97062

YARMAN JERRY L & YARMAN JENNIFER  
A  
20980 SW 84TH AVE  
TUALATIN, OR 97062

YOUNG SAMUEL J & YOUNG ANNE B  
8105 SW SHENANDOAH WAY  
TUALATIN, OR 97062

YOUNKER JASON L & YOUNKER EMILY  
20150 SW 72ND AVE  
TUALATIN, OR 97062

YU KE  
20873 SW MARTINAZZI AVE  
TUALATIN, OR 97062

ZAMORA OSCAR & TORRES IRMA  
21110 SW 84TH AVE  
TUALATIN, OR 97062

ZELINSKY SHARON P REV LIV TRUST  
8489 SW UMATILLA ST  
TUALATIN, OR 97062

ZHU HE  
8320 SW MOHAWK ST  
TUALATIN, OR 97062

ZIMEL RANDI N  
20222 SW 72ND AVE  
TIGARD, OR 97223

3J Consulting  
Attn: Heather Austin, AICP  
9600 SW Nimbus Ave., Ste. 100  
Beaverton, OR 97008

Colrich California Construction, LLC  
Attn: Matthew Moiseve  
444 West Beech St., Ste. 300  
San Diego, CA 92101

**From:** Keith Leonard  
**Sent:** Thursday, October 13, 2022 1:27 PM  
**To:** riverparkcio@gmail.com; jasuw7@gmail.com; famtunstall1@frontier.com; dan@danhardyproperties.com; katepinamonti@hotmail.com; cynmartz12@gmail.com; daniel@bachhuber.co; cio.east.west@gmail.com; doug\_ulmer@comcast.net; keenanwoods7@gmail.com; keenanwoods7@gmail.com; dana476@gmail.com; mcrowell248@comcast.net; tualatinmidwestcio@gmail.com; dikkusan@live.com; cniew@yahoo.com; tmpgarden@comcast.net; snoelluwcwle@yahoo.com; MartinazziWoodsCIO@gmail.com; solson.1827@gmail.com; delmoore@frontier.com; jamison.l.shields@gmail.com; ClaudiaSterling68@gmail.com; janet7531@gmail.com; roydloop@gmail.com; Tualatinibachcio@gmail.com; edkcnw@comcast.net; patricia.parsons@ctt.com; rwcleanrooms@gmail.com; byromcio@gmail.com; mwestenhaver@hotmail.com; tualatincommercialcio@gmail.com; tualatincommercialcio@gmail.com; scottm@capacitycommercial.com; robertekellogg@yahoo.com; famtunstall1@frontier.com; tualatincio@gmail.com; Megan George  
**Subject:** Notice of Hearing November 30th: AR22-0008 7800 SW Sagert St. and 20400 SW Martinazzi Ave.- Alden Apartments



#### **NOTICE OF HEARING AND OPPORTUNITY TO COMMENT**

**NOTICE IS HEREBY GIVEN** that a public hearing will be held before the City of Tualatin Architectural Review Board on Wednesday November 30, 2022 at 6:30 p.m. All are invited to attend the hearing and testify verbally. The hearing will be held at the Tualatin Service Center, 10699 SW Herman Road, Tualatin, OR 97062, and a Zoom meeting link will be published with the meeting agenda and packet materials at: [www.tualatinoregon.gov/meetings](http://www.tualatinoregon.gov/meetings).

***3j Consulting, on behalf of CR Alden Communities, LLC., is requesting approval to construct 45 new townhome units in 12 new buildings. The 16.7 acre property is located in the Medium High Density Residential Zone (RMH) at 7800 SW Sagert Street and 20400 SW Martinazzi Avenue, Tax Lot 2S125BA00100. Two existing buildings are proposed for removal for a net gain of 10 buildings on the site. Removal of an existing basketball court is proposed. There will be a total of 5 shared outdoor play areas for the overall development.***

You may view the application materials on our Projects web page:  
<https://www.tualatinoregon.gov/planning/ar22-0008-alden-apartments-0>.

**Individuals wishing to comment may do so in writing** to the Planning Division prior to the hearing and/or present written and/or verbal testimony to the Architectural Review Board at the hearing. To be

included in the materials packet published ahead of the hearing, comments must be **received by November 16, 2022**. Hearings begin with a staff presentation, followed by testimony by proponents, testimony by opponents, and rebuttal. The time of individual testimony may be limited. If a participant requests before the hearing is closed, the record shall remain open for at least 7 days after the hearing.

All citizens are invited to attend and be heard upon the Architectural Features application: Failure of an issue to be raised in the hearing, in person, or by letter, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond to the issue precludes appeal to the State Land Use Board of Appeals (LUBA) based on that issue. The failure of the applicant to raise constitutional or other issues relating to the proposed conditions of approval with sufficient specificity to the decision maker to respond to the issue precludes an action for damages in circuit court.

**Type III Architectural Review Criteria:** Tualatin Development Code Chapters: 32, 33, 42, 73A-D, 74, 75

A staff report will available seven day prior to the public hearing, published at [www.tualatinoregon.gov/meetings](http://www.tualatinoregon.gov/meetings). This meeting and any materials being considered can be made accessible upon request.

Written comments and questions can be submitted to: [kleonard@tualatin.gov](mailto:kleonard@tualatin.gov).

**Keith Leonard, AICP**

Associate Planner

City of Tualatin | Planning

503.691.3029 | [www.tualatinoregon.gov](http://www.tualatinoregon.gov)





**From:** Keith Leonard  
**Sent:** Thursday, October 13, 2022 1:35 PM  
**To:** camila.garrido@dahlingroup.com; troym@mearsdesigngroup.com; Ashley Doty; matm@colrich.com; Heather Austin  
**Cc:** Alyssa Kerr; Don Hudson; Erin Engman; Jonathan Taylor; Kim McMillan; Martin Loring; Mike McCarthy; Rich Mueller; Sherilyn Lombos; Steve Koper; Terrance Leahy; Tom Scott; Tom Steiger; Hayden Ausland; Tony Doran; Lindsey Hagerman; Madeleine Nelson; Keith Leonard; Suzanne Tyler; Edward Jones; naomi\_vogel@co.washington.or.us; theresa\_cherniak@co.washington.or.us; deqinfo@deq.state.or.us; landusenotifications@oregonmetro.gov; ODOT\_R1\_DevRev@odot.oregon.gov; baldwinb@trimet.org; LUComments@cleanwaterservices.org; Ty.Darby@tvfr.com; KHerrod@republicservices.com; trose1@ttsd.k12.or.us; info@theintertwine.org; Anneleah@tualatinchamber.com; OR.METRO.ENGINEERING@ZIPLY.COM; tod.shattuck@pgn.com; brandon.fleming@pgn.com; kenneth.spencer@pgn.com; richard.girard@nwnatural.com; icrawford@wcca.com  
**Subject:** Notice of Hearing November 30th: AR22-0008 7800 SW Sagert St. and 20400 SW Martinazzi Ave.- Alden Apartment



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<https://www.tualatinoregon.gov/planning/ar22-0008-alden-apartments-0>.

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**November 16, 2022.** Hearings begin with a staff presentation, followed by testimony by proponents, testimony by opponents, and rebuttal. The time of individual testimony may be limited. If a participant requests before the hearing is closed, the record shall remain open for at least 7 days after the hearing.

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**Keith Leonard, AICP**

Associate Planner

City of Tualatin | Planning

503.691.3029 | [www.tualatinoregon.gov](http://www.tualatinoregon.gov)





## FIRE CODE / LAND USE / BUILDING REVIEW APPLICATION

**North Operating Center**  
 11945 SW 70<sup>th</sup> Avenue  
 Tigard, OR 97223  
 Phone: 503-649-8577

**South Operating Center**  
 8445 SW Elligsen Rd  
 Wilsonville, OR 97070  
 Phone: 503-649-8577

REV 6-30-20

### Project Information

Applicant Name: Brian O'Rourke  
 Address: 9600 SW Nimbus Ave, Suite 100  
 Phone: 503-946-9365 x209  
 Email: brian.orourke@3i-consulting.com  
 Site Address: 7800 SW Sagert St & 20400 SW Martinazzi Ave  
 City: Tualatin  
 Map & Tax Lot #: 2S125BA00100  
 Business Name: Alden Apartments  
 Land Use/Building Jurisdiction: City of Tualatin  
 Land Use/ Building Permit # Pre-App 22-0004

Choose from: Beaverton, Tigard, Newberg, **Tualatin**, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

### Project Description

Removal of two existing apartment buildings and associated site features. Addition of 12 buildings (45 total townhome style apartment units) including associated roads, pedestrian paths, and site utilities.

### Permit/Review Type (check one):

- Land Use / Building Review - Service Provider Permit
- Emergency Radio Responder Coverage Install/Test
- LPG Tank (Greater than 2,000 gallons)
- Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)
  - \* Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.
- Explosives Blasting (Blasting plan is required)
- Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)
- Tents or Temporary Membrane Structures (in excess of 10,000 square feet)
- Temporary Haunted House or similar
- OLCC Cannabis Extraction License Review
- Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

### For Fire Marshal's Office Use Only

TVFR Permit # 2022-0097  
 Permit Type: SPP  
 Submittal Date: 8/30/22  
 Assigned To: ORourke  
 Due Date: \_\_\_\_\_  
 Fees Due: \_\_\_\_\_  
 Fees Paid: \_\_\_\_\_

### Approval/Inspection Conditions (For Fire Marshal's Office Use Only)

#### This section is for application approval only

[Signature] ORourke 8/30/22  
 Fire Marshal or Designee Date

Conditions:

**X PLEASE SUBMIT FIRE FLOW RESULTS ASAP.**

See Attached Conditions:  Yes  No

Site Inspection Required:  Yes  No

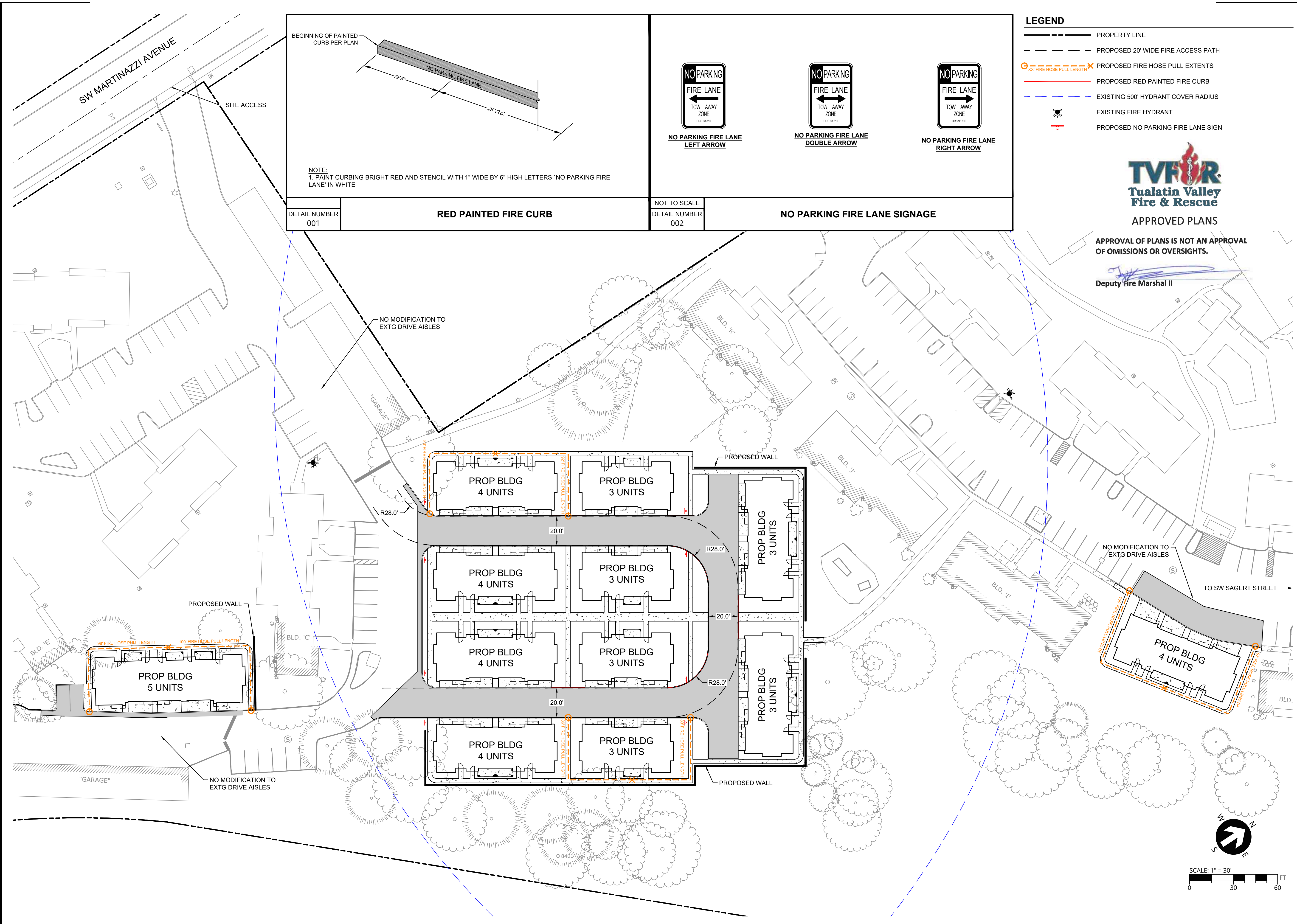
#### This section used when site inspection is required

Inspection Comments:

Final TVFR Approval Signature & Emp ID \_\_\_\_\_ Date \_\_\_\_\_



P:\22791-ALDEN APARTMENTS\CAD\SHEETS\DDC700 - FIRE ACCESS PLAN.DWG



LEGEND

- PROPERTY LINE
- - - PROPOSED 20' WIDE FIRE ACCESS PATH
- PROPOSED FIRE HOSE PULL EXTENTS
- PROPOSED RED PAINTED FIRE CURB
- EXISTING 500' HYDRANT COVER RADIUS
- EXISTING FIRE HYDRANT
- PROPOSED NO PARKING FIRE LANE SIGN

NOTE:  
1. PAINT CURBING BRIGHT RED AND STENCIL WITH 1" WIDE BY 6" HIGH LETTERS 'NO PARKING FIRE LANE' IN WHITE

DETAIL NUMBER 001      **RED PAINTED FIRE CURB**

NOT TO SCALE  
DETAIL NUMBER 002      **NO PARKING FIRE LANE SIGNAGE**

NO PARKING FIRE LANE LEFT ARROW  
NO PARKING FIRE LANE DOUBLE ARROW  
NO PARKING FIRE LANE RIGHT ARROW

**TVALR**  
Tualatin Valley  
Fire & Rescue

**APPROVED PLANS**

APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.

Deputy Fire Marshal II

PUBLISH DATE  
#####  
ISSUED FOR  
DD  
REVISIONS

**FIRE ACCESS PLAN**  
**ALDEN APARTMENTS**

7800 SW SAGERT STREET  
TUALATIN, OR 97062

**3J CONSULTING**

CIVIL ENGINEERING  
WATER RESOURCES  
COMMUNITY PLANNING

9600 SW NIMBUS AVE., SUITE 100, BEAVERTON, OR 97008

PROJECT INFORMATION  
3J PROJECT # | 22791  
TAX LOT(S) | 2S125BA00100  
LAND USE # | 22-0004  
DESIGNED BY | KMK  
CHECKED BY | BMO

SHEET NUMBER  
**FS-1**



## MEMORANDUM

**Date:** November 10, 2022

**To:** Keith Leonard, Associate Planner, City of Tualatin

**From:** Jackie Sue Humphreys, Clean Water Services (CWS)

**Subject:** Alden Apartments New Buildings, AR22-0008, 2S125BA00100

Please include the following comments when writing your conditions of approval:

### **PRIOR TO ANY WORK ON THE SITE**

A Clean Water Services (CWS) Storm Water Connection Permit Authorization must be obtained. Application for CWS Permit Authorization must be in accordance with the requirements of the Design and Construction Standards, Resolution and Order No. 19-5 as amended by R&O 19-22, or prior standards as meeting the implementation policy of R&O 18-28, and is to include:

- a. Detailed plans prepared in accordance with Chapter 2, Section 2.04.
- b. Detailed grading and erosion control plan. An Erosion Control Permit will be required. Area of Disturbance must be clearly identified on submitted construction plans. If site area and any offsite improvements required for this development exceed one-acre of disturbance, project will require a 1200-CN Erosion Control Permit. If site area and any offsite improvements required for this development exceed five-acres of disturbance, project will require a 1200-C Erosion Control Permit.
- c. Detailed plans showing the development having direct access by gravity to public storm and sanitary sewer.
- d. Provisions for water quality in accordance with the requirements of the above named design standards. Water Quality is required for all new development and redevelopment areas per R&O 19-5, Section 4.04. Access shall be provided for maintenance of facility per R&O 19-5, Section 4.07.6.

- e. If use of an existing offsite or regional Water Quality Facility is proposed, it must be clearly identified on plans, showing its location, condition, capacity to treat this site and, any additional improvements and/or upgrades that may be needed to utilize that facility.
- f. If private lot LIDA systems proposed, must comply with the current CWS Design and Construction Standards. A private maintenance agreement, for the proposed private lot LIDA systems, needs to be provided to the City for review and acceptance.
- g. Show all existing and proposed easements on plans. Any required storm sewer, sanitary sewer, and water quality related easements must be granted to the City.
- h. Application may require additional permitting and plan review from CWS Source Control Program. For any questions or additional information, please contact Source Control at (503) 681-5175.
- i. Any proposed offsite construction activities will require an update or amendment to the current Service Provider Letter for this project.

## CONCLUSION

This Land Use Review does not constitute CWS approval of storm or sanitary sewer compliance to the NPDES permit held by CWS. CWS, prior to issuance of any connection permits, must approve final construction plans and drainage calculations.



# Oregon

Kate Brown, Governor

## Department of Transportation

Region 1 Headquarters  
123 NW Flanders Street  
Portland, Oregon 97209  
(503) 731.8200  
FAX (503) 731.8259

November 14, 2022

ODOT #12791

## ODOT Response

<b>Project Name:</b> Alden Apartments Addition	<b>Applicant:</b> Alden Apartments
<b>Jurisdiction:</b> City of Tualatin	<b>Jurisdiction Case #:</b> AR22-0008
<b>Site Address:</b> 20400 SW MARTINAZZI AVE, 7800 SW Sagert St, Tualatin, Oregon	<b>State Highway:</b> I-5

The site of this proposed land use action is in the vicinity of I-5. ODOT has permitting authority for this facility and an interest in ensuring that this proposed land use is compatible with its safe and efficient operation. **Please direct the applicant to the District Contact indicated below to determine permit requirements and obtain application information.**

### COMMENTS/FINDINGS

ODOT has reviewed the formal application materials submitted for the additions to Alden Apartments including new apartment buildings, parking lots, other hardscaping, and utility improvements. The project site is located in the vicinity of ODOT's I-5 facility and discharges to storm drain infrastructure within ODOT right-of-way. Due to the amount of impervious area modified, storm water management approaches are proposed. The applicant is indicating detention to 50 year events to accommodate their release to ODOT.

ODOT recommends the City of Tualatin require the applicant to obtain a Miscellaneous Permit from ODOT for connection to state highway drainage facilities as a condition of the land use approval. Please direct the applicant to the District 2B contact indicated below to determine permit requirements and obtain application information. All ODOT permits and approvals must reach 100% plans before the District Contact will sign-off on a local jurisdiction building permit, or other necessary requirement prior to construction.

Below is a summary of ODOT's initial technical review comments for the Preliminary Stormwater Report submitted in the formal application materials, however formal review of site drainage and storm water management plans will occur through the permitting process with ODOT Geo-Hydro staff.

- 1. The use of 50 year storm for detention is correct. ODOT will need to review analysis for the 100 year storm verifying that the facilities will safely store and release the check storm to approximate the risk to ODOT downstream facilities. What is the likelihood of impact to ODOT facilities?*
- 2. Two of the three proposed storm facility outfalls are shown on sheet C400 of the submitted materials. For the proposed building #J2, there is a proposed connection to an existing storm line. Where does this line outfall? All outfalls/scour pads need to be on the private property and maintained by the property owner.*
- 3. What is the allowable freeboard per CWS standards? Shown are 6-inch proposed on plans for the infiltration ponds. Our standard for ODOT facilities is 12-inch minimum.*

*This may not be required in this case, however the applicant will need to show the overflow risk.*

4. *In the pending final storm report, ODOT will need to review the pre and post development total volume of water contributing to ODOT's system.*
5. *Please present the full hydro-modification impacts to ODOT system and identify changes.*
6. *Hydrographs: The Post development hydrographs do not show the impact of the detention facility, only the increased runoff. ODOT will need to receive post development runoff hydrographs with the inclusion of the detention to understand the impact to the ODOT facility. The current provided post-development hydrographs only illustrate an increased peak and volume. The axis should have consistent and labeled units on both axis, i.e (CFS) and time (hours) not with days of the week (both on some charts).*

#### **ODOT RECOMMENDED LOCAL CONDITIONS OF APPROVAL**

- An ODOT Miscellaneous Permit is required for connection to state highway drainage facilities. Connection will only be considered if the site's drainage naturally enters ODOT right of way. The applicant must provide ODOT District with a preliminary drainage plan showing impacts to the highway right of way.

A drainage study prepared by an Oregon Registered Professional Engineer is usually required by ODOT if:

1. Total peak runoff entering the highway right of way is greater than 1.77 cubic feet per second; or
2. The improvements create an increase of the impervious surface area greater than 10,758 square feet.

**Please send a copy of the Notice of Decision including conditions of approval to:**

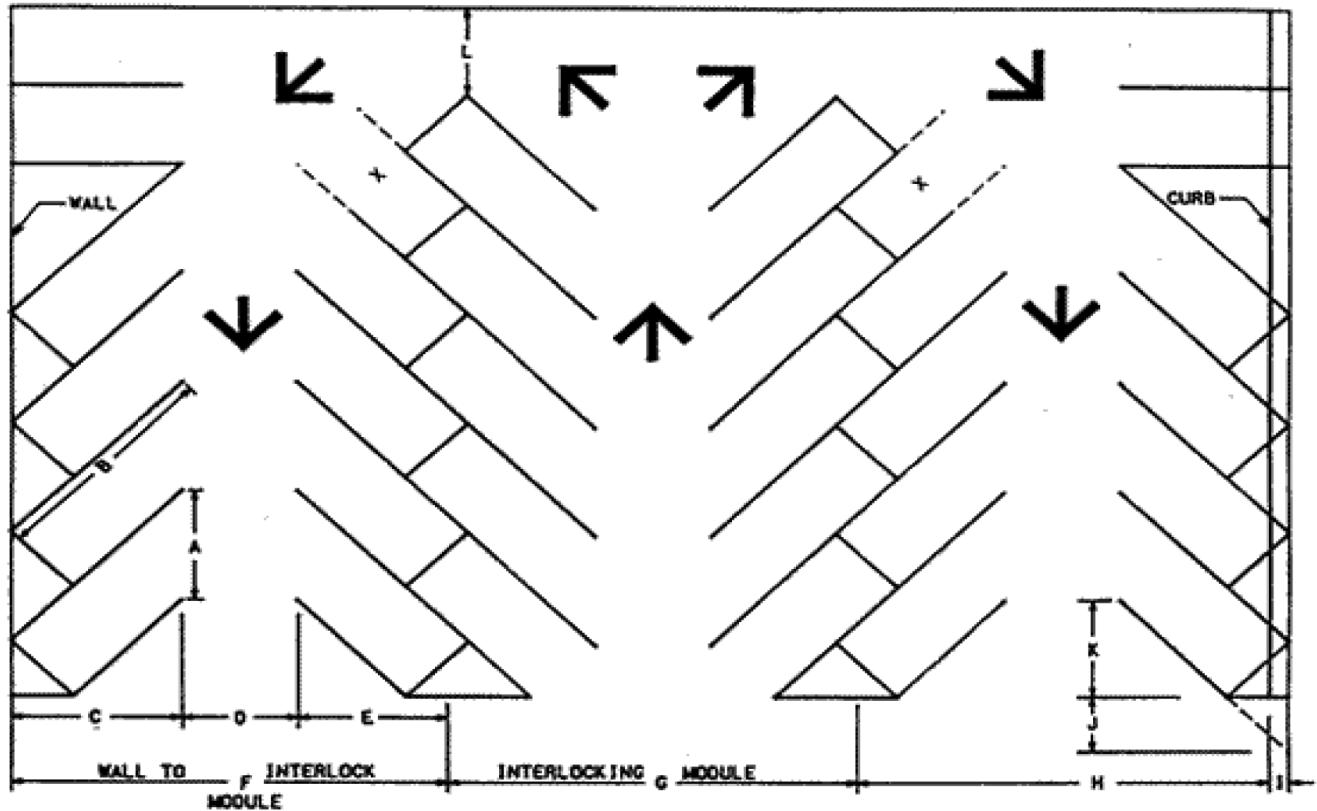
ODOT Region 1 Planning  
Development Review  
123 NW Flanders St  
Portland, OR 97209

[ODOT\\_R1\\_DevRev@odot.oregon.gov](mailto:ODOT_R1_DevRev@odot.oregon.gov)

Development Review Planner: Diana Powers	<a href="mailto:Diana.Powers@odot.oregon.gov">Diana.Powers@odot.oregon.gov</a>
District Contact: District 2B	<a href="mailto:D2BUP@odot.oregon.gov">D2BUP@odot.oregon.gov</a>



**Tualatin Development Code - Figure 73-1  
Parking Space Design Standards for 9-Foot Stalls**



<u>Dimension</u>	<u>On Diagram</u>	<u>45°</u>	<u>60°</u>	<u>75°</u>	<u>90°</u>
Stall width parallel to aisle	A	12.7	10.4	9.3	9.0
Stall Length of line	B	25.0	22.0	20.0	18.5
Stall depth to wall	C	17.5	19.0	19.5	18.5
Aisle width between stall lines	D	12.0	16.0	21.0	24.0
Stall depth, interlock	E	15.3	17.5	18.8	18.5
Module, wall to interlock	F	44.8	52.5	61.3	63.0
Module, interlocking	G	42.6	51.0	61.0	63.0
Module, interlocking to curb face	H	42.8	50.2	58.8	60.5
Bumper overhang (typical)	I	2.0	2.3	2.5	2.5
Offset	J	6.3	2.7	0.5	0.0
Setback	K	11.0	8.3	5.0	0.0
Cross aisle, one-way	L	12.0	12.0	12.0	12.0
Cross aisle, two way	-	22.0	22.0	22.0	22.0

X = Stall not accessible in some cases.

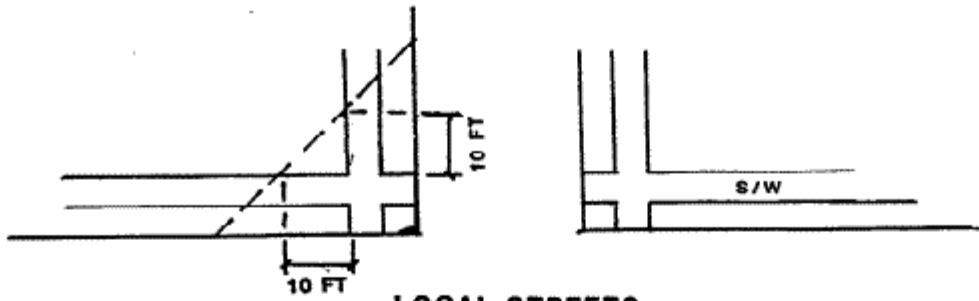
**Parking Dimensions for Subcompact Parking**

	<u>45°</u>	<u>60°</u>	<u>75°</u>	<u>90°</u>
Stall Width	7.5	7.5	7.5	7.7
Aisle Width per Stall	10.5	8.7	7.8	7.5
Depth of Stalls at right angle to aisle	16.0	16.7	16.3	15.0
Aisle Width	11.0	14.0	17.4	20.0
Wall-to-Wall module	43.0	47.4	50.0	50.0

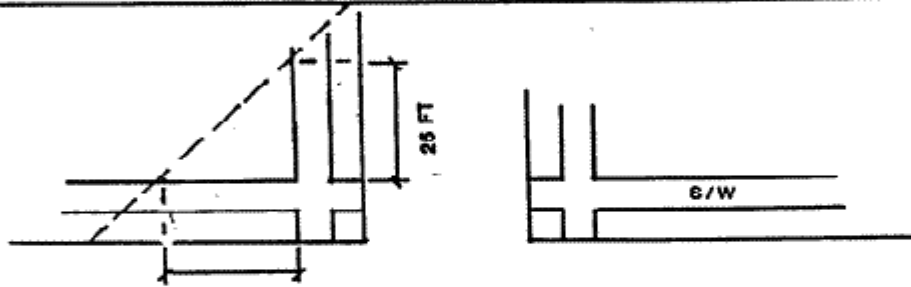
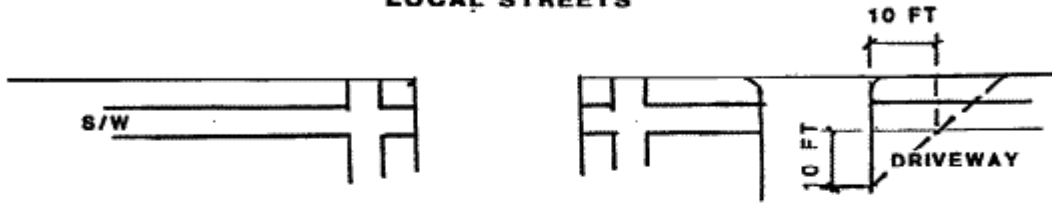
**Note:** These measurements are inadequate for average compacts. Each stall depth should be increased about 1 foot (2 feet total for the module) to accommodate for the usual range of compact sizes.



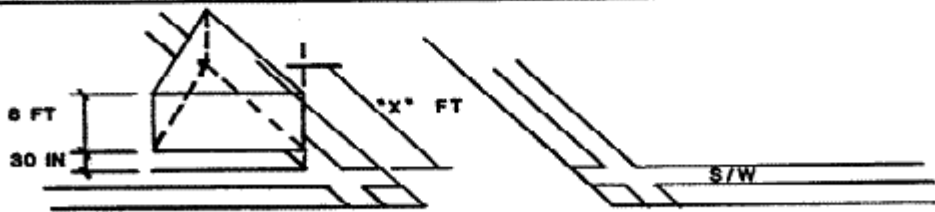
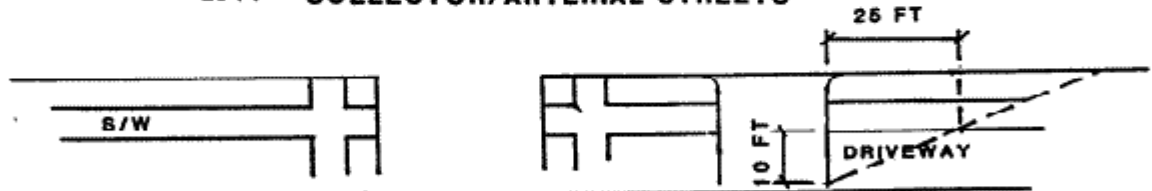
# VISION CLEARANCE AREA



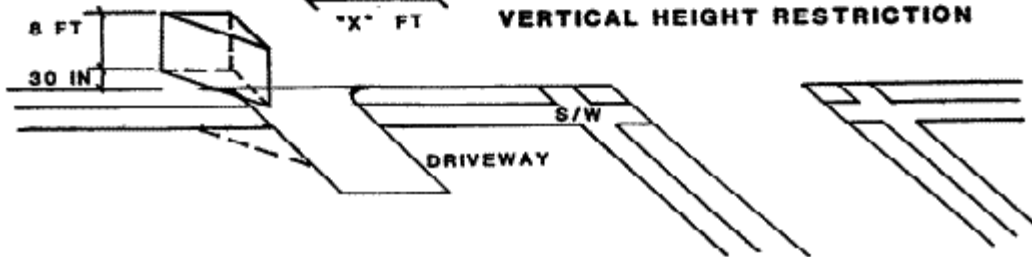
**LOCAL STREETS**



**25 FT COLLECTOR/ARTERIAL STREETS**



**VERTICAL HEIGHT RESTRICTION**

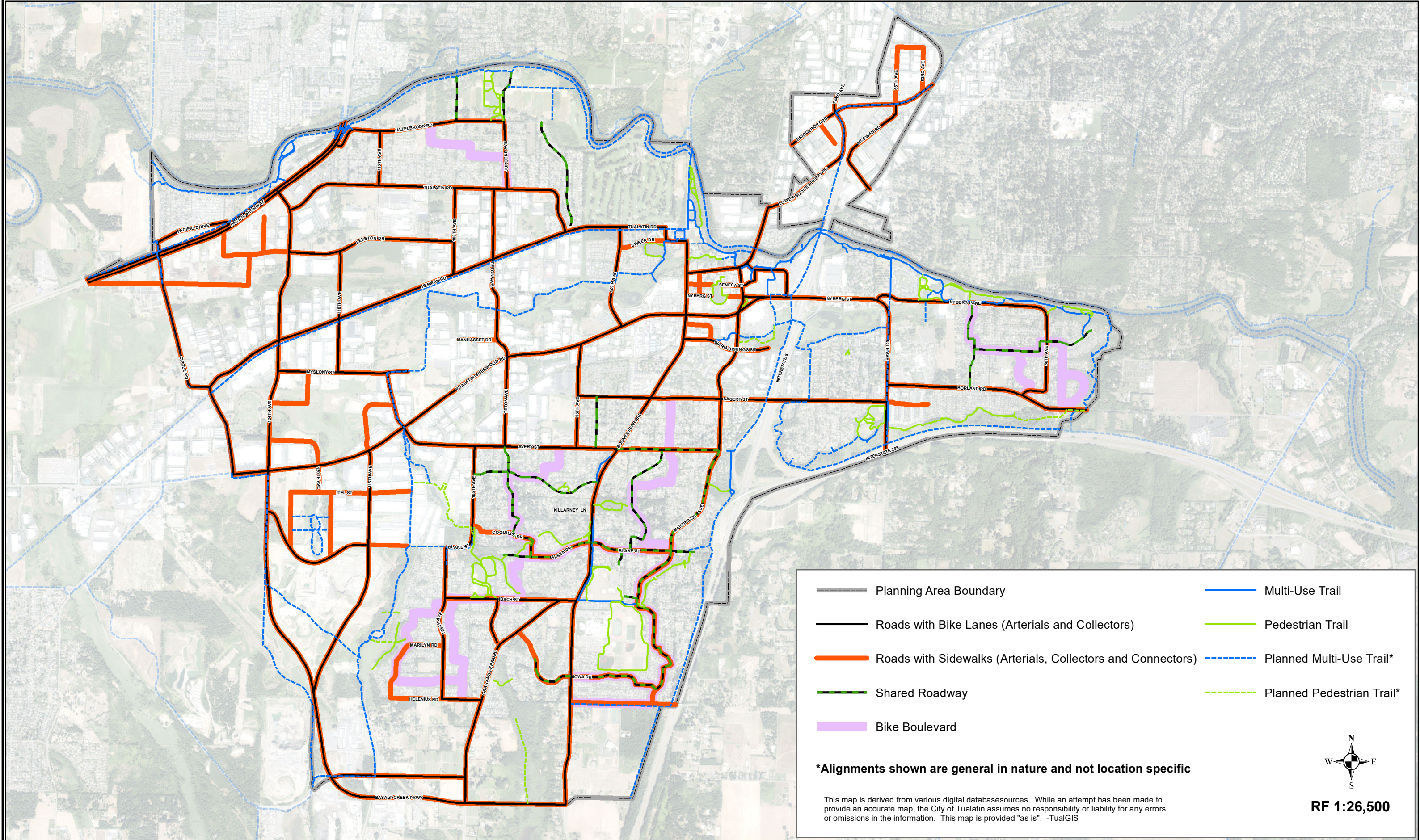








# Map 8-4: Bicycle and Pedestrian Plan



- Planning Area Boundary
- Roads with Bike Lanes (Arterials and Collectors)
- Roads with Sidewalks (Arterials, Collectors and Connectors)
- Shared Roadway
- Bike Boulevard
- Multi-Use Trail
- Pedestrian Trail
- Planned Multi-Use Trail\*
- Planned Pedestrian Trail\*

**\*Alignments shown are general in nature and not location specific**

This map is derived from various digital databasesources. While an attempt has been made to provide an accurate map, the City of Tualatin assumes no responsibility or liability for any errors or omissions in the information. This map is provided "as is". -TualGIS

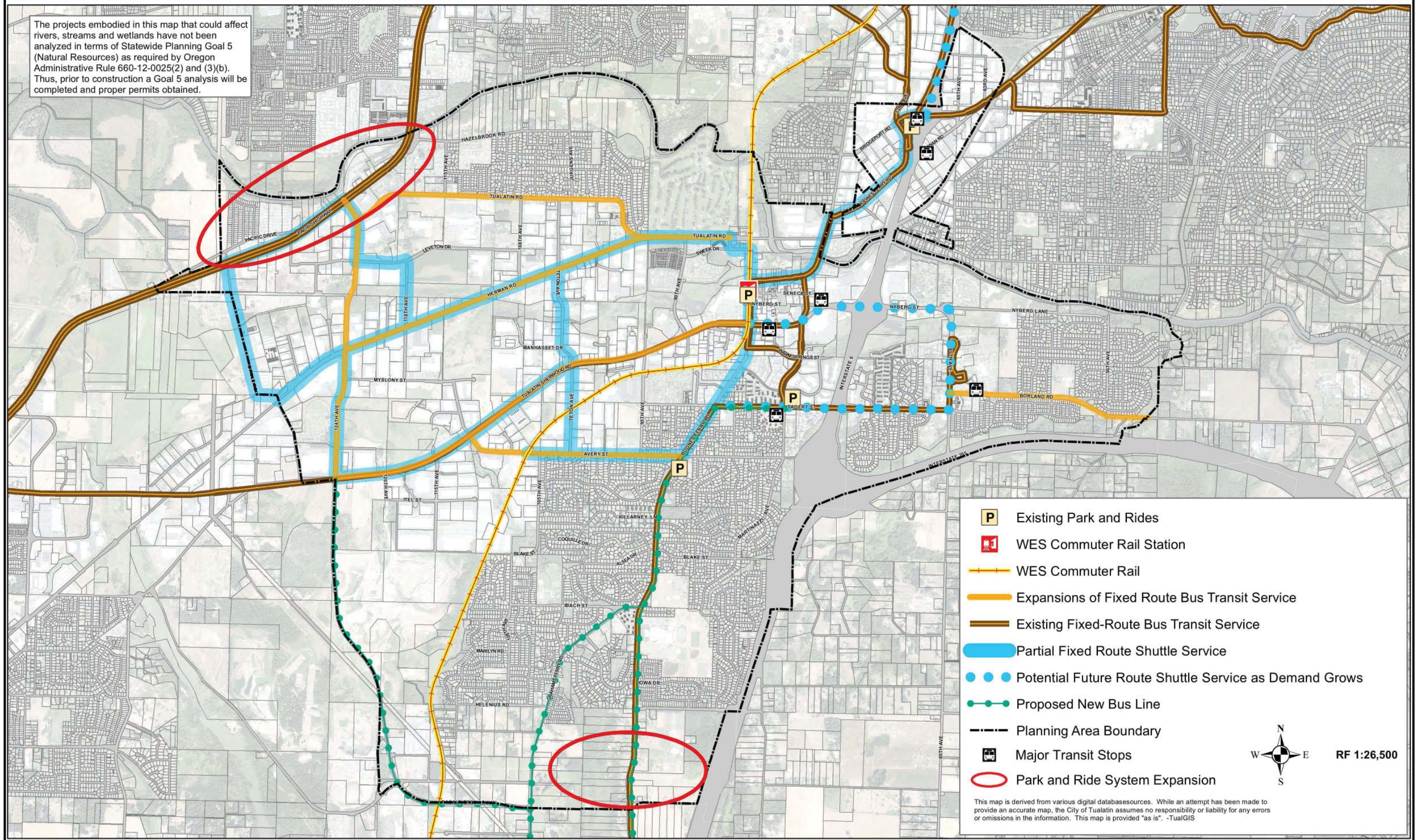


**RF 1:26,500**



# Map 8-5: Tualatin Transit Plan

The projects embodied in this map that could affect rivers, streams and wetlands have not been analyzed in terms of Statewide Planning Goal 5 (Natural Resources) as required by Oregon Administrative Rule 660-12-0025(2) and (3)(b). Thus, prior to construction a Goal 5 analysis will be completed and proper permits obtained.



- Existing Park and Rides
- WES Commuter Rail Station
- WES Commuter Rail
- Expansions of Fixed Route Bus Transit Service
- Existing Fixed-Route Bus Transit Service
- Partial Fixed Route Shuttle Service
- Potential Future Route Shuttle Service as Demand Grows
- Proposed New Bus Line
- Planning Area Boundary
- Major Transit Stops
- Park and Ride System Expansion



This map is derived from various digital databasesources. While an attempt has been made to provide an accurate map, the City of Tualatin assumes no responsibility or liability for any errors or omissions in the information. This map is provided "as is". -TualGIS





## ARCHITECTURAL REVIEW BOARD DECISION

November 30, 2022

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Case #:	AR 22-0008
Project:	Alden Apartments
Location:	7800 SW Sagert Street and 20400 SW Martinazzi Avenue, Tax Map/Lot: 2S125BA00100
Representative	Heather Austin, AICP, 3j Consulting, Inc.
Owner:	CR Alden Communities, LLC

---

### I. FINDINGS

- A. An application for Architectural Review (AR 22-0008) was filed by 3j Consulting, Inc., requesting approval of a 45 unit multi-family development addition to the Alden Apartments.
- B. The Architectural Review Board (ARB) conducted a noticed quasi-judicial public hearing on November 30, 2022 in conformance with the laws of the State of Oregon and the City of Tualatin.
- C. At the November 30, 2022 public hearing, the ARB found that with conditions of approval to further the implementation of the requirements of the Tualatin Development Code, and in order to meet purpose and objectives of community design standards to achieve pleasant environments for living and ensure all public facilities are adequate to serve the development, as described in TDC 33.020.

### II. ACTION

The Architectural Review Board Decision approves AR 22-0008 and adopted the staff analysis and findings, dated November 30, 2022, with the following Conditions of Approval:

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#### GENERAL:

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- A1. This Architectural Review approval shall expire after two years unless a building, or grading permit submitted in conjunction with a building permit application, has been issued and substantial construction pursuant thereto has taken place and an inspection performed by a member of the Building Division, or an extension is granted under TDC 33.020(10).

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#### PRIOR TO EROSION CONTROL, PUBLIC WORKS, AND WATER QUALITY PERMIT ISSUANCE:

---

**Submit to [eTrakit](#) for review and approval:**

- A2. The applicant must apply for applicable Engineering Erosion Control, Water Quality, and Public Works permits:
  - a. Apply using [eTrakit](#). With the initial Engineering permit(s) application(s) include:

- i. One combined set of 24"x36" plans including all applicable Engineering permits attached to one Engineering permit. Include a note on other Engineering permits stating which application includes the set; and,
  - ii. Payment for an Erosion Control permit fee per the [fee schedule](#); and,
  - iii. Engineering estimate and deposit for each Water Quality or Public Works permit per the [fee schedule](#); and,
- b. Deliver two 24"x36" hard copies of the combined Engineering permit plan sets to:

**City of Tualatin**  
**Attn: Engineering Division c/o Principal Engineer**  
**10699 SW Herman Road**  
**Tualatin, OR 97062**

- A3. The applicant must submit Final Street Improvement Plans for SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street adjacent to the lot in accordance with applicable sections of Tualatin Development Code (TDC) 74 and 75 and Public Works Construction Code (PWCC) that show:
- a. Dedication of half-street right-of-way from centerline totaling:
    - i. 25 feet for SW Avery Street; and,
    - ii. 38 feet for SW Martinazzi Avenue; and,
    - iii. 37 feet for SW Sagert Street; and,
  - b. Any additional dedication needed for SW Avery Street and SW Martinazzi Avenue and construction:
    - i. On the north side of SW Avery Street to the Shaniko Greenway Trail:
      1. A 4-foot-wide planter strip; and,
      2. Street trees; and,
      3. Widened to accommodate any required LIDA street swales for public stormwater to meet current CWS requirements; and,
      4. A 5-foot-wide public sidewalk; and,
      5. Street lighting improvements as necessary to meet Tualatin standards.
    - ii. Ramps at the northeast corner of the intersection of SW Avery Street and SW Martinazzi Avenue; and,
  - c. Ramp replacement at the intersection of SW Avery Street and SW Martinazzi:
    - i. For the northeast and southeast corners crossing the east side of the intersection; and,
    - ii. For the northwest and northeast corners crossing the north side of the intersection with curb extensions; and,
  - d. Continental striping of all four crosswalks of the intersection of SW Avery Street and SW Martinazzi Avenue.
  - e. SW Martinazzi Avenue on the east side including:
    - i. Preferred half-street improvements including on-street parallel parking along Martinazzi. This section may be adjusted as necessary (as determined by the City Engineer) to preserve existing large mature trees; and,
    - ii. Street lighting improvements as necessary to meet City Engineer standards including PGE's Option A.
    - iii. A planter strip with street trees:
      6. With a minimum 6-foot width where possible; and,



7. Widened to preserve street and private trees or accommodate any required LIDA street swales for public stormwater to meet current CWS requirements; and,
        - iv. A 6-foot-wide sidewalk meandered as needed for topography, tree preservation, and to match the planter strip; and,
      - f. SW Sagert Street with:
        - i. Preferred half-street improvements including a center turn lane extending from the existing center turn lane (near the western edge of the property) east serving the Alden driveway and tapering to meet the existing SW Sagert Street structure at ODOT's bridge over I-5 at the eastern edge of the subject property. and,
        - ii. Street lighting improvements as necessary to meet City Engineer standards including PGE's Option A.
        - iii. A planter strip with street trees adjacent to locations of adequate lengths new or replaced sidewalk as determined by the City Engineer:
          8. With a minimum 6-foot width where possible; and,
          9. Widened to preserve existing mature trees, match existing topography, or accommodate any required LIDA street swales for public stormwater to meet current CWS requirements; and,
        - iv. A 6-foot-wide sidewalk extended as far east towards the bridge as possible; and,
      - g. An 8-foot-wide public utility easement and any required slope easement, or existing equivalent approved by the City Engineer, adjacent to SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street including:
        - i. Five feet of public utility easement surrounding water meter, backflow protection, and fire vault; and,
        - ii. Any proposed private retaining walls must be outside of public utility and slope easements; and,
        - iii. The City Engineer may allow existing right-of-way in excess of the Preferred half-street to equivalently reduce the required easement width; and,
      - h. Bring into compliance of ADA standards:
        - i. All public sidewalks adjacent to the lot; and,
        - ii. Driveways serving the lot; and,
        - iii. All ramps adjacent to the lot including receiving ramps at the northwest and southeast corner at the intersection of SW Avery Street and SW Martinazzi Avenue.
- A4. The applicant must submit Final Water System Plans in accordance with Tualatin Development Code (TDC) 74.610, Tualatin Municipal Code (TMC) 3-3, and Public Works Construction Code (PWCC) that show:
  - a. Separate laterals for domestic and fire services; and,
  - b. A gate valve at the main for both domestic and fire service laterals; and
  - c. Adjacent to public right-of-way:
    - i. Reduced pressure backflow prevention for the domestic lateral; and,
    - ii. Water meter(s) behind the curb within the planter strip, and
    - iii. If within final plans, irrigation after a domestic meter and reduced pressure backflow device; and,
    - iv. Fire vault(s) surrounded by a five foot public utility easement.
- A5. The applicant must submit Final Sanitary Sewer System Plans in accordance with Tualatin Development Code (TDC) 74.620, Tualatin Municipal Code (TMC) 3-2, and

Public Works Construction Code (PWCC) that show location of the lines, grade, materials, and other details including cleanout at right-of-way.

A6. The applicant must submit:

- a. Proof from DEQ of approval of construction of the Underground Infiltration Facility or accommodation of associated stormwater infiltration volume within detention facilities approvable under City of Tualatin codes and Clean Water Services' Design and Construction Standards; and,
- b. Final Stormwater System Calculations and Plans in accordance with Tualatin Development Code (TDC) 74.630 and 74.650, Tualatin Municipal Code (TMC) 3-5-200 through 3-5-430, Public Works Construction Code (PWCC), and Clean Water Services' (CWS) Design & Construction Standards (D&CS) Chapter 4 stamped by an Oregon registered, professional engineer in accordance with TMC 3-5-390(1) that:
  - i. Provide a downstream analysis, including but not limited to erosion, and include solutions within final plans for ¼ mile downstream from the release from the private development through the public stormwater system, in accordance with TMC 3-5-210(4); and,
  - ii. Accommodate up to a 25-year storm event within the City of Tualatin's public stormwater system with a maximum capacity of 82% for Tualatin's lines in accordance with TDC 74.640, CWS D&CS 5.05.2.d, and the City Engineer; and,
  - iii. Evaluate the 100-year check storm for any release directly or indirectly to ODOT's stormwater system in accordance with the ODOT Hydraulics Manual; and
  - iv. Address runoff from all new and modified private and public impervious areas; and,
  - v. Prove gravity flow five feet from the outside of the established line of the building to the public stormwater system or as otherwise approved by the City Engineer, in accordance with CWS D&CS 1.03.39 and 5.09.3(a) (1) and (4); and,
  - vi. Discharge to an approved public system; and,
  - vii. Treat new and modified impervious areas in accordance with CWS D&CS 4.08.1.d meeting phosphorous removal in accordance with TMC 3-5-350 per the design storm in accordance with TMC 3-5-360 and CWS D&CS 4.08.2; and,
  - viii. Prove infiltration rates in accordance with CWS D&CS 4.08.03; and,
  - ix. Detain as required for conveyance with the City of Tualatin's stormwater system and up to the 50-year storm event for release to ODOT's stormwater system in accordance with the ODOT Hydraulics Manual, TMC 3-5-220, TMC 3-5-230, and CWS D&CS 4.08; and,
  - x. Accommodate hydromodification including post-development runoff rates not exceeding pre-development runoff rates for ½ the 2-year storm event and the 5-year and 10-year storm events for proposed new and modified impervious areas in accordance with CWS D&CS 4.03.5; and,
  - xi. In accordance with TDC 74.650(2) and CWS D&CS 3.01.2(d), comply with:
    1. The submitted Clean Water Services' Service Provider Letter CWS File Number dated July 19, 2022 conditions to obtain a Stormwater Connection Permit Authorization Letter, and,

2. Requirements stated within the Clean Water Services' Memorandum dated November 10, 2022; and,
  - c. Financial assurance for construction performance in accordance with TMC 3-390(3), PWCC 102.14.00, and amount per CWS D&CS 2.07 Table 2-1; and,
  - d. A copy of the recorded private stormwater maintenance agreement in accordance with TMD 3-5-390(4). The agreement must assure the owner as responsible for maintenance of the constructed portions of private stormwater systems within their lot. The identified system must include all conveyance, detention, hydromodification, and treatment.
- A7. The applicant must submit Final Erosion Control Plans in accordance with Tualatin Development Code (TDC) 74.640, Tualatin Municipal Code (TMC) 3-5-050 and 3-5-060, Public Works Construction Code (PWCC), and Clean Water Services' (CWS) Design & Construction Standards (D&CS) Chapters 2 and 6 that:
  - a. Minimize the impact of stormwater from the development to adjacent properties; and,
  - b. Are sufficient to obtain a National Pollution Discharge Elimination System (NPDES) 1200-CN Stormwater Discharge Permit from Clean Water Services as an agent of Oregon Department of Environmental Quality if disturbance is between 1 and 5 acres.

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**PRIOR TO BUILDING PERMIT ISSUANCE:**

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- A8. The applicant must submit copies of recorded deeds of right-of-way dedication along with public utility and slope easements, as approved by the City Engineer, in accordance with Tualatin Development Code (TDC) 74.210 and 74.330 which show:
  - a. Right-of-way dedication including:
    - i. A half-street from centerline for a total of:
      1. 25 feet for SW Avery Street; and,
      2. 38 feet for SW Martinazzi Avenue; and,
      3. 37 feet for SW Sagert Street; and,
    - ii. Any additional at the intersection of SW Avery Street and SW Martinazzi Avenue to construct a 5-foot-wide public sidewalk and 4-foot-wide planter strip along with ramps at the northeast corner of the intersection; and,
    - iii. Any additional to accommodate and any final public street improvements or stormwater LIDA facilities; and,
  - b. 8-foot-wide public utility and any necessary slope easements, adjacent to SW Avery Street, SW Martinazzi Avenue, and SW Sagert Street including:
    - i. A 10-foot-wide public utility easement centered on any water lateral extending onsite past the public utility easement adjacent to right-of-way; and,
    - ii. Five feet of public utility easement surrounding water meters, backflow protection, and fire vaults; and
    - iii. Reduced width of easements from standard due to existing right-of-way in excess of the Preferred half-street width as determined by the City Engineer; and,
- A9. The applicant must obtain:
  - a. A National Pollution Discharge Elimination System (NPDES) 1200-CN Stormwater Discharge Permit from Clean Water Services as an agent of Oregon Department of Environmental Quality, and,
  - b. ODOT Miscellaneous Permit
  - c. Erosion Control, Public Works, and Water Quality Permits from the City of Tualatin.
- A10. The applicant must submit a Final Site Plan Set (in PDF format) to the Planning Division that is in substantial conformance to the submitted site plans and includes:

- a. Tree Preservation Plan that corresponds to the Tree Assessment Report (submitted as Exhibit A3) that is drawn to scale that includes the location of all trees proposed for removal and preservation that are eight inches or more in diameter, all existing and proposed structures, all existing and proposed public and private improvements, and all existing public and private easements in accordance with TDC 33.110(4)(a).
- b. Private outdoor areas of 80 square feet or greater attached to each ground level unit, consistent with TDC 73A.200(1).
- c. Balcony areas of 48 square feet or greater provided for each above-ground unit, consistent with TDC 73A.200(2).
- d. Entry areas of 24 square feet or greater provided for each unit, or a minimum combined area of 1,392 square feet or greater for each multi-family building, consistent with TDC 73A.200(3).
- e. Shared outdoor area of 72,000 square feet or greater with features consistent with TDC 73A.200(4).
- f. Children's play area of 36,000 square feet or greater with design features consistent with TDC 73A.200(5).
- g. Storage areas for each unit that are a minimum of: 36 square feet for two-bedroom units, and 48 square feet for three-bedroom or greater units, consistent with TDC 73A.200(6).
- h. Walkways that are a minimum of 6 feet in width; constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete; and meet ADA standards at time of construction, consistent with TDC 73A.200(7).
- i. An accessway that is a minimum 8 feet in width; constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete; meets ADA standards at time of construction; and connects the private on-site walkways to the public sidewalk or multiuse path on Boones Ferry Road, consistent with TDC 73A.200(7). The width may be reduced, as needed to accommodate right-of-way improvements and/or constraints, subject to approval by the City Engineer.
- j. The applicant shall provide detailed information including materials and colors proposed for the carports in compliance with TDC 73A.200(9).
- k. The applicant or property owner must submit scaled elevations illustrating that demonstrates compliance with TDC 73A.200(11).
- l. Trees identified for retention in Tree Assessment Report (Exhibit A3) must be identified on the grading plan, consistent with TDC 73B.080(3) and reflect the applicants Arborist report recommendations. Tree protection fencing and other preservation measures recommended by the Arborist should also be specified on the grading plan.
- m. The applicant shall provide and irrigation plan in compliance with 73B.080(5).
- n. The applicant must provide information that demonstrates compliance with site lighting requirements of TDC 73A.200(10)(b) and parking lot landscaping requirements of TDC 73C.020(11).
- o. Parking space dimensional information conforming to TDC Appendix B Figure 73-1 must be provided.



- p. Where bicycle parking spaces are not located within a garage of a dwelling unit, the applicant must provide information that demonstrates compliance with 73.050 (2).
- q. The applicant shall provide additional information that demonstrates the abutting sidewalk to the existing driveways are at least 6-feet in width in compliance with TDC 73C.130 (c).
- r. The applicant shall provide landscaping plans that illustrate clear vision requirements of TDC 73C.210 (2) are met.

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**DURING CONSTRUCTION ACTIVITY:**

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- A11. The applicant must install the tree protection fencing consistent with the Tree Assessment Report submitted as Exhibit A3 and Section 73B.080(3). Please contact the Planning Division to schedule an inspection with a minimum of 48 hours' notice. Where site conditions make grading or other similar encroachment upon a preserved tree's drip-line area, such grading or similar encroachment must only be permitted under the direction of a qualified arborist.

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**PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY AND/OR CERTIFICATE OF COMPLETION:**

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- A12. The applicant must complete all the private stormwater and public improvements as shown on the approved permit plans. All improvements must also be accepted by the City in accordance with Tualatin Development Code (TDC) 74.120.
- A13. The applicant must submit paper and electronic as-builts of the Engineering permits along with maintenance bonds and any final fees for public and water quality improvements.
- A14. The applicant shall provide information that demonstrates compliance with TDC 73A.200 (10).
- A15. Areas impacted by grading and all areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped, pursuant to TDC 73B.030(1).
- A16. Areas impacted by grading and all areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped, pursuant to TDC 73B.030(1).
- A17. The applicant shall provide information that demonstrates compliance with parking lot design standards and construct any required improvements per TDC 73C.020.
- A18. The applicant shall provide information that demonstrates the entire development meets the parking requirements 73C.100.
- A19. No vehicular parking, hedge, planting, fence, wall structure, or temporary/permanent physical obstruction is permitted between 30 inches and eight feet above the established height of the curb in the vision clearance area specified in TDC Figure 73-2 (Exhibit G).
- A20. The applicant shall follow the method of waste and recycling storage and pickup as described in the letter dated September 2, 2022 from Republic Services.

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**THE FOLLOWING ITEMS APPLY TO THE SITE IN AN ON-GOING MANNER:**

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- A21. All mechanical equipment must be screened in accordance with TDC 73A.200(11)(c). Prior to approval of a mechanical permit, the applicant or property owner must submit scaled elevations illustrating that above-grade or on-grade equipment will be screened by parapet, sight-obscuring fence, landscaping, or other method.
- A22. All sign permits require separate sign permit approval per TDC Chapter 38. This approval does not constitute sign permit approval.
- A23. All site, building exterior, and landscaping improvements approved through the AR process must be continually maintained, so as to remain substantially similar to original approval through the AR process, except as permitted under TDC 33.020(7) (Modifications to Previously Approved Final Architectural Review Decisions).
- A24. All parking spaces shall be continuously maintained in compliance with the dimensional standards specified in TDC Figure 73-1 (Exhibit F).
- A25. No vehicular parking, hedge, planting, fence, wall structure, or temporary/permanent physical obstruction is permitted between 30 inches and eight feet above the established height of the curb in the vision clearance area specified in TDC Figure 73-2 (Exhibit G).

### III.APPEAL

The applicant or any person who submitted written comments or testified orally or in writing at the Tualatin Architectural Review Board hearing and who may be adversely affected by the Board's decision may file a request for review of the final decision of the Tualatin Architectural Review Board to the City Council.

The Tualatin Architectural Review Board's decision will be final after 14 calendar days from the mailing of this order, unless a written appeal is received by the **Tualatin Planning Division at 10699 SW Herman Road, Tualatin, Oregon, before 5:00 p.m., November \_\_, 2022. The appeal must be submitted on the City appeal form with all the information requested provided thereon, signed by the appellant, and include the applicable appeal fee.** The plans and appeal forms are available at the Planning Division offices. The appeal forms must include reasons, current appeal fee, and meet the requirements of Section 32.310 of the Tualatin Development Code. The City Council will review and make a decision. The parties will be notified of the Council meeting date.

ADOPTED THIS \_\_\_\_ DAY OF November.

ARCHITECTURAL REVIEW BOARD  
CITY OF TUALATIN

BY: \_\_\_\_\_  
Nancy Grimes, Acting Chair  
Architectural Review Board



**TO:** Architectural Review Board

**THROUGH:** Steve Koper, AICP, Assistant Community Development Director

**FROM:** Erin Engman, Senior Planner

**DATE:** November 30, 2022

---

**SUBJECT:**

Consideration of an Architectural Review application (AR 22-0006) requesting approval of a 120,000 square foot office building development on a 58 acre campus in the Manufacturing Park (MP) zone at 11155 SW Leveton Drive. (Tax Lots: 2S122AA 00500, 00800 and 2S122AB 00100).

**RECOMMENDATION:**

Based on the analysis and findings, as well as the application materials demonstrating compliance with the applicable review criteria, staff respectfully recommends approval of the subject Architectural Review application (AR 22-0006), subject to the recommended conditions of approval in the attached written order.

**EXECUTIVE SUMMARY:**

- The subject proposal is a Type III land use case, subject to a quasi-judicial hearing before the Architectural Review Board.
- The subject site is comprised of three parcels that total 58 acres of land in the Manufacturing Park zone, located on SW Leveton Drive, west of 108<sup>th</sup> Avenue, and south of SW Tualatin Road. The land is currently occupied by Lam Research Corporation and is improved with five buildings and associated parking.
- The applicant requests approval to construct a four-story, 120,000 square foot office building, two new access drives off of SW 108<sup>th</sup>, and parking lot expansions by approximately 549 stalls. The applicant has also submitted a tree removal permit for 80 trees to construct the improvements.
- The proposed development was granted an industrial master plan through IMP 22-0001 that established appropriate building materials and colors, modified setback standards, and modified parking lot landscaping standards for the south half of the site (Exhibit D).
- There are existing City utilities that will adequately serve the site.
- Two public comments were received (Exhibit F) which inquired about the existing street trees and screening along SW Tualatin Road. The subject application is not seeking to modify any site frontage along SW Tualatin Road.

**OUTCOMES OF DECISION:**

Approval of AR 22-0006 will facilitate construction of the proposed development.

**ALTERNATIVES TO RECOMMENDATION:**

The Architectural Review Board may alternatively:

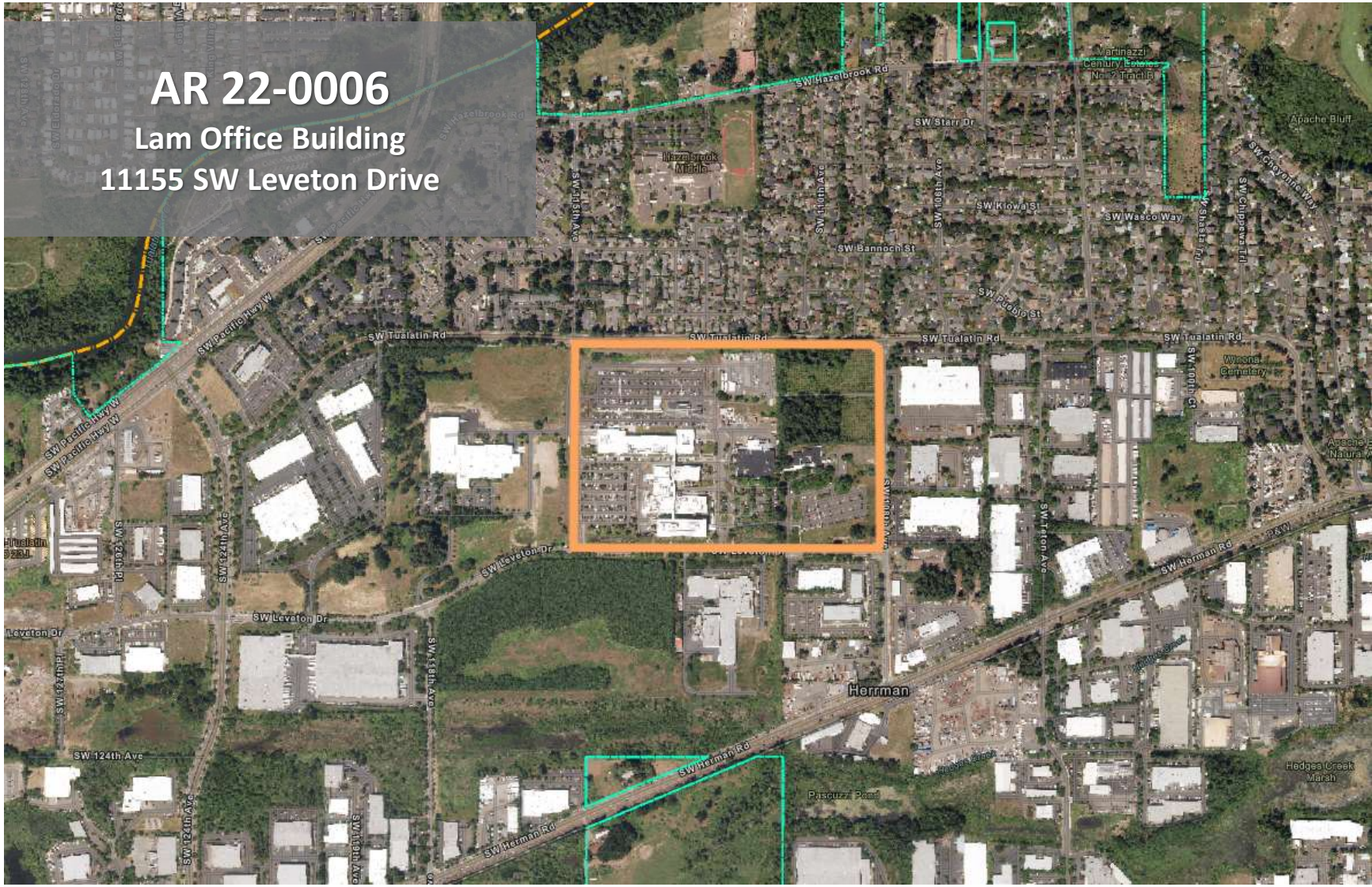
- Approve AR 22-0006 with amended conditions of approval and direct staff to provide updated Analysis and Findings;
  - Continue the hearing to a later date for further consideration; or
  - Deny AR 22-0006.
- 

**ATTACHMENTS:**

- Attachment A – Presentation
- Attachment B - Analysis and Findings
  - Exhibit A1 - Narrative
  - Exhibit A2 – Plan Set and Elevations
  - Exhibit A3 – Tree Assessment Report
  - Exhibit A4 – Transportation Impact Analysis
  - Exhibit A5 – Preliminary Stormwater Report
  - Exhibit A6 – Supporting Documents
  - Exhibit B – Public Noticing Requirements
  - Exhibit C – Clean Water Services Memorandum
  - Exhibit D – IMP 22-0001 Written Order
  - Exhibit E – Water System Capacity Analysis
  - Exhibit F – Public Comment
  - Exhibit G – Map 8-5 Transit Plan
  - Exhibit H – TDC Figure 73-1
  - Exhibit I – TDC Figure 73-2
  - Exhibit J – Map 8-1
- Attachment C - Written Order



**AR 22-0006**  
**Lam Office Building**  
**11155 SW Leveton Drive**



**AR 22-0006**  
**Lam Office Building**

**ARCHITECTURAL REVIEW BOARD**  
**November 30, 2022**



# Tonight's Presentation

1. Site Background
2. Past Decision: IMP 22-0001
3. Project Overview
4. Applicable Criteria
5. Conclusion





# Site Background



AR 22-0006  
Lam Office Building

ARCHITECTURAL REVIEW BOARD  
November 30, 2022



# Past Decision

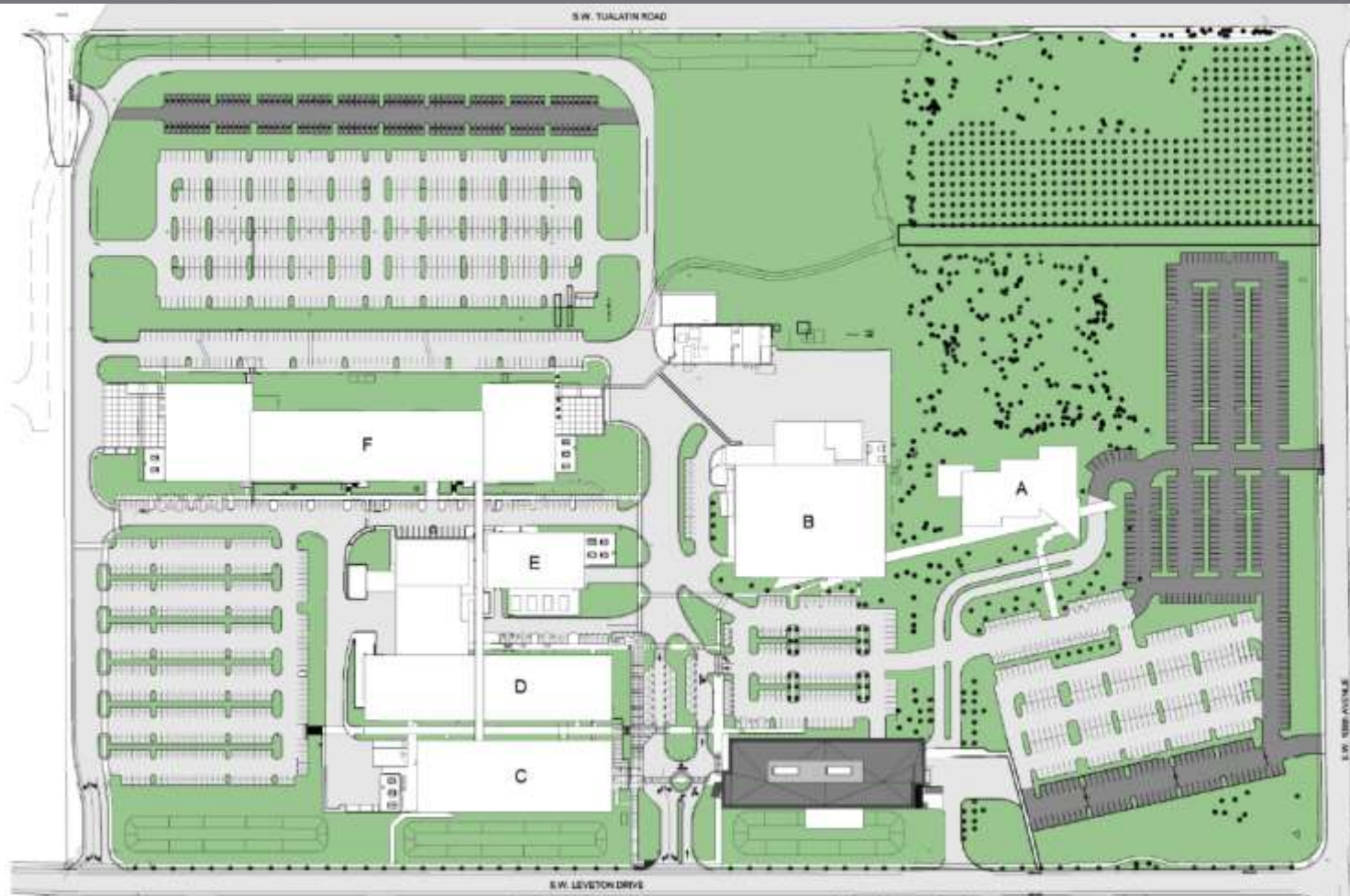
## **IMP 22-001 Approved:**

- Established appropriate building materials and colors;
- Modified setback standards; and
- Modified parking lot landscaping standards for the south half of the site





# Project Overview



AR 22-0006  
Lam Office Building

ARCHITECTURAL REVIEW BOARD  
November 30, 2022



# Procedures (TDC 32.230)

## **Type III Architectural Review:**

- Application submitted – August 17, 2022
- Forced complete – September 15, 2022
- Notice of Hearing sent – October 28, 2022
- Public hearing – November 30, 2022
- Final decision required – January 13, 2023



# Architectural Review (TDC 33.020)

## **Architectural Review for Large Commercial Developments:**

Approval criteria listed in Chapter 73A through 73G, including:

- Site Design Standards
- Landscaping Standards
- Parking Standards
- Waste & Recyclable Management Standards

**Conditions of Approval:** may implement identified public facilities and services needed to serve the proposed development through Chapters 74 and 75.

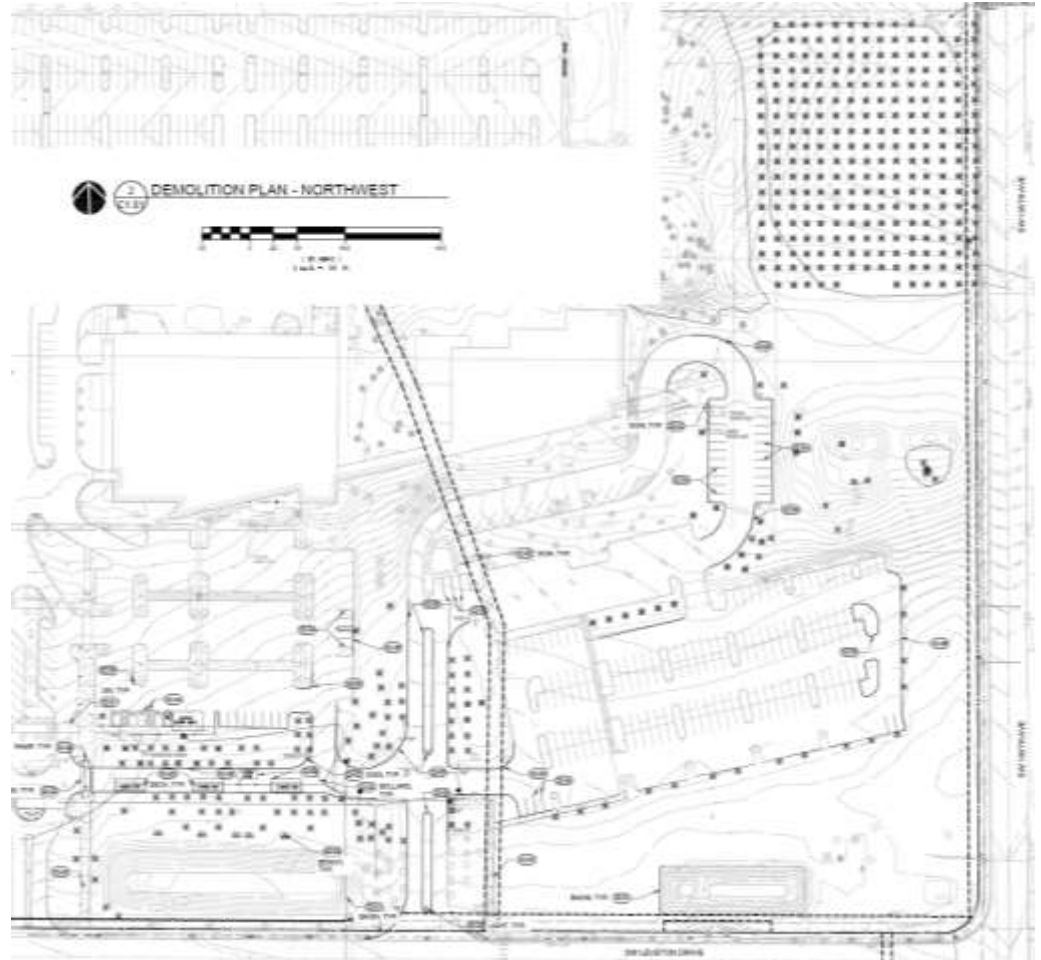


# Tree Removal (TDC 33.110)

**The application includes tree removal:**

Approval Criteria

- The tree is diseased;
- The tree is a hazard;
- Necessary to remove tree to construct proposed improvements



AR 22-0006  
Lam Office Building

ARCHITECTURAL REVIEW BOARD  
November 30, 2022





# MP Zone (TDC 62) & IMP 22-0001

## The proposal complies with zoning:

- Setbacks
- Building height
- Permitted uses

\* IMP 22-0001

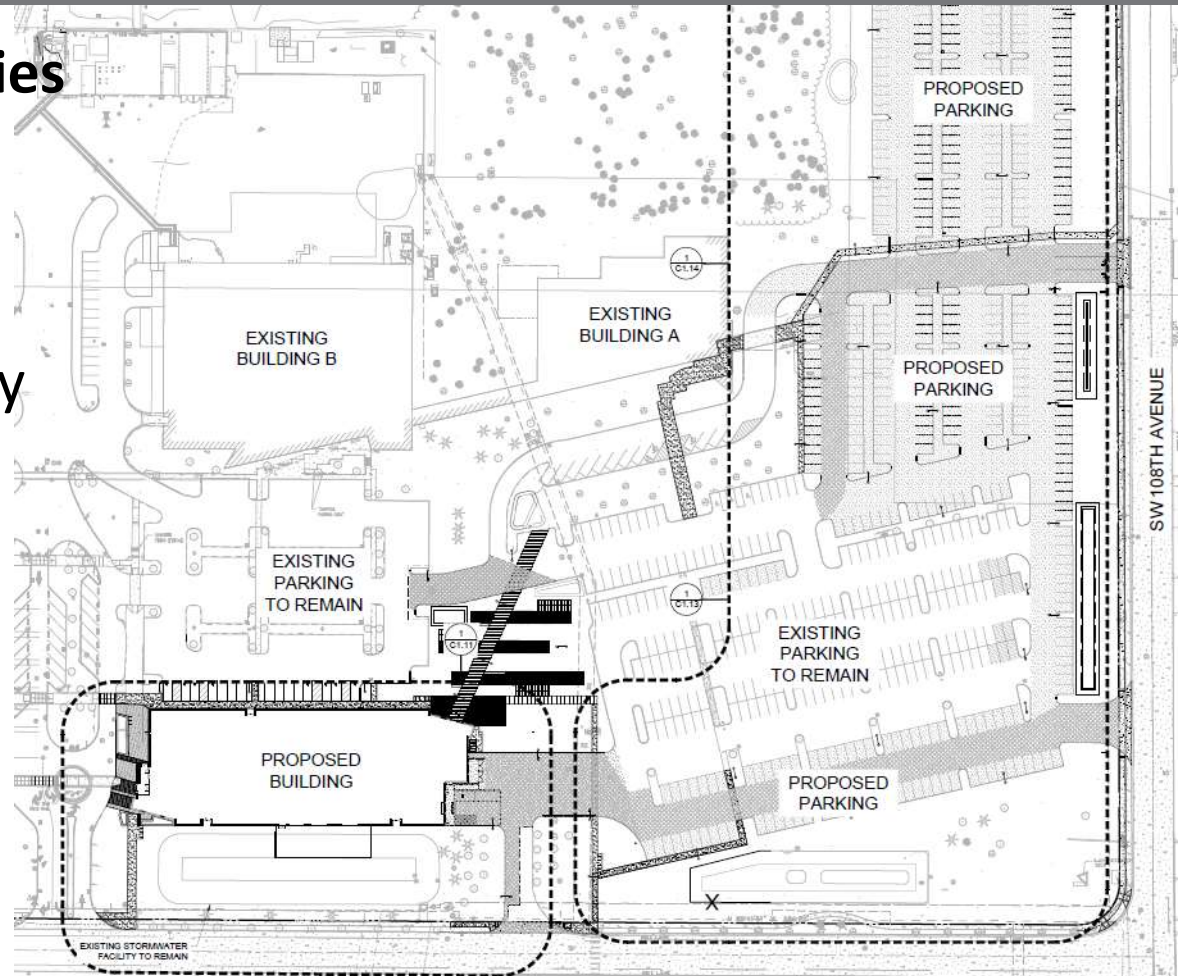
USE CATEGORY	STATUS	
Office	Accessory to a permitted industrial use	
STANDARD	REQUIREMENT	PROPOSAL
<b>Building Setbacks:</b>		
<i>Leveton Drive</i>	68 ft*	89 ft
<i>Side/Rear</i>	0 ft*	56 ft
<b>Parking and Circulation Setbacks:</b>		
<i>Leveton Drive</i>	50 ft	58 ft
<i>108<sup>th</sup> Avenue</i>	43 ft*	43 ft
<i>Tualatin Road</i>	35 ft*	107 ft
<b>Building Height:</b>	70 ft	67 ft



# Site Design (TDC 73A)

The proposal complies with requirements for:

- Walkways
- Safety and Security
- Service, Delivery, and Screening



AR 22-0006  
Lam Office Building

ARCHITECTURAL REVIEW BOARD  
November 30, 2022



# Building Design (TDC 73A)



AR 22-0006  
Lam Office Building

ARCHITECTURAL REVIEW BOARD  
November 30, 2022





# Building Design (TDC 73A)



AR 22-0006  
Lam Office Building

ARCHITECTURAL REVIEW BOARD  
November 30, 2022

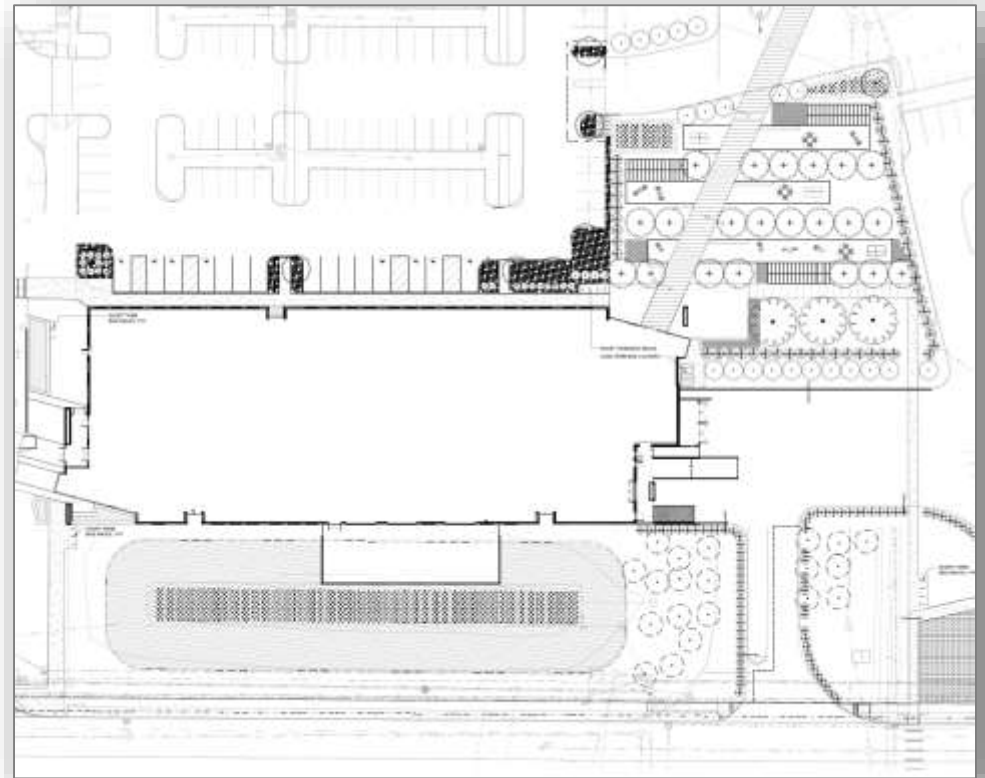




# Landscaping Standards (TDC 73B)

**The application demonstrates the proposal complies with requirements for:**

- 25% of development area
- Building perimeter
- Tree preservation/revegetation
- Minimum standards for plantings
- Irrigation





# Parking Standards (TDC 73C)

**With conditions the application complies with requirements for:**

- Minimum stall requirements
- Bike parking
- Vanpool / Carpool
- Dimensional Requirements

USE	MINIMUM VEHICLE PARKING	BIKE PARKING	COVERED BIKE PARKING
Office supporting manufacturing	1.60 spaces / 1,000 SF of GFA	0.10 spaces / 1,000 GFA	First 5
<b>REQUIRED</b>	192	12	5
<b>PROVIDED</b>	<b>549</b>	<b>12</b>	<b>5</b>



# Parking Lot Landscaping (TDC 73C)

**With conditions the application complies with requirements for:**

- Minimum landscape square footage
- Island separation every 8 stalls for north lots
- Island separation every 12 stalls for south lots\*

\* *Under IMP 22-0001*



AR 22-0006  
Lam Office Building

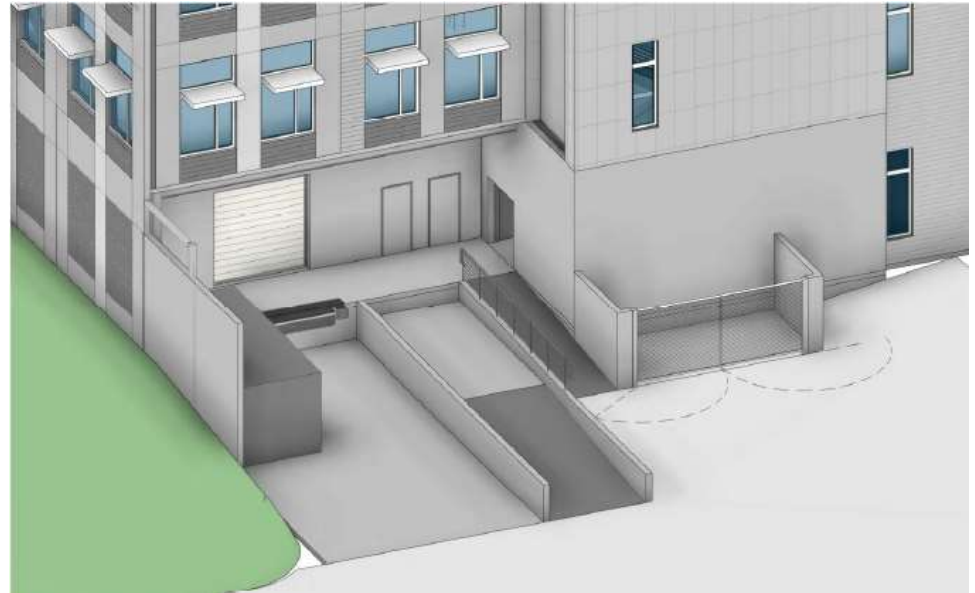
ARCHITECTURAL REVIEW BOARD  
November 30, 2022



# Loading Standards (TDC 73C)

**With conditions, the proposal complies with TDC 73C.120(1):**

- Three loading facilities: 12 feet x 35 feet; or
- Evidence that adequate loading facilities exist on the same parcel









# Public Improvements (TDC 74)

**With conditions, the proposal complies with public improvement standards:**

- Right-of-Way and Easement Dedication
- Street Improvements
- Utilities: Water, Sanitary Sewer, Storm Sewer
- Stormwater: Water Quality Detention Facility
- Grading and Erosion Control





# Conclusion

- The findings demonstrate that the proposal meets the applicable criteria of the Tualatin Development Code with the recommended Conditions of Approval.
- Therefore, staff respectfully recommends approval of the subject Architectural Review application (AR 22-0006), as conditioned.
- Questions?





## ANALYSIS AND FINDINGS LAM RESEARCH CAMPUS

**ARB Hearing: November 30, 2022**  
*Republished: November 30, 2022*

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Case #:	AR 22-0006
Project:	Lam Research Corporation Campus
Location:	11155-11361 SW Leveton Drive; Tax Lots: 2S122AA 500 and 800; 2S122AB 100
Representative:	Suzannah Stanley, Mackenzie
Owner:	Lam Research Corporation

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*Arrangements can be made to provide these materials in alternative formats such as large type or audio recording. Please contact the Planning Division at 503.691.3026 and allow as much lead time as possible.*

## I. INTRODUCTION

### A. Applicable Criteria

The following Chapters of the Tualatin Development Code (TDC) are applicable to the subject proposal:

- TDC 33.020: Architectural Review
- TDC 33.050: Industrial Master Plan
- TDC 33.110: Tree Removal Permit/Review
- TDC 62: Manufacturing Park (MP) Zone
- TDC 73A: Site Design Standards
- TDC 73B: Landscaping Standards
- TDC 73C: Parking Standards
- TDC 73D: Waste and Recyclables Management Standards
- TDC 74: Public Improvements
- TDC 75: Access

### B. Site Description

The subject site is a 58 acre campus located at 11155 SW Leveton Drive (Washington County Tax Lots: 2S122AA 500 and 800; 2S122AB 100), and is zoned Manufacturing Park (MP).

The site currently consists of three lots, five buildings, and associated parking. This property is located in the former Leveton Taxing District; north of SW Leveton Drive, west of SW 108th Avenue, and south of SW Tualatin Road. The land reaches a high point of 188 feet in elevation in the northwest corner and slopes down to a low point of 146 feet near the southern end of the property.

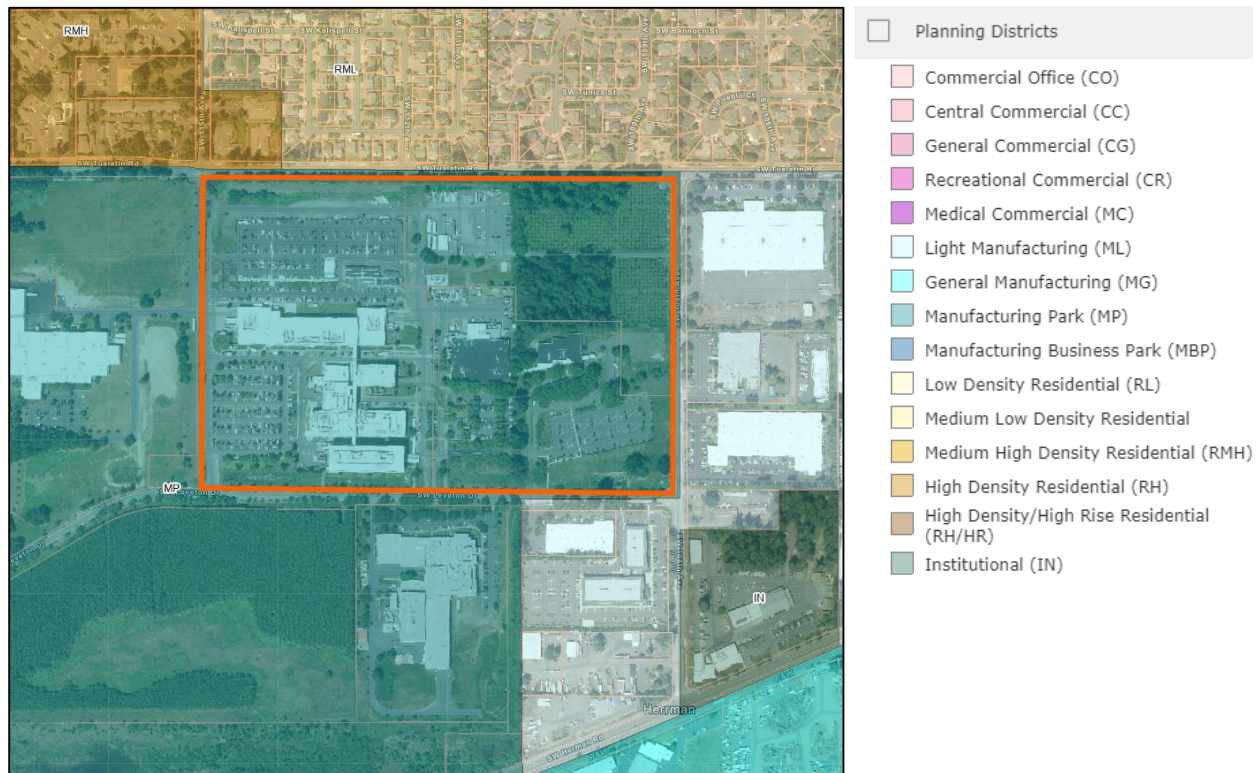
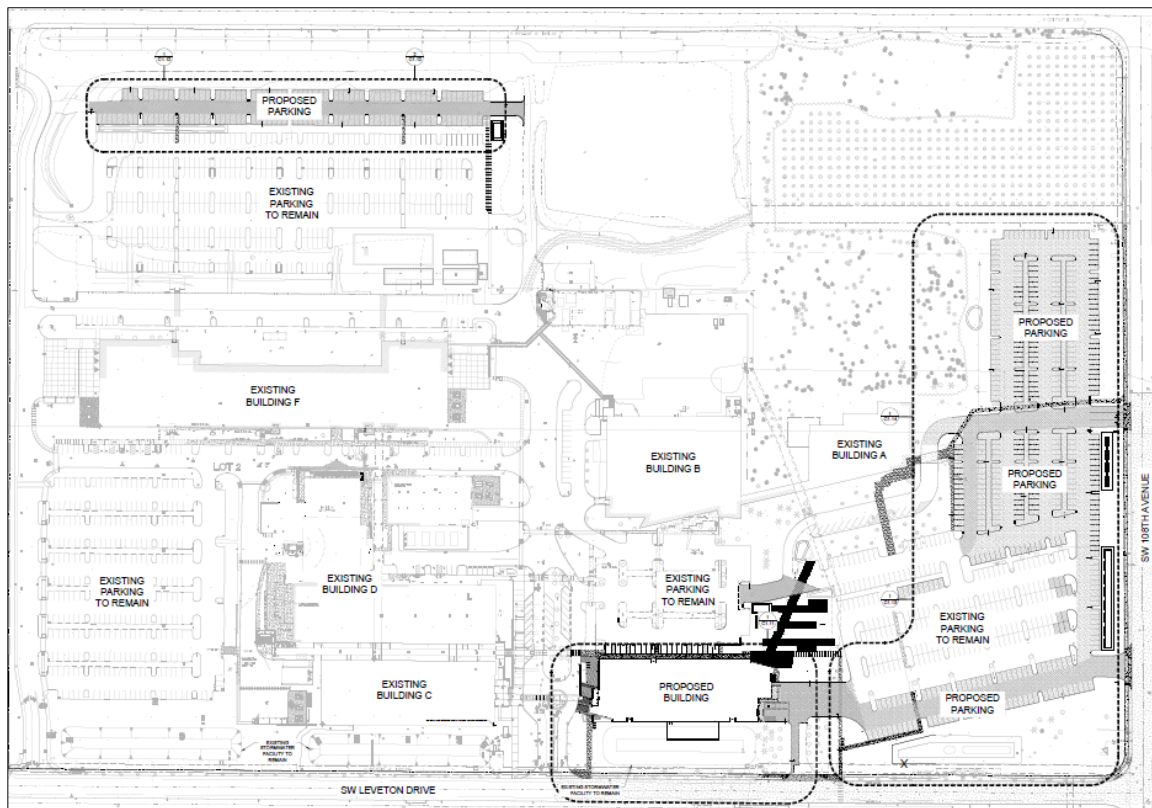


Figure 1: Aerial view of subject site (highlighted)

### C. Proposed Project

As described in the applicant’s narrative (Exhibit A1), Lam Research Corporation proposes to construct a four-story, 120,000 square foot office building sited on the south end of the campus and east of the main entrance. The new building will be connected to existing Building C by a skybridge. The scope also includes an expansion of parking areas located on the northwest and eastern portions of the overall site. The new eastern parking area is proposed to be served by two access drives located off of SW 108th Avenue. The applicant also proposes to convert the east access on SW Leveton Drive to a truck-only access with appropriate signage. The campus development was granted modified development standards for building setbacks and parking and circulation setbacks through IMP 22-0001 (Exhibit D).

Figure 2: Site Plan (overview)



### D. Previous Land Use Actions

- IMP 22-0001 – Modifications to Setback Standards
- AR 20-0001 – Lam Building D Addition
- AR 16-0010 – Lam Campus Parking Master Plan
- PLA 16-006 – Property Line Adjustment
- AR 15-0029 – Building D Expansion
- PAR 00-04 – Partition
- AR 00-03 – Novellus Phase 1
- IMP 00-01 – Novellus
- AR 89-24 – Oki Semiconductor

### **E. Surrounding Uses**

Surrounding areas indicate a transitional area including industrial and residential use. Adjacent land uses include:

North: Residential Medium-Low Density (RML)

- SW Tualatin Road
- Fox Run Subdivision

South: Manufacturing Park (MP)

- SW Leveton Drive
- Fujimi Corporation

West: Manufacturing Park (MP)

- JAE Corporation
- Vacant land (Phight LLC)

East: Light Manufacturing (ML)

- SW 108<sup>th</sup> Avenue
- Ascentec Engineering LLC
- Olympus Controls

### **F. Exhibit List**

Exhibit A1 - Narrative

Exhibit A2 – Plan Set and Elevations

Exhibit A3 – Tree Assessment Report

Exhibit A4 – Transportation Impact Analysis

Exhibit A5 – Preliminary Stormwater Report

Exhibit A6 – Supporting Documents

Exhibit B – Public Noticing Requirements

Exhibit C – Clean Water Services Memorandum

Exhibit D – IMP 22-0001 Written Order

Exhibit E – Water System Capacity Analysis

Exhibit F – Public Comment

Exhibit G – Map 8-5 Transit Plan

Exhibit H – TDC Figure 73-1

Exhibit I – TDC Figure 73-2

Exhibit J – Map 8-1



## II. PLANNING FINDINGS

These findings reference the Tualatin Development Code (TDC), unless otherwise noted.

### Chapter 32: Procedures

#### Section 32.010 – Purpose and Applicability.

[...]

(2) **Applicability of Review Procedures.** All land use and development permit applications and decisions, will be made by using the procedures contained in this Chapter. The procedure “type” assigned to each application governs the decision-making process for that permit or application. There are five types of permit/application procedures as described in subsections (a) through (e) below. Table 32-1 lists the City’s land use and development applications and corresponding review procedure(s).

[...]

(c) **Type III Procedure (Quasi-Judicial Review – Public Hearing).** Type III procedure is used when the standards and criteria require discretion, interpretation, or policy or legal judgment. Quasi-Judicial decisions involve discretion but implement established policy. Type III decisions are made by the Planning Commission or Architectural Review Board and require public notice and a public hearing, with an opportunity for appeal to the City Council.

[...]

(3) **Determination of Review Type.** Unless specified in Table 32-1, the City Manager will determine whether a permit or application is processed as Type I, II, III, IV-A or IV-B based on the descriptions above. Questions regarding the appropriate procedure will be resolved in favor of the review type providing the widest notice and opportunity to participate. An applicant may choose to elevate a Type I or II application to a higher numbered review type, provided the applicant pays the appropriate fee for the selected review type.

Table 32-1 – Applications Types and Review Procedures

Application / Action	Type	Decision Body*	Appeal Body*	Pre-Application Conference Required	Neighborhood /Developer Mtg Required	Applicable Code Chapter
<b>Architectural Review</b>						
Commercial Buildings 50,000 square feet and larger	III	ARB	CC	Yes	Yes	TDC 33.020
[...]						
* City Council (CC); Planning Commission (PC); Architectural Review Board (ARB); City Manager or designee (CM); Land Use Board of Appeals (LUBA).						

#### **Finding:**

*The proposal is for a 120,000 square foot office building, and is therefore classified as a Type III Procedure Types according to Table 32-1. The application has been processed according to the applicable code for Type III procedures. This standard is met.*

#### Section 32.030 – Time to Process Applications.

(1) **Time Limit - 120-day Rule.** The City must take final action on all Type II, Type III, and Type IV-A land use applications, as provided by ORS 227.178, including resolution of all local appeals, within 120 days after the application has been deemed complete under TDC 32.160, unless the applicant provides

written request or consent to an extension in compliance with ORS 227.178. (Note: The 120-day rule does not apply to Type IV-B (Legislative Land Use) decisions.)  
[...]

**Finding:**

*The application was forced complete on September 15, 2022, and the hearing for AR 22-0006 is scheduled for November 30, 2022. Final action will take place by January 13, 2023 in compliance with ORS 227.178. This standard is met.*

**Section 32.110 – Pre-Application Conference.**

**(1) Purpose of Pre-Application Conferences.** Pre-application conferences are intended to familiarize applicants with the requirements of the TDC; to provide applicants with an opportunity discuss proposed projects in detail with City staff; and to identify approval criteria, standards, and procedures prior to filing a land use application. The pre-application conference is intended to be a tool to assist applicants in navigating the land use process, but is not intended to be an exhaustive review that identifies or resolves all potential issues, and does not bind or preclude the City from enforcing any applicable regulations or from applying regulations in a manner differently than may have been indicated at the time of the pre-application conference.

**(2) When Mandatory.** Pre-application conferences are mandatory for all land use actions identified as requiring a pre-application conference in Table 32-1. An applicant may voluntarily request a pre-application conference for any land use action even if it is not required.

**(3) Timing of Pre-Application Conference.** A pre-application conference must be held with City staff before an applicant submits an application and before an applicant conducts a Neighborhood/Developer meeting.

**(4) Application Requirements for Pre-Application Conference.**

**(a) Application Form.** Pre-application conference requests must be made on forms provided by the City Manager.

**(b) Submittal Requirements.** Pre-application conference requests must include:

**(i)** A completed application form;

**(ii)** Payment of the application fee;

**(iii)** The information required, if any, for the specific pre-application conference sought; and

**(iv)** Any additional information the applicant deems necessary to demonstrate the nature and scope of the proposal in sufficient detail to allow City staff to review and comment.

**(5) Scheduling of Pre-Application Conference.** Upon receipt of a complete application, the City Manager will schedule the pre-application conference. The City Manager will coordinate the involvement of city departments, as appropriate, in the pre-application conference. Pre-application conferences are not open to the general public.

**(6) Validity Period for Mandatory Pre-Application Conferences; Follow-Up Conferences.** A follow-up conference is required for those mandatory pre-application conferences that have previously been held when:

**(a)** An application relating to the proposed development that was the subject of the pre-application conference has not been submitted within six (6) months of the pre-application conference;

**(b)** The proposed use, layout, and/or design of the proposal have significantly changed; or

**(c)** The owner and/or developer of a project changes after the pre-application conference and prior to application submittal.

**Finding:**

*The subject land use action is identified as requiring a pre-application conference in Table 32-1. The applicant participated in a pre-application meeting on July 22, 2022, less than one month prior to submittal. These standards are met.*

**Section 32.120 – Neighborhood/Developer Meetings.**

**(1) Purpose.** The purpose of this meeting is to provide a means for the applicant and surrounding property owners to meet to review a development proposal and identify issues regarding the proposal so they can be considered prior to the application submittal. The meeting is intended to allow the developer and neighbors to share information and concerns regarding the project. The applicant may consider whether to incorporate solutions to these issues prior to application submittal.

**(2) When Mandatory.** Neighborhood/developer meetings are mandatory for all land use actions identified in Table 32-1 as requiring a neighborhood/developer meeting. An applicant may voluntarily conduct a neighborhood/developer meeting even if it is not required and may conduct more than one neighborhood/developer meeting at their election.

**(3) Timing.** A neighborhood/developer meeting must be held after a pre-application meeting with City staff, but before submittal of an application.

**(4) Time and Location.** Required neighborhood/developer meetings must be held within the city limits of the City of Tualatin at the following times:

(a) If scheduled on a weekday, the meeting must begin no earlier than 6:00 p.m.

(b) If scheduled on a weekend, the meeting must begin between 10:00 a.m. and 6:00 p.m.

**(5) Notice Requirements.**

(a) The applicant must provide notice of the meeting at least 14 calendar days and no more than 28 calendar days before the meeting. The notice must be by first class mail providing the date, time, and location of the meeting, as well as a brief description of the proposal and its location. The applicant must keep a copy of the notice to be submitted with their land use application.

(b) The applicant must mail notice of a neighborhood/developer meeting to the following persons:

(i) All property owners within 1,000 feet measured from the boundaries of the subject property;

(ii) All property owners within a platted residential subdivision that is located within 1,000 feet of the boundaries of the subject property. The notice area includes the entire subdivision and not just those lots within 1,000 feet. If the residential subdivision is one of two or more individually platted phases sharing a single subdivision name, the notice area need not include the additional phases; and

(iii) All designated representatives of recognized Citizen Involvement Organizations as established in TMC Chapter 11-9.

(c) The City will provide the applicant with labels for mailing for a fee.

(d) Failure of a property owner to receive notice does not invalidate the neighborhood/developer meeting proceedings.

**(6) Neighborhood/Developer Sign Posting Requirements.** The applicant must provide and post on the subject property, at least 14 calendar days before the meeting. The sign must conform to the design and placement standards established by the City for signs notifying the public of land use actions in TDC 32.150.

**(7) Neighborhood/Developer Meeting Requirements.** The applicant must have a sign-in sheet for all attendees to provide their name, address, telephone number, and email address and keep a copy of the sign-in sheet to provide with their land use application. The applicant must prepare meeting notes

identifying the persons attending, those commenting and the substance of the comments expressed, and the major points that were discussed. The applicant must keep a copy of the meeting notes for submittal with their land use application.

**Finding:**

*The applicant has provided evidence within Exhibit A3 that they held a Neighborhood/Developer meeting on August 16, 2022, one day prior to application submittal. The applicant has provided documentation of sign posting and notification in compliance with this section, as well as a sign-in sheet and notes from the meeting. These standards are met.*

**Section 32.130 – Initiation of Applications.**

**(1) Type I, Type II, Type III, and Type IV-A Applications. Type I, Type II, Type III, and Type IV-A applications may be submitted by one or more of the following persons:**

- (a) The owner of the subject property;**
- (b) The contract purchaser of the subject property, when the application is accompanied by proof of the purchaser's status as such and by the seller's written consent;**
- (c) A lessee in possession of the property, when the application is accompanied by the owners' written consent; or**
- (d) The agent of any of the foregoing, when the application is duly authorized in writing by a person authorized to submit an application by paragraphs (a), (b) or (c) of this subsection, and accompanied by proof of the agent's authority.**

[...]

**Finding:**

*The application has been signed by a representative of Lam Research Corporation, who is the owner of the subject property. This standard is met.*

**Section 32.140 – Application Submittal.**

**(1) Submittal Requirements. Land use applications must be submitted on forms provided by the City. A land use application may not be accepted in partial submittals. All information supplied on the application form and accompanying the application must be complete and correct as to the applicable facts. Unless otherwise specified, all of the following must be submitted to initiate completeness review under TDC 32.160:**

- (a) A completed application form. The application form must contain, at a minimum, the following information:**
  - (i) The names and addresses of the applicant(s), the owner(s) of the subject property, and any authorized representative(s) thereof;**
  - (ii) The address or location of the subject property and its assessor's map and tax lot number;**
  - (iii) The size of the subject property;**
  - (iv) The comprehensive plan designation and zoning of the subject property;**
  - (v) The type of application(s);**
  - (vi) A brief description of the proposal; and**
  - (vii) Signatures of the applicant(s), owner(s) of the subject property, and/or the duly authorized representative(s) thereof authorizing the filing of the application(s).**
- (b) A written statement addressing each applicable approval criterion and standard;**
- (c) Any additional information required under the TDC for the specific land use action sought;**
- (d) Payment of the applicable application fee(s) pursuant to the most recently adopted fee schedule;**



(e) Recorded deed/land sales contract with legal description.

(f) A preliminary title report or other proof of ownership.

(g) For those applications requiring a neighborhood/developer meeting:

(i) The mailing list for the notice;

(ii) A copy of the notice;

(iii) An affidavit of the mailing and posting;

(iv) The original sign-in sheet of participants; and

(v) The meeting notes described in TDC 32.120(7).

(h) A statement as to whether any City-recognized Citizen Involvement Organizations (CIOs) whose boundaries include, or are adjacent to, the subject property were contacted in advance of filing the application and, if so, a summary of the contact. The summary must include the date when contact was made, the form of the contact and who it was with (e.g. phone conversation with neighborhood association chairperson, meeting with land use committee, presentation at neighborhood association meeting), and the result;

(i) Any additional information, as determined by the City Manager, that may be required by another provision, or for any other permit elsewhere, in the TDC, and any other information that may be required to adequately review and analyze the proposed development plan as to its conformance to the applicable criteria;

(2) Application Intake. Each application, when received, must be date-stamped with the date the application was received by the City, and designated with a receipt number and a notation of the staff person who received the application.

(3) Administrative Standards for Applications. The City Manager is authorized to establish administrative standards for application forms and submittals, including but not limited to plan details, information detail and specificity, number of copies, scale, and the form of submittal.

**Finding:**

*The applicant submitted the subject application on March 4 2022. The applicant submitted additional information on March 30, 2022 and the application was deemed complete on April 12, 2022. The general land use submittal requirements were included with this application. These standards are met.*

**Section 32.150 - Sign Posting.**

(1) When Signs Posted. Signs in conformance with these standards must be posted as follows:

(a) Signs providing notice of an upcoming neighborhood/developer meeting must be posted prior to a required neighborhood/developer meeting in accordance with Section 32.120(6); and

(b) Signs providing notice of a pending land use application must be posted after land use application has been submitted for Type II, III and IV-A applications.

(2) Sign Design Requirements. The applicant must provide and post a sign(s) that conforms to the following standards:

(a) Waterproof sign materials;

(b) Sign face must be no less than eighteen (18) inches by twenty-four (24) inches (18" x 24"); and

(c) Sign text must be at least two (2) inch font.

(3) On-site Placement. The applicant must place one sign on their property along each public street frontage of the subject property. (Example: If a property adjoins four public streets, the applicant must place a sign at each of those public street frontages for a total of four signs). The applicant cannot place the sign within public right of way.

(4) Removal. If a sign providing notice of a pending land use application disappears prior to the final decision date of the subject land use application, the applicant must replace the sign within forty-eight (48) hours of discovery of the disappearance or of receipt of notice from the City of its

disappearance, whichever occurs first. The applicant must remove the sign no later than fourteen (14) days after:

- (a) The meeting date, in the case of signs providing notice of an upcoming neighborhood/developer meeting; or
- (b) The City makes a final decision on the subject land use application, in the case of signs providing notice of a pending land use application.

**Finding:**

*The applicant provided certification within Exhibit A6 that signs in conformance with this section were placed on site in accordance with this section. This standard is met.*

**Section 32.160 – Completeness Review.**

- (1) **Duration.** Except as otherwise provided under ORS 227.178, the City Manager must review an application for completeness within 30 days of its receipt.
- (2) **Considerations.** Determination of completeness will be based upon receipt of the information required under TDC 32.140 and will not be based on opinions as to quality or accuracy. Applications that do not respond to relevant code requirements or standards can be deemed incomplete. A determination that an application is complete indicates only that the application is ready for review on its merits, not that the City will make a favorable decision on the application.
- (3) **Complete Applications.** If an application is determined to be complete, review of the application will commence.
- (4) **Incomplete Applications.** If an application is determined to be incomplete, the City Manager must provide written notice to the applicant identifying the specific information that is missing and allowing the applicant the opportunity to submit the missing information. An application which has been determined to be incomplete must be deemed complete for purposes of this section upon receipt of:
  - (a) All of the missing information;
  - (b) Some of the missing information and written notice from the applicant that no other information will be provided; or
  - (c) Written notice from the applicant that none of the missing information will be provided.
- (5) **Vesting.** If an application was complete at the time it was first submitted, or if the applicant submits additional required information within 180 days of the date the application was first submitted, approval or denial of the application must be based upon the standards and criteria that were in effect at the time the application was first submitted.
- (6) **Void Applications.** An application is void if the application has been on file with the City for more than 180 days and the applicant has not provided the missing information or otherwise responded, as provided in subsection (4) of this section.  
[...]

**Finding:**

*The subject application was submitted on August 17, 2022. The application was forced complete on September 15, 2022. These standards are met.*

**Section 32.230 – Type III Procedure (Quasi-Judicial Review – Public Hearing).**

Type III decisions involve the use of discretion and judgment and are made by the Planning Commission or Architectural Review Board after a public hearing with an opportunity for appeal to the City Council. The decision body for each application type is specified in Table 32-1. A hearing under these procedures provides a forum to apply standards to a specific set of facts to determine

whether the facts conform to the applicable criteria and the resulting determination will directly affect only a small number of identifiable persons.

**(1) Submittal Requirements.** Type III applications must include the submittal information required by TDC 32.140(1).

**(2) Determination of Completeness.** After receiving an application for filing, the City Manager will review the application will for completeness in accordance with TDC 32.160.

**(3) Written Notice of Public Hearing – Type III.** Once the application has been deemed complete, the City must mail by regular first class mail Notice of a Public Hearing to the following individuals and agencies no fewer than 20 days before the hearing.

**(a) Recipients:**

**(i) The applicant and, the owners of the subject property;**

**(ii) All property owners within 1,000 feet measured from the boundaries of the subject property;**

**(iii) All property owners within a platted residential subdivision that is located within 1,000 feet of the boundaries of the subject property. The notice area includes the entire subdivision and not just those lots within 1,000 feet. If the residential subdivision is one of two or more individually platted phases sharing a single subdivision name, the notice area need not include the additional phases;**

**(iv) All recognized neighborhood associations within 1,000 feet from the boundaries of the subject property;**

**(v) All designated representatives of recognized Citizen Involvement Organizations as established in TMC Chapter 11-9;**

**(vi) Any person who submits a written request to receive a notice;**

**(vii) Any governmental agency that is entitled to notice under an intergovernmental agreement entered into with the City and any other affected agencies, including but not limited to: school districts; fire district; where the project either adjoins or directly affects a state highway, the Oregon Department of Transportation; and where the project site would access a County road or otherwise be subject to review by the County, then the County; and Clean Water Services; Tri Met; and, ODOT Rail Division and the railroad company if a railroad-highway grade crossing provides or will provide the only access to the subject property. The failure of another agency to respond with written comments on a pending application does not invalidate an action or permit approval made by the City under this Code;**

**(viii) Utility companies (as applicable); and,**

**(ix) Members of the decision body identified in Table 32-1.**

**(b) The Notice of a Public Hearing, at a minimum, must contain all of the following information:**

**(i) The names of the applicant(s), any representative(s) thereof, and the owner(s) of the subject property;**

**(ii) The street address if assigned, if no street address has been assigned then Township, Range, Section, Tax Lot or Tax Lot ID;**

**(iii) The type of application and a concise description of the nature of the land use action;**

**(iv) A list of the approval criteria by TDC section for the decision and other ordinances or regulations that apply to the application at issue;**

**(v) Brief summary of the local decision making process for the land use decision being made and a general explanation of the requirements for submission of testimony and the procedure for conduct of hearings;**

**(vi) The date, time and location of the hearing;**

**(vii) Disclosure statement indicating that if any person fails to address the relevant approval criteria with enough detail, he or she may not be able to appeal to the Land Use Board of**

**Appeals on that issue, and that only comments on the relevant approval criteria are considered relevant evidence;**

**(viii) The name of a City representative to contact and the telephone number where additional information may be obtained; and**

**(ix) Statement that the application and all documents and evidence submitted to the City are in the public record and available for review, and that copies can be obtained at a reasonable cost from the City; and**

**(x) Statement that a copy of the staff report will be available for inspection at no cost at least seven days prior to the hearing and will be provided at reasonable cost.**

**(c) Failure of a person or agency to receive a notice, does not invalidate any proceeding in connection with the application, provided the City can demonstrate by affidavit that required notice was given.**

**Finding:**

*After submittal and completeness review as required by this section, notice for the Type III hearing concerning AR 22-0006 was mailed by city staff on October 28, 2022 as Exhibit B, which contained the information required by this section. One public comment was received and has been included as Exhibit F. These standards are met.*

**(4) Conduct of the Hearing - Type III.**

**The person chairing the hearing must follow the order of proceedings set forth below. These procedures are intended to provide all interested persons a reasonable opportunity to participate in the hearing process and to provide for a full and impartial hearing on the application before the body. Questions concerning the propriety or the conduct of a hearing will be addressed to the chair with a request for a ruling. Rulings from the chair must, to the extent possible, carry out the stated intention of these procedures. A ruling given by the chair on such question may be modified or reversed by a majority of those members of the decision body present and eligible to vote on the application before the body. The procedures to be followed by the chair in the conduct of the hearing are as follows:**

**(a) At the commencement of the hearing, the person chairing the hearing must state to those in attendance all of the following information and instructions:**

**(i) The applicable substantive criteria;**

**(ii) That testimony, arguments and evidence must be directed toward the criteria described in paragraph (i) of this subsection or other criteria in the plan or land use regulation which the person believes to apply to the decision;**

**(iii) That failure to raise an issue accompanied by statements or evidence sufficient to afford the decision maker and the parties an opportunity to respond to the issue precludes appeal to the State Land Use Board of Appeals based on that issue;**

**(iv) At the conclusion of the initial evidentiary hearing, the decision body must deliberate and make a decision based on the facts and arguments in the public record; and**

**(v) Any participant may ask the decision body for an opportunity to present additional relevant evidence or testimony that is within the scope of the hearing; if the decision body grants the request, it will schedule a date to continue the hearing as provided in TDC 32.230(4)(e), or leave the record open for additional written evidence or testimony as provided TDC 32.230(4)(f).**

**(b) The public is entitled to an impartial decision body as free from potential conflicts of interest and pre-hearing ex parte (outside the hearing) contacts as reasonably possible. Where questions related to ex parte contact are concerned, members of the decision body must follow the**



**guidance for disclosure of ex parte contacts contained in ORS 227.180. Where a real conflict of interest arises, that member or members of the decision body must not participate in the hearing, except where state law provides otherwise. Where the appearance of a conflict of interest is likely, that member or members of the decision body must individually disclose their relationship to the applicant in the public hearing and state whether they are capable of rendering a fair and impartial decision. If they are unable to render a fair and impartial decision, they must be excused from the proceedings.**

**(c) Presenting and receiving evidence.**

- (i) The decision body may set reasonable time limits for oral presentations and may limit or exclude cumulative, repetitious, irrelevant, or personally derogatory testimony or evidence;**
- (ii) No oral testimony will be accepted after the close of the public hearing. Written testimony may be received after the close of the public hearing only as provided by this section; and**
- (iii) Members of the decision body may visit the property and the surrounding area, and may use information obtained during the site visit to support their decision, if the information relied upon is disclosed at the beginning of the hearing and an opportunity is provided to dispute the evidence.**

**(d) The decision body, in making its decision, must consider only facts and arguments in the public hearing record; except that it may take notice of facts not in the hearing record (e.g., local, state, or federal regulations; previous City decisions; case law; staff reports). Upon announcing its intention to take notice of such facts in its deliberations, it must allow persons who previously participated in the hearing to request the hearing record be reopened, as necessary, to present evidence concerning the newly presented facts.**

**(e) If the decision body decides to continue the hearing, the hearing must be continued to a date that is at least seven days after the date of the first evidentiary hearing (e.g., next regularly scheduled meeting). An opportunity must be provided at the continued hearing for persons to present and respond to new written evidence and oral testimony. If new written evidence is submitted at the continued hearing, any person may request, before the conclusion of the hearing, that the record be left open for at least seven days, so that he or she can submit additional written evidence or arguments in response to the new written evidence. In the interest of time, after the close of the hearing, the decision body may limit additional testimony to arguments and not accept additional evidence.**

**(f) If the decision body leaves the record open for additional written testimony, the record must be left open for at least seven days after the hearing. Any participant may ask the decision body in writing for an opportunity to respond to new evidence (i.e., information not disclosed during the public hearing) submitted when the record was left open. If such a request is filed, the decision body must reopen the record, as follows:**

- (i) When the record is reopened to admit new evidence or arguments (testimony), any person may raise new issues that relate to that new evidence or testimony;**
- (ii) An extension of the hearing or record granted pursuant to this section is subject to the limitations of TDC 32.030, unless the applicant waives his or her right to a final decision being made within the required timeframe; and**
- (iii) If requested by the applicant, the decision body must grant the applicant at least seven days after the record is closed to all other persons to submit final written arguments, but not evidence, provided the applicant may expressly waive this right.**

**Finding:**

*The Architectural Review Board will follow the hearing requirements set forth by this section. These standards will be met.*

**(5) Notice of Adoption of a Type III Decision.**

Notice of Adoption must be provided to the property owner, applicant, and any person who provided testimony at the hearing or in writing. The Type III Notice of Adoption must contain all of the following information:

- (a) A description of the applicant’s proposal and the City’s decision on the proposal, which may be a summary, provided it references the specifics of the proposal and conditions of approval in the public record;
- (b) The address or other geographic description of the property proposed for development, including a map of the property in relation to the surrounding area;
- (c) A statement that a copy of the decision and complete case file, including findings, conclusions, and conditions of approval, if any, is available for review and how copies can be obtained;
- (d) The date the decision becomes final, unless a request for appeal is submitted; and
- (e) The notice must include an explanation of rights to appeal the decision to the City Council in accordance with TDC 32.310.

**(6) Appeal of a Type III Decision.** Appeal of an Architectural Review Board or Planning Commission Type III Decision to the City Council may be made in accordance with TDC 32.310.

**(7) Effective Date of a Type III Decision.**

- (a) The written order is the final decision on the application.
- (b) The mailing date is the date of the order certifying its approval by the decision body.
- (c) A decision of the Architectural Review Board or Planning Commission is final unless:
  - (i) a written appeal is received at the City offices within 14 calendar days of the date notice of the final decision is mailed; or
  - (ii) The City Manager or a member of the City Council requests a review of the decision within 14 calendar days of the date notice of the final decision is mailed.

**Finding:**

*A final decision and any appeal will follow the requirements of this section. These standards will be met.*

## **Chapter 33: Applications and Approval Criteria**

[...]

### **Section 33.020 Architectural Review**

[...]

**(5) Approval Criteria.**

**(c) Large Commercial, Industrial, and Multifamily Development.** Applications for Large Commercial, Industrial, and Multifamily Development must comply with the applicable standards and objectives in TDC Chapter 73A through 73G.

**Finding:**

*The subject application, which is for a large commercial development, which must comply with the standards and objectives in TDC 73A through 73G. These standards are met by findings and conditions of approval for the subject application.*

**(9) Permit Expiration.**

Architectural Review decisions (including Minor Architectural Review decisions) expire two (2) years from the effective date unless the applicant has received a building, or grading permit submitted in conjunction with a building permit application, substantial construction has occurred pursuant to the building permit, and an inspection has been performed by a member of the Building Division.

**(10) Extension of Permit Expiration.**

**(a) An Architectural Review approval may be extended if the applicant, or successor interest, submits a written request for an extension of time within two (2) years of the effective date.**

[...]

**(c) Upon receipt of a request for an extension of time, the City will process the extension request as follows:**

**(i) If the City Manager approved the Architectural Review, then the City Manager will decide the extension request under the Type II procedures in TDC 32.220.**

**(ii) If the Architectural Review Board (ARB) approved the Architectural Review, then the ARB will decide the extension request under the Type III quasi-judicial procedures in TDC 32.230.**

**(d) The City must provide notice of the extension request to past recipients of the Architectural Review notice of decision and the applicant must post a sign pursuant to TDC 32.150.**

**(e) The City Manager or Architectural Review Board, as applicable, may grant the extension of time upon finding the following:**

**(i) The applicant submitted a written extension request prior to the expiration date;**

**(ii) There have been no significant changes in any conditions, ordinances, regulations or standards of the City or applicable agencies that affect the previously approved project so as to warrant its resubmittal for Architectural Review;**

**(iii) If the previously approved application included a special study, the applicant provided a status report includes a letter from a recognized professional that states that conditions have not changed after the original approval and that no new study is warranted; and**

**(iv) If the site has been neglected so as to allow the site to become blighted, the deciding party must factor this into its decision.**

**(f) The City Manager or Architectural Review Board, as applicable, may grant or deny the extension request. The decision must be in writing and must be made within sixty (60) days of receipt of the request for extension. If the decision is to grant the extension, the extension can be no more than a single one-year extension.**

**(g) Upon making the decision, the City must provide notice of the extension decision as provided in TDC 32.220 for Type II decisions made by the City Manager and TDC 32.230 for Type III decisions made by the Architectural Review Board.**

**Finding:**

*The proposed application is approved subject the compliance with the above criteria. With recommended Condition of Approval A1, these standards are met.*

**Section 33.110 Tree Removal Permit/Review**

**(1) Purpose. To regulate the removal of trees within the City limits other than trees within the public right-of-way which are subject to TDC Chapter 74.**

**(2) Applicability. No person may remove a tree on private property within the City limits, unless the City grants a tree removal permit, consistent with the provisions of this Section.**

[...]

**(3) Procedure Type. Tree Removal Permit applications are subject to Type II Review in accordance with TDC Chapter 32. Tree Removal Permit applications submitted with an Architectural Review, Subdivision, or Partition application will be processed in conjunction with the Architectural Review, Subdivision, or Partition decision.**

**Finding:**

*The applicant has submitted for tree removal in conjunction with the Architectural Review application. The criteria in TDC 33.110, addressed below, are the basis for approval or denial for tree removal as part of this Architectural Review. These standards are met.*

**Section 33.110 Tree Removal Permit/Review Approval Criteria**

**(5) Approval Criteria.**

**(a) An applicant must satisfactorily demonstrate that at least one of the following criteria are met:**

**(i) The tree is diseased and:**

**(A) The disease threatens the structural integrity of the tree; or**

**(B) The disease permanently and severely diminishes the esthetic value of the tree; or**

**(C) The continued retention of the tree could result in other trees being infected with a disease that threatens either their structural integrity or esthetic value.**

**(ii) The tree represents a hazard which may include but not be limited to:**

**(A) The tree is in danger of falling; or**

**(B) Substantial portions of the tree are in danger of falling.**

**(iii) It is necessary to remove the tree to construct proposed improvements based on Architectural Review approval, building permit, or approval of a Subdivision or Partition Review.**

**(b) If none of the conditions in TDC 33.110(5)(a) are met, the certified arborist must evaluate the condition of each tree.**

[...]

**Finding:**

*The applicant's arborist surveyed trees on-site and adjacent to the site. The report, submitted as Exhibit A3, recommends the preservation of 175 trees, as well as removal of 80 trees that are over 8" dbh. Of the on-site trees proposed for removal, the majority are to be removed to construct the proposed improvements in accordance with criterion 33.110(5)(a)(iii). The report also noted that some trees that are either dead or in poor condition are proposed for retention, as an example: Trees 23419 and 23479.*

*Tree protection measures for are identified in Attachment 1 and 4 of the submitted tree assessment. With recommended Conditions of Approval A11.a. and A12 related to tree removal as well as tree protection, these standards are met.*

**Section 33.050. - Industrial Master Plans.**

**(1)Purpose.** The Industrial Master Plan sets particular standards for development within the Industrial Master Plan Area (defined by such plan), in accordance with the Tualatin Comprehensive Plan, the Southwest Tualatin Concept Plan (SWCP) and the Leveton Tax Increment Plan. Such approved plans are intended to achieve a campus-like setting within an Industrial Master Plan Area, while allowing development to occur independently on a number of smaller parcels within that area. It is the intent of this chapter to provide procedures and criteria for the submission and review of such Industrial Master Plan applications. Development standards approved through a Master Plan process establishes alternative development standards that supersede conflicting provisions in the Tualatin Development Code.

**(2)Applicability.**

[...]

**(b)An Industrial Master Plan is optional for any development in the Manufacturing Park (MP) Zone or Manufacturing Business Park (MBP) Zone. An Industrial Master Plan is required to do any of the following:**



**(i)Modify the requirements for internal circulation, building location and orientation, street frontage, parking, setbacks, building height, or lot size as provided in TDC Chapter 62 for the Manufacturing Park (MP) Zone and TDC Chapter 64 for the Manufacturing Business Park (MBP) Zone; and**

**(ii)Provide for individual parcels of less than 40 acres in the Manufacturing Park Zone. However, the parcels must not be less than 15 acres north of SW Leveton Drive and five acres south of SW Leveton Drive, unless otherwise provided under TDC 62.050(1).**

**(c)An Industrial Master Plan must be submitted for the entire Industrial Master Plan Area and include all owners of property within the area.**

**Finding:**

*The campus development was granted modified standards for building and parking and circulation setbacks, as well as the allowance of 15 acre parcels through IMP 22-0001, included as Exhibit D. This Architectural Review submittal will be subject to the modified standards memorialized under IMP 22-0001 in Exhibit D.*

**Chapter 62: Manufacturing Park Zone (MP)**

[...]

**TDC 62.200. - Use Categories.**

**(1)Use Categories.** Table 62-1 lists use categories Permitted Outright (P) or Conditionally Permitted (C) in the MP zone. Use categories may also be designated as Limited (L) and subject to the limitations listed in Table 62-1 and restrictions identified in TDC 62.210. Limitations may restrict the specific type of use, location, size, or other characteristics of the use category. Use categories which are not listed are prohibited within the zone, except for uses which are found by the City Manager or appointee to be of a similar character and to meet the purpose of this zone, as provided in TDC 31.070.

**(2)Overlay Zones.** Additional uses may be allowed in a particular overlay zone. See the overlay zone Chapters for additional uses.

**Table 62-1  
 Use Categories in the MP Zone**

USE CATEGORY	STATUS	LIMITATIONS AND CODE REFERENCES
<b>Commercial USE CATEGORIES</b>		
Office	P (L)	Permitted uses limited, see TDC 62.210(2).
<b>INDUSTRIAL USE CATEGORIES</b>		
Light Industrial	P (L)	Permitted uses limited to: <ul style="list-style-type: none"> <li>• Manufacture or assembly of electronic or optical instruments, equipment, devices</li> <li>[...]</li> <li>• Research and development laboratories.</li> </ul>

[...]

**Finding:**

*The project area is within the Manufacturing Park (MP) Planning District. Lam designs and manufactures equipment used in the fabrication of semiconductor products. The proposed office building is an accessory use to permitted light manufacturing uses, subject to limitations found in TDC 62.210(2). While*

*the proposed office building will include a fitness facility and cafeteria/café on the main level, these uses are not open the public and are considered accessory to the primary use. As a result, the use limitations found in TDC 62.210(4) do not apply to the accessory amenities. This standard is met.*

**TDC 62.210. - Additional Limitations on Uses.**

[...]

**(2)Offices. Office uses are a permitted as specified below.**

[...]

**(b)Accessory Uses to an Industrial Use. Office uses accessory to a permitted industrial use are permitted.**

**Finding:**

*As mentioned previously, Lam designs and manufactures equipment used in the fabrication of semiconductor products. The proposed office building is accessory to permitted light industrial uses, including the manufacturing of electronic instruments or equipment and research and development laboratories. Therefore the proposed office use meets the standard.*

**TDC 62.300. - Development Standards.**

**Development standards in the MP zone are listed in Table 62-2. Additional standards may apply to some uses and situations, see TDC 62.310.**

STANDARD	IMP 22-0001 DEVELOPMENT STANDARDS	PROPOSED
<b>MINIMUM SETBACKS</b>		
Minimum Building Setback for Yards Adjacent to SW Leveton Drive	68 feet	89 feet
Minimum Building Setback for Yards Adjacent to SW 108th Drive	98 feet	600 feet
Minimum Building Setback for Yards Adjacent to SW Tualatin Road	Subject to Table 62-2 Development Standards in the MP Zone (100 feet)	1,105 feet
Minimum Setback for Side and Rear Yards not Adjacent to Streets or Alleys	0 feet from side and rear yards under common ownership  From Lot 2S122BA00100 (currently owned by JAE Oregon Inc.): Subject to Table 62-2 Development Standards in the MP Zone (50 feet)	56 feet from internal property line  1,015 feet from Lot 2S122BA00100
Parking and Circulation Areas Adjacent to SW Leveton Drive	50 feet	58 feet

STANDARD	IMP 22-0001 DEVELOPMENT STANDARDS	PROPOSED
Parking and Circulation Areas Adjacent to SW 108 <sup>th</sup> Avenue	43 feet	43 feet
Parking and Circulation Areas Adjacent to SW Tualatin Road	35 feet	107 feet
Parking and Circulation Areas Adjacent to Private Property Line	0 feet from property lines under common ownership 9.5 feet from Lot 2S122BA00100 (currently owned by JAE Oregon Inc.)	No proposed changes
Fences	Subject to Table 62-2 Development Standards in the MP Zone (50 feet from public right-of-way)	None proposed outside of safety fence around Stormwater facility
<b>STRUCTURE HEIGHT</b>		
Maximum Height	Subject to Table 62-2 Development Standards in the MP Zone (70 feet May be increased to 85 feet if yards adjacent to structure are not less than a distance equal to one and one-half times the height of the structure)	67 feet

[...]

**Finding:**

*The Lam campus has an approved Industrial Master Plan IMP 22-0001, included as Exhibit D, that modified setbacks as reflected in the table above. And as shown in the table above, the development standards are met.*

**TDC 62.210. - Additional Limitations on Uses.**

**(5)Outdoor Uses.** All uses must be conducted wholly within a completely enclosed building, except as provided by this section.

**(a)Permitted Uses.** Off-street parking and loading, utility facilities, wireless communication facilities, and outdoor storage occupying less than ten (10) percent of the total site area, are permitted outright as outdoor uses.

**Finding:**

*The applicant has not proposed outdoor uses outside of parking, loading, and utilities. With recommended Condition of Approval A19, this standard is met.*

**TDC 62.310. - Additional Development Standards.**

**(1) Industrial Master Plan. Minimum lot size, setbacks, maximum height, and other development standards may be modified by submittal of an Industrial Master Plan application. See TDC 33.050.**

[...]

**Finding:**

*As mentioned in the previous finding, standards modified by IMP 22-0001 have been addressed. This standard is met.*

## **Chapter 63: Industrial Uses and Utilities and Manufacturing Zones – Environmental Regulations**

**Section 63.020 – Applicability.**

The regulations of this Chapter apply to:

- (1) All industrial uses and utilities, regardless of the Planning District in which they are located, and**
- (2) All Manufacturing Planning Districts, regardless of the use category**

[...]

**Finding:**

*The site is located in the Manufacturing Park District and the proposal includes industrial uses. Therefore the noise, vibration, air quality, odor, heat and glare, materials storage, waste disposal, and dangerous substances regulations of this Chapter apply. With recommended Condition of Approval A20, these standards are met.*

## **Chapter 73A: Site Design**

**TDC 73A.300. - Commercial Design Standards.**

The following standards are minimum requirements for commercial development in all zones, except the Mixed-Use Commercial (MCU) zone, which has its own standards:

**(1) Walkways. Commercial development must provide walkways as follows:**

- (a) Walkways must be a minimum of six feet in width;**
- (b) Walkways must be constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete. Gravel or bark chips are not acceptable;**
- (c) Walkways must meet ADA standards applicable at time of construction or alteration;**
- (d) Walkways must be provided between the main building entrances and other on-site buildings, accessways, and sidewalks along the public right-of-way;**
- (e) Walkways through parking areas, drive aisles, and loading areas must be visibly raised and of a different appearance than the adjacent paved vehicular areas;**
- (f) Bikeways must be provided that link building entrances and bike facilities on the site with adjoining public right-of-way and accessways; and**



**(g)Outdoor Recreation Access Routes must be provided between the development's walkway and bikeway circulation system and parks, bikeways and greenways where a bike or pedestrian path is designated.**

**Finding:**

*As shown in Exhibit A2, walkways throughout the site are a minimum of 6-feet wide and concrete. A walkway is provided between the main entrances of the proposed building and other on-site buildings, accessways, and sidewalks. Bicycle facilities have been provided near entrances of the proposed. Further evaluation for ADA standards will be conducted during the building permit phase. There are no outdoor recreation access routes required for this site. With recommended Condition of Approval A11.b., these standards are met.*

**(2)Accessways.**

**(a)When Required. Accessways are required to be constructed when a multi-family development is adjacent to any of the following:**

[...]

**Finding:**

*The proposal is not adjacent to multi-family development. This standard does not apply.*

**(3)Drive-up Uses. Drive-up uses must comply with the following:**

[...]

**Finding:**

*The proposal does not include a drive-up use. This standard does not apply.*

**(4)Safety and Security. Commercial development must provide safety and security features as follows:**

**(a)Locate windows and provide lighting in a manner that enables tenants, employees, and police to watch over pedestrian, parking, and loading areas;**

**(b)Locate windows and interior lighting to enable surveillance of interior activity from the public right-of-way;**

**(c)Locate, orient, and select exterior lighting to facilitate surveillance of on-site activities from the public right-of-way without shining into public rights-of-way or fish and wildlife habitat areas;**

**(d)Provide an identification system which clearly locates buildings and their entries for patrons and emergency services; and**

**(e)Above ground sewer or water pumping stations, pressure reading stations, water reservoirs, electrical substations, and above ground natural gas pumping stations must provide a minimum six foot tall security fence or wall..**

**Finding:**

*As shown in Exhibit A2, the proposed building has windows along all sides and all floors. A photometric plan demonstrates full cutoff light fixtures have been selected to reduce light pollution from shining into public rights-of-way. No new above ground sewer or water pumping stations, pressure reading stations, water reservoirs, electrical substations, or above ground natural gas pumping stations are proposed. With recommended Condition of Approval A13 to address (d), these standards are met.*

**(5)Service, Delivery and Screening.** Commercial development must provide service, delivery, and screening features as follows:

- (a)Above grade and on-grade electrical and mechanical equipment such as transformers, heat pumps and air conditioners must be screened with sight obscuring fences, walls or landscaping;
- (b)Outdoor storage must be screened with a sight obscuring fence, wall, berm or dense evergreen landscaping; and
- (c)Above ground pumping stations, pressure reading stations, water reservoirs; electrical substations, and above ground natural gas pumping stations must be screened with sight-obscuring fences or walls and landscaping.

**Finding:**

*As shown in Exhibit A2, the rooftop mechanical equipment will be located behind a screen wall. The narrative included as Exhibit A1 states: the transformer will be in a below grade vault near the trash enclosure. No new outdoor storage is proposed. With recommended Condition of Approval A21, these standards are met.*

**(6)Adjacent to Transit.** Commercial development adjacent to transit must comply with the following:

- (a)Development on a transit street designated in TDC Chapter 11 (Figure 11-5) must provide either a transit stop pad on-site, or an on-site or public sidewalk connection to a transit stop along the subject property's frontage on the transit street.

[...]

**Finding:**

*As shown on Comprehensive Plan Map 8-5 (Exhibit G), the subject site is located along the Blue Line shuttle route with a stop located near the main driveway entrance on SW Leveton Drive. Public sidewalks along SW Leveton Drive and SW 108th Avenue connect the campus to this stop. There is no other plan in place for additional transit along either frontage. This standard is met.*

## Chapter 73B: Landscaping Standards

### Section 73B.020 – Landscape Area Standards Minimum Areas by Use and Zone.

Zone	Minimum Area Requirement*	Minimum Area Requirement with dedication for a fish and wildlife habitat*
(5) IN, CN, CO/MR, MC and MP zones—All uses	25% of the total area to be developed	22.5% of the total area to be developed

*\* For properties within the Hedges Creek Wetland Protection District which have signed the "Wetlands Mitigation Agreement," the improved or unimproved wetland buffer area may reduce the required landscaping to 12.5 percent as long as all other landscape requirements are met.*

**Finding:**

*As shown in Exhibit A2 states the proposal will include 26.4% landscape area. This standard is met.*

**TDC 73B.040. - Additional Minimum Landscaping Requirements for Commercial Uses..**

**(1)General. In addition to requirements in TDC 73B.020, commercial uses, except those located in the Mixed-Use Commercial (MUC) zone, must comply with the following:**

**(a)All areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped.**

**(i)This standard does not apply to areas subject to the Hedges Creek Wetlands Mitigation Agreement.**

**(b)Minimum 5-foot-wide landscaped area must be located along all building perimeters viewable by the general public from parking lots or the public right-of-way, but the following may be used instead of the 5-foot-wide landscaped area requirement:**

**(i)Pedestrian amenities such as landscaped plazas and arcades; and**

**(ii)Areas developed with pavers, bricks, or other surfaces, for exclusive pedestrian use and contain pedestrian amenities, such as benches, tables with umbrellas, children's play areas, shade trees, canopies.**

**(c)Five-foot wide landscaped area requirement does not apply to:**

**(i>Loading areas;**

**(ii)Bicycle parking areas;**

**(iii)Pedestrian egress/ingress locations; and**

**(iv)Where the distance along a wall between two vehicle or pedestrian access openings (such as entry doors, garage doors, carports and pedestrian corridors) is less than eight feet.**

**(d)Development that abuts an RL or MP Zone must have landscaping approved through Architectural Review and must provide and perpetually maintain dense, evergreen landscaped buffers between allowed uses and the adjacent RL and MP zones.**

**Finding:**

*Landscaping is provided in all areas not otherwise occupied by buildings, vehicle areas, or pedestrian amenity areas. The site is not located adjacent to the Hedges Creek Wetland. All building elevations will be viewable from either parking areas or the public right of way. As shown in Exhibit A2, a combination of existing lawn and patio is proposed on the south elevation. The east elevation serves as the main entrance with pedestrian arcade and bike parking and the west elevation includes loading areas and bike parking. And while the north elevation directly abuts a walkway to a parking area, a landscaped plaza with seating is proposed at the northwest corner of the building instead of the traditional perimeter landscape treatment. With recommended Conditions of Approval A11.c. and A14, this standard is met.*

**Section 73B.080 – Minimum Landscaping Standards for All Zones.**

**The following are minimum standards for landscaping for all zones.**

<p><b>(1) Required Landscape Areas</b></p>	<ul style="list-style-type: none"> <li>• Must be designed, constructed, installed, and maintained so that within three years the ground must be covered by living grass or other plant materials.</li> <li>• The foliage crown of trees cannot be used to meet this requirement.</li> <li>• A maximum of 10% of the landscaped area may be covered with un-vegetated areas of bark chips, rock or stone.</li> <li>• Must be installed in accordance with the provisions of the American National Standards Institute ANSI A300 (Part 1) (Latest Edition).</li> <li>• Must be controlled by pruning, trimming, or otherwise so that:</li> <li>• It will not interfere with designated pedestrian or vehicular access; and</li> <li>• It will not constitute a traffic hazard because of reduced visibility.</li> </ul>
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**Finding:**

*The density of plantings as shown on Landscape Plans (Exhibit A2) is sufficient to provide full coverage of landscaping within three years. These standards are met.*

<b>(2) Fences</b>	<b>Landscape plans that include fences must integrate any fencing into the plan to guide wild animals toward animal crossings under, over, or around transportation corridors.</b>
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**Finding:**

*No fencing is proposed, and there are no established wildlife crossings in the vicinity. This standard is met.*

<b>(3) Tree Preservation</b>	<ul style="list-style-type: none"> <li>• <b>Trees and other plant materials to be retained must be identified on the landscape plan and grading plan.</b></li> <li><b>During construction:</b> <ul style="list-style-type: none"> <li>○ <b>Must provide above and below ground protection for existing trees and plant materials identified to remain;</b></li> <li>○ <b>Trees and plant materials identified for preservation must be protected by chain link or other sturdy fencing placed around the tree at the drip line;</b></li> <li>○ <b>If it is necessary to fence within the drip line, such fencing must be specified by a qualified arborist;</b></li> <li>○ <b>Top soil storage and construction material storage must not be located within the drip line of trees designated to be preserved;</b></li> <li>○ <b>Where site conditions make necessary a grading, building, paving, trenching, boring, digging, or other similar encroachment upon a preserved tree's drip-line area, such grading, paving, trenching, boring, digging, or similar encroachment must only be permitted under the direction of a qualified arborist. Such direction must assure that the health needs of trees within the preserved area can be met; and</b></li> <li>○ <b>Tree root ends must not remain exposed.</b></li> </ul> </li> <li>• <b>Landscaping under preserved trees must be compatible with the retention and health of the preserved tree.</b></li> <li>• <b>When it is necessary for a preserved tree to be removed in accordance with TDC 33.110 (Tree Removal Permit) the landscaped area surrounding the tree or trees must be maintained and replanted with trees that relate to the present landscape plan, or if there is no landscape plan, then trees that are complementary with existing, landscape materials. Native trees are encouraged</b></li> <li>• <b>100% of the area preserved under any tree or group of trees (Except for impervious surface areas) retained in the landscape plan must apply directly to the percentage of landscaping required for a development</b></li> </ul>
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**Finding:**

*The Arborist Report (Exhibit A3) calls for preserving 175 on-site trees. With recommended Conditions of Approval A11.a. and A12, these standards are met.*

<b>(4) Grading</b>	<ul style="list-style-type: none"> <li>• <b>After completion of site grading, top-soil is to be restored to exposed cut and fill areas to provide a suitable base for seeding and planting.</b></li> <li>• <b>All planting areas must be graded to provide positive drainage.</b></li> <li>• <b>Soil, water, plant materials, mulch, or other materials must not be allowed to wash across roadways or walkways.</b></li> </ul>
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	<ul style="list-style-type: none"> <li>• Impervious surface drainage must be directed away from pedestrian walkways, dwelling units, buildings, outdoor private and shared areas and landscape areas except where the landscape area is a water quality facility.</li> </ul>
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**Finding:**

*The applicant is required to obtain an erosion control and grading permit with the City. With recommended Conditions of Approval A2 and A7, this standard is met.*

(5) Irrigation	<ul style="list-style-type: none"> <li>• Landscaped areas must be irrigated with an automatic underground or drip irrigation system</li> <li>• Exceptions: Irrigation requirement does not apply to duplexes and townhouses.</li> </ul>
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**Finding:**

*Irrigation is proposed in new landscaping areas as detailed in the Notes on the Landscape Plan (Exhibit A2). This standard is met.*

(6) Re-vegetation in Un-landscaped Areas	<ul style="list-style-type: none"> <li>• Vegetation must be replanted in all areas where vegetation has been removed or damaged in areas not affected by the landscaping requirements and that are not to be occupied by structures or other improvements,.</li> <li>• Plant materials must be watered at intervals sufficient to ensure survival and growth for a minimum of two growing seasons.</li> <li>• The use of native plant materials is encouraged to reduce irrigation and maintenance demands.</li> <li>• Disturbed soils should be amended to an original or higher level of porosity to regain infiltration and stormwater storage capacity.</li> </ul>
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**Finding:**

*The applicant proposes to landscape all areas not otherwise proposed for development. Drought tolerant plants, as well as some natives, have been selected to reduce irrigation and maintenance needs. With recommended Condition of Approval A14, this standard is met.*

**Section 73B.080 – Minimum Standards Trees and Plants.**

**The following minimum standards apply to the types of landscaping required to be installed for all zones.**

(1) Deciduous Shade Trees	<ul style="list-style-type: none"> <li>• One and on-half inch caliper measured six inches above ground;</li> <li>• Balled and burlapped; bare root trees will be acceptable to plant during their dormant season;</li> <li>• Reach a mature height of 30 feet or more;</li> <li>• Cast moderate to dense shade in summer;</li> <li>• Live over 60 years;</li> <li>• Do well in urban environments, tolerant of pollution and heat, and resistant to drought;</li> <li>• Require little maintenance and mechanically strong;</li> <li>• Insect- and disease-resistant;</li> <li>• Require little pruning; and</li> <li>• Barren of fruit production.</li> </ul>
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<b>(2) Deciduous Ornamental Trees</b>	<ul style="list-style-type: none"> <li>• One and on-half inch caliper measured six inches above ground;</li> <li>• balled and burlapped; bare root trees will be acceptable to plant during their dormant season; and</li> <li>• Healthy, disease-free, damage-free, well-branched stock, characteristic of the species</li> </ul>
<b>(3) Coniferous Trees</b>	<ul style="list-style-type: none"> <li>• 5 feet in height above ground;</li> <li>• balled and burlapped; bare root trees will be acceptable to plant during their dormant season; and</li> <li>• Healthy, disease-free, damage-free, well-branched stock, characteristic of the species.</li> </ul>
<b>(4) Evergreen and Deciduous Shrubs</b>	<ul style="list-style-type: none"> <li>• One to five gallon size;</li> <li>• Healthy, disease-free, damage-free, well-branched stock, characteristic of the species; and</li> <li>• Side of shrub with best foliage must be oriented to public view.</li> </ul>
<b>(5) Groundcovers</b>	<ul style="list-style-type: none"> <li>• Fully rooted;</li> <li>• Well branched or leafed;</li> <li>• Healthy, disease-free, damage-free, well-branched stock, characteristic of the species; and</li> <li>• English ivy (<i>Hedera helix</i>) is prohibited.</li> </ul>
<b>(6) Lawns</b>	<ul style="list-style-type: none"> <li>• Consist of grasses, including sod, or seeds of acceptable mix within the local landscape industry;</li> <li>• 100 percent coverage and weed free; and</li> <li>• Healthy, disease-free, damage-free, characteristic of the species.</li> </ul>

**Finding:**

*Per the Plant Schedule provided on the Landscape Plan included in Exhibit A2, the standards for groundcover, shrubs, and trees to be planted are met.*

**Chapter 73C: Parking Standards**

**TDC 73C.010. - Off-Street Parking and Loading Applicability and General Requirements.**

[...]

**(2)General Requirements.** Off-street parking spaces, off-street vanpool and carpool parking spaces, off-street bicycle parking, and off-street loading berths must be as provided as set forth in TDC 73C.100, unless greater requirements are otherwise established by the conditional use permit or the Architectural Review process.

**(a)**The following apply to property and/or use with respect to the provisions of TDC 73C.100:

**(i)**The requirements apply to both the existing structure and use, and enlarging a structure or use;

**(ii)**The floor area is measured by gross floor area of the building primary to the function of the particular use of the property other than space devoted to off-street parking or loading;

[...]

**(iv)**Calculations to determine the number of required parking spaces and loading berths must be rounded to the nearest whole number;

- (v) If the use of a property changes, thereby increasing off-street parking or loading requirements, the increased parking/loading area must be provided prior to commencement of the new use;
- (vi) Parking and loading requirements for structures not specifically listed herein must be determined by the City Manager, based upon requirements of comparable uses listed
- (vii) When several uses occupy a single structure, the total requirements for off-street parking may be the sum of the requirements of the several uses computed separately or be computed in accordance with TDC 73.370(1)(m), Joint Use Parking;  
[...]
- (ix) Required parking spaces must be available for the parking of operable passenger automobiles of residents, customers, patrons and employees and must not be used for storage of vehicles or materials or for the parking of trucks used in conducting the business;
- (x) Institution of on-street parking, where none is previously provided, must not be done solely for the purpose of relieving crowded parking lots in commercial or industrial zones;
- (xi) Required vanpool and carpool parking must meet the 9-foot parking stall standards in Figure 73-1 and be identified with appropriate signage;  
[...]
- (xiii) If the applicant demonstrates that too many or too few parking spaces are required, applicant may seek a variance from the minimum or maximum by providing evidence that the particular use needs more or less than the amount specified in this Code.

**Finding:**

*While the campus has an industrial master plan, no modified parking standard has been requested or approved. That said, case files IMP 00-01 and AR16-0010 made findings that the manufacturing parking rate is acceptable for determining minimum parking requirements for the campus development. Under (vi), staff finds that a rate of 1.6 spaces per 1,000 square feet of gross floor area is acceptable for determining parking requirements for the proposed office that supports a research and development campus that is primarily dedicated to specialized manufacturing. No on-street parking is proposed. Additionally the applicant has not requested a parking variance. With recommended Conditions of Approval A11.d, standard (vi) is met and A15, standard (xi) is met.*

**Section 73C.020 – Parking Lot Design Standards.**

**A parking lot, whether an accessory or principal use, intended for the parking of automobiles or trucks, must comply with the following:**

- (1) Off-street parking lot design must comply with the dimensional standards set forth in Figure 73-1;  
[...]**
- (2) Parking lot drive aisles must be constructed of asphalt, concrete, or pervious concrete;**
- (3) Parking stalls must be constructed of asphalt, concrete, pervious concrete, or a pervious surface such as pavers or grasscrete, but not gravel or woody material. Pervious surfaces, are encouraged for parking stalls in or abutting the Natural Resource Protection Overlay District, Other Natural Areas, or in a Clean Water Services Vegetated Corridor;**
- (4) Parking lots must be maintained adequately for all-weather use and drained to avoid water flow across sidewalks;**
- (5) Parking bumpers or wheel stops or curbing must be provided to prevent cars from encroaching on adjacent landscaped areas, or adjacent pedestrian walkways.**

**Finding:**

*As shown on the Site Plan (Exhibit A2), most stalls are proposed at 9 feet wide and are either 16 feet long with landscape overhang or 18.5 feet long. Drive aisles are proposed between 24 to 30 feet. Both aisles and stalls are proposed to be comprised of asphalt. Concrete curbs are also proposed. Wheel stops are proposed for parking stalls adjacent to pedestrian walkways to prevent encroachment. With recommended Condition of Approval A24, these standards are met.*

**(6) Disability parking spaces and accessibility must meet ADA standards applicable at time of construction or alteration;**

**(7) Parking stalls for sub-compact vehicles must not exceed 35 percent of the total parking stalls required by TDC 73C.100. Stalls in excess of the number required by TDC 73C.100 can be sub-compact stalls;**

**Finding:**

*The Site Plan (Exhibit A2) shows a total of eight ADA-compliant parking spaces planned near building entrances. ADA standards will be reviewed in greater detail during the building permit phase. No compact stalls are included in the proposal. These standards are met.*

**(8) Groups of more than 4 parking spaces must be so located and served by driveways that their use will require no backing movements or other maneuvering within a street right-of-way other than an alley;**

**(9) Drives to off-street parking areas must be designed and constructed to facilitate the flow of traffic, provide maximum safety of traffic access and egress, and maximum safety of pedestrians and vehicular traffic on the site;**

**(10) On-site drive aisles without parking spaces, which provide access to parking areas with regular spaces or with a mix of regular and sub-compact spaces, must have a minimum width of 22 feet for two-way traffic and 12 feet for one-way traffic; When 90 degree stalls are located on both sides of a drive aisle, a minimum of 24 feet of aisle is required. On-site drive aisles without parking spaces, which provide access to parking areas with only sub-compact spaces, must have a minimum width of 20 feet for two-way traffic and 12 feet for one-way traffic;**

**Finding:**

*The design of the parking lot will not require movement on the public street. Drive aisles with parking are at between 24 to 30 feet wide as proposed. These standards are met.*

**(11) Artificial lighting, must be deflected to not shine or create glare in a residential zones, street right-of-way, a Natural Resource Protection Overlay District, Other Natural Areas, or a Clean Water Services Vegetated Corridor;**

**(12) Parking lot landscaping must be provided pursuant to the requirements of TDC 73C.200; and**

**(13) Except for parking to serve residential uses, parking areas adjacent to or within residential zones or adjacent to residential uses must be designed to minimize disturbance of residents.**

**Finding:**

*All exterior site lighting fixtures that have been selected are compliant with The Dark Sky Society lighting standards. As shown on the Site Lighting Plan (Exhibit A2), lighting will primarily be focused toward the building entrances, loading, and interior parking areas. These standards are met.*

**Section 73C.050 – Bicycle Parking Requirements and Standards.**

**(1) Requirements. Bicycle parking facilities must include:**



- (a) Long-term parking that consists of covered, secure stationary racks, lockable enclosures, or rooms in which the bicycle is stored;
  - (i) Long-term bicycle parking facilities may be provided inside a building in suitable secure and accessible locations.
  - (b) Short-term parking provided by secure stationary racks (covered or not covered), which accommodate a bicyclist's lock securing the frame and both wheels.
- (2) Standards. Bicycle parking must comply with the following:**
- (a) Each bicycle parking space must be at least six feet long and two feet wide, with overhead clearance in covered areas must be at least seven feet;
  - (b) A five (5) foot-wide bicycle maneuvering area must be provided beside or between each row of bicycle parking. It must be constructed of concrete, asphalt, or a pervious hard surface such as pavers or grasscrete, and be maintained;
  - (c) Access to bicycle parking must be provided by an area at least three feet in width. It must be constructed of concrete, asphalt, or a pervious hard surface such as pavers or grasscrete, and be maintained;
  - (d) Bicycle parking areas and facilities must be identified with appropriate signing as specified in the Manual on Uniform Traffic Control Devices (MUTCD) (latest edition). At a minimum, bicycle parking signs must be located at the main entrance and at the location of the bicycle parking facilities;
  - (e) Bicycle parking must be located in convenient, secure, and well-lighted locations approved through the Architectural Review process. Lighting, which may be provided, must be deflected to not shine or create glare into street rights-of-way or fish and wildlife habitat areas;
  - (f) Required bicycle parking spaces must be provided at no cost to the bicyclist, or with only a nominal charge for key deposits, etc. This does not preclude the operation of private for-profit bicycle parking businesses;
  - [...]
  - (h) The City Manager or the Architectural Review Board may approve a form of bicycle parking not specified in these provisions but that meets the needs of long-term and/or short-term parking pursuant to Architectural Review.

**Finding:**

*As shown in Exhibit A2, the applicant proposes a combination of short-term and long-term bike parking areas; however dimensioned details of the bike parking furnishings were not included in the application materials. With recommended Conditions of Approval A11.e. and A15 which will show compliance with standards (a), (b), (c), and (d), these standards are met.*

**Section 73C.100 – Off-Street Parking Minimum/Maximum Requirements.**

USE	MINIMUM MOTOR VEHICLE PARKING	MAXIMUM MOTOR VEHICLE PARKING	BICYCLE PARKING	PERCENTAGE OF BICYCLE PARKING TO BE COVERED
<b>(f) Industrial</b>				
<b>(i) Manufacturing</b>	1.60 spaces per 1,000 square feet of gross floor area	None	2 spaces, or 0.10 spaces per 1,000 gross square feet, whichever is greater	First five spaces or 30 percent, whichever is greater

**Finding:**

While the campus has an industrial master plan, no modified parking standard has been requested or approved. As previously mentioned under TDC 73C.010, staff finds that the manufacturing rate of 1.6 spaces per 1,000 square feet of gross floor area is acceptable for determining parking requirements for the proposed office that supports a research and development campus that is primarily dedicated to specialized manufacturing. As shown in Exhibit A2, the site currently has 1,377 stalls and the proposal includes 549 additional stalls for a total of 1,926 stalls. An analysis of required parking for the proposed use is provided in the table below.

Table 1: Minimum and Proposed Parking by Use

Use	GFA	Minimum Required Parking	Proposed Parking	Required Bike Parking	Required Covered Bike Parking
Office to support specialized manufacturing	120,000	192	549	12	5

With recommended Conditions of Approval A 11.d-e, these standards are met.

(2) In addition to the general parking requirements in subsection (1), the following are the minimum number of off-street vanpool and carpool parking for commercial, institutional, and industrial uses.

Number of Required Parking Spaces	Number of Vanpool or Carpool Spaces
26 and greater	1 for each 25 spaces

**Finding:**

The proposal is for a commercial uses which will require a minimum of eight vanpool and carpool spaces, and as shown in Exhibit A2, 12 spaces are proposed. With recommend Condition of Approval A11.f., this standard is met.

**Section 73C.120 – Off-Street Loading Facilities Minimum Requirements.**

(1) The minimum number of off-street loading berths for commercial, industrial, and institutional uses is as follows:

Use	Square Feet of Floor Area	Number of Berths	Dimensions of Berth	Unobstructed Clearance of Berth
Commercial	60,000 and over	3	12 feet × 35 feet	14 feet

(2) Loading berths must not use the public right-of-way as part of the required off-street loading area.

(3) Required loading areas must be screened from public view, public streets, and adjacent properties by means of sight-obscuring landscaping, walls or other means, as approved through the Architectural Review process.

(4) Required loading facilities must be installed prior to final building inspection and must be permanently maintained as a condition of use.

**(5)The off-street loading facilities must in all cases be on the same lot or parcel as the structure they are intended to serve. In no case must the required off-street loading spaces be part of the area used to satisfy the off-street parking requirements.**

**(6)A driveway designed for continuous forward flow of passenger vehicles for the purpose of loading and unloading children must be located on the site of a school or child day care center having a capacity greater than 25 students.**

**Finding:**

*The campus site includes a number of existing buildings and loading dock facilities. As shown in Exhibit A2, the proposed office building is 120,000 square feet and includes two loading docks. The proposed loading docks are approximately 13 feet x 43 feet and 10 feet x 43 feet. The loading area is located on the east elevation of the proposed building and will be screened from public view by landscaping and parking areas. While the overall site will include a total of 13 loading docks, the applicant has not provided sufficient evidence to satisfy the requirement that adequate loading facilities will be located on the same lot as the proposed office building. With recommended Conditions of Approval A11.g., these standards are met.*

**Section 73C.130 – Parking Lot Driveway and Walkway Minimum Requirements.**

**Parking lot driveways and walkways must comply with the following requirements:**

[...]

**(2)Commercial Uses.** Ingress and egress for commercial and institutional uses must not be less than the following:

Required Parking Spaces	Minimum Number Required	Minimum Pavement Width	Minimum Pavement Walkways, etc.
1-250	1	36 feet for first 50' from ROW, 24 feet thereafter	No curbs or walkway required

[...]

**Finding:**

*As shown in Exhibit A2, the proposal includes two new access driveways located off of SW 108<sup>th</sup> Avenue to serve the expanded parking lots on the eastern side of the campus. The driveways are 36' wide for the first 50' from right of way and more than 24' wide thereafter. A sidewalk is provided near the northern access. Additional findings are provided in Chapter 75.*

**(6) Maximum Driveway Widths and Other Requirements.**

[...]

**(d) There must be a minimum distance of 40 feet between any two adjacent driveways on a single property unless a lesser distance is approved by the City Manager.**

**(e) Must comply with the distance requirements for access as provided in TDC 75.**

**(f) Must comply with vision clearance requirements in TDC 75.**

**Finding:**

*Proposed driveway are located approximately 395 feet apart. With recommended Condition of Approval A3 standard (e) is met and Condition of Approval A25 standard (f) is met.*

**TDC 73C.220. - Commercial Parking Lot Landscaping Requirements.**

**Commercial uses must comply with the following landscaping requirements for parking lots in all zones:**

**(1)General. Locate landscaping or approved substitute materials in all areas not necessary for vehicular parking and maneuvering.**

**Finding:**

*The parking lot contains landscaping in areas not used for vehicle and pedestrian movement. This standard is met.*

**(2)Clear Zone. Clear zone must be provided for the driver at ends of on-site drive aisles and at driveway entrances, vertically between a maximum of 30 inches and a minimum of eight feet as measured from the ground level.**

[...]

**Finding:**

*As shown in the Landscape Plans (Exhibit A2), the proposed plantings will provide for visual clearance at the end of drive aisles and drive entrances. With recommended Condition of Approval A25 related to maintenance, this standard is met.*

**(3)Perimeter. Minimum five feet in width in all off-street parking and vehicular circulation areas, including loading areas and must comply with the following.**

- (a)Deciduous trees located not more than 30 feet apart on average as measured on center;**
- (b)Shrubs or ground cover, planted so as to achieve 90 percent coverage within three years;**
- (c)Plantings which reach a mature height of 30 inches in three years which provide screening of vehicular headlights year round;**
- (d)Native trees and shrubs are encouraged; and**
- (e)Exception: Not required where off-street parking areas on separate lots are adjacent to one another and connected by vehicular access.**

**Finding:**

*As shown in the Landscape Plans (Exhibit A2), perimeter landscaping is proposed around all parking, circulation, and loading areas. Trees are located less than 30 feet on center. This standard is met.*

**(4)Landscape Island. Minimum 25 square feet per parking stall must be improved with landscape island areas and must comply with the following:**

- (a)May be lower than the surrounding parking surface to allow them to receive stormwater runoff and function as water quality facilities as well as parking lot landscaping;**
- (b)Must be protected from vehicles by curbs, but the curbs may have spaces to allow drainage into the islands;**
- (c)Landscape separation required for every eight continuous spaces in a row;**
- (d)Must be planted with one deciduous shade trees for every four parking spaces. Required trees must be evenly dispersed throughout the parking lot;**
- (e)Must be planted with groundcover or shrubs;**
- (f)Native plant materials are encouraged;**
- (g)Landscape island areas with trees must be a minimum of five feet in width (from inside of curb to curb);**



- (h) Required plant material in landscape islands must achieve 90 percent coverage within three years; and**
- (i) Exceptions: [...]**

**Finding:**

*The campus has an approved Industrial Master Plan IMP 22-0001 that established modified parking lot landscaping standards for the south half of the site to accommodate the natural grade under Condition of Approval A3.e. Given that a minimum of 192 parking spaces are required for the proposed use, 4,800 square feet of parking lot landscape island area and 48 trees are required. While the application materials are silent on the square footage of parking lot landscaping included in the proposal, there are 83 trees proposed throughout the parking areas. Staff did note that the southwestern bank of parking illustrated on Sheet C1.14 proposed a landscape separation every 13 stalls as opposed to the 12 stalls approved under the modified standards of IMP 22-0001. With recommended Condition of Approval A11.h., these standards are met.*

**(5) Driveway Access.** For lots with 12 or more parking spaces, site access from the public street must be defined by:

- (a) Landscape area at least five feet in width on each side of the site access;**
- (b) Landscape area must extend 25 feet from the right-of-way line; and**
- (c) Exceptions: [...]**

**Finding:**

*As shown in Exhibit A2, the proposed driveways are flanked by a five foot wide landscape area that extends more than 25 feet from the right-of-way line. This standard is met.*

## **Chapter 73D: Waste and Recyclables Management Standards**

### **Section 73D.010 – Applicability and Objectives.**

- (1) Applicability.** The requirements of this Chapter apply to all new or expanded:
- (a) Common wall residential developments containing five or more units;**
  - [...]**

### **Section 73D.020 - Design Methods.**

**An applicant required to provide mixed solid waste and source separated recyclables storage areas must comply with one of following methods:**

- (1) The minimum standards method in TDC 73D.030;**
- (2) The waste assessment method in TDC 73D.040;**
- (3) The comprehensive recycling plan method in TDC 73D.050; or**
- (4) The franchised hauler review method in TDC 73D.060.**

**Finding:**

*The applicant proposes to use the Minimum Standards Method (TDC 73D.030) and has verified that the location and configuration of the proposed waste facility and access will satisfy Republic Services in Exhibit A6. As discussed below, these standards are met.*

### **Section 73D.030 – Minimum Standards Method.**

**This method specifies a minimum storage area requirement based on the size and general use category of the new or expanded development. This method is most appropriate when specific use of a new or expanded development is not known. It provides specific dimensional standards for the minimum size of storage areas by general use category.**

**(1) The size and location of the storage area(s) must be indicated on the site plan. Requirements are based on an assumed storage area height of four feet for mixed solid waste and source separated recyclables. Vertical storage higher than four feet, but no higher than 7 feet may be used to accommodate the same volume of storage in a reduced floor space (potential reduction of 43 percent of specific requirements). Where vertical or stacked storage is proposed, submitted plans must include drawings to illustrate the layout of the storage area and dimensions for containers.**

**(2) The storage area requirement is based on uses. If a building has more than one use and that use occupies 20 percent or less of the gross leasable area (GLA) of the building, the GLA occupied by that use must be counted toward the floor area of the predominant use(s). If a building has more than one use and that use occupies more than 20 percent of the GLA of the building, then the storage area requirement for the whole building must be the sum of the area of each use. Minimum storage area requirements by use is as follows:**

[...]

**(c) Commercial, industrial, and institutional developments must provide a minimum storage area of ten square feet plus:**

**(i) Office—Four square feet/1,000 square feet gross leasable area (GLA);**

[...]

**Finding:**

*The proposal is for a 120,000 square foot office building, which requires 490 square feet. As shown on the site plan included in Exhibit A2, both a trash enclosure and trash compactor is proposed. A 203 square foot trash enclosure is located along the eastern elevation of the proposed. With recommended Condition of Approval A11.i. demonstrating that the development includes an acceptable waste and recyclables management solution, these standards are met.*

**Section 73D.070 – Location, Design and Access Standards.**

**The following location, design, and access standards are applicable to all storage areas:**

**(1) Location Standards.**

**(a) The storage area for source separated recyclables may be collocated with the storage area for mixed solid waste.**

**(b) Storage area space requirements can be satisfied with a single location or multiple locations, and can combine both interior and exterior locations.**

**(c) Exterior storage areas must:**

**(i) Be located in central and visible locations on the site to enhance security for users;**

**(ii) Be located in a parking area; and**

**(iii) Not be located within a required front yard setback or in a yard adjacent to a public or private street.**

**(2) Design Standards.**

**(a) The dimensions of the storage area must accommodate containers consistent with current methods of local collection at time of construction or alteration.**

**(b) Indoor and outdoor storage areas must comply with Oregon Building and Fire Code requirements.**

- (c) Exterior storage areas must be enclosed by a sight obscuring fence or wall at least 6 feet in height.**
- (d) Evergreen plants must be placed around the enclosure walls, excluding the gate or entrance openings for common wall, commercial, and institutional developments.**
- (e) Gate openings for haulers must be a minimum of 10 feet wide and must be capable of being secured in a closed and open position.**
- (f) Horizontal clearance must be a minimum of 10 feet and a vertical clearance of 8 feet is required if the storage area is covered.**
- (g) A separate pedestrian access must also be provided in common wall, commercial, and institutional developments.**
- (h) Exterior storage areas must have either a concrete or asphalt floor surface.**
- (i) Storage areas and containers must be clearly labeled to indicate the type of material accepted.**

**Finding:**

*As shown in Exhibit A2, trash areas will be located near the loading dock on the east side of the building and will not be located in the setback area. The trash enclosure is approximately 25 feet wide by 10 feet deep and is not covered. The trash compactor is a 265XP-30, self-contained 30 cubic yard compactor. The trash enclosure will be enclosed by an eight foot high concrete wall panel and chain link gate. Each gate door is 10 feet wide and can be secured in an open position. The trash enclosure is located near the loading area and is screened by sight obscuring walls as permitted under TDC 73C.120(3). Access to the trash compactor and trash enclosure is through the loading dock and there are dedicated personnel doors from both the commercial kitchen and circulation spaces to avoid needing to pass through the main building entrance. Trash enclosure area will be concrete floor surface and bins will be labeled by the hauler service. With recommended Condition of Approval A11.i., these standards are met.*

**(3) Access Standards.**

- (a) Storage areas must be accessible to users at convenient times of the day, and to hauler personnel on the day and approximate time they are scheduled to provide hauler service.**
- (b) Storage areas must be designed to be easily accessible to hauler trucks and equipment, considering paving, grade, gate clearance and vehicle access.**
- (c) Storage areas must be accessible to hauler trucks without requiring backing out of a driveway onto a public street. If only a single access point is available to the storage area, adequate turning radius must be provided to allow hauler trucks to safely exit the site in a forward motion.**
- (d) Storage areas must be located so that pedestrian and vehicular traffic movement are not obstructed on site or on public streets adjacent to the site.**
- (e) The following is an exception to the access standard:**
  - (i) Access may be limited for security reasons.**

**Finding:**

*As shown in the applicant's submittal, Republic Services, the applicable waste hauler, has indicated that the dimensions and accessibility of the enclosures meet their service needs (Exhibit A6). These standards are met.*

## **Chapter 74: Public Improvement Requirements**

[...]

### **TDC 74.120 Public Improvements.**

**(1) Except as specially provided, all public improvements must be installed at the expense of the applicant. All public improvements installed by the applicant must be constructed and guaranteed as to workmanship and material as required by the Public Works Construction Code prior to acceptance by the City. Work must not be undertaken on any public improvement until after the construction plans have been approved by the City Manager and a Public Works Permit issued and the required fees paid.**

**Finding:**

*All public improvements will be installed by the applicant at their expense after approval of plans and issued Erosion Control, Water Quality, and Public Works Permits. With recommended Conditions of Approval A2 and A8, this standard is met.*

**TDC 74.130 Private Improvements.**

**All private improvements must be installed at the expense of the applicant. The property owner must retain maintenance responsibilities over all private improvements.**

**Finding:**

*All private improvements will be installed by the applicant at their expense and will require prior approval of plans and building permits. With recommended Conditions of Approval A17 and A23, this standard is met.*

**TDC 74.140 Construction Timing.**

**(1) All the public improvements required under this chapter must be completed and accepted by the City prior to the issuance of a Certificate of Occupancy.**

**(2) All private improvements required under this Chapter must be approved by the City prior to the issuance of a Certificate of Occupancy.**

**Finding:**

*All public and private improvements proposed and modified by conditions of approval will be completed and accepted by the City prior to receiving a Certificate of Occupancy. With recommended Conditions of Approval A16 and A17, this standard is met.*

[...]

**TDC 74.210 Minimum Street Right-of-Way Widths.**

**The width of streets in feet shall not be less than the width required to accommodate a street improvement needed to mitigate the impact of a proposed development. In cases where a street is required to be improved according to the standards of the TDC, the width of the right-of-way shall not be less than the minimums indicated in TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G.**

**(2) For development applications other than subdivisions and partitions, wherever existing or future streets adjacent to property proposed for development are of inadequate right-of-way width, the additional right-of-way necessary to comply with TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G of the Tualatin Community Plan must be dedicated to the City for use by the public prior to issuance of any building permit for the proposed development. This right-of-way**



**dedication must be for the full width of the property abutting the roadway and, if required by the City Manager, additional dedications must be provided for slope and utility easements if deemed necessary.**

**Finding:**

*The proposal is adjacent to SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road. Final plans will include a minimum of half-street right-of-way dedications to preferred cross-sections along with improvements within SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road meeting the requirements of the City of Tualatin. With recommended Conditions of Approval A3 and A8, this standard is met.*

**TDC 74.320. - Slope Easements.**

**(1)The applicant must obtain and convey to the City any slope easements determined by the City Manager to be necessary adjacent to the proposed development site to support the street improvements in the public right-of-way or accessway or utility improvements required to be constructed by the applicant.**

**[...]**

**(3)For all other development applications, a slope easement dedication must be submitted to the City Manager; building permits must not be issued for the development prior to acceptance of the easement by the City.**

**Finding:**

*Any required slope easements along SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road will be provided and completed prior to Building Permit issuance. With recommended Conditions of Approval A3 and A8, this standard is met.*

**TDC 74.330. - Utility Easements.**

**(1) Utility easements for water, sanitary sewer and storm drainage facilities, telephone, television cable, gas, electric lines and other public utilities must be granted to the City.**

**[...]**

**(4)For development applications other than subdivisions and partitions, and for both on-site and off-site easement areas, a utility easement must be granted to the City; building permits must not be issued for the development prior to acceptance of the easement by the City. The City may elect to exercise eminent domain and condemn necessary off-site public utility easements at the applicant's request and expense. The City Council must determine when condemnation proceedings are to be used.**

**(5) The width of the public utility easement must meet the requirements of the Public Works Construction Code. All subdivisions and partitions must have a 6-foot public utility easement adjacent to the street and a 5-foot public utility easement adjacent to all side and rear lot lines. Other easements may be required as determined by the City Manager.**

**Finding:**

*Any required utility easements will be granted to the City, with required widths to meet the Public Works Construction Code. With recommended Conditions of Approval A3 and A8, these standards are met.*

**TDC 74.420 Street Improvements.**

**When an applicant proposes to develop land adjacent to an existing or proposed street, including land which has been excluded under TDC 74.220, the applicant should be responsible for the improvements to the adjacent existing or proposed street that will bring the improvement of the street into conformance with the Transportation Plan (TDC Chapter 11), TDC 74.425 (Street Design Standards), and the City's Public Works Construction Code, subject to the following provisions:**

**(1) For any development proposed within the City, roadway facilities within the right-of-way described in TDC 74.210 must be improved to standards as set out in the Public Works Construction Code.**

**(2) The required improvements may include the rebuilding or the reconstruction of any existing facilities located within the right-of-way adjacent to the proposed development to bring the facilities into compliance with the Public Works Construction Code.**

**(3) The required improvements may include the construction or rebuilding of off-site improvements which are identified to mitigate the impact of the development.**

**(4) Where development abuts an existing street, the improvement required must apply only to that portion of the street right-of-way located between the property line of the parcel proposed for development and the centerline of the right-of-way, plus any additional pavement beyond the centerline deemed necessary by the City Manager to ensure a smooth transition between a new improvement and the existing roadway (half-street improvement). Additional right-of-way and street improvements and off-site right-of-way and street improvements may be required by the City to mitigate the impact of the development. The new pavement must connect to the existing pavement at the ends of the section being improved by tapering in accordance with the Public Works Construction Code.**

**(5) If additional improvements are required as part of the Access Management Plan of the City, TDC Chapter 75, the improvements must be required in the same manner as the half-street improvement requirements.**

**(6) All required street improvements must include curbs, sidewalks with appropriate buffering, storm drainage, street lights, street signs, street trees, and, where designated, bikeways and transit facilities.**

[...]

**(8) For development applications other than subdivisions and partitions, all street improvements required by this section must be completed and accepted by the City prior to the issuance of a Certificate of Occupancy.**

[...]

**(10) Streets within, or partially within, a proposed development site must be graded for the entire right-of-way width and constructed and surfaced in accordance with the Public Works Construction Code.**

**(11) Existing streets which abut the proposed development site must be graded, constructed, reconstructed, surfaced or repaired as necessary in accordance with the Public Works Construction Code and TDC Chapter 11, Transportation Plan, and TDC 74.425 (Street Design Standards).**

[...]

**(14) The applicant must construct any required street improvements adjacent to parcels excluded from development, as set forth in TDC 74.220 of this chapter.**

[...]

**(17) Intersections should be improved to operate at a level of service of at least D and E for signalized and unsignalized intersections, respectively.**

[...]

**Finding:**

*A Traffic Study conducted by Mackenzie was submitted as Exhibit A4. Plans show two new driveways off of SW 108th Avenue, as well as a modification to the existing eastern driveway off of SW Leveton Drive. The sidewalk on the west side of SW 108th Avenue and select locations on SW Leveton Drive are shown to be improved to bring into compliance with ADA specifications. Additionally the City Engineer has reviewed the proposal against the above requirements. Required dedication of right-of-way and construction of public street surface infrastructure will benefit this development's expected addition of bicycle, pedestrian, and vehicular trips utilizing streets and sidewalks. With recommended Conditions of Approval A3, A8, A9 and A10, these standards are met.*

#### **TDC 74.425 Street Design Standards.**

**(1) Street design standards are based on the functional and operational characteristics of streets such as travel volume, capacity, operating speed, and safety. They are necessary to ensure that the system of streets, as it develops, will be capable of safely and efficiently serving the traveling public while also accommodating the orderly development of adjacent lands.**

**(2) The proposed street design standards are shown in Figures 72A through 72G. The typical roadway cross sections comprise the following elements: right-of-way, number of travel lanes, bicycle and pedestrian facilities, and other amenities such as landscape strips. These figures are intended for planning purposes for new road construction, as well as for those locations where it is physically and economically feasible to improve existing streets.**

[...]

**(4) All streets must be designed and constructed according to the preferred standard. The City Manager may reduce the requirements of the preferred standard based on specific site conditions, but in no event will the requirement be less than the minimum standard. The City Manager must take into consideration the following factors when deciding whether the site conditions warrant a reduction of the preferred standard:**

**(a) Arterials:**

- (i) Whether adequate right-of-way exists;**
- (ii) Impacts to properties adjacent to right-of-way;**
- (iii) Current and future vehicle traffic at the location; and**
- (iv) Amount of heavy vehicles (buses and trucks).**

**(b) Collectors:**

- (i) Whether adequate right-of-way exists;**
- (ii) Impacts to properties adjacent to right-of-way;**
- (iii) Amount of heavy vehicles (buses and trucks); and**
- (iv) Proximity to property zoned manufacturing or industrial.**

[...]

#### **Finding:**

*The proposal is adjacent to SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road which are designated a Minor Collector, Minor Arterial, and Major Collector, respectively on the Tualatin Comprehensive Plan Map 8-1 (Exhibit J). A Traffic Study conducted submitted as Exhibit A4 did not recommend additional improvements greater than the planned cross-sections. With recommended Condition of Approval A3, these standards are met.*

#### **TDC 74.430. - Streets, Modifications of Requirements in Cases of Unusual Conditions.**

#### **Finding:**

*The City Engineer has found that no modifications are required. This section does not apply.*

**TDC 74.440 Streets, Traffic Study Required.**

**(1) The City Manager may require a traffic study to be provided by the applicant and furnished to the City as part of the development approval process as provided by this Code, when the City Manager determines that such a study is necessary in connection with a proposed development project in order to:**

**(a) Assure that the existing or proposed transportation facilities in the vicinity of the proposed development are capable of accommodating the amount of traffic that is expected to be generated by the proposed development, and/or**

**(b) Assure that the internal traffic circulation of the proposed development will not result in conflicts between on-site parking movements and/or on-site loading movements and/or on-site traffic movements, or impact traffic on the adjacent streets.**

**(2) The required traffic study must be completed prior to the approval of the development application.**

**(3) The traffic study must include, at a minimum:**

**(a) an analysis of the existing situation, including the level of service on adjacent and impacted facilities.**

**(b) an analysis of any existing safety deficiencies.**

**(c) proposed trip generation and distribution for the proposed development.**

**(d) projected levels of service on adjacent and impacted facilities.**

**(e) recommendation of necessary improvements to ensure an acceptable level of service for roadways and a level of service of at least D and E for signalized and unsignalized intersections respectively, after the future traffic impacts are considered.**

**(f) The City Manager will determine which facilities are impacted and need to be included in the study.**

**(g) The study must be conducted by a registered engineer.**

**(4) The applicant must implement all or a portion of the improvements called for in the traffic study as determined by the City Manager.**

**Finding:**

*A Traffic Study conducted by Mackenzie was submitted as Exhibit A4 and did not recommend any improvements. The study recommendations and mitigation stated:*

*All study area intersections currently operate within City of Tualatin mobility standards except the SW Tualatin Road/SW Teton Avenue intersection. The northbound left-turn movement at this location currently has a delay greater than 90 seconds which exceeds the City's LOS E standard for an unsignalized intersection, as reported by Synchro software; however, video observations of existing conditions show delays for this movement are closer to 14 seconds. Similarly, the delay reported by SimTraffic for existing conditions is approximately 27 seconds. Therefore, we estimate the delay under 2024 post-development conditions will be approximately 40 seconds as reported by SimTraffic software, and corresponding with an LOS E.*

*All other study area intersections are projected to operate at acceptable levels, as reported by Synchro software. While queues during the peak 15-minute periods of the morning and afternoon show some queuing that exceeds available storage, queues for the remainder of the AM and PM peak hours are expected to be accommodated within existing queue storage areas. Therefore, no other improvements are recommended at this time.*



*City staff has reviewed the subject analysis and has determined that it meets the above requirements. This standard is met.*

**TDC 74.450. - Bikeways and Pedestrian Paths.**

**(1) Where proposed development abuts or contains an existing or proposed bikeway, pedestrian path, or multi-use path, as set forth in TDC Chapter 11, Transportation Figure 11-4, the City may require that a bikeway, pedestrian path, or multi-use path be constructed, and an easement or dedication provided to the City.**

**(2) Where required, bikeways and pedestrian paths must be provided as follows:**

**(a) Bike and pedestrian paths must be constructed and surfaced in accordance with the Public Works Construction Code.**

**(b) The applicant must install the striping and signing of the bike lanes and shared roadway facilities, where designated.**

**Finding:**

*The proposal is adjacent to SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road. All roadways require a sidewalk and bike lane on Tualatin Comprehensive Plan Map 8-4. The City Engineer has reviewed the proposal and found required bikeways are existing. These standards are met.*

[...]

**TDC 74.470 Street Lights.**

**(1) Street light poles and luminaries must be installed in accordance with the Public Works Construction Code.**

**(2) The applicant must submit a street lighting plan for all interior and exterior streets on the proposed development site prior to issuance of a Public Works Permit.**

**Finding:**

*The proposal abuts SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road which requires street lights. With recommended Conditions of Approval A3 and A17, these standards are met.*

[...]

**TDC 74.485. - Street Trees.**

[...]

**(2) In nonresidential subdivisions and partitions street trees must be planted by the owners of the individual lots as development occurs.**

**(3) The Street Tree Ordinance specifies the species of tree which is to be planted and the spacing between trees.**

**Finding:**

*The Landscape Plan submitted as Exhibit A2, illustrates selected street tree species and spacing. With recommended Condition of Approval A3, these standards are met.*

**TDC 74.610 Water Service.**

**(1) Water lines must be installed to serve each property in accordance with the Public Works Construction Code. Water line construction plans must be submitted to the City Manager for review and approval prior to construction.**

[...]

**(3) As set forth is TDC Chapter 12, Water Service, the City has three water service levels. All development applicants must be required to connect the proposed development site to the service level in which the development site is located. If the development site is located on a boundary line between two service levels the applicant must be required to connect to the service level with the higher reservoir elevation. The applicant may also be required to install or provide pressure reducing valves to supply appropriate water pressure to the properties in the proposed development site.**

**Finding:**

*Utility Plans, submitted as Exhibit A2, illustrate the proposed office building will be served by a 3-inch diameter domestic and an 8-inch diameter fire service lateral with associated meter and fire vault to the public main north of SW Leveton Drive.*

*A gate valve will be located near the main for each water lateral. A public utility easement will surround the water meter and fire vault by five feet.*

*The City's consultant Consor provided a Water System Capacity Analysis (Exhibit E) which did not recommend additional public water infrastructure improvements were required to serve this development. With recommended Condition of Approval A4 these standards are met.*

**TDC 74.620 Sanitary Sewer Service.**

**(1) Sanitary sewer lines must be installed to serve each property in accordance with the Public Works Construction Code. Sanitary sewer construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.**

**(2) If there are undeveloped properties adjacent to the proposed development site which can be served by the gravity sewer system on the proposed development site, the applicant must extend public sanitary sewer lines to the common boundary line with these properties. The lines must be sized to convey flows to include all future development from all up stream areas that can be expected to drain through the lines on the site, in accordance with the City's Sanitary Sewer System Master Plan, TDC Chapter 13.**

**Finding:**

*Utility Plans, submitted as Exhibit A2, illustrate the proposed office building will be served by a six-inch sanitary sewer lateral connected to an existing stub off a manhole to serve the proposed building. With recommended Condition of Approval A5, this standard is met.*

**TDC 74.630 Storm Drainage System.**

**(1) Storm drainage lines must be installed to serve each property in accordance with City standards and Clean Water Services standards. Storm drainage construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.**

**(2)The storm drainage calculations must confirm that adequate capacity exists to serve the site. The discharge from the development must be analyzed in accordance with the City's Storm and Surface Water Regulations and Clean Water Services standards.**

[...]

**Finding:**

*As shown on the Utility Plans, submitted as Exhibit A2, the proposal includes a connection to stormwater lines within SW 108th Avenue right-of-way that flow south towards a public drywell at the intersection of SW 108th Avenue and SW Leveton Drive. Final plans and stormwater calculations will demonstrate that the development has direct access by gravity to the public stormwater system with adequate infiltration and/or downstream capacity in accordance with City of Tualatin and Clean Water Service standards.*

*A Clean Water Services' Service Provider Letter and Memorandum were received. After land use decision issuance the applicant will submit final plans complying with the Service Provider Letter conditions and CWS Memorandum that are sufficient to obtain a Stormwater Connection Permit Authorization Letter from Clean Water Services in accordance with TDC 74.650(2) and CWS D&CS 3.01.2(d). With recommended Condition of Approval A6 these standards are met.*

**TDC 74.640 Grading.**

**(1) Development sites must be graded to minimize the impact of storm water runoff onto adjacent properties and to allow adjacent properties to drain as they did before the new development.**

**(2) A development applicant must submit a grading plan showing that all lots in all portions of the development will be served by gravity drainage from the building crawl spaces; and that this development will not affect the drainage on adjacent properties. The City Manager may require the applicant to remove all excess material from the development site.**

**Finding:**

*The plans indicate disturbance of approximately 4.27 acres. Final plans may include over 5 acres of disturbance based on conditions of approval. Erosion and sediment control plans and permit applications conforming to the requirements of the City of Tualatin, CWS, and Oregon Department of Environmental Quality must be provided with the construction permit submittal documents. The applicant must obtain an erosion control permit from the City of Tualatin for disturbance greater than 500 square feet and a National Pollution Discharge Elimination System (NPDES) 1200-C Construction Erosion Control permit from Oregon DEQ for over 5 acres.*

*With recommended Conditions of Approval A6 and A7, these standards are met.*

**TDC 74.650 Water Quality, Storm Water Detention and Erosion Control.**

**The applicant must comply with the water quality, storm water detention and erosion control requirements in the Surface Water Management Ordinance. If required:**

[...]

**(2)On all other development applications, prior to issuance of any building permit, the applicant must arrange to construct a permanent on-site water quality facility and storm water detention facility and submit a design and calculations indicating that the requirements of the Surface Water Management Ordinance will be met and obtain a Stormwater Connection Permit from Clean Water Services.**

**(3)For on-site private and regional non-residential public facilities, the applicant must submit a stormwater facility agreement, which will include an operation and maintenance plan provided by the**

**City, for the water quality facility for the City's review and approval. The applicant must submit an erosion control plan prior to issuance of a Public Works Permit. No construction or disturbing of the site must occur until the erosion control plan is approved by the City and the required measures are in place and approved by the City.**

**Finding:**

*A Stormwater Report has been submitted as Exhibit A5 which proposes both modifying existing stormwater facilities and constructing new stormwater facilities to provide treatment, hydromodification, and detention for all private impervious areas.*

*A Clean Water Services Service Memorandum was received and included as Exhibit C. After land use decision issuance, the applicant must submit final plans complying with the Service Provider Letter conditions and CWS Memorandum that are sufficient to obtain a Stormwater Connection Permit Authorization Letter from Clean Water Services in accordance with TDC 74.650(2) and CWS D&CS 3.01.2(d).*

*With recommended Conditions of Approval A2, A6, and A9 this standard is met.*

**TDC 74.660 Underground.**

**(1) All utility lines including, but not limited to, those required for gas, electric, communication, lighting and cable television services and related facilities must be placed underground. Surface-mounted transformers, surface-mounted connection boxes and meter cabinets may be placed above ground. Temporary utility service facilities, high capacity electric and communication feeder lines, and utility transmission lines operating at 50,000 volts or above may be placed above ground. The applicant must make all necessary arrangements with all utility companies to provide the underground services. The City reserves the right to approve the location of all surface-mounted transformers.**

**(2) Any existing overhead utilities may not be upgraded to serve any proposed development. If existing overhead utilities are not adequate to serve the proposed development, the applicant must, at their own expense, provide an underground system. The applicant must be responsible for obtaining any off-site deeds and/or easements necessary to provide utility service to this site; the deeds and/or easements must be submitted to the City Manager for acceptance by the City prior to issuance of the Public Works Permit.**

**Findings:**

*The Utility Plan illustrates reconstruction of the west side of SW 108th Avenue to include a planter strip and ADA compliant sidewalk. The improvements will extend from SW Leveton Drive to SW Tualatin Road including undergrounding of overhead utilities as approved by the City Engineer. With recommended Conditions of Approval A3 and A17 these standards are met.*

**TDC 74.765. - Street Tree Species and Planting Locations.**

**All trees, plants or shrubs planted in the right-of-way of the City must conform in species and location and in accordance with the street tree plan and City standards, including Table 74-1. If the City Manager determines that none of the species in City standards, including Table 74-1 is appropriate or finds appropriate a species not listed, the City Manager may substitute an unlisted species.**



Species Common Names	Planting Strip Width (feet)			Power line compatible	Spacing on center (feet)
	4	5	6+		
Amur Maackia	•	•	•	•	30
Amur Maple	•	•	•	•	30
Armstrong Maple	•	•	•		30
Autumn Applause Ash		•	•		30
Black Tupelo	•	•	•		30
Capital Flowering Pear	•	•	•		30
Cascara	•	•	•	•	30
Crimson King Maple		•	•		30
Crimson Sentry Maple	•	•	•	•	30
Eastern Redbud	•	•	•		30
European Hornbeam	•	•	•	•	30
Frontier Elm			•		60
Ginko		•	•		30
Globe Sugar Maple			•		60
Golden Desert Ash	•	•	•	•	30
Goldenrain	•	•	•		30
Greenspire Linden		•	•		30
Ivory Japanese Lilac	•	•	•	•	30
Leprechaun Ash	•	•	•		30
Persain Parrotia	•	•	•		30
Purple Beech	•	•	•		30
Raywood Ash		•	•	•	30
Katsura	•	•	•		30
Red Oak			•		60
Red Sunset Maple			•		60
Scanlon/Bowhall Maple	•	•	•		30
Scarlet Oak			•		60
Shademaster Honey Locust		•	•		30
Skyrocket English Oak	•	•	•		30
Japanese snowbell	•	•	•	•	30
Sourwood	•	•	•	•	30
Tall Stewartia	•	•	•	•	30
Chinese Fringetree	•	•	•	•	30
Tri-Color Beech			•		60
Trident Maple	•	•	•	•	30
Urbanite Ash		•	•		30
Yellowwood	•	•	•		30
Zelkova Musashino	•	•	•		30

**Finding:**

*The Landscape Plan submitted as Exhibit A2, illustrates Persian Parrotia street trees along SW 108<sup>th</sup> Avenue. With recommended Condition of Approval A3, this standard is met.*

**Chapter 75 Access Management**

[...]

**TDC 75.020. - Permit for New Driveway Approach**

- (1) Applicability.** A driveway approach permit must be obtained prior to constructing, relocating, reconstructing, enlarging, or altering any driveway approach.
- (3) Procedure Type.** A Driveway Approach Permit is processed as a Type II procedure under TDC 32.220 (Type II).
- (4) Submittal Requirements.** In addition to the application materials required by TDC 32.140, the following application materials are also required:
  - (a)** A site plan, of a size and form and in the number of copies meeting the standards established by the City Manager, containing the following information:
    - (i)** The location and dimensions of the proposed driveway approach;
    - (ii)** The relationship to nearest street intersection and adjacent driveway approaches;
    - (iii)** Topographic conditions;
    - (iv)** The location of all utilities;
    - (v)** The location of any existing or proposed buildings, structures, or vehicular use areas;
    - (vi)** The location of any trees and vegetation adjacent to the location of the proposed driveway approach that are required to be protected pursuant to TDC Chapter 73B or 73C; and
    - (vii)** The location of any street trees adjacent to the location of the proposed driveway approach.
  - (b)** Identification of the uses or activities served, or proposed to be served, by the driveway approach; and
  - (c)** Any other information, as determined by the City Manager, which may be required to adequately review and analyze the proposed driveway approach for conformance with the applicable criteria.
- (5) Criteria.** A Driveway Approach Permit must be granted if:
  - (a)** The proposed driveway approach meets the standards of this Chapter and the Public Works Construction Code;
  - (b)** No site conditions prevent placing the driveway approach in the required location;
  - (c)** The number of driveway approaches onto an arterial are minimized;
  - (d)** The proposed driveway approach, where possible:
    - (i)** Is shared with an adjacent property; or
    - (ii)** Takes access from the lowest classification of street abutting the property;
  - (e)** The proposed driveway approach meets vision clearance standards;
  - (f)** The proposed driveway approach does not create traffic hazards and provides for safe turning movements and access;
  - (g)** The proposed driveway approach does not result in significant adverse impacts to the vicinity;
  - (g)** The proposed driveway approach minimizes impact to the functionality of adjacent streets and intersections; and
  - (i)** The proposed driveway approach balances the adverse impacts to residentially zoned property and the functionality of adjacent streets.

[...]

**Finding:**

*Plans submitted under Exhibit A2 indicate that two driveways are proposed to SW 108<sup>th</sup> Avenue which is designated a collector street. These driveways were also reviewed in the traffic study submitted as Exhibit A4. With recommended Condition of Approval A3 these standards are met.*

#### **TDC 75.040. - Driveway Approach Requirements**

**(1) The provision and maintenance of driveway approaches from private property to the public streets as stipulated in this Code are continuing requirements for the use of any structure or parcel of real property in the City of Tualatin. No building or other permit may be issued until scale plans are presented that show how the driveway approach requirement is to be fulfilled. If the owner or occupant of a lot or building changes the use to which the lot or building is put, thereby increasing driveway approach requirements, it is unlawful and a violation of this code to begin or maintain such altered use until the required increase in driveway approach is authorized by the City.**

**(2) Owners of two or more uses, structures, or parcels of land may agree to utilize jointly the same driveway approach when the combined driveway approach of both uses, structures, or parcels of land satisfies their combined requirements as designated in this code; provided that satisfactory legal evidence is presented to the City Attorney in the form of deeds, easements, leases or contracts to establish joint use. Copies of said deeds, easements, leases or contracts must be placed on permanent file with the City Recorder.**

**(3) Joint and Cross Access.**

**[...]**

**(b) A system of joint use driveways and cross access easements may be required and may incorporate the following:**

**(i) A continuous service drive or cross access corridor extending the entire length of each block served to provide for driveway separation consistent with the access management classification system and standards;**

**(ii) A design speed of ten mph and a maximum width of 24 feet to accommodate two-way travel aisles designated to accommodate automobiles, service vehicles, and loading vehicles;**

**(iii) Stub-outs and other design features to make it visually obvious that the abutting properties may be tied in to provide cross access via a service drive; and**

**(iv) An unified access and circulation system plan for coordinated or shared parking areas.**

**(c) Pursuant to this section, property owners may be required to:**

**(i) Record an easement with the deed allowing cross access to and from other properties served by the joint use driveways and cross access or service drive;**

**(ii) Record an agreement with the deed that remaining access rights along the roadway will be dedicated to the city and pre-existing driveways will be closed and eliminated after construction of the joint-use driveway;**

**(iii) Record a joint maintenance agreement with the deed defining maintenance**

**responsibilities of property owners; and (iv) If subsection (i) through (iii) above involve access to the state highway system or county road system, ODOT or the county must be contacted and must approve changes to subsection (i) through (iii) above prior to any changes.**

**[...]**

**(4) Requirements for Development on Less than the Entire Site.**

**(a) To promote unified access and circulation systems, lots and parcels under the same ownership or consolidated for the purposes of development and comprised of more than one building site must be reviewed as one unit in relation to the access standards. The number of access points permitted must be the minimum number necessary to provide reasonable access to these properties, not the maximum available for that frontage. All necessary easements, agreements, and stipulations must be met. This must also apply to phased development plans. The owner and all lessees within the affected area must comply with the access requirements.**

**(b) All access must be internalized using the shared circulation system of the principal commercial development or retail center. Driveways should be designed to avoid queuing across surrounding parking and driving aisles.**

**(5) Lots that front on more than one street may be required to locate motor vehicle accesses on the street with the lower functional classification as determined by the City Manager.**

**(6) Except as provided in TDC 53.100, all driveway approach must connect directly with public streets.**

**(7) To afford safe pedestrian access and egress for properties within the City, a sidewalk must be constructed along all street frontage, prior to use or occupancy of the building or structure proposed for said property. The sidewalks required by this section must be constructed to City standards, except in the case of streets with inadequate right-of-way width or where the final street design and grade have not been established, in which case the sidewalks must be constructed to a design and in a manner approved by the City Manager. Sidewalks approved by the City Manager may include temporary sidewalks and sidewalks constructed on private property; provided, however, that such sidewalks must provide continuity with sidewalks of adjoining commercial developments existing or proposed. When a sidewalk is to adjoin a future street improvement, the sidewalk construction must include construction of the curb and gutter section to grades and alignment established by the City Manager.**

**(8) The standards set forth in this Code are minimum standards for driveway approaches, and may be increased through the Architectural Review process in any particular instance where the standards provided herein are deemed insufficient to protect the public health, safety, and general welfare.**

**(9) Minimum driveway approach width for uses are as provided in Table 75-1 (Driveway Approach Width):**

<b>TABLE 75-1 Driveway Approach Width</b>		
<b>Use</b>	<b>Minimum Driveway Approach Width</b>	<b>Maximum Driveway Approach Width</b>
<b>Industrial</b>	36 feet	Over 250 Parking Spaces = As Required by the City Manager, but not exceeding 40 feet

**(10) Driveway Approach Separation. There must be a minimum distance of 40 feet between any two adjacent driveways on a single property unless a lesser distance is approved by the City Manager.**

**(11) Distance between Driveways and Intersections. Except for single-family dwellings, duplexes, townhouses, triplexes, quadplexes, and cottage clusters, the minimum distance between driveways and intersections must be as provided below. Distances listed must be measured from the stop bar at the intersection.**

**(a) At the intersection of collector or arterial streets, driveways must be located a minimum of 150 feet from the intersection.**

[...]

**(12) Vision Clearance Area.**

[...]

**(b) Collector Streets. A vision clearance area for all collector/arterial street intersections, collector/arterial street and local street intersections, and collector/arterial street and railroad intersections must be that triangular area formed by the right-of-way lines along such lots and a straight line joining the right-of-way lines at points which are 25 feet from the intersection point of the right-of-way lines, as measured along such lines. Where a driveway intersects with a collector/arterial street, the distance measured along the driveway line for the triangular area must be ten feet (see Figure 73-2 for illustration).**



**(c) Vertical Height Restriction.** Except for items associated with utilities or publicly owned structures such as poles and signs and existing street trees, no vehicular parking, hedge, planting, fence, wall structure, or temporary or permanent physical obstruction must be permitted between 30 inches and eight feet above the established height of the curb in the clear vision area (see Figure 73-2 for illustration).

**Finding:**

*Plans (Exhibit A2) new accesses are proposed to SW 108th Avenue. Condition A3 will necessitate moving the southern proposed driveway to 108th to be opposite an existing driveway more than 300 feet (centerline to centerline) from the intersection of 108th Ave with Leveton Drive. These accesses were evaluated within the traffic report included as Exhibit A4. With recommended Conditions of Approval A3 and A25, these standards are met.*

[...]

**TDC 75.140. - Existing Streets Access Standards.**

The following list describes in detail the freeways and arterials as defined in TDC 75.050 with respect to access. Recommendations are made for future changes in accesses and location of future accesses. These recommendations are examples of possible solutions and shall not be construed as limiting the City's authority to change or impose different conditions if additional studies result in different recommendations from those listed below.

[...]

**(15) LEVETON DRIVE.**

**(a) 108th Avenue to 118th Avenue.**

**(i) On the north side of Leveton Drive, [...] Novellus (2S122AA 500 and 2S122AB 100) shall be permitted three driveways located approximately 25 feet and 950 feet from the west property line for Tax Lot 100 and 600 feet west of 108th Avenue for Tax Lot 500.**

**Finding:**

*The Site Plan illustrates multiple existing accesses: one to SW 108th Avenue, three to SW Leveton Drive, and one emergency vehicle only to SW Tualatin Road via a lot to the west. This standard is met.*

### III. RECOMMENDATION

Based on the application materials and analysis and findings presented above, staff finds that the applicable criteria have been met relative to AR 22-0006, and therefore recommend approval of this application with the following conditions of approval:

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**GENERAL:**

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- A1. This Architectural Review approval shall expire after two years unless a building, or grading permit submitted in conjunction with a building permit application, has been issued and substantial construction pursuant thereto has taken place and an inspection performed by a member of the Building Division, or an extension is granted under TDC 33.020(10).

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**PRIOR TO EROSION CONTROL, PUBLIC WORKS, AND WATER QUALITY PERMIT ISSUANCE:**

---

*Submit to [eTrakit](#) for review and approval:*

- A2. The applicant must apply for applicable Engineering Erosion Control, Water Quality, and Public Works permits:
- a. Apply using [eTrakit](#). With the initial Engineering permit(s) application(s) include:
    - i. One combined set of 24"x36" plans including all applicable Engineering permits attached to one Engineering permit. Include a note on other Engineering permits stating which application includes the set.
    - ii. Payment for an Erosion Control permit fee per the fee schedule.
    - iii. Engineering estimate and deposit for each Water Quality or Public Works permit per the fee schedule.
  - b. Deliver two 24"x36" hard copies of the combined Engineering permit plan sets to:  
City of Tualatin  
Attn: Engineering Division c/o Hayden Ausland, Principal Engineer, PE  
10699 SW Herman Road  
Tualatin, OR 97062
- A3. The applicant must submit Final Street Improvement Plans for SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road in accordance with applicable sections of Tualatin Development Code (TDC) 74 and 75 and Public Works Construction Code (PWCC) that show:
- a. Dedication of half-street right-of-ways to total 37 feet from centerline for SW Leveton Drive and SW Tualatin Road.
  - b. For SW 108th Avenue from SW Leveton Drive to SW Tualatin Road:
    - i. Dedication of adequate right-of-way to construct required public improvements with a minimum of a half-street total of 38 feet from centerline for SW 108th Avenue;
    - ii. A minimum 6-foot-wide planter strip on the west side including:
      - 1. Curb;
      - 2. Replace existing street lights with the LED, Option A standard;
      - 3. Street trees; and
      - 4. Public LIDA stormwater street swales within an adequately wide planter strip or:

- a. Proof that the existing public drywell at the intersection of SW 108th Avenue and SW Leveton Drive has capacity to accommodate stormwater requirement due to addition and modification of public impervious area; and,
    - b. Meet any and all requirements from DEQ for continued use of said public drywell.
    - iii. A 6-foot-wide sidewalk;
    - iv. Undergrounding overhead utilities as approved by the City Engineer; and
    - v. Ramp replacement on the west side of the intersection of SW 108th Avenue and SW Leveton Drive for both north (sending) and south (receiving).
  - c. An 8-foot-wide public utility easement, or existing equivalent approved by the City Engineer, and any required slope easements adjacent to SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road including five feet of public utility easement surrounding water meter, backflow protection, and fire vault;
  - d. All adjacent public sidewalks for all lots involved with this development within compliance of ADA standards or replacement of necessary driveways, ramps, and panels to bring into compliance;
  - e. All proposed driveways:
    - i. A minimum distance of 300 feet from intersections of SW 108th Avenue & SW Leveton Drive and SW 108th Avenue & SW Tualatin Road; and
    - ii. Opposing existing driveways or offset a minimum of 150 feet.
  - f. Turning movement diagrams showing all existing and proposed driveways operate without adverse impact to public rights-of-way as determined by the City Engineer:
    - i. Identify any driveways privately restricted for specific passenger vehicles or truck use, proposed private signage necessary to control movement, and a circulation plan;
    - ii. Onsite signage and maintenance plan for onsite signage as approved by the City Engineer; and
    - iii. Show existing and proposed curb radii are able to accommodate associated allowed vehicular movements.
  - g. Replacement of concrete doweled panels impacted by construction as determined by the City Engineer.
- A4. The applicant must submit Final Water System Plans in accordance with Tualatin Development Code (TDC) 74.610, Tualatin Municipal Code (TMC) 3-3, and Public Works Construction Code (PWCC) that show:
- a. A gate valve at the main for both domestic and fire service laterals; and
  - b. Adjacent to SW Leveton Drive right-of-way:
    - i. A reduced pressure backflow prevention and water meter for the domestic lateral;
    - ii. The water meter behind the curb within the planter strip;
    - iii. If within final plans, irrigation after a domestic meter and reduced pressure backflow device; and
    - iv. The fire vault surrounded by a five foot public utility easement.

- A5. The applicant must submit Final Sanitary Sewer System Plans in accordance with Tualatin Development Code (TDC) 74.620, Tualatin Municipal Code (TMC) 3-2, and Public Works Construction Code (PWCC) that show location of the lines, grade, materials, and other details.
- A6. The applicant must submit:
- a. A DEQ Rule Authorization letter with associated plans indicating approval and any and all required modifications to accommodate stormwater from new and modified public impervious areas within the existing public drywell at the intersection of SW 108th Avenue and SW Leveton Drive.
  - b. Final Stormwater System Calculations and Plans in accordance with Tualatin Development Code (TDC) 74.630 and 74.650, Tualatin Municipal Code (TMC) 3-5-200 through 3-5-430, Public Works Construction Code (PWCC), and Clean Water Services' (CWS) Design & Construction Standards (D&CS) Chapter 4 stamped by an Oregon registered, professional engineer in accordance with TMC 3-5-390(1) that:
    - i. Provide a downstream analysis, including but not limited to erosion, and include solutions within final plans for ¼ mile downstream from the release from the private development through the public stormwater system, in accordance with TMC 3-5-210(4);
    - ii. Accommodate up to a 25-year storm event within the public stormwater system with a maximum capacity of 82% in accordance with TDC 74.640 and CWS D&CS 5.05.2.d and the City Engineer;
    - iii. Address runoff from all new and modified private and public impervious areas; and,
    - iv. Prove gravity flow five feet from the outside of the established line of the building to the public stormwater system or as otherwise approved by the City Engineer, in accordance with CWS D&CS 1.03.39 and 5.09.3(a) (1) and (4);
    - v. Discharge to an approved public system;
    - vi. Treat new and modified impervious areas in accordance with CWS D&CS 4.08.1.d meeting phosphorous removal in accordance with TMC 3-5-350 per the design storm in accordance with TMC 3-5-360 and CWS D&CS 4.08.2;
    - vii. Detain up to the 25-year storm event in accordance with TMC 3-5-220, TMC 3-5-230, and CWS D&CS 4.08;
    - viii. Accommodate hydromodification including post-development runoff rates not exceeding pre-development runoff rates for ½ the 2-year storm event and the 5-year and 10-year storm events for proposed new and modified impervious areas in accordance with CWS D&CS 4.03.5; and
    - ix. In accordance with TDC 74.650(2) and CWS D&CS 3.01.2(d), comply with:
      1. The submitted Clean Water Services' Service Provider Letter CWS File Number dated July 12, 2022 conditions to obtain a Stormwater Connection Permit Authorization Letter; and
      2. Requirements stated within the Clean Water Services' Memorandum dated November 8, 2022.
  - c. Financial assurance for construction performance in accordance with TMC 3-390(3), PWCC 102.14.00, and amount per CWS D&CS 2.07 Table 2-1; and
  - d. A copy of the recorded private stormwater maintenance agreement in accordance with TMD 3-5-390(4). The agreement must assure the owner as responsible for maintenance of the



constructed portions of private stormwater systems within their lot. The identified system must include all conveyance, detention, hydromodification, and treatment.

- A7. The applicant must submit Final Erosion Control Plans in accordance with Tualatin Development Code (TDC) 74.640, Tualatin Municipal Code (TMC) 3-5-050 and 3-5-060, Public Works Construction Code (PWCC), and Clean Water Services' (CWS) Design & Construction Standards (D&CS) Chapters 2 and 6 that:
- a. Minimize the impact of stormwater from the development to adjacent properties; and
  - b. Plans sufficient to either:
    - i. Obtain a National Pollution Discharge Elimination System (NPDES) 1200-CN Stormwater Discharge Permit from Clean Water Services as an agent of Oregon Department of Environmental Quality if disturbance is between 1 and 5 acres; or,
    - ii. Obtain a National Pollution Discharge Elimination System (NPDES) 1200-C Construction Erosion Control permit from Oregon DEQ.

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**PRIOR TO BUILDING PERMIT ISSUANCE:**

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*Submit to [eTrakit](#) for review and approval:*

- A8. The applicant must submit a copy of recorded public utility and slope easements, as approved by the City Engineer, and deeds of right-of-way dedication in accordance with Tualatin Development Code (TDC) 74.210 and 74.330 which show:
- a. An 8-foot-wide public utility and any necessary slope easement, adjacent to SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road including five feet of public utility easement surrounding proposed water meter, backflow protection, and fire vault; and
  - b. Half-street right-of-way dedication from centerline for a total of 38 feet for SW 108th Avenue and 37 feet for both SW Leveton Drive and SW Tualatin Road and any additional dedication for SW 108th Avenue to accommodate and any final public stormwater LIDA facilities.
- A9. The applicant must obtain:
- a. A National Pollution Discharge Elimination System (NPDES) 1200-C Construction Erosion Control permit from Oregon DEQ; and
  - b. Erosion Control, Public Works, and Water Quality Permits from the City of Tualatin.
- A10. The applicant must pay a fee-in-lieu of construction, as determined by the City Engineer, for any new PGE Option A street lights associated with reconstruction of the west side of SW 108<sup>th</sup> Avenue, and any other street lights (associated with the development) that will be in public right-of-way and/or city responsibility.
- A11. The applicant must submit a Final Site Plan Set (in PDF format) to the Planning Division that is in substantial conformance to the submitted site plans and includes:
- a. Trees identified in Tree Assessment Report (Exhibit A3) must be identified on the landscaping and grading plan, consistent with TDC 73B.080(3). Tree protection fencing and other preservation measures recommended by the Arborist should also be specified on the grading plan.

- b. Walkways that are a minimum of 6 feet in width; constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete; and meet ADA standards at time of construction, consistent with TDC 73A.300(1).
- c. As a substitute for building perimeter landscaping, plazas that are developed with pavers, bricks, or other surfaces and contain pedestrian amenities, such as: benches, tables with umbrellas, shade trees, and canopies must be provided along building perimeters viewable by the general public from parking lots or the public right-of-way, in conformance with TDC 73B.040(1). This requirement does not apply to loading areas, bicycle parking areas, and pedestrian entrances.
- d. A minimum of 192 parking spaces at an applied rate of 1.6 spaces per 1,000 square feet of gross floor area, consistent with TDC 73C.010(2)(a)(iv).
- e. Details to demonstrate that proposed bicycle parking meets the standards of TDC 73C.050(2)(a)-(c), and that a minimum of 12 short-term and 5 long-term bicycle parking spaces are provided, in conformance with TDC 73C.100(1).
- f. A minimum of 8 vanpool or carpool parking spaces, consistent with TDC 73C.100(2).
- g. A minimum of 3 loading facilities that are a no less than 12 feet wide x 35 feet long with an unobstructed height of 14 feet, or evidence that adequate loading facilities exist on the same lot as the proposed office building, consistent with TDC 73C.120.
- h. In accordance with IMP 22-0001, parking lot landscaping for the north-half of the site must follow the standard requirements of TDC Chapter 73C. To accommodate grade changes, an alternative method of parking lot landscaping is acceptable for terraced parking lots proposed for the south-half of the site. These lots must provide a minimum landscape island area of 25 square feet per parking stall and comply with the following:
  - i. Landscape separation that is a minimum of five feet in width is required for every twelve continuous spaces in a row;
  - ii. Landscaping strip that is a minimum of ten feet in width must be placed in between rows of facing vehicles;
  - iii. Must be planted with one deciduous shade trees for every four parking spaces, with required trees evenly dispersed throughout the parking lot;
  - iv. Must be planted with groundcover or shrubs; and
  - v. Native plant materials are encouraged.
- i. Demonstrate that an adequate waste and recyclables management solution is provided in compliance with TDC 73D. If the minimum standards method is chosen, a minimum of 490 square feet of trash enclosure area must be shown on the plans. These facilities must comply with the location, design, and access standards in TDC 73D.070.
- j. In accordance with IMP 22-0001, building materials must consist of, or be complimentary to: masonry, sandstone, architectural metal siding, and window glazing. Color palettes must remain complimentary to earth toned shades.

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**DURING CONSTRUCTION ACTIVITY:**

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- A12. The applicant must install tree protection fencing consistent with the Tree Assessment Report submitted as Exhibit A3 and Section 73B.080(3). Please contact the Planning Division to schedule an inspection with a minimum of 48 hours' notice. Where site conditions make grading or other

similar encroachment upon a preserved tree's drip-line area, such grading or similar encroachment must only be permitted under the direction of a qualified arborist.

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**PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY:**

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- A13. Provide an identification system which clearly locates buildings and their entries for patrons and emergency services, pursuant to TDC 73A.300(4)(d). Building identification approved by TVF&R must be placed in a position that is plainly legible and visible from the street fronting the property. Numbers must contrast with their background, be a minimum of 4 inches high, and have a minimum stroke width of 1/2 inch.
- A14. Areas impacted by grading and all areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped, pursuant to TDC 73B.040(1)(a).
- A15. The applicant must install required vanpool and carpool signage, pursuant to TDC 73C.010(2)(a)(xi) and bicycle parking signage per MUTCD standards, pursuant to TDC 73C.050(2)(d).
- A16. The applicant must construct proposed buildings and all site improvements as illustrated on the approved Final Site Plan and Final Color Architectural Elevations. The applicant must contact the Planning Division for a site inspection at least 72 hours prior to requesting a certificate of occupancy. This inspection is separate from inspection(s) done by the Building Division.
- A17. The applicant must complete all the private stormwater and public improvements as shown on the approved permit plans. All improvements must also be accepted by the City in accordance with Tualatin Development Code (TDC) 74.120.
- A18. The applicant must submit paper and electronic as-builts of the Engineering permits along with maintenance bonds and any final fees for public and water quality improvements.

---

**THE FOLLOWING ITEMS APPLY TO THE SITE IN AN ON-GOING MANNER:**

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- A19. All uses must be conducted within a completely enclosed building, except off-street parking and loading, and basic utilities, pursuant to TDC 62.210(5).
- A20. The proposed development must comply with the Environmental Regulations of TDC 63.
- A21. All mechanical equipment must be screened in accordance with TDC 73A.300(5). Prior to approval of a mechanical permit, the applicant or property owner must submit scaled elevations illustrating that above-grade or on-grade equipment will be screened by parapet, sight-obscuring fence, landscaping, or other method.
- A22. All sign permits require separate sign permit approval per TDC Chapter 38. This approval does not constitute sign permit approval.

- A23. All site, building exterior, and landscaping improvements approved through the AR process must be continually maintained, so as to remain substantially similar to original approval through the AR process, except as permitted under TDC 33.020(7) (Modifications to Previously Approved Final Architectural Review Decisions).
- A24. All parking spaces shall be continuously maintained in compliance with the dimensional standards specified in TDC Figure 73-1 (Exhibit H).
- A25. No vehicular parking, hedge, planting, fence, wall structure, or temporary/permanent physical obstruction is permitted between 30 inches and eight feet above the established height of the curb in the vision clearance area specified in TDC Figure 73-2 (Exhibit I).

# MACKENZIE.

## **ARCHITECTURAL REVIEW – TYPE III**

**To**  
City of Tualatin

**For**  
Lam Research Building G

**Dated**  
August 17, 2022

**Project Number**  
2220087.00



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**ATTACHMENTS**

1. Land Use Application form
2. Plans
3. Title Report
4. Hydraulic Modeling Worksheet
5. Service Provider Letter (CWS)
6. Service Provider Letter (Republic Services)
7. Documentation of Neighborhood Meeting
8. Certification of Sign Posting
9. Transportation Impact Analysis
10. Stormwater Management Report



## I. PROJECT SUMMARY

**Applicant:** Lam Research Corporation

**Owner:** Lam Research Corporation  
11155 SW Leveton Drive  
Tualatin, OR 97062

**Site Address:** 11155-11361 SW Leveton Drive  
(West of SW 108th Avenue between SW Tualatin Road and SW Leveton Drive)

**Assessor Site Acreage:** 2S122AA00500 – 15.75 acres  
2S122AA00800 – 15.03 acres  
2S122AB00100 – 27.23 acres  
Total: 58.0 acres

**Zoning:** Industrial, Manufacturing Park (MP)

**Comprehensive Plan:** Manufacturing Park (MP)

**Adjacent Zoning:** Industrial, Manufacturing Park (MP)  
Industrial, Light Manufacturing (ML)  
Low Density Residential (RL)

**Request:** Approval of Type III Architectural Review for new office building (Building G) and associated parking lots and driveways

**Project Contact:** Suzannah Stanley  
Mackenzie  
1515 SE Water Avenue, Suite 100  
Portland, OR 97214  
971-346-3808  
sstanley@mcknze.com

## **II. INTRODUCTION**

### **Description of Request**

The applicant is requesting approval of a Type III Architectural Review for a new building and additional parking on this previously developed site, located in the Leveton Industrial District and the Manufacturing Park (MP) Planning District.

### **Site and Surrounding Land Use**

The existing site consists of three lots containing several buildings and associated facilities, parking areas, and landscaping. There are three main driveways into the campus from SW Leveton Drive, and one additional driveway entrance from Tualatin Road. To the west and south are additional MP-designated lots. On the southeast corner and to the east are Light Manufacturing (ML)-designated lots. To the north, across SW Leveton Drive, there is residential development in the is Low Density Residential (RL) Planning District, and in the Medium High Density Residential (RMH) District to the northwest.

### **Description of Proposed Development**

The proposal is for a new four-story building containing 120,000 SF of floor area in the southern part of the existing site, to the east and south of existing buildings. The new office building will be connected to the existing officing building to the west (Building C) via a skybridge). The proposed parking expansion of approximately 578 stalls will be east and northeast of the proposed building, as well as to the north of Building F. The new building and parking addition will allow Lam to increase employment at this location by approximately 600 employees. Two new access points will be provided on SW 108th Avenue, to provide direct access to the new parking area. The existing east access on SW Leveton Drive is proposed to be converted to a truck-only access with appropriate signage.

Aerial Image – Project Site



### III. ARCHITECTURAL REVIEW APPROVAL CRITERIA

This application addresses the necessary approval standards of the Tualatin Development Code relevant to Architectural Review for industrial development. As described in the following narrative, the proposal meets the standards of TDC *Chapter 62: Manufacturing Park Planning District (MP)*, *Chapter 73: Community Design Standards*, *Chapter 74: Public Improvement Requirements*, *Chapter 75: Access Management*, and specific standards applicable to the subject property under the approved Industrial Master Plan, IMP 00-001.

#### **Chapter 33 - Applications and Approval Criteria**

##### **Section 33.020. - Architectural Review.**

(2) *Applicability.*

- (a) *The following types of development are subject to Architectural Review:*
  - (i) *Any exterior modifications to improved or unimproved real property;*
  - (ii) *Any remodeling that changes the exterior appearance of a building;*
  - (iii) *Any site alteration which alters the topography, appearance or function of the site; and*
  - (iv) *Any change in occupancy from single family use to commercial or industrial use.*
- (b) *Examples of development subject to Architectural Review, include but are not limited to the following:*
  - (i) *New buildings, condominiums, townhouse, single family dwellings, or manufactured dwelling park;*
  - (ii) *Construction, installation, or alteration of a building or other structure;*
  - (iii) *Landscape improvements;*
  - (iv) *New, improved, or expanded parking lots;*
  - (v) *New, or alterations to, above ground public utility facilities, pump stations, pressure reading stations, water reservoirs, electrical substations, and natural gas pumping stations;*
  - (vi) *New wireless communication facilities, and new attached wireless communication;*
  - (vii) *Installation of decorative lighting; and*
  - (viii) *Exterior painting, awnings, or murals.*

**Response:** The proposal will include improving real property, altering the site, and adding a new building, landscape improvements, and new parking. See project description for detail. Therefore, the proposal is subject to Architectural Review.

(3) *Types of Architectural Review Applications—Procedure Type.*

- (f) *General Development. All development applications, (except Single Family Dwelling, duplex, townhouse, triplex, quadplex, or cottage cluster, Clear and Objective and Large Commercial, Industrial, and Multifamily Development) are subject to Type II Review.*
- (g) *Large Commercial, Industrial, and Multifamily Development. Development applications that propose any of the following are subject to Type III Review by the Architectural Review Board as the hearing body:*
  - (i) *New Commercial Buildings 50,000 square feet and larger;*
  - (ii) *New Industrial Buildings 150,000 square feet and larger; and*



- (iii) *New Multifamily Housing Projects with 100 units or more units (or any number of units abutting a single family district).*

**Response:** The proposed development includes a new 120,000 SF commercial office building which falls into the category of Large Commercial Buildings, requiring a Type III Review.

- (4) *Application Materials. The application must be on forms provided by the City. In addition to the application materials required by TDC 32.140 (Application Submittal), the following application materials are also required:*

- (a) *The project name and the names, addresses, and telephone numbers of the architect, landscape architect, and engineer on the project;*
- (b) *Existing conditions plan, site plan, grading plan, utility plan, landscape plan, and lighting plan all drawn to scale;*
- (c) *A building materials plan that includes a written description and image representation of facade, windows, trim, and roofing materials, colors, and textures;*
- (d) *Title report; and*
- (e) *A Service Provider Letter from Clean Water Services.*

**Response:** All required forms, information, plans, reports, and service provider letters as described above are attached and submitted with this narrative. This standard is met.

- (5) *Approval Criteria.*

- (c) *General Development. Applications for General Development must comply with the applicable standards and objectives in TDC Chapter 73A through 73G.*
- (d) *Large Commercial, Industrial, and Multifamily Development. Applications for Large Commercial, Industrial, and Multifamily Development must comply with the applicable standards and objectives in TDC Chapter 73A through 73G.*

**Response:** As shown in this narrative, the proposed new development complies with the applicable standards of TDC Chapter 73A through 73G. The approval criteria is met.

- (6) *Conditions of Approval.*

- (a) *Architectural Review decisions may include conditions of approval that apply restrictions and conditions that:*
  - (i) *Implement identified public facilities and services needed to serve the proposed development;*
  - (ii) *Implement identified public facilities and services needed to be altered or increased attributable to the impacts of the proposed development; and*
  - (iii) *Implement the requirements of the Tualatin Development Code.*
- (b) *Types of conditions of approval that may be imposed include, but are not limited to:*
  - (i) *Development Schedule. A reasonable time schedule placed on construction activities associated with the proposed development, or portion of the development.*
  - (ii) *Dedications, Reservation. Dedication or reservation of land, or the granting of an easement for park, open space, rights-of-way, bicycle or pedestrian paths, Greenway, Natural Area, Other Natural Area, riverbank, the conveyance of title or easements to the City or a non-profit conservation organization, or a homeowners' association.*
  - (iii) *Construction and Maintenance Guarantees. Security from the property owners in such an amount that will assure compliance with approval granted.*
  - (iv) *Plan Modifications. Changes in the design or intensity of the proposed development, or in proposed construction methods or practices, necessary to assure compliance with this chapter.*

- (v) *Other Approvals. Evaluation, inspections or approval by other agencies, jurisdictions, public utilities, or consultants, may be required for all or any part of the proposed development.*
- (vi) *Access Limitation. The number, location and design of street accesses to a proposed development may be limited or specified where necessary to maintain the capacity of streets to carry traffic safely, provided that sufficient access to the development is maintained.*

**Response:** These provisions authorize the City to impose conditions of approval on Architectural Review approvals, and require no evidence submittal or response from the applicant.

- (7) *Modifications to Previously Approved Final Architectural Review Decisions. An applicant who wishes to modify a previously approved final Architectural Review decision may utilize one of the following procedures: ...*

**Response:** The subject property is the site of multiple AR approvals under which all the existing buildings and other improvements have been constructed; however, the proposed building and parking improvements are in a site sub-area that is vacant but was previously identified for future development. Because the sub-area was not the subject of any specific requirements in previous AR approvals, it is not necessary or appropriate to process this application as a modification of any existing AR decision. It is preferable to process this application as a new AR for the previously undeveloped sub-area, while ensuring that the review and approval are informed by and consistent with existing AR approvals for the property as a whole. As noted above, the scale of the proposed development requires Type III review.

- (8) *Effective Date. The effective date of an Architectural Review decision or Minor Architectural Review decision is the date the notice of decision is mailed.*
- (9) *Permit Expiration. Architectural Review decisions (including Minor Architectural Review decisions) expire two years from the effective date unless the applicant has received a building, or grading permit submitted in conjunction with a building permit application, substantial construction has occurred pursuant to the building permit, and an inspection has been performed by a member of the Building Division.*

**Response:** These provisions govern the validity period of an AR approval, and require no evidence or response from the applicant.

- (10) *Extension of Permit Expiration...*

**Response:** This request is not an application for an extension. These provisions may become applicable if the applicant needs to request an extension following approval.

**Section 33.030. - Permit for New Driveway Approach and Closure Decisions.**

*All requests for driveway approaches and closures are as provided in TDC 75.020 and TDC 75.030.*

**Response:** See the responses to Chapter 75 below.

**Section 33.050. - Industrial Master Plans.**

**Response:** The project is part of Phase 1 of IMP 00-01, approved in 2001. A new IMP is proposed to modify the minimum parking area setback from SW Leveton Drive in condition of approval 1.b. of that IMP; see the IMP narrative submitted concurrently.

**Section 33.080. – Signs—Permits, Design Review, and Variances.**

- (1) *Purpose.* To implement the standards of TDC Chapter 38. Sign Variance review provides a public hearing process to review special situations that are not anticipated by the Sign Regulations in TDC Chapter 38, including TDC 38.100, 38.110, 38.120 and 38.140-38.240.
- (2) *Applicability.* The requirements of this section apply to sign permits, sign design review and sign variances as required in accordance with TDC Chapter 38.
- (3) *Procedure Type.* Sign permits, sign design review and variances are processed in accordance with the procedures in TDC Chapter 32 as follows:
  - (a) Sign Permits are subject to Type I review.
  - (b) Sign Design Reviews are subject to Type I review.
  - (c) Sign Variances are subject to Type III review.
- (4) *Specific Submittal Requirements.* In addition to the general submittal requirements in TDC 32.140 (Application Submittal), the applicant must submit the information required by TDC 38.070 (Sign Permit Process).
- (5) *Approval Criteria.*
  - (a) A Sign Permit may be granted if the City Manager finds that the proposed sign is in compliance with the regulations in TDC Chapter 38.
  - (b) Sign Design Review may be approved if the City Manager finds that the proposed sign is in compliance with the regulations in TDC Chapter 38 and the clear and objective standards in TDC 38.075.
  - (c) *Sign Variances.* All six of the following criteria must be met before a variance can be granted:
    - (i) A hardship is created by exceptional or extraordinary conditions applying to the property that do not apply generally to other properties in the same zone, and such conditions are a result of lot size or shape or topography over which the applicant or owner has no control;
    - (ii) The hardship does not result from actions of the applicant, owner or previous owner, or from personal circumstances, or from the financial situation of the applicant or owner or the company, or from regional economic conditions;
    - (iii) The variance is the minimum remedy necessary to eliminate the hardship;
    - (iv) The variance is necessary for the preservation of a property right of the owner substantially the same as is possessed by owners of other property in the same zone however, nonconforming or illegal signs on the subject property or on nearby properties does not constitute justification to support a variance request;
    - (v) The variance must not be detrimental to the general public health, safety and welfare, and not be injurious to properties or improvements in the vicinity; and
    - (vi) The variance must not be detrimental to any applicable Comprehensive Plan goals and policies.

**Response:** Building signage will be limited to address “B” signage, which will match what is currently on Building C. Two new monument signs will be added to the new entrances located off 108th which will match what is currently in use at all other driveway entrances. The monument sign on the far eastern drive from Leveton will be modified to indicate “deliveries only” from the current “Building A & B.”

**Section 33.110. - Tree Removal Permit/Review.**

- (2) *Applicability.* No person may remove a tree on private property within the City limits, unless the City grants a tree removal permit, consistent with the provisions of this Section.
- (3) *Exemptions.* The following actions are exempt from the requirements of a tree removal permit.
  - (a) *General Exemption.* Four or fewer trees may be removed within a single calendar year from a single parcel of property or contiguous parcels of property under the same ownership without a permit, if the tree is:
    - (i) Not located in the Natural Resource Protection Overlay District (NRPO);

- (ii) *Not located in the Wetlands Protection Area (WPA) of the Wetlands Protection District (WPD);*
- (iii) *Not a Heritage Tree; and*
- (iv) *Not previously required to be retained or planted under an approved Architectural Review decision.*
- (b) *Forest Harvesting Exemption. Forest Harvesting Uses, as provided by Agricultural Uses in TDC 39.300 are exempt.*
- (c) *Orchard Exemption. Orchards Uses, as provided by Agricultural Uses in TDC 39.300, are exempt.*
- (d) *Public Property Exemption. Tree removal on federal, state, county, or City property is exempt from the requirements of a tree removal permit. This exemption includes, but is not limited to road, improvements and maintenance to City parks, rights-of-way, water, sanitary sewer, and stormwater facilities. (Removal of trees from public right-of-way are governed by TDC Chapter 74.)*

**Response:** The proposal does not fall under a subparagraph (2) exemption. This section applies.

- (3) *Procedure Type. Tree Removal Permit applications are subject to Type II Review in accordance with TDC Chapter 32. Tree Removal Permit applications submitted with an Architectural Review, Subdivision, or Partition application will be processed in conjunction with the Architectural Review, Subdivision, or Partition decision.*
- (4) *Specific Submittal Requirements. In addition to the general submittal requirements in TDC 32.140 (Application Submittal), an applicant must submit the following:*
  - (a) *Tree Preservation Plan. A tree preservation plan drawn to scale must include:*
    - (i) *The location, size, species, and tag identification number of all trees on-site eight inches or more in diameter;*
    - (ii) *All trees proposed for removal and all trees proposed to be preserved;*
    - (iii) *All existing and proposed structures;*
    - (iv) *All existing and proposed public and private improvements; and*
    - (v) *All existing public and private easements.*

**Response:** A Tree Preservation Plan is being submitted with this Architectural Review; see sheets C1.01 and C1.02 of Attachment 2. This standard is met.

- (b) *Tree Assessment Report. A tree assessment prepared by a certified arborist must include:*
  - (i) *An analysis as to whether trees proposed for preservation may be preserved in light of the development proposed, are healthy specimens, and do not pose an imminent hazard to persons or property if preserved;*
  - (ii) *An analysis as to whether any trees proposed for removal could reasonably be preserved in light of the development proposed and health of the tree;*
  - (iii) *a statement addressing the approval criteria set forth in TDC 33.110(5);*
  - (iv) *the name, contact information, and signature of the arborist preparing the report; and*
  - (v) *The tree assessment report must have been prepared and dated no more than one calendar year preceding the date the development or Tree Removal Permit application is deemed complete by the City.*

**Response:** As provided in subsection (5)(b) below, an arborist's evaluation is necessary "if none of the conditions in TDC 33.110(5)(a) are met." Construction of the proposed improvements requires removing identified certain trees whose locations within the site conflict with the proposed location of the building, the parking configuration, and the required site grading for those features. The Approval Criterion in Subsection (5)(a)(iii) allows a tree to be removed when

“[i]t is necessary to remove the tree to construct proposed improvements based on Architectural Review approval,” and Approval Criterion (5)(b) requires an arborist evaluation “if none of the conditions in TDC 33.110(5)(a) are met.” Because the condition in TDC 33.110(5)(a)(iii) is met, an arborist’s assessment is not required in this case.

- (c) *Tree Tags. All trees on-site must be physically identified and numbered in the field with an arborist-approved tagging system that corresponds to the Tree Preservation Plan and Tree Assessment Report.*

**Response:** All trees near the area of work will be identified and numbered per this method.

(5) *Approval Criteria.*

- (a) *An applicant must satisfactorily demonstrate that at least one of the following criteria are met:*
  - (i) *The tree is diseased and:*
    - (A) *The disease threatens the structural integrity of the tree; or*
    - (B) *The disease permanently and severely diminishes the esthetic value of the tree; or*
    - (C) *The continued retention of the tree could result in other trees being infected with a disease that threatens either their structural integrity or esthetic value.*
  - (ii) *The tree represents a hazard which may include but not be limited to:*
    - (A) *The tree is in danger of falling; or*
    - (B) *Substantial portions of the tree are in danger of falling.*
  - (iii) *It is necessary to remove the tree to construct proposed improvements based on Architectural Review approval, building permit, or approval of a Subdivision or Partition Review.*

**Response:** Tree removal is necessary to construct proposed improvements to the site, consistent with the anticipated development pattern previously approved in the IMP. The removal is necessary for the efficient use of the site. Criterion (a)(iii) is satisfied.

- (b) *If none of the conditions in TDC 33.110(5)(a) are met, the certified arborist must evaluate the condition of each tree.*
  - (i) *Evergreen Trees. An evergreen tree which meets any of the following criteria as determined by a certified arborist will not be required to be retained:*
    - (A) *Trunk Condition—extensive decay and hollow; or*
    - (B) *Crown Development—unbalanced and lacking a full crown;*
  - (ii) *Deciduous Trees. A deciduous tree which meets any of the following criteria as determined by a certified arborist will not be required to be retained:*
    - (A) *Trunk Condition—extensive decay and hollow;*
    - (B) *Crown Development—unbalanced and lacking a full crown; or*
    - (C) *Structure—Two or more dead limbs.*

**Response:** Condition TDC 33.110(5)(a)(iii) is met as noted above. This standard does not apply.

- (6) *Emergencies. If emergency conditions occur requiring the immediate cutting or removal of trees to avoid danger or hazard to persons or property, an emergency permit must be issued by the City Manager without payment of a fee and without formal application, provided the owner provides enough information to the City Manager to document that an emergency exists. If an emergency exists and the City Offices are closed, the emergency condition may be abated provided the person files information documenting the emergency and necessity of immediate removal of the tree as soon as practical after the City Offices reopen. An "emergency condition" for purposes of this*



*section is when a tree presents an immediate danger of collapse, and represents a clear and present hazard to persons or property. For the purposes of this section, "immediate danger of collapse" means that the tree is already leaning, and there is a significant likelihood that the tree will topple or otherwise fail and cause damage before a tree cutting permit could be obtained through the nonemergency process. "Immediate danger of collapse" does not include hazardous conditions that can be alleviated by pruning or treatment. Examples of emergency conditions include:*

- (a) A tree leaning on a structure;*
- (b) A tree leaning on another tree and there is a significant likelihood that the tree will topple or otherwise fail; or*
- (c) If a utility service has been interrupted and repairs cannot be completed without the removal of a tree.*

**Response:** No emergency tree conditions exist. This standard does not apply.

- (7) Conditions of Approval. Any tree required to be retained must be protected in accordance with the TDC 73B and 73C.*

**Response:** All trees required to be retained will be protected in accordance with TDC 73B and C. This standard is met.

- (8) Permit Expiration. A Tree Removal Permit is valid for one year from the date of issue. A Tree Removal Permit approved in conjunction with an Architectural Review, Subdivision, or Partition decision is valid as provided in the terms of the Architectural Review, Subdivision, or Partition decision.*

**Response:** Any tree removal will be completed within a year of the Tree Removal Permit issuance. This standard is met.

- (9) Tree removal in violation of Zone Standards.*
  - (a) In addition to any applicable civil violation penalties, any property owner who removes, or causes to be removed, one or more trees in violation of applicable TDC provisions must pay an Enforcement Fee and a Restoration Fee to the City of Tualatin, as follows:*
    - (i) Enforcement Fee of \$837.00 per incident, plus \$10.00 for each tree removed; and*
    - (ii) Restoration Fee of \$2,000.00 per tree removed.*
  - (b) The City Manager may administratively reduce or waive these fees based upon a demonstration of hardship, adequate mitigation, or other good cause shown.*

**Response:** This Section provides guidance and penalties for enforcement actions and requires no response from the applicant. No tree removal in violation of Zone Standards is proposed.

## **Chapter 62: Manufacturing Park Planning District**

### **Section 62.200. - Use Categories**

- (1) Use Categories. Table 62-1 lists use categories Permitted Outright (P) or Conditionally Permitted (C) in the MP zone. Use categories may also be designated as Limited (L) and subject to the limitations listed in Table 62-1 and restrictions identified in TDC 62.210. Limitations may restrict the specific type of use, location, size, or other characteristics of the use category. Use categories which are not listed are prohibited within the zone, except for uses which are found by the City Manager or appointee to be of a similar character and to meet the purpose of this zone, as provided in TDC 31.070.*

(2) *Overlay Zones. Additional uses may be allowed in a particular overlay zone. See the overlay zone Chapters for additional uses.*

<i>Table 62-1: Use Categories in the MP Zone (Excerpt)</i>		
<i>Use Category</i>	<i>Status</i>	<i>Limitations and Code References</i>
<b>Commercial Use Categories</b>		
<i>Commercial Parking</i>	<i>P</i>	—
<i>Commercial Recreation</i>	<i>P (L)</i>	<i>Permitted uses limited to a health or fitness facility as a limited use subject to TDC 62.210(4).</i>
<i>Eating and Drinking Establishments</i>	<i>P (L)</i>	<i>Permitted uses limited to a restaurant or deli as a limited use and subject to TDC 62.210(4).</i>
<i>Marijuana Facilities</i>	<i>P (L)</i>	<i>Subject to TDC Chapter 80.</i>
<i>Office</i>	<i>P (L)</i>	<i>Permitted uses limited, see TDC 62.210(2).</i>
<i>Other Educational and Vocational Services</i>	<i>P (L)</i>	<i>Permitted uses limited to:</i> <ul style="list-style-type: none"> <li>• <i>Correspondence, trade, or vocational school as a limited use subject to TDC 62.210(4);</i></li> <li>• <i>Job training or related services as a limited use subject to TDC 62.210(4).</i></li> </ul>
<i>Retail Sales and Services</i>	<i>P (L)</i>	<i>Permitted uses limited to:</i> <ul style="list-style-type: none"> <li>• <i>Sale of goods produced on-site subject to TDC 62.210(1);</i></li> <li>• <i>Child day care center, subject to TDC 34.200;</i></li> <li>• <i>Food or convenience store, mailing operations, reproduction or photocopying services, bank, and medical services as limited uses subject to TDC 62.210(2).</i></li> </ul>
<b>Industrial Use Categories</b>		
<i>Light Manufacturing</i>	<i>P (L)</i>	<i>Permitted uses limited to:</i> <ul style="list-style-type: none"> <li>• <i>Manufacture or assembly of electronic or optical instruments, equipment, devices; musical instruments; toys; and sporting goods.</i></li> <li>• <i>Production of textiles or apparel;</i></li> <li>• <i>Printing, publishing, and lithography shops; and</i></li> <li>• <i>Research and development laboratories.</i></li> </ul> <i>Primary processing of organic materials, such as tanning of leather, is prohibited.</i>

<b>INFRASTRUCTURE AND UTILITIES USE CATEGORIES</b>		
<i>Basic Utilities</i>	<i>P</i>	—
<i>Greenways and Natural Areas</i>	<i>P</i>	—
<i>Public Safety Facilities</i>	<i>C (L)</i>	<i>Conditional uses limited to a fire station.</i>
<i>Transportation Facilities</i>	<i>P</i>	—
<i>Wireless Communication Facility</i>	<i>P (L)</i>	<i>Subject to maximum height and minimum setback standards defined by TDC Chapter 73F.</i>

**Response:** The proposed office building within a large manufacturing campus site will be accessory to the primary use of the property for a permitted Light Manufacturing use, “Manufacture or assembly of electronic or optical instruments, equipment, devices.” The proposed office building is part of Phase 1 of the buildout of IMP 00-01 for the manufacturing campus. The building will also include a fitness facility and cafeteria/café on the main level, in support of the employees at the office building and manufacturing campus. See TDC 62.210 below for detailed discussion of how applicable standards are met.

**Section 62.210. - Additional Limitations on Uses**

- (2) *Offices. Office uses are a permitted as specified below.*
- (a) *Permitted Uses. The following are permitted uses:*
- (i) *Offices for chemical and physical sciences, engineering, cartography, or other research functions;*
  - (ii) *Shared service facilities (as defined by TDC 31.060); and*
  - (iii) *Corporate, regional, or district headquarter offices if:*
    - (A) *The headquarters is for a permitted use in this Code;*
    - (B) *The offices occupy at least 20,000 square feet; and*
    - (C) *Manufacturing is not conducted, unless the manufacturing is a permitted use in the MP zone.*

**Response:** As noted above, the proposed building will be used as offices for engineering activities in conjunction with a permitted use in the MP zone, “[m]anufacture or assembly of electronic or optical instruments, equipment, devices...” Therefore, the use is permitted. Additionally, some manufacturing would be allowed within the office building as a permitted use in the MP zone, per subsection (2)(a)(iii)(C).

- (b) *Accessory Uses to an Industrial Use. Office uses accessory to a permitted industrial use are permitted.*

**Response:** The proposed building is for an office use accessory to the manufacturing buildings. This standard is met.

(c) *Limited Uses. Offices located on the same site as a permitted industrial use may be permitted, subject to TDC 62.210(4).*

**Response:** The proposed office building is located on the same site as existing manufacturing buildings and meets standards of TDC 62.210(4):

(4) *Limited Commercial Uses. Commercial uses permitted as limited uses, as specified in Table 62-1, must be located on the same site as a permitted industrial use. The site must be used primarily for industrial purposes and the commercial use is subject to the following limitations. The office, retail, and service uses may be located in a stand-alone building or combined in a building with other permitted uses.*

(a) *Offices. Office uses must not exceed 25 percent of the total gross floor area of all buildings on the site...*

**Response:** *The proposed building was planned as part of Phase 1 of the approved IMP 00-01, which included a mix of manufacturing, office, research and development, training, and other related components of the Lam Research manufacturing use. The use allowances and limitations of this section are superseded by the IMP. This standard does not apply. Section 62.300. - Development Standards*

Development standards in the MP zone are listed in Table 62-2. Additional standards may apply to some uses and situations, see TDC 62.310.

<b>Table 62-2: Section 62.300 Development Standards</b>				
<b>MP District Standards</b>			<b>IMP Conditions</b>	<b>Proposed</b>
<b>Setback Requirements</b>				
<b>Minimum Building setback for Yards Adjacent to Streets or Alleys, North of SW Leveton Drive</b>	100'		68' from Leveton Drive and 98' from 108th Avenue.	89' from Leveton Drive and 600' from 108th Avenue. COMPLIES
<b>Minimum Setback for Side and Rear Yards not Adjacent to Streets or Alleys, north of SW Leveton Drive</b>	50'	No minimum setback if adjacent to railroad right-of-way or spur track.		50' from west side yard. 500' from rear yard. COMPLIES
<b>Parking and Circulation Areas Adjacent to Public Right-of-Way</b>	50'	No minimum setback required adjacent to joint access approach in accordance with TDC 73C.	108' from Leveton Drive and 43' from 108th Avenue.	58' from Leveton Drive and 43' from 108 <sup>th</sup> Avenue. <b>The concurrent IMP request proposes to reduce Leveton Drive minimum setback to 50' to maintain compliance.</b>

<i>Parking and Circulation Areas Adjacent to Private Property Line</i>	<i>5-25'</i>	<i>Determined through Architectural Review Process.  No minimum setback required adjacent to joint access approach in accordance with TDC 73C.</i>		<i>Proposed new parking in northwest corner of the site is set back 152' from western property line (also internal to Lam site). COMPLIES</i>
<i>Fences</i>	<i>50 feet</i>	<i>From public right-of-way.</i>		<i>No proposed fences other than required safety fence around detention pond. COMPLIES</i>
<b>Structure Height</b>				
<i>Maximum Height</i>	<i>70 feet</i>	<i>May be increased to 85 feet if yards adjacent to structure are not less than a distance equal to one and one-half times the height of the structure.</i>		<i>67' to the parapet. COMPLIES</i>

**Response:** As shown in the table above, all standards from Table 62-2 (Development Standards) and the approved IMP are met, with the exception of the minimum parking lot setback from Leveton Drive. The concurrent IMP application proposes to reduce the minimum parking area setback along Leveton Drive to 50', which will remain in compliance with the 50' minimum standard in the MP zone.

**Section 62.310. - Additional Development Standards**

(1) *Industrial Master Plan. Minimum lot size, setbacks, maximum height, and other development standards may be modified by submittal of an Industrial Master Plan application. See TDC 33.050.*

**Response:** An IMP application is being submitted concurrent to this AR to modify the prior IMP 00-01 condition of approval 1.b, which requires a 108' setback from Leveton Drive. Instead, 50' (standard for the zone) is proposed through that IMP.

(2) *Spur Rail Tracks. Spur rail tracks are not permitted within 200 feet of an adjacent residential district.*

**Response:** No spur rail tracks are present on the site nor being proposed. This standard does not apply.

(3) *Wetland Conservation Lots. Minimum lot size, width, or frontage requirement do not apply to wetland conservation lots.*

**Response:** The site is not a Wetland Conservation Lot. This standard does not apply.



## **Chapter 63: Industrial Uses and Utilities and Manufacturing Zones – Environmental Regulations**

### **Section 63.051. - Noise.**

*All uses and development must comply with the Oregon State Department of Environmental Quality standards relating to noise and the City of Tualatin noise ordinance in, TMC 6-14.*

**Response:** The proposed new building will be used as offices and will comply with all DEQ and City of Tualatin noise standards. This standard is met.

### **Section 63.052. - Vibration.**

*(1) Restrictions. All uses and development must not cause or permit ground vibration into the property of another person that exceeds the limits set forth below in this section. (Shortened for brevity)*

**Response:** The proposed new building will be used as office space and will not create ground vibration. This standard does not apply.

### **Section 63.053. - Air Quality.**

*(1) Restrictions. All uses and development must comply with the most recent air quality standards adopted by the Oregon Department of Environmental Quality. Plans of construction and operations must comply with the recommendations and regulations of the State Department of Environmental Quality. (Shortened for brevity)*

**Response:** The proposed new building will be used as office space and will not produce air pollution. Construction will comply with DEQ regulations. This standard is met.

### **Section 63.054. - Odors.**

*All uses and development must not emit odors in such quantities as to create a nuisance condition at any point beyond the subject property line of the emitting use.*

**Response:** The proposed new building will be used as office space and will not emit odors. This standard is met.

### **Section 63.055. - Heat and Glare.**

*(1) All uses and development must conduct all operations producing heat or glare entirely within an enclosed building.*

*(2) All uses and development may utilize exterior lighting, but the exterior lighting must be screened, baffled or directed away from residential planning districts.*

**Response:** The proposed new building will be used as office space and will not produce heat or glare. All exterior lighting will be screened, baffled, or directed away from residential planning districts according to TDC standards, as shown in photometrics plans, sheets C2.10 – C2.15 in Attachment 2. This standard is met.

### **Section 63.056. - Storage and Stored Materials.**

*(1) All uses and development must store all materials, including wastes, in a manner that will not attract or aid the propagation of insects or rodents, or in any other way create a health or safety hazard.*

- (2) *All uses and development that utilize open storage that would otherwise be visible at the property line must conceal it from view at the abutting property line by a sight obscuring fence not less than six feet high and not accessible to the general public to protect public safety.*

**Response:** The proposed new building will store waste and recyclables in accordance with TDC waste and recyclables storage management standards as shown in *Chapter 73D: Waste and Recyclable Management Standards*; see sheet A4.10 for waste storage plans. No other open storage will be associated with the development of the proposed new building. This standard is met.

***Section 63.057. - Liquid or Solid Waste Materials.***

*All uses and development are prohibited from disposing waste onto the site or into adjacent drainage ditches, creeks or other natural waterways in violation of State of Oregon DEQ standards, Clean Water Services Standards, City Standards, or in a manner that causes harm to wildlife.*

**Response:** There will be no disposal of liquid or solid waste materials onto the site or into adjacent drainage ditches or waterways in either the use or development of the proposed new building. This standard is met.

***Section 63.058. - Dangerous Substances.***

*All uses and development are prohibited from the storage, transfer, or processing of hazardous, toxic, or radioactive waste.*

**Response:** There will be no hazardous, toxic, or radioactive waste involved in the proposed development. This standard is met.

**Chapter 73A: Site Design Standards**

***Commercial Design Standards***

***Section 73A.300. - Commercial Design Standards***

*The following standards are minimum requirements for commercial development in all zones, except the Mixed-Use Commercial (MUC) zone, which has its own standards:*

- (1) *Walkways. Commercial development must provide walkways as follows:*
- (a) *Walkways must be a minimum of six feet in width;*
  - (b) *Walkways must be constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete. Gravel or bark chips are not acceptable;*
  - (c) *Walkways must meet ADA standards applicable at time of construction or alteration;*
  - (d) *Walkways must be provided between the main building entrances and other on-site buildings, accessways, and sidewalks along the public right-of-way;*
  - (e) *Walkways through parking areas, drive aisles, and loading areas must be of a different appearance than the adjacent paved vehicular areas;*
  - (f) *Bikeways must be provided that link building entrances and bike facilities on the site with adjoining public right-of-way and accessways; and*
  - (g) *Outdoor Recreation Access Routes must be provided between the development's walkway and bikeway circulation system and parks, bikeways and greenways where a bike or pedestrian path is designated.*

**Response:** Proposed walkways are a minimum of 7' in width and constructed of asphalt, as shown on C1.11. All new walkways will meet ADA standards as of July 2022. A walkway is provided between the proposed new building main entrances and other on-site buildings, accessways, and sidewalks. New

walkways through parking areas are made of concrete with a different appearance than the paving of the parking areas. Bicycle facilities have been provided near entrances of the proposed new building near sidewalks and drive aisles with easy access to public right-of-way (see sheet L1.15). No parks, bikeways, or greenways abut this property. Applicable elements of these standards are met.

(2) *Accessways.*

(a) *When Required. Accessways are required to be constructed when a multi-family development is adjacent to any of the following:*

- (i) *Residential property;*
- (ii) *Commercial property;*
- (iii) *Areas intended for public use, such as schools and parks; and*
- (iv) *Collector or arterial streets where transit stops or bike lanes are provided or designated.*

**Response:** The proposal is not for a multifamily development and no multi-family development is adjacent to the property. This standard does not apply.

(3) *Drive-up Uses. Drive-up uses must comply with the following:*

(a) *Must provide a minimum stacking area clear of the public right-of-way and parking lot aisles from the window serving the vehicles as follows:*

- (i) *Banks—each lane must be 100 feet long;*
- (ii) *Restaurants—each lane must be 160 feet long; and*
- (iii) *Other uses—each lane must be between 80 and 160 feet long, as determined by the City.*

**Response:** No drive-up uses are proposed. This standard does not apply.

(4) *Safety and Security. Industrial development must provide safety and security features as follows:*

(a) *Locate windows and provide lighting in a manner that enables tenants, employees, and police to watch over pedestrian, parking, and loading areas;*

**Response:** The proposed building has windows along all sides and all floors. The proposed pedestrian, parking, and loading areas provide lighting which enables visibility of the spaces from windows.

(b) *Locate windows and interior lighting to enable surveillance of interior activity from the public right-of-way;*

**Response:** As mentioned above, the proposed building has windows along all sides and all floors, and interior lighting will be located to enable visibility from public rights-of-way.

(c) *Locate, orient, and select exterior lighting to facilitate surveillance of on-site activities from the public right-of-way without shining into public rights-of-way or fish and wildlife habitat areas;*

**Response:** Lighting has been selected and located to facilitate surveillance of on-site activities from the public right-of-way without shining into public rights-of-way or habitat areas. See photometrics plans in sheets C2.10 – C2.15 of Attachment 2. This standard is met.

(d) *Provide an identification system which clearly locates buildings and their entries for patrons and emergency services; and*

**Response:** A new wayfinding monument sign is being added near a driveway for vehicles inbound from SW 108th Avenue. Directions to the new building will also be added to existing signs. This standard is met.

(e) *Above ground sewer or water pumping stations, pressure reading stations, water reservoirs, electrical substations, and above ground natural gas pumping stations must provide a minimum six foot tall security fence or wall.*

**Response:** No new above ground sewer or water pumping stations, pressure reading stations, water reservoirs, electrical substations, or above ground natural gas pumping stations are proposed. This standard does not apply.

(5) *Service, Delivery, and Screening. Commercial development must provide service, delivery, and screening features as follows:*

(a) *Above grade and on-grade electrical and mechanical equipment such as transformers, heat pumps and air conditioners must be screened with sight obscuring fences, walls or landscaping;*

**Response:** There will be mechanical equipment on the roof (screened); see sheet A2.10. The transformer will be in a below grade vault near the trash enclosure; see sheet C1.11. This standard is met.

(b) *Outdoor storage must be screened with a sight obscuring fence, wall, berm or dense evergreen landscaping; and*

**Response:** No new outdoor storage is proposed. This standard does not apply.

(c) *Above ground pumping stations, pressure reading stations, water reservoirs; electrical substations, and above ground natural gas pumping stations must be screened with sight-obscuring fences or walls and landscaping.*

**Response:** No new above-ground pumping stations, pressure reading stations, water reservoirs, electrical substations, or above ground natural gas pumping stations are proposed. This standard does not apply.

(6) *Adjacent to Transit. Commercial development adjacent to transit must comply with the following:*

(a) *Development on a transit street designated in TDC Chapter 11 (Figure 11-5) must provide either a transit stop pad on-site, or an on-site or public sidewalk connection to a transit stop along the subject property's frontage on the transit street; and*

**Response:** There is a Tualatin Shuttle (Blue Line) stop across the street from the main driveway entrance on SW Leveton Drive, with connecting public sidewalks. There is a public sidewalk along the entire property's frontage on SW Leveton Drive and SW 108th Avenue, and the sidewalks along SW 108th Avenue will be improved by this project. There is no other plan in place for additional transit along either frontage. This standard is met.

(b) *Development abutting major transit stops as designated in TDC Chapter 11 (Figure 11-5) must:*

(i) *Locate any portion of a building within 20 feet of the major transit stop or provide a pedestrian plaza at the transit stop;*

(ii) *Provide a reasonably direct pedestrian connection between the major transit stop and a building entrance on the site;*

(iii) *Provide a transit passenger landing pad accessible to disabled persons;*

(iv) *Provide an easement or dedication for a passenger shelter as determined by the City; and*

(v) *Provide lighting at the major transit stop.*

**Response:** The proposed development does not abut any major transit stops. This standard does not apply.

**Chapter 73B: Landscaping Standards**

**Section 73B.020. - Landscape Area Standards Minimum Areas by Use and Zone**

The following are the minimum areas required to be landscaped for each use and zone: (excerpt)

Zone	Minimum Area Requirement*	Minimum Area Requirement with dedication for a fish and wildlife habitat*
(5) IN, CN, CO/MR, MC and MP zones— All uses	25 percent of the total area to be developed	22.5 percent of the total area to be developed

**Response:** The site overall, including the proposed new building and parking, will contain 45.5% landscape area. This standard is met.

**Section 73B.040. - Additional Minimum Landscaping Requirements for Commercial Uses**

(1) *General. In addition to requirements in TDC 73B.020, commercial uses, except those located in the Mixed-Use Commercial (MUC) zone, must comply with the following:*

(a) *All areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped.*

(i) *This standard does not apply to areas subject to the Hedges Creek Wetlands Mitigation Agreement.*

**Response:** All areas in the proposed development not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas will be landscaped. See landscape plan, sheets L0.01 through L1.15. This standard is met.

(b) *Minimum 5-foot-wide landscaped area must be located along all building perimeters viewable by the general public from parking lots or the public right-of-way, but the following may be used instead of the 5-foot-wide landscaped area requirement:*

(i) *Pedestrian amenities such as landscaped plazas and arcades; and*

(ii) *Areas developed with pavers, bricks, or other surfaces, for exclusive pedestrian use and contain pedestrian amenities, such as benches, tables with umbrellas, children's play areas, shade trees, canopies.*

(c) *Five-foot wide landscaped area requirement does not apply to:*

(i) *Loading areas;*

(ii) *Bicycle parking areas;*

(iii) *Pedestrian egress/ingress locations; and*

(iv) *Where the distance along a wall between two vehicle or pedestrian access openings (such as entry doors, garage doors, carports and pedestrian corridors) is less than eight feet.*

**Response:** There is one new building proposed with landscaping wider than 5' along all applicable site perimeters. See sheet L1.14 in Attachment 2. This standard is met.

(d) *Development that abuts an RL or MP Zone must have landscaping approved through Architectural Review and must provide and perpetually maintain dense, evergreen landscaped buffers between allowed uses and the adjacent RL and MP zones.*



**Response:** The proposed development abuts MP-zoned land to the east, west, and south of the subject property. There is RL-zoned property to the north of the Lam property, on the opposite side of SW Tualatin Road). A landscape plan is included in this Architectural Review application. See sheets L0.01 through L1.15. This standard is met.

(2) *Manufacturing Park (MP)—Wetland Buffer. Wetland buffer areas up to 50 feet in width may be counted toward the required percentage of site landscaping, subject to the following:...*

**Response:** No wetland buffers exist on the site. This standard does not apply.

**Section 73B.080. - Minimum Landscaping Standards for All Zones**

*The following are minimum standards for landscaping for all zones.*

<p>(1) <i>Required Landscape Areas</i></p>	<ul style="list-style-type: none"> <li>• <i>Must be designed, constructed, installed, and maintained so that within three years the ground must be covered by living grass or other plant materials.</i></li> <li>• <i>The foliage crown of trees cannot be used to meet this requirement.</i></li> <li>• <i>A maximum of ten percent of the landscaped area may be covered with un-vegetated areas of bark chips, rock or stone.</i></li> <li>• <i>Must be installed in accordance with the provisions of the American National Standards Institute ANSI A300 (Part 1) (Latest Edition).</i></li> <li>• <i>Must be controlled by pruning, trimming, or otherwise so that:</i> <ul style="list-style-type: none"> <li>○ <i>It will not interfere with designated pedestrian or vehicular access; and</i></li> <li>○ <i>It will not constitute a traffic hazard because of reduced visibility.</i></li> </ul> </li> </ul>
<p><b>Response:</b></p>	<p>Landscape areas will be designed, constructed, installed, and maintained so that within three years, the ground will be covered with living grass or other plant material. Less than 10% of the landscaped area will be covered with bark chips, rock, or stone. All landscaping will be installed in accordance with the provisions of the ANSI A300. All will be controlled with pruning and trimming. No landscaping will interfere with pedestrian or vehicular access and will not create reduced visibility for traffic. These are all shown in landscape plans and discussed in Planting Notes on L0.01. This standard is met.</p>
<p>(2) <i>Fences</i></p>	<ul style="list-style-type: none"> <li>• <i>Landscape plans that include fences must integrate any fencing into the plan to guide wild animals toward animal crossings under, over, or around transportation corridors.</i></li> </ul>
<p><b>Response:</b></p>	<p>No landscape fencing is proposed. This standard does not apply.</p>
<p>(3) <i>Tree Preservation</i></p>	<ul style="list-style-type: none"> <li>• <i>Trees and other plant materials to be retained must be identified on the landscape plan and grading plan.</i></li> <li>• <i>During construction:</i> <ul style="list-style-type: none"> <li>○ <i>Must provide above and below ground protection for existing trees and plant materials identified to remain;</i></li> <li>○ <i>Trees and plant materials identified for preservation must be protected by chain link or other sturdy fencing placed around the tree at the drip line;</i></li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ <i>If it is necessary to fence within the drip line, such fencing must be specified by a qualified arborist;</i></li> <li>○ <i>Top soil storage and construction material storage must not be located within the drip line of trees designated to be preserved;</i></li> <li>○ <i>Where site conditions make necessary a grading, building, paving, trenching, boring, digging, or other similar encroachment upon a preserved tree's drip-line area, such grading, paving, trenching, boring, digging, or similar encroachment must only be permitted under the direction of a qualified arborist. Such direction must assure that the health needs of trees within the preserved area can be met; and</i></li> <li>○ <i>Tree root ends must not remain exposed.</i></li> <li>● <i>Landscaping under preserved trees must be compatible with the retention and health of the preserved tree.</i></li> <li>● <i>When it is necessary for a preserved tree to be removed in accordance with TDC 33.110 (Tree Removal Permit) the landscaped area surrounding the tree or trees must be maintained and replanted with trees that relate to the present landscape plan, or if there is no landscape plan, then trees that are complementary with existing, landscape materials. Native trees are encouraged.</i></li> <li>● <i>100 percent of the area preserved under any tree or group of trees (Except for impervious surface areas) retained in the landscape plan must apply directly to the percentage of landscaping required for a development</i></li> </ul>
<p><b>Response:</b></p>	<p>Trees and plant materials to be retained are identified in the Tree Preservation plan. During construction, all preservation standards will be followed. Landscaping under preserved trees will be compatible with the preserved tree. Tree removal will only be necessary for the proposed building and parking areas. All landscaping requirements will be followed for these areas in accordance with the TDC landscaping standards. See tree preservation plan (sheets C1.01 and C1.02) and landscape plans. This standard is met.</p>
<p><i>(4) Grading</i></p>	<ul style="list-style-type: none"> <li>● <i>After completion of site grading, top-soil is to be restored to exposed cut and fill areas to provide a suitable base for seeding and planting.</i></li> <li>● <i>All planting areas must be graded to provide positive drainage.</i></li> <li>● <i>Soil, water, plant materials, mulch, or other materials must not be allowed to wash across roadways or walkways.</i></li> <li>● <i>Impervious surface drainage must be directed away from pedestrian walkways, dwelling units, buildings, outdoor private and shared areas and landscape areas except where the landscape area is a water quality facility.</i></li> </ul>
<p><b>Response:</b></p>	<p>After grading, topsoil will be restored to provide a suitable base for seeding and planting. All planting areas will be graded to provide positive drainage. Soil, water, plant material, and mulch will not be allowed to wash across roadways and walkways. Impervious surface drainage will be directed away from walkways, buildings, outdoor shared areas, and landscape areas. This standard is met.</p>
<p><i>(5) Irrigation</i></p>	<ul style="list-style-type: none"> <li>● <i>Landscaped areas must be irrigated with an automatic underground or drip irrigation system.</i></li> </ul>

<p><b>Response:</b></p>	<p>Landscape areas will be irrigated with an automatic underground or drip irrigation system, as shown in landscape notes on sheet L0.01. This standard is met.</p>
<p><i>(6) Re-vegetation in Un-landscaped Areas</i></p>	<ul style="list-style-type: none"> <li>• <i>Vegetation must be replanted in all areas where vegetation has been removed or damaged in areas not affected by the landscaping requirements and that are not to be occupied by structures or other improvements.</i></li> <li>• <i>Plant materials must be watered at intervals sufficient to ensure survival and growth for a minimum of two growing seasons.</i></li> <li>• <i>The use of native plant materials is encouraged to reduce irrigation and maintenance demands.</i></li> <li>• <i>Disturbed soils should be amended to an original or higher level of porosity to regain infiltration and stormwater storage capacity.</i></li> </ul>
<p><b>Response:</b></p>	<p>As shown in landscape notes on sheet L0.01, vegetation will be replanted in areas where it was removed or damaged. Plant materials will be watered to ensure survival and growth for at least two growing seasons. Disturbed soils will be amended to the original or higher level of porosity to regain infiltration and stormwater storage capacity. This standard is met.</p>

**Section 73B.090. - Minimum Standards Trees and Plants**

*The following minimum standards apply to the types of landscaping required to be installed for all zones.*

<p><i>(1) Deciduous Shade Trees</i></p>	<ul style="list-style-type: none"> <li>• <i>One and on-half inch caliper measured six inches above ground;</i></li> <li>• <i>Balled and burlapped; bare root trees will be acceptable to plant during their dormant season;</i></li> <li>• <i>Reach a mature height of 30 feet or more;</i></li> <li>• <i>Cast moderate to dense shade in summer;</i></li> <li>• <i>Live over 60 years;</i></li> <li>• <i>Do well in urban environments, tolerant of pollution and heat, and resistant to drought;</i></li> <li>• <i>Require little maintenance and mechanically strong;</i></li> <li>• <i>Insect- and disease-resistant;</i></li> <li>• <i>Require little pruning; and</i></li> <li>• <i>Barren of fruit production.</i></li> </ul>
<p><i>(2) Deciduous Ornamental Trees</i></p>	<ul style="list-style-type: none"> <li>• <i>One and on-half inch caliper measured six inches above ground;</i></li> <li>• <i>balled and burlapped; bare root trees will be acceptable to plant during their dormant season; and</i></li> <li>• <i>Healthy, disease-free, damage-free, well-branched stock, characteristic of the species</i></li> </ul>
<p><i>(3) Coniferous Trees</i></p>	<ul style="list-style-type: none"> <li>• <i>Five feet in height above ground;</i></li> <li>• <i>Balled and burlapped; bare root trees will be acceptable to plant during their</i></li> </ul>

	<p><i>dormant season; and</i></p> <ul style="list-style-type: none"> <li>• <i>Healthy, disease-free, damage-free, well-branched stock, characteristic of the species.</i></li> </ul>
(4) <i>Evergreen and Deciduous Shrubs</i>	<ul style="list-style-type: none"> <li>• <i>One to five gallon size;</i></li> <li>• <i>Healthy, disease-free, damage-free, well-branched stock, characteristic of the species; and</i></li> <li>• <i>Side of shrub with best foliage must be oriented to public view.</i></li> </ul>
(5) <i>Groundcovers</i>	<ul style="list-style-type: none"> <li>• <i>Fully rooted;</i></li> <li>• <i>Well branched or leafed;</i></li> <li>• <i>Healthy, disease-free, damage-free, well-branched stock, characteristic of the species; and</i></li> <li>• <i>English ivy (Hedera helix) is prohibited.</i></li> </ul>
(6) <i>Lawns</i>	<ul style="list-style-type: none"> <li>• <i>Consist of grasses, including sod, or seeds of acceptable mix within the local landscape industry;</i></li> <li>• <i>100 percent coverage and weed free; and</i></li> <li>• <i>Healthy, disease-free, damage-free, characteristic of the species.</i></li> </ul>

**Response:** All proposed trees, groundcover, and lawn meet the standards of the trees and plants table above, as shown in the planting schedule on sheet L.01. This standard is met.

### **Chapter 73C: Parking Standards**

#### **General**

#### **Section 73C.010. - Off-Street Parking and Loading Applicability and General Requirements**

- (1) *Applicability. Off-street parking and loading is required to be provided by the owner and/or developer, in all zones, whenever the following occurs:*
- (a) *Establishment of a new structure or use;*
  - (b) *Change in use; or*
  - (c) *Change in use of an existing structure.*

**Response:** The proposal includes the net addition of approximately 545 parking spaces in conjunction with the new building. The standards for parking will be met as shown in the following sections.

- (2) *General Requirements. Off-street parking spaces, off-street vanpool and carpool parking spaces, off-street bicycle parking, and off-street loading berths must be as provided as set forth in TDC 73C.100, unless greater requirements are otherwise established by the conditional use permit or the Architectural Review process.*
- (a) *The following apply to property and/or use with respect to the provisions of TDC 73C.100:*
    - (i) *The requirements apply to both the existing structure and use, and enlarging a structure or use;*
    - (ii) *The floor area is measured by gross floor area of the building primary to the function of the particular use of the property other than space devoted to off-street parking or loading;*

- (iii) *Where employees are specified, the term applies to all persons, including proprietors, working on the premises during the peak shift;*
- (iv) *Calculations to determine the number of required parking spaces and loading berths must be rounded to the nearest whole number;*
- (v) *If the use of a property changes, thereby increasing off-street parking or loading requirements, the increased parking/loading area must be provided prior to commencement of the new use;*
- (vi) *Parking and loading requirements for structures not specifically listed herein must be determined by the City Manager, based upon requirements of comparable uses listed;*
- (vii) *When several uses occupy a single structure, the total requirements for off-street parking may be the sum of the requirements of the several uses computed separately or be computed in accordance with TDC 73.370(1)(m), Joint Use Parking;*

**Response:** The parking requirements for the site were set by IMP 00-01. Per that IMP, 2,750 spaces were approved for full build-out, with the entire campus to be parked at the Manufacturing ratio of 1.6 spaces per 1,000 SF of gross floor area. Based on that approach, the minimum required parking associated with the new building is 192 spaces.

As shown on sheet C1.10:

- The existing site has total parking of 1,377 spaces, 29 of which are accessible.
- The proposed development will eliminate 37 of those (four accessible).
- It will add a total of 586 spaces (eight accessible).
- The project will bring total on-site parking to 1,926 spaces, of which 33 will be accessible.

Therefore, the resulting on-site parking count remains below the planned campuswide total, and the applicable parking standards are satisfied. Specific additional standards of this chapter are addressed below.

- (viii) *Off-street parking spaces for dwellings must be located on the same lot with the dwelling. Other required parking spaces may be located on a separate parcel, provided the parcel is not greater than five hundred (500) feet from the entrance to the building to be served, measured along the shortest pedestrian route to the building. The applicant must prove that the parking located on another parcel is functionally located and that there is safe vehicular and pedestrian access to and from the site. The parcel upon which parking facilities are located must be in the same ownership as the structure;*

**Response:** The proposal is not for dwelling units. This standard does not apply.

- (ix) *Required parking spaces must be available for the parking of operable passenger automobiles of residents, customers, patrons and employees and must not be used for storage of vehicles or materials or for the parking of trucks used in conducting the business;*

**Response:** All proposed parking will be available for automobiles of customers, patrons, and employees. They will not be used for storage of vehicles or materials, or for the parking of trucks. This standard is met.



- (x) *Institution of on-street parking, where none is previously provided, must not be done solely for the purpose of relieving crowded parking lots in commercial or industrial zones;*

**Response:** No on-street parking is proposed. This standard does not apply.

- (xi) *Required vanpool and carpool parking must meet the 9-foot parking stall standards in Figure 73-1 and be identified with appropriate signage;*

**Response:** All vanpool and carpool parking spaces are 9' in width, as shown on sheets C1.11-C1.14. This standard is met.

- (xii) *Where uses are mixed in a single building, parking must be a blend of the ratio required less ten percent for the minimum number of spaces. The maximum number of spaces must be ten percent less than the total permitted maximum for each use; and*

**Response:** Mixed uses are not proposed for the new building. This standard does not apply.

- (xiii) *If the applicant demonstrates that too many or too few parking spaces are required, applicant may seek a variance from the minimum or maximum by providing evidence that the particular use needs more or less than the amount specified in this Code.*

**Response:** No variance is being sought. This standard does not apply.

### **Section 73C.020. - Parking Lot Design Standards**

*A parking lot, whether an accessory or principal use, intended for the parking of automobiles or trucks, must comply with the following:*

- (1) *Off-street parking lot design must comply with the dimensional standards set forth in Figure 73-1;*  
 (a) *Exception: Parking structures and underground parking where stall length and width requirements for a standard size stall must be reduced by one-half feet and vehicular access at the entrance if gated must be a minimum of 18 feet in width.*

**Response:** This standard applies and will be met as shown in the following sections of Chapter 73C. The exception in subparagraph (a) is not applicable as no parking structures or underground parking are proposed.

- (2) *Parking lots and parking areas must be constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete. Gravel is not an acceptable material;*

**Response:** All proposed parking areas will be constructed of asphalt. This standard is met.

- (3) *Parking stalls must be constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete. Gravel or woody material are not an acceptable materials. Pavers, pervious concrete, or grasscrete are encouraged for parking stalls in or abutting the Natural Resource Protection Overlay District, Other Natural Areas, or in a Clean Water Services Vegetated Corridor;*

**Response:** All proposed parking stalls will be constructed of asphalt. There is no Natural Resource Protection Overlay, Natural Area, or CWS Vegetated Corridor present on the site. This standard is met.

- (4) *Parking lots must be maintained adequately for all-weather use and drained to avoid water flow across sidewalks;*

**Response:** New basins and swales will be located near the new parking. Detention will be provided through the existing four storm ponds with enlargement of the eastern pond as needed (see Attachment 10). This standard is met.

(5) *Parking bumpers or wheel stops or curbing must be provided to prevent cars from encroaching on adjacent landscaped areas, or adjacent pedestrian walkways.*

**Response:** Vertical curbs are proposed along all landscaped and pedestrian areas adjacent to the proposed parking. See sheet C1.13. This standard is met.

(6) *Disability parking spaces and accessibility must meet ADA standards applicable at time of construction or alteration;*

**Response:** There are 33 existing accessible parking spaces across the site as a whole. The proposal includes the removal of four accessible spaces and the addition of eight new accessible spaces, resulting in a total of 33 accessible parking stalls. Compliance with building code accessibility requirements can be verified during the building permit approval process. This standard is met.

(7) *Parking stalls for sub-compact vehicles must not exceed 35 percent of the total parking stalls required by TDC 73C.100. Stalls in excess of the number required by TDC 73C.100 can be sub-compact stalls;*

**Response:** The proposal does not include sub-compact parking stalls. This standard does not apply.

(8) *Groups of more than four parking spaces must be so located and served by driveways that their use will require no backing movements or other maneuvering within a street right-of-way other than an alley;*

**Response:** None of the proposed parking will require maneuvering within a street right-of-way (see sheet C1.13). This standard is met.

(9) *Drives to off-street parking areas must be designed and constructed to facilitate the flow of traffic, provide maximum safety of traffic access and egress, and maximum safety of pedestrians and vehicular traffic on the site;*

**Response:** Proposed drives have been designed by certified civil engineers in coordination with the City. This standard is met.

(10) *On-site drive aisles without parking spaces, which provide access to parking areas with regular spaces or with a mix of regular and sub-compact spaces, must have a minimum width of 22 feet for two-way traffic and 12 feet for one-way traffic; When 90 degree stalls are located on both sides of a drive aisle, a minimum of 24 feet of aisle is required. On-site drive aisles without parking spaces, which provide access to parking areas with only sub-compact spaces, must have a minimum width of 20 feet for two-way traffic and 12 feet for one-way traffic;*

**Response:** All proposed drive aisles are a minimum of 24' wide. This standard is met.

(11) *Artificial lighting, must be deflected to not shine or create direct glare on adjacent properties, street right-of-way, a Natural Resource Protection Overlay District, Other Natural Areas, or a Clean Water Services Vegetated Corridor;*

**Response:** No proposed lighting will shine or create direct glare on adjacent properties, street rights of way, a Natural Resource Protection Overlay District, Other Natural Areas, or a Clean Water Services Vegetated Corridor. See photometric plans on sheets C2.10 to C2.15 of Attachment 2. This standard is met.

(12) *Parking lot landscaping must be provided pursuant to the requirements of TDC 73C.200; and*

**Response:** See section 73C.200 responses. This standard is met.

(13) *Except for parking to serve residential uses, parking areas adjacent to or within residential zones or adjacent to residential uses must be designed to minimize disturbance of residents.*

**Response:** The proposed parking in the northwest corner of the site (across the street from a residential zone) has a large setback of over 107' with existing drainage channels that will remain. Access to this proposed lot will be by way of a private drive on the western border of the lot. This design approach minimizes disturbance of nearby residents and meets this standard.

### **Section 73C.030. - Shared Parking Requirements**

*Parking facilities may be shared by users on adjacent parcels if the following standards are met:*

...

**Response:** The site is part of an IMP which includes three parcels, all of which are under the same ownership and are used as an industrial campus for Lam Research. Existing and proposed parking facilities meet all standards, and shared parking facilities are not needed. This standard does not apply.

### **Section 73C.040. - Joint Use Parking Requirements**

**Response:** As mentioned above, the site is part of an IMP which includes three parcels under the same ownership in use as an industrial campus for Lam Research. This standard does not apply.

### **Section 73C.050. - Bicycle Parking Requirements and Standards**

(1) *Requirements. Bicycle parking facilities must include:*

- (a) *Long-term parking that consists of covered, secure stationary racks, lockable enclosures, or rooms in which the bicycle is stored;*
  - (i) *Long-term bicycle parking facilities may be provided inside a building in suitable secure and accessible locations.*
- (b) *Short-term parking provided by secure stationary racks (covered or not covered), which accommodate a bicyclist's lock securing the frame and both wheels.*

**Response:** Based on bicycle requirements for 120,000 SF of new floor area, the proposal includes 5 new long-term bike lockers and 14 new short-term bike spaces with racks. See sheet L1.15 for details. This standard is met.

(2) *Standards. Bicycle parking must comply with the following:*

- (a) *Each bicycle parking space must be at least six feet long and two feet wide, with overhead clearance in covered areas must be at least seven feet;*
- (b) *A five-foot-wide bicycle maneuvering area must be provided beside or between each row of bicycle parking. It must be constructed of concrete, asphalt, or a pervious hard surface such as pavers or grasscrete, and be maintained;*
- (c) *Access to bicycle parking must be provided by an area at least three feet in width. It must be constructed of concrete, asphalt, or a pervious hard surface such as pavers or grasscrete, and be maintained;*
- (d) *Bicycle parking areas and facilities must be identified with appropriate signing as specified in the Manual on Uniform Traffic Control Devices (MUTCD) (latest edition). At a minimum, bicycle parking signs must be located at the main entrance and at the location of the bicycle parking facilities;*
- (e) *Bicycle parking must be located in convenient, secure, and well-lighted locations approved through the Architectural Review process. Lighting, which may be provided, must be*

*deflected to not shine or create glare into street rights-of-way or fish and wildlife habitat areas;*

- (f) Required bicycle parking spaces must be provided at no cost to the bicyclist, or with only a nominal charge for key deposits, etc. This does not preclude the operation of private for-profit bicycle parking businesses;*
- (g) Bicycle parking may be provided within the public right-of-way in the Core Area Parking District subject to approval of the City Engineer and provided it meets the other requirements for bicycle parking; and*
- (h) The City Manager or the Architectural Review Board may approve a form of bicycle parking not specified in these provisions but that meets the needs of long-term and/or short-term parking pursuant to Architectural Review.*

**Response:** As shown on sheet L1.15, all bicycle spaces are 6' long and 2' wide with 5' maneuvering space. All access is at least 3' in width and located on hard surface. The bike spaces are conveniently located near entrances and sidewalks. Signs will be located at the main entrance and at the location of the bike parking itself. This standard is met.

**Section 73C.100. - Off-Street Parking Minimum/Maximum Requirements**

- (1) The following are the minimum and maximum requirements for off-street motor vehicle parking in the City, except these standards do not apply in the Core Area Parking District. The Core Area Parking District standards are in TDC 73C.110.*

**Response:** As described above in the response to 73C.010, the parking requirements for the site were set by IMP 00-01. Per that IMP, 2,750 spaces were approved for full build-out, with the entire campus to be parked at the Manufacturing ratio of 1.6 spaces per 1,000 SF of gross floor area. Based on that approach, the minimum required parking associated with the new building is 192 spaces. This section does not apply to vehicle parking.

Bicycle parking at the Manufacturing ratio of 0.10 per 1,000 SF of floor area will require a minimum of 12 additional bike parking spaces, of which five need to be long-term spaces. The proposal includes the addition of 14 new short-term and 5 new long-term spaces. The proposed provision of vehicle and bicycle parking is therefore consistent with the approved IMP.

- (2) In addition to the general parking requirements in subsection (1), the following are the minimum number of off-street vanpool and carpool parking for commercial, institutional, and industrial uses.*

<i>Number of Required Parking Spaces</i>	<i>Number of Vanpool or Carpool Spaces</i>
<i>0 to 10</i>	<i>1</i>
<i>10 to 25</i>	<i>2</i>
<i>26 and greater</i>	<i>1 for each 25 spaces</i>

**Response:** The proposed building requires 192 parking spaces. As such, 8 vanpool/carpool spaces are required for the new parking areas. As shown on sheet C1.10, 12 spaces are provided. This standard is met.

**Section 73C.120. - Off-Street Loading Facilities Minimum Requirements**

(1) *The minimum number of off-street loading berths for commercial, industrial, and institutional uses is as follows:*

<i>Use</i>	<i>Square Feet of Floor Area</i>	<i>Number of Berths</i>	<i>Dimensions of Berth</i>	<i>Unobstructed Clearance of Berth</i>
<b>Commercial</b>	<i>Less than 5,000</i>	<i>0</i>	<i>0</i>	<i>0</i>
	<i>5,000—25,000</i>	<i>1</i>	<i>12 feet × 25 feet</i>	<i>14 feet</i>
	<i>25,000—60,000</i>	<i>2</i>	<i>12 feet × 35 feet</i>	<i>14 feet</i>
	<i>60,000 and over</i>	<i>3</i>	<i>12 feet × 35 feet</i>	<i>14 feet</i>
<b>Industrial</b>	<i>Less than 5,000</i>	<i>0</i>	<i>0</i>	<i>0</i>
	<i>5,000—25,000</i>	<i>1</i>	<i>12 feet × 60 feet</i>	<i>14 feet</i>
	<i>25,000—60,000</i>	<i>2</i>	<i>12 feet × 60 feet</i>	<i>14 feet</i>
	<i>60,000 and over</i>	<i>3</i>	<i>12 feet × 60 feet</i>	<i>14 feet</i>

**Response:** The existing site development includes numerous existing buildings and loading dock facilities, such that the property complies with the minimum three loading berth requirement for industrial facilities exceeding 60,000 SF. The proposed new building will add 120,000 SF and will have two loading docks; with that addition the property will remain in compliance with this standard. Compliant dimensions for the proposed loading docks are provided on sheet A4.10. This standard is met.

(2) *Loading berths must not use the public right-of-way as part of the required off-street loading area.*

**Response:** Proposed loading berths do not use public right of way. This standard is met.

(3) *Required loading areas must be screened from public view, public streets, and adjacent properties by means of sight-obscuring landscaping, walls or other means, as approved through the Architectural Review process.*

**Response:** Existing and proposed loading docks are not visible from public areas or adjacent properties. This standard is met.

(4) *Required loading facilities must be installed prior to final building inspection and must be permanently maintained as a condition of use.*

**Response:** Proposed loading facilities will be installed prior to final building inspection and will be permanently maintained. This standard is met.

(5) *The off-street loading facilities must in all cases be on the same lot or parcel as the structure they are intended to serve. In no case must the required off-street loading spaces be part of the area used to satisfy the off-street parking requirements.*



**Response:** All proposed and existing off-street loading facilities associated with the proposed new building are on the same lot as the structure they will serve and are not part of the area used to satisfy off-street parking. See sheet C1.11 for loading dock locations. This standard is met.

(6) *A driveway designed for continuous forward flow of passenger vehicles for the purpose of loading and unloading children must be located on the site of a school or child day care center having a capacity greater than 25 students.*

**Response:** The site does not have or propose a school or childcare center. This standard does not apply.

**Section 73C.130. - Parking Lot Driveway and Walkway Minimum Requirements**

*Parking lot driveways and walkways must comply with the following requirements:*

(2) *Commercial Uses. Ingress and egress for commercial and institutional uses must not be less than the following:*

<i>Required Parking Spaces</i>	<i>Minimum Number Required</i>	<i>Minimum Pavement Width</i>	<i>Minimum Pavement Walkways, etc.</i>
1-99	1	32 feet for first 50 feet from ROW, 24 feet thereafter	Curbs required; walkway 1 side only
100-249	2	32 feet for first 50 feet from ROW, 24 feet thereafter	Curbs required; walkway 1 side only
Over 250	As required by City Manager	As required by City Manager	As required by City Manager

(3) *Industrial Use. Ingress and egress for industrial uses must not be less than the following:*

<i>Required Parking Spaces</i>	<i>Minimum Number Required</i>	<i>Minimum Pavement Width</i>	<i>Minimum Pavement Walkways, etc.</i>
1-250	1	36 feet for first 50' from ROW, 24 feet thereafter	No curbs or walkway required
Over 250	As required by City Manager	As required by City Manager	As required by City Manager

**Response:** The proposal is for an office building accessory to a permitted manufacturing use on an industrial site in the MP District. Driveways have been designed in coordination with City Engineering staff and have been sized to accommodate anticipated traffic. Proposed new driveways are more than 36' wide for the first 50' from ROW and more than 24' wide thereafter. See sheets C1.13 and C1.14. This standard is met.

(4) *Institutional Uses. Ingress and egress must not be less than 24 feet. In all other cases, ingress and egress for institutional uses must not be less than the following: ...*

**Response:** The proposal is for an office building on a manufacturing site. This section does not apply.

(5) *One-way Ingress or Egress. When approved through the Architectural Review process, one-way ingress or egress may be used to satisfy the requirements. However, the hard surfaced pavement of one-way drives must not be less than 16 feet for multi-family residential developments (as defined in TDC 31.060), commercial, or industrial uses.*

**Response:** A one-way ingress or egress is not proposed. This standard does not apply.

(6) *Maximum Driveway Widths and Other Requirements.*

(a) *Unless otherwise provided in this chapter, maximum driveway widths for Commercial, Industrial, and Institutional uses must not exceed 40 feet.*

**Response:** As mentioned in responses to Sections 73C.130 (2) and (3) above, driveways are a maximum of 36' wide.

(b) *Driveways must not be constructed within five feet of an adjacent property line, unless the two adjacent property owners elect to provide joint access to their respective properties, as provided by TDC73C.040.*

**Response:** No driveways are proposed within 5' of an adjacent property line. This standard is met.

(c) *The provisions of subsection (b) do not apply to townhouses, duplexes, triplexes, quadplexes, and cottage clusters which are allowed to construct driveways within five feet of adjacent property lines.*

**Response:** The proposal is not residential. This standard does not apply.

(d) *There must be a minimum distance of 40 feet between any two adjacent driveways on a single property unless a lesser distance is approved by the City Manager.*

**Response:** No proposed driveway is within 40' of another driveway. This standard is met.

(e) *Must comply with the distance requirements for access as provided in TDC 75.*

**Response:** The proposal complies with distance requirements of TDC 75. See Section 75. This standard is met.

(f) *Must comply with vision clearance requirements in TDC 75.*

**Response:** The proposal complies with the requirements of TDC 75. See Section 75. This standard is met.

### **Parking Lot Landscaping**

#### **Section 73C.220. - Commercial Parking Lot Landscaping Requirements**

**Response:** IMP 00-01 modified some parking lot landscaping requirements. Where the current TDC standards do not conflict, they are addressed below and met.

*Commercial uses must comply with the following landscaping requirements for parking lots in all zones:*

(1) *General. Locate landscaping or approved substitute materials in all areas not necessary for vehicular parking and maneuvering.*

**Response:** As shown on Landscape plans, sheets L0.01 through L1.15, landscaping or approved materials will be located in all areas not necessary for vehicular parking and maneuvering. This standard is met.

(2) *Clear Zone. Clear zone required for the driver at ends of on-site drive aisles and at driveway entrances, vertically between a maximum of 30 inches and a minimum of eight feet as measured from the ground level.*

(a) *Exception: does not apply to parking structures and underground parking.*

**Response:** Clear zones are present at the ends of all on-site drive aisles and driveway entrances between 30" and 8' from the ground level. See sheets L0.01 through L1.15. This standard is met.

(3) *Perimeter. Minimum five feet in width in all off-street parking and vehicular circulation areas, including loading areas and must comply with the following.*

(a) *Deciduous trees located not more than 30 feet apart on average as measured on center;*

(b) *Shrubs or ground cover, planted so as to achieve 90 percent coverage within three years;*

(c) *Plantings which reach a mature height of 30 inches in three years which provide screening of vehicular headlights year round;*

(d) *Native trees and shrubs are encouraged; and*

(e) *Exception: Not required where off-street parking areas on separate lots are adjacent to one another and connected by vehicular access.*

**Response:** More than 5' of perimeter landscaping exists around all parking, circulation, and loading areas, as shown on L1.10 – L1.14. Deciduous trees are located less than 30' apart on average, shrubs and ground cover will achieve 90% coverage within three years, and plantings with 30" mature height within three years will provide screening of vehicular light year around. See landscape plans. This standard is met.

(4) *Landscape Island. Minimum 25 square feet per parking stall must be improved with landscape island areas and must comply with the following.*

(a) *May be lower than the surrounding parking surface to allow them to receive stormwater run-off and function as water quality facilities as well as parking lot landscaping;*

**Response:** No below-grade islands are proposed. This option is not used.

(b) *Must be protected from vehicles by curbs, but the curbs may have spaces to allow drainage into the islands;*

**Response:** All landscape islands will have curbs, as shown on C1.11 – C1.14. This standard is met.

(c) *Islands must be utilized at aisle ends to protect parked vehicles from moving vehicles and emphasize vehicular circulation patterns;*

**Response:** Landscape islands are proposed at every aisle end. This standard is met.

(d) *Landscape separation required for every eight continuous spaces in a row.*

**Response:** The south end of the site has landscape islands at least every 12 continuous spaces per the approved IMP 00-01 alternative method for parking lot landscaping. The north side of the site has landscape islands every 8 spaces. See Landscape plans L1.10 -L1.16. This standard is met.

(e) *Must be planted with one deciduous shade trees for every four parking spaces; Required trees must be evenly dispersed throughout the parking lot;*

**Response:** Per the IMP 00-01 alternative parking landscape methods, more than one deciduous tree is proposed for every 9 parking stalls in the south half of the site (83 trees proposed for 578 new stalls, in excess of the minimum of 65 for these stalls). This standard is met.

(f) *Must be planted with groundcover or shrubs;*

**Response:** All landscape islands are planted with groundcover and shrubs. See sheets L1.10-L1.16. This standard is met.

(g) *Native plant materials are encouraged;*

**Response:** Many native plants are used.

(h) *Landscape island areas with trees must be a minimum of five feet in width (from inside of curb to curb);*

(i) *Required plant material in landscape islands must achieve 90 percent coverage within three years; and*

(j) *Exceptions:*

(i) *Landscape island requirements do not apply to Duplexes and Townhouses; and*

(ii) *Landscape square footage requirements do not apply to parking structures and underground parking.*

**Response:** As shown in the civil and landscape plans, landscape islands are at least 5' wide. This standard is met.

(5) *Driveway Access. For lots with 12 or more parking spaces, site access from the public street must be defined by:*

(a) *Landscape area at least five feet in width on each side of the site access;*

(b) *Landscape area must extend 25 feet from the right-of-way line; and*

(c) *Exceptions: Does not apply to parking structures and underground parking which must be determined through the Architectural Review process.*

**Response:** All proposed driveway accesses have more than 5' of landscape area on each side which extends more than 2' from the right-of-way line, as shown on L1.13 and L1.14. This standard is met.

## **Chapter 73D: Waste and Recyclables Management Standards**

### **Section 73D.020. - Design Methods**

*An applicant required to provide mixed solid waste and source separated recyclables storage areas must comply with one of following methods:*

(1) *The minimum standards method in TDSC 73D.030;*

(2) *The waste assessment method in TDC 73D.040;*

(3) *The comprehensive recycling plan method in TDC 73D.050; or*

(4) *The franchised hauler review method in TDC 73D.060.*

**Response:** The proposed new building will comply with the minimum standards method of 73D.030 as discussed below. This standard is met.

### **Section 73D.030. - Minimum Standards Method**

*This method specifies a minimum storage area requirement based on the size and general use category of the new or expanded development. This method is most appropriate when specific use of a new or expanded development is not known. It provides specific dimensional standards for the minimum size of storage areas by general use category.*

(1) *The size and location of the storage area(s) must be indicated on the site plan. Requirements are based on an assumed storage area height of four feet for mixed solid waste and source separated*

recyclables. Vertical storage higher than four feet, but no higher than seven feet may be used to accommodate the same volume of storage in a reduced floor space (potential reduction of 43 percent of specific requirements). Where vertical or stacked storage is proposed, submitted plans must include drawings to illustrate the layout of the storage area and dimensions for containers.

- (2) The storage area requirement is based on uses. If a building has more than one use and that use occupies 20 percent or less of the gross leasable area (GLA) of the building, the GLA occupied by that use must be counted toward the floor area of the predominant use(s). If a building has more than one use and that use occupies more than 20 percent of the GLA of the building, then the storage area requirement for the whole building must be the sum of the area of each use. Minimum storage area requirements by use is as follows:
- (a) Common wall residential five to ten units must provide 50 square feet.
  - (b) Common wall residential greater than ten units must provide 50 square feet plus an (additional five square feet per unit above ten.
  - (c) Commercial, industrial, and institutional developments must provide a minimum storage area of ten square feet plus:
    - (i) Office—Four square feet/1,000 square feet gross leasable area (GLA);
    - (ii) Retail—Ten square feet/1,000 square feet GLA;
    - (iii) Wholesale/Warehouse/Manufacturing—Six square feet/1,000 square feet GLA;
    - (iv) Educational and Institutional—Four square feet/1,000 square feet GLA; and
    - (v) All other uses—Four square feet/1,000 square feet GLA.

**Response:** The proposed new office building has 200 SF of standard storage area plus a 160 SF, 30 CU YD trash compactor as shown on A4.10. This standard is met.

- (3) Mixed solid waste and source separated recyclables storage areas for multiple tenants on a single site may be combined and shared.

**Response:** The site is occupied by a single tenant/owner. This provision is not applicable.

### **Section 73D.070. - Location, Design and Access Standards**

The following location, design, and access standards are applicable to all storage areas:

- (1) Location Standards.

- (a) The storage area for source separated recyclables may be collocated with the storage area for mixed solid waste.

**Response:** Combined waste storage areas are proposed. This option is proposed.

- (b) Storage area space requirements can be satisfied with a single location or multiple locations, and can combine both interior and exterior locations.

**Response:** As shown on A4.10, an exterior trash enclosure and trash compactor are proposed.

- (c) Exterior storage areas must:

- (i) Be located in central and visible locations on the site to enhance security for users;
- (ii) Be located in a parking area; and
- (iii) Not be located within a required front yard setback or in a yard adjacent to a public or private street.

**Response:** As shown on A4.10, trash areas will be located near the loading dock on the east side of the building and will not be located in the setback area.

- (2) Design Standards.



(a) *The dimensions of the storage area must accommodate containers consistent with current methods of local collection at time of construction or alteration.*

**Response:** The trash enclosure is 25' wide and 10' deep with two 8 cubic yard bins plus excess space for pallet storage from the kitchen area. The trash compactor is a 265XP-30, self-contained 30 cubic yard compactor. This standard is met.

(b) *Indoor and outdoor storage areas must comply with Oregon Building and Fire Code requirements.*

**Response:** The construction type of the building is IIA, which does not require a fire rating for non-bearing exterior walls. The exterior wall construction is concrete tilt up which is noncombustible per 304.3 of the OFC. This standard is met.

(c) *Exterior storage areas must be enclosed by a sight obscuring fence or wall at least six feet in height.*

**Response:** The trash enclosure will be enclosed by a minimum 6' height wall matching the building construction. This standard is met.

(d) *Evergreen plants must be placed around the enclosure walls, excluding the gate or entrance openings for common wall, commercial, and institutional developments.*

**Response:** As shown on L1.15, landscaping is shown around the loading dock and trash enclosure. This standard is met.

(e) *Gate openings for haulers must be a minimum of ten feet wide and must be capable of being secured in a closed and open position.*

**Response:** As shown on C1.11, there will be two sets of double gates each 10' wide. These gates will be locked with padlocks for building users only. This standard is met.

(f) *Horizontal clearance must be a minimum of ten feet and a vertical clearance of eight feet is required if the storage area is covered.*

**Response:** The storage area will not be covered and is about 24' wide. This standard is met.

(g) *A separate pedestrian access must also be provided in common wall, commercial, and institutional developments.*

**Response:** Access to the trash compactor and trash enclosure is through the loading dock and there are dedicated personnel doors from both the commercial kitchen and circulation spaces to avoid needing to pass through the main building entrance. This standard is met.

(h) *Exterior storage areas must have either a concrete or asphalt floor surface.*

(i) *Storage areas and containers must be clearly labeled to indicate the type of material accepted.*

**Response:** Trash enclosure area will be concrete floor surface and bins will be labeled by the hauler service. This standard is met.

(3) *Access Standards.*

(a) *Storage areas must be accessible to users at convenient times of the day, and to hauler personnel on the day and approximate time they are scheduled to provide hauler service.*

**Response:** Clear circulation paths will be provided to both building users and hauler provider that will not be blocked by any other delivery services and access is always provided. This standard is met.

- (b) *Storage areas must be designed to be easily accessible to hauler trucks and equipment, considering paving, grade, gate clearance and vehicle access.*

**Response:** As the trash enclosure will be located immediately next to the loading dock and the trash compactor is located in the loading dock, the hauler provider will have the same maneuvering clearances that delivery trucks are provided. This standard is met.

- (c) *Storage areas must be accessible to hauler trucks without requiring backing out of a driveway onto a public street. If only a single access point is available to the storage area, adequate turning radius must be provided to allow hauler trucks to safely exit the site in a forward motion.*

**Response:** The loading area/trash enclosure is accessed via a one-way delivery drive off Leviton, and then trucks will egress through the southern new driveway to 108th. The provided truck court will provide ample maneuvering clearance on site and not require any backing onto a driveway or public street. This standard is met.

- (d) *Storage areas must be located so that pedestrian and vehicular traffic movement are not obstructed on site or on public streets adjacent to the site.*

**Response:** The dedicated loading/trash enclosure has separate truck/pedestrian accesses which is independent from driveways and public streets. This standard is met.

- (e) *The following is an exception to the access standard:*  
(i) *Access may be limited for security reasons.*

**Response:** Gate will be locked to the trash enclosure. This standard is met.

## **Chapter 74: Public Improvement Requirements**

### **Section 74.110. - Phasing of Improvements.**

*The applicant may build the development in phases. If the development is to be phased the applicant must submit a phasing plan to the City Manager for approval with the development application. The timing and extent or scope of public improvements and the conditions of development must be determined by the City Council on subdivision applications and by the City Manager on other development applications.*

**Response:** No phasing is proposed. This standard does not apply.

### **Section 74.120. - Public Improvements.**

- (1) *Except as specially provided, all public improvements must be installed at the expense of the applicant. All public improvements installed by the applicant must be constructed and guaranteed as to workmanship and material as required by the Public Works Construction Code prior to acceptance by the City. Work must not be undertaken on any public improvement until after the construction plans have been approved by the City Manager and a Public Works Permit issued and the required fees paid.*

- (2) *In accordance with the Tualatin Basin Program for fish and wildlife habitat the City intends to minimize or eliminate the negative impacts of public streets by modifying right-of-way widths and street improvements when appropriate. The City Manager is authorized to modify right-of-way widths and street improvements to address the negative impacts on fish and wildlife habitat.*

**Response:** All public improvements will be installed at the expense of the applicant and constructed according to the Public Works Construction Code. Plans will be approved prior to construction. Any authorized modifications to street improvements will be followed. This standard is met.

**Section 74.130. - Private Improvements.**

*All private improvements must be installed at the expense of the applicant. The property owner must retain maintenance responsibilities over all private improvements.*

**Response:** All private improvements will be maintained by property owner. This standard is met.

**Section 74.140. - Construction Timing.**

- (1) *All the public improvements required under this chapter must be completed and accepted by the City prior to the issuance of a Certificate of Occupancy; or, for subdivision and partition applications, in accordance with the requirements of the Subdivision regulations.*
- (2) *All private improvements required under this Chapter must be approved by the City prior to the issuance of a Certificate of Occupancy; or for subdivision and partition applications, in accordance with the requirements of the Subdivision regulations.*

**Response:** All public and private improvements will be completed and approved before Certificate of Occupancy. This standard is met.

**Right-of-Way**

**Section 74.210. - Minimum Street Right-of-Way Widths.**

**Response:** Dedication is proposed along SW 108th Avenue to accommodate the new sidewalk and planter strip to City standards. This standard is met.

**Section 74.220. - Parcels Excluded from Development.**

*On subdivision development applications ...*

**Response:** The proposal is not for a subdivision. This standard does not apply.

**Easements and Tracts**

**Section 74.310. - Greenway, Natural Area, Bike, and Pedestrian Path Dedications and Easements.**

**Response:** No greenway, natural area, bike, or pedestrian path dedications or easements are proposed. This standard does not apply.

**Section 74.320. - Slope Easements.**

**Response:** No slope easements are proposed. This standard does not apply.

**Section 74.330. - Utility Easements.**

**Response:** No new utility easements are proposed. This standard does not apply.

**Section 74.340. - Watercourse Easements.**

**Response:** No watercourse easements are proposed or required. This standard does not apply.

**Section 74.350. - Maintenance Easement or Lots.**

**Response:** No maintenance easements are proposed or required. This standard does not apply.

**Section 74.410. - Future Street Extensions.**

**Response:** No future street extensions are proposed or required. This standard does not apply.

**Section 74.420. - Street Improvements.**

*When an applicant proposes to develop land adjacent to an existing or proposed street, including land which has been excluded under TDC 74.220, the applicant should be responsible for the improvements to the adjacent existing or proposed street that will bring the improvement of the street into conformance with the Transportation Plan (TDC Chapter 11), TDC 74.425 (Street Design Standards), and the City's Public Works Construction Code, subject to the following provisions:...*

- (1) For any development proposed within the City, roadway facilities within the right-of-way described in TDC 74.210 must be improved to standards as set out in the Public Works Construction Code.*
- (2) The required improvements may include the rebuilding or the reconstruction of any existing facilities located within the right-of-way adjacent to the proposed development to bring the facilities into compliance with the Public Works Construction Code.*
- (3) The required improvements may include the construction or rebuilding of off-site improvements which are identified to mitigate the impact of the development.*
- (4) Where development abuts an existing street, the improvement required must apply only to that portion of the street right-of-way located between the property line of the parcel proposed for development and the centerline of the right-of-way, plus any additional pavement beyond the centerline deemed necessary by the City Manager to ensure a smooth transition between a new improvement and the existing roadway (half-street improvement). Additional right-of-way and street improvements and off-site right-of-way and street improvements may be required by the City to mitigate the impact of the development. The new pavement must connect to the existing pavement at the ends of the section being improved by tapering in accordance with the Public Works Construction Code.*
- (5) If additional improvements are required as part of the Access Management Plan of the City, TDC Chapter 75, the improvements must be required in the same manner as the half-street improvement requirements.*
- (6) All required street improvements must include curbs, sidewalks with appropriate buffering, storm drainage, street lights, street signs, street trees, and, where designated, bikeways and transit facilities.*
- (7) For subdivision and partition applications, the street improvements required by TDC Chapter 74 must be completed and accepted by the City prior to signing the final subdivision or partition plat, or prior to releasing the security provided by the applicant to assure completion of such improvements or as otherwise specified in the development application approval.*
- (8) For development applications other than subdivisions and partitions, all street improvements required by this section must be completed and accepted by the City prior to the issuance of a Certificate of Occupancy.*
- (9) In addition to land adjacent to an existing or proposed street, the requirements of this section must apply to land separated from such a street only by a railroad right-of-way.*
- (10) Streets within, or partially within, a proposed development site must be graded for the entire right-of-way width and constructed and surfaced in accordance with the Public Works Construction Code.*
- (11) Existing streets which abut the proposed development site must be graded, constructed, reconstructed, surfaced or repaired as necessary in accordance with the Public Works Construction Code and TDC Chapter 11, Transportation Plan, and TDC 74.425 (Street Design Standards).*

- (12) *Sidewalks with appropriate buffering must be constructed along both sides of each internal street and at a minimum along the development side of each external street in accordance with the Public Works Construction Code.*
- (13) *The applicant must comply with the requirements of the Oregon Department of Transportation (ODOT), Tri-Met, Washington County and Clackamas County when a proposed development site is adjacent to a roadway under any of their jurisdictions, in addition to the requirements of this chapter.*
- (14) *The applicant must construct any required street improvements adjacent to parcels excluded from development, as set forth in TDC 74.220 of this chapter.*
- (15) *Except as provided in TDC 74.430, whenever an applicant proposes to develop land with frontage on certain arterial streets and, due to the access management provisions of TDC Chapter 75, is not allowed direct access onto the arterial, but instead must take access from another existing or future public street thereby providing an alternate to direct arterial access, the applicant must be required to construct and place at a minimum street signage, a sidewalk, street trees and street lights along that portion of the arterial street adjacent to the applicant's property. The three certain arterial streets are S.W. Tualatin-Sherwood Road, S.W. Pacific Highway (99W) and S.W. 124th Avenue. In addition, the applicant may be required to construct and place on the arterial at the intersection of the arterial and an existing or future public non-arterial street warranted traffic control devices (in accordance with the Manual on Uniform Traffic Control Devices, latest edition), pavement markings, street tapers and turning lanes, in accordance with the Public Works Construction Code.*
- (16) *The City Manager may determine that, although concurrent construction and placement of the improvements in (14) and (15) of this section, either individually or collectively, are impractical at the time of development, the improvements will be necessary at some future date. In such a case, the applicant must sign a written agreement guaranteeing future performance by the applicant and any successors in interest of the property being developed. The agreement must be subject to the City's approval.*
- (17) *Intersections should be improved to operate at a level of service of at least D and E for signalized and unsignalized intersections, respectively.*
- (18) *Pursuant to requirements for off-site improvements as conditions of development approval, proposed multi-family residential, commercial, or institutional uses that are adjacent to a major transit stop will be required to comply with the City's Mid-Block Crossing Policy.*

**Response:** The only required street improvement is the sidewalk improvements on the collector SW 108th Avenue. The improvements are in accordance with the Transportation Plan (TDC Chapter 11), TDC 74.425 (Street Design Standards), and the City's Public Works Construction Code. The improved sidewalk will be 5.5' wide and include a planter strip with trees from the PGE approved tree list. See plans for details. This standard is met.

#### **Section 74.425. - Street Design Standards.**

- (1) *Street design standards are based on the functional and operational characteristics of streets such as travel volume, capacity, operating speed, and safety. They are necessary to ensure that the system of streets, as it develops, will be capable of safely and efficiently serving the traveling public while also accommodating the orderly development of adjacent lands.*
- (2) *The proposed street design standards are shown in Figures 72A through 72G. The typical roadway cross sections comprise the following elements: right-of-way, number of travel lanes, bicycle and pedestrian facilities, and other amenities such as landscape strips. These figures are intended for planning purposes for new road construction, as well as for those locations where it is physically and economically feasible to improve existing streets.*



- (3) *In accordance with the Tualatin Basin Program for fish and wildlife habitat it is the intent of Figures 74-2A through 74-2G to allow for modifications to the standards when deemed appropriate by the City Manager to address fish and wildlife habitat.*
- (4) *All streets must be designed and constructed according to the preferred standard. The City Manager may reduce the requirements of the preferred standard based on specific site conditions, but in no event will the requirement be less than the minimum standard. The City Manager must take into consideration the following factors when deciding whether the site conditions warrant a reduction of the preferred standard:...*

**Response:** Sidewalk improvements are required on SW 108th Avenue. The improved sidewalk will be 5.5' wide and include a planter strip with trees from the PGE approved tree list. The sidewalk improvements will all be in accordance with TDC code. See civil and landscape plans for details (Attachment 2). This standard is met.

**Section 74.430. - Streets, Modifications of Requirements in Cases of Unusual Conditions.**

**Response:** No modifications are required. This standard does not apply.

**Section 74.440. - Streets, Traffic Study Required.**

- (1) *The City Manager may require a traffic study to be provided by the applicant and furnished to the City as part of the development approval process as provided by this Code, when the City Manager determines that such a study is necessary in connection with a proposed development project in order to:...*
- (2) *The required traffic study must be completed prior to the approval of the development application.*
- (3) *The traffic study must include, at a minimum:*
  - (a) *An analysis of the existing situation, including the level of service on adjacent and impacted facilities.*
  - (b) *An analysis of any existing safety deficiencies.*
  - (c) *Proposed trip generation and distribution for the proposed development.*
  - (d) *Projected levels of service on adjacent and impacted facilities.*
  - (e) *Recommendation of necessary improvements to ensure an acceptable level of service for roadways and a level of service of at least D and E for signalized and unsignalized intersections respectively, after the future traffic impacts are considered.*
  - (f) *The City Manager will determine which facilities are impacted and need to be included in the study.*
  - (g) *The study must be conducted by a registered engineer.*

**Response:** The Transportation Impact Analysis is Attachment 9 and includes minimum requirements (a) – (g). This standard is met.

- (4) *The applicant must implement all or a portion of the improvements called for in the traffic study as determined by the City Manager.*

**Response:** The applicant will implement required improvements. This standard is met.

**Section 74.450. - Bikeways and Pedestrian Paths.**

- (1) *Where proposed development abuts or contains an existing or proposed bikeway, pedestrian path, or multi-use path, as set forth in TDC Chapter 11, Transportation Figure 11-4, the City may require that a bikeway, pedestrian path, or multi-use path be constructed, and an easement or dedication provided to the City.*

**Response:** The proposed development does not abut or contain an existing or proposed bikeway, pedestrian path, or multi-use path. This standard does not apply.

**Section 74.460. - Accessways in Residential, Commercial and Industrial Subdivisions and Partitions.**

**Response:** No accessways are proposed and the project is not a subdivision or partition. This standard does not apply.

**Section 74.470. - Street Lights.**

- (1) *Street light poles and luminaries must be installed in accordance with the Public Works Construction Code.*
- (2) *The applicant submit a street lighting plan for all interior and exterior streets on the proposed development site prior to issuance of a Public Works Permit.*

**Response:** No street lights are required. This standard does not apply.

**Section 74.475. - Street Names.**

**Response:** No new streets or street names are proposed. This standard does not apply.

**Section 74.480. - Street Signs.**

**Response:** No new street names signs are proposed. This standard does not apply.

**Section 74.485. - Street Trees.**

- (1) *Prior to approval of a residential subdivision or partition final plat, the applicant must pay the City a non-refundable fee equal to the cost of the purchase and installation of street trees. The location, placement, and cost of the trees must be determined by the City. This sum must be calculated on the interior and exterior streets as indicated on the final subdivision or partition plat.*
- (2) *In nonresidential subdivisions and partitions street trees must be planted by the owners of the individual lots as development occurs.*
- (3) *The Street Tree Ordinance specifies the species of tree which is to be planted and the spacing between trees.*

**Response:** The proposal is not for a subdivision. This standard does not apply.

**Utilities**

**Section 74.610. - Water Service.**

- (1) *Water lines must be installed to serve each property in accordance with the Public Works Construction Code. Water line construction plans must be submitted to the City Manager for review and approval prior to construction.*
- (2) *If there are undeveloped properties adjacent to the subject site, public water lines must be extended by the applicant to the common boundary line of these properties. The lines must be sized to provide service to future development, in accordance with the City's Water System Master Plan, TDC Chapter 12.*
- (3) *As set forth in TDC Chapter 12, Water Service, the City has three water service levels. All development applicants must be required to connect the proposed development site to the service level in which the development site is located. If the development site is located on a boundary line between two service levels the applicant must be required to connect to the service level with the*

higher reservoir elevation. The applicant may also be required to install or provide pressure reducing valves to supply appropriate water pressure to the properties in the proposed development site.

**Response:** New water service is proposed for the new building. Lines will be installed in accordance with the Public Works Construction Code and connected to appropriate water service levels. See utility plan for details. There are not undeveloped properties adjacent to the subject site. This standard is met.

**Section 74.620. - Sanitary Sewer Service.**

- (1) *Sanitary sewer lines must be installed to serve each property in accordance with the Public Works Construction Code. Sanitary sewer construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.*
- (2) *If there are undeveloped properties adjacent to the proposed development site which can be served by the gravity sewer system on the proposed development site, the applicant must extend public sanitary sewer lines to the common boundary line with these properties. The lines must be sized to convey flows to include all future development from all up stream areas that can be expected to drain through the lines on the site, in accordance with the City's Sanitary Sewer System Master Plan, TDC Chapter 13.*

**Response:** New sanitary sewer lines will be connected to existing on-site sewer system. No new laterals to the public system are proposed. See utility plan (C1.30 - C1.33) for details. No undeveloped properties are adjacent. This standard is met.

**Section 74.630. - Storm Drainage System.**

- (1) *Storm drainage lines must be installed to serve each property in accordance with City standards. Storm drainage construction plans and calculations must be submitted to the City Manager for review and approval prior to construction.*
- (2) *The storm drainage calculations must confirm that adequate capacity exists to serve the site. The discharge from the development must be analyzed in accordance with the City's Storm and Surface Water Regulations.*
- (3) *If there are undeveloped properties adjacent to the proposed development site which can be served by the storm drainage system on the proposed development site, the applicant must extend storm drainage lines to the common boundary line with these properties. The lines must be sized to convey expected flows to include all future development from all up stream areas that will drain through the lines on the site, in accordance with the Tualatin Drainage Plan in TDC Chapter 14.*

**Response:** New storm drain system will be connected to existing on-site storm system with modifications to accommodate needed drainage; however, no new connections to the public system are proposed. See utility plan for details. No undeveloped properties are adjacent. This standard is met.

**Section 74.640. - Grading.**

- (1) *Development sites must be graded to minimize the impact of storm water runoff onto adjacent properties and to allow adjacent properties to drain as they did before the new development.*
- (2) *A development applicant must submit a grading plan showing that all lots in all portions of the development will be served by gravity drainage from the building crawl spaces; and that this development will not affect the drainage on adjacent properties. The City Manager may require the applicant to remove all excess material from the development site.*

**Response:** The development site will be graded to minimize the impact of storm runoff. This application includes a grading plan on sheets C1.21 -C1.24 (plus grading notes on C0.01) showing that the proposed development will not affect the drainage on adjacent properties. This standard is met.

**Section 74.650. - Water Quality, Storm Water Detention and Erosion Control.**

*The applicant must comply with the water quality, storm water detention and erosion control requirements in the Surface Water Management Ordinance. If required:*

- (1) *On subdivision and partition development applications...*

**Response:** The proposal is not for a subdivision. This standard does not apply.

- (2) *On all other development applications, prior to issuance of any building permit, the applicant must arrange to construct a permanent on-site water quality facility and storm water detention facility and submit a design and calculations indicating that the requirements of the Surface Water Management Ordinance will be met and obtain a Stormwater Connection Permit from Clean Water Services.*

**Response:** The existing water quality, storm water detention, and erosion control facilities will be modified to handle additional runoff per CWS standards. See plans for details. This standard is met.

- (3) *For on-site private and regional non-residential public facilities, the applicant must submit a stormwater facility agreement, which will include an operation and maintenance plan provided by the City, for the water quality facility for the City's review and approval. The applicant must submit an erosion control plan prior to issuance of a Public Works Permit. No construction or disturbing of the site must occur until the erosion control plan is approved by the City and the required measures are in place and approved by the City.*

**Response:** The stormwater facility agreement and erosion control plan will be submitted with the construction permit. This standard is met.

**Section 74.660. - Underground.**

- (1) *All utility lines including, but not limited to, those required for gas, electric, communication, lighting and cable television services and related facilities must be placed underground. Surface-mounted transformers, surface-mounted connection boxes and meter cabinets may be placed above ground. Temporary utility service facilities, high capacity electric and communication feeder lines, and utility transmission lines operating at 50,000 volts or above may be placed above ground. The applicant must make all necessary arrangements with all utility companies to provide the underground services. The City reserves the right to approve the location of all surface-mounted transformers.*

- (2) *Any existing overhead utilities may not be upgraded to serve any proposed development. If existing overhead utilities are not adequate to serve the proposed development, the applicant must, at their own expense, provide an underground system. The applicant must be responsible for obtaining any off-site deeds and/or easements necessary to provide utility service to this site; the deeds and/or easements must be submitted to the City Manager for acceptance by the City prior to issuance of the Public Works Permit.*

**Response:** The existing utility lines do not need to be upgraded for the proposed development and no undergrounding is currently required. This standard is met.

**Section 74.670. - Existing Structures.**

- (1) *Any existing structures requested to be retained by the applicant on a proposed development site must be connected to all available City utilities at the expense of the applicant.*
- (2) *The applicant must convert any existing overhead utilities serving existing structures to underground utilities, at the expense of the applicant.*

- (3) *The applicant must be responsible for continuing all required street improvements adjacent to the existing structure, within the boundaries of the proposed development site.*

**Response:** There are no existing structures to be retained in the area of the proposed new building and parking. This standard does not apply.

**Section 74.700. - Removal, Destruction or Injury of Trees.**

*It is unlawful for a person, without a written permit from the City Manager, to remove, destroy, break or injure a tree, plant or shrub, that is planted or growing in or upon a public right-of-way within the City, or cause, authorize, or procure a person to do so, authorize or procure a person to injure, misuse or remove a device set for the protection of any tree, in or upon a public right-of-way.*

**Response:** No trees or plants in the public right-of-way will be removed, destroyed, or broken during development. This standard is met.

**Section 74.705. - Street Tree Removal Permit.**

**Response:** No street trees are being removed. This standard does not apply.

**Section 74.710. - Open Ground.**

*When impervious material or substance is laid down or placed in or upon a public right-of-way near a tree, at least nine square feet of open ground for a tree up to three inches in diameter must be provided about the base of the trunk of each tree.*

**Response:** No impervious material is proposed to be laid down in the public right-of-way. This standard does not apply.

**Section 74.720. - Protection of Trees During Construction.**

- (1) *During the erection, repair, alteration or removal of a building or structure, it is unlawful for the person in charge of such erection, repair, alteration or removal to leave a tree in or upon a public right-of-way in the vicinity of the building or structure without a good and sufficient guard or protectors to prevent injury to the tree arising out of or by reason of such erection, repair, alteration or removal.*
- (2) *Excavations and driveways must not be placed within six feet of a tree in or upon a public right-of-way without written permission from the City Manager. During excavation or construction, the person must guard the tree within six feet and all building material or other debris must be kept at least four feet from any tree.*

**Response:** The only proposed work near trees in the right-of-way is the alteration of one driveway off SW Leveton. All trees will be properly protected according to code requirements, as shown in Landscape Notes on L0.01. This standard is met.

**Section 74.740. - Prohibited Trees.**

*It is unlawful for a person to plant a tree within the right-of-way of the City of Tualatin that is not in conformance with City standards, including Table 74-1. Any tree planted subsequent to adoption of this Chapter not in compliance with City standards, including Table 74-1, must be removed at the expense of the property owner.*

**Response:** The proposed trees being planted in the public right-of-way on SW 108th Avenue have been selected from the PGE list of approved trees so as not to conflict with the powerlines above. This standard is met.



**Section 74.745. - Cutting and Planting Specifications.**

*The following regulations are established for the planting, trimming and care of trees in or upon the public right-of-way of the City.*

- (1) *When trees are cut down, the stump must be removed to a depth of six inches below the surface of the ground or finish grade of the street, whichever is of greater depth.*

**Response:** No trees are proposed to be cut. This standard does not apply.

- (2) *Trees must be planted in accordance with City standards, Table 74-1, except when a greater density is allowed under a special permit from the City Manager.*

**Response:** The proposed trees to be planted in the public right-of-way on SW 108th Avenue have been selected from the PGE list of approved trees so as not to conflict with the powerlines above. See landscape plans in Attachment 2. This standard is met.

**Section 74.765. - Street Tree Species and Planting Locations.**

*All trees, plants or shrubs planted in the right-of-way of the City must conform in species and location and in accordance with the street tree plan and City standards, including Table 74-1. If the City Manager determines that none of the species in City standards, including Table 74-1 is appropriate or finds appropriate a species not listed, the City Manager may substitute an unlisted species.*

**Response:** The proposed trees to be planted in the public right-of-way on SW 108th Avenue have been selected from the PGE list of approved trees so as not to conflict with the powerlines above. See landscape plans in Attachment 2. This standard is met.

**Chapter 75: Access Management**

**Section 75.020. - Permit for New Driveway Approach**

- (1) *Applicability. A driveway approach permit must be obtained prior to constructing, relocating, reconstructing, enlarging, or altering any driveway approach.*
- (2) *Exceptions. A driveway approach permit is not required for:*
- (a) *The construction, relocation, reconstruction, enlargement, or alteration of any driveway approach that requires a state highway access permit; or*
  - (b) *The construction, relocation, reconstruction, enlargement or alteration of any driveway approach that is part of the construction of a publicly or privately engineered public improvement project.*
- (3) *Procedure Type. A Driveway Approach Permit is processed as a Type II procedure under TDC 32.220 (Type II).*

**Response:** Driveway Approach Permit applies. See 75.020.4-5 below showing standards are met.

- (4) *Submittal Requirements. In addition to the application materials required by TDC 32.140 (Application Submittal), the following application materials are also required:*
- (a) *A site plan, of a size and form and in the number of copies meeting the standards established by the City Manager, containing the following information:*
    - (i) *The location and dimensions of the proposed driveway approach;*
    - (ii) *The relationship to nearest street intersection and adjacent driveway approaches;*
    - (iii) *Topographic conditions;*
    - (iv) *The location of all utilities;*

- (v) *The location of any existing or proposed buildings, structures, or vehicular use areas;*
- (vi) *The location of any trees and vegetation adjacent to the location of the proposed driveway approach that are required to be protected pursuant to TDC Chapter 73B or 73C; and*
- (vii) *The location of any street trees adjacent to the location of the proposed driveway approach.*

**Response:** Proposed driveways are in the submitted plans which also show items (i)-(vii). This standard is met.

- (b) *Identification of the uses or activities served, or proposed to be served, by the driveway approach; and*
- (c) *Any other information, as determined by the City Manager, which may be required to adequately review and analyze the proposed driveway approach for conformance with the applicable criteria.*

**Response:** See Traffic Study (Attachment 9) for more information including review of site distance at the proposed new driveway locations.

- (5) *Criteria. A Driveway Approach Permit must be granted if:*
  - (a) *The proposed driveway approach meets the standards of this Chapter and the Public Works Construction Code;*
  - (b) *No site conditions prevent placing the driveway approach in the required location;*

**Response:** The proposed new driveways meet standards of the TDC and the Public Works Construction Code and no site conditions have been found that prevent placing the driveway approaches in the required locations. This standard is met.

- (c) *The number of driveway approaches onto an arterial are minimized;*

**Response:** The proposed driveway approaches are located on a collector street. This standard is met.

- (d) *The proposed driveway approach, where possible:*
  - (i) *Is shared with an adjacent property; or*
  - (ii) *Takes access from the lowest classification of street abutting the property;*

**Response:** Per the IMP, the accesses are on both 108th and Leveton. This standard is met.

- (e) *The proposed driveway approach meets vision clearance standards;*
- (f) *The proposed driveway approach does not create traffic hazards and provides for safe turning movements and access;*
- (g) *The proposed driveway approach does not result in significant adverse impacts to the vicinity;*

**Response:** These were reviewed in the Traffic Study dated August 12, 2022. The approaches meet the standards of (e) – (g) above; see Attachment 9. These standards are met.

- (h) *The proposed driveway approach minimizes impact to the functionality of adjacent streets and intersections; and*
  - (i) *The proposed driveway approach balances the adverse impacts to residentially zoned property and the functionality of adjacent streets.*

**Response:** The proposed driveway approaches are on a collector street in an industrial area with no direct impact to residentially zoned areas. This standard is met.

- (6) *Effective Date.* The effective date of a Driveway Approach Permit approval is the date the notice of decision is mailed.
- (7) *Permit Expiration.* A Driveway Approach Permit approval expires one year from the effective date, unless the driveway approach is constructed within the one-year period in accordance with the approval decision and City standards.

**Response:** The effective date and expiration are noted and will be followed.

**Section 75.030. - Driveway Approach Closure.**

- (1) *The City Manager may require the closure of a driveway approach where:*
  - (a) *The driveway approach is not constructed in conformance with this Chapter and the Public Works Construction Code;*
  - (b) *The driveway approach is not maintained in a safe manner;*
  - (c) *A public street improvement project is being constructed, and closure of the driveway approach will more closely conform to the current driveway approach standards;*
  - (d) *A new building or driveway is constructed on the property;*
  - (e) *A plan text amendment or zone change is proposed for the property served by the driveway;*
  - (f) *A change of use or activity in an existing building increases the amount of required parking;*
  - (g) *The driveway approach has been abandoned; or*
  - (h) *There is a demonstrated safety issue.*

**Response:** All existing driveways have been constructed in accordance with TDC standards and were reviewed for traffic and safety, no issues were found. This standard does not apply.

- (2) *Notice.* Notice of driveway approach closure must be given in writing to the property owner and any affected tenants stating the grounds for closure, the date upon which the closure becomes effective, and the right to appeal.
- (3) *Appeals.* Any person entitled to notice under subsection (2) of this section may appeal the decision to the City Council.
- (4) *Effect.* Closure is effective immediately upon the mailing of notice of the decision. Unless otherwise provided in the notice, closure terminates all rights to continue the use the driveway approach for which the notice of closure has been issued.
- (5) *Failure to Close Driveway.* If the owner fails to close the driveway approach to conform to the notice within 90 days, the City Manager may cause the closure to be completed and all expenses assessed against the property owner.

**Response:** It is noted that if a driveway closure is needed, the above standards would apply.

**Section 75.040. - Driveway Approach Requirements.**

- (1) *The provision and maintenance of driveway approaches from private property to the public streets as stipulated in this Code are continuing requirements for the use of any structure or parcel of real property in the City of Tualatin. No building or other permit may be issued until scale plans are presented that show how the driveway approach requirement is to be fulfilled. If the owner or occupant of a lot or building changes the use to which the lot or building is put, thereby increasing driveway approach requirements, it is unlawful and a violation of this code to begin or maintain such altered use until the required increase in driveway approach is authorized by the City.*

**Response:** All proposed driveway approaches will be authorized by the City before construction and maintained in accordance with the TDC. This standard is met.

- (2) *Owners of two or more uses, structures, or parcels of land may agree to utilize jointly the same driveway approach when the combined driveway approach of both uses, structures, or parcels of land satisfies their combined requirements as designated in this code; provided that satisfactory legal evidence is presented to the City Attorney in the form of deeds, easements, leases or contracts to establish joint use. Copies of said deeds, easements, leases or contracts must be placed on permanent file with the City Recorder.*

**Response:** All three lots are owned by Lam. This standard does not apply.

- (3) *Joint and Cross Access....*

**Response:** Lam is owner of all joint and cross access; no additional access easements are needed. This standard is met.

- (4) *Requirements for Development on Less than the Entire Site.*

- (a) *To promote unified access and circulation systems, lots and parcels under the same ownership or consolidated for the purposes of development and comprised of more than one building site must be reviewed as one unit in relation to the access standards. The number of access points permitted must be the minimum number necessary to provide reasonable access to these properties, not the maximum available for that frontage. All necessary easements, agreements, and stipulations must be met. This must also apply to phased development plans. The owner and all lessees within the affected area must comply with the access requirements.*

**Response:** Per the IMP, all existing access points were found to provide reasonable access. The proposed new building and parking accesses have been designed to accommodate the added traffic and parking. This standard is met.

- (b) *All access must be internalized using the shared circulation system of the principal commercial development or retail center. Driveways should be designed to avoid queuing across surrounding parking and driving aisles.*

**Response:** This provision is not applicable because the site is an industrial campus owned and operated by a single manufacturing user/tenant.

- (5) *Lots that front on more than one street may be required to locate motor vehicle accesses on the street with the lower functional classification as determined by the City Manager.*

**Response:** The proposed accesses have been located in accordance with a previously approved access management plan in IMP 00-01. This standard is met.

- (6) *Except as provided in TDC 53.100, all driveway approaches must connect directly with public streets.*

**Response:** The proposed driveway approaches connect directly with public streets. This standard is met.

- (7) *To afford safe pedestrian access and egress for properties within the City, a sidewalk must be constructed along all street frontage, prior to use or occupancy of the building or structure proposed for said property. The sidewalks required by this section must be constructed to City standards, except in the case of streets with inadequate right-of-way width or where the final street design and grade have not been established, in which case the sidewalks must be constructed to a design and in a manner approved by the City Manager. Sidewalks approved by the City Manager may include temporary sidewalks and sidewalks constructed on private property; provided, however, that such sidewalks must provide continuity with sidewalks of adjoining commercial developments existing or proposed. When a sidewalk is to adjoin a future*

*street improvement, the sidewalk construction must include construction of the curb and gutter section to grades and alignment established by the City Manager.*

**Response:** All street frontages have existing or proposed sidewalks that meet City standards. This standard is met.

- (8) *The standards set forth in this Code are minimum standards for driveway approaches, and may be increased through the Architectural Review process in any particular instance where the standards provided herein are deemed insufficient to protect the public health, safety, and general welfare.*
- (9) *Minimum driveway approach width for uses are as provided in Table 75-1 (Driveway Approach Width): ... (Table withheld for brevity, Industrial standard minimum is 36' and maximum is 40')*

**Response:** All proposed driveway approaches are 36'. See sheet C1.13, C1.14. This standard is met.

- (10) *Driveway Approach Separation. There must be a minimum distance of 40 feet between any two adjacent driveways on a single property unless a lesser distance is approved by the City Manager.*

**Response:** All proposed driveway approaches are more than 40' apart. See sheets C1.13 and C1.14. This standard is met.

- (11) *Distance between Driveways and Intersections. Except for single-family dwellings, duplexes, townhouses, triplexes, quadplexes, and cottage clusters, the minimum distance between driveways and intersections must be as provided below. Distances listed must be measured from the stop bar at the intersection.*

- (a) *At the intersection of collector or arterial streets, driveways must be located a minimum of 150 feet from the intersection.*
- (b) *At the intersection of two local streets, driveways must be located a minimum of 30 feet from the intersection.*
- (c) *If the subject property is not of sufficient width to allow for the separation between driveway and intersection as provided, the driveway must be constructed as far from the intersection as possible, while still maintaining the 5-foot setback between the driveway and property line.*
- (d) *When considering a driveway approach permit, the City Manager may approve the location of a driveway closer than 150 feet from the intersection of collector or arterial streets, based on written findings of fact in support of the decision.*

**Response:** All proposed driveways are located at least 150' from the intersection of 108th and Leveton. See sheet C1.13. This standard is met.

- (12) *Vision Clearance Area.*

- (a) *Local Streets. A vision clearance area for all local street intersections, local street and driveway intersections, and local street or driveway and railroad intersections must be that triangular area formed by the right-of-way lines along such lots and a straight line joining the right-of-way lines at points which are ten feet from the intersection point of the right-of-way lines, as measured along such lines (see Figure 73-2 for illustration).*
- (b) *Collector Streets. A vision clearance area for all collector/arterial street intersections, collector/arterial street and local street intersections, and collector/arterial street and railroad intersections must be that triangular area formed by the right-of-way lines along such lots and a straight line joining the right-of-way lines at points which are 25 feet from the intersection point of the right-of-way lines, as measured along such lines. Where a driveway intersects with a collector/arterial street, the distance measured along the driveway line for the triangular area must be ten feet (see Figure 73-2 for illustration).*
- (c) *Vertical Height Restriction. Except for items associated with utilities or publicly owned structures such as poles and signs and existing street trees, no vehicular parking, hedge,*



*planting, fence, wall structure, or temporary or permanent physical obstruction must be permitted between 30 inches and eight feet above the established height of the curb in the clear vision area (see Figure 73-2 for illustration).*

**Response:** The proposal includes driveways on 108th Avenue. Neither standard (a) nor (b) above applies. No obstructions are proposed above 30" near driveway corners, as shown in Attachment 2. This standard is met.

#### IV. ORIGINAL MASTER PLAN CONDITIONS OF APPROVAL (IMP 00-01) COMPLIANCE

The following presents the original conditions of approval for the campus's master plan, with applicable requirements addressed.

##### 1. *Alternative Methods*

- a. *To meet the requirements of the TDC, through the Architectural Review process, building setbacks shall not be approved less than 68 feet to SW Leveton Drive and 98 feet to SW 108th Avenue after required dedication of right-of-way, turn lane and intersection improvements. Building setbacks to SW Tualatin Road shall meet the requirements of TDC 62.060(2)(a) and 62.080(2). Interior side yard building setbacks shall be no less than 20 feet, except setbacks to the common property line with JAE shall be no less than 100 feet.*

**Response:** This condition is met by the existing development and will be met by the proposed building.

- b. *To meet the requirements of the TDC, through the Architectural Review process parking/circulation setbacks shall not be approved less than 108 feet to SW Leveton Drive and 43 feet to SW 108th Avenue after required dedication of right-of-way, turn lane and intersection improvements. Interior side yard parking and circulation setbacks shall be as shown on Exhibit 2, Sheet SD-5, dated December 22, 2000.*

**Response:** This condition is proposed to be modified by a separate, concurrent IMP application, which requests parking/circulation setbacks of at least 50' to SW Leveton Drive and 43' to SW 108th Avenue. See IMP application submitted concurrently.

- c. *As mitigation for a reduced parking and circulation setbacks to SW Tualatin Road an earthen berm with landscaping consisting of deciduous street trees, evergreen trees and shrubs shall be provided along SW Tualatin Road, the large evergreen trees along the roadway shall be retained and the berm and landscaping shall be installed as part of the Phase 1 development. The final design of the berm and landscaping shall be reviewed through the Architectural Review process.*

**Response:** This was constructed following the 2001 AR approval and will not be affected by the proposal. This condition is met.

- d. *Through the Partition and Architectural Review processes shared parking and circulation easements shall be reviewed and evaluated. Where necessary, shared parking and circulation easements shall be established.*

**Response:** The Partition and AR following the IMP established these. This condition is met.

- k. *To meet the requirements of the TDC, through the Architectural Review process final parking areas shall be determined and the stand of trees behind the former Oki manufacturing building shall be retained or integrated into the parking lot design as determined appropriate.*

**Response:** This stand of trees was and will remain preserved. This condition is met.

- f. *To ensure that vehicular access requirements meet the TDC, through the Partition and Architectural Review processes shared site vehicular accesses will need to be reviewed and evaluated. Where necessary, shared site vehicular access easements shall be established.*

**Response:** No site access easements are necessary because the three subject parcels are used by the owner as a single manufacturing operation.

*g. To meet the requirements of the TDC, through the Architectural Review processes loading areas that encroach onto a separate adjoining lot, excluding JAE, will need to be reviewed and evaluated. If encroachments off-site and into parking areas are necessary the Architectural Review process shall determine the appropriateness.*

**Response:** No such encroachments are proposed. This condition is met.

*k. Through the Partition and Architectural Review processes onsite utilities shall be reviewed and evaluated. Where necessary, easements shall be established.*

**Response:** The Partition and AR following this IMP established these if required. This condition is met.

*i. The applicant shall submit a partition application to the City to partition the site into the proposed three individual lots.*

**Response:** The Partition was completed following the approval of the IMP to meet this condition.

*j. The applicant's request for an alternative method in parking lot landscaping requirements is acceptable for surface parking proposed for the south-half of the site as depicted in the applicant's proposal (Exhibit 2). Proposed parking lot landscaping for the north-half of the site shall follow the standard requirements of Chapter 73 of the TDC.*

**Response:** Development on the site has continued to meet the alternative or standard parking lot requirements, as appropriate. Much of the proposed parking is on the south half of the site and proposes the alternative landscaping. This condition is met.

*k. The applicant shall be required to submit an Architectural Review application meeting the requirements of the TDC and include the alternative methods approved through the Industrial Master Plan. If future modifications to an approved Industrial Master Plan are necessary, a new Industrial Master Plan application shall be submitted to the City for review.*

**Response:** AR applications following the approval of IMP 00-01 have met this condition. This AR application addresses this condition. The concurrently submitted IMP application proposes a modification to condition 1.b. above. This condition is met.

## 2. Public Facilities

*a. Through the Architectural Review process Novellus shall address the ODOT recommended condition of approval concerning the 99W/124th Avenue intersection contained in Exhibit D.*

**Response:** This intersection has been improved since the approval of this IMP.

*b. At the time of submittal of Architectural Review applications for each phase of on-site development a traffic analysis report shall be submitted and improvements identified. The traffic analysis report shall be reviewed through the Public Facilities component of the Architectural Review process and conditions applied.*

**Response:** The TIA in Attachment 9 meets this condition for this application.

*c. Construction of Phases 2-4, when proposed, shall be evaluated through the Architectural Review process on the availability of an adequate City water supply to service the proposed development phase.*

**Response:** Construction of phases 2-4 is not yet proposed. This condition does not apply.

- d. *Through the Architectural Review process the volume and pressure needs for each development phase shall be evaluated. Based on calculations, the water transmission line may be required to be extended to serve the development.*

**Response:** The Lam Research campus is currently served by City of Tualatin Water from two transmission mains in SW Leveton Drive, a low-pressure main which predated the 2001 IMP, and a high-pressure main which was installed after IMP approval. The proposed office building will connect to the high-pressure main which is expected to provide adequate flow and pressure for the new building.

- e. *Through the Architectural Review process the applicant shall submit evaluations on the downstream sanitary sewer system and the discharge rates and volumes per proposed development phase and participate where required in mitigation measures. Recycling and reuse options shall be considered by the applicant to reduce the discharge rates and volumes. The applicant shall work with the City to develop a program to release the sanitary sewer discharge during off-peak hours.*

**Response:** The Lam Research campus is currently served with municipal sewer by City of Tualatin from a main within SW Leveton Drive. Campus managers indicate no current issues or required sewer flow rate mitigation based on the existing campus development and uses. The proposed office building is not expected to generate significant sewer demands and is not expected to require any flow reduction or mitigation.

- f. *Through the Architectural Review process the adequacy of on-site stormwater detention shall be evaluated and Novellus shall provide supporting documentation and calculations showing adequacy of the storm system. At the time road widening for SW Leveton Drive or SW 108th Avenue is required, Novellus shall submit drawings and calculations for water quality and detention for review and approval as part of the Architectural Review process.*

**Response:** The stormwater report in Attachment 10 demonstrates compliance with stormwater requirements. This condition is met. Road widening is not yet required.

### 3. *Location, Design, Color and Materials*

- a. *Through the Architectural Review process, final material colors shall be presented for approval based on the pallet of colors identified in the Industrial Master Plan.*
- b. *Through the Architectural Review process, final building materials shall be presented for approval based on the pallet of materials identified in the Industrial Master Plan.*

**Response:** The exterior materials information on sheets A2.10 and A2.11 of Attachment 2 show the proposed building will be of similar materials to the existing buildings on the campus, identified in the original IMP. These conditions are met.

## **V. CONCLUSION**

As demonstrated in the narrative above and referenced attachments, this AR application meets the relevant criteria and warrants approval.





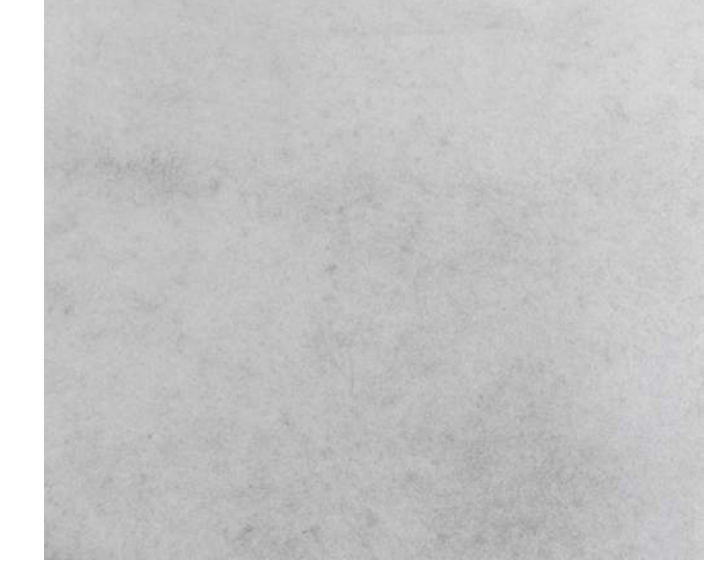








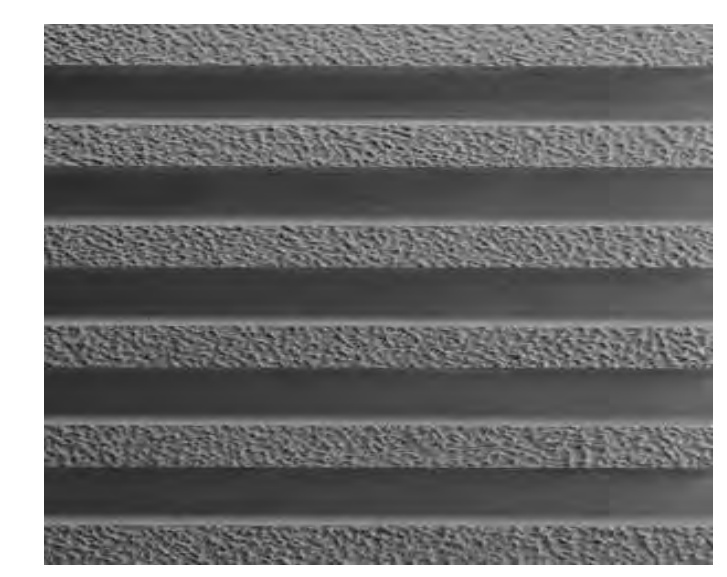
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2 CONC-1 - LIGHT GRAY CONCRETE TILT PANEL



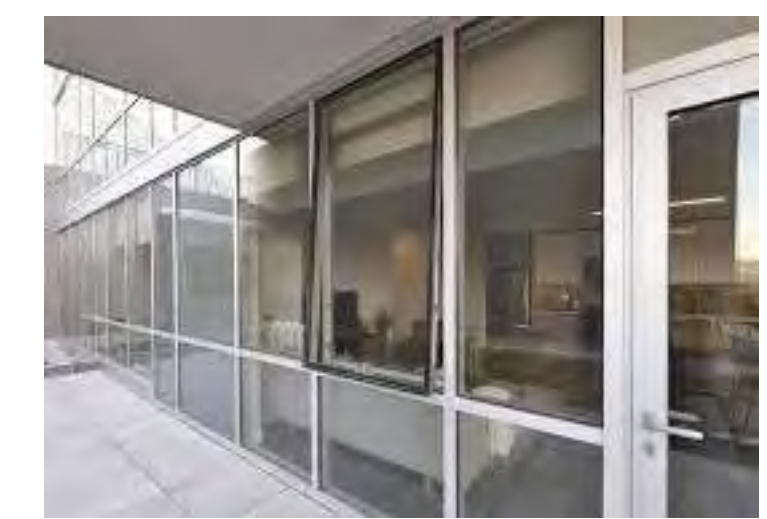
3 CONC-3 - DARK GRAY CONCRETE WITH FORMLINER



4 MP-1 - SMOOTH OR RIBBED PANELS - PREFINISHED



5 STOREFRONT - SILVER MULLIONS



6 TERRACOTTA ACCENT TILES



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REVISION SCHEDULE		
Delta	Issued As	Issue Date

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**MATERIALITY**

DRAWN BY: Author

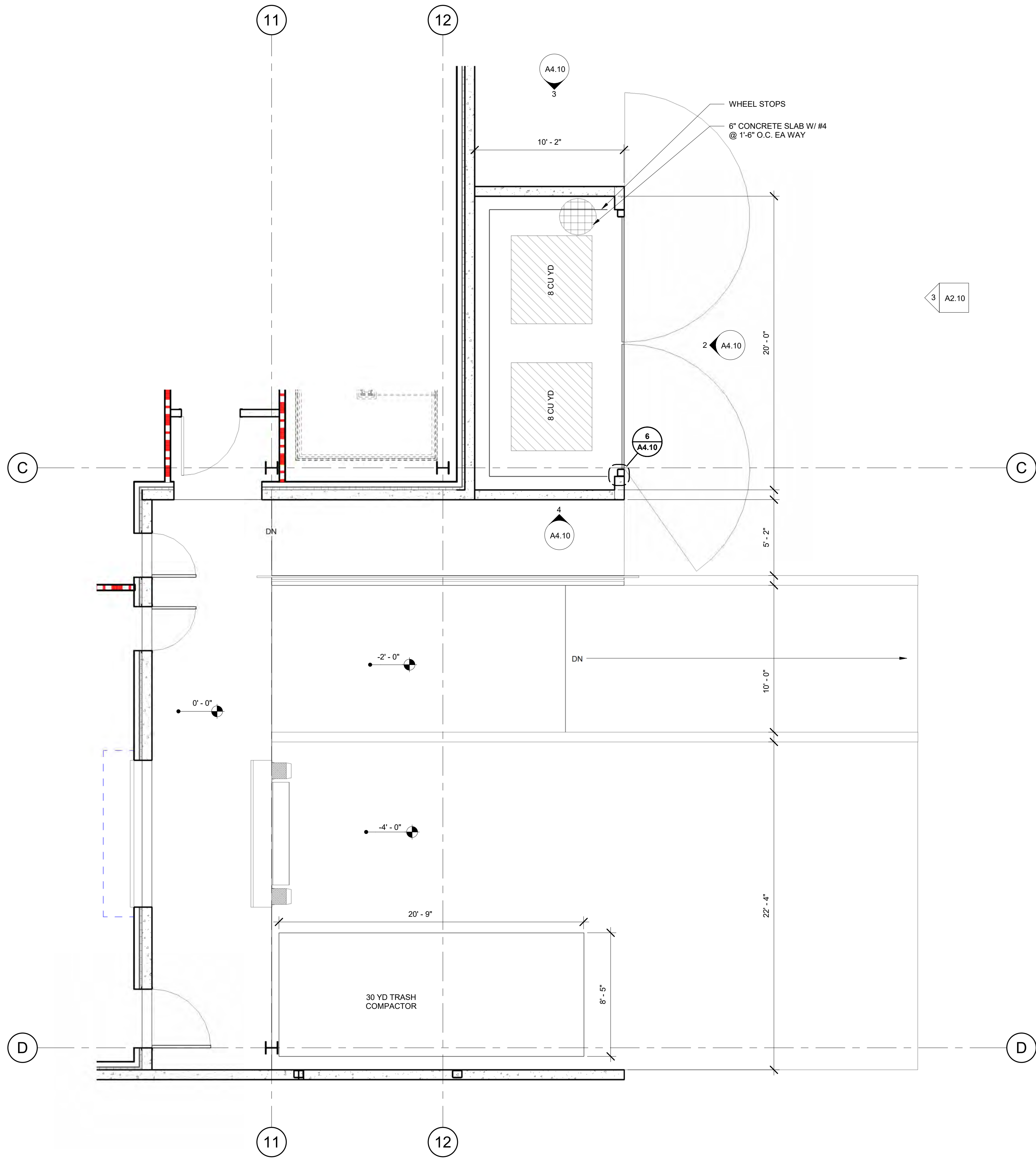
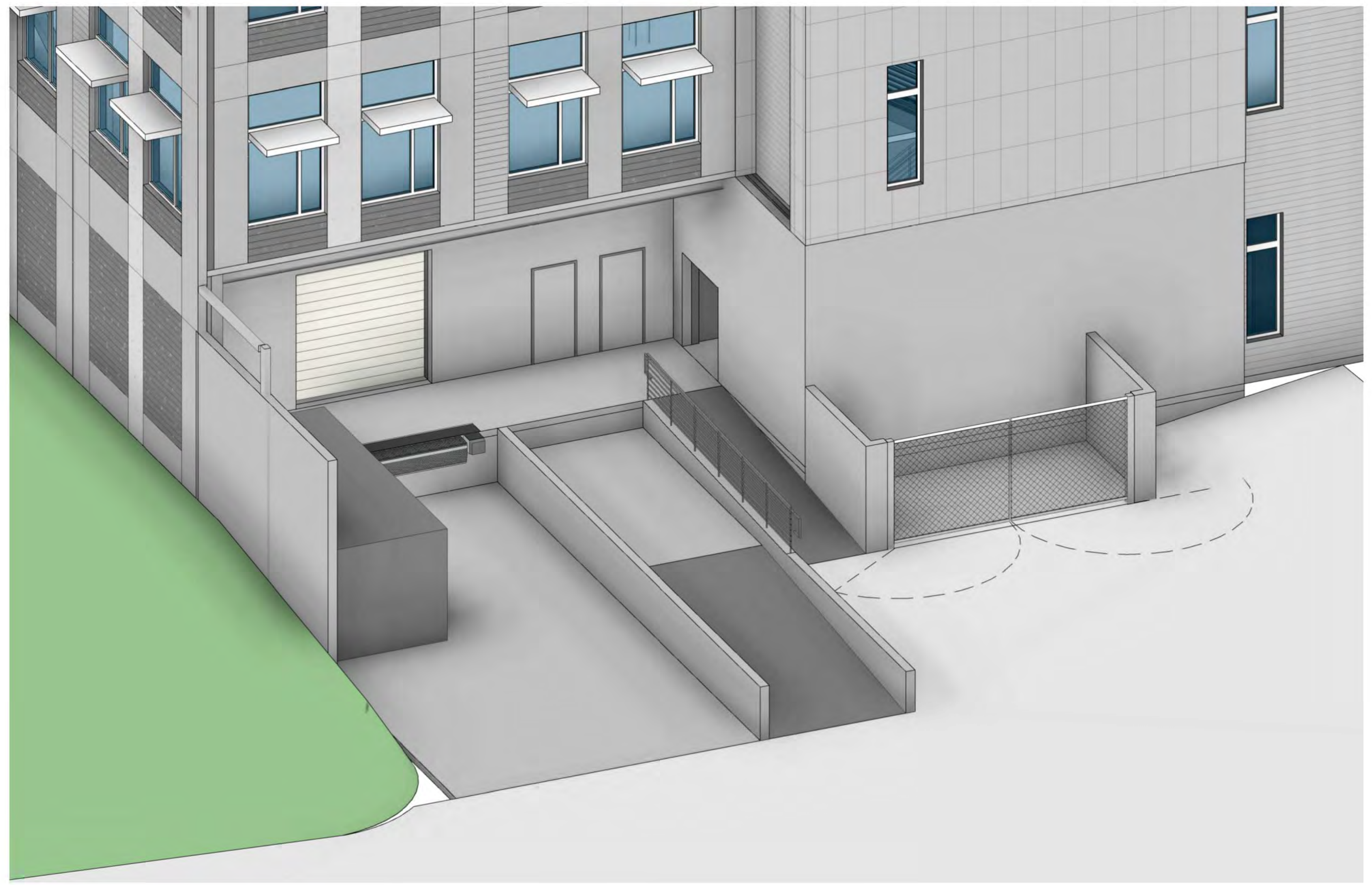
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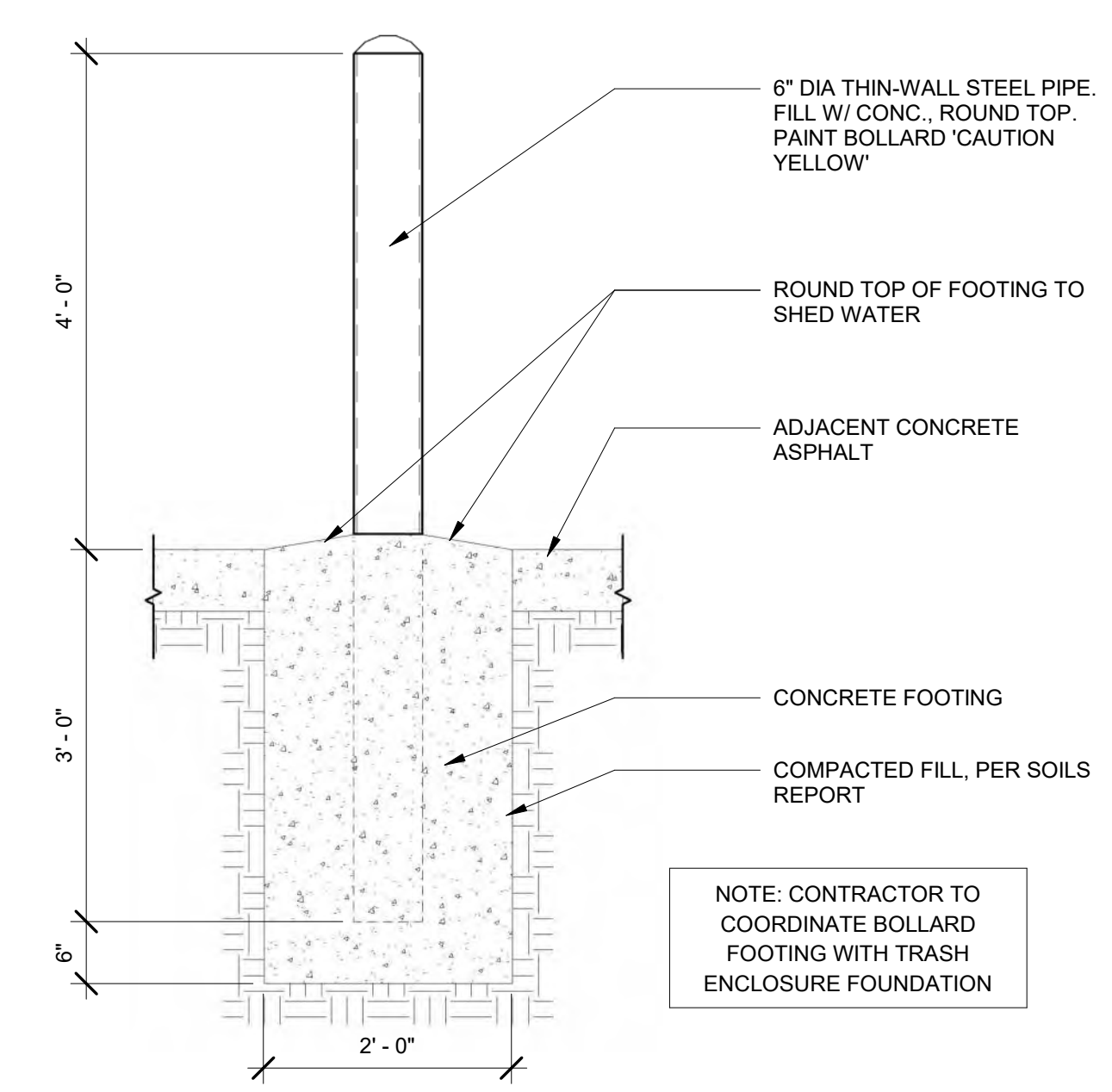
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JOB NO. **2220087.00**

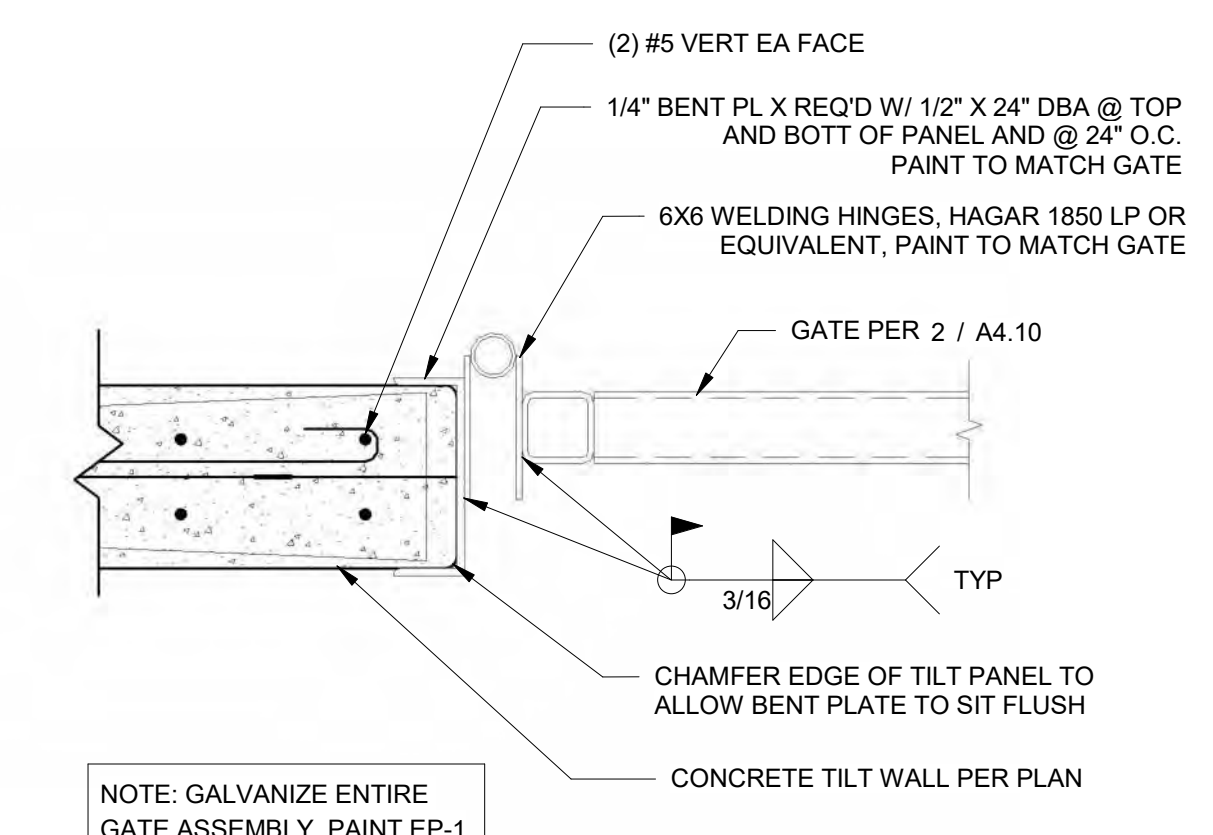




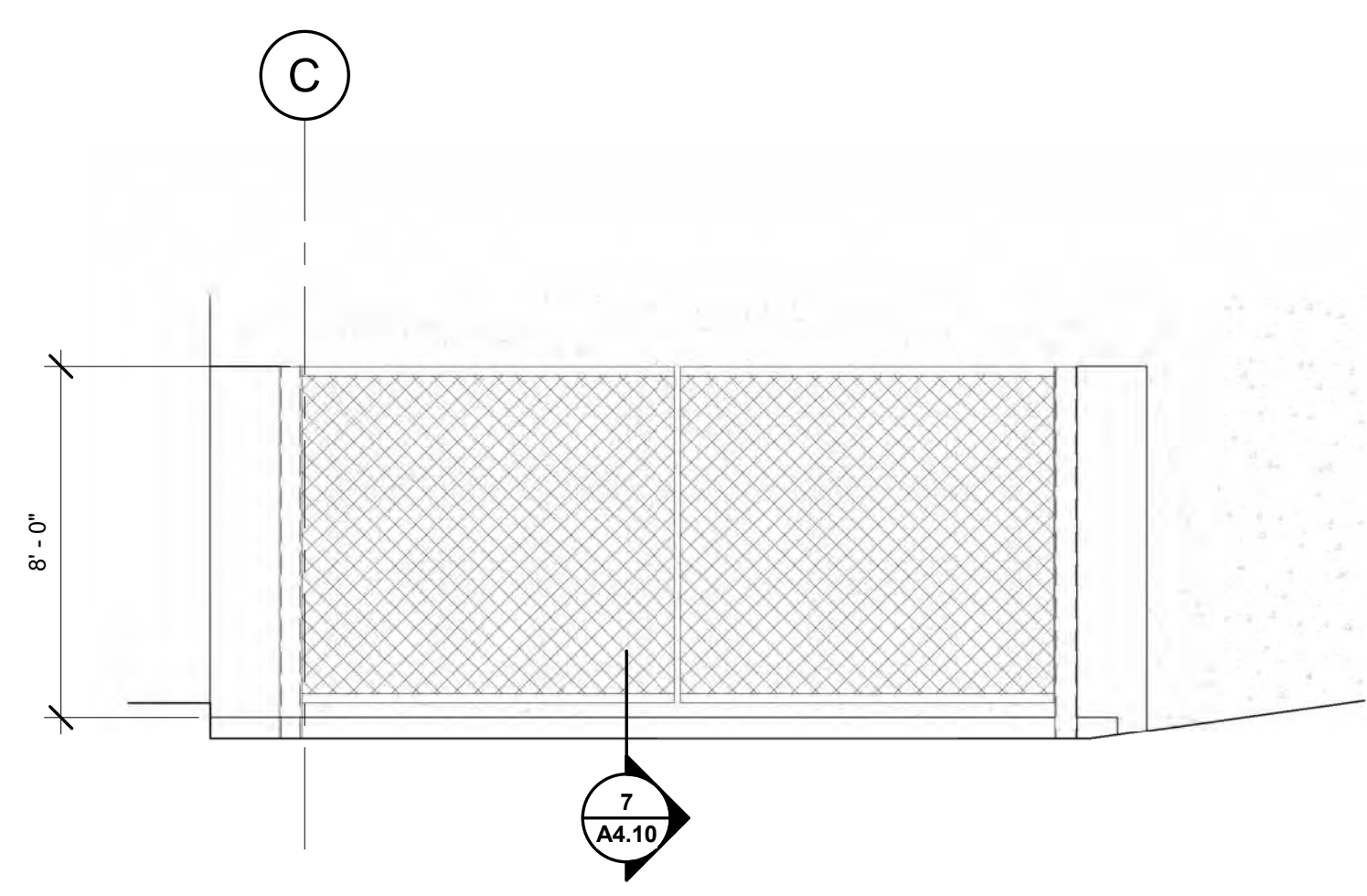
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A4.10 1/4" = 1'-0"



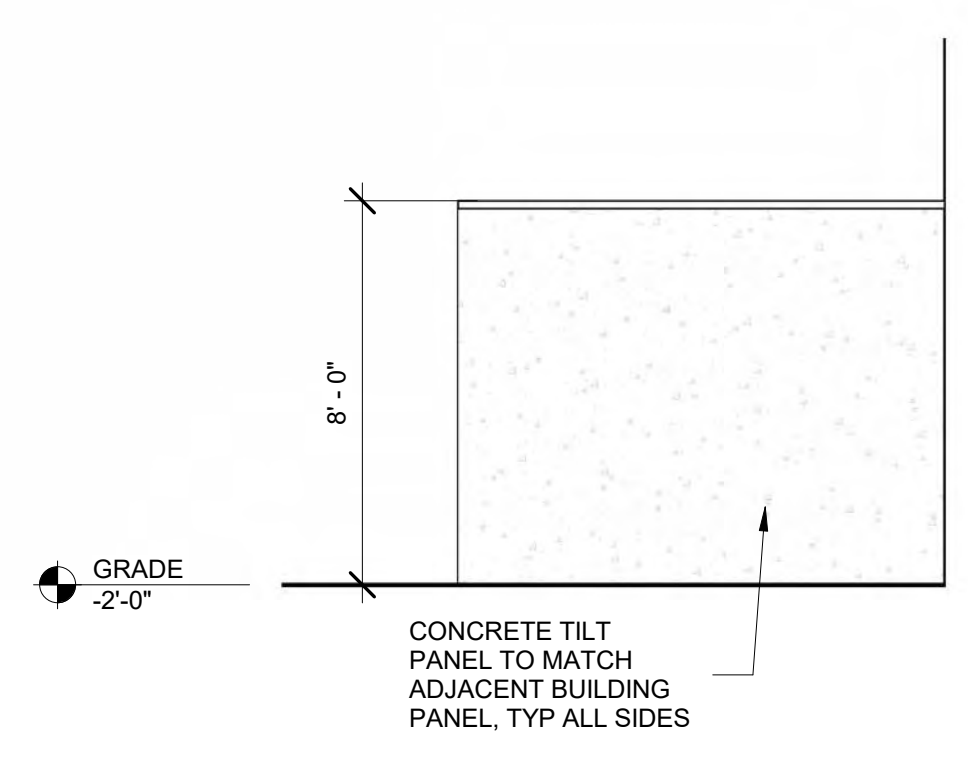
5 BOLLARD DETAIL  
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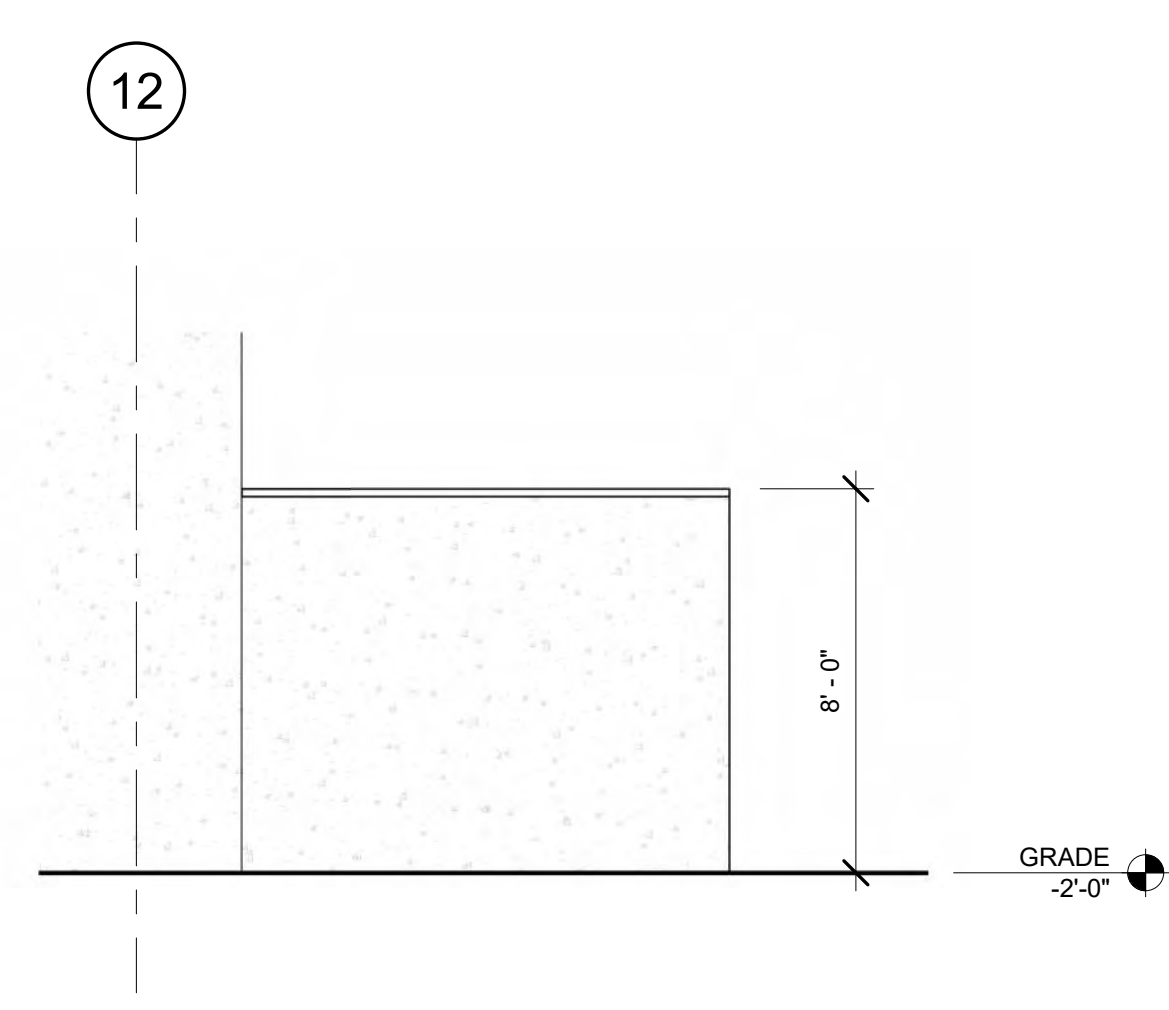
6 GATE HINGE DETAIL  
A4.10 1 1/2" = 1'-0"



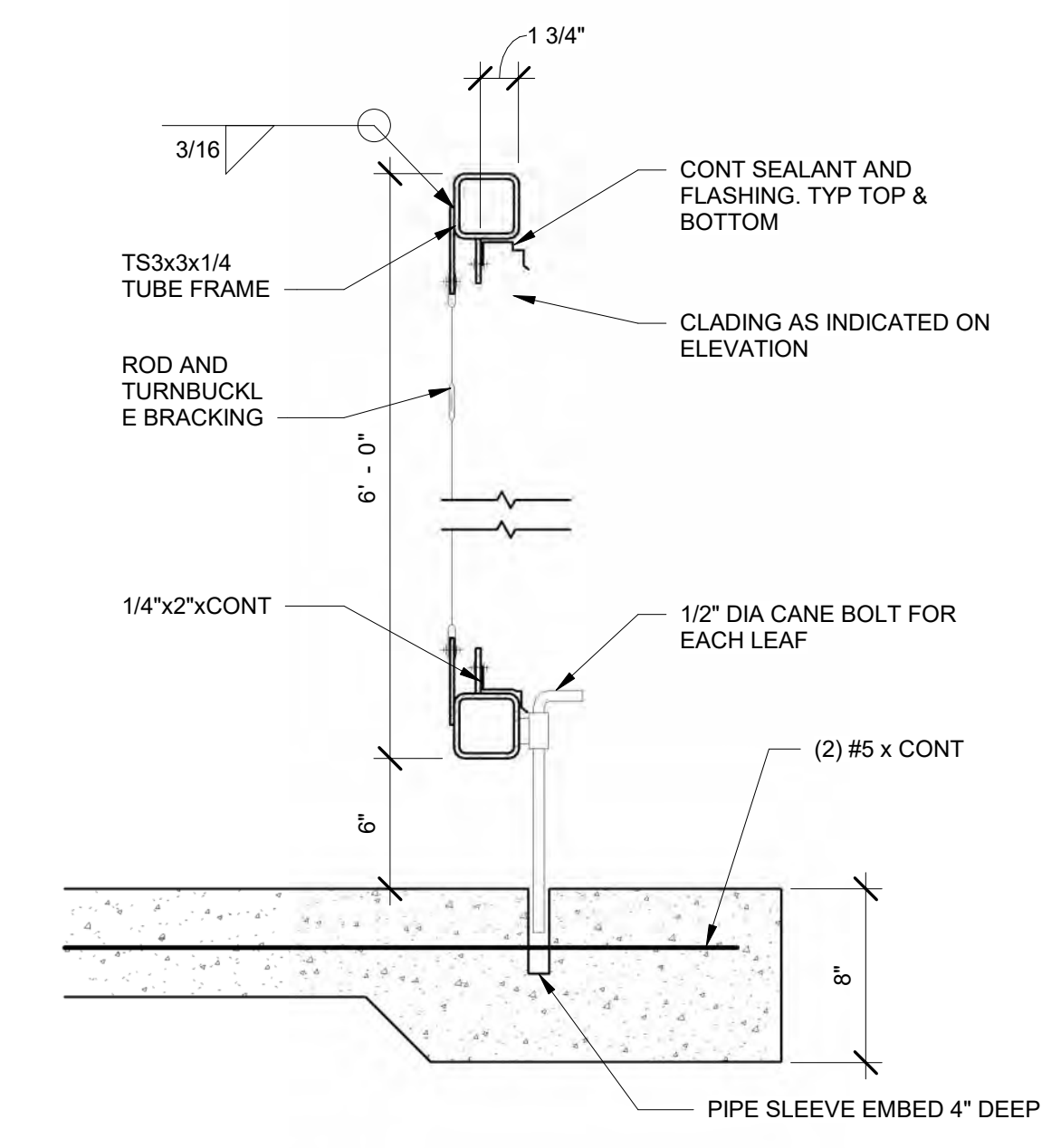
2 TRASH ENCLOSURE ELEVATION  
A4.10 1/4" = 1'-0"



3 TRASH ENCLOSURE ELEVATION  
A4.10 1/4" = 1'-0"



4 TRASH ENCLOSURE ELEVATION  
A4.10 1/4" = 1'-0"



7 GATE SECTION  
A4.10 1 1/2" = 1'-0"

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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**ENLARGED PLANS**

DRAWN BY: Author  
CHECKED BY: Checker  
SHEET

**A4.10**

JOB NO. 2220087.00



## GENERAL NOTES

- ALL WORK SHALL CONFORM TO THE CURRENT STANDARD SPECIFICATIONS AND REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION AND THE CURRENT AMERICAN PUBLIC WORKS ASSOCIATION STANDARDS FOR PUBLIC WORKS CONSTRUCTION
- THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN IS BASED ON A SURVEY BY OTHERS AND IS SHOWN FOR REFERENCE ONLY. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS WITH ITS OWN RESOURCES PRIOR TO START OF ANY CONSTRUCTION
- CONTRACTOR MUST COMPLY WITH LOCAL AND STATE REQUIREMENTS TO NOTIFY ALL UTILITY COMPANIES FOR LINE LOCATIONS SEVENTY-TWO (72) HOURS (MINIMUM) PRIOR TO START OF WORK. DAMAGE TO UTILITIES SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE
- CONTRACTOR SHALL ADJUST ALL STRUCTURES IMPACTED BY CONSTRUCTION IMPROVEMENTS TO NEW FINISH GRADES
- REQUEST BY THE CONTRACTOR FOR CHANGES TO THE PLANS MUST BE APPROVED BY THE ENGINEER
- ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY REQUIRES A PUBLIC WORKS PERMIT
- CONTRACTOR SHALL PROVIDE THE ENGINEER OF RECORD WITH AS-BUILT PLANS AT LEAST 2 WEEKS PRIOR TO REQUESTING AGENCY SIGN OFF ON PERMITS FOR OCCUPANCY
- CONTRACTOR SHALL PERFORM ALL THE WORK SHOWN ON THE DRAWINGS AND ALL INCIDENTAL WORK NECESSARY TO COMPLETE THE PROJECT

## SITE DEMOLITION NOTES

- COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS FOR DEMOLITION OPERATIONS AND SAFETY OF ADJACENT STRUCTURES AND THE PUBLIC
- INSTALL EROSION CONTROL MEASURES AND TEMPORARY FENCING PRIOR TO ANY DEMOLITION ACTIVITIES
- MITIGATE DUST POLLUTION DUE TO DEMOLITION ACTIVITIES
- PROTECT ALL EXISTING STRUCTURES, UTILITIES, LANDSCAPE AND OTHER ELEMENTS THAT ARE NOT DESIGNATED FOR REMOVAL. ANY DAMAGE TO EXISTING IMPROVEMENTS NOT DESIGNATED FOR REMOVAL SHALL BE REPAIRED/REPLACED AT THE CONTRACTOR'S EXPENSE
- DO NOT BEGIN REMOVAL UNTIL ITEMS TO BE SALVAGED OR RELOCATED HAVE BEEN REMOVED AS NOTED. IF REMOVED GRAVEL OR PAVEMENT MATERIALS ARE TO BE RECYCLED OR REUSED, PREVENT CONTAMINATION OF THESE MATERIALS FROM TOPSOIL OR OTHER DELETERIOUS MATERIAL
- CONTRACTOR SHALL COORDINATE DEMOLITION WORK WITH AFFECTED UTILITY COMPANIES, OBTAIN ALL REQUIRED PERMITS, NOTIFY THEM PRIOR TO STARTING WORK, AND COMPLY WITH THEIR REQUIREMENTS. ADDITIONAL REMOVALS MAY BE REQUIRED BY THE AUTHORITIES HAVING JURISDICTION AND THE CONTRACTOR SHALL CONFIRM ACCORDINGLY PRIOR TO BID. ACCURATELY RECORD ACTUAL LOCATIONS OF CAPPED AND ACTIVE UTILITIES FOR AS-BUILT PURPOSES AND SUPPLY TO OWNER AND ARCHITECT/ENGINEER OF RECORD
- DEMOLISH AND REMOVE ALL NON-BUILDING SITE STRUCTURES AND ASSOCIATED FEATURES (APPURTENANCES) AS SHOWN. WITHIN AREA OF NEW CONSTRUCTION, REMOVE DESIGNATED WALLS AND FOOTINGS TO 2 FEET MINIMUM BELOW FINISHED GRADE. DEMOLISH ALL PAVED AREAS DESIGNATED FOR REMOVAL DOWN TO NATIVE SUBGRADE
- ALL VEGETATION AND DELETERIOUS MATERIALS WITHIN THE LIMITS OF WORK SHALL BE STRIPPED AND REMOVED FROM THE SITE PRIOR TO GRADING WORK UNLESS NOTED OTHERWISE (E.G. PROTECTED TREES)
- IF HAZARDOUS MATERIALS ARE DISCOVERED DURING DEMOLITION, STOP WORK AND IMMEDIATELY NOTIFY THE OWNER AND ARCHITECT/ENGINEER OF RECORD

## GRADING NOTES

- ROUGH GRADING:** ROUGH GRADE TO ALLOW FOR DEPTH OF BUILDING SLABS, PAVEMENTS, BASE COURSES, AND TOPSOIL PER DETAILS AND SPECIFICATIONS
- FINISH GRADING:** BRING ALL FINISH GRADES TO LEVELS INDICATED. WHERE GRADES ARE NOT OTHERWISE INDICATED, LANDSCAPE FINISH GRADES ARE TO BE THE SAME AS ADJACENT SIDEWALKS, CURBS, OR THE OBVIOUS GRADE OF ADJACENT STRUCTURE. SOFTSCAPE GRADES (INCLUDING ADDITIONAL DEPTH OF TOPSOIL) SHALL BE SET 6 INCHES BELOW BUILDING FINISHED FLOORS WHERE ABUTTING BUILDINGS, 1-2 INCHES WHERE ABUTTING WALKWAYS OR CURBS, OR MATCHING OTHER SOFTSCAPE GRADES. GRADE TO UNIFORM LEVELS OR SLOPES BETWEEN POINTS WHERE GRADES ARE GIVEN. ROUND OFF SURFACES, AVOID ABRUPT CHANGES IN LEVELS. AT COMPLETION OF JOB AND AFTER BACKFILLING BY OTHER TRADES HAS BEEN COMPLETED, REFILL AND COMPACT AREAS WHICH HAVE SETTLED OR ERODED TO BRING TO FINAL GRADES
- EXCAVATION:** EXCAVATE FOR SLABS, PAVING, AND OTHER IMPROVEMENTS TO SIZES AND LEVELS SHOWN OR REQUIRED. ALLOW FOR FORM CLEARANCE AND FOR PROPER COMPACTION OF REQUIRED BACKFILLING MATERIAL. DAMAGE TO UTILITIES SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE
- EFFECTIVE EROSION PREVENTION AND SEDIMENT CONTROL IS REQUIRED. EROSION CONTROL DEVICES MUST BE INSTALLED AND MAINTAINED MEETING THE LOCAL AGENCY AND STATE AGENCY REQUIREMENTS. THE AUTHORITIES HAVING JURISDICTION MAY, AT ANY TIME, ORDER CORRECTIVE ACTION AND STOPPAGE OF WORK TO ACCOMPLISH EFFECTIVE EROSION CONTROL
- DRAINAGE SHALL BE CONTROLLED WITHIN THE WORK SITE AND SHALL BE ROUTED SO THAT ADJACENT PRIVATE PROPERTY, PUBLIC PROPERTY, AND THE RECEIVING SYSTEM ARE NOT ADVERSELY IMPACTED. THE ENGINEER AND/OR AUTHORITIES HAVING JURISDICTION MAY, AT ANY TIME, ORDER CORRECTIVE ACTION AND STOPPAGE OF WORK TO ACCOMPLISH EFFECTIVE DRAINAGE CONTROL
- SITE TOPSOIL STOCKPILED DURING CONSTRUCTION AND USED FOR LANDSCAPING SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT
- CONTRACTOR TO REVIEW AND CONFIRM GRADES AT JOIN POINTS, SUCH AS AT DAYLIGHT LIMITS AND BUILDING ENTRANCES, PRIOR TO CONSTRUCTION
- ACCESSIBLE PARKING SPACES AND LOADING ZONES SHALL BE CONSTRUCTED AT 2% MAXIMUM SLOPE IN ALL DIRECTIONS
- PEDESTRIAN SIDEWALK CONNECTIONS BETWEEN PUBLIC R.O.W. AND BUILDING ENTRANCES SHALL BE CONSTRUCTED AT AND 2% MAXIMUM CROSS SLOPE AND 5% MAXIMUM LONGITUDINAL SLOPE (8.33% FOR DESIGNATED RAMPS)

## UTILITY NOTES

- ALL WORK SHALL CONFORM TO THE CURRENT EDITIONS OF THE STATE PLUMBING AND BUILDING CODES WITH LOCAL AMENDMENTS AS APPLICABLE ALONG WITH ANY ADDITIONAL REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION
- THE WORKING DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND OR ELBOW REQUIRED FOR INSTALLATION IN THE SPACE PROVIDED. THEY DO NOT SHOW EVERY DIMENSION, COMPONENT PIECE, SECTION, JOINT OR FITTING REQUIRED TO COMPLETE THE PROJECT. ALL LOCATIONS FOR WORK SHALL BE CHECKED AND COORDINATED WITH EXISTING CONDITIONS IN THE FIELD BEFORE BEGINNING CONSTRUCTION. EXISTING UNDERGROUND UTILITIES WITHIN THE LIMITS OF EXCAVATION SHALL BE VERIFIED AS TO CONDITION, SIZE AND LOCATION BY UNCOVERING (POTHOLING), PROVIDING SUCH IS PERMITTED BY THE AUTHORITIES HAVING JURISDICTION, BEFORE BEGINNING CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES
- NOT ALL REQUIRED CLEANOUTS ARE SHOWN ON THE PLANS. PROVIDE CLEANOUTS PER DETAIL XX/CX.XX AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION AND THE CURRENT EDITION OF THE STATE PLUMBING CODE (E.G. UNIFORM PLUMBING CODE CHAPTER 7, SECTIONS 707 AND 719, AND CHAPTER 11, SECTION 1101.13).
- ALL SANITARY AND STORM PIPING IS DESIGNED USING CONCENTRIC PIPE TO PIPE AND WYE FITTINGS, UNLESS OTHERWISE NOTED
- ALL DOWNSPOUT LEADERS TO BE 6 INCHES AT 2.0% MINIMUM UNLESS NOTED OTHERWISE
- IF APPLICABLE, PROVIDE 2 INCH PVC DRAIN LINE FROM DOMESTIC WATER METER VAULT AND BACKFLOW PREVENTER VAULT TO THE DOUBLE DETECTOR CHECK VALVE (FIRE) VAULT. PROVIDE 1/3 HP SUMP PUMP AT BASE OF FIRE VAULT AND INSTALL 2 INCH PVC DRAIN LINE WITH BACKFLOW VALVE FROM SUMP PUMP TO DAYLIGHT AT NEAREST CURB. FURNISH 3/4 INCH DIAMETER CONDUIT FROM BUILDING ELECTRICAL ROOM TO FIRE VAULT FOR SUMP PUMP ELECTRICAL SERVICE. NOTE: COORDINATE WITH FIRE PROTECTION CONTRACTOR FOR FLOW SENSOR INSTALLATION AND CONDUIT REQUIREMENTS
- PREFABRICATED PLUMBING PRODUCTS USED SHALL BE LISTED ON THE IAPMO R&T PRODUCT LISTING DIRECTORY ([pd.iapmo.org](http://pd.iapmo.org)). ALL SUBMITTALS FOR REVIEW SHALL BE ACCOMPANIED BY MANUFACTURER'S LITERATURE CLEARLY STATING THIS CERTIFICATION AND/OR THE PRODUCT LISTING CERTIFICATE FROM THE IAPMO DIRECTORY WEBSITE
- IF APPLICABLE, CONTRACTOR TO PROVIDE POWER TO IRRIGATION CONTROLLER. SEE LANDSCAPE PLANS AND SPECIFICATIONS
- SEE BUILDING PLUMBING DRAWINGS FOR PIPING WITHIN THE BUILDING AND UP TO 5 FEET OUTSIDE THE BUILDING, INCLUDING ANY FOUNDATION DRAINAGE PIPING
- CONTRACTOR TO MAINTAIN MINIMUM 3 FEET OF COVER OVER ALL UTILITY PIPING AND CONDUITS, UNLESS NOTED OTHERWISE
- WHERE CONNECTING TO AN EXISTING PIPE, AND PRIOR TO ORDERING MATERIALS, THE CONTRACTOR SHALL EXPOSE THE EXISTING PIPE TO VERIFY THE LOCATION, SIZE, AND ELEVATION. NOTIFY ENGINEER OF ANY DISCREPANCIES
- CONTRACTOR SHALL SCOPE ALL PRIVATE ONSITE GRAVITY SYSTEM LINES THAT ARE BEING CONNECTED TO FOR PROPOSED SERVICE. SCOPING SHALL OCCUR A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION AND THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES WITH AS-BUILT RECORDS/SURVEY FINDINGS OR IF THE EXISTING UTILITIES ARE DAMAGED OR SHOW SIGNS OF SIGNIFICANT DETERIORATION. CONTRACTOR SHALL PROVIDE THE ENGINEER WITH VIDEO RECORDS, ALONG WITH A SKETCH IF THE LOCATIONS DIFFER FROM AS-BUILT PLANS OR SURVEY FINDINGS
- PRODUCT MATERIAL SUBMITTALS FOR REVIEW BY THE ENGINEER SHALL BE ACCOMPANIED BY A MANUFACTURER'S CERTIFICATION THAT THE PRODUCT IS CAPABLE OF MEETING PERFORMANCE EXPECTATIONS (I.E. - WATERTIGHT, MINIMUM/MAXIMUM BURIAL, PREVENTION OF GROUNDWATER INTRUSION, ETC.) BASED ON THEIR REVIEW OF THE PROJECT PLANS. IN THE ABSENCE OF A MANUFACTURER'S CERTIFICATION, THE GENERAL CONTRACTOR'S REVIEW STAMP SHALL CONSTITUTE THAT THEY HAVE PERFORMED THE NECESSARY REVIEW TO CERTIFY THE PRODUCT'S CONFORMANCE TO PROJECT SPECIFICATIONS AND GENERAL EXPECTATIONS
- PIPE LENGTHS SHOWN ON PLANS ARE TWO DIMENSIONAL AND MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE
- MANHOLE RIM ELEVATIONS SHOWN ON PLANS REFERENCE THE CENTER OF THE STRUCTURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECONCILING LIDS/GRATES/ETC TO THE SLOPES OF THE SITE GRADING
- MANHOLE OR VAULT RIM ELEVATIONS SHALL BE SET FLUSH IN PAVEMENT AREAS AND 3-4 INCHES ABOVE GRADE IN LANDSCAPE AREAS. RIMS IN PAVEMENT AREAS SHALL BE H-20 TRAFFIC RATED

## EROSION CONTROL NOTES

- HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE LOCAL AGENCY INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS
- EROSION AND SEDIMENT CONTROL MEASURES MUST BE IN PLACE BEFORE ANY LAND IS DISTURBED AND MUST REMAIN IN PLACE AND BE MAINTAINED, REPAIRED, AND PROMPTLY IMPLEMENTED FOLLOWING PROCEDURES ESTABLISHED FOR THE DURATION OF CONSTRUCTION, INCLUDING APPROPRIATE NON-STORMWATER POLLUTION CONTROLS
- THE EROSION CONTROL DRAWING IS FOR GENERAL GUIDANCE ONLY. THE CONTRACTOR SHALL KEEP THE PLAN CURRENT FOR ALL PHASES OF CONSTRUCTION AND MEET EROSION/SEDIMENT CONTROL REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION (AHJ). ALL EROSION CONTROL MEASURES SHALL CONFORM TO THE REQUIREMENTS OF THE AHJ, THE PLANS, AND THE PROJECT SPECIFICATIONS
- CONSTRUCT EROSION CONTROL IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LOADED WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS
- METHOD OF INSTALLATION FOR SEDIMENT FENCE SHALL NOT CAUSE DAMAGE TO VEGETATED SLOPE EXCEPT AT POINT OF INSTALLATION. SIDECAST MATERIAL SHALL BE KEPT TO A MINIMUM AND SHALL BE TO THE UPHILL SIDE OF THE SEDIMENT FENCE. THE FENCE SHALL BE INSTALLED AT LEAST 4 FEET FROM ADJACENT TREES
- ALL EROSION CONTROL DEVICES SHALL BE EXAMINED AND REPAIRED AFTER EACH STORM OCCURRENCE, AND INLETS SHALL BE CLEANED OF SEDIMENT WHENEVER NECESSARY
- HYDROSEED AND MULCH ALL DISTURBED AREAS UPON COMPLETION OF CONSTRUCTION OR AS DIRECTED BY THE AUTHORITIES HAVING JURISDICTION
- THE CONTRACTOR SHALL LIMIT CONSTRUCTION TRAFFIC TO PAVED AREAS TO PREVENT AND MINIMIZE SEDIMENT TRACKING OFF-SITE. CONTRACTOR SHALL SWEEP OR VACUUM PAVED AREAS IF SEDIMENT ACCUMULATION OCCURS. DO NOT TRACK SEDIMENT TO THE PUBLIC STREET OR NEIGHBORING PROPERTIES
- INSTALL TEMPORARY EROSION PREVENTION SUCH AS JUTE NETTING OR GEOTEXTILE ON DISTURBED AREAS STEEPER THAN 4H:1V
- STAGING AND STOCKPILE AREAS TO BE DETERMINED BY CONTRACTOR AND ADJUSTED TO ACCOMMODATE THE PROGRESS OF CONSTRUCTION

## SITE WORK NOTES

- ALL CURB RADII TO BE 3 FEET UNLESS NOTED OTHERWISE
- STAIR RISERS AND TREADS SHALL BE CONFORMANT WITH THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION AND THE CURRENT EDITION OF THE STATE BUILDING CODE (E.G. INTERNATIONAL BUILDING CODE, CHAPTER 10, SECTION 1011.5)
- WHEREVER A PEDESTRIAN WALKING PATH IS WITHIN 36 INCHES OF A VERTICAL DROP OF 30 INCHES OR GREATER, GUARDRAIL SHALL BE INSTALLED CONFORMANT WITH THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION AND THE CURRENT EDITION OF THE STATE BUILDING CODE (E.G. INTERNATIONAL BUILDING CODE, CHAPTER 10, SECTION 1015)
- PAVEMENTS WITH DEPRESSIONS OR BIRD BATHS, UNCONTROLLED CRACKS WHICH ARE VISIBLE WITHOUT MAGNIFICATION, AND/OR BONY OR OPEN GRADED SURFACES (EXCEPTING POROUS PAVEMENTS) WILL BE CONSIDERED UNACCEPTABLE. CONTRACTOR SHALL REVIEW PAVEMENT REPAIR OR REPLACEMENT ALTERNATIVES WITH THE OWNER AND ENGINEER PRIOR TO CONDUCTING THE REPAIR WORK.

## LEGEND

	EXISTING	PROPOSED
RIGHT-OF-WAY LINE	-----	-----
BOUNDARY LINE	-----	-----
CENTERLINE	-----	-----
PROPERTY LINE	-----	-----
CURB	-----	-----
WETLAND BOUNDARY	-----	-----
EDGE OF PAVEMENT	-----	-----
EASEMENT	-----	-----
FENCE LINE	-----	-----
GRAVEL EDGE	-----	-----
POWER LINE	-----	-----
OVERHEAD WIRE	-----	-----
TRAFFIC SIGNAL WIRE	-----	-----
TELEPHONE LINE	-----	-----
TELEVISION LINE	-----	-----
GAS LINE	-----	-----
STORM SEWER LINE	-----	-----
SANITARY SEWER LINE	-----	-----
WATER LINE	-----	-----
TREE	☼	☼ (REMOVAL)
CONTROL MANHOLE	⊙	⊙
DRYWELL	⊕	⊕
FIRE DEPARTMENT CONNECTION	⊕	⊕
FIRE HYDRANT	⊕	⊕
WATER BLOWOFF/AIR RELEASE	⊕	⊕
WATER METER	⊕	⊕
WATER VALVE	⊕	⊕
BACKFLOW PREVENTOR	⊕	⊕
WATER VAULT	⊕	⊕
MONITORING WELL	⊕	⊕
STORM/SANITARY MANHOLE	⊕	⊕
STORM SEWER CATCH BASIN	⊕	⊕
SANITARY CLEAN OUT	⊕	⊕
GAS VALVE	⊕	⊕
GAS METER	⊕	⊕
SIGN	⊕	⊕
MAIL BOX	⊕	⊕
FOUND SURVEY MONUMENT	⊕	⊕
GUY WIRE ANCHOR	⊕	⊕
UTILITY POLE	⊕	⊕
HVAC UNIT	⊕	⊕
POWER VAULT	⊕	⊕
ELECTRICAL METER	⊕	⊕
POWER JUNCTION BOX	⊕	⊕
POWER TRANSFORMER	⊕	⊕
LIGHT POLE	⊕	⊕
TELEPHONE/TELEVISION VAULT	⊕	⊕
TELEPHONE/TELEVISION JUNCTION BOX	⊕	⊕
TELEPHONE/TELEVISION RISER	⊕	⊕
SIGNAL JUNCTION BOX	⊕	⊕
BOLLARD	⊕	⊕
ADA COMPLIANT CURB RAMP SLOPE ARROW	→	→
SLOPE ARROW	→	→

## ABBREVIATIONS

CL	CENTER LINE	IE	INVERT ELEVATION
PL	PROPERTY LINE	LT	LEFT
AC	ASPHALT CONCRETE	ME	MATCH EXISTING ELEVATION
BC	BOTTOM OF CURB ELEVATION	MH	MANHOLE
BCR	BEGIN CURB RETURN	MJ	MECHANICAL JOINT
BMP	BEST MANAGEMENT PRACTICE	ON	ON CENTER
BS	BOTTOM OF STEP ELEVATION	ODOT	OREGON DEPARTMENT OF TRANSPORTATION
BW	BACK OF WALK ELEVATION	OSHA	OREGON STATE HEALTH AUTHORITY
CB	CATCH BASIN	PC	POINT OF CURVATURE
CI	CAST IRON	PCC	POINT OF COMPOUND CURVATURE
CO	CLEANOUT	PR	PROPOSED
CLR	CLEAR	PRC	POINT OF REVERSE CURVATURE
CVR	COVER	PT	POINT OF TANGENCY
DI	DUCTILE IRON	RD	ROOF DRAIN
DW	DOMESTIC WATER	RIM	RIM ELEVATION
ECR	END CURB RETURN	ROW	RIGHT OF WAY
ELEV	ELEVATION	RSGV	RESILIENT SEAT GATE VALVE
EP	EDGE OF PAVEMENT	RT	RIGHT
ESC	EROSION/SEDIMENT CONTROL	RS	SANITARY SEWER
EW	EACH WAY	STA	STATION
EX	EXISTING	SW	SIDEWALK
FDC	FIRE DEPARTMENT CONNECTION	TC	TOP OF CURB ELEVATION
FF	FINISH FLOOR	TH	THRESHOLD ELEVATION
FG	FINISHED GRADE ELEVATION	TS	TOP OF STEP ELEVATION
FH	FIRE HYDRANT	TW	TOP OF WALL ELEVATION
FI	FIELD INLET	TYP	TYPICAL
FL	FLOWLINE ELEVATION		
FS	FINISHED SURFACE ELEVATION		
FW	FIRE WATERFACE OF WALL		
G	GUTTER LINE		
GB	GRADE BREAK		

**NOTICE TO EXCAVATORS:**  
ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.  
(NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503)-232-1987.)

POTENTIAL UNDERGROUND FACILITY OWNERS

## Dig Safely.

Call the Oregon One-Call Center  
DIAL 811 or 1-800-332-2344

EMERGENCY TELEPHONE NUMBERS

NW NATURAL GAS	503-226-4211
PGE	503-464-7777
QWEST	800-673-1311
CITY BUREAU OF MAINTENANCE	503-823-1700
CITY WATER	503-823-4874
VERIZON	800-483-1000

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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**CIVIL NOTES AND LEGEND**

DRAWN BY: SJS

CHECKED BY: BDN

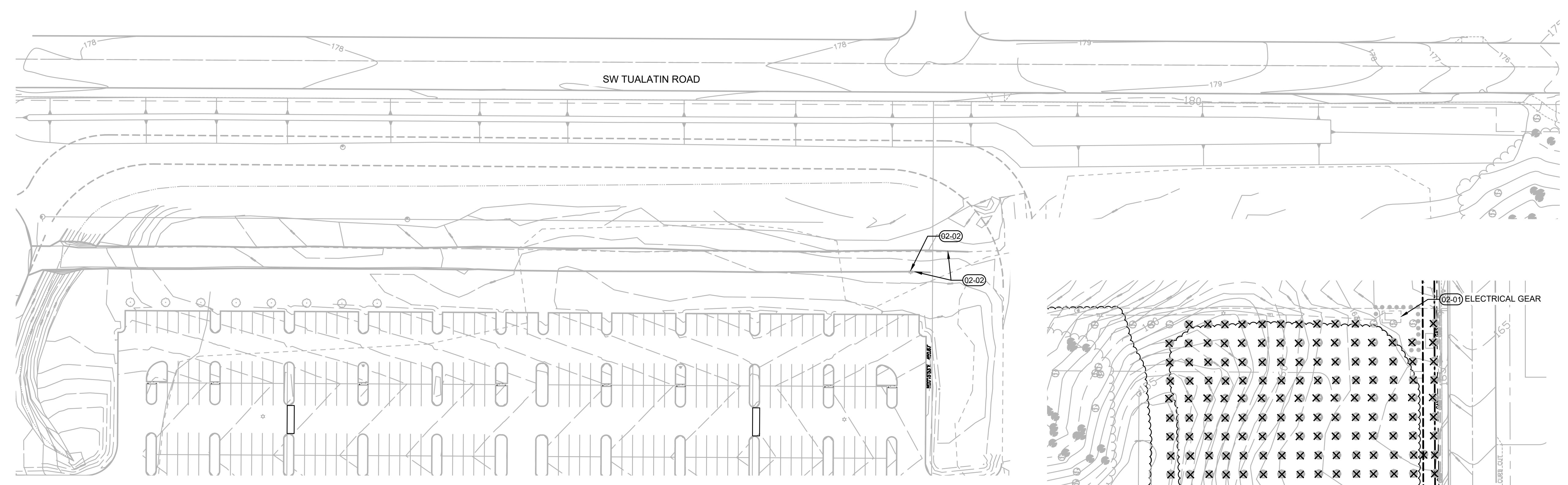
SHEET

## C0.01

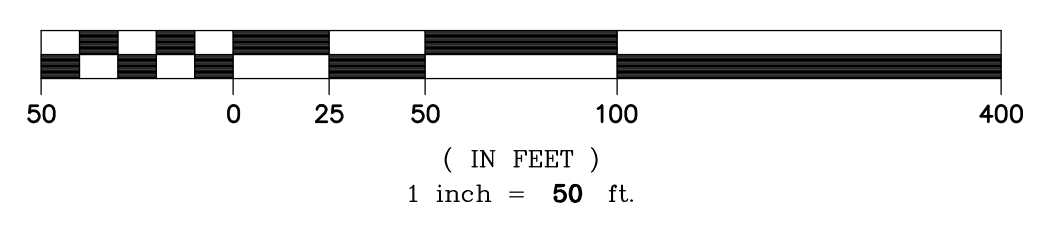
JOB NO. **2220087.00**

ARCHITECTURAL REVIEW: 8/17/2022



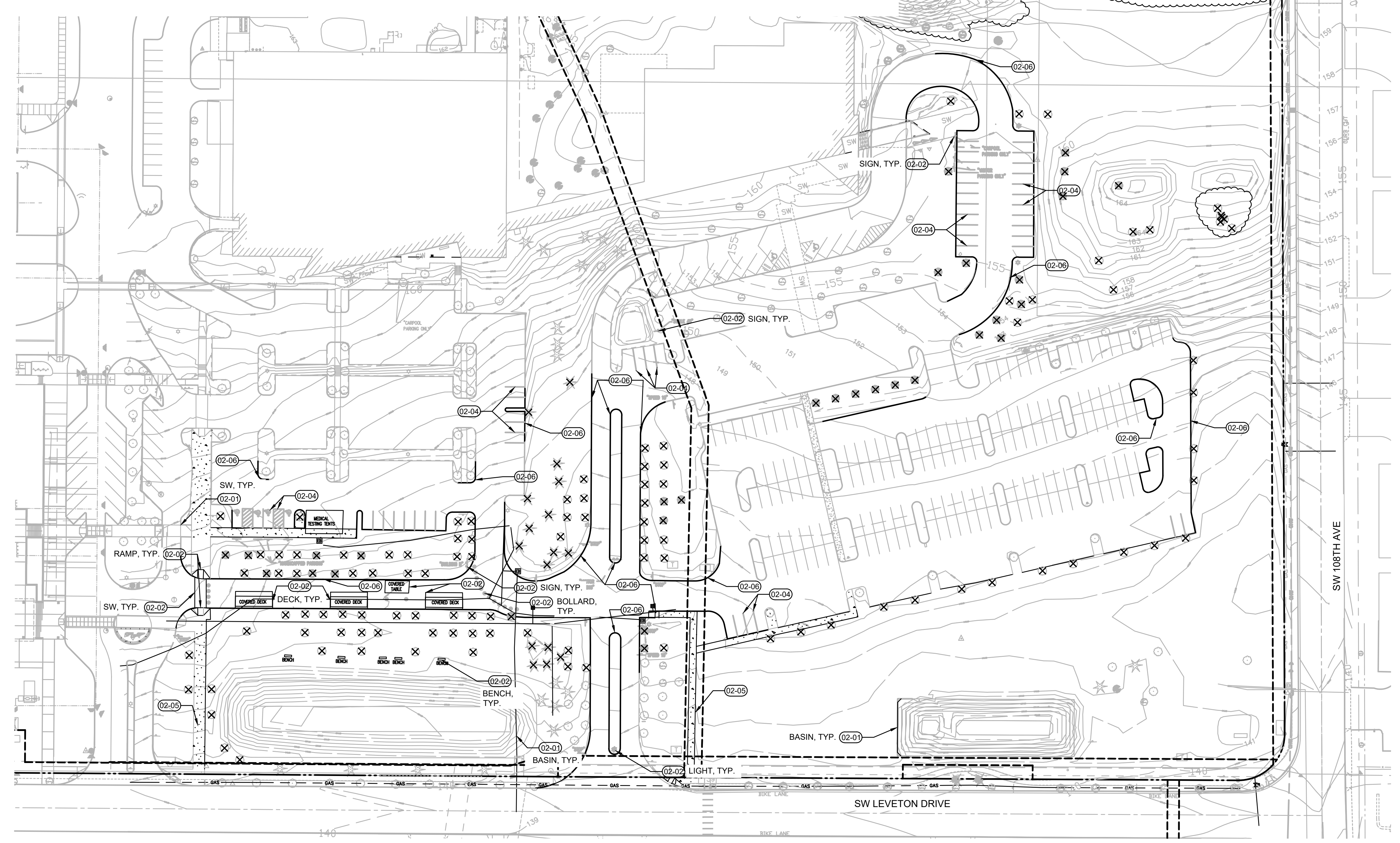


**2** DEMOLITION PLAN - NORTHWEST  
 C1.01

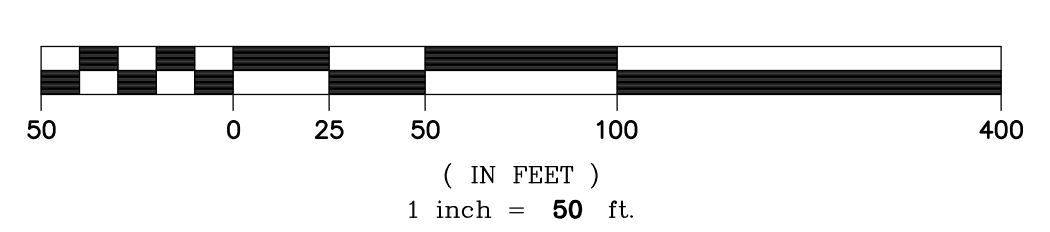


**KEYNOTES**

02-01	PROTECT ITEM TO REMAIN (AS NOTED)
02-02	REMOVE ITEM (AS NOTED)
02-04	REMOVE EXISTING STRIPING
02-05	REMOVE EXISTING SIDEWALK
02-06	REMOVE EXISTING CURB



**1** DEMOLITION PLAN - SOUTHEAST  
 C1.01



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**REVISION SCHEDULE**

Delta	Issued As	Issue Date

SHEET TITLE:  
**DEMOLITION PLAN**

DRAWN BY: SJS  
 CHECKED BY: BDN  
 SHEET

**C1.01**

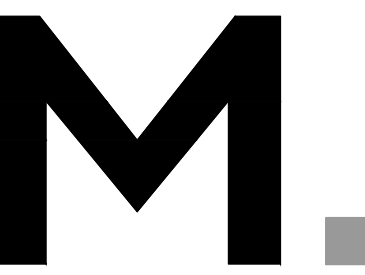
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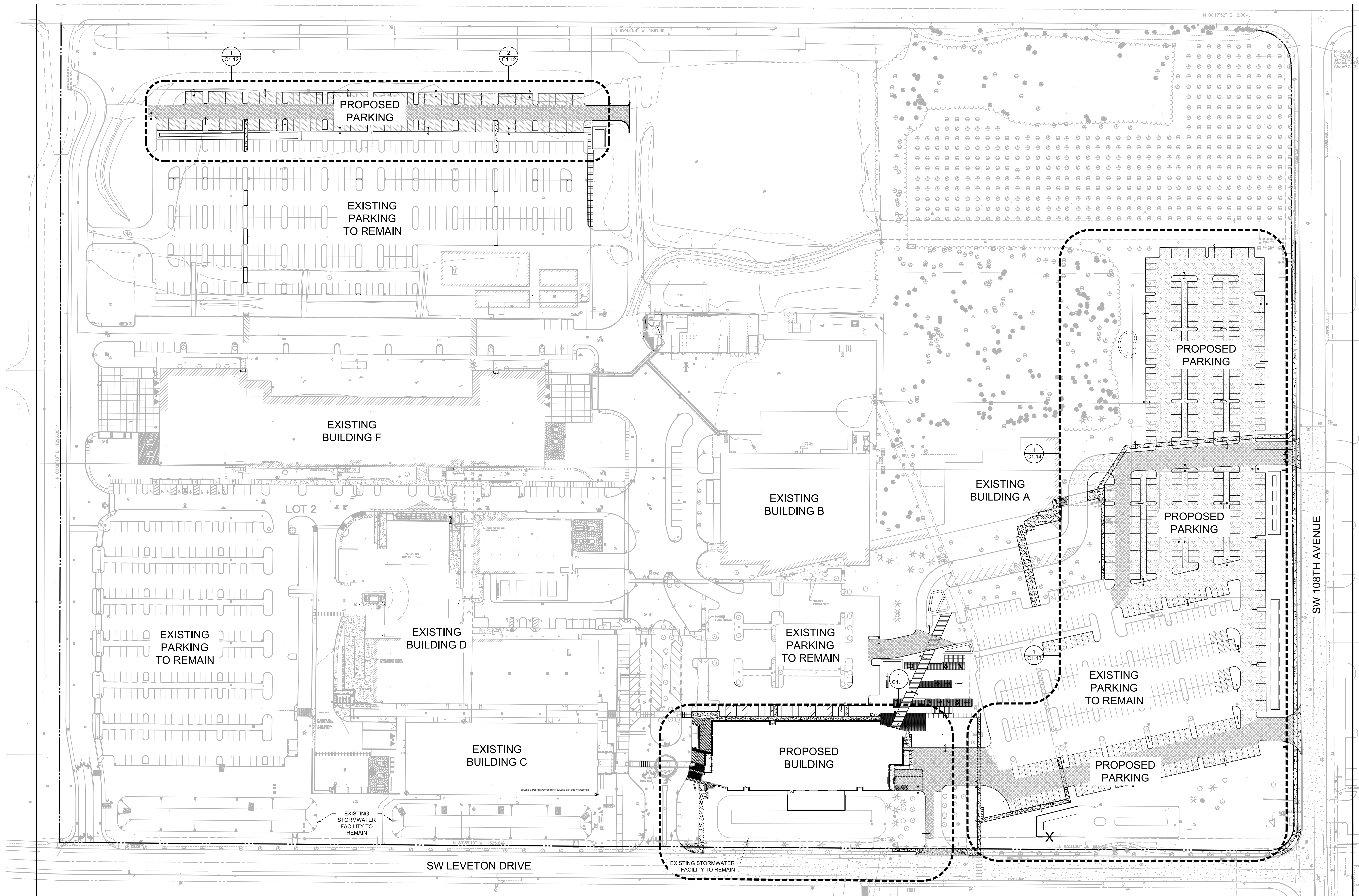
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Client  
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Project  
**LAM RESEARCH  
TUALATIN  
FAC-1446**

**NEW OFFICE BUILDING**



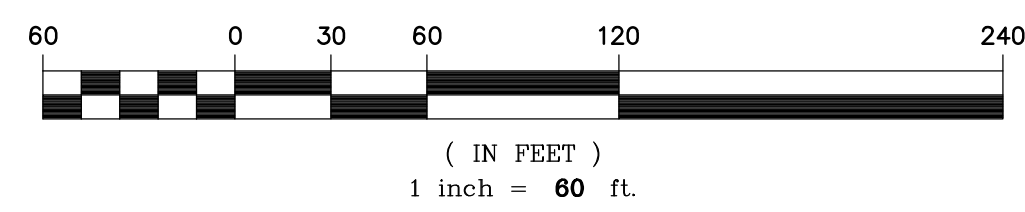
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REVISION SCHEDULE

Delta	Issued As	Issue Date

SHEET TITLE:  
**OVERALL SITE PLAN**

**1 OVERALL SITE PLAN**  
C1.10 1" = 60'-0"



	BUILDING FLOOR AREA	
	EXISTING AREA (SF)	PROPOSED AREA (SF)
EXISTING BUILDINGS	560,040 ±	560,040 ±
PROPOSED BUILDING G	N/A	120,000
TOTAL SITE	560,040 ±	680,040 ±

	SITE DATA	
	EXISTING COVERAGE (AC)	PROPOSED COVERAGE (AC)
TOTAL PROPERTY AREA	58.01	58.01
BUILDING AREA	6.31	7.06
PAVED IMPERVIOUS AREA	22.91	24.55
TOTAL IMPERVIOUS AREA	29.22	31.61
LANDSCAPE AREA	28.79	26.40

	PARKING DATA			
	EXISTING	PARKING REMOVED	ADDED PARKING	TOTAL SPACES
STANDARD PARKING	1336	33	578	1881
ACCESSIBLE PARKING	29	4	8	33
LOADING BERTHS	13	0	2	15
CARPOOL SPACES	12	2	2	12
COMPACT SPACES	0	0	0	0
TOTAL PARKING	1377	37	586	1926

DRAWN BY: SJS  
CHECKED BY: BDN  
SHEET

**C1.10**

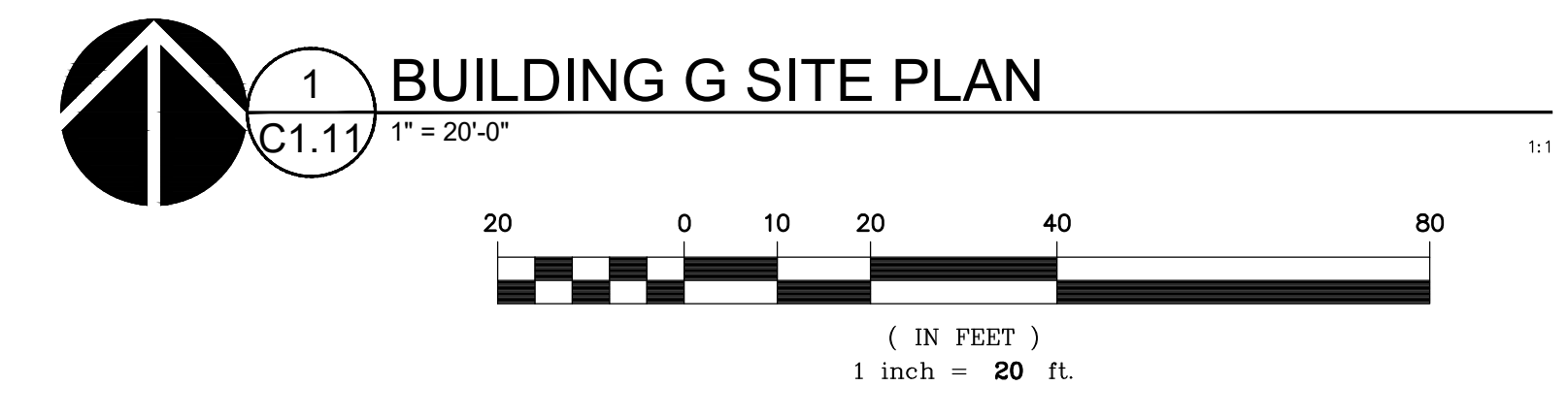
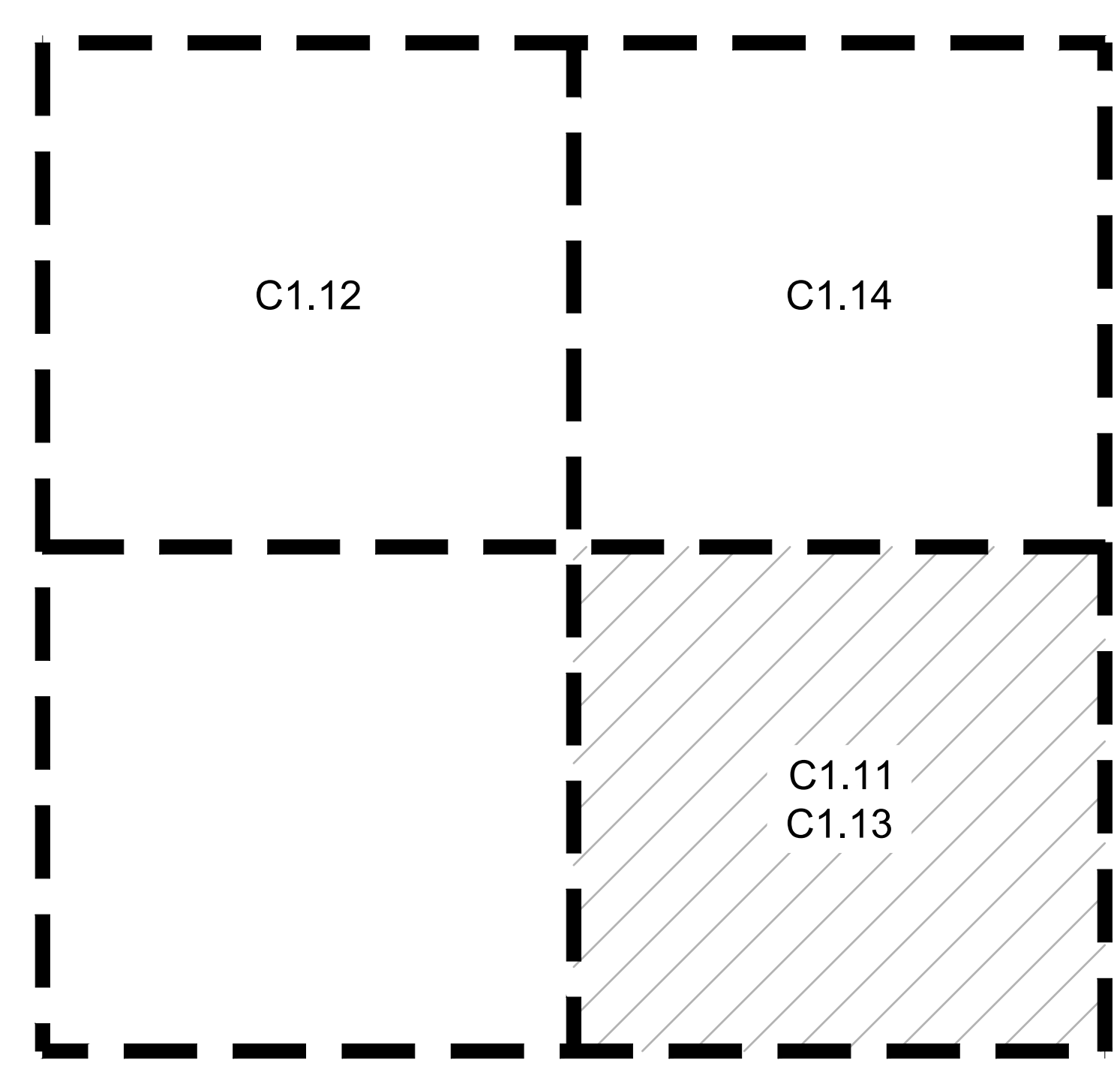
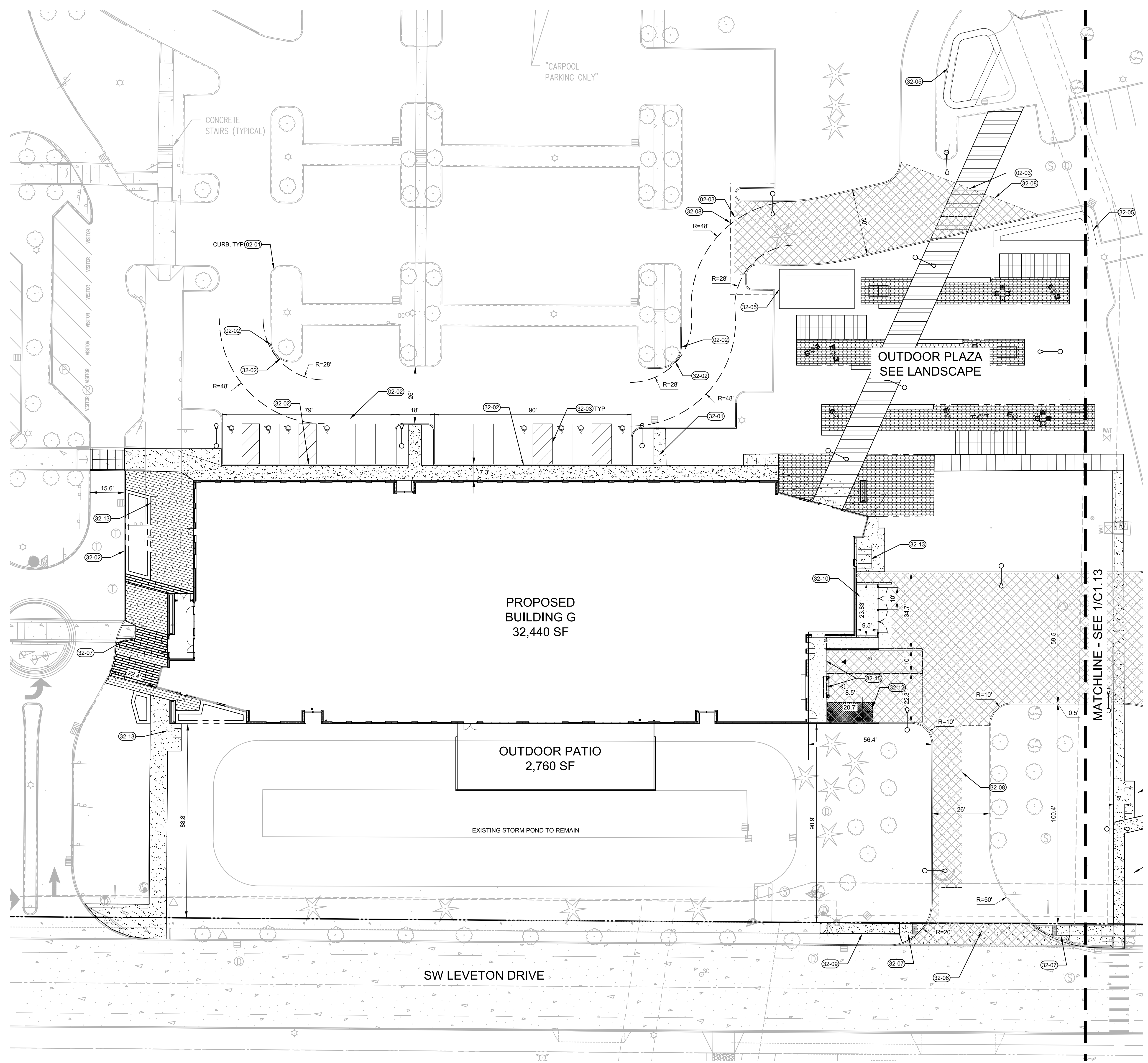
JOB NO. **2220087.00**

**ARCHITECTURAL REVIEW: 8/17/2022**



**KEYNOTES**

- 02-01 PROTECT ITEM TO REMAIN (AS NOTED)
- 02-02 REMOVE ITEM (AS NOTED)
- 02-03 MATCH EXISTING PAVING
- 32-01 LANDSCAPE AREA PER LANDSCAPE PLANS
- 32-02 VERTICAL CURB
- 32-03 PARKING STALL STRIPING
- 32-04 NEW STORMWATER SWALE
- 32-05 NEW STORMWATER BASIN
- 32-06 NEW INDUSTRIAL DRIVEWAY
- 32-07 SIDEWALK CURB RAMP
- 32-08 SAWCUT AC PAVING
- 32-09 CONCRETE SIDEWALK
- 32-10 TRASH ENCLOSURE
- 32-11 WAYFINDING MONUMENT SIGN
- 32-12 TRASH COMPACTOR
- 32-13 LOCATION FOR BIKE PARKING
- 32-15 LOADING DOCK



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Delta	Issued As	Issue Date

SHEET TITLE:  
**BUILDING G**  
**SITE PLAN**

DRAWN BY: SJS  
 CHECKED BY: BDN  
 SHEET

**C1.11**



**ARCHITECTURAL REVIEW: 8/17/2022**

JOB NO. **2220087.00**







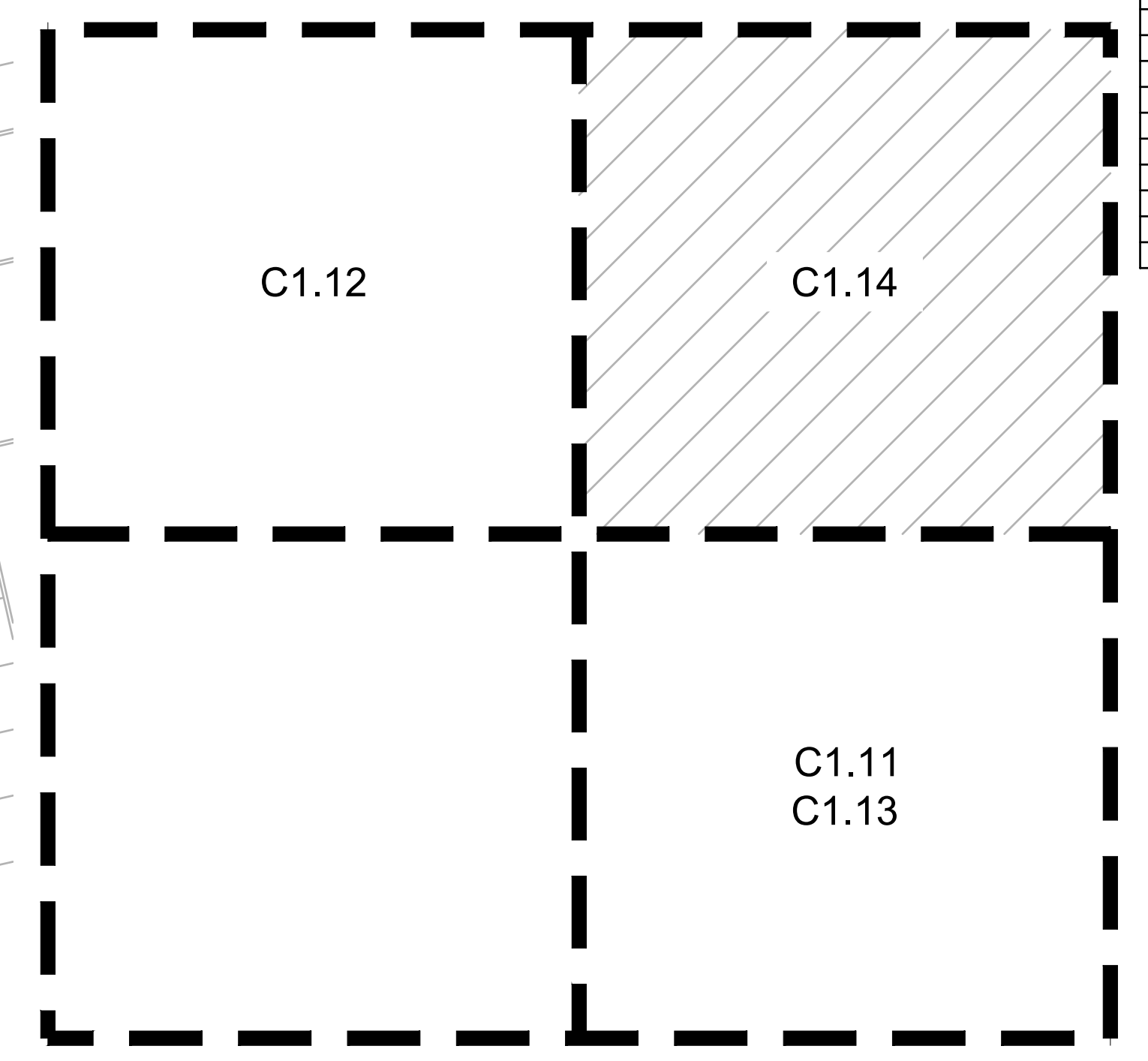
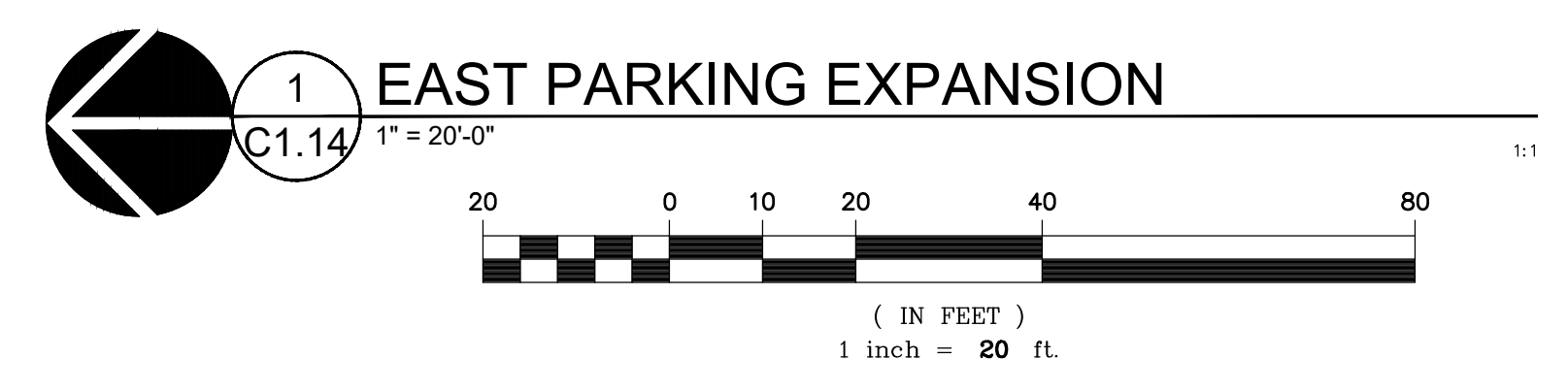
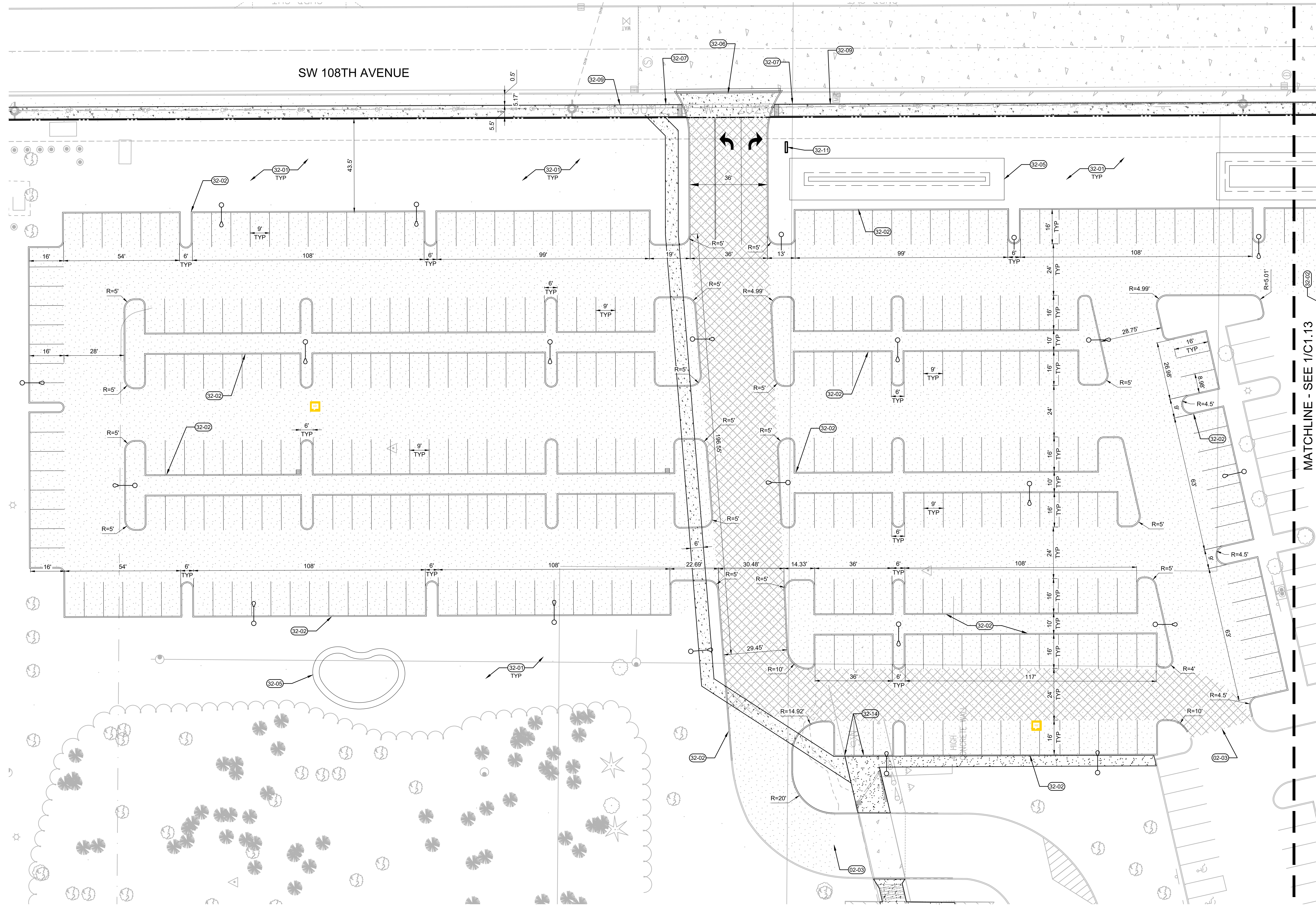


**KEYNOTES**

- 02-01 PROTECT ITEM TO REMAIN (AS NOTED)
- 02-02 REMOVE ITEM (AS NOTED)
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- 32-01 LANDSCAPE AREA PER LANDSCAPE PLANS
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- 32-05 NEW STORMWATER BASIN
- 32-06 NEW INDUSTRIAL DRIVEWAY
- 32-07 SIDEWALK CURB RAMP
- 32-08 SAWCUT AC PAVING
- 32-09 CONCRETE SIDEWALK
- 32-11 WAVYENDING MONUMENT SIGN
- 32-14 CARPOOL PARKING

**NOTES**

1. SEE C0.01 FOR GENERAL CIVIL NOTES AND LEGEND



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Delta	Issued As	Issue Date

SHEET TITLE:  
**EAST PARKING  
 EXPANSION  
 SITE PLAN**

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 CHECKED BY: BDN  
 SHEET

**C1.14**



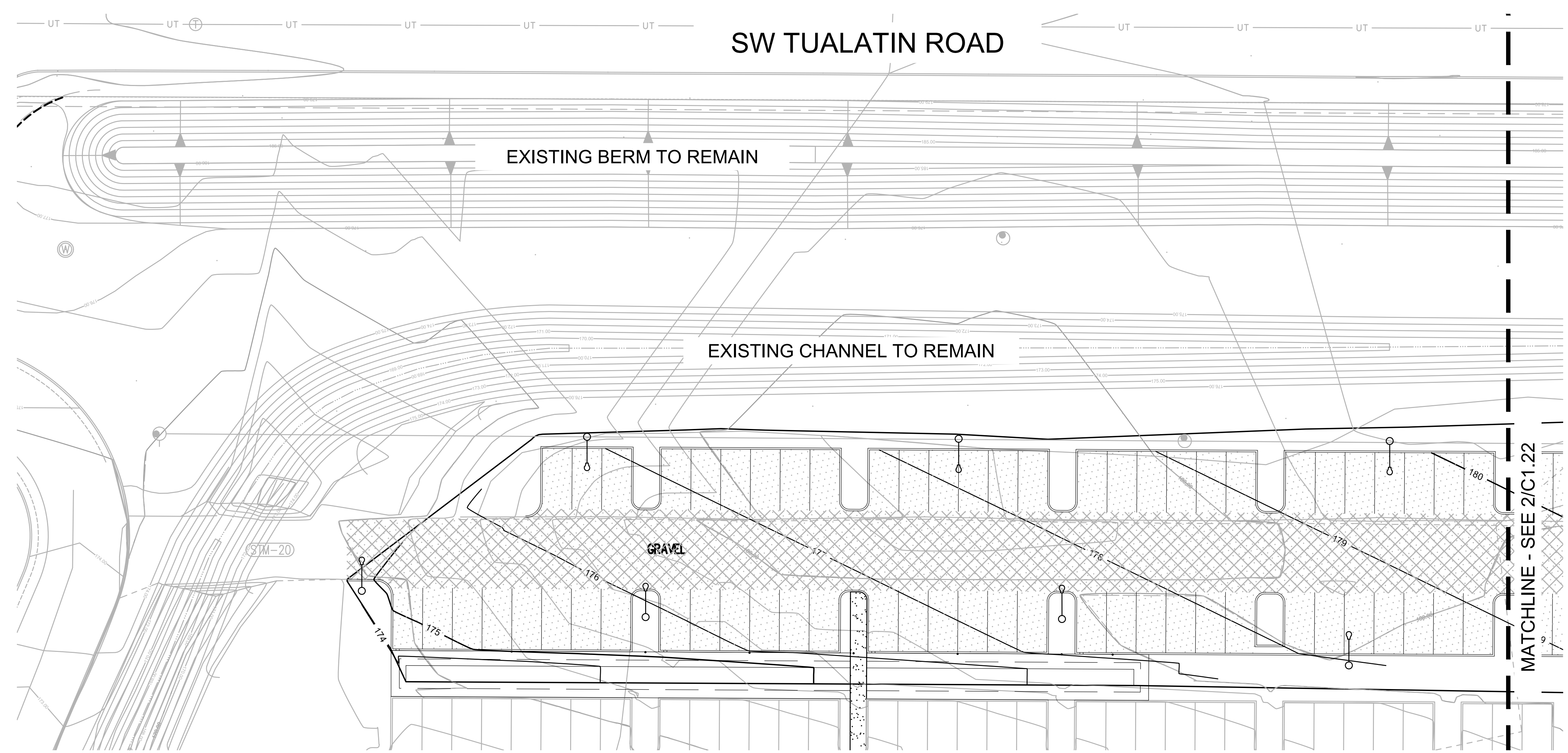
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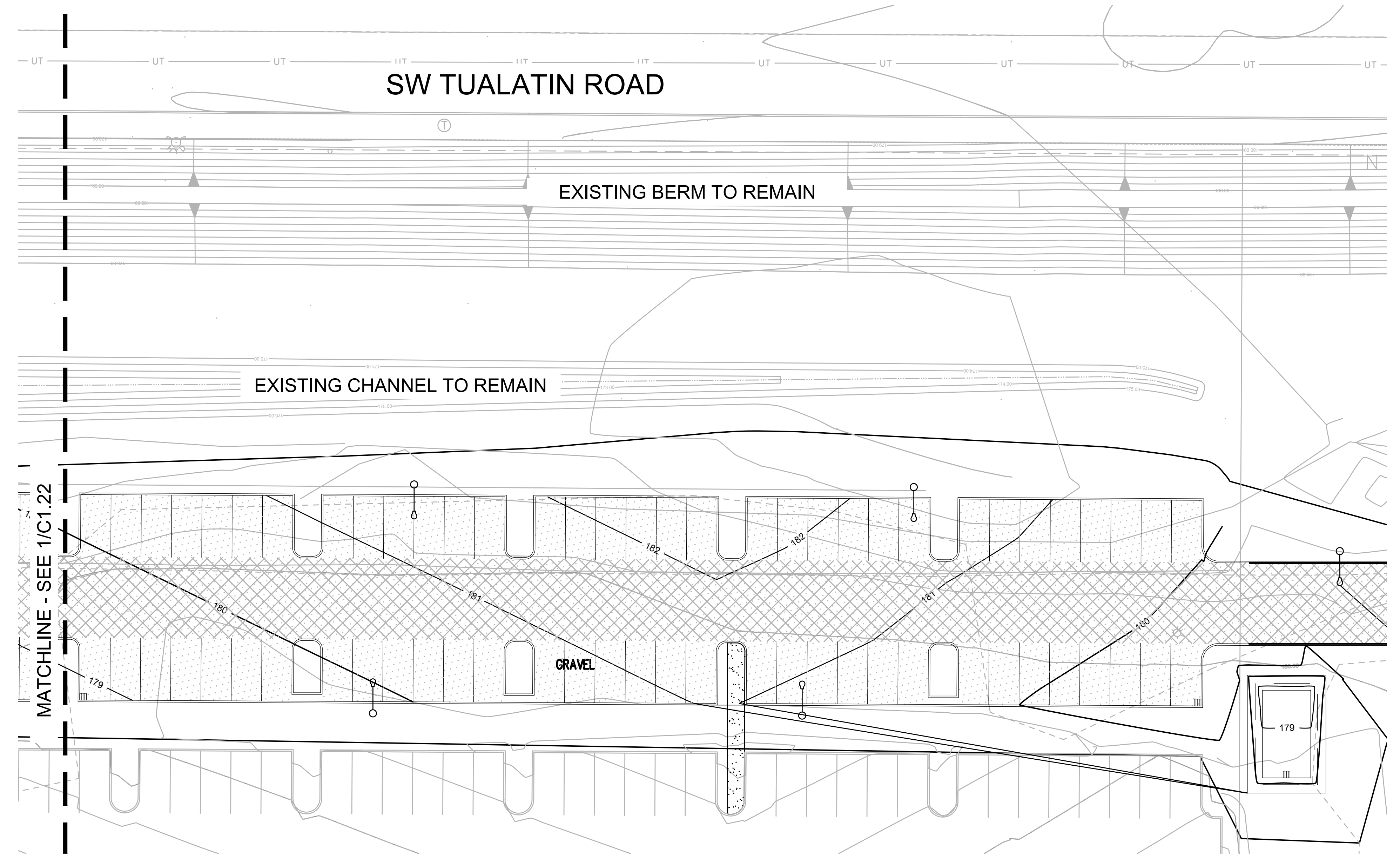




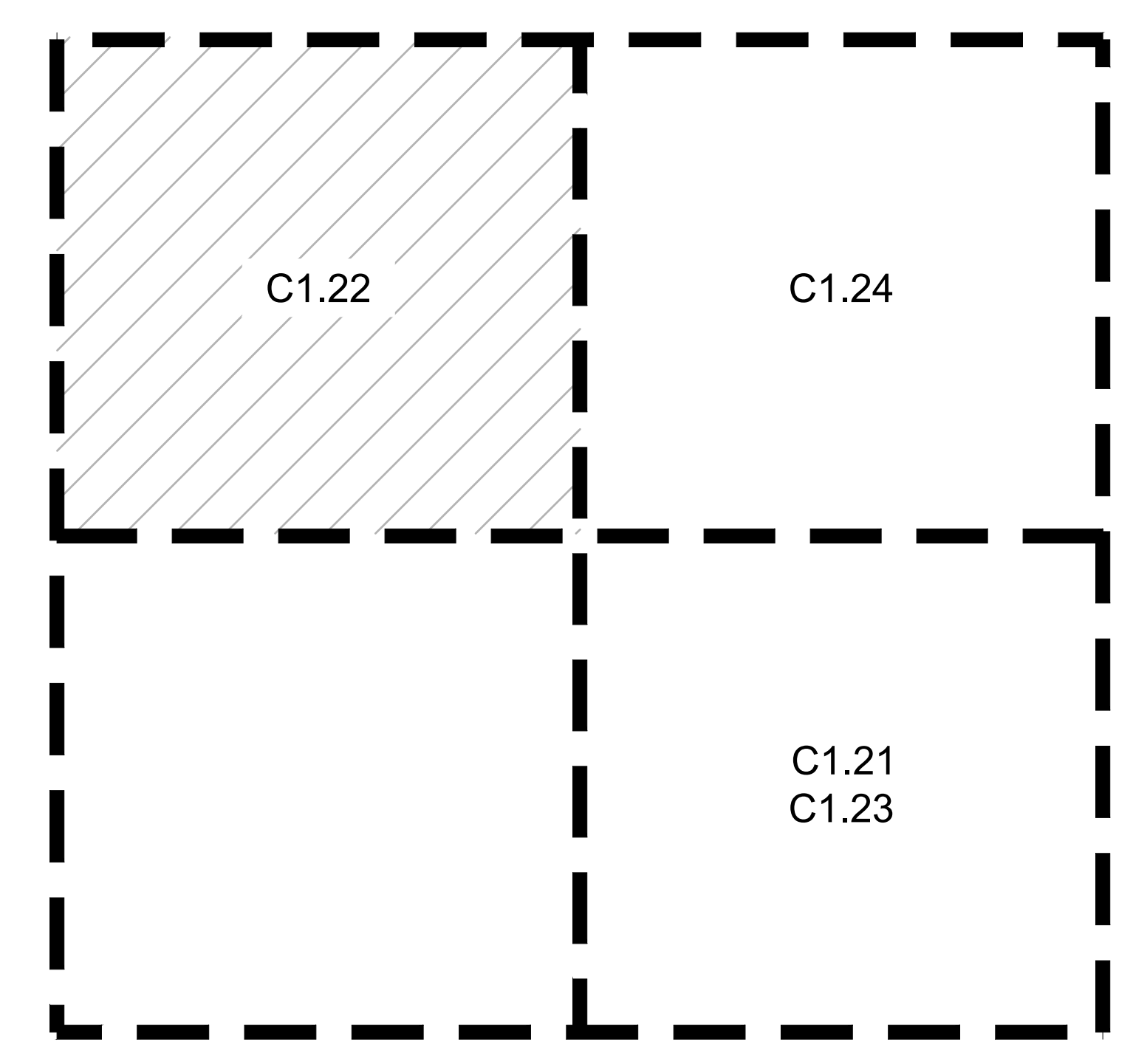




**1 NW PARKING GRADING PLAN - WEST**  
 C1.22  
 1" = 20'-0"  
 ( IN FEET )  
 1 inch = 20 ft.



**2 NW PARKING GRADING PLAN - EAST**  
 C1.22  
 1" = 20'-0"  
 ( IN FEET )  
 1 inch = 20 ft.



**KEY MAP**  
 SCALE: NTS

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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**NORTHWEST**  
**PARKING**  
**EXPANSION**  
**GRADING**  
**PLANS**

DRAWN BY: SJS

CHECKED BY: BDN

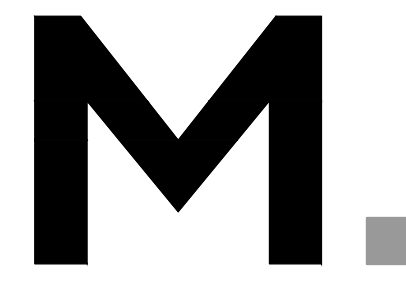
SHEET

**C1.22**

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**NEW OFFICE BUILDING**

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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**EAST PARKING  
EXPANSION  
GRADING PLAN**

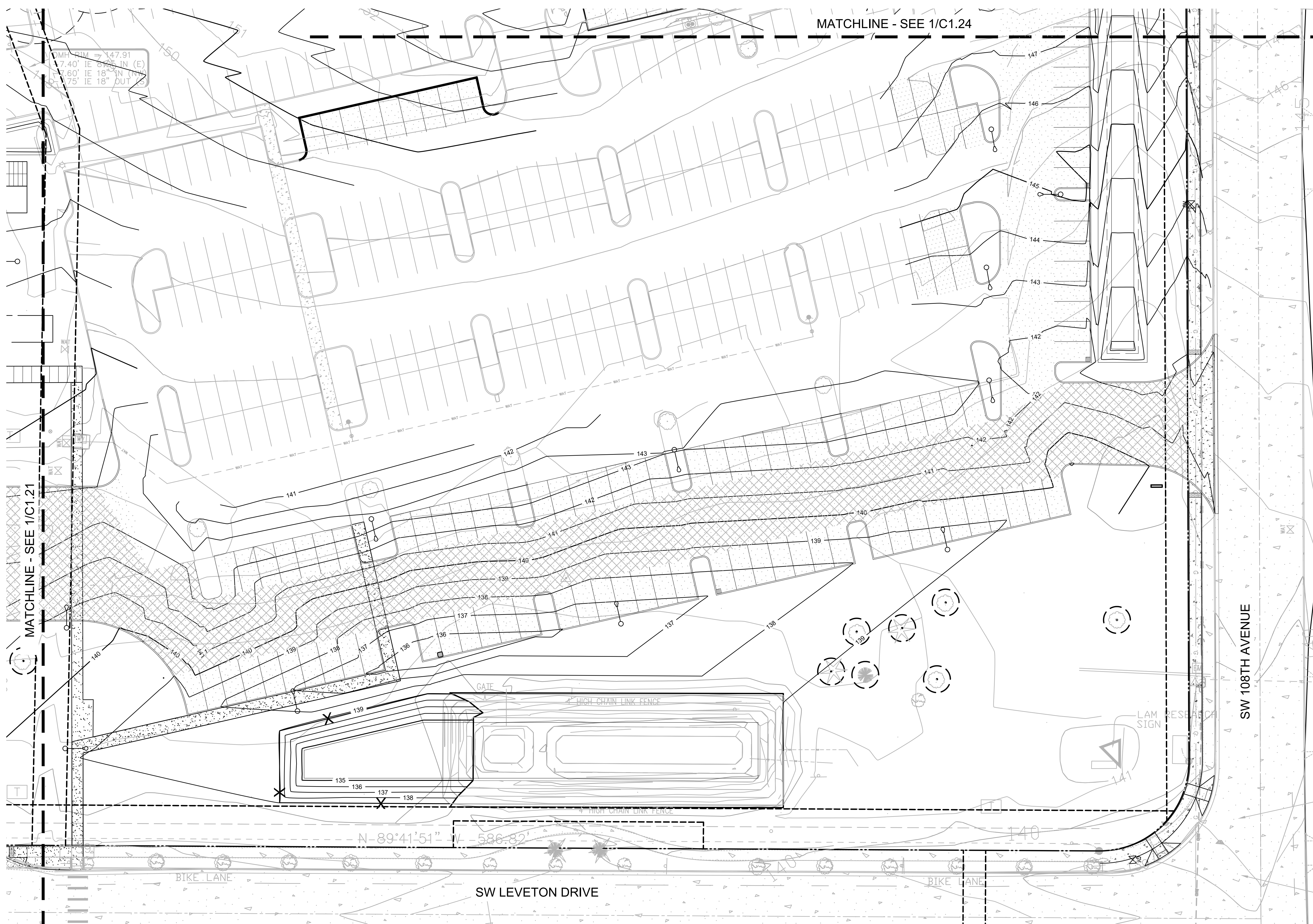
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SHEET

**C1.23**

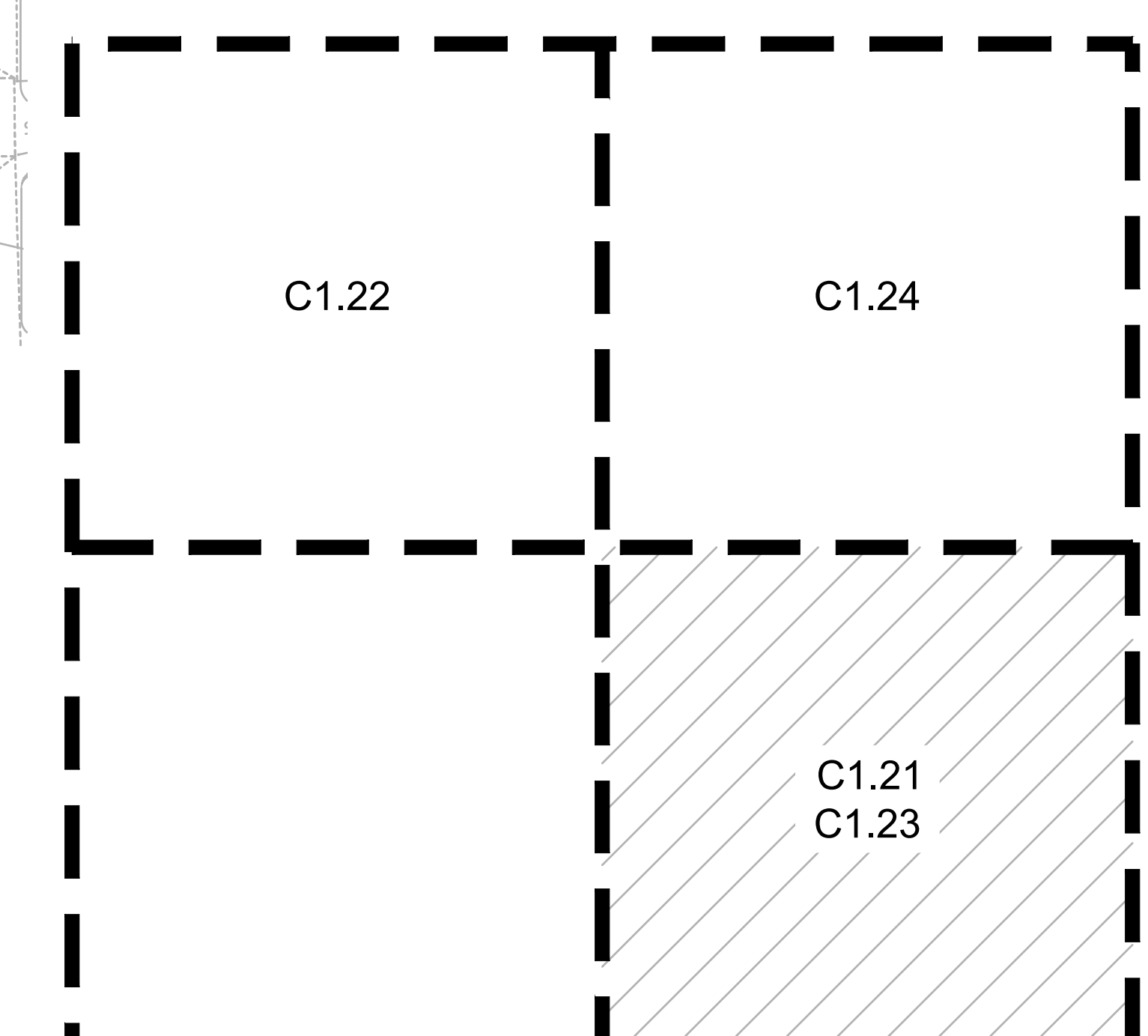
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147.91  
 7.40' IE DRAIN IN (E)  
 1.60' IE 18" DRAIN (W)  
 0.75' IE 18" DUT

MATCHLINE - SEE 1/C1.24

MATCHLINE - SEE 1/C1.21



SCALE: NTS

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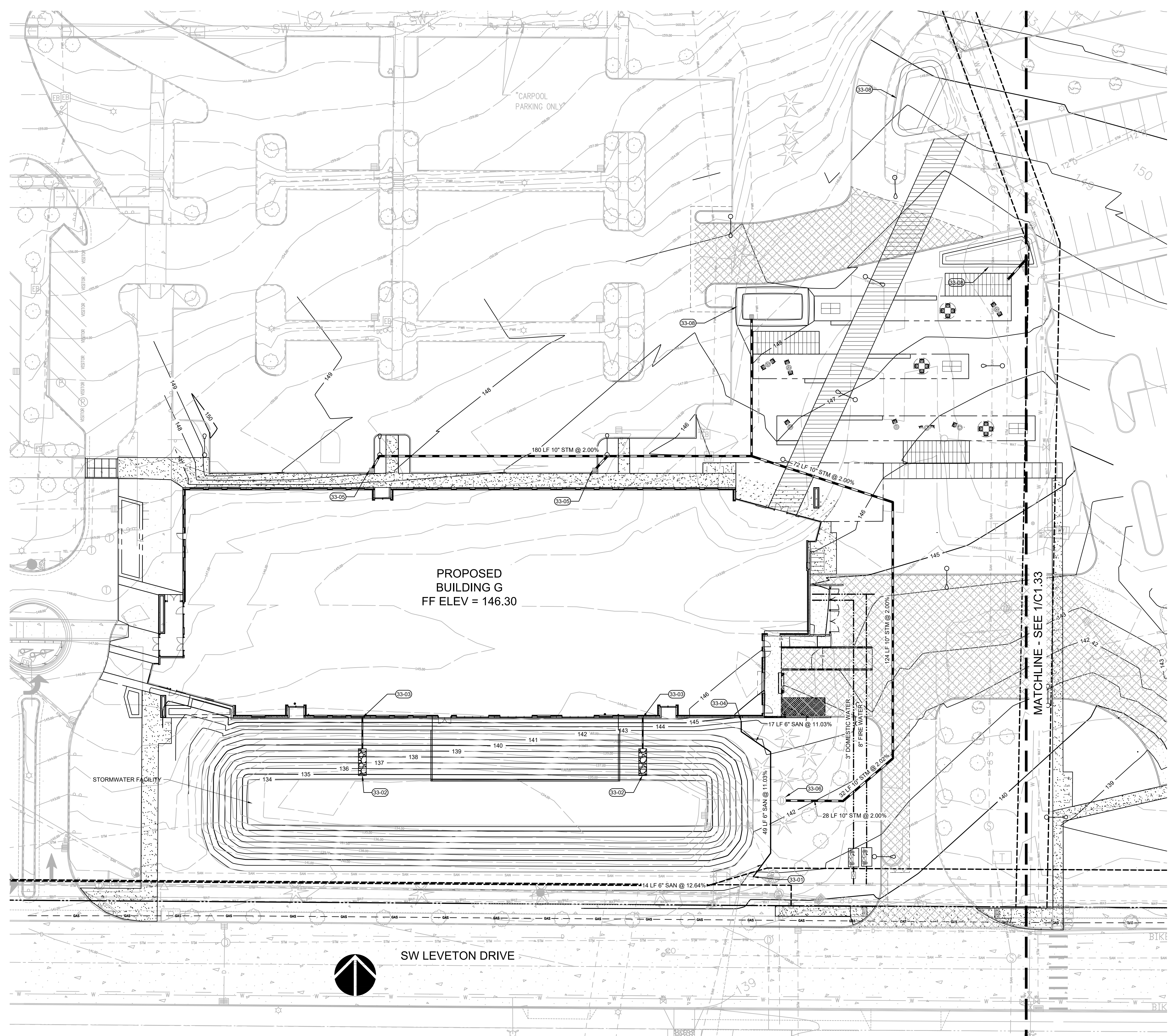
REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**BUILDING G**  
**UTILITY PLAN**

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 SHEET

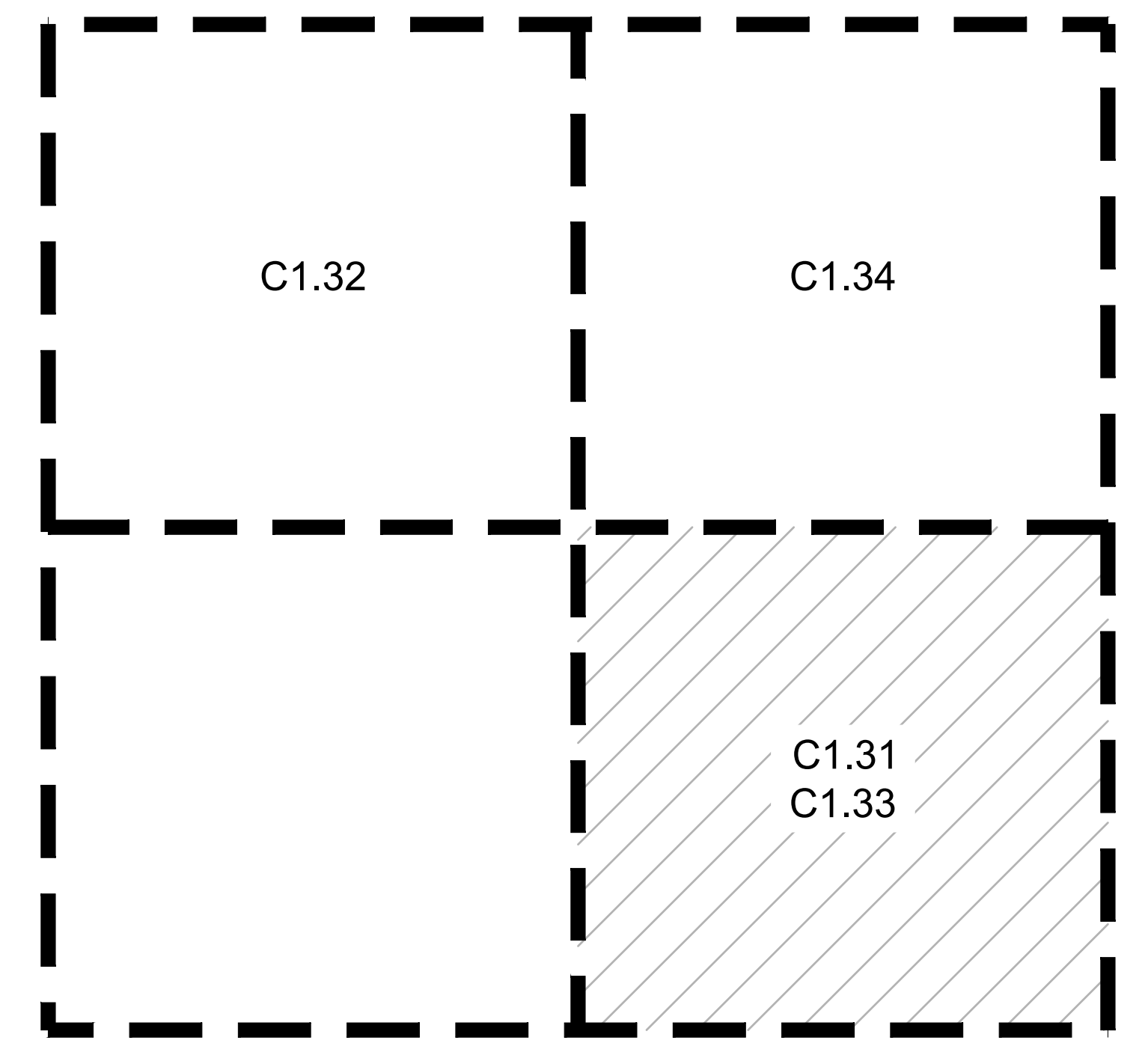
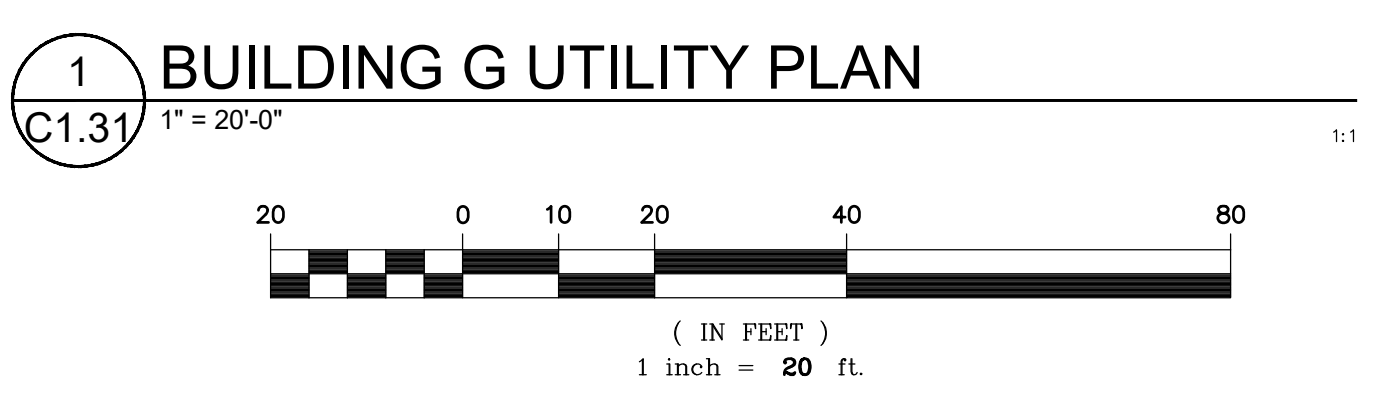
**C1.31**

JOB NO. **2220087.00**



**KEYNOTES**

- 33-01 CONNECT SEWER TO EXISTING MANHOLE STUB
- 33-02 6" ROOF DRAIN OFFFALL WITH RIPRAP
- 33-03 ROOF DRAIN CONNECTION TO PLUMBING
- 33-04 CONNECT SEWER LATERAL TO PLUMBING
- 33-05 CATCH BASIN
- 33-06 CONNECT STORM TO EXISTING MANHOLE
- 33-08 STORMWATER BASIN
- 33-09 OVERFLOW OUTLET









**KEYNOTES**

- 33-05 CATCH BASIN
- 33-07 PIPE OUTFALL WITH RIPRAP
- 33-08 STORMWATER BASIN
- 33-09 OVERFLOW OUTLET

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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**EAST PARKING  
EXPANSION  
UTILITY PLAN**

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CHECKED BY: BDN

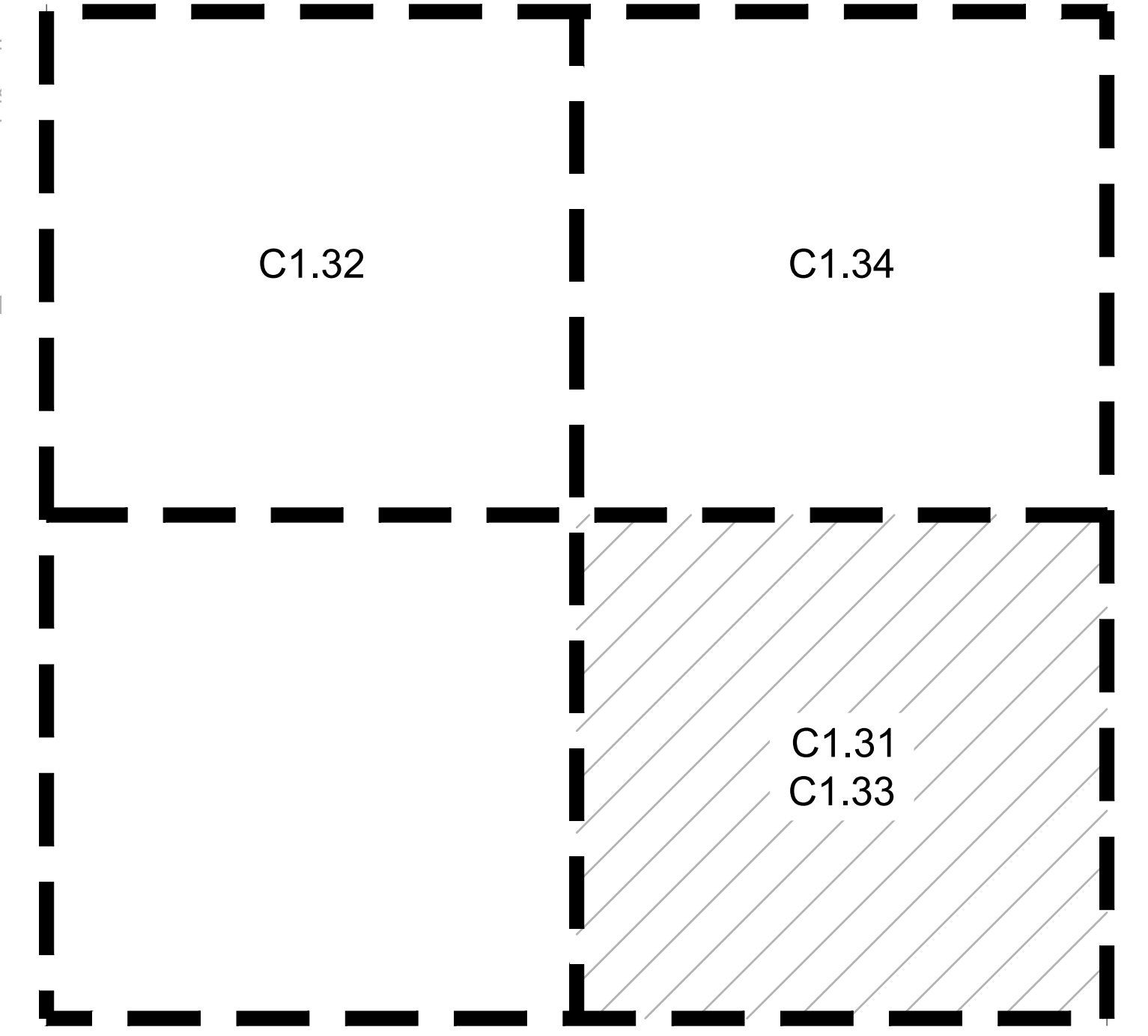
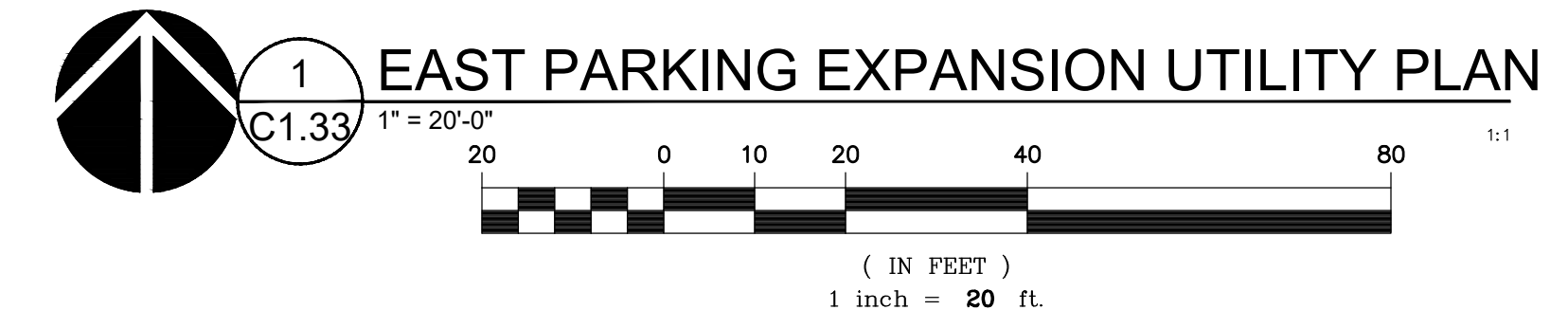
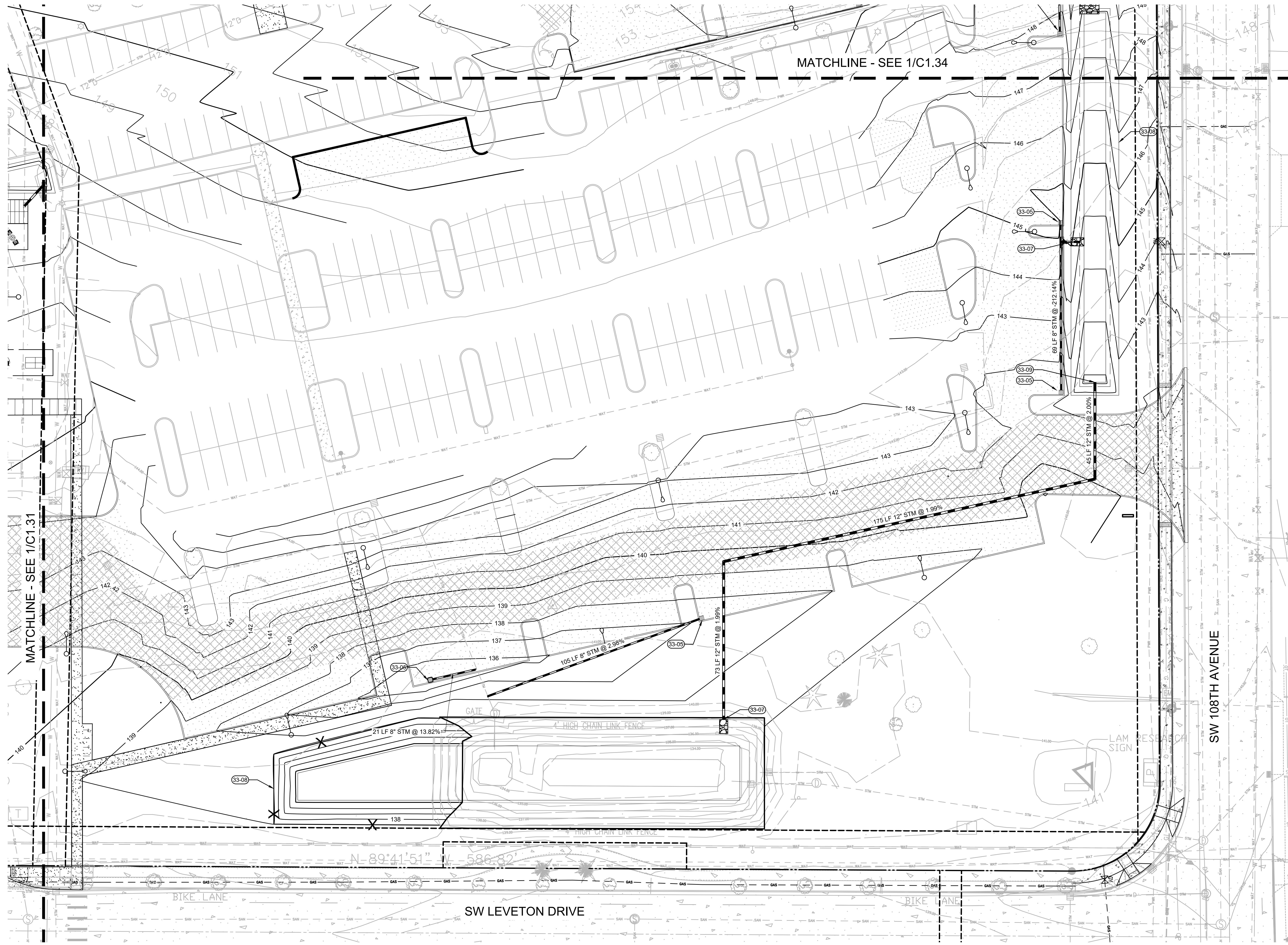
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**C1.33**

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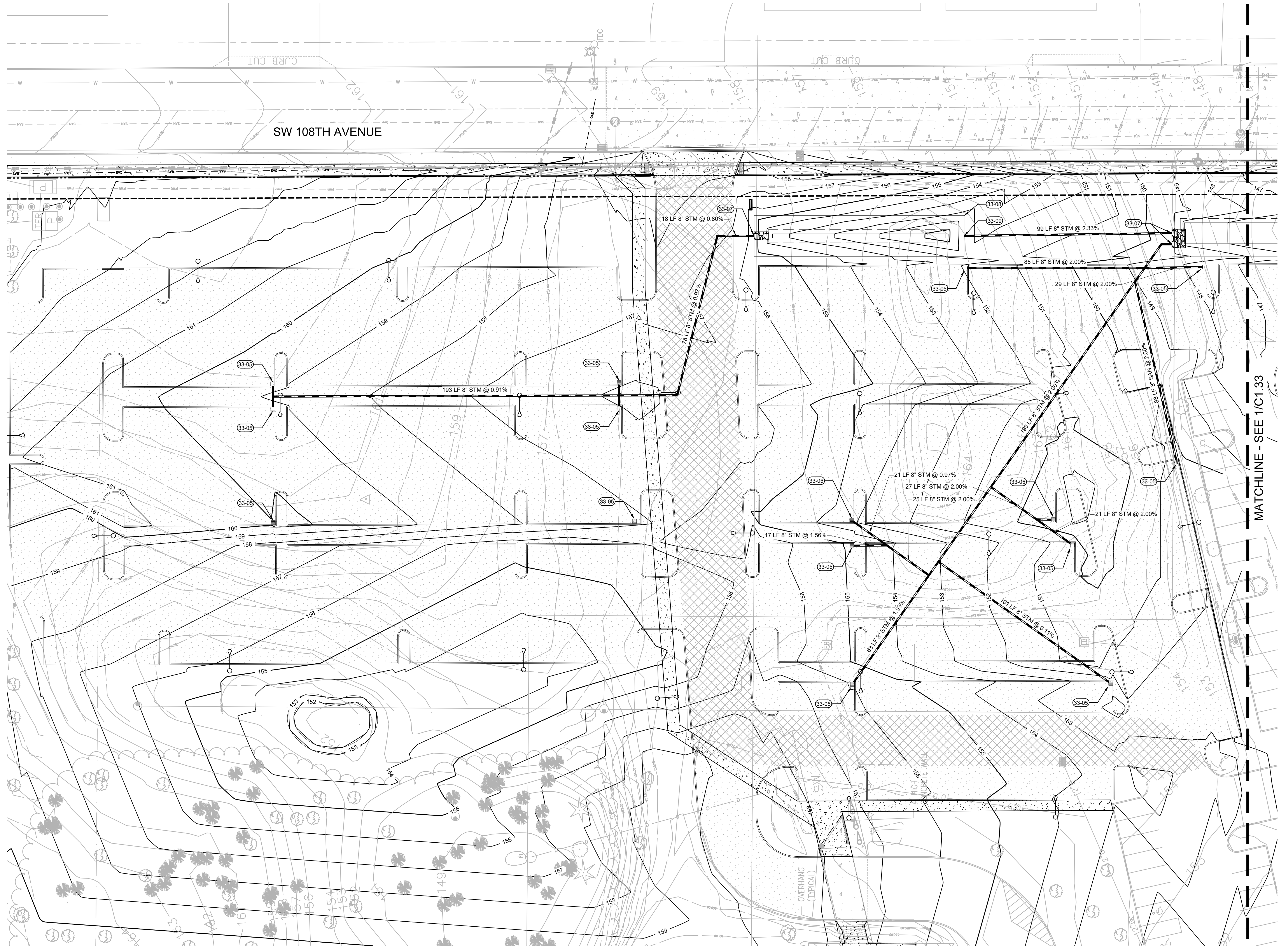
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**KEYNOTES**

- 33-05 CATCH BASIN
- 33-07 PIPE OUTFALL WITH RIPRAP
- 33-08 STORMWATER BASIN
- 33-09 OVERFLOW OUTLET



MATCHLINE - SEE 1/C1.33

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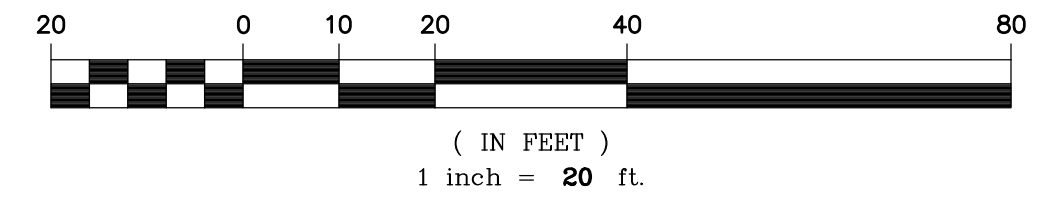
REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**EAST PARKING  
 EXPANSION  
 UTILITY PLAN**

DRAWN BY: SJS  
 CHECKED BY: BDN  
 SHEET

**C1.34**

**1 EAST PARKING EXPANSION UTILITY PLAN**  
 C1.34  
 T = 20'-0"



**KEY MAP**  
 SCALE: NTS

**ARCHITECTURAL REVIEW: 8/17/2022**

JOB NO. **2220087.00**

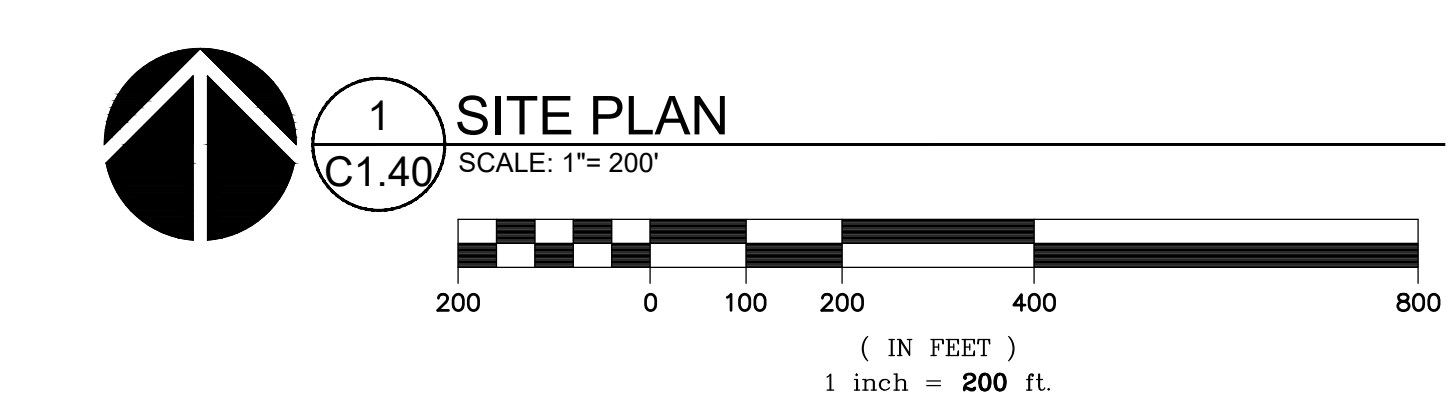
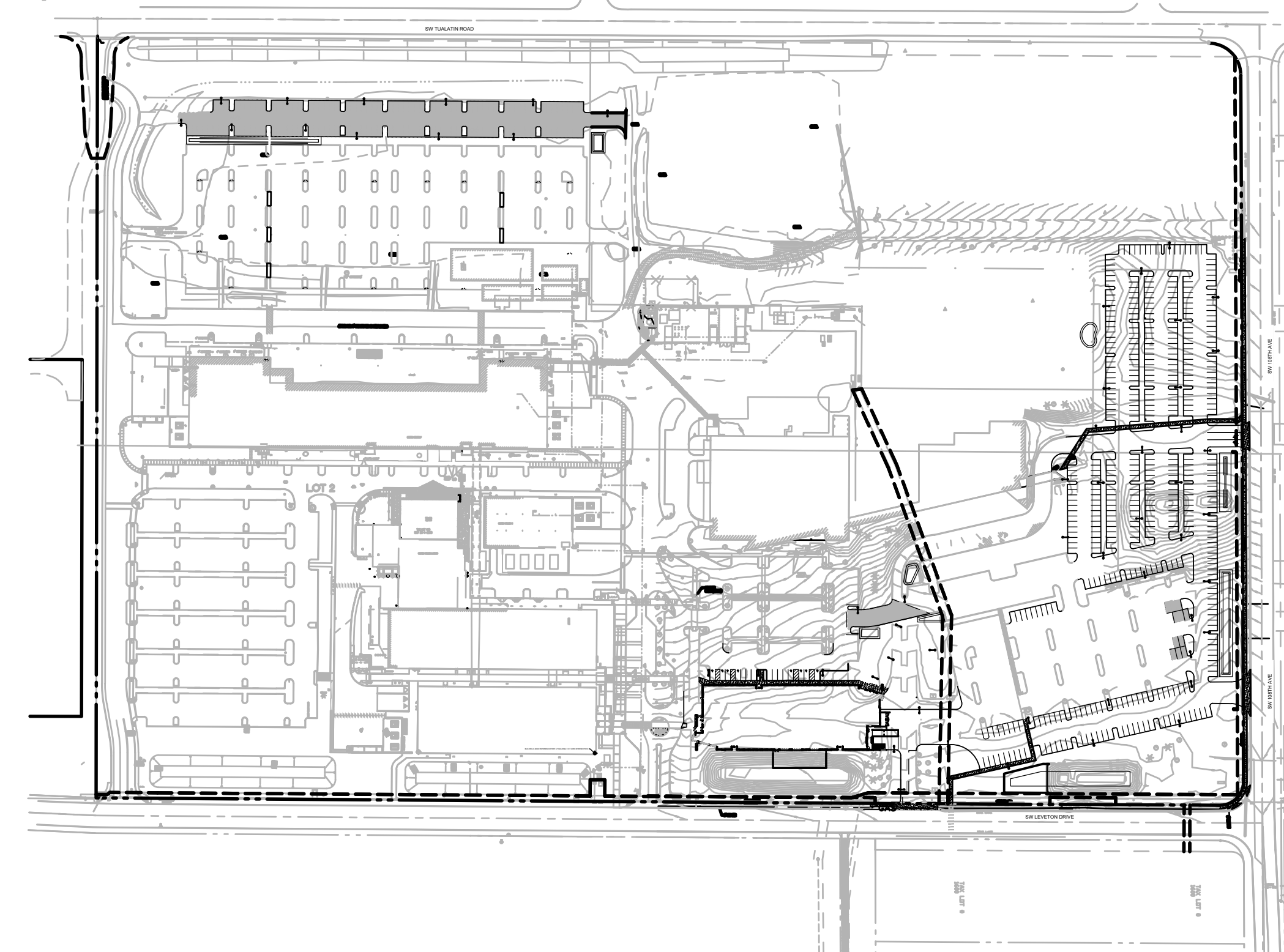


# LAM RESEARCH TUALATIN

## EROSION AND SEDIMENT CONTROL PLAN

### TUALATIN, OREGON

TAX LOTS 2S122AA00500, 2S122AB00100 AND 2S122AA00800  
NE 1/4 OF THE NE 1/4 OF SECTION 22, TOWNSHIP 2S, RANGE 1W  
WASHINGTON COUNTY, OREGON



**CLIENT**  
LAM RESEARCH CORP  
CONTACT: HUGH KINGERY  
11155 SW LEVETON DRIVE  
TUALATIN, OR 97206  
PHONE: 971-762-8510

**CIVIL ENGINEER**  
MACKENZIE  
CONTACT: BRENT NIELSEN  
9450 SW COMMERCE CIRCLE, SUITE 100  
PORTLAND, OR 97214  
PHONE: 503-224-9560

**SURVEYOR**  
NORTHWEST SURVEYING, INC.  
CONTACT: SCOTT FIELD  
1815 NW 169TH PLACE, SUITE 2090  
BEAVERTON, OR 97006  
PHONE: 503-648-2179

**GEOTECHNICAL**  
NVS  
CONTACT: NAJIB A. KALAS  
9450 SW COMMERCE CIRCLE, SUITE 300  
WILSONVILLE, OR 97070  
PHONE: 503-968-8787

### NARRATIVE DESCRIPTION

#### EXISTING SITE CONDITIONS

PARTIALLY DEVELOPED INDUSTRIAL LAND

#### DEVELOPED CONDITIONS

INDUSTRIAL RESEARCH BUILDINGS WITH ASSOCIATED PARKING, LANDSCAPE, DRIVE AISLE AND SIDEWALKS

#### NATURE OF CONSTRUCTION

#### ACTIVITY AND ESTIMATED TIME

#### TABLE

- CLEARING (OCTOBER 2022)
- MASS GRADING (OCTOBER 2022 TO FEBRUARY 2023)
- UTILITY CONSTRUCTION (MARCH 2023 TO AUGUST 2023)
- VERTICAL CONSTRUCTION (FEBRUARY 2023 TO DECEMBER 2023)
- FINAL STABILIZATION (DECEMBER 2023)

#### SITE SOIL CLASSIFICATION:

HM - HILLSBORO LOAM, 0 TO 3 PERCENT SLOPES,  
3 TO 7 PERCENT SLOPES, 7 TO 12 PERCENT SLOPES,  
12 TO 20 PERCENT SLOPES

#### RECEIVING WATER BODIES:

TUALATIN RIVER

#### SITE AREA:

PRIVATE SITE: 2,529,532 SF (58.07 AC)  
PUBLIC IMPROVEMENTS: 4,900 SF (0.112 AC)

#### IMPROVEMENTS:

PRIVATE DISTURBED AREA: 658,789 SF (15.12 AC)  
PUBLIC DISTURBED AREA: 4,900 SF (0.112 AC)

### STANDARD EROSION AND SEDIMENT CONTROL PLAN

#### DRAWING NOTES

- ONCE KNOWN, INCLUDE A LIST OF ALL CONTRACTORS THAT WILL ENGAGE IN CONSTRUCTION ACTIVITIES ON SITE, AND THE AREAS OF THE SITE WHERE THE CONTRACTOR(S) WILL ENGAGE IN CONSTRUCTION ACTIVITIES. REVISE THE LIST AS APPROPRIATE UNTIL PERMIT COVERAGE IS TERMINATED (SECTION 4.4.C). IN ADDITION, INCLUDE A LIST OF ALL PERSONNEL (BY NAME AND POSITION) THAT ARE RESPONSIBLE FOR THE DESIGN, INSTALLATION AND MAINTENANCE OF STORMWATER CONTROL MEASURES (E.G. ESCP DEVELOPER, BMP INSTALLER (SEE SECTION 4.10), AS WELL AS THEIR INDIVIDUAL RESPONSIBILITIES (SECTION 4.1.C).
- VISUAL MONITORING INSPECTION REPORTS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS (SECTION 6.5).
- INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS (SECTION 6.5.Q).
- RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY (SECTION 4.7).
- THE PERMIT REGISTRANT MUST IMPLEMENT THE ESCP. FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT (SECTIONS 4 AND 4.11).
- THE ESCP MUST BE ACCURATE AND REFLECT SITE CONDITIONS (SECTION 4.8).
- SUBMISSION OF ALL ESCP REVISIONS IS NOT REQUIRED. SUBMITTAL OF THE ESCP REVISIONS IS ONLY UNDER SPECIFIC CONDITIONS. SUBMIT ALL NECESSARY REVISION TO DEQ OR AGENT WITHIN 10 DAYS (SECTION 4.9).
- SEQUENCE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION (SECTION 2.2.2).
- CREATE SMOOTH SURFACES BETWEEN SOIL SURFACE AND EROSION AND SEDIMENT CONTROLS TO PREVENT STORMWATER FROM BYPASSING CONTROLS AND PONDING (SECTION 2.2.3).
- IDENTIFY, MARK AND PROTECT (BY CONSTRUCTION FENCING OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS (SECTION 2.2.1).
- PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED (SECTION 2.2.5).
- MAINTAIN AND DELINEATE ANY EXISTING NATURAL BUFFER WITHIN THE 50-FOOT OF WATERS OF THE STATE (SECTION 2.2.4).
- INSTALL PERIMETER SEDIMENT CONTROL, INCLUDING STORM DRAIN INLET PROTECTION AS WELL AS ALL SEDIMENT BASINS, TRAPS, AND BARRIERS PRIOR TO LAND DISTURBANCE (SECTIONS 2.1.3).
- CONTROL BOTH PEAK FLOW RATES AND TOTAL STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS AND DOWNSTREAM CHANNELS AND STREAMBANKS (SECTIONS 2.1.1 AND 2.2.16).
- CONTROL SEDIMENT AS NEEDED ALONG THE SITE PERIMETER AND AT ALL OPERATIONAL INTERNAL STORM DRAIN INLETS AT ALL TIMES DURING CONSTRUCTION, BOTH INTERNALLY AND AT THE SITE BOUNDARY (SECTIONS 2.2.6 AND 2.2.13).
- ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK (SECTION 2.2.14).
- APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES. TEMPORARY OR PERMANENT STABILIZATION MEASURES ARE NOT REQUIRED FOR AREAS THAT ARE INTENDED TO BE LEFT UNVEGETATED, SUCH AS DIRT ACCESS ROADS OR UTILITY POLE PADS (SECTIONS 2.2.20 AND 2.2.21).
- ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS (SECTION 2.3.7).
- KEEP WASTE CONTAINER LIDS CLOSED WHEN NOT IN USE AND CLOSE LIDS AT THE END OF THE BUSINESS DAY FOR THOSE CONTAINERS THAT ARE ACTIVELY USED THROUGHOUT THE DAY. FOR WASTE CONTAINERS THAT DO NOT HAVE LIDS, PROVIDE EITHER (1) COVER (E.G., A TARP, PLASTIC SHEETING, TEMPORARY ROOF) TO PREVENT EXPOSURE OF WASTES TO PRECIPITATION, OR (2) A SIMILARLY EFFECTIVE MEANS DESIGNED TO PREVENT THE DISCHARGE OF POLLUTANTS (E.G., SECONDARY CONTAINMENT) (SECTION 2.3.7).
- PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPs SUCH AS: CONSTRUCTION ENTRANCE, GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ON-SITE, OR USE AN EXIT TIRE WASH. THESE BMPs MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES (SECTION 2.2.7) WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE (SECTION 2.2.7.F).
- CONTROL PROHIBITED DISCHARGES FROM LEAVING THE CONSTRUCTION SITE, I.E., CONCRETE WASH-OUT, WASTEWATER FROM CLEANOUT OF STUCCO, PAINT AND CURING COMPOUNDS (SECTIONS 1.5 AND 2.3.9).
- ENSURE THAT STEEP SLOPE AREAS WHERE CONSTRUCTION ACTIVITIES ARE NOT OCCURRING ARE NOT DISTURBED (SECTION 2.2.10).
- PREVENT SOIL COMPACTION IN AREAS WHERE POST-CONSTRUCTION INFILTRATION FACILITIES ARE TO BE INSTALLED (SECTION 2.2.12).
- USE BMPs TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS, VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, FERTILIZER, PESTICIDES AND HERBICIDES, PAINTS, SOLVENTS, CURING COMPOUNDS AND ADHESIVES FROM CONSTRUCTION OPERATIONS (SECTIONS 2.2.15 AND 2.3).
- PROVIDE PLANS FOR SEDIMENTATION BASINS THAT HAVE BEEN DESIGNED PER SECTION 2.2.17 AND STAMPED BY AN OREGON PROFESSIONAL ENGINEER. (SEE SECTION 2.2.17.A)
- IF ENGINEERED SOILS ARE USED ON SITE, A SEDIMENTATION BASIN/IMPONDMENT MUST BE INSTALLED. (SEE SECTIONS 2.2.17 AND 2.2.18)
- PROVIDE A Dewatering PLAN FOR ACCUMULATED WATER FROM PRECIPITATION AND UNCONTAMINATED GROUNDWATER SEEPAGE DUE TO SHALLOW EXCAVATION ACTIVITIES (SEE SECTION 2.4)
- IMPLEMENT THE FOLLOWING BMPs WHEN APPLYING WATERWAY RIPARIAN ZONE (SECTION 2.3.5)
  - IF AN ACTIVE TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, PLAN AND FREQUENCY BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN ENVIRONMENTAL MANAGEMENT PLAN APPROVAL FROM DEQ BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS (SECTION 1.2.9).
  - TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE REGISTRANT IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR (SECTION 2.2)
  - AS NEEDED BASED ON WEATHER CONDITIONS, AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPs MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS (SECTION 2.2.8)
  - SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL (SECTION 2.1.5.B)
  - OTHER SEDIMENT BARRIERS (SUCH AS BIOBAGS): REMOVE SEDIMENT BEFORE IT REACHES TWO INCHES DEPTH ABOVE GROUND HEIGHT AND BEFORE BMP REMOVAL (SECTION 2.1.5.C)
  - CATCH BASINS: CLEAN BEFORE RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT. SEDIMENT BASINS AND SEDIMENT TRAPS: REMOVE TRAPPED SEDIMENTS BEFORE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT AND AT COMPLETION OF PROJECT (SECTION 2.1.5.D)
  - WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE, MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEANUP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DEPARTMENT OF STATE LANDS REQUIRED TIMEFRAME (SECTION 2.2.19.A)
  - THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS OR DRAINAGE WAYS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS (SECTION 2.2.19)
  - DOCUMENT ANY PORTIONS OF THE SITE WHERE LAND DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED OR WILL BE TEMPORARILY INACTIVE FOR 14 OR MORE CALENDAR DAYS (SECTION 6.5.F)
  - PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE (SECTION 2.2.20)
  - DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED, ALL TEMPORARY EROSION CONTROLS AND RETAINED SOILS MUST BE REMOVED AND DISPOSED OF PROPERLY, UNLESS NEEDED FOR LONG TERM USE FOLLOWING TERMINATION OF PERMIT COVERAGE (SECTION 2.2.21)

#### RATIONALE STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ'S GUIDANCE MANUAL HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMPs WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITIONS TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS. AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESC PLAN, AN ACTION PLAN WILL BE SUBMITTED.

INITIALS

### INSPECTION FREQUENCY TABLE

SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	ON INITIAL DATE THAT LAND DISTURBANCE ACTIVITIES COMMENCE.
2. INACTIVE PERIODS GREATER THAN FOURTEEN (14) CONSECUTIVE CALENDAR DAYS	WITHIN 24 HOURS OF ANY STORM EVENT, INCLUDING RUNOFF FROM SNOW MELT, THAT RESULTS IN DISCHARGE FROM THE SITE. AT LEAST ONCE EVERY 14 DAYS, REGARDLESS OF WHETHER STORMWATER RUNOFF IS OCCURRING
3. PERIODS DURING WHICH THE SITE IS UNACCESSIBLE DUE TO INCLEMENT WEATHER	THE INSPECTOR MAY REDUCE THE FREQUENCY OF INSPECTIONS IN ANY AREA OF THE SITE WHERE THE STABILIZATION STEPS IN SECTION 2.2.20 HAVE BEEN COMPLETED TO TWICE PER MONTH FOR THE FIRST MONTH, NO LESS THAN 14 CALENDAR DAYS APART, THEN ONCE PER MONTH
4. PERIODS DURING WHICH CONSTRUCTION ACTIVITIES ARE SUSPENDED AND RUNOFF IS UNLIKELY DUE TO FROZEN CONDITIONS	IF SAFE, ACCESSIBLE AND PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT DISCHARGE POINT OR DOWNSTREAM LOCATION OF THE RECEIVING WATERBODY
5. PERIODS DURING WHICH CONSTRUCTION ACTIVITIES ARE CONDUCTED AND RUNOFF IS UNLIKELY DURING FROZEN CONDITIONS	VISUAL MONITORING INSPECTIONS MAY BE TEMPORARILY SUSPENDED IMMEDIATELY RESUME MONITORING UPON THAWING, OR WHEN WEATHER CONDITIONS MAKE DISCHARGES LIKELY

- \* HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS
- \* ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS
- \* INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS
- \* RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, RETAIN THE ESCP AT THE CONSTRUCTION SITE OR AT ANOTHER LOCATION

THE PERMITTEE IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200-C PERMIT. THIS ESCP AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200-C PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200-C PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS OF THIS PLAN

### BMP MATRIX FOR CONSTRUCTION PHASES

REFER TO DEQ GUIDANCE MANUAL FOR A COMPREHENSIVE LIST OF AVAILABLE BMPs

	CLEARING	MASS GRADING	UTILITY INSTALLATION	STREET CONSTRUCTION	FINAL STABILIZATION
<b>EROSION PREVENTION</b>					
PRESERVE NATURAL VEGETATION	**x	x	x	x	x
GROUND COVER		x			x
HYDRAULIC APPLICATIONS					x
PLASTIC SHEETING		x	x		
MATTING					
DUST CONTROL	x	x	x	x	x
TEMPORARY/PERMANENT SEEDING		x	x	x	x
BUFFER ZONE	**x	x	x	x	x
<b>OTHER:</b>					
<b>SEDIMENT CONTROL</b>					
SEDIMENT FENCE (PERIMETER)	**x	x	x	x	x
SEDIMENT FENCE (INTERIOR)	x	x	x	x	x
STRAW WATTLES			x		
FILTER BERM		x	x	x	
INLET PROTECTION	**x	x	x	x	
DEWATERING			x		
SEDIMENT TRAP					
NATURAL BUFFER ENCROACHMENT					
SEDIMENT BAG					
<b>OTHER:</b>					
<b>RUNOFF CONTROL</b>					
CONSTRUCTION ENTRANCE	x	x	x	x	
PIPE SLOPE DRAIN					
OUTLET PROTECTION	x	x	x	x	
SURFACE ROUGHENING					
CHECK DAMS					
<b>OTHER:</b>					
<b>POLLUTION PREVENTION</b>					
PROPER SIGNAGE	x	x	x	x	x
HAZ WASTE MGMT	x	x	x	x	x
SPILL KIT ON-SITE	x	x	x	x	x
CONCRETE WASHOUT AREA			x	x	
<b>OTHER:</b>					

\*\*SIGNIFIES ADDITIONAL BMPs REQUIRED FOR WORK WITHIN 50' OF WATER OF THE STATE

\*\*SIGNIFIES BMP THAT WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBING ACTIVITY

### SHEET INDEX EROSION AND SEDIMENT CONTROL PLANS

- C1.40 EROSION AND SEDIMENT CONTROL COVER SHEET
- C1.41 ESCP CLEARING AND DEMOLITION PLAN
- C1.42 ESCP MASS GRADING AND STABILIZATION PLAN
- C1.43 ESCP UTILITY CONSTRUCTION PLAN
- C1.44 ESCP VERTICAL CONSTRUCTION PLAN
- C1.45 EROSION AND SEDIMENT CONTROL DETAILS



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**NEW OFFICE BUILDING**

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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**ESC COVER SHEET**

DRAWN BY: SJS

CHECKED BY: BDN

SHEET

**C1.40**

JOB NO. **2220087.00**

**ARCHITECTURAL REVIEW: 8/17/2022**







**LEGEND**

- SEDIMENT FENCE PER 3/EC6.0
- LIMITS OF GRADING
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING DRAINAGE FLOW ARROW
- PROPOSED DRAINAGE FLOW ARROW
- CATCH BASIN SEDIMENT FILTER BAG PER 1/EC6.0
- CONCRETE WASHOUT PER 6/EC6.0
- WHEEL WASH PER 5/EC6.0
- CONSTRUCTION ENTRANCE PER 2/EC6.0
- SOIL STOCKPILE AREA PER 4/EC6.0
- AREA FOR SOLID AND HAZARDOUS WASTE, FUEL STORAGE AND REFUELING AND EQUIPMENT STORAGE AND MAINTENANCE

**KEYNOTES**

- 01-01 CATCH BASIN SEDIMENT FILTER BAG PER DETAIL 1/C1.45
- 01-02 CONSTRUCTION ENTRANCE PER DETAIL 2/C1.45
- 01-04 AREA FOR TEMPORARY SOIL STOCKPILE FROM EARTHWORK CUTTINGS. COVER STOCKPILE PER 4/C1.45
- 01-05 WHEEL WASH PER 5/C1.45
- 01-07 LIMIT OF GRADING
- 01-10 AREA FOR SOLID AND HAZARDOUS WASTE, FUEL STORAGE AND REFUELING AND EQUIPMENT STORAGE AND MAINTENANCE. PROVIDE PERIMETER SEDIMENT FENCE PER 3/C1.45
- 01-13 STOCKPILE EXCESS ON SITE EXCAVATED SOIL. ROUGHEN SLOPE AND SEED PER 06/C1.45

**EROSION CONTROL GENERAL NOTES**

1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES, UNLESS OTHERWISE AUTHORIZED.
  - A. VEGETATED CORRIDOR AREAS REQUIRE NATIVE SEED MIXES. SEE RESTORATION PLAN FOR APPROPRIATE SEED MIX.
  - B. DWARF GRASS MIX (MIN. 100 LB./AC.)
    - 1. DWARF PERENNIAL RYEGRASS (80% BY WEIGHT)
    - 2. CREEPING RED FESCUE (20% BY WEIGHT)
  - C. STANDARD HEIGHT GRASS MIX (MIN. 100 LB./AC.)
    - 1. ANNUAL RYEGRASS (40% BY WEIGHT)
    - 2. TURF-TYPE FESCUE (60% BY WEIGHT)
2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.
4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.
5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.
7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
10. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LOADED WATER.
11. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
12. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORM WATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.
13. AVOID PAVING WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORM WATER SYSTEM.
14. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
15. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORM WATER SYSTEM.
16. AREAS MARKED AS "WO" SHALL NOT HAVE CONSTRUCTION RUNOFF DIRECTED TOWARDS THEM. THESE AREAS SHALL BE PROTECTED SO AS TO NOT IMPACT THEIR NATURAL INFILTRATION CHARACTERISTICS.

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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**ESC MASS  
GRADING**

DRAWN BY: SJS

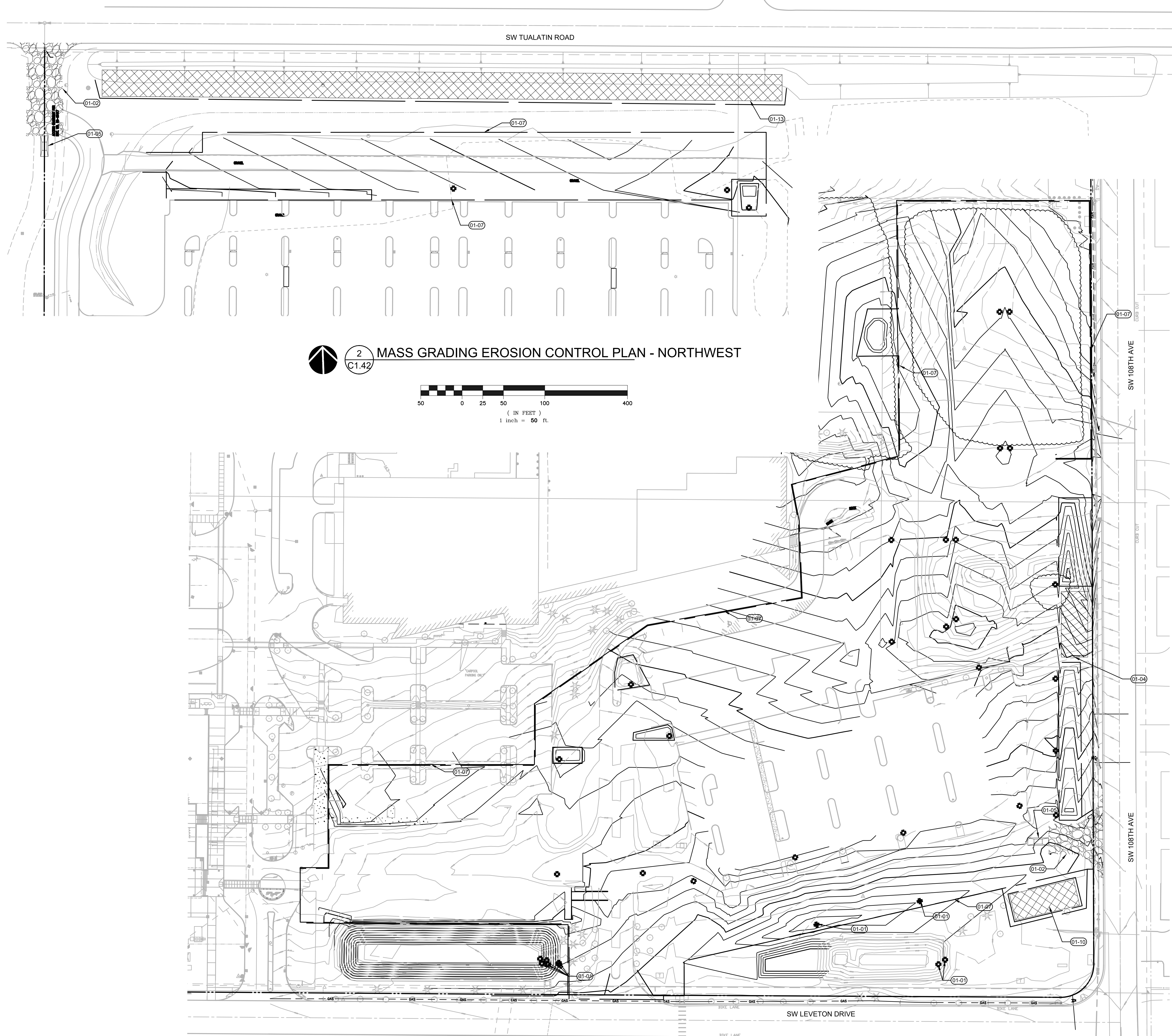
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SHEET

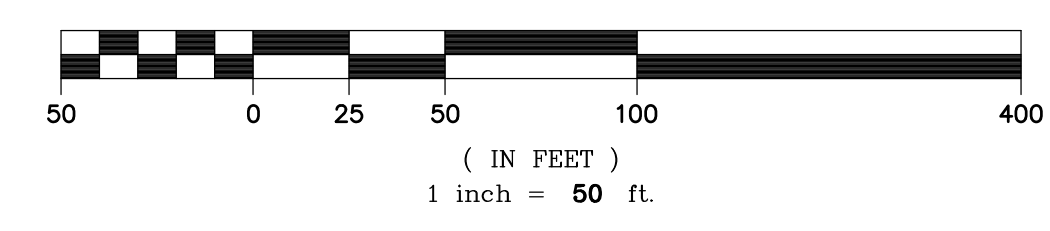
**C1.42**

JOB NO. **2220087.00**

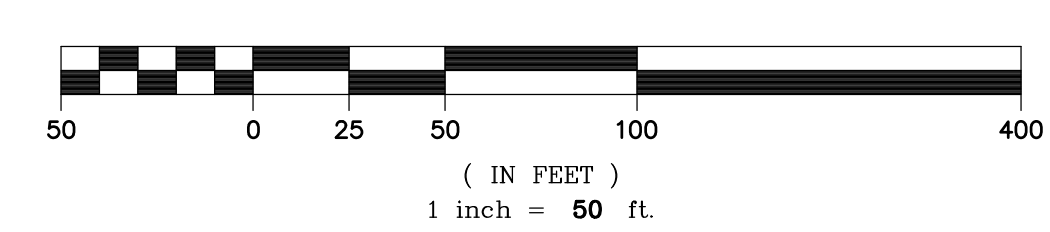
**ARCHITECTURAL REVIEW: 8/17/2022**



**2 MASS GRADING EROSION CONTROL PLAN - NORTHWEST**  
C1.42



**1 MASS GRADING EROSION CONTROL PLAN - SOUTHEAST**  
C1.42





LEGEND

- SEDIMENT FENCE PER 3/EC6.0
- LIMITS OF GRADING
- EXISTING CONTOUR
- PROPOSED CONTOUR
- STORM LINE
- SANITARY LINE
- FIRE WATER LINE
- DOMESTIC WATER LINE
- CATCH BASIN SEDIMENT FILTER BAG PER 1/EC6.0
- CONCRETE WASHOUT PER 6/EC6.0
- WHEEL WASH PER 5/EC6.0
- CONSTRUCTION ENTRANCE PER 2/EC6.0
- SOIL STOCKPILE AREA PER 4/EC6.0
- AREA FOR SOLID AND HAZARDOUS WASTE, FUEL STORAGE AND REFUELING AND EQUIPMENT STORAGE AND MAINTENANCE

UTILITIES PHASE NOTES

1. PROPOSED DETENTION POND TO BE DISCHARGE POINT FOR ALL STORMWATER RUNOFF CONVEYANCE
2. ANY TRENCH DEWATERING SHALL BE DISCHARGE THROUGH A FILTER BAG INTO DETENTION POND WITHIN THE FOREBAY AREAS AS SHOWN
3. STRAW MULCH AND/OR HYDROSEED SHALL BE USED FOR TEMPORARY STABILIZATION OF ANY EXPOSED TRENCH SPOILS (INCLUDING STOCKPOLE IF PLASTIC SHEETING DOESNT WORK)

KEYNOTES

- 01-01 CATCH BASIN SEDIMENT FILTER BAG PER DETAIL 1/C1.45
- 01-06 CONCRETE WASHOUT PER 6/C1.45
- 01-07 LIMIT OF GRADING
- 01-08 PROVIDE AND MAINTAIN 2" THICK COVER LAYER OF COMPOST OVER FINAL GRADING LAYER OF DISTURBED SOIL. AREA OF STORMWATER FACILITY AREA UNTIL PERMANENT GROUND COVER PLANTINGS ARE ESTABLISHED.
- 01-10 AREA FOR SOLID AND HAZARDOUS WASTE, FUEL STORAGE AND REFUELING AND EQUIPMENT STORAGE AND MAINTENANCE. PROVIDE PERIMETER SEDIMENT FENCE PER 3/C1.45.
- 01-11 INLET PROTECTION PER 7/C1.45.
- 01-13 STOCKPILE EXCESS ON SITE EXCAVATED SOIL. ROUGHEN SLOPE AND SEED PER 08/C1.45

EROSION CONTROL GENERAL NOTES

1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES, UNLESS OTHERWISE AUTHORIZED:
  - A. VEGETATED EROSION CONTROL SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
  - B. DWARF GRASS MIX (MIN. 100 LB./AC.)
    - 1. DWARF PERENNIAL RYEGRASS (80% BY WEIGHT)
    - 2. CREEPING RED FESCUE (20% BY WEIGHT)
  - C. STANDARD HEIGHT GRASS MIX (MIN. 100 LB./AC.)
    - 1. ANNUAL RYEGRASS (40% BY WEIGHT)
    - 2. TURF-TYPE FESCUE (60% BY WEIGHT)
2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.
4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.
5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.
7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
10. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.
11. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT. SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
12. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORM WATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.
13. AVOID PAVING WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORM WATER SYSTEM.
14. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
15. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORM WATER SYSTEM.
16. AREAS MARKED AS "WQ" SHALL NOT HAVE CONSTRUCTION RUNOFF DIRECTED TOWARDS THEM. THESE AREAS SHALL BE PROTECTED SO AS TO NOT IMPACT THEIR NATURAL INFILTRATION CHARACTERISTICS.

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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**ESC UTILITIES  
AND PAVING**

DRAWN BY: SJS

CHECKED BY: BDN

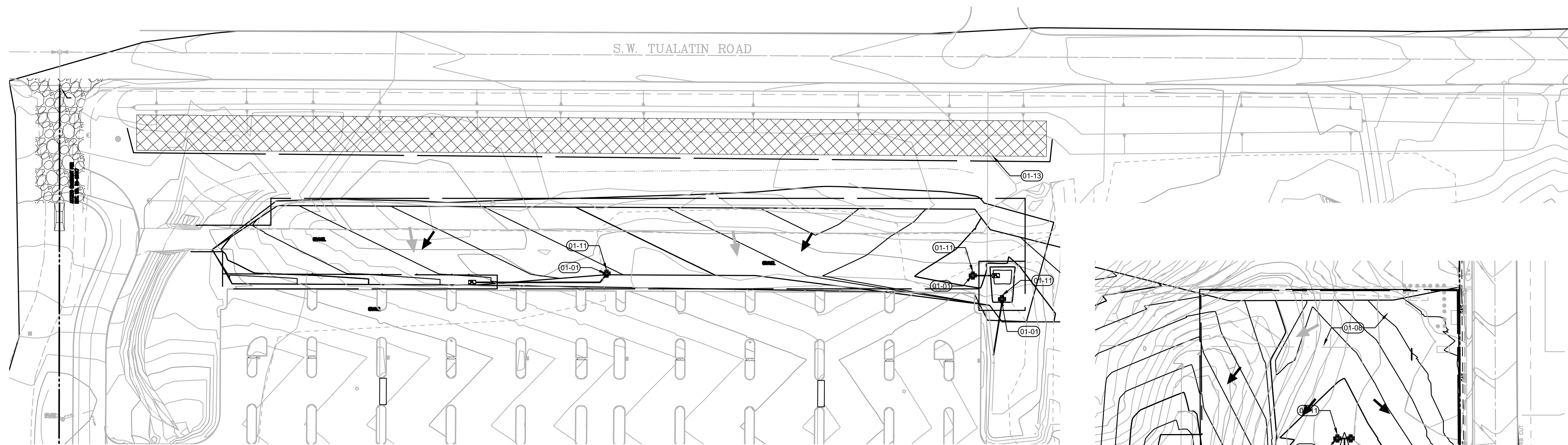
SHEET

**C1.43**

JOB NO. 2220087.00

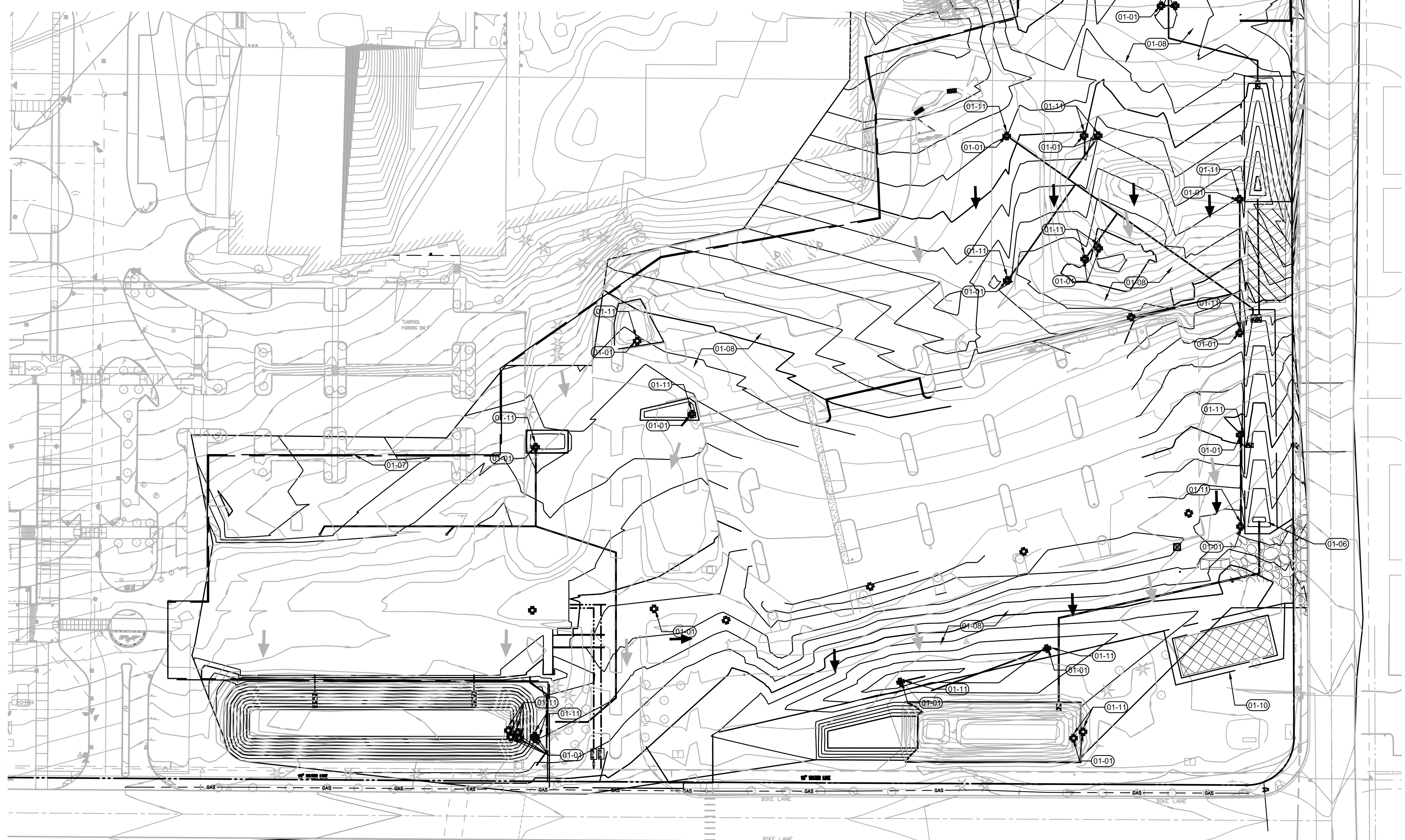
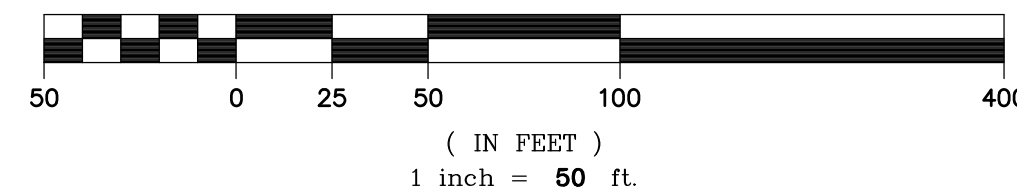
ARCHITECTURAL REVIEW: 8/17/2022

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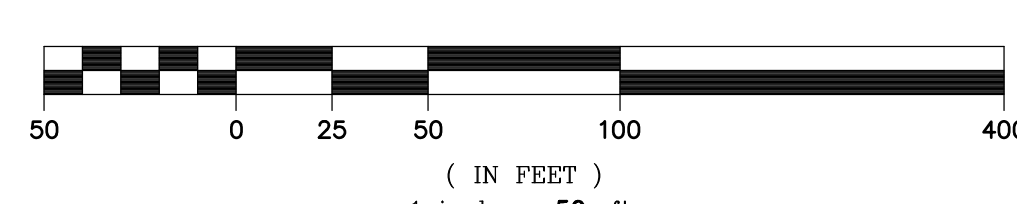
**2 NORTHWEST PARKING UTILITIES AND PAVING**

C1.43











**1 SOUTH EAST PARKING UTILITIES AND PAVING**

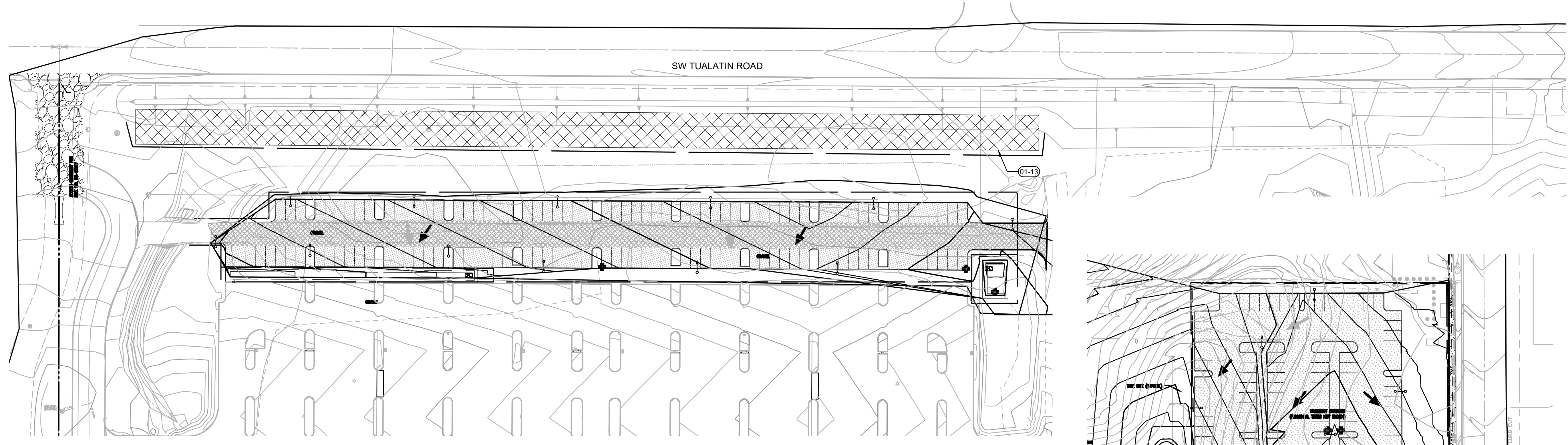
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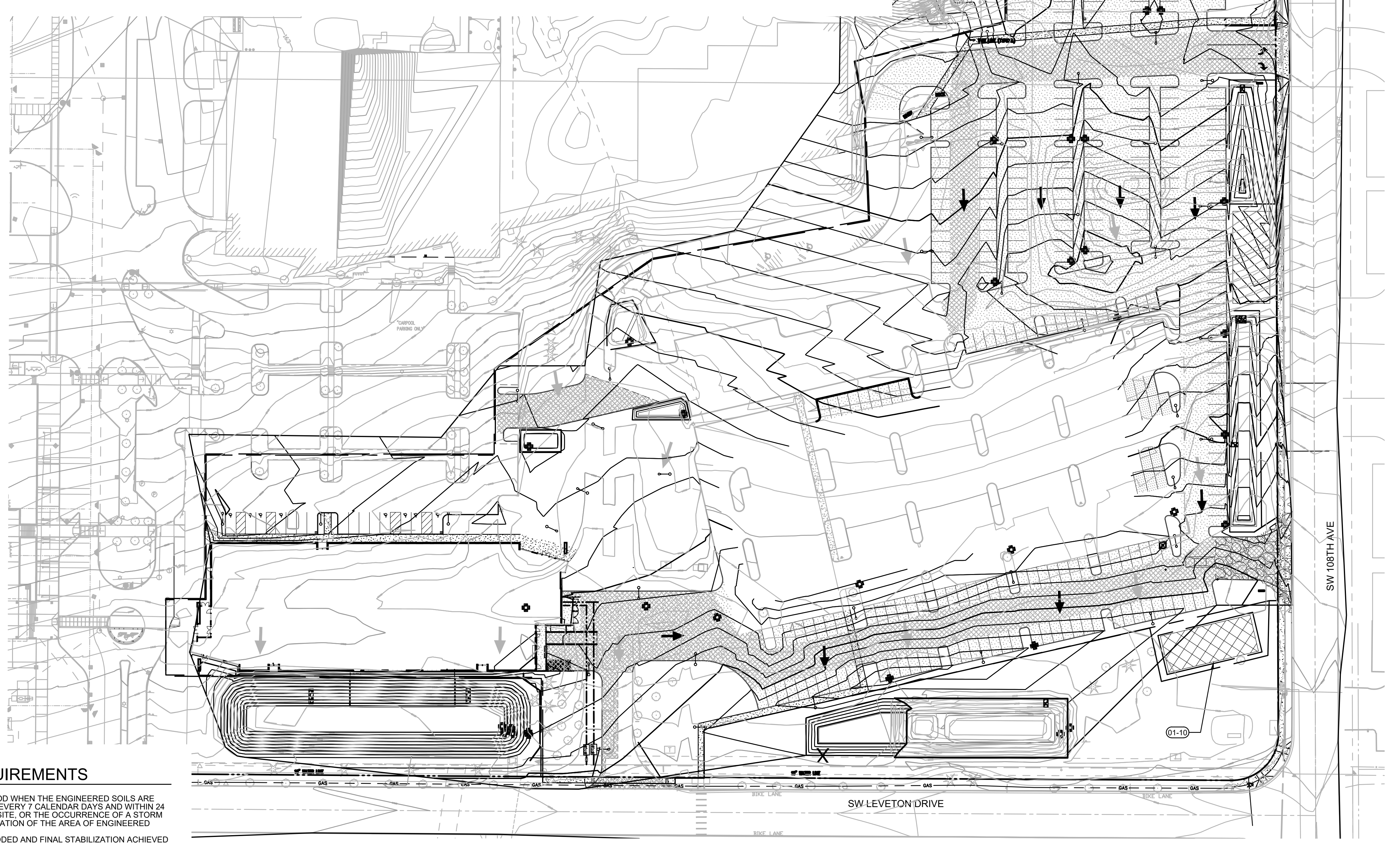
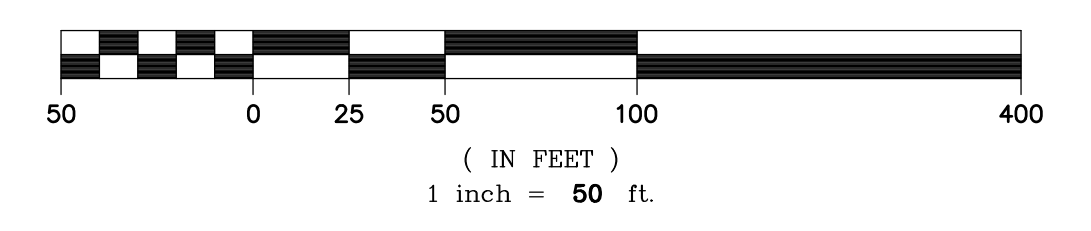


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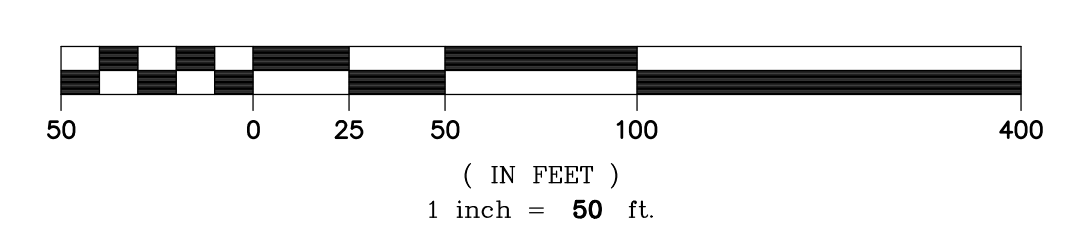
-  SEDIMENT FENCE PER 3/EC6.0
-  LIMITS OF GRADING
-  CATCH BASIN SEDIMENT FILTER BAG PER 1/EC6.0
-  CONCRETE WASHOUT PER 6/EC6.0
-  WHEEL WASH PER 5/EC6.0
-  CONSTRUCTION ENTRANCE PER 2/EC6.0
-  SOIL STOCKPILE AREA PER 4/EC6.0
-  AREA FOR SOLID AND HAZARDOUS WASTE, FUEL STORAGE AND REFUELING AND EQUIPMENT STORAGE AND MAINTENANCE



**2 NORTHWEST PARKING BUILDING CONSTRUCTION**  
C1.44



**1 BUILDING G CONSTRUCTION**  
C1.44



**DISCHARGE MONITORING REQUIREMENTS**

1. THE REGISTRANT MUST BEGIN THE PH MONITORING PERIOD WHEN THE ENGINEERED SOILS ARE FIRST EXPOSED TO PRECIPITATION AND MUST CONTINUE EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS OF THE OCCURRENCE OF DISCHARGE FROM THE SITE, OR THE OCCURRENCE OF A STORM EVENT OF 0.10 INCHES OR GREATER UNTIL FINAL STABILIZATION OF THE AREA OF ENGINEERED SOILS IS ESTABLISHED (SEE SECTION 2.2.2).
2. DOCUMENT THE DATE WHEN SOIL AMENDMENTS WERE ADDED AND FINAL STABILIZATION ACHIEVED IN THE INSPECTION REPORT PER SECTION 6.9.
3. THE REGISTRANT MUST MONITOR THE PH OF STORMWATER IN THE SEDIMENT BASINS/IMPONDEMENTS AND AT DISCHARGE LOCATIONS THAT RECEIVE STORMWATER RUNOFF FROM THE AREA WHERE ENGINEERED SOILS WERE USED BEFORE THE STORMWATER DISCHARGES TO SURFACE WATERS.
4. THE BENCHMARK VALUE FOR PH IS DEFINED IN STANDARD UNITS (SU), AND DETERMINED BY THE RIVER BASIN CONTAINING THE RECEIVING WATERBODY ACCORDING TO OAR 840-041-0021. ANYTIME MONITORING INDICATES THAT THE PH OF THE SITE'S STORMWATER IS THE MAXIMUM ALLOWED SU OR GREATER, THE REGISTRANT MUST EITHER:
  - 4.1. PREVENT THE HIGH PH WATER FROM ENTERING STORM SEWER SYSTEMS OR SURFACE WATERS; OR
  - 4.2. ADJUST OR NEUTRALIZE THE HIGH PH WATER UNTIL IT IS IN THE RANGE OF PH SU ACCEPTABLE FOR DISCHARGE TO THE RIVER BASIN CONTAINING THE RECEIVING WATERBODY BY USING AN APPROPRIATE TREATMENT BMP SUCH AS CARBON DIOXIDE (CO2) SPARGING OR DRY ICE. THE REGISTRANT MUST OBTAIN WRITTEN PERMISSION FROM DEQ OR AGENT BEFORE USING ANY FORM OF CHEMICAL TREATMENT OTHER THAN CO2 SPARGING OR DRY ICE PER SECTION 1.2.9.
5. THE REGISTRANT MUST PERFORM PH MONITORING ON SITE WITHIN 15 MINUTES OF SAMPLE COLLECTION WITH AN ACCURATELY CALIBRATED PH METER. THE REGISTRANT MUST RECORD THE PH MONITORING RESULTS AND ANY PH ADJUSTMENT TREATMENTS IN THE INSPECTION REPORT.

**VERTICAL CONSTRUCTION PHASE NOTES**

1. ALL CONSTRUCTION MATERIALS THAT COULD LEAD TO POLLUTION IF SPILLED NOT IN IMMEDIATE USE SHALL BE STORED IN A STORAGE BOX TO PREVENT SPILLS AND EXPOSURE TO WET WEATHER
2. FOR SPILL PREVENTION SPILL KITS AND OTHER SPILL CONTAINMENT DEVICES (I.E. WATTLES, ABSORBENT SOCKS/BOOMS, ORGANIC OIL ABSORBENTS AGENT, ETC.) SHALL BE KEPT ONSITE THROUGH THE COMPLETION OF THE PROJECT

**KEYNOTES**

- 01-10 AREA FOR SOLID AND HAZARDOUS WASTE, FUEL STORAGE AND REFUELING AND EQUIPMENT STORAGE AND MAINTENANCE. PROVIDE PERIMETER SEDIMENT FENCE PER 3/1.45.
- 01-13 STOCKPILE EXCESS ON SITE EXCAVATED SOIL. ROUGHEN SLOPE AND SEED PER 08/C1.45

**EROSION CONTROL GENERAL NOTES**

1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES, UNLESS OTHERWISE AUTHORIZED:
  - A. VEGETATED CORRIDOR AREAS REQUIRE NATIVE SEED MIXES. SEE RESTORATION PLAN FOR APPROPRIATE SEED MIX
  - B. DWARF GRASS MIX (MIN. 100 LB./AC.)
    - 1. DWARF PERENNIAL RYEGRASS (80% BY WEIGHT)
    - 2. CREEPING RED FESCUE (20% BY WEIGHT)
  - C. STANDARD HEIGHT GRASS MIX (MIN. 100LB./AC.)
    - 1. ANNUAL RYEGRASS (40% BY WEIGHT)
    - 2. TURF-TYPE FESCUE (60% BY WEIGHT)
2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.
4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.
5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING. EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.
7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
10. SATURATED MATERIALS THAT ARE HAILED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.
11. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
12. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORM WATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.
13. AVOID PAVING WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORM WATER SYSTEM.
14. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
15. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORM WATER SYSTEM.
16. AREAS MARKED AS "STORM FACILITY" SHALL NOT HAVE CONSTRUCTION RUNOFF DIRECTED TOWARDS THEM. THESE AREAS SHALL BE PROTECTED SO AS TO NOT IMPACT THEIR NATURAL INFILTRATION CHARACTERISTICS.

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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**ESC BUILDING CONSTRUCTION**

DRAWN BY: SJS

CHECKED BY: BDN

SHEET

**C1.44**

JOB NO. **2220087.00**



**CATCH BASIN INSERT**

NOTE:  
1. RECESSED CURB INLET CATCH BASINS MUST BE BLOCKED WHEN USING FILTER FABRIC INLET SACKS. SIZE OF FILTER FABRIC INLET SACKS TO BE DETERMINED BY MANUFACTURER.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

1  
C1.45  
INLET PROTECTION TYPE 5  
DRAWING NO. 920  
REVISED 10-31-19  
CleanWater Services

**CONSTRUCTION ENTRANCE**

NOTE:  
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.  
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.  
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.  
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.  
5. DIMENSIONS:  
SINGLE FAMILY: 20' LONG BY 20' WIDE 8" DEEP OF 3/4" MINUS CLEAN ROCK.  
COMMERCIAL/SITE DEVELOPMENT: 50' LONG BY 20' WIDE 3-6" CLEAN ROCK, GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

2  
C1.45  
DRAWING NO. 855  
REVISED 10-31-19  
CleanWater Services

**SEDIMENT FENCE**

NOTE:  
1. SEDIMENT FENCE TO HAVE STITCHED LOOPS AROUND 2" x 2" POSTS.  
2. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.  
3. 2" x 2" FIR, PINE OR STEEL FENCE POSTS.  
4. POSTS TO BE INSTALLED ON UPHILL SIDE OF SLOPE.  
5. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.  
6. PANELS MUST BE PLACED ACCORDING TO SPACING ON DRAWING NO. 945.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

3  
C1.45  
DRAWING NO. 875  
REVISED 10-31-19  
CleanWater Services

**PLASTIC SHEETING**

NOTE:  
1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.  
2. PERIMETER SEDIMENT CONTROL BMP TO BE INSTALLED A MINIMUM OF 3' FROM TOE OF STOCKPILE.  
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR APPROVED EQUAL ON ROSES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.  
4. PLASTIC TO EXTEND MINIMUM 1' BEYOND TOE OF SLOPE.  
5. AS APPROPRIATE BMP'S SHALL BE INSTALLED TO CONVEY WATER DISCHARGE FROM STOCKPILE AREAS.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

4  
C1.45  
DRAWING NO. 810  
REVISED 10-31-19  
CleanWater Services

**TIRE WASH-(DRIVE-THROUGH)**

NOTE:  
1. CONTRACTOR TO REMOVE ACCUMULATED SEDIMENT AS NEEDED TO PREVENT TRACKING FROM TIRE WASH; SEDIMENT LADEN WATER MAY BE PIPED TO AN APPROVED BMP.  
2. USE GEOTEXTILE FABRIC WITH AGGREGATE FOR A TEMPORARY TIRE WASH.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

5  
C1.45  
DRAWING NO. 870  
REVISED 10-31-19  
CleanWater Services

**CONCRETE WASHOUT**

NOTE:  
1. WASHOUT FACILITIES SHALL BE MAINTAINED TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM PRESEDIMENT OF 12 INCHES.  
2. WASHOUT FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED AND READY FOR USE ONCE THE WASHOUT IS 75% FULL.  
3. IF THE WASHOUT IS NEARING CAPACITY, VACUUM AND DISPOSE OF THE WASTE MATERIAL IN AN APPROVED MANNER.  
4. TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE LOCATED A MINIMUM OF 50 FT. FROM SENSITIVE AREAS INCLUDING OPEN DRAINAGE FACILITIES AND WATER SOURCES.  
5. CONCRETE WASHOUT FACILITIES SHALL BE CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS.  
6. INSTALL CONCRETE WASHOUT SIGN WITHIN 30 FEET OF TEMPORARY CONCRETE WASHOUT FACILITY.  
7. TEMPORARY CONCRETE WASHOUTS MAY BE A PREFABRICATED CONTAINER THAT IS PORTABLE AND REUSABLE.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

6  
C1.45  
DRAWING NO. 900  
REVISED 10-31-19  
CleanWater Services

**INLET PROTECTION TYPE 6**

NOTE:  
1. INSTALL SOLID FABRIC SIDE DOWN MESH SIDE UP.  
2. ATTACH TO CATCH BASIN GRATE AT A MINIMUM OF 3 LOCATIONS TIGHT TO CURB WITH 1/4" ZIP TIES.

MAINTENANCE NOTES:  
1. ANY VISIBLE SIGN OF SEDIMENT ACCUMULATION TO BE CLEANED UP AT THE END OF EACH WORKDAY.  
2. REPLACE U-SHAPED FILTER BAG AS NECESSARY TO PREVENT WOOD CHIPS FROM ENTERING THE STORM SYSTEM.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

7  
C1.45  
DRAWING NO. 925  
REVISED 10-31-19  
CleanWater Services

**SURFACE ROUGHENING CAT TRACKING**

NOTE:  
1. CULTIVATE SOIL TO CREATE FURROWS PERPENDICULAR TO SLOPE.  
2. USE DOZER TRACKS TO CREATE GROOVES PERPENDICULAR TO SLOPE.

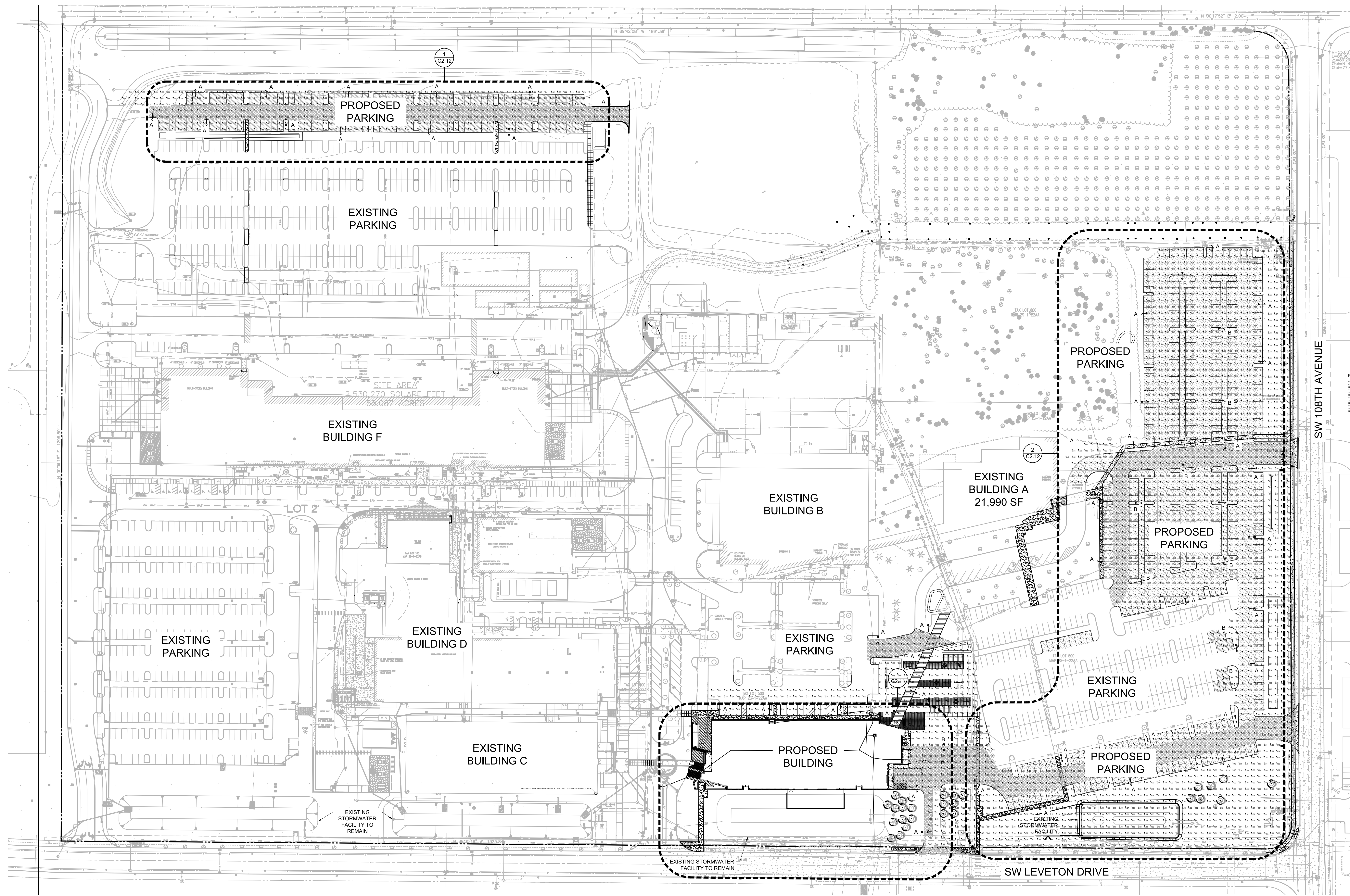
FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

8  
C1.45  
DRAWING NO. 830  
REVISED 10-31-19  
CleanWater Services

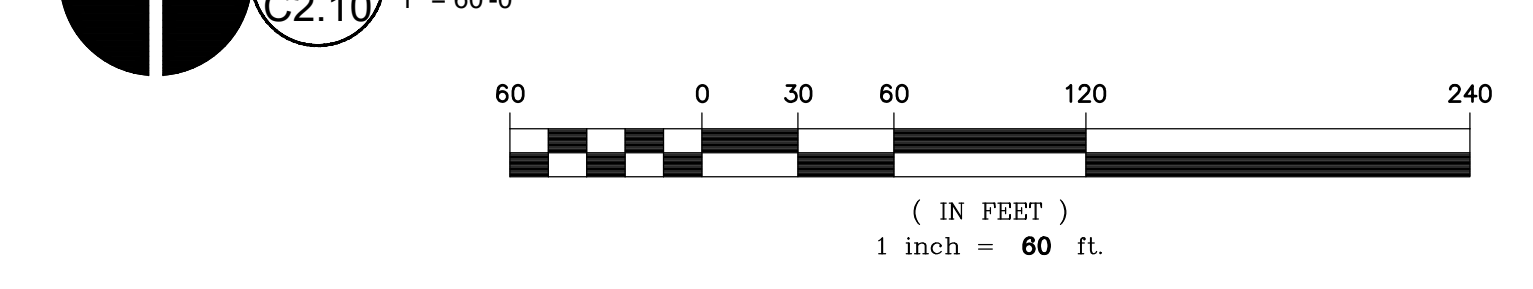
REVISION SCHEDULE		
Delta	Issued As	Issue Date



REVISION SCHEDULE		
Delta	Issued As	Issue Date



**1 OVERALL PHOTOMETRIC PLAN**



LUMINAIRE SCHEDULE	SYM	QTY	MANUFACTURER	CATALOG #	DISTRIBUTION	WATTS	VOLTAGE	HEIGHT	MA LENGTH	CONFIGURATION
A	44		LITHONIA LIGHTING	KAD LED 20C 530 30K R2 MVOLT	LITHONIA LIGHTING KAD-LED LED CONTOUR SOFT SQUARE FULL CUTOFF	35	UNIVERSAL (120-277 V)	30 FT	N/A	SINGLE
B	14		LITHONIA LIGHTING	KAD LED 20C 530 30K R2 MVOLT	LITHONIA LIGHTING KAD-LED LED CONTOUR SOFT SQUARE FULL CUTOFF	35	UNIVERSAL (120-277 V)	30 FT	N/A	TWIN

PHOTOMETRIC CALCULATIONS:

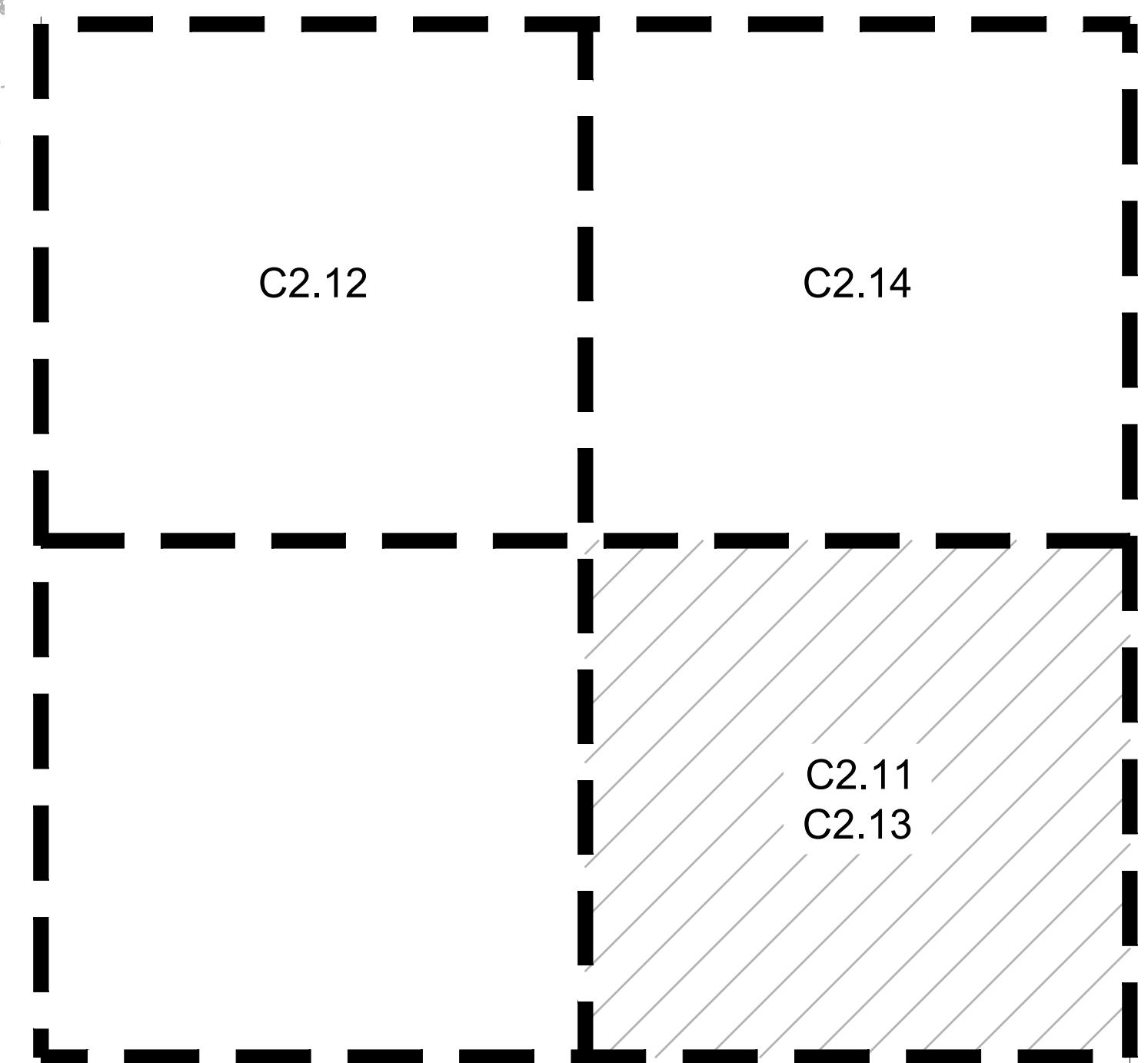
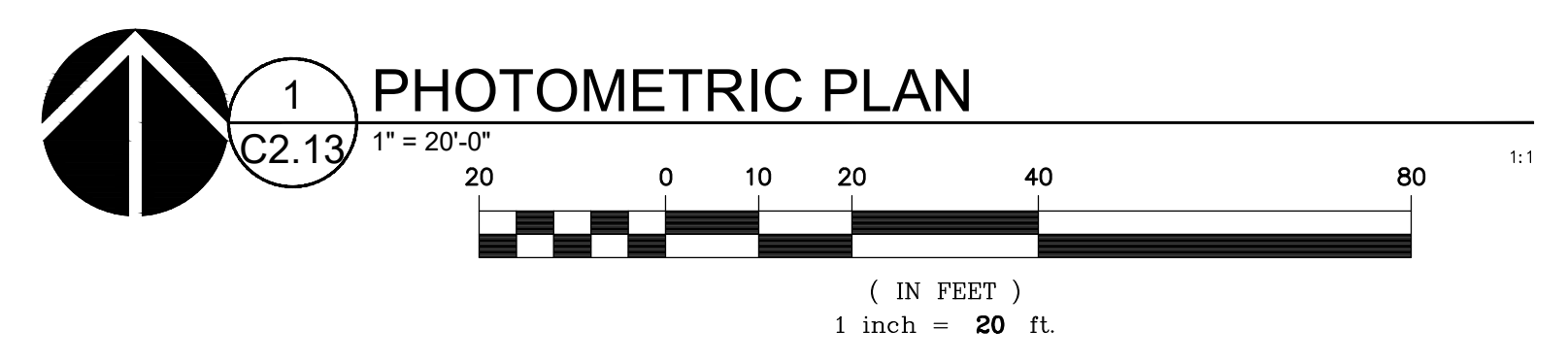
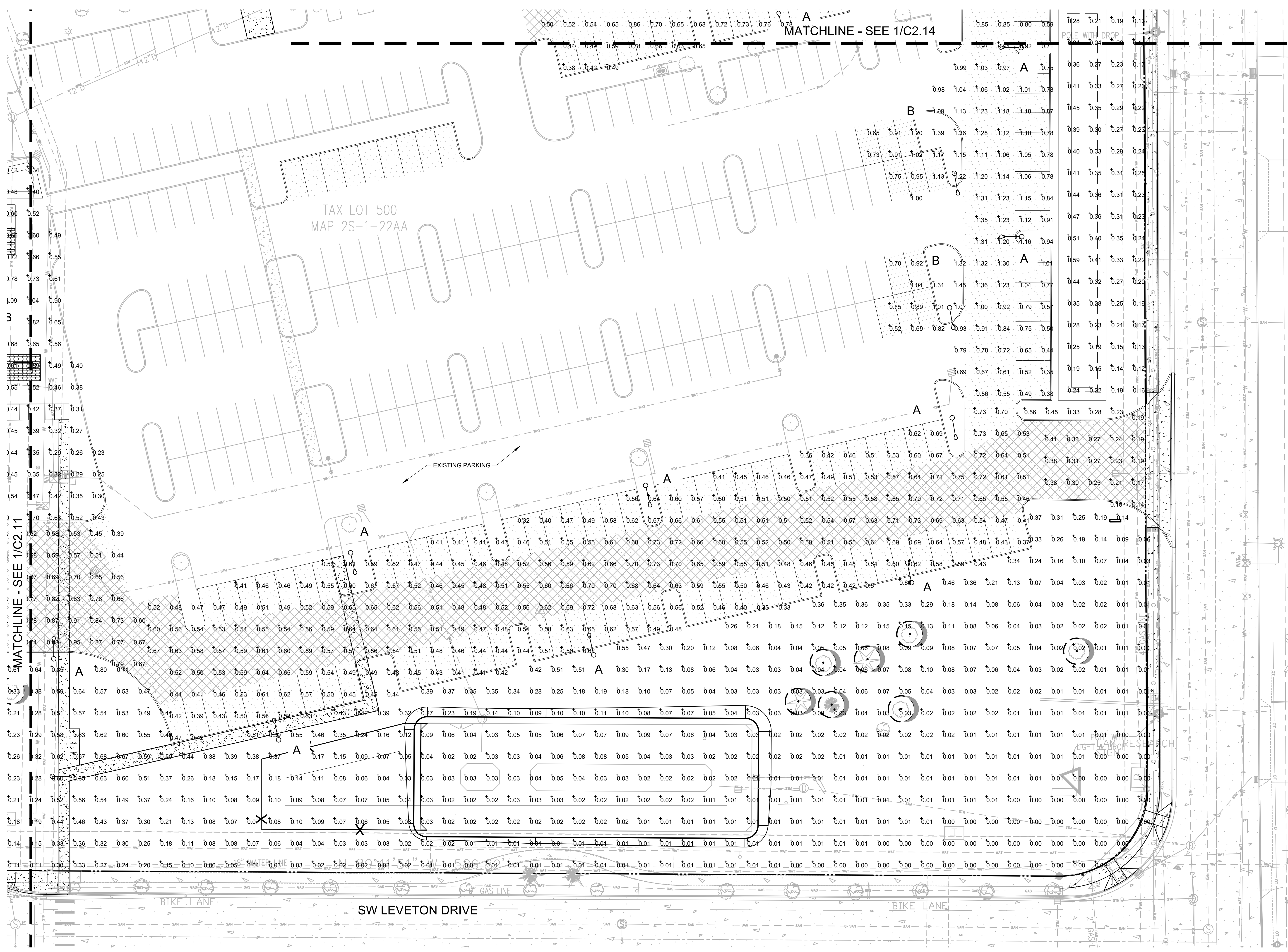
AREA	AVERAGE FOOT-CANDLES
NORTHWEST PARKING LOT	AVERAGE = 0.54 FC
NORTHEAST PARKING LOT	AVERAGE = 0.59 FC
EAST PARKING LOT	AVERAGE = 0.62 FC
SOUTHWEST PARKING LOT	AVERAGE = 0.55 FC
SOUTH ENTRANCE	AVERAGE = 0.26 FC
SOUTHWEST ENTRANCE	AVERAGE = 0.26 FC
EAST ENTRANCE	AVERAGE = 0.28 FC
SOUTHWEST PROPERTY LINE	AVERAGE = 0.13 FC
EAST PROPERTY LINE	AVERAGE = 0.20 FC
NORTHEAST PROPERTY LINE	AVERAGE = 0.15 FC
CENTER DRIVE CONNECTION	AVERAGE = 0.78 FC
NORTH PRCP. BLDG PARKING SIDEWALK	AVERAGE = 0.50 FC
OUTDOOR PLAZA	AVERAGE = 0.70 FC
EAST PARKING SIDEWALK	AVERAGE = 0.12 FC
NORTHWEST LANDSCAPE	AVERAGE = 0.51 FC











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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**PHOTOMETRIC PLAN**

DRAWN BY: AOC  
 CHECKED BY: BDN  
 SHEET

**C2.13**





REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**PHOTOMETRIC  
PLAN**

DRAWN BY: AOC

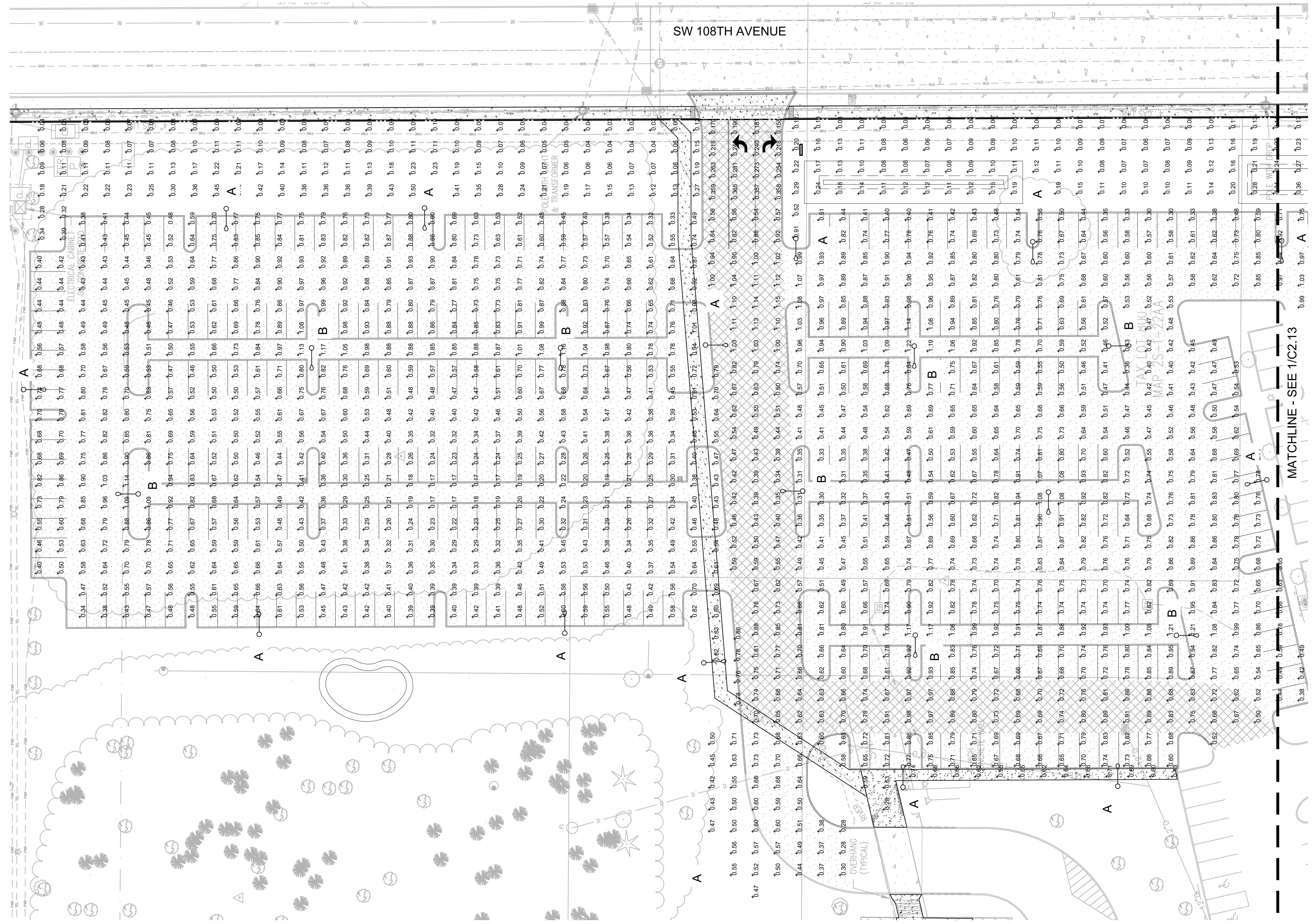
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SHEET

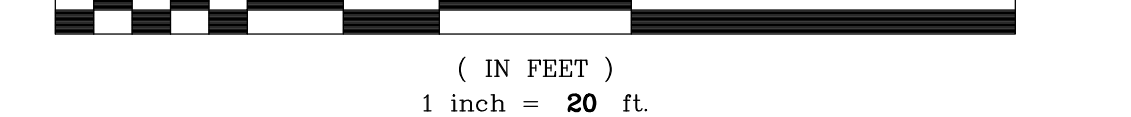
**C2.14**

JOB NO. **2220087.00**

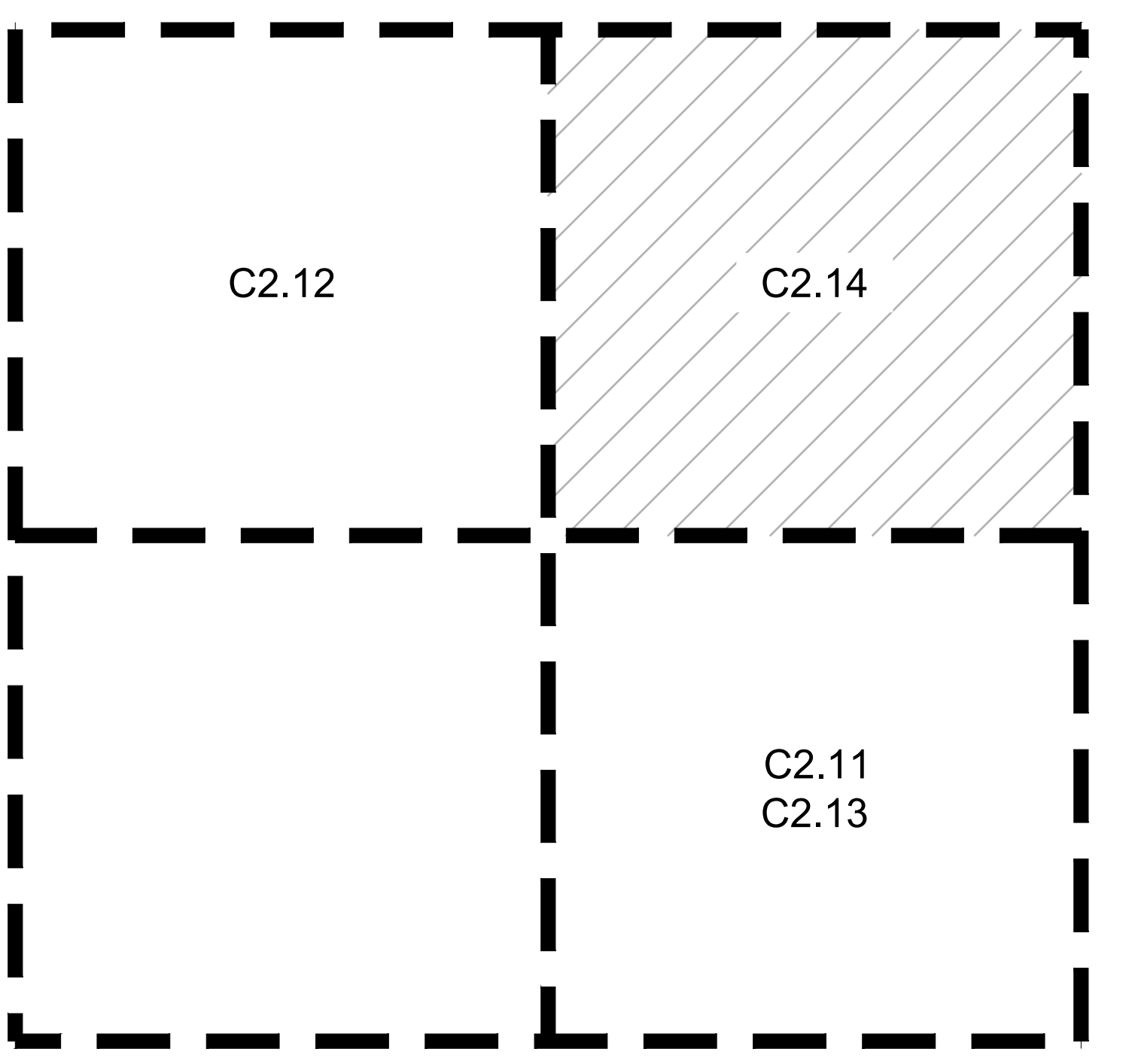
**ARCHITECTURAL REVIEW: 8/17/2022**



**1 PHOTOMETRIC PLAN**  
C2.14 1" = 20'-0"



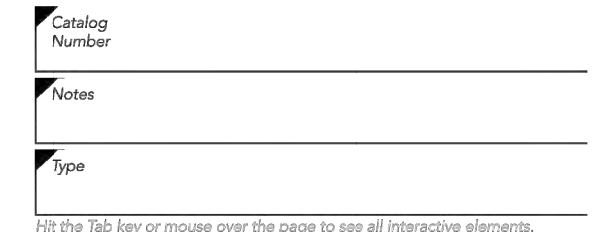
**KEY MAP**  
SCALE: NTS







KAD LED LED Area Luminaire



Specifications EPA: 1.2 ft² (0.11 m²) Length: 17.1/2" (443 mm) Width: 17.1/2" (443 mm) Height: 7.5/8" (19.1 mm) Weight (max): 36 lbs. (16.4 kg)

Ordering Information

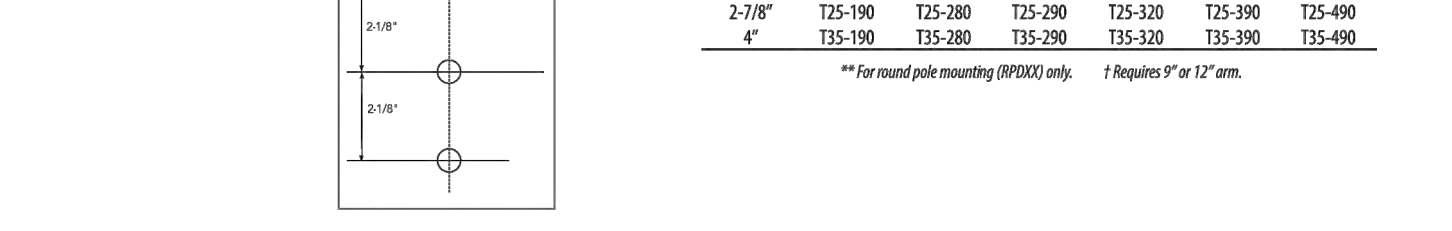
Table with columns: KAD LED, LEDs, Power, CCT, Installation, Voltage, Mounting, Shipped/Installed, and Shipped separately.

Table with columns: Stock Part Number, Stock Part Number, and Stock Part Number, detailing various configurations.

Stock configurations are offered for shorter lead times. Accessories include: B-level, motion/ambient sensor; B-level, motion/ambient sensor; B-level, motion/ambient sensor; B-level, motion/ambient sensor.

Notes: 1. 200 or 300 LED are not available with 500mA Current and 34V or 48V. 2. Not available with 80V voltage. 3. SHCCT color temperature is available from 100-2700K (500mA).

Drilling Template #5



Performance Data Table with columns: Luminaire, Power, Length, Width, Height, and Weight.

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configuration shown, within the tolerance allowed by Lighting Facts.

Large table with columns: Luminaire, Power, Length, Width, Height, and Weight, showing lumen output for various configurations.

Performance Data

Table with columns: Ambient Temperature (Ta), Lumen Output, and Power Consumption.

Electrical Load

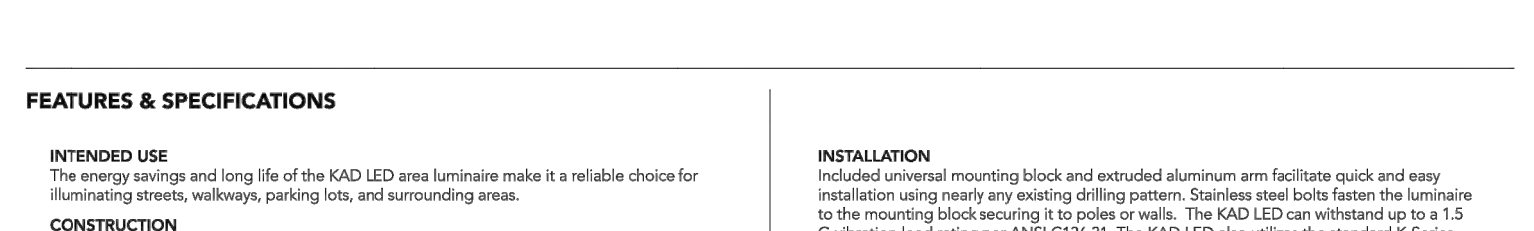
Table with columns: Ambient Temperature, Power Consumption, and Voltage.

Projected LED Lumen Maintenance

Confirms the anticipated performance projections for the KAD LED luminaire in a 0°C ambient, based on 100,000 hours of LED testing based on IESNA LM-80-08 and projected per IESNA TM-21-11.

Table with columns: Ambient Temperature, Lumen Output, and Power Consumption.

Photometric Diagrams



FEATURES & SPECIFICATIONS

INTENDED USE: The average average and long life of the KAD LED area luminaire make it a reliable choice for illuminating areas, walkways, parking lots, and surrounding areas.

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Project LAM RESEARCH TUALATIN FAC-1446 NEW OFFICE BUILDING

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Table with columns: Delta, Issued As, Issue Date

SHEET TITLE: PHOTOMETRIC DETAILS

DRAWN BY: AOC CHECKED BY: BDN

JOB NO. 2220087.00



ZONING COMPLIANCE

SITE INFORMATION

JURISDICTION	TJUALATIN, OR
STORMWATER	AGENCY
SITE AREA	435,600 SF
BUILDING AREA	10.0 AC
BUILDING COVERAGE	87,120 SF
LANDSCAPE AREA	20%
	87,120 SF

SHEET INDEX

L0.01	LANDSCAPE GENERAL INFORMATION AND KEY PLAN
L1.10	PLANTING PLAN NORTH (WEST)
L1.11	PLANTING PLAN NORTH (EAST)
L1.12	PLANTING PLAN NORTHEAST
L1.13	PLANTING PLAN EAST
L1.14	PLANTING PLAN SOUTHEAST
L1.15	PLANTING PLAN SOUTHWEST
L1.16	PLANTING PLAN WEST
L2.10	PLAN ENLARGEMENT
L2.11	PLAN ENLARGEMENT



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NEW OFFICE BUILDING

PLANT SCHEDULE

TREES	BOTANICAL / COMMON NAME	SIZE	
•	ACER RUBRUM 'BONHALL' BONHALL MAPLE	1.5" CAL.	
•	CERCIDIPHYLLUM JAPONICUM KATSURA TREE	1.5" CAL. BAB	
•	GLETTISIA TRIACANTHOS INERMIS 'MORANE' MORANE HONEY LOCUST	2" CAL. BAB	
•	LIRIODENDRON TULIPIFERA TULIP POPLAR	2" CAL. BAB	
•	MALUS X 'PRAIRIFIRE' PRAIRIFIRE CRAB APPLE	2" CAL. BAB	
•	NYSSA SYLVATICA 'DAVID ODUM' AFTERBURNER TUPelo	2" CAL. BAB	
•	PARROTTIA PERSICA PERSIAN PARROTTIA	2" CAL. BAB	
•	PRUNUS X YEDOENSIS 'AKEBONO' AKEBONO YOSHINO CHERRY	1.5" CAL. BAB MATCHING	
•	ULMUS 'PATRIOT' PATRIOT ELM	1.5" CAL. BAB	
•	ZELKOVA SERRATA 'HALKA' HALKA ZELKOVA	1.5" CAL. BAB	
EXISTING	BOTANICAL / COMMON NAME	SIZE	
•	EXISTING TREE TO REMAIN	---	
SHRUBS	BOTANICAL / COMMON NAME	SIZE	SPACING
•	ABELIA X GRANDIFLORA 'KALEIDOSCOPE' KALEIDOSCOPE GLOSSY ABELIA	5 GAL.	48" o.c.
•	BOUTELOUA GRACILIS 'BLONDE AMBITION' BLONDE AMBITION BLUE GRAMA	2 GAL.	24" o.c.
•	CISTUS X PLAVIRENTEUS 'SUNSET' SUNSET ROCKROSE	5 GAL.	48" o.c.
•	PANICUM VIRGATUM 'HEAVY METAL' BLUE SWITCH GRASS	2 GAL.	36" o.c.
•	PHILADELPHUS LEWISII WILD MOCKORANGE	5 GAL.	5' o.c.
•	FINUS MUDD VAR. MUDD DWARF MUDD PINE	5 GAL.	36" o.c.
•	PRUNUS LAUROCARPUS 'ZABELIANA' ZABEL LAUREL	5 GAL.	48" o.c.
•	RHAPHANALIS INDICA 'MONTI' INDIAN PRINCESS INDIAN HAWTHORN	5 GAL.	48" o.c.
•	SPIRAEA DOUGLASSII WESTERN SPIREA	5 GAL.	36" o.c.
•	SYMPHORICARPOS ALBUS 'MAGIC BERRY' COMPACT SNOWBERRY	5 GAL.	48" o.c.
•	THALIA OCCIDENTALIS 'BRANDON' BRANDON ARBORVITAE	5 GAL.	6' o.c.
•	THALIA OCCIDENTALIS 'CONCARE' FIRE CHIEF GLOBE ARBORVITAE	5 GAL.	36" o.c.
•	VACCINIUM OVATUM EVERGREEN HUCKLEBERRY	5 GAL.	36" o.c.
•	VERBURNUM DAVIDII DAVID VERBURNUM	5 GAL.	36" o.c.
•	VERBURNUM TINUS 'SPRING BOUQUET' SPRING BOUQUET LAURUSTINUS	5 GAL.	10' o.c.
GROUND COVERS	BOTANICAL / COMMON NAME	SIZE	SPACING
•	ARCTOSTAPHYLOS UVA-URSII KINNICKINICK	1 GAL.	24" o.c.
•	LAWN	1 LB / 1000 SF	
•	MAHONIA REPENS 'MONARK' MONARK CREEPING OREGON GRAPE	1 GAL.	24" o.c.
•	RUBUS CALYCIDOIDES GREEN CARPET RASPBERRY	1 GAL.	24" o.c.
•	SEED MIX MEADOW ROUGH SEED MIX	1 LB / 1000 SF	
STORMWATER	BOTANICAL / COMMON NAME	SIZE	SPACING
•	STORMWATER ZONE A HERBACEOUS PLANTS	1 GAL.	15" o.c.
•	STORMWATER ZONE B GROUNDCOVER MIX	1 GAL.	12" o.c.

LANDSCAPE CODE AREAS

[Pattern]	GENERAL LANDSCAPING
[Pattern]	10FTH SF RIGHT OF WAY IMPROVEMENTS
[Pattern]	PARKING ISLAND LANDSCAPING
[Pattern]	PARKING PERIMETER LANDSCAPING
[Pattern]	STORMWATER

LANDSCAPE NOTES

- GENERAL**
- CONTRACTOR SHALL CONFIRM ALL EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
  - CALL BEFORE YOU DIG. CONTRACTOR SHALL VERIFY INVERT ELEVATIONS OF ALL UNDERGROUND UTILITIES AND NOTIFY LANDSCAPE ARCHITECT IF THERE ARE ANY DISCREPANCIES WITH PLANTING ROOT ZONES. TO REQUEST LOCATES FOR PROPOSED EXCAVATION CALL 1-800-332-2344 (OR 811) IN OREGON / 1-800-424-5555 (OR 811) IN WASHINGTON. [SELECT ONE STATE AND DELETE THE OTHER AND THIS NOTE.]
  - NOTIFY THE OWNER OR OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES OR CONFLICTS WITH EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF ANY WORK.
  - LOCATION OF EXISTING TREES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.
  - DAMAGE TO EXISTING CONCRETE CURB, ASPHALT PAVING, OR OTHER STRUCTURE SHALL BE REPAIRED OR REPLACED TO PRE CONSTRUCTION CONDITIONS.
  - CONTRACTOR SHALL COORDINATE WITH THE OWNER ANY DISRUPTION TO VEHICULAR CIRCULATION PRIOR TO COMMENCEMENT OF ANY WORK.
- PLANTING**
- ALL EXISTING TREES, PLANTS, AND ROOTS SHALL BE PROTECTED FROM DAMAGE FROM ANY CONSTRUCTION PREPARATION, REMOVAL OR INSTALLATION ACTIVITIES WITHIN AND ADJACENT TO PROJECT LIMITS.
  - SHRUBS ADJACENT TO PARKING AREAS SHALL BE PLANTED 2 FT MINIMUM AWAY FROM THE BACK OF CURB. SHRUBS AND GROUNDCOVER ALONG OTHER PAVEMENT EDGES SHALL BE PLANTED A MINIMUM OF ONE HALF THEIR ON CENTER SPACING AWAY FROM PAVEMENT EDGE.
  - ALL PLANT MATERIAL SHALL BE HEALTHY NURSERY STOCK, WELL BRANCHED AND ROOTED, FULL FOLIAGE, FREE FROM INSECTS, DISEASES, WEEDS, WEED ROT, INJURIES AND DEFECTS WITH NO LESS THAN MINIMUMS SPECIFIED IN AMERICAN STANDARDS FOR NURSERY STOCK, ANSI Z66.1-2004.
  - TREES IN THE RIGHT OF WAY SHALL BE TALL ENOUGH TO BE LIMBED UP TO AT LEAST 8 FT ABOVE DRIVE SURFACE GRADE WHILE MAINTAINING ENOUGH BRANCHES TO SUPPORT HEALTHY GROWTH.
  - DO NOT PLANT TREES ABOVE WATERLINES, UTILITIES, OR OTHER UNDERGROUND PIPING.
  - IF DISTURBANCE IS NECESSARY AROUND EXISTING TREES, CONTRACTOR SHALL PROTECT THE CROWN AND ALL WORK WITHIN THE TREE DRIPZONE SHALL BE LIMITED TO THE USE OF HAND TOOLS AND MANUAL EQUIPMENT ONLY.
  - REPLACE, REPAIR AND RESTORE DISTURBED LANDSCAPE AREAS DUE TO GRADING, TRENCHING OR OTHER REASONS TO PRE-CONSTRUCTION CONDITION AND PROVIDE MATERIAL, APPROVED BY THE OWNER AND OWNERS REPRESENTATIVE.
  - EXISTING AREAS PROPOSED FOR NEW PLANT MATERIAL SHALL BE CLEARED AND LEGALLY DISPOSED UNLESS SO NOTED.
  - A SOILS ANALYSIS, BY AN INDEPENDENT SOILS TESTING LABORATORY RECOGNIZED BY THE STATE DEPARTMENT OF AGRICULTURE, SHALL BE USED TO RECOMMEND AN APPROPRIATE PLANTING SOIL AND/OR SPECIFIED SOIL AMENDMENTS.
  - TOPSOIL SHALL BE AMENDED AS RECOMMENDED BY AN INDEPENDENT SOILS TESTING LABORATORY AND AS OUTLINED IN THE SPECIFICATION.
  - ALL LANDSCAPED AREAS SHALL BE COVERED BY A LAYER OF ORGANIC MULCH TO A MINIMUM DEPTH OF 2-INCHES.
- IRRIGATION**
- UNLESS OTHERWISE INDICATED, ALL NEW LANDSCAPE AREAS TO BE IRRIGATED WITH A FULLY AUTOMATIC UNDERGROUND IRRIGATION SYSTEM. PROVIDE LOOP SYSTEM FOR OPTIMUM EFFICIENCY.
  - CONTRACTOR SHALL SUBMIT SHOP DRAWINGS (IRRIGATION PLANS) TO LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION. DRAWINGS TO INDICATE HEAD TYPE, GALLONS PER MINUTE, LATERAL LINES, AND BE AT MINIMUM SCALE OF 1"=20'
  - CONTRACTOR TO DETERMINE STATIC WATER PRESSURE AT THE P.O.C. PRIOR TO PREPARING SHOP DRAWINGS
  - CONTRACTOR SHALL ESTABLISH MINIMUM PRESSURE AND MAXIMUM DEMAND REQUIREMENTS FOR IRRIGATION SYSTEM DESIGN, AND PROVIDE INFORMATION IN AN IRRIGATION SCHEDULE.
  - IRRIGATION SYSTEM AS DESIGNED AND INSTALLED SHALL PERFORM WITHIN THE TOLERANCES AND SPECIFICATIONS OF THE SPECIFIED MANUFACTURERS.
  - SYSTEM SHALL BE DESIGNED TO SUPPLY MANUFACTURER'S SPECIFIED MINIMUM OPERATING PRESSURE TO FARTHEST EMITTER FROM WATER METER.
  - SYSTEM SHALL PROVIDE HEAD TO HEAD COVERAGE WITHOUT OVERSPRAY ONTO BUILDING, FENCES, SIDEWALKS, PARKING AREAS, OR OTHER NON-VEGETATED SURFACES.
  - ALL IRRIGATION PIPE MATERIAL AND INSTALLATION SHALL CONFORM TO APPLICABLE CODE FOR PIPING AND COMPONENT REQUIREMENTS.
  - PROVIDE SLEEVING AT ALL AREAS WHERE PIPE TRAVELS UNDER CONCRETE OR HARD SURFACING.
  - VALVES SHALL BE WIRED AND INSTALLED PER MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES AND CONNECTED TO THE IRRIGATION CONTROLLER.
  - REFER TO CIVIL DETAILS AND DETAILS ON L5.10 FOR POINT OF CONNECTION AND BACKFLOW PREVENTION INFORMATION.
  - MAINLINE LAYOUT IS DIAGRAMMATIC ONLY.
  - CONTROLLER TO BE MOUNTED ON BUILDING EXTERIOR. GENERAL CONTRACTOR TO COORDINATE LOCATION WITH OWNER'S REPRESENTATIVE.
  - ZONE THE FOLLOWING AREAS SEPARATELY: TEMPORARY AREAS, PERMANENT LANDSCAPE AREAS, AND TREES.
  - QUICK COUPLERS TO BE PLACED EVERY 300 LINEAR FEET MAX.
  - IRRIGATION SHALL BE WINTERIZED THROUGH LOW PRESSURE, HIGH VOLUME AIR BLOWOUT CONNECTION THROUGH QUICK COUPLER.
  - THE SYSTEM SHALL BE GRAVITY DRAINED. THE CONTRACTOR SHALL PROVIDE APPROPRIATE MANUAL DRAINS AT LOW POINTS.

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SHEET TITLE:  
LANDSCAPE  
GENERAL  
INFORMATION

DRAWN BY: AB

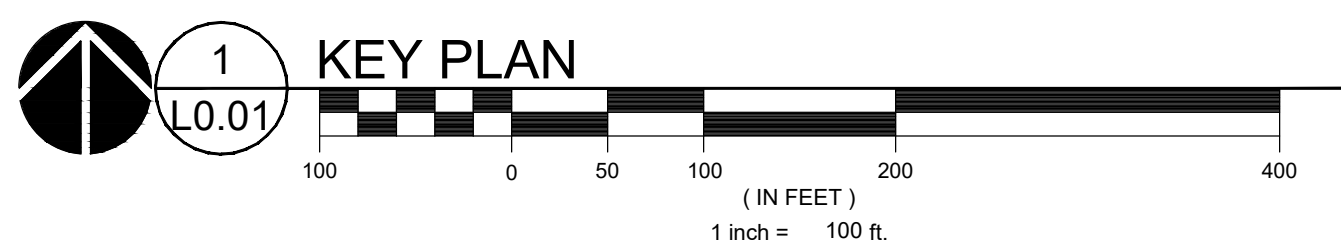
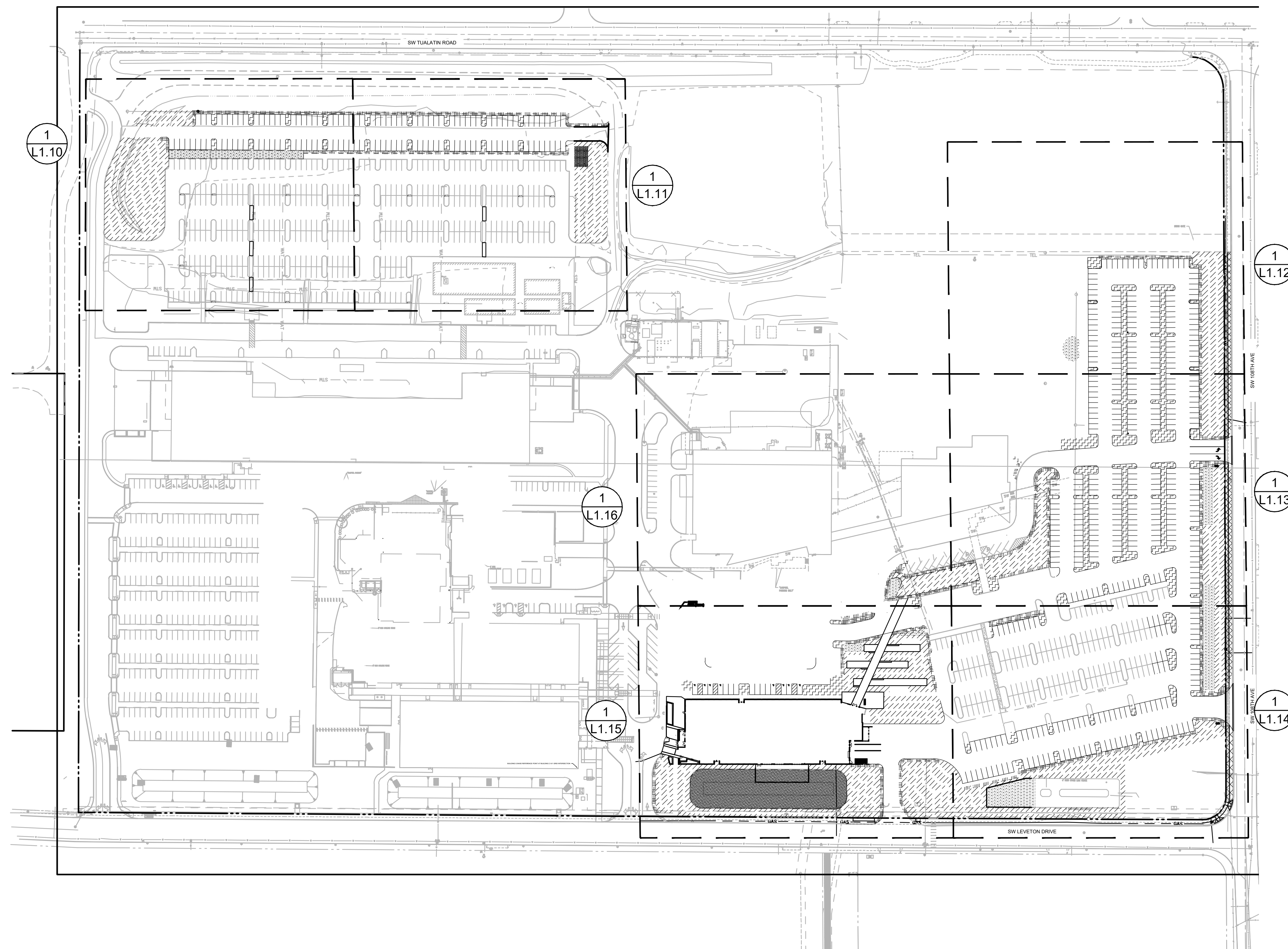
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SHEET

L0.01

JOB NO. 2220087.00

ARCHITECTURAL REVIEW: 8/17/2022





REVISION SCHEDULE		
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SHEET TITLE:  
**PLANTING PLAN  
NORTH (WEST)**

DRAWN BY: AB

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SHEET

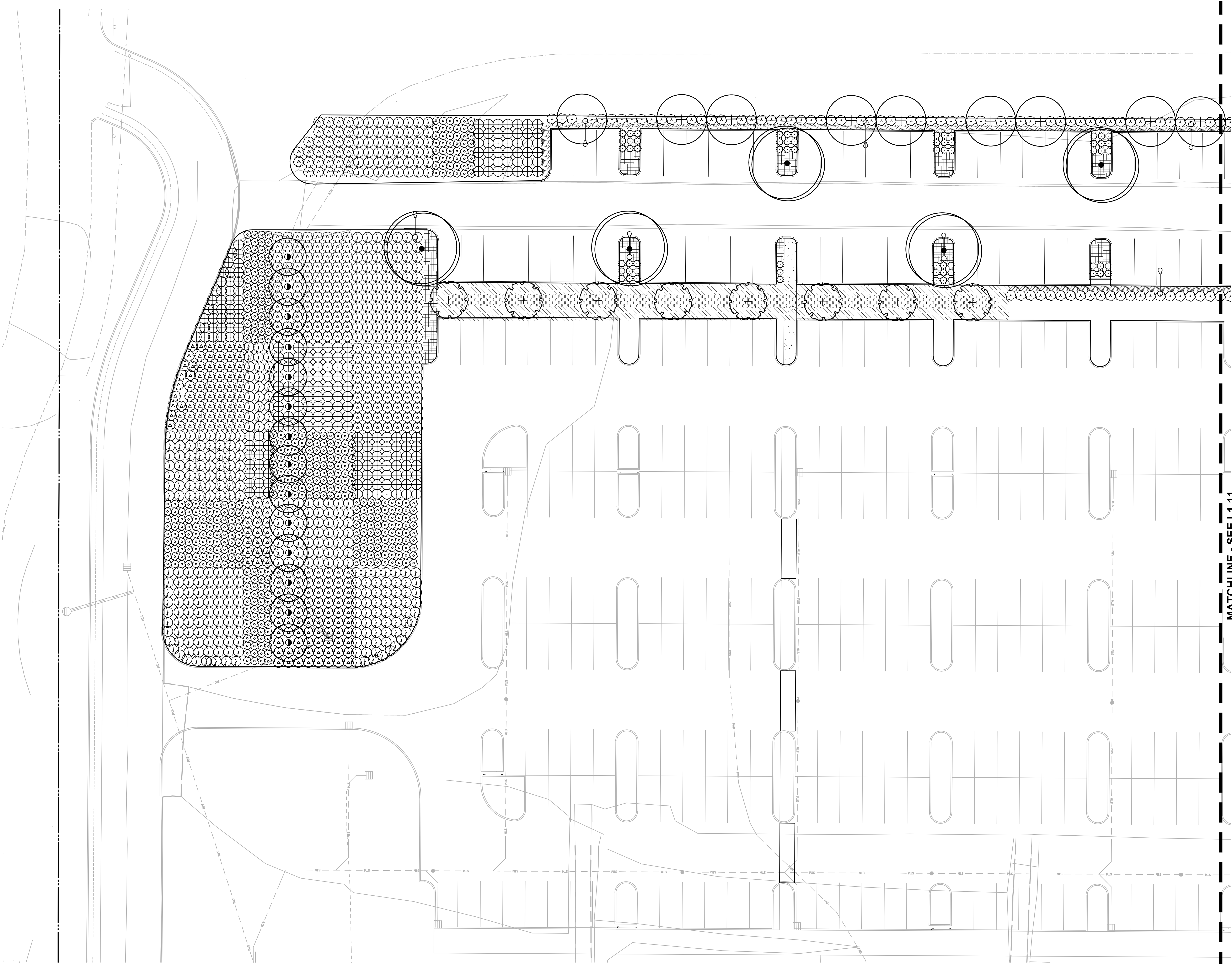
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JOB NO. **2220087.00**

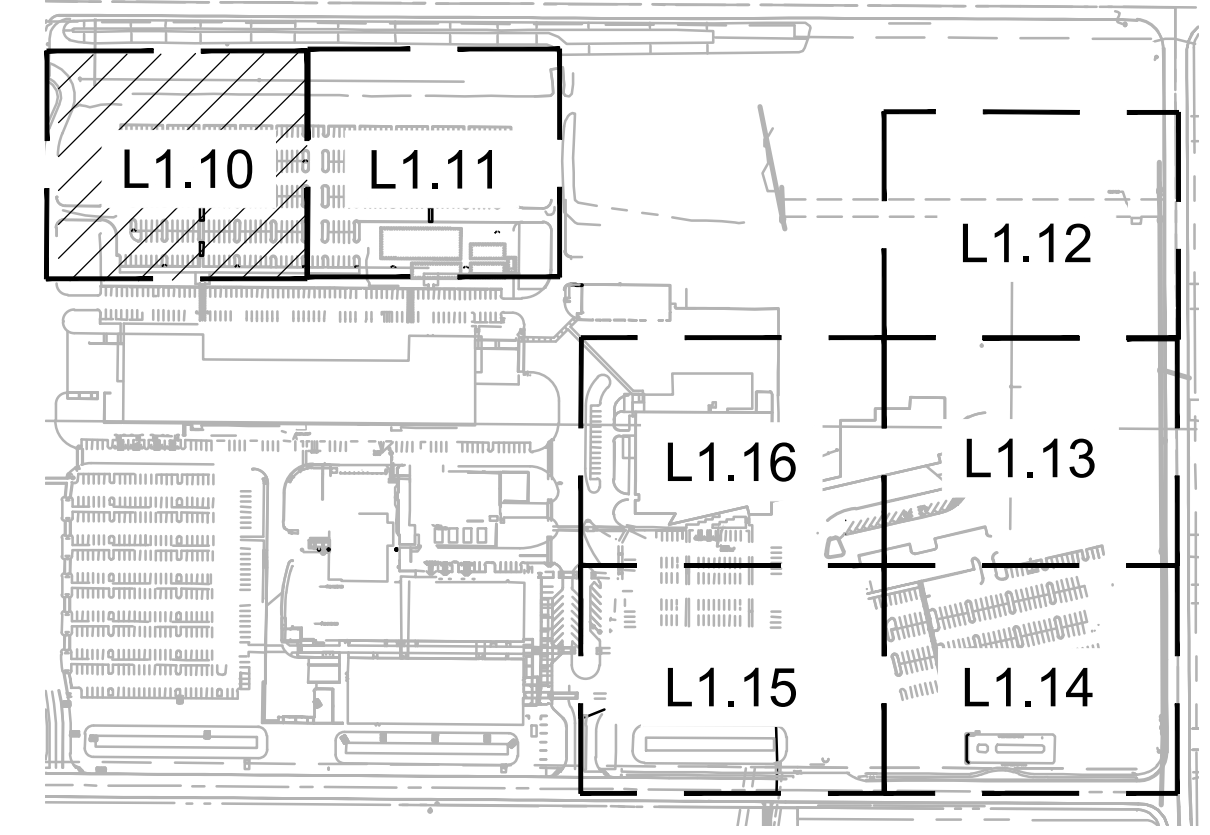
**PLANT KEY LEGEND**

- TREES**
- CERCIDIPHYLLUM JAPONICUM  
KATSURA TREE
  - GLEDITSIA TRIACANTHOS INERMIS 'MORAINÉ'  
MORAINÉ HONEY LOCUST
  - MALUS X 'PRAIRIFIRE'  
PRAIRIFIRE CRAB APPLE
  - NYSSA SYLVATICA 'DAVID ODOM'  
AFTERBURNER TUPELO
- SHRUBS**
- ABELIA X GRANDIFLORA 'KALEIDOSCOPE'  
KALEIDOSCOPE GLOSSY ABELIA
  - CISTUS X PULVERULENTUS 'SUNSET'  
SUNSET ROCKROSE
  - PANICUM VIRGATUM 'HEAVY METAL'  
BLUE SWITCH GRASS
  - PINUS MUGO VAR. MUGO  
DWARF MUGO PINE
  - PRUNUS LAUROCERASUS 'ZABELIANA'  
ZABEL LAUREL
  - RHAPHIOLEPIS INDICA 'MONTO'  
INDIAN PRINCESS INDIAN HAWTHORN
- GROUND COVERS**
- ARCTOSTAPHYLOS UVA-URSI  
KINNICKINICK
  - RUBUS CALYCINOIDES  
GREEN CARPET RASPBERRY
- STORMWATER**
- STORMWATER ZONE A  
HERBACEOUS PLANTS
  - STORMWATER ZONE B  
GROUND COVER MIX

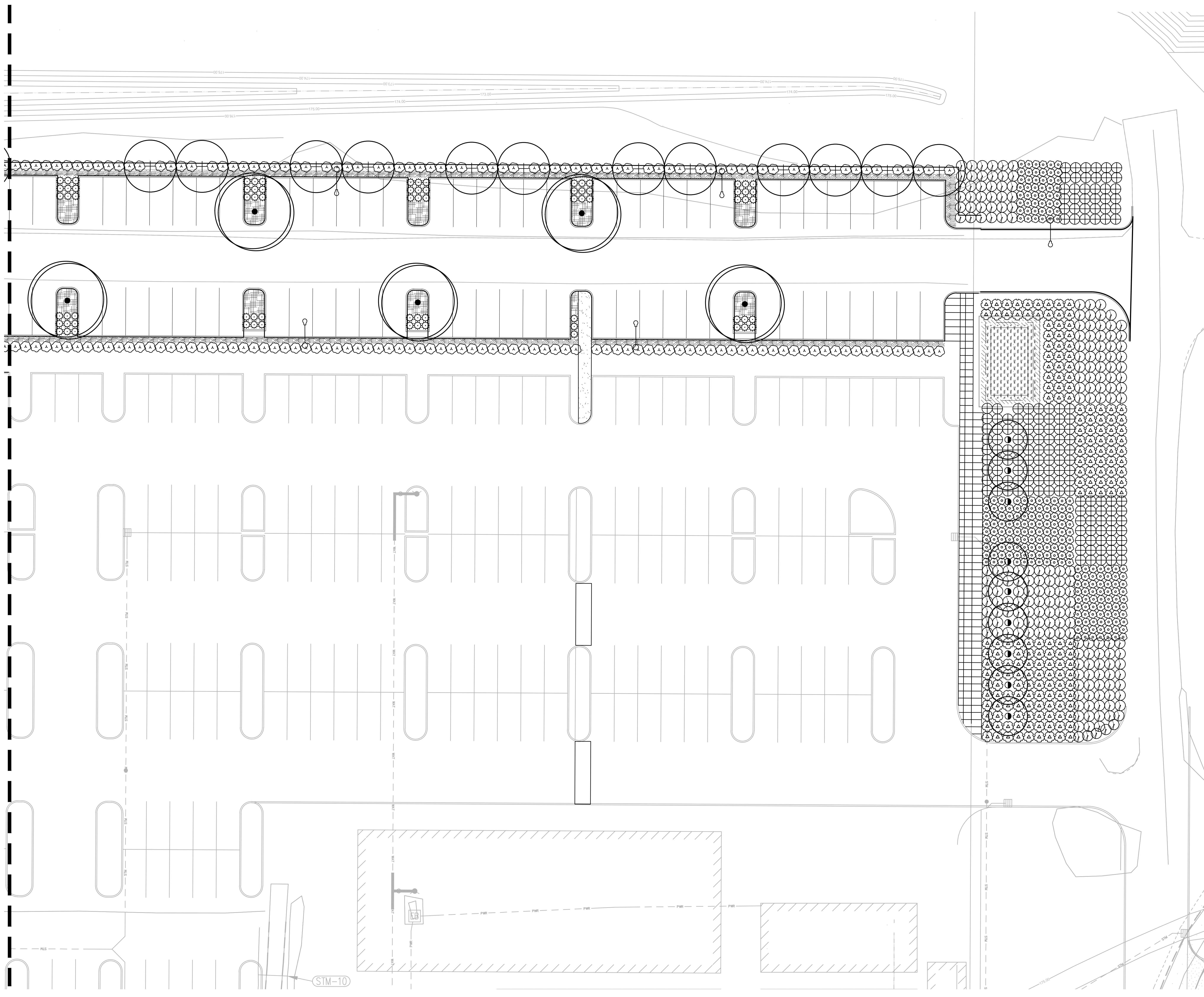
MATCHLINE - SEE L1.11



**1**  
L1.10  
PLANTING PLAN - NORTH (WEST)  
1/16" = 1'-0"



**KEY MAP**  
SCALE: NTS



**PLANT KEY LEGEND**

- TREES**
- CERCIDIPHYLLUM JAPONICUM  
KATSURA TREE
  - ⊕ GLEDITSIA TRIACANTHOS INERMIS 'MORAINÉ'  
MORAINÉ HONEY LOCUST
  - MALUS X 'PRAIRIFIRE'  
PRAIRIFIRE CRAB APPLE
- SHRUBS**
- ⊗ ABELIA X GRANDIFLORA 'KALEIDOSCOPE'  
KALEIDOSCOPE GLOSSY ABELIA
  - ⊖ CISTUS X PULVERULENTUS 'SUNSET'  
SUNSET ROCKROSE
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ZABEL LAUREL
  - ⊕ RHAPHIOLEPIS INDICA 'MONTO'  
INDIAN PRINCESS INDIAN HAWTHORN
- GROUND COVERS**
- ▨ ARCTOSTAPHYLOS UVA-URSI  
KINNIKINNICK
  - ▨ RUBUS CALYCINOIDES  
GREEN CARPET RASPBERRY
- STORMWATER**
- ▨ STORMWATER ZONE A  
HERBACEOUS PLANTS
  - ▨ STORMWATER ZONE B  
GROUND COVER MIX



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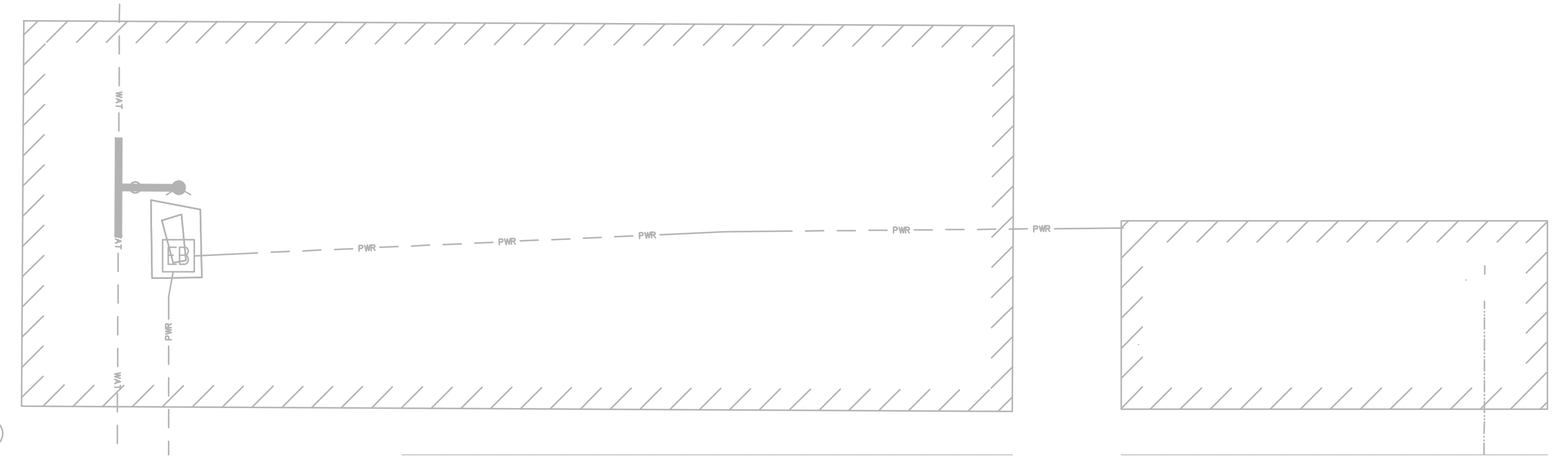
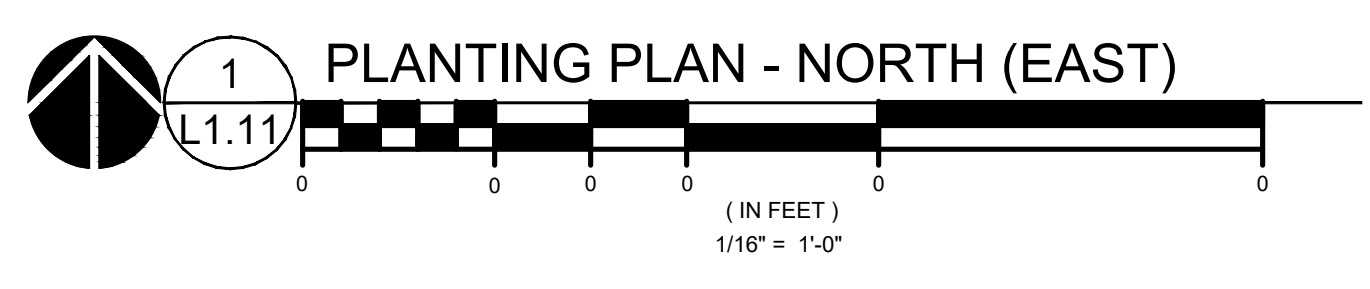
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**NEW OFFICE BUILDING**

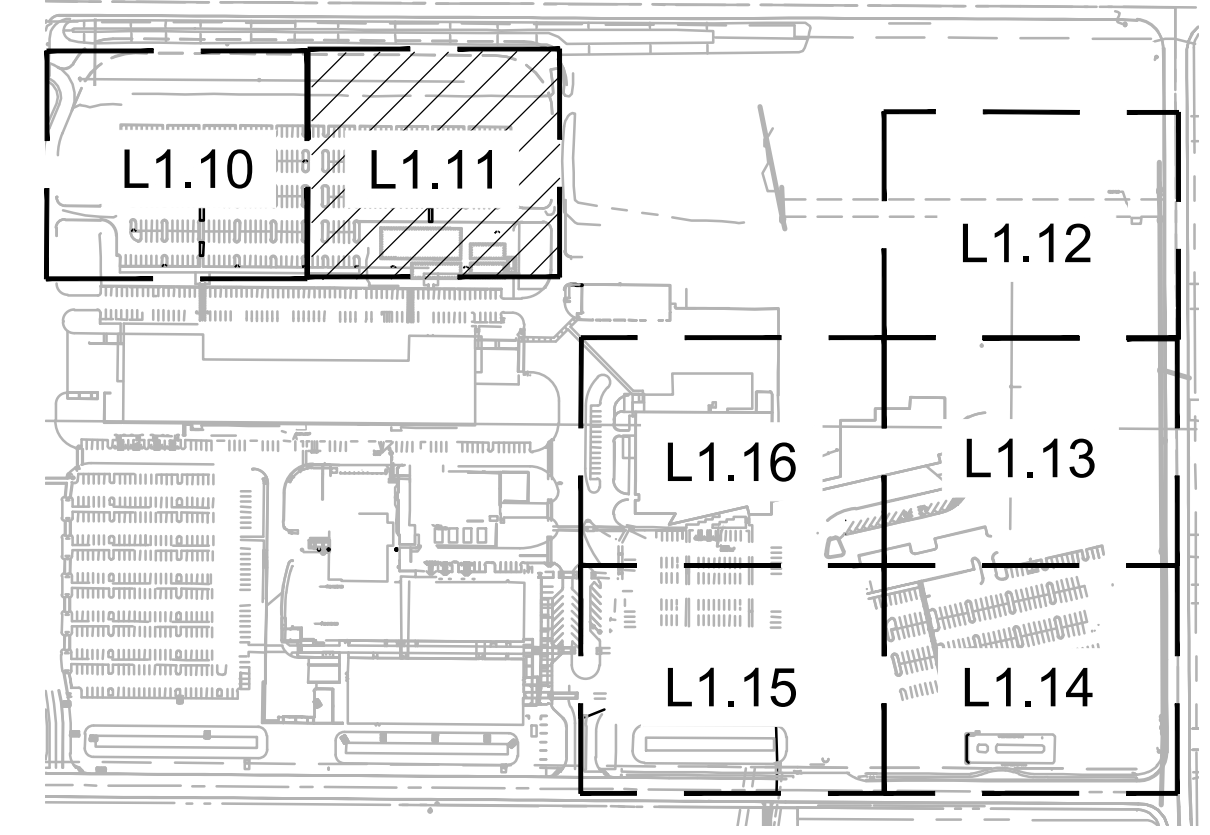
MATCHLINE - SEE L1.10



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Delta	Issued As	Issue Date

SHEET TITLE:  
**PLANTING PLAN  
NORTH (EAST)**



DRAWN BY: AB  
CHECKED BY: ST  
SHEET

**L1.11**

JOB NO. **2220087.00**

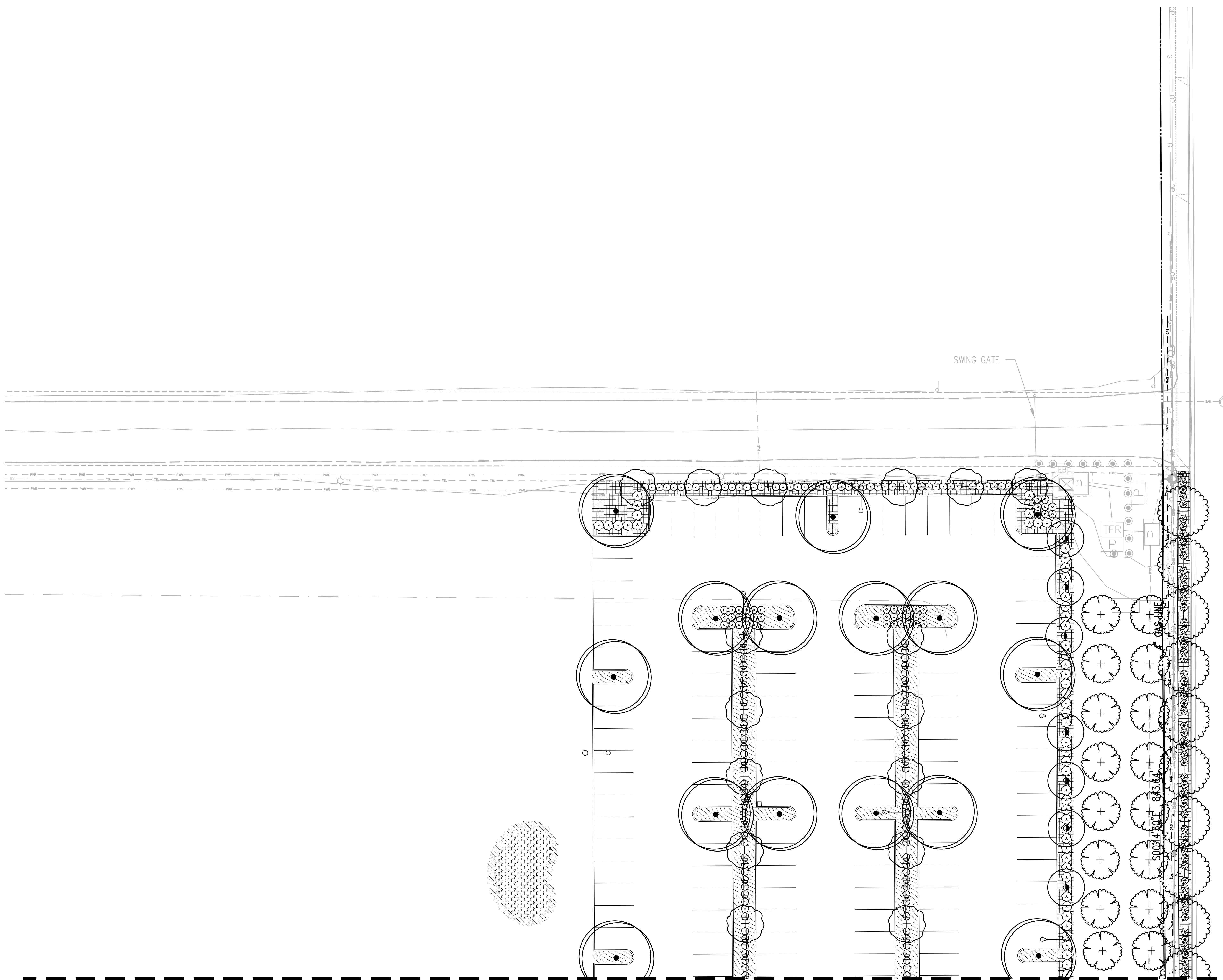
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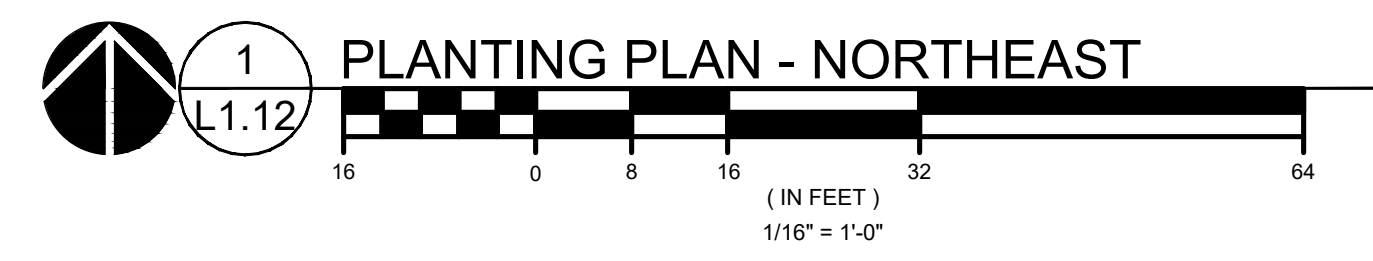
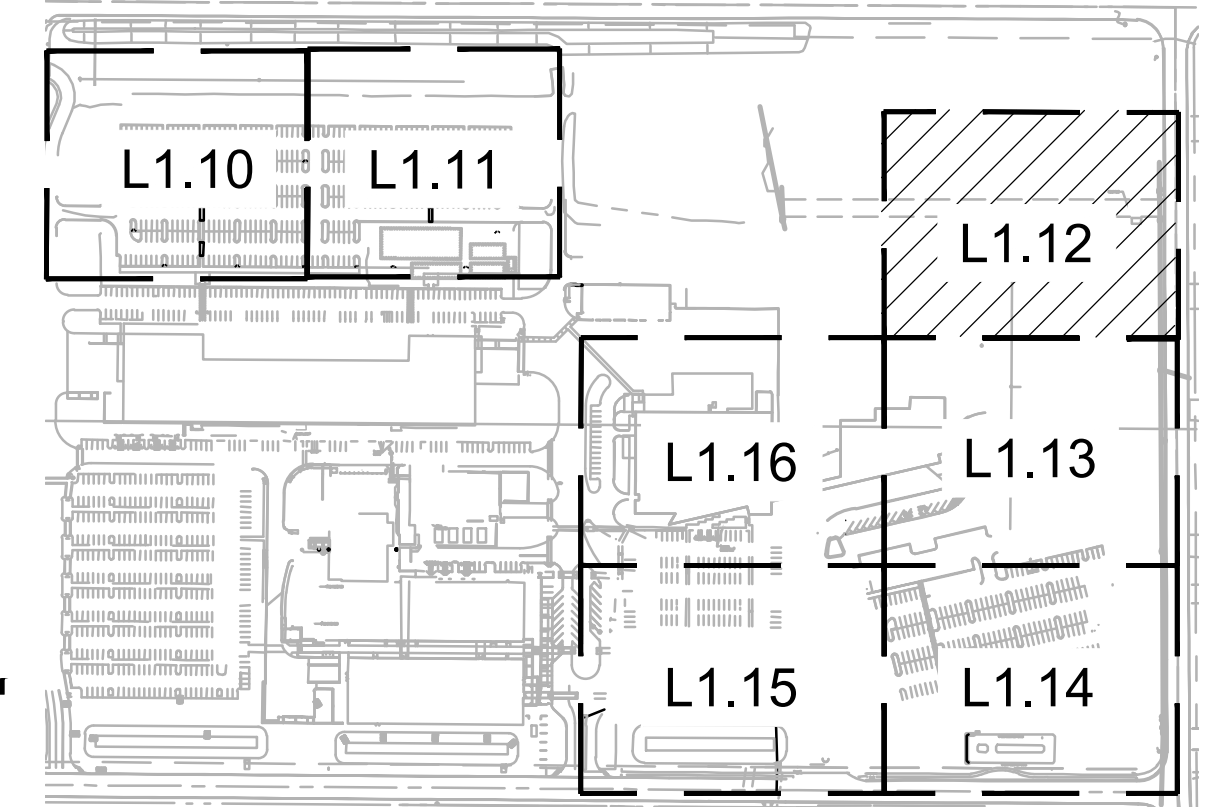
REVISION SCHEDULE		
Delta	Issued As	Issue Date

**PLANT KEY LEGEND**

- TREES**
- CERCIDIPHYLLUM JAPONICUM*  
KATSURA TREE
  - MALUS X 'PRAIRIFIRE'*  
PRAIRIFIRE CRAB APPLE
  - PARROTTIA PERSICA*  
PERSIAN PARROTTIA
  - PRUNUS X YEDOENSIS 'AKEBONO'*  
AKEBONO YOSHINO CHERRY
  - ULMUS 'PATRIOT'*  
PATRIOT ELM
- SHRUBS**
- PRUNUS LAUROCERASUS 'ZABELIANA'*  
ZABEL LAUREL
  - SPIRAEA DOUGLASII*  
WESTERN SPIREA
  - THUJA OCCIDENTALIS 'CONGARE'*  
FIRE CHIEF GLOBE ARBORVITAE
  - VACCINIUM OVATUM*  
EVERGREEN HUCKLEBERRY
  - VIBURNUM DAVIDII*  
DAVID VIBURNUM
- GROUND COVERS**
- ARCTOSTAPHYLOS UVA-URSI*  
KINNIKINICK
  - MAHONIA REPENS 'MONRWS'*  
DARKSTAR CREEPING OREGON GRAPE
- STORMWATER**
- STORMWATER ZONE A  
HERBACEOUS PLANTS
  - STORMWATER ZONE B  
GROUNDCOVER MIX



MATCHLINE - SEE L1.13



**KEY MAP**  
 SCALE: NTS





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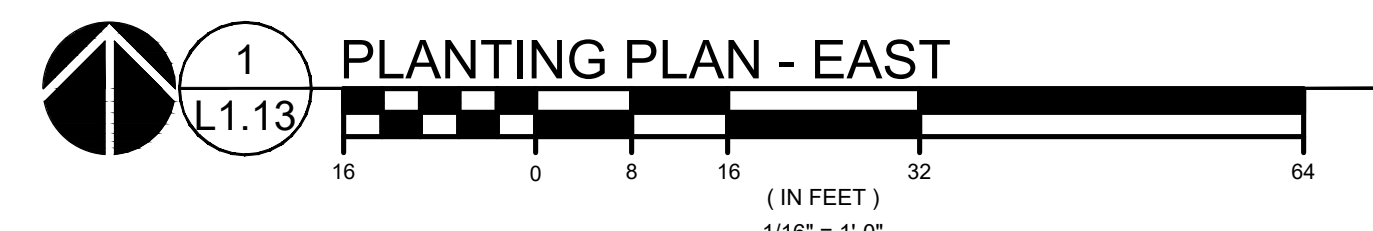
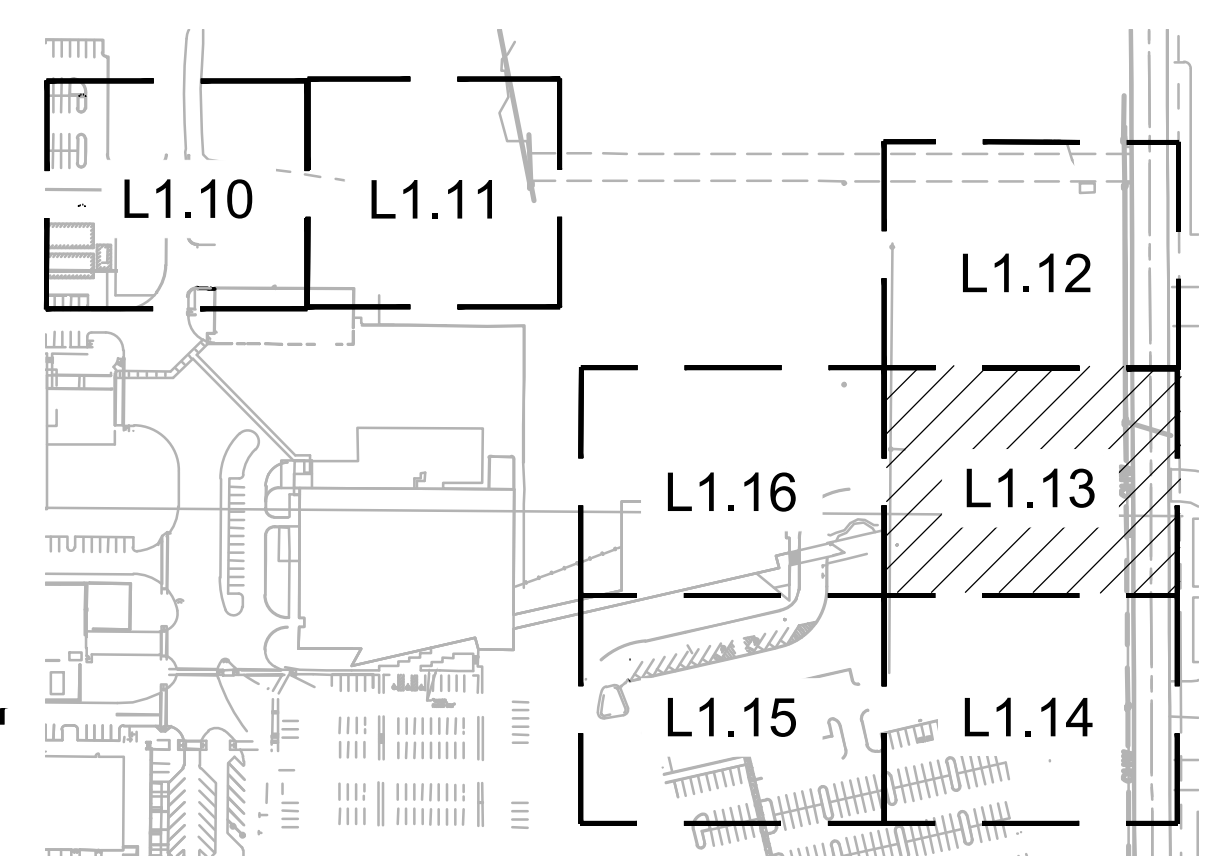
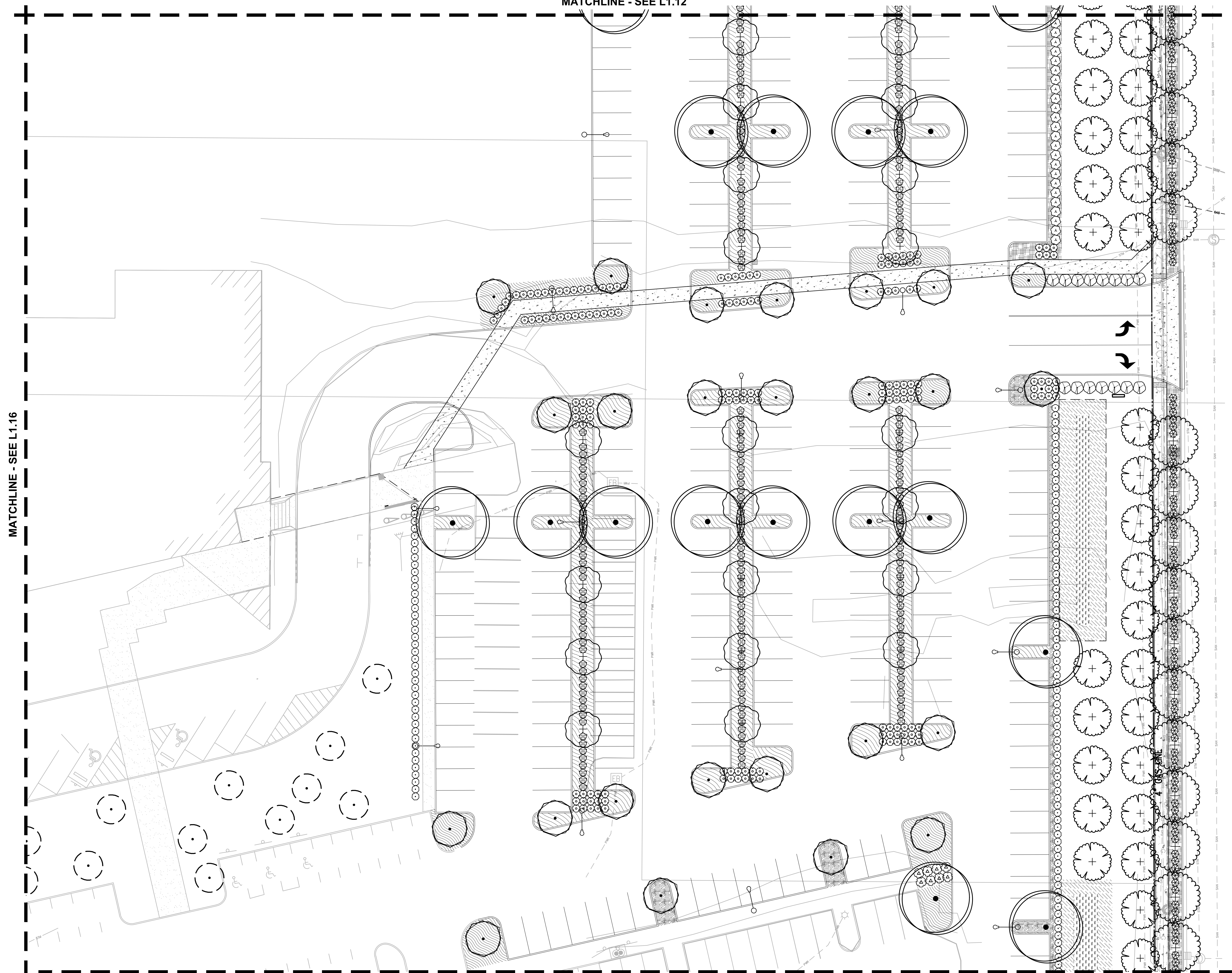
**PLANT KEY LEGEND**

- TREES**
- ACER RUBRUM 'BOWHALL'  
BOWHALL MAPLE
  - CERCIDIPHYLLUM JAPONICUM  
KATSURA TREE
  - PARROTIA PERSICA  
PERSIAN PARROTIA
  - PRUNUS X YEDOENSIS 'AKEBONO'  
AKEBONO YOSHINO CHERRY
  - ULMUS 'PATRIOT'  
PATRIOT ELM
- EXISTING**
- EXISTING TREE  
TO REMAIN
- SHRUBS**
- ABELIA X GRANDIFLORA 'KALEIDOSCOPE'  
KALEIDOSCOPE GLOSSY ABELIA
  - PHILADELPHUS LEWISII  
WILD MOCKORANGE
  - PRUNUS LAUROCERASUS 'ZABELIANA'  
ZABEL LAUREL
  - SPIRAEA DOUGLASII  
WESTERN SPIREA
  - THUJA OCCIDENTALIS 'CONGARE'  
FIRE CHIEF GLOBE ARBORVITAE
  - VACCINIUM OVATUM  
EVERGREEN HUCKLEBERRY
  - VIBURNUM DAVIDII  
DAVID VIBURNUM
- GROUND COVERS**
- ARCTOSTAPHYLOS UVA-URSI  
KINNIKINNICK
  - MAHONIA REPENS 'MONRWS'  
DARKSTAR CREEPING OREGON GRAPE
  - RUBUS CALYCINOIDES  
GREEN CARPET RASPBERRY
- STORMWATER**
- STORMWATER ZONE A  
HERBACEOUS PLANTS
  - STORMWATER ZONE B  
GROUND COVER MIX

MATCHLINE - SEE L1.16

MATCHLINE - SEE L1.12

MATCHLINE - SEE L1.14



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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**PLANTING PLAN  
EAST**

DRAWN BY: AB

CHECKED BY: ST

SHEET

**L1.13**

JOB NO. **2220087.00**

**ARCHITECTURAL REVIEW: 8/17/2022**  
222008700\DRAWINGS\LANDSCAPE\087-L0.01.DWG-L1.13 AB 08/17/22 07:31 1.0.00





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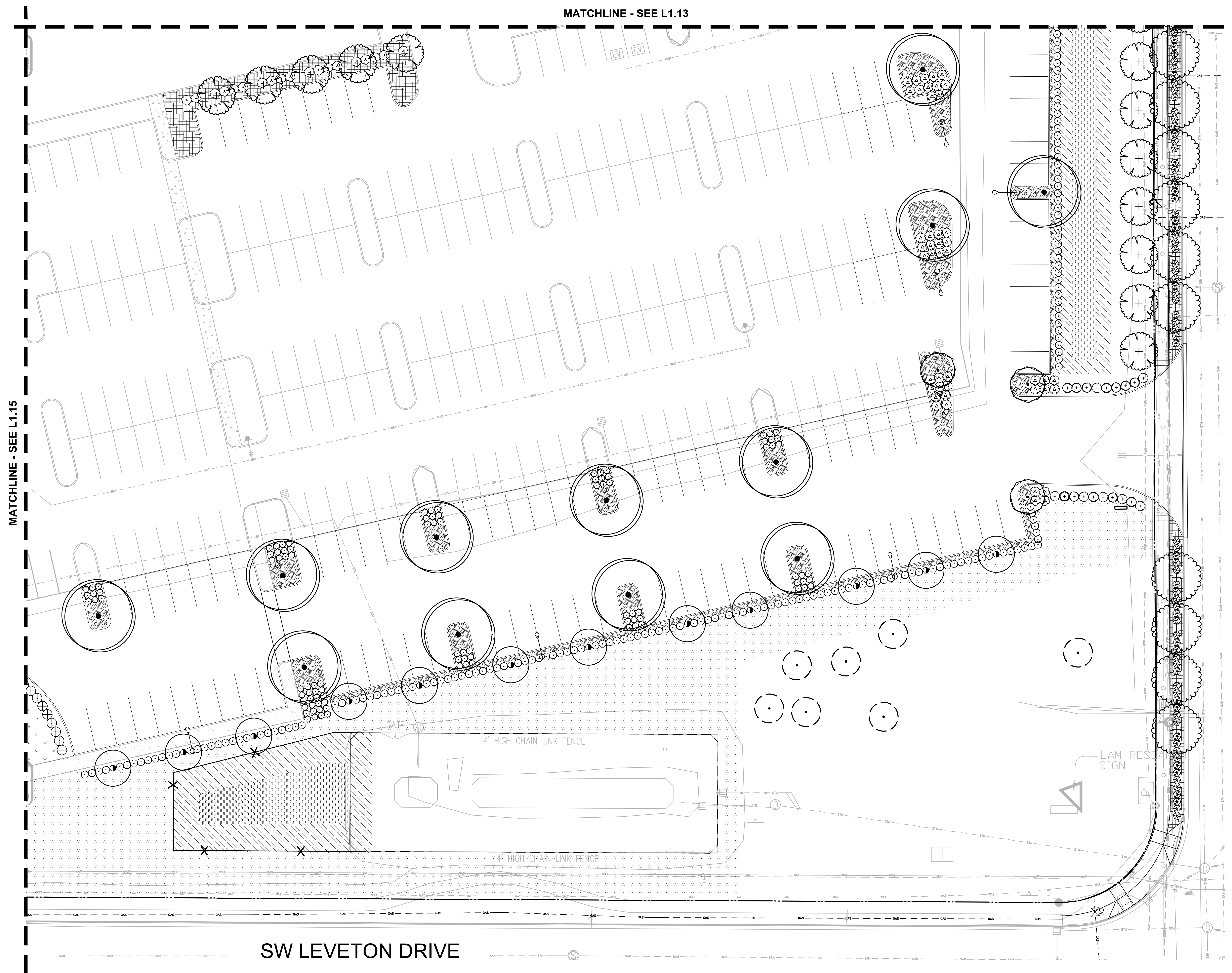


Project  
**LAM RESEARCH  
TUALATIN  
FAC-1446**

**NEW OFFICE BUILDING**

**PLANT KEY LEGEND**

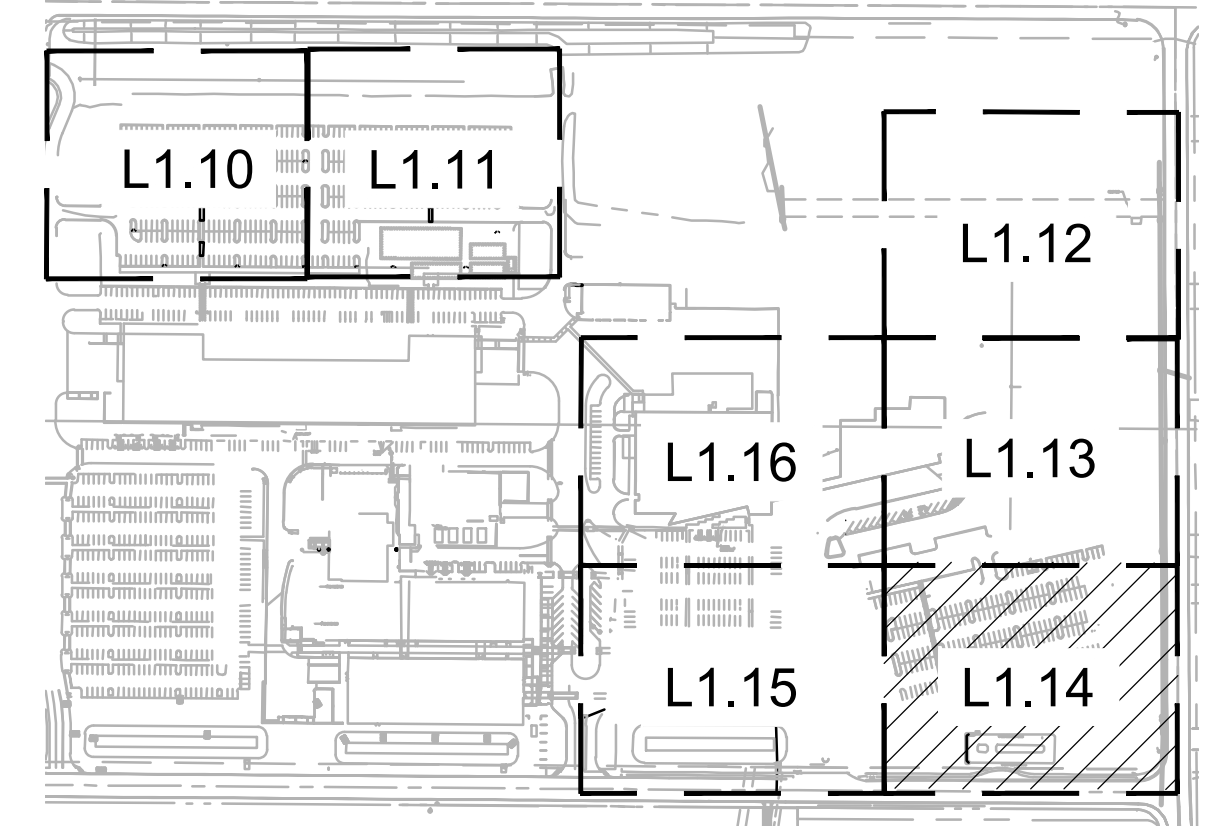
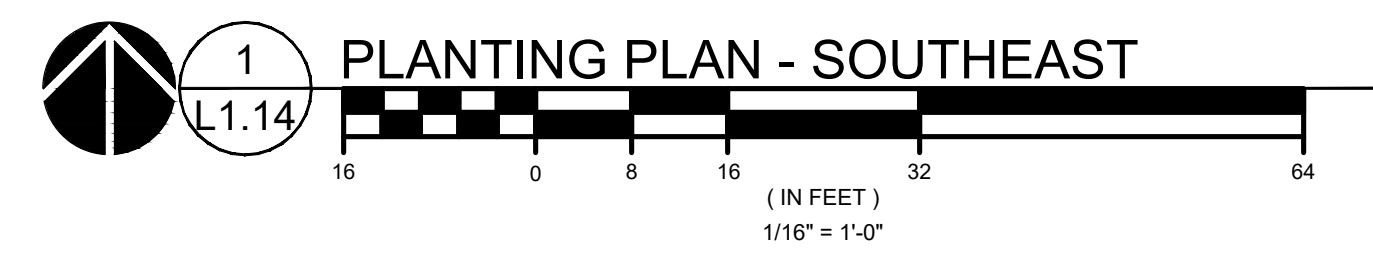
- TREES**
- ACER RUBRUM 'BOWHALL'  
BOWHALL MAPLE
  - CERCIDIPHYLLUM JAPONICUM  
KATSURA TREE
  - PARROTIA PERSICA  
PERSIAN PARROTIA
  - PRUNUS X YEDOENSIS 'AKEBONO'  
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DARKSTAR CREEPING OREGON GRAPE
  - RUBUS CALYCINOIDES  
GREEN CARPET RASPBERRY
- STORMWATER**
- STORMWATER ZONE A  
HERBACEOUS PLANTS
  - STORMWATER ZONE B  
GROUNDCOVER MIX



MATCHLINE - SEE L1.15

MATCHLINE - SEE L1.13

SW LEVETON DRIVE



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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**PLANTING PLAN  
SOUTHEAST**

DRAWN BY: AB

CHECKED BY: ST

SHEET

**L1.14**

JOB NO. 2220087.00

ARCHITECTURAL REVIEW: 8/17/2022  
222008700\DRAWINGS\LANDSCAPE\087-L0.01.DWG-L1.14 AB 08/02/22 00:07 1:0-0





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**NEW OFFICE BUILDING**

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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**PLANTING PLAN  
SOUTHWEST**

DRAWN BY: AB

CHECKED BY: ST

SHEET

**L1.15**

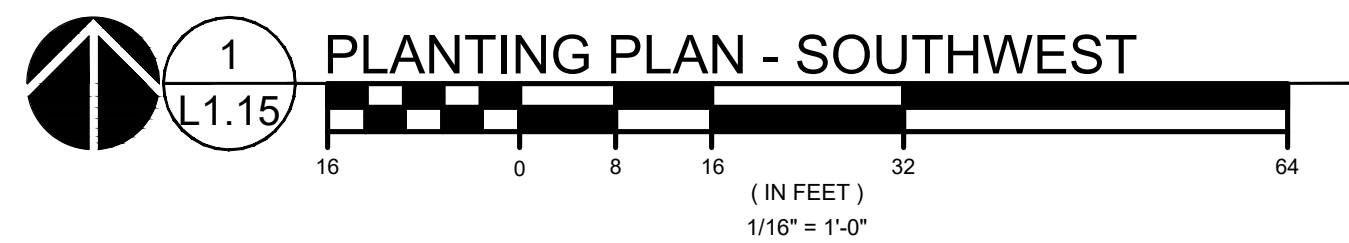
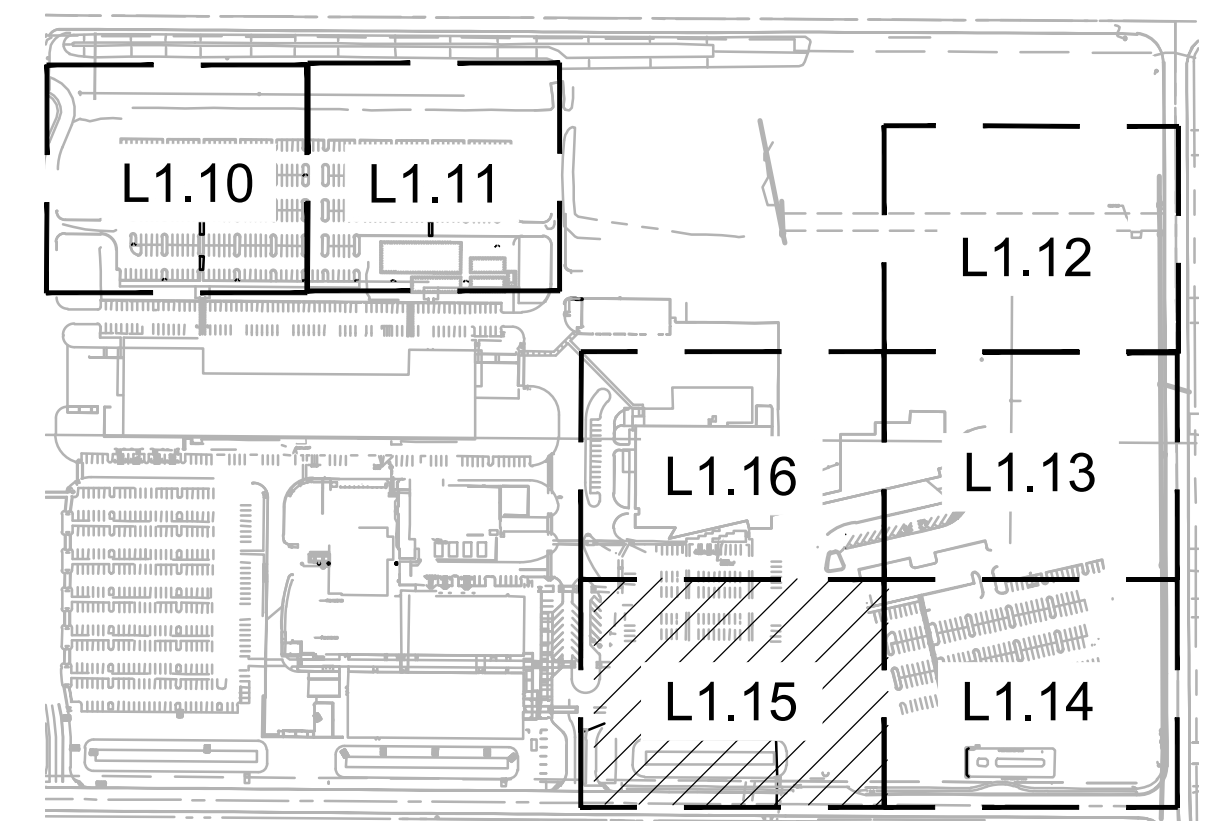
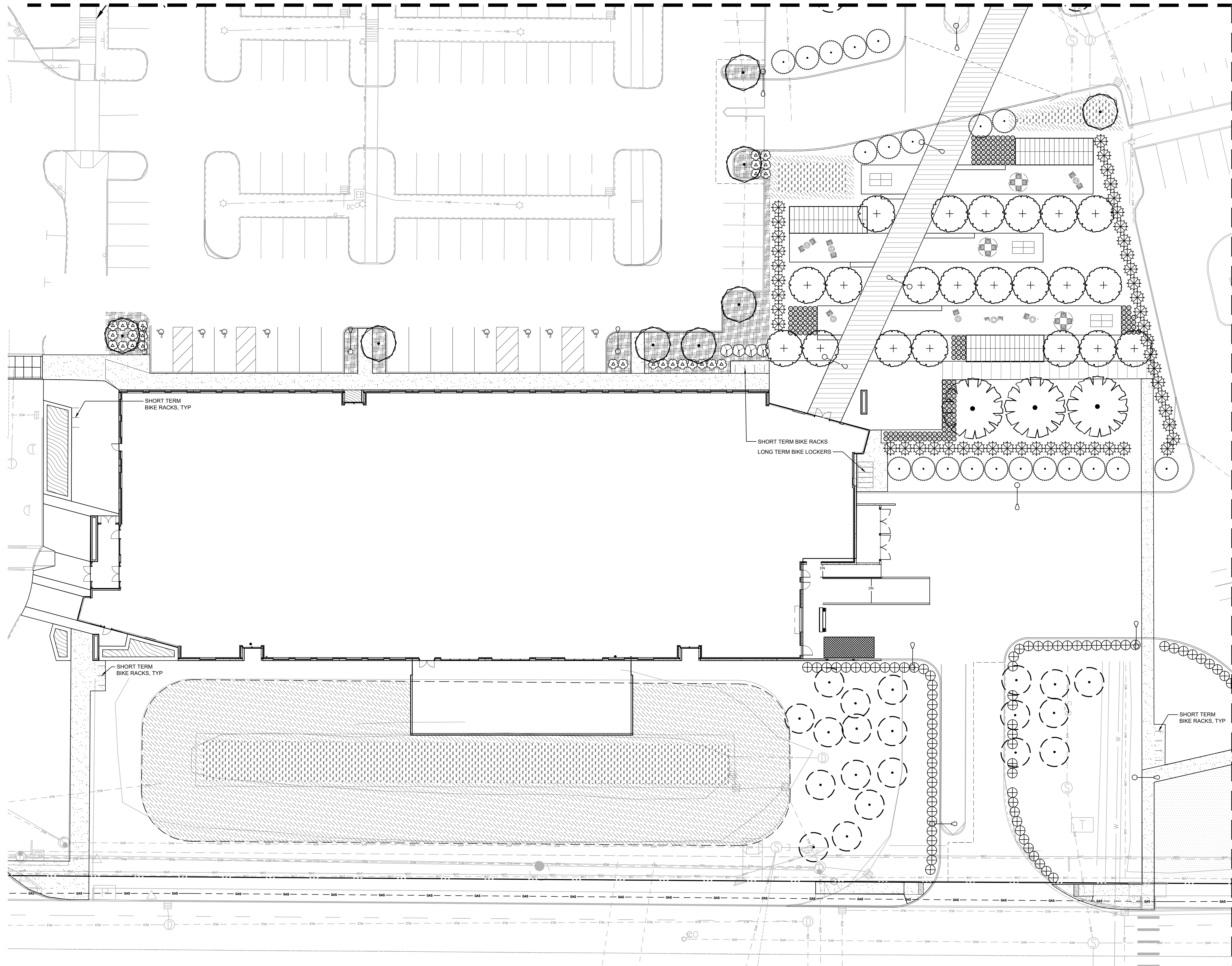
JOB NO. **2220087.00**

**PLANT KEY LEGEND**

- TREES**
- BOTANICAL / COMMON NAME**  
ACER RUBRUM 'BOWHALL'  
BOWHALL MAPLE
  - LIRIODENDRON TULIPIFERA  
TULIP POPLAR
  - ZELKOVA SERRATA 'HALKA'  
HALKA ZELKOVA
- EXISTING**
- EXISTING TREE  
TO REMAIN
- SHRUBS**
- BOTANICAL / COMMON NAME**  
ABELIA X GRANDIFLORA 'KALEIDOSCOPE'  
KALEIDOSCOPE GLOSSY ABELIA
  - BOUTELLOJA GRACILIS 'BLONDE AMBITION'  
BLONDE AMBITION BLUE GRAMA
  - PHILADELPHUS LEWISII  
WILD MOCKORANGE
  - RHAPHIOLEPIS INDICA 'MONTI'  
INDIAN PRINCESS INDIAN HAWTHORN
  - THUJA OCCIDENTALIS 'BRANDON'  
BRANDON ARBORVITAE
  - VIBURNUM TINUS 'SPRING BOUQUET'  
SPRING BOUQUET LAURUSTINUS
- GROUND COVERS**
- BOTANICAL / COMMON NAME**  
ARCTOSTAPHYLOS UVA-URSII  
KINNIKINICK
  - LAWN
  - MAHONIA REPENS 'MONRWS'  
DARKSTAR CREEPING OREGON GRAPE
- STORMWATER**
- BOTANICAL / COMMON NAME**  
STORMWATER ZONE A  
HERBACEOUS PLANTS
  - STORMWATER ZONE B  
GROUND COVER MIX

MATCHLINE - SEE L1.16

MATCHLINE - SEE L1.14

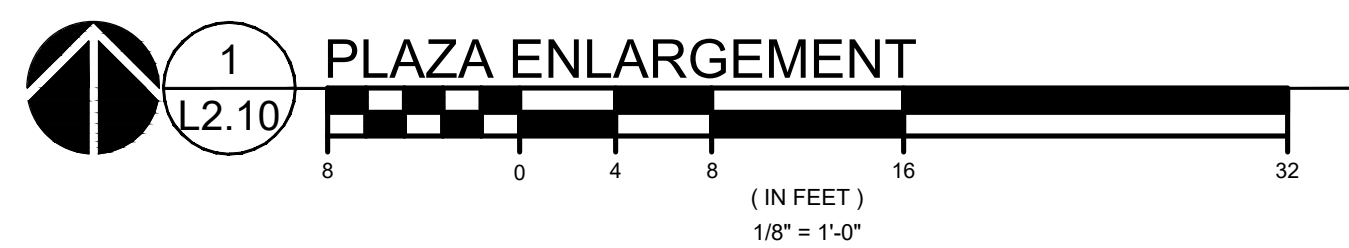
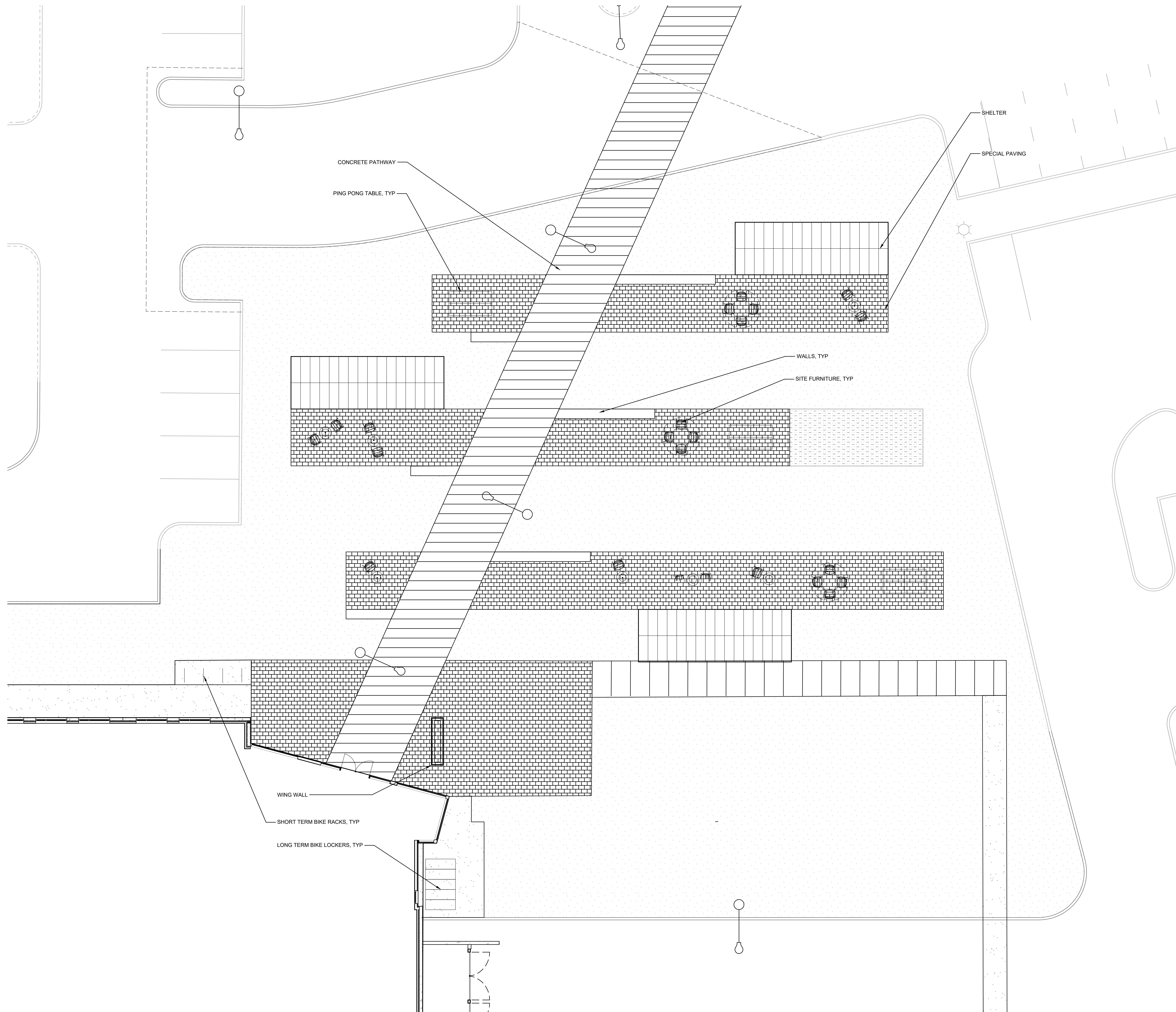


**KEY MAP**  
SCALE: NTS

**ARCHITECTURAL REVIEW: 8/17/2022**  
222008700\DRAWINGS\LANDSCAPE\087-L0.01.DWG-L1.15 AB 08/17/22 07:45 1:0-0









## Todd Prager & Associates LLC

### **MEMORANDUM**

**DATE:** September 16, 2022

**TO:** Mike Rueter (Mackenzie)

**FROM:** Christine Johnson, ISA Certified Arborist® PN-8730A  
Todd Prager, RCA #597, ISA Board Certified Master Arborist®

**RE:** Tree Removal and Protection Plan for Lam Research Project

---

#### **Summary**

This report includes tree removal and protection recommendations for construction of a new building, parking, and associated improvements at the Lam Research campus at 11361 SW Leveton Drive in Tualatin.

#### **Background**

Lam Research Corporation is proposing to construct a new building, parking, and associated improvements at their campus at 11361 SW Leveton Drive in Tualatin. The proposed site plan with existing trees and proposed grading is provided in Attachment 1.

The purpose of this report is to:

1. Provide tree removal findings and recommendations based on the proposed site and grading plan; and
2. Provide recommendations for adequately protecting the trees to be retained during construction.

#### **Tree Assessment**

On September 7 and 8, 2022, our firm completed an inventory of all trees in the vicinity of the proposed construction. The complete inventory data is provided in the tree inventory spreadsheet in Attachment 3. The data collected for each tree includes the tree number, species (common and scientific names), trunk diameter (DBH), crown radius, tree health condition, tree structural condition, pertinent comments, exempt status (less than 8-inches DBH or dead), and treatment (remove/retain). The tree numbers in the tree inventory in Attachment 3 correspond to the tree numbers on the proposed site plan/grading plan in Attachment 1 and the existing conditions survey in

Attachment 2. The trees were also tagged with their corresponding numbers in the field.

### Proposed Tree Removal

A typical minimum root protection zone allows encroachments no closer than a radius from a tree of 0.5 feet per inch of DBH if no more than 25 percent of the root protection zone area (estimated at one foot radius per inch of DBH) is impacted. Figure 1 illustrates this concept. This standard may need to be adjusted on a case-by-case basis due to tree health, species, root distribution, whether the tree will be impacted on multiple sides, the specific development proposed, and other factors.

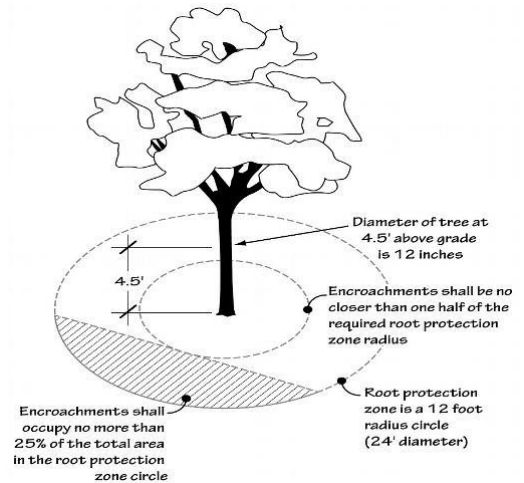


Figure 1: Typical minimum protection zone

Attachment 1 illustrates the proposed construction and grading impacts in relation to the existing trees. Based on the construction and grading impacts, 80 trees over 8-inch DBH are proposed for removal because they are either within the construction and grading footprint or their root zones would be severely impacted by construction and grading. Additional tree removal findings are provided in the next section of this report.

Protection recommendations for the 175<sup>1</sup> trees over 8-inch DBH to be retained at the edges of the construction and grading impacts are provided in the Tree Protection Recommendations section of this report.

### Tree Removal Findings

This section of the report provides finding for the Tree Assessment Report criteria in Section 33.110(4)(b) of the Tualatin Development Code. The code criteria are listed followed by my findings in *italics*.

(b) Tree Assessment Report. A tree assessment prepared by a certified arborist must include:

*This report has been prepared by Christine Johnson and Todd Prager, both ISA certified arborists. This criterion is met.*

(i) An analysis as to whether trees proposed for preservation may be preserved in light of the development proposed, are healthy specimens, and do not pose an imminent hazard to persons or property if preserved;

*The health and structural conditions of the trees to be preserved in the vicinity of the proposed development have been evaluated by our firm. A summary of the tree conditions is provided in the tree inventory in Attachment 3. The preserved trees are*

<sup>1</sup> This number reflects trees in the immediate vicinity of construction and trees that were inventoried outside the limits of construction.



*healthy specimens and are not imminent hazards to persons or property as of our assessment date. The preserved trees will need to be protected during construction as detailed in the Tree Protection Recommendations Section of this report so they remain healthy and viable for the foreseeable future. This criterion is met.*

(ii) An analysis as to whether any trees proposed for removal could reasonably be preserved in light of the development proposed and health of the tree;

*Our firm coordinated with the project design team at Mackenzie to consider design options for preserving healthy trees. Based on the project design along with site constraints, stormwater requirements, utility and site access connections, parking requirements, and client needs, tree preservation has been maximized to the extent practicable. This criterion is met.*

(iii) a statement addressing the approval criteria set forth in TDC 33.110(5);

*The reason for the proposed tree removals is to construct proposed improvements based on Architectural Review approval (TDC Subsection 33.110(5)(iii)). This criterion is met.*

(iv) the name, contact information, and signature of the arborist preparing the report; and

*The name, contact information, and signatures of the arborists that prepared this report are provided. This criterion is met.*

(v) The tree assessment report must have been prepared and dated no more than one calendar year preceding the date the development or Tree Removal Permit application is deemed complete by the City.

*This report has been prepared and provided less than one calendar year preceding the date the development application has been deemed complete. This criterion is met.*

### **Tree Protection Recommendations**

The following tree protection measures will be necessary to protect the trees during construction:

- *Tree Protection Fencing:* Erect six-foot metal tree protection fencing in the locations shown in Attachment 1 to protect the trees from construction.
- *Shift Grading Near Protected Trees:* Proposed grading near trees 20371 through 20375 and 20378, shall be adjusted to protect existing trees.
- *Curb demolition and repair:* Several existing curbs in existing parking lots are slated for demolition and/or repair. Curbs shall be demolished under arborist supervision.
- *Sidewalk improvements:* Sidewalk improvements near trees 3036 through 3038 are slated for demolition and/or repair. Demolition should occur under arborist supervision.

- *Stump Removal*: The stumps of trees 21525 and 21526 shall be carefully ground out rather than pulled with an excavator to minimize impacts to the adjacent trees to be retained.
- *Pruning of Trees*: Some of the trees may need to be clearance and/or reduction pruned to allow for construction access. Any reduction and/or clearance pruning shall occur prior to construction in accordance with ANSI A300 pruning standards the minimum necessary to allow for construction. Reduction cuts shall be made to lateral branches that are at least one-third to one-half the sizes of the parent branches. All cuts shall be made just outside the branch collars.

Existing parking lots that will be in use for non-construction parking do not have tree protection fencing at this time (parking lot south of building 'B'). Additional tree protection recommendations that are consistent with City of Tualatin standards are provided in Attachment 4.

### **Conclusion**

Eight (80) trees over 8-inch DBH are recommended for removal with construction. The 175 trees to be retained will be protected during construction by adhering to the recommendations in this report. Any change to the tree protection plan shall be completed by the project arborist to ensure that the trees to be retained are properly protected.

Please contact me if you have questions, concerns, or need any additional information.

Sincerely,



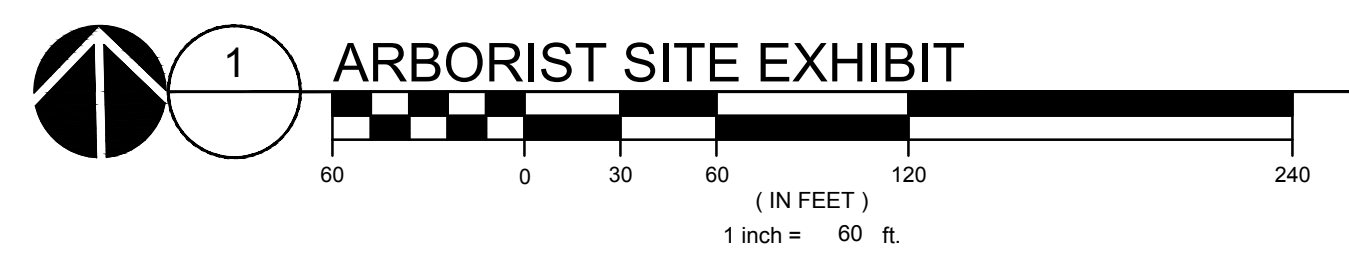
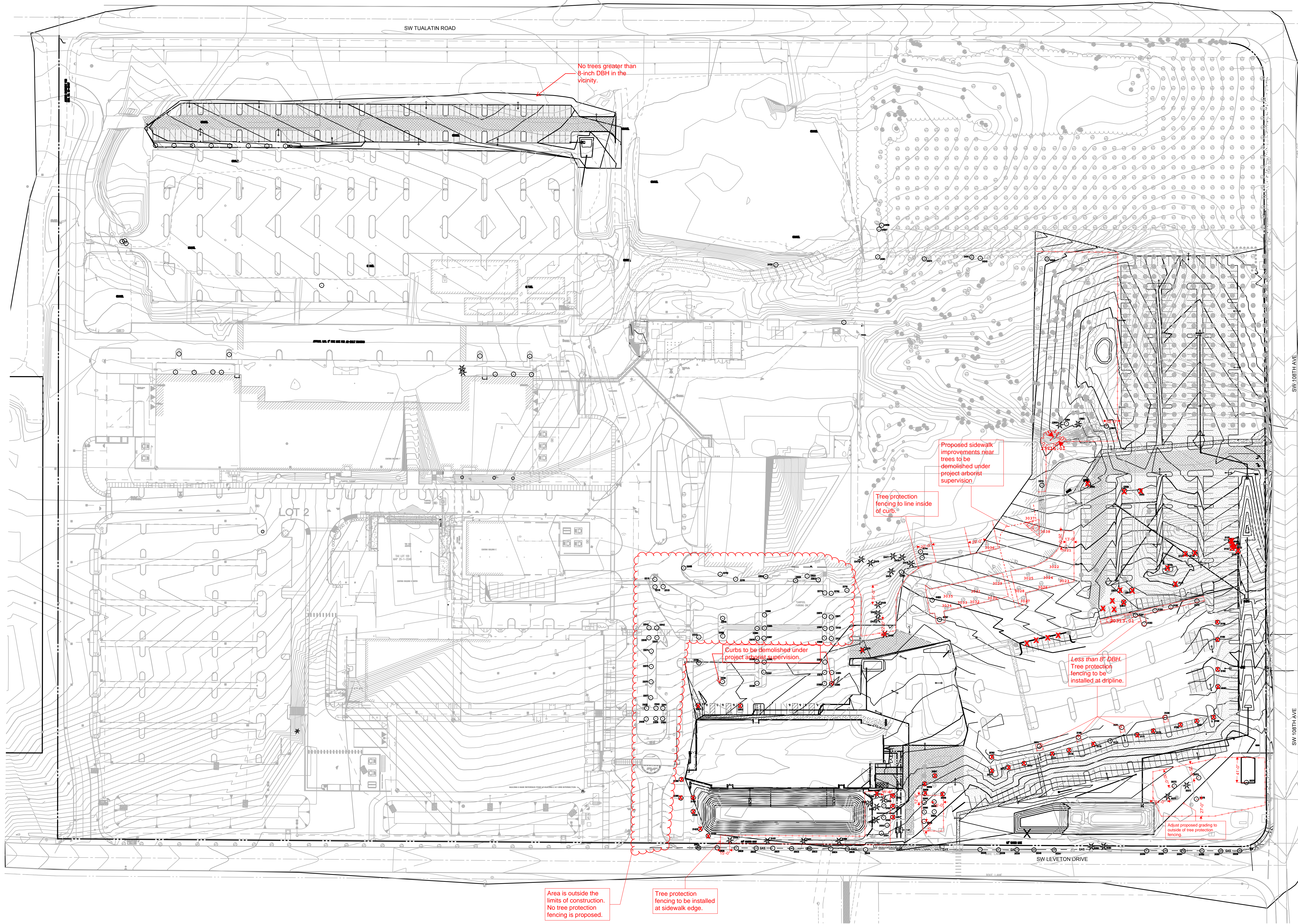
**Christine Johnson**  
*ISA Certified Arborist®*, PN-8730A  
*ISA Qualified Tree Risk Assessor*  
*Member, American Society of Consulting Arborists*



**Todd Prager**  
*ASCA Registered Consulting Arborist #597*  
*ISA Board Certified Master Arborist®*, WE-6723B  
*ISA Qualified Tree Risk Assessor*  
*AICP, American Planning Association*

Enclosures: Attachment 1 – Site/Grading Plan with Existing Tree Locations  
Attachment 2 – Existing Conditions Survey with Tree Locations  
Attachment 3 – Tree Inventory  
Attachment 4 – Tree Protection Recommendations  
Attachment 5 – Assumptions and Limiting Conditions





- Tree Legend**
- ## Tree No.
  - Tree Protection Fencing
  - ⊗ Tree added by arborist, location approximate

Area is outside the limits of construction. No tree protection fencing is proposed.

Tree protection fencing to be installed at sidewalk edge.

No trees greater than 8-inch DBH in the vicinity.

Tree protection fencing to line inside of curb.

Proposed sidewalk improvements near trees to be demolished under project arborist supervision

Curbs to be demolished under project arborist supervision.

Less than 8" DBH. Tree protection fencing to be installed at dripline.

Adjust proposed grading to outside of tree protection fencing.



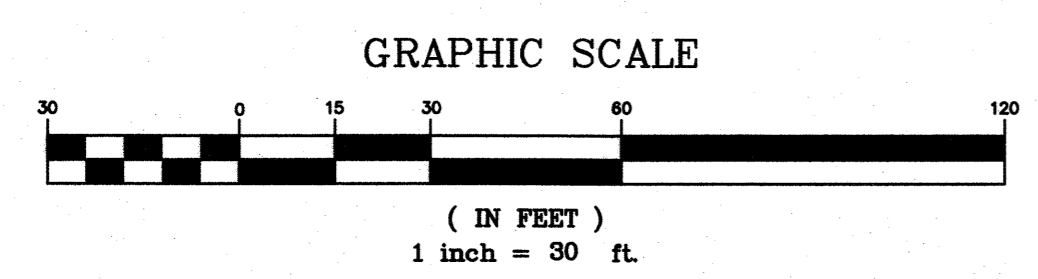
22688.04  
22688.02 22688.03  
22688.01

**LEGEND**

DECIDUOUS TREE		GAS METER	
CONIFEROUS TREE		GAS VALVE	
FIRE HYDRANT		GUY WIRE ANCHOR	
FIRE DEPARTMENT CONNECTION		UTILITY POLE	
WATER METER		POWER VAULT	
WATER VALVE		ELECTRICAL METER	
WATER VAULT		POWER JUNCTION BOX	
SANITARY SEWER CLEAN OUT		POWER TRANSFORMER	
SANITARY SEWER MANHOLE		POWER MANHOLE	
STORM SEWER CLEAN OUT		3' HIGH LIGHT POST	
STORM SEWER CATCH BASIN		AREA LIGHT	
STORM SEWER MANHOLE		STREET LIGHT	
BICYCLE RACK		TELEPHONE/TELEVISION VAULT	
SIGN		TELEPHONE/TELEVISION JUNCTION BOX	
BOLLARD		TELEPHONE/TELEVISION MANHOLE	
FOUND SURVEY MONUMENT		FLAG POLE	
		MAILBOX	

RIGHT-OF-WAY LINE	
BOUNDARY LINE	
PROPERTY LINE	
CENTERLINE	
DITCH	
CURB	
EXTRUDED CURB	
EDGE OF PAVEMENT	
EASEMENT	
FENCE LINE	
GRAVEL EDGE	
POWER LINE	
OVERHEAD WIRE	
TELEPHONE LINE	
GAS LINE	
STORM SEWER LINE	
SANITARY SEWER LINE	
WATER LINE	



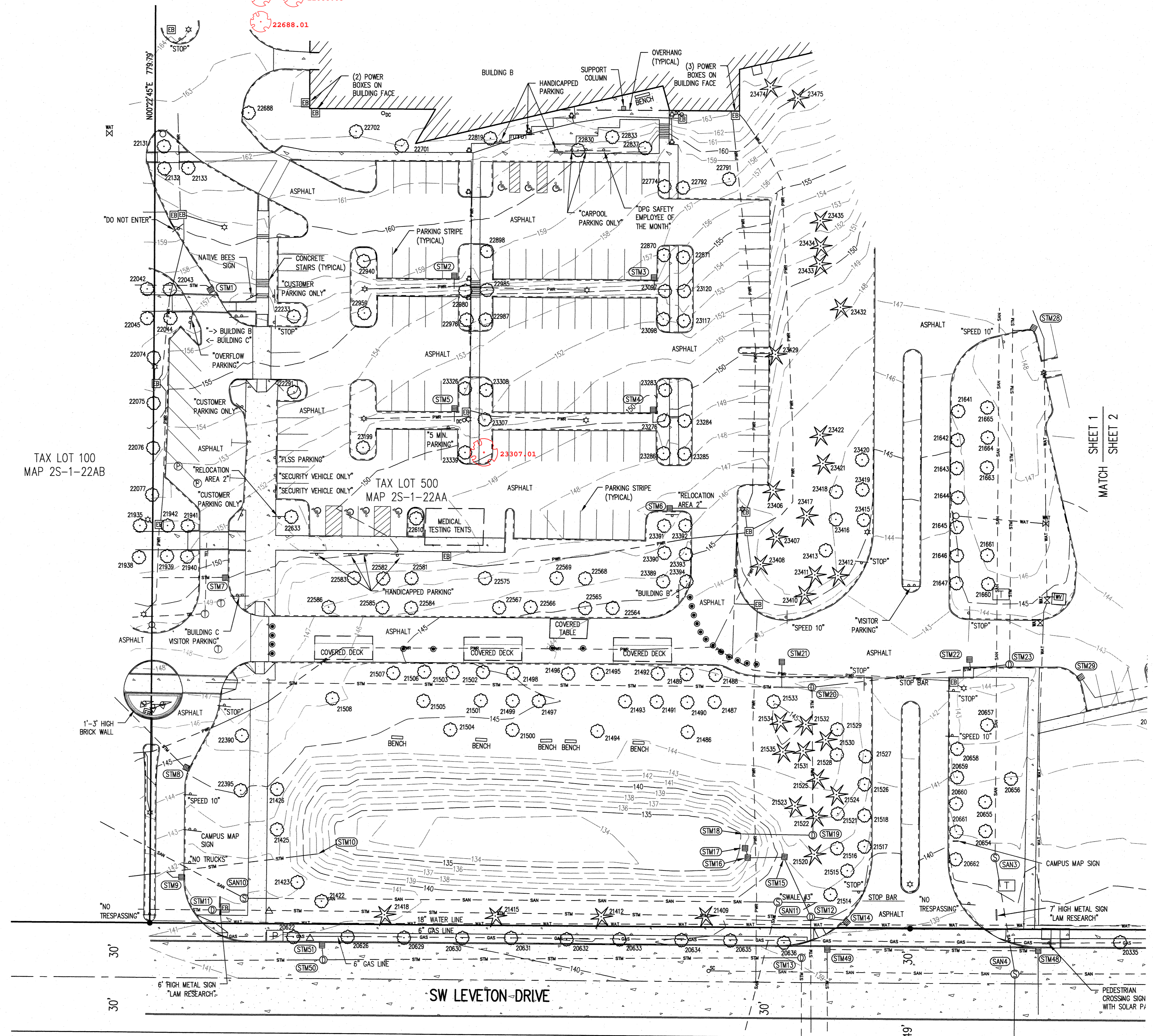
Location approximated by arborist

**NOTE:**  
SEE SHEET 2 FOR TREE INFORMATION  
SEE SHEET 3 FOR STORM SEWER AND SANITARY SEWER INFORMATION

- NOTES**
- 1) THE FIELD SURVEY FOR THIS MAP WAS COMPLETED DURING MAY AND JUNE 2022.
  - 2) ELEVATIONS ARE BASED ON THE ONE-QUARTER SECTION CORNER COMMON TO SECTIONS 15 AND 22, T2S, R1W. THE ELEVATION WAS HELD PER WASHINGTON COUNTY GC\_022-086 DATA SHEET ON FILE WITH THE WASHINGTON COUNTY SURVEYOR'S OFFICE. THE PUBLISHED ELEVATION IS 177.22 FEET ON THE NGVD 29 VERTICAL DATUM.
  - 3) THE RIGHT-OF-WAY WIDTHS WERE ESTABLISHED USING INFORMATION FROM RECORD SURVEYS AND THE TAX ASSESSOR'S MAP.
  - 4) THE SURVEYOR WAS NOT PROVIDED WITH A TITLE REPORT FOR THE PROPERTY. IT IS UNKNOWN IF ANY EASEMENTS ENCUMBER OR BENEFIT THE PROPERTY.
  - 5) THE UNDERGROUND UTILITIES ARE BASED ON THE MARKINGS PER LOCATE TICKET NUMBERS 22104712, 22104717, 22155185, AND A PRIVATE UTILITY LOCATING COMPANY.

**UTILITY STATEMENT**

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



**NORTHWEST**  
1815 NW 169th PLACE, SUITE 2090  
BEAVERTON, OR 97006  
PH: (503) 848-2127 FAX: (503) 848-2179  
EMAIL: nwsurveying@swrvc.com

**SURVEYING, INC.**

LOCATED IN THE NORTHEAST 1/4 OF SECTION 22,  
TOWNSHIP 2 SOUTH, RANGE 10 WEST, N.W.M.  
CITY OF TUALATIN, WASHINGTON COUNTY, OREGON

**TOPOGRAPHIC SURVEY**  
**OREGON**  
**TUALATIN,**

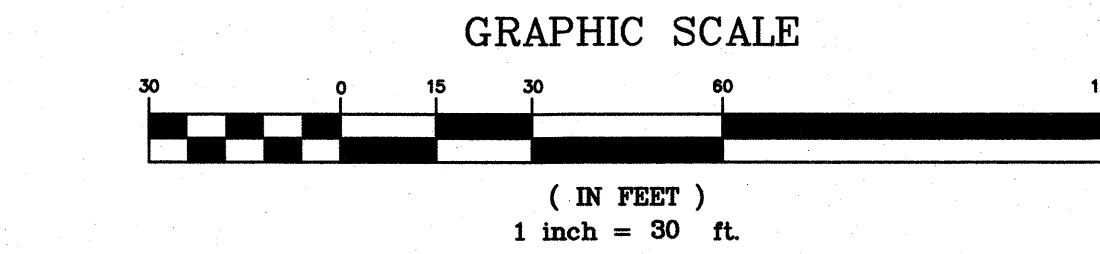
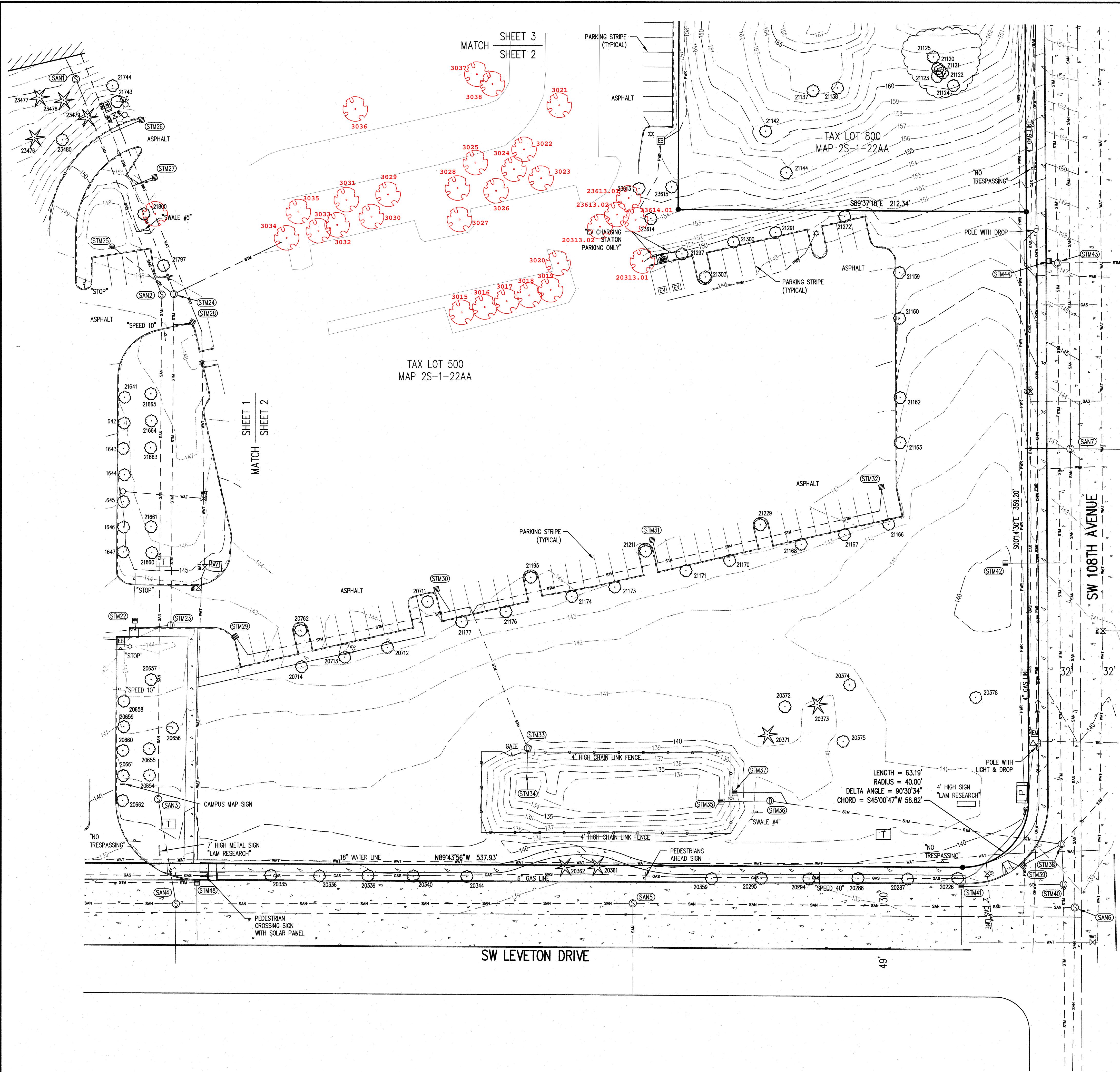
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CHECKED BY: SFF/CDW  
**PREPARED FOR:**  
LAM RESEARCH CORPORATION  
4650 CUSHING PARKWAY  
FREMONT, CA 94538

**REVISIONS:**  
INITIAL RELEASE: JULY 11, 2022

REGISTERED  
PROFESSIONAL  
LAND SURVEYOR  
*Scott F. Field*  
OREGON  
JUNE 30, 1997  
SCOTT F. FIELD  
2844  
12-31-2023  
RENEWAL DATE

JOB NUMBER  
**1344**  
SHEET  
**1 OF 3**





TREE INFORMATION

20226	13'	DECIDUOUS	21491	14'	CHERRY	22586	15'	CHERRY
20287	10'	DECIDUOUS	21492	15'	CHERRY	22610	14'	DECIDUOUS
20298	10'	DECIDUOUS	21493	14'	CHERRY	22633	13'	DECIDUOUS
20294	13'	DECIDUOUS	21494	14'	CHERRY	22688	14'	MAPLE
20295	6'	DECIDUOUS	21495	16'	CHERRY	22701	23'	OAK
20330	14'	DECIDUOUS	21496	10'	CHERRY	22702	25'	OAK
20336	3'	DECIDUOUS	21497	14'	CHERRY	22774	10'	DECIDUOUS
20339	8'	DECIDUOUS	21498	16'	CHERRY	22791	22'	OAK
20340	11'	DECIDUOUS	21499	17'	CHERRY	22792	14'	DECIDUOUS
20344	9'	DECIDUOUS	21500	3'	CHERRY	22819	23'	OAK
20359	13'	DECIDUOUS	21501	15'	CHERRY	22830	14'	OAK
20361	36'	FIR	21502	10'	CHERRY	22833	13'	OAK
20362	54'	FIR	21503	10'	CHERRY	22837	28'	OAK
20371	49'	CONIFER	21504	20'	CHERRY	22870	12'	DECIDUOUS
20372	35'	DECIDUOUS	21505	3'	CHERRY	22871	15'	DECIDUOUS
20373	28'	PINE	21506	20'	CHERRY	22888	14'	DECIDUOUS
20374	25'	MAPLE	21507	3'	CHERRY	22940	10'	DECIDUOUS
20375	27'	DECIDUOUS	21508	26'	CHERRY	22959	11'	DECIDUOUS
20378	SPLIT 16" (2) 19", 21" MAPLE		21514	24'	CHERRY	22976	14'	DECIDUOUS
20922	8'	DECIDUOUS	21515	20'	CHERRY	22980	15'	DECIDUOUS
20626	9'	DECIDUOUS	21516	19'	CHERRY	22985	13'	DECIDUOUS
20629	1'	DECIDUOUS	21517	14'	CHERRY	22987	14'	DECIDUOUS
20630	1'	DECIDUOUS	21518	15'	CHERRY	22997	14'	DECIDUOUS
20631	7'	DECIDUOUS	21520	23'	FIR	23098	13'	DECIDUOUS
20632	9'	DECIDUOUS	21521	15'	CHERRY	23117	13'	DECIDUOUS
20633	4'	DECIDUOUS	21522	21'	FIR	23120	15'	DECIDUOUS
20634	7'	DECIDUOUS	21523	18'	DECIDUOUS	23169	18'	DECIDUOUS
20635	27'	DECIDUOUS	21524	20'	FIR	23276	15'	DECIDUOUS
20636	16'	DECIDUOUS	21525	18'	FIR	23283	13'	DECIDUOUS
20654	30'	CHERRY	21526	14'	CHERRY	23284	10'	DECIDUOUS
20655	13'	CHERRY	21527	14'	CHERRY	23285	14'	DECIDUOUS
20656	14'	CHERRY	21528	17'	CHERRY	23286	13'	DECIDUOUS
20657	24'	CHERRY	21529	25'	CHERRY	23287	15'	DECIDUOUS
20658	23'	CHERRY	21530	17'	FIR	23306	12'	DECIDUOUS
20659	22'	CHERRY	21531	17'	FIR	23326	14'	DECIDUOUS
20660	20'	CHERRY	21532	18'	FIR	23339	10'	DECIDUOUS
20661	14'	CHERRY	21533	19'	CHERRY	23360	15'	DECIDUOUS
20662	30'	CHERRY	21534	20'	FIR	23390	13'	DECIDUOUS
20712	2'	DECIDUOUS	21535	23'	FIR	23391	14'	DECIDUOUS
20713	3'	DECIDUOUS	21536	15'	CHERRY	23392	15'	DECIDUOUS
20714	3'	DECIDUOUS	21642	15'	CHERRY	23393	12'	DECIDUOUS
20762	3'	MAPLE	21643	12'	CHERRY	23394	14'	DECIDUOUS
21015	21'	OAK	21644	13'	CHERRY	23406	18'	FIR
21120	12'	DECIDUOUS	21645	13'	CHERRY	23407	20'	FIR
21121	14'	DECIDUOUS	21646	13'	CHERRY	23408	27'	FIR
21122	14'	DECIDUOUS	21647	9'	CHERRY	23410	29'	FIR
21123	12'	DECIDUOUS	21660	1'	CHERRY	23411	11'	FIR
21124	SPLIT 10", 12" DECIDUOUS		21661	1'	CHERRY	23412	27'	FIR
21125	15'	DECIDUOUS	21663	14'	CHERRY	23413	27'	OAK
21137	23'	CHERRY	21664	12'	CHERRY	23415	20'	CHERRY
21138	16'	BIRCH	21665	12'	CHERRY	23416	22'	CHERRY
21142	20'	APPLE	21743	21'	CHERRY	23417	20'	FIR
21144	3'	DECIDUOUS	21744	24'	OAK	23418	CHERRY	
21159	3'	DECIDUOUS	21797	23'	DECIDUOUS	23419	16'	CHERRY
21160	3'	DECIDUOUS	21800	20'	DECIDUOUS	23420	CHERRY	
21162	3'	DECIDUOUS	21935	5'	DECIDUOUS	23421	13'	FIR
21163	4'	DECIDUOUS	21936	4'	DECIDUOUS	23422	19'	FIR
21166	3'	DECIDUOUS	21939	4'	DECIDUOUS	23429	14'	FIR
21167	3'	DECIDUOUS	21940	5'	DECIDUOUS	23432	25'	FIR
21168	2'	DECIDUOUS	21941	4'	DECIDUOUS	23433	44'	FIR
21170	2'	DECIDUOUS	21942	5'	DECIDUOUS	23434	45'	FIR
21171	3'	DECIDUOUS	22042	4'	DECIDUOUS	23435	28'	FIR
21173	3'	DECIDUOUS	22043	5'	DECIDUOUS	23474	18'	FIR
21174	4'	DECIDUOUS	22044	5'	DECIDUOUS	23475	10'	CHERRY
21176	3'	DECIDUOUS	22045	3'	DECIDUOUS	23476	20'	FIR
21177	3'	DECIDUOUS	22074	11'	DECIDUOUS	23477	19'	FIR
21179	3'	DECIDUOUS	22075	11'	DECIDUOUS	23478	25'	FIR
21185	3'	DECIDUOUS	22076	6'	DECIDUOUS	23479	15'	FIR
21211	3'	DECIDUOUS	22077	12'	DECIDUOUS	23480	24'	CHERRY
21229	3'	DECIDUOUS	22131	4'	DECIDUOUS	23509	11'	OAK
21272	2'	DECIDUOUS	22132	4'	DECIDUOUS	23613	10'	OAK
21291	2'	DECIDUOUS	22133	6'	DECIDUOUS	23614	29'	OAK
21297	1'	DECIDUOUS	22233	14'	DECIDUOUS	23615	25'	OAK
21300	1'	DECIDUOUS	22291	16'	DECIDUOUS	23693	1'	DECIDUOUS
21303	2'	DECIDUOUS	22292	10'	DECIDUOUS	23715	11'	OAK
21409	SPLIT 6", 7", 14" CEDAR		22395	12'	DECIDUOUS	23800	49'	FIR
21412	9'	CEDAR	22564	14'	CHERRY	23801	7'	MAPLE
21415	7'	OAK	22565	23'	CHERRY	23802	30'	MAPLE
21418	14'	CEDAR	22566	23'	CHERRY	23807	CHERRY	
21422	5'	CHERRY	22567	16'	CHERRY	24041	CHERRY	
21423	5'	CHERRY	22568	23'	CHERRY	24042	10'	MAPLE
21425	7'	CHERRY	22569	21'	CHERRY	24049	30'	COTTONWOOD
21426	7'	DECIDUOUS	22575	17'	DECIDUOUS	24056	20'	MAPLE
21486	15'	CHERRY	22581	10'	CHERRY	24057	SPLIT 7", 8", 9", 10", 22" MAPLE	
21487	15'	CHERRY	22582	10'	CHERRY	24058	30'	MAPLE
21488	10'	CHERRY	22583	3'	CHERRY	24073	18'	DECIDUOUS
21489	12'	CHERRY	22584	3'	CHERRY	24104	SPLIT (2) 14" COTTONWOOD	
21490	14'	CHERRY	22585	3'	CHERRY			

Location approximated by arborist

**NORTHWEST SURVEYING, INC.**  
 1815 NW 169th PLACE, SUITE 2090  
 BEAVERTON, OR 97006  
 PH: (503) 848-2127 FAX: (503) 848-2179  
 EMAIL: nwsurveying@nwsvy.com

LOCATED IN THE NORTHEAST 1/4 OF SECTION 22, TOWNSHIP 2 SOUTH, RANGE 1 WEST, W.M., CITY OF TUALATIN, WASHINGTON COUNTY, OREGON

**TOPOGRAPHIC SURVEY OREGON TUALATIN**

DRAWING NO.: 1344 TOPO-SW  
SCALE: AS NOTED  
DRAWING GENERATED BY: LD2004  
DRAWN BY: SFJ  
CHECKED BY: SFJ/CDW  
PREPARED FOR: LAM RESEARCH CORPORATION 4650 CUSHING PARKWAY FREMONT, CA 94538

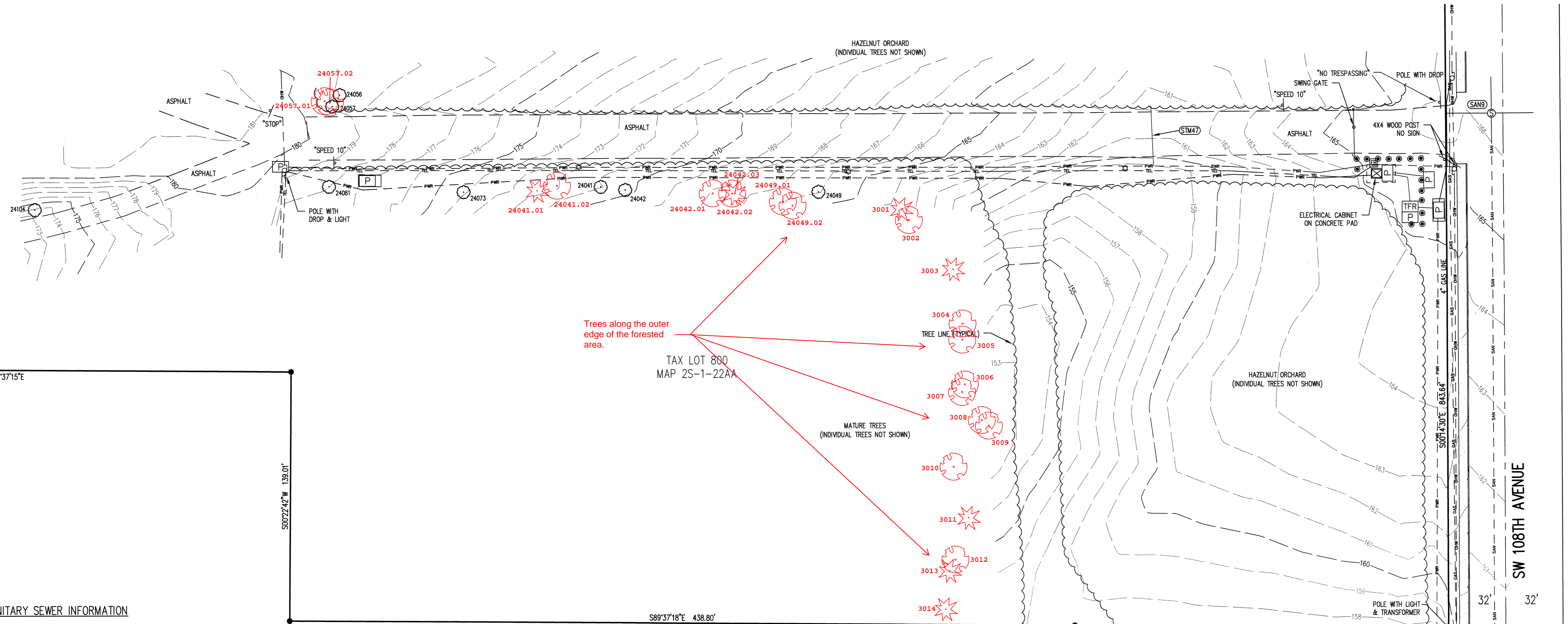
REVISIONS:  
INITIAL RELEASE: JULY 11, 2022

REGISTERED PROFESSIONAL LAND SURVEYOR  
Scott Field  
OREGON JUNE 30, 1997  
SCOTT FIELD 2844  
12-31-2023 RENEWAL DATE

JOB NUMBER 1344

SHEET 2 OF 3





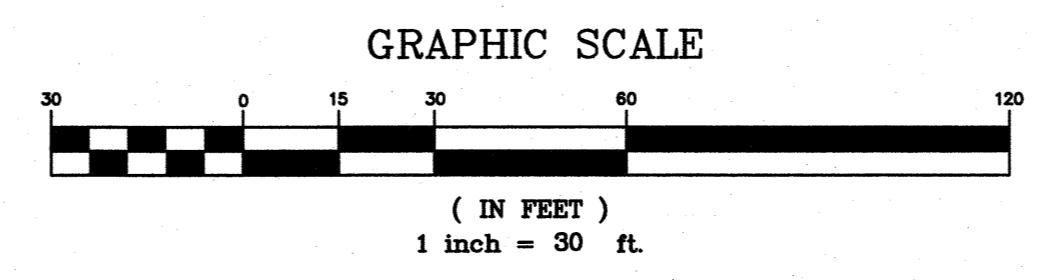
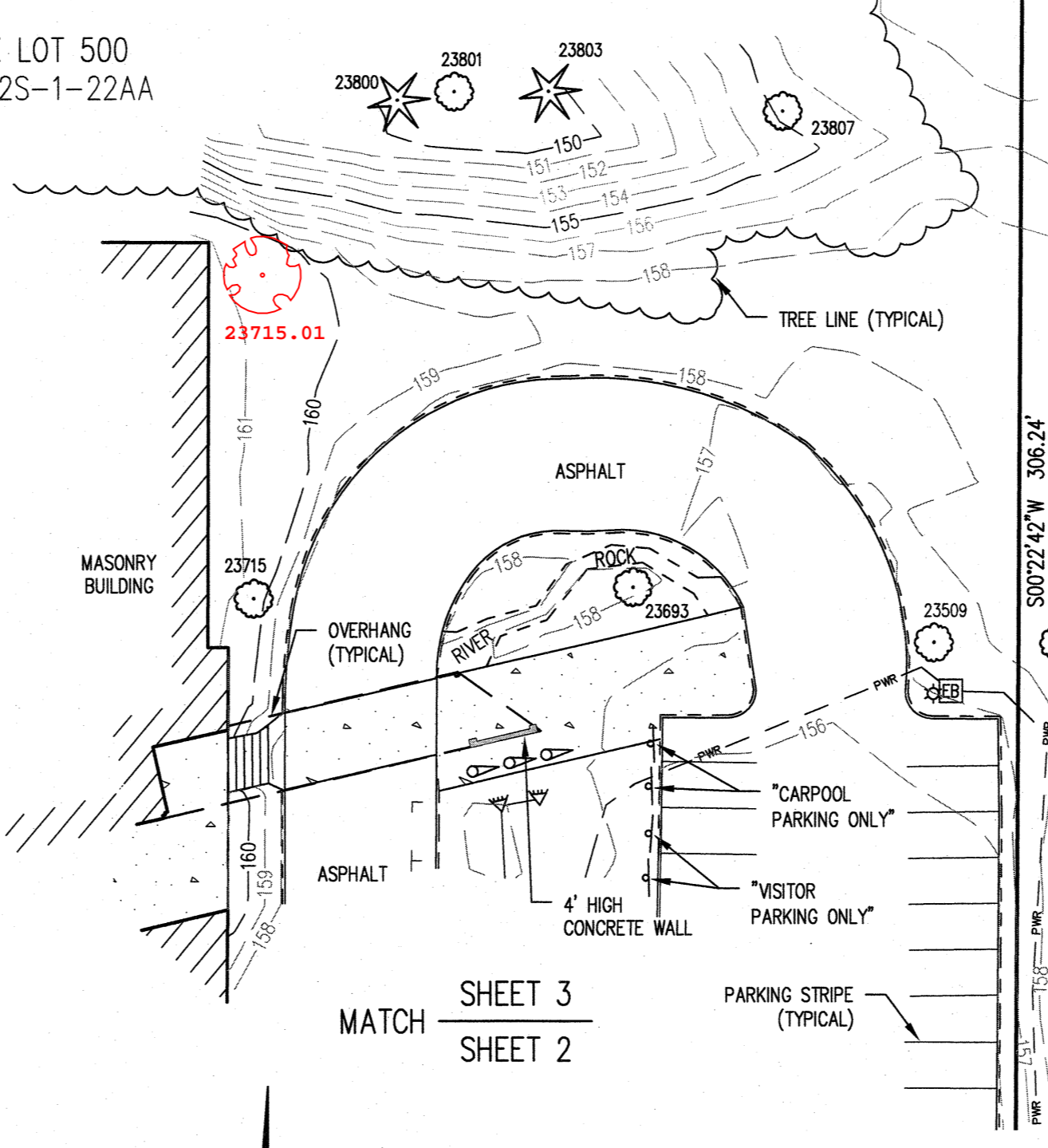
**SANITARY SEWER INFORMATION**

<b>(SANT1)</b> MANHOLE RIM = 159.29' 8" I.E. IN (NW) = 148.8' 8" I.E. OUT (SE) = 148.6'	<b>(SAN2)</b> MANHOLE RIM = 147.53' 8" I.E. IN (NW) = 141.8' 8" I.E. OUT (S) = 141.7'	<b>(SAN3)</b> MANHOLE RIM = 140.68' 8" I.E. IN (N) = 133.0' 8" I.E. OUT (S) = 132.9'	<b>(SAN4)</b> MANHOLE RIM = 138.31' 8" I.E. IN (N) = 131.2' 8" I.E. IN (S) = 131.2' 8" I.E. IN (W) = 131.2' 8" I.E. OUT (E) = 131.0'	<b>(SAN5)</b> MANHOLE RIM = 139.58' 8" I.E. IN (S) = 130.0' 8" I.E. IN (W) = 129.9' 8" I.E. OUT (E) = 129.8'	<b>(SAN6)</b> MANHOLE RIM = 138.83' 8" I.E. IN (W) = 128.6' (NO FLOW) 8" I.E. IN (W) = 125.9' 8" I.E. IN (N) = 125.9' 8" I.E. OUT (S) = 125.8'	<b>(SAN7)</b> MANHOLE RIM = 143.06' 8" I.E. IN (E) = 127.1' 8" I.E. IN (W) = 127.0' 8" I.E. IN (N) = 127.0' 8" I.E. OUT (S) = 127.9'	<b>(SAN8)</b> MANHOLE RIM = 159.71' 8" I.E. IN (E) = 143.7' 8" I.E. IN (W) = 143.7' 8" I.E. IN (N) = 143.7' 8" I.E. OUT (S) = 143.6'	<b>(SAN9)</b> MANHOLE RIM = 166.35' 8" I.E. IN (N) = 151.2' 8" I.E. IN (W&E) = 151.1' 8" I.E. OUT (S) = 150.9'	<b>(SANT10)</b> MANHOLE RIM = 142.18' 15" I.E. IN (NW) = 133.4' 15" I.E. OUT (E) = 133.1'	<b>(SANT11)</b> MANHOLE RIM = 140.17' 12" I.E. IN (E) = 130.1' 15" I.E. IN (W) = 130.1' 15" I.E. OUT (S) = 129.8'
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**STORM SEWER INFORMATION**

<b>(STM1)</b> CATCH BASIN RIM = 157.17' RIM BOTTOM = 140.32' 4" I.E. OUT (NW) = 155.5'	<b>(STM2)</b> CATCH BASIN RIM = 158.53' 4" I.E. OUT (S) = 157.8'	<b>(STM3)</b> CATCH BASIN RIM = 156.45' 4" I.E. OUT (S) = 155.7'	<b>(STM4)</b> CATCH BASIN RIM = 149.56' 4" I.E. OUT (S) = 148.9'	<b>(STM5)</b> CATCH BASIN RIM = 152.05' 4" I.E. OUT (S) = 151.3'	<b>(STM6)</b> CATCH BASIN RIM = 148.58' 4" I.E. OUT (E) = 145.8'	<b>(STM7)</b> CATCH BASIN RIM = 149.47' 6" I.E. OUT (W) = 147.8'	<b>(STM8)</b> CATCH BASIN RIM = 144.63' 6" I.E. OUT (NW) = 142.9'	<b>(STM9)</b> CATCH BASIN RIM = 141.55' 6" I.E. OUT (W) = 139.9'	<b>(STM10)</b> PVC OUTLET 8" I.E. (E) = 137.5'	<b>(STM11)</b> MANHOLE RIM = 141.76' 30" I.E. IN (W) = 135.6' 30" I.E. OUT (E) = 135.5'	<b>(STM12)</b> MANHOLE RIM = 140.17' 6" I.E. IN (E) = 135.1' 18" I.E. IN (NW) = 134.9' 30" I.E. IN (W) = 134.9' 30" I.E. OUT (S) = 134.8'	<b>(STM13)</b> MANHOLE RIM = 138.92' 36" I.E. IN (W) = 134.2' 36" I.E. OUT (S) = 134.1'	<b>(STM14)</b> CATCH BASIN RIM = 139.23' TRAP (W)	<b>(STM15)</b> DITCH INLET RIM TOP = 141.62' RIM BOTTOM = 140.32' 6" I.E. IN (W) = 136.1' CAPPED 18" I.E. OUT (SE) = 134.7'	<b>(STM16)</b> DITCH INLET RIM TOP = 136.97' RIM BOTTOM = 135.63' 4" I.E. IN (NW) = 135.0' 6" I.E. OUT (E) = 135.0'	<b>(STM17)</b> DITCH INLET RIM TOP = 136.50' RIM BOTTOM = 135.18' 4" I.E. OUT (SE) = 135.1' CAPPED	<b>(STM18)</b> CPP OUTFALL 18" I.E. (E) = 135.0'	<b>(STM19)</b> MANHOLE RIM = 142.52' 12" I.E. IN (W) = 136.3' 18" I.E. IN (E) = 136.3' 24" I.E. OUT (S) = 136.1'	<b>(STM20)</b> CATCH BASIN RIM = 142.50' 4" I.E. OUT (S) = 140.8'	<b>(STM21)</b> CATCH BASIN RIM = 142.41' TRAP (S)	<b>(STM22)</b> MANHOLE RIM = 147.73' 6" I.E. IN (NW) = 144.5' 12" I.E. IN (W) = 140.5' 18" I.E. IN (N) = 140.2' 18" I.E. OUT (S) = 140.0'	<b>(STM23)</b> MANHOLE RIM = 147.56' 6" VERTICAL PIPE WITH LID	<b>(STM24)</b> CATCH BASIN RIM = 142.89' TRAP (S)	<b>(STM25)</b> CATCH BASIN RIM = 142.53' 24" I.E. IN (N) = 135.3' 18" I.E. OUT (W) = 135.2'	<b>(STM26)</b> CATCH BASIN RIM = 142.89' TRAP (S)	<b>(STM27)</b> CATCH BASIN RIM = 151.38' TRAP (W)	<b>(STM28)</b> CATCH BASIN RIM = 147.45' 6" I.E. OUT (W) = 146.5'	<b>(STM29)</b> CATCH BASIN RIM = 142.17' TRAP (SE)	<b>(STM30)</b> CATCH BASIN RIM = 143.07' TRAP (S)	<b>(STM31)</b> CATCH BASIN RIM = 142.89' TRAP (S)	<b>(STM32)</b> CATCH BASIN RIM = 142.22' TRAP (S)	<b>(STM33)</b> MANHOLE RIM = 140.78' 12" I.E. IN (NW) = 134.2' 12" ORIFICE (S) = 133.5'	<b>(STM34)</b> CATCH BASIN RIM = 159.13' 12" I.E. IN (SW) = 156.6' 12" I.E. IN (NE) = 156.3' 12" I.E. OUT (S) = 156.3'	<b>(STM35)</b> DITCH INLET RIM TOP = 135.61' RIM BOTTOM = 134.74' 12" I.E. IN (E) = 134.4'	<b>(STM36)</b> FLOW CONTROL MANHOLE RIM = 141.38' 12" I.E. IN (W) = 134.2' 12" I.E. OUT (E) = 133.9'	<b>(STM37)</b> DITCH INLET RIM TOP = 138.92' RIM BOTTOM = 137.61' 12" I.E. IN (E) = 135.0'	<b>(STM38)</b> MANHOLE RIM = 139.17' 12" I.E. IN (SW) = 134.8' 12" I.E. IN (W) = 133.4' 12" I.E. IN (NE) = 131.9' 12" I.E. IN (N) = 131.8' 15" I.E. OUT (S) = 131.4'	<b>(STM39)</b> CATCH BASIN RIM = 138.72' 12" I.E. OUT (NE) = 134.8'	<b>(STM40)</b> MANHOLE RIM = 138.91' 12" I.E. IN (W) = 133.8' 15" I.E. IN (N) = 131.4' 15" I.E. OUT (S) = 131.3'	<b>(STM41)</b> CATCH BASIN RIM = 138.36' 10" I.E. IN (S) = 135.0' 12" I.E. OUT (E) = 134.8'	<b>(STM42)</b> CATCH BASIN RIM = 139.53' WITH FILTER FABRIC	<b>(STM43)</b> MANHOLE RIM = 147.16' 10" I.E. IN (W) = 142.6' 10" I.E. IN (E) = 139.6' 12" I.E. IN (N) = 138.9' 12" I.E. OUT (S) = 138.8'	<b>(STM44)</b> CATCH BASIN RIM = 146.91' 10" I.E. OUT (E) = 142.5'	<b>(STM45)</b> CATCH BASIN RIM = 159.13' 12" I.E. IN (SW) = 156.6' 12" I.E. IN (NE) = 156.3' 12" I.E. OUT (S) = 156.3'	<b>(STM46)</b> CATCH BASIN RIM = 159.79'	<b>(STM47)</b> PVC CULVERT 8" I.E. IN (N) = 159.8' 8" I.E. OUT (S) = 158.8'	<b>(STM48)</b> CATCH BASIN RIM = 137.91' 12" I.E. IN (W) = 135.7' 10" I.E. OUT (S) = 135.7'	<b>(STM49)</b> CATCH BASIN RIM = 138.49' 12" I.E. IN (E) = 134.9' 12" I.E. OUT (S) = 134.8'	<b>(STM50)</b> MANHOLE RIM = 140.57' 12" I.E. IN (W) = 137.1' 36" I.E. IN (W) = 135.3' 36" I.E. OUT (E) = 135.2'	<b>(STM51)</b> CATCH BASIN RIM = 140.34' 12" I.E. OUT (S) = 137.4'
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**TAX LOT 500  
MAP 2S-1-22AA**



Location approximated by arborist  
 Location approximated by arborist

Attachment 2  
Existing Conditions Survey with Tree Locations

**ORTHWEST SURVEYING, INC.**  
1815 NW 169th PLACE SUITE 2090  
BEAVERTON, OR 97006  
PH: (503) 848-2127 FAX: (503) 848-2179  
EMAIL: nwsurveying@swsury.com

LOCATED IN THE NORTHEAST 1/4 OF SECTION 22,  
TOWNSHIP 2 SOUTH, RANGE 1 WEST, W.M.,  
CITY OF TUALATIN, WASHINGTON COUNTY, OREGON

**TOPOGRAPHIC SURVEY  
TUALATIN, OREGON**

DRAWING NO.:	1344 TOPO-SW
SCALE:	AS NOTED
DRAWING GENERATED BY:	LD2004
DRAWN BY:	SFT
CHECKED BY:	SFT/CDW
<b>PREPARED FOR:</b>	LAM RESEARCH CORPORATION 4650 CUSHING PARKWAY FREMONT, CA 94538

REVISIONS:  
INITIAL RELEASE: JULY 11, 2022

REGISTERED PROFESSIONAL LAND SURVEYOR  
*Scott F. Field*  
OREGON  
JUNE 30, 1997  
SCOTT F. FIELD  
2844  
12-31-2023  
RENEWAL DATE

JOB NUMBER  
**1344**  
SHEET  
**3 OF 3**





Attachment 3 - Tree Inventory - All Trees

LAM Research  
9/7/2022 9/8/2022

Tree No.	Common Name	Scientific Name	DBH <sup>1</sup>	Single DBH <sup>2</sup>	C-Rad <sup>3</sup>	Condition <sup>4</sup>	Structure <sup>4</sup>	Comments	Exempt (less than 8-inches DBH or dead)	Treatment
20226	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	14	14	22	good	good			retain
20287	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	11	11	18	fair	fair	deadwood, one-sided, thin, high crown		retain
20288	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	11	11	15	good	fair	high crown		retain
20294	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	14	14	20	fair	fair	lean, thin		retain
20295	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	7	7	10	good	good		exempt (<8" DBH)	retain
20313.01	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	1	1	5	poor	fair	deadwood, thin, near EV charging station, at end of second stall, east line	exempt (<8" DBH)	retain
20313.02	Autumn Blaze red maple	<i>Acer x freemanii</i>	3	3	5	good	good	location approximated by arborist, likely Rocky Mountain or Bowhall	exempt (<8" DBH)	remove
20335	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	14	14	22	good	fair	heavy end weight		retain
20336	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	3	3	5	fair	fair	dead tops, trunk flare wound, good response growth	exempt (<8" DBH)	retain
20339	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	8	8	14	good	fair	one-sided		retain
20340	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	11	11	15	good	fair	lean, one-sided		retain
20344	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	9	9	15	good	fair	heavy end weight		retain
20359	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	13	13	15	good	fair	heavy end weight		retain
20361	Douglas-fir	<i>Pseudotsuga menziesii</i>	38	38	20	good	good			retain
20362	Douglas-fir	<i>Pseudotsuga menziesii</i>	56	56	30	good	good			retain
20371	Blue atlas cedar	<i>Cedrus atlantica</i>	48	48	35	good	fair	codominant leaders, two sets of codominant leaders at 40' and 60', history of failure		retain
20372	northern red oak	<i>Quercus rubra</i>	35	35	30	good	fair	one-sided, heavy epicormic branches on limbs		retain
20373	ponderosa pine	<i>Pinus ponderosa</i>	26	26	15	fair	fair	sweeping trunk, high crown		retain
20374	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	10	10	12	fair	fair	deadwood, one-sided, thin		retain
20374	silver maple	<i>Acer saccharinum</i>	26	26	25	fair	fair	deadwood, lean		retain
20375	Horse chestnut	<i>Aesculus hippocastanum</i>	27	27	15	fair	fair	lean, trunk decay, 3' by 2' cavity at 5' on north side of trunk		retain
20378	Norway maple	<i>Acer platanoides</i>	41	41	30	good	fair	codominant leaders with inclusion, diameter measured at 1.5', possible Crimson King variety that has converted		retain
20622	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	9	9	13	fair	fair	deadwood, lean, one-sided, thin		retain
20629	Paperbark maple	<i>Acer griseum</i>	1	1	0	dead	dead		exempt (<8" DBH)	retain
20630	Paperbark maple	<i>Acer griseum</i>	1	1	2	poor	fair	deadwood, thin, 50 percent live canopy	exempt (<8" DBH)	retain
20631	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	7	7	10	fair	fair	deadwood, thin	exempt (<8" DBH)	retain
20632	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	9	9	12	fair	fair	codominant leaders, thin		retain
20633	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	5	5	7	poor	fair	deadwood, one-sided, thin, trunk decay, Central leader cut, two lateral leaders remain	exempt (<8" DBH)	retain
20634	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	8	8	12	fair	poor	one-sided, thin, central leader cut, two lateral leaders remain		retain
20635	elm	<i>Ulmus sp.</i>	2	2	8	good	good		exempt (<8" DBH)	retain
20636	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	16	16	25	fair	fair	lean, one-sided, heavy end weight, trunk wound south side		retain
20654	flowering cherry	<i>Prunus serrulata</i>	29	29	26	good	fair	crossing leaders		retain
20655	flowering cherry	<i>Prunus serrulata</i>	13	13	14	good	fair	one-sided		retain
20656	flowering cherry	<i>Prunus serrulata</i>	15	15	15	good	good			remove
20657	flowering cherry	<i>Prunus serrulata</i>	26	26	25	fair	poor	deadwood, one-sided, trunk decay, depressed soil in west side		remove
20658	flowering cherry	<i>Prunus serrulata</i>	23	23	18	good	fair	crossing leaders, epicormic branches		remove
20659	flowering cherry	<i>Prunus serrulata</i>	23	23	15	fair	fair	fewer leaders than neighboring cherry trees, epicormic branches		retain
20660	flowering cherry	<i>Prunus serrulata</i>	21	21	16	good	good			retain
20661	flowering cherry	<i>Prunus serrulata</i>	26	26	16	good	good			retain
20662	flowering cherry	<i>Prunus serrulata</i>	30	30	20	good	fair	lean, lacks buttress roots on northeast side		retain
20711	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	4	4	8	good	good		exempt (<8" DBH)	remove
20712	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	3	3	7	fair	good	thin	exempt (<8" DBH)	remove
20713	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	4	4	8	fair	good	thin	exempt (<8" DBH)	remove
20714	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	4	4	8	fair	good	thin	exempt (<8" DBH)	remove
20762	Autumn Blaze red maple	<i>Acer x freemanii</i>	5	5	8	good	good		exempt (<8" DBH)	remove
21015	northern red oak	<i>Quercus rubra</i>	22	22	22	good	fair	codominant leaders		remove
21120	white poplar	<i>Populus alba</i>	8	8	8	fair	poor	lean, one-sided, inaccessible, diameter estimated		remove
21121	white poplar	<i>Populus alba</i>	12	12	12	fair	fair	lean, one-sided, inaccessible, diameter estimated		remove
21122	white poplar	<i>Populus alba</i>	12	12	12	fair	fair	lean, one-sided, inaccessible, diameter estimated		remove
21123	white poplar	<i>Populus alba</i>	12	12	12	fair	fair	lean, one-sided, inaccessible, diameter estimated		remove
21124	white poplar	<i>Populus alba</i>	10,8	13	14	fair	poor	codominant leaders, lean, one-sided, inaccessible, diameter estimated		remove



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Tree No.	Common Name	Scientific Name	DBH <sup>1</sup>	Single DBH <sup>2</sup>	C-Rad <sup>3</sup>	Condition <sup>4</sup>	Structure <sup>4</sup>	Comments	Exempt (less than 8-inches DBH or dead)	Treatment
21125	white poplar	<i>Populus alba</i>	12	12	10	fair	fair	lean, one-sided, inaccessible, diameter estimated		remove
21137	fruiting cherry	<i>Prunus sp.</i>	22	22	16	fair	poor	deadwood, thin, diameter measured at 2'		remove
21138	European white birch	<i>Betula pendula</i>	16	16	10	fair	fair	deadwood, lean, dead top		remove
21142	pear	<i>Pyrus sp.</i>	17,13	21	15	poor	poor	codominant leaders, deadwood, lean, thin, surrounded by small diameter English hawthorn and English ivy		remove
21144	sweet cherry	<i>Prunus avium</i>	9,8,8	14	8	very poor	very poor	codominant leaders, thin, not tagged, inaccessible, overgrown with English hawthorn and Himalayan blackberry	exempt (dead)	remove
21159	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	3	3	8	fair	good	thin	exempt (<8" DBH)	remove
21160	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	4	4	8	fair	good	thin	exempt (<8" DBH)	remove
21162	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	4	4	8	fair	good	thin	exempt (<8" DBH)	remove
21163	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	5	5	12	fair	good	thin	exempt (<8" DBH)	remove
21166	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	3	3	8	fair	good	thin	exempt (<8" DBH)	remove
21167	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	4	4	8	fair	good	thin	exempt (<8" DBH)	remove
21168	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	5	5	10	good	good		exempt (<8" DBH)	remove
21170	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	3	3	8	fair	good	thin	exempt (<8" DBH)	remove
21171	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	4	4	10	fair	good	thin	exempt (<8" DBH)	remove
21173	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	4	4	10	fair	good	thin	exempt (<8" DBH)	remove
21174	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	4	4	10	fair	good	thin	exempt (<8" DBH)	remove
21176	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	4	4	10	fair	good	thin	exempt (<8" DBH)	remove
21177	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	4	4	10	fair	good	thin	exempt (<8" DBH)	remove
21195	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	4	4	8	good	good		exempt (<8" DBH)	remove
21211	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	4	4	8	good	good		exempt (<8" DBH)	remove
21229	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	4	4	8	good	good		exempt (<8" DBH)	remove
21272	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	3	3	8	poor	good	thin	exempt (<8" DBH)	retain
21291	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	2	2	8	poor	good	thin	exempt (<8" DBH)	retain
21297	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	1	1	5	very poor	poor	deadwood, thin	exempt (<8" DBH)	retain
21300	Street Keeper® honey locust	<i>Gleditsia tricanthos</i> 'Draves'	1	1	3	very poor	poor	deadwood, thin	exempt (<8" DBH)	retain
21303	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	3	3	3	very poor	poor	deadwood, thin, dead top	exempt (<8" DBH, dead)	remove
21409	western redcedar	<i>Thuja plicata</i>	13,7,6	17	15	good	fair	codominant leaders		retain
21412	western redcedar	<i>Thuja plicata</i>	9	9	12	good	good			retain
21415	western redcedar	<i>Thuja plicata</i>	7	7	9	good	good		exempt (<8" DBH)	retain
21418	incense cedar	<i>Calocedrus decurrens</i>	15	15	12	good	good			retain
21422	flowering cherry	<i>Prunus serrulata</i>	8	8	6	poor	poor	deadwood, lean, trunk decay, diameter measured at 3.5'		remove
21423	flowering cherry	<i>Prunus serrulata</i>	6	6	12	fair	fair	deadwood, lean, one-sided, thin, diameter measures at 4.0'	exempt (<8" DBH)	remove
21425	flowering cherry	<i>Prunus serrulata</i>	8	8	6	fair	poor	deadwood, trunk decay, diameter measured at 3.0', diameter measured at 3.5'		remove
21426	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	7	7	12	fair	good	deadwood	exempt (<8" DBH)	remove
21486	flowering cherry	<i>Prunus serrulata</i>	16	16	16	fair	fair	deadwood, lean, one-sided, thin		remove
21487	flowering cherry	<i>Prunus serrulata</i>	16	16	15	poor	poor	deadwood, one-sided, only two leaders		remove
21488	flowering cherry	<i>Prunus serrulata</i>	11	11	12	good	fair	one-sided		remove
21489	flowering cherry	<i>Prunus serrulata</i>	14	14	12	fair	fair	thin, only two leaders		remove
21490	flowering cherry	<i>Prunus serrulata</i>	15	15	12	poor	poor	one-sided, thin		remove
21491	flowering cherry	<i>Prunus serrulata</i>	15	15	12	fair	fair	deadwood, one-sided		remove
21492	flowering cherry	<i>Prunus serrulata</i>	15	15	15	fair	fair	deadwood, one-sided		remove
21493	flowering cherry	<i>Prunus serrulata</i>	14	14	15	good	fair	lean		remove
21494	flowering cherry	<i>Prunus serrulata</i>	15	15	15	good	good			remove
21495	flowering cherry	<i>Prunus serrulata</i>	18	18	15	good	fair	lean		remove
21496	flowering cherry	<i>Prunus serrulata</i>	12	12	10	good	good			remove
21497	flowering cherry	<i>Prunus serrulata</i>	15	15	12	good	fair	crossing leaders		remove
21498	flowering cherry	<i>Prunus serrulata</i>	18	18	16	good	good			remove
21499	flowering cherry	<i>Prunus serrulata</i>	19	19	15	good	good			remove
21500	flowering cherry	<i>Prunus serrulata</i>	3	3	4	good	good		exempt (<8" DBH)	remove





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Tree No.	Common Name	Scientific Name	DBH <sup>1</sup>	Single DBH <sup>2</sup>	C-Rad <sup>3</sup>	Condition <sup>4</sup>	Structure <sup>4</sup>	Comments	Exempt (less than 8-inches DBH or dead)	Treatment
21501	flowering cherry	<i>Prunus serrulata</i>	17	17	15	fair	fair	deadwood, lean, one-sided, thin		remove
21502	flowering cherry	<i>Prunus serrulata</i>	11	11	12	good	good			remove
21503	flowering cherry	<i>Prunus serrulata</i>	21	21	20	good	good			remove
21504	flowering cherry	<i>Prunus serrulata</i>	21	21	20	good	fair	trunk flare oddities		remove
21505	flowering cherry	<i>Prunus serrulata</i>	3	3	3	good	good		exempt (<8" DBH)	remove
21506	flowering cherry	<i>Prunus serrulata</i>	21	21	20	fair	fair	deadwood, trunk decay		remove
21507	flowering cherry	<i>Prunus serrulata</i>	3	3	4	good	good		exempt (<8" DBH)	remove
21508	flowering cherry	<i>Prunus serrulata</i>	26	26	22	good	good			remove
21514	flowering cherry	<i>Prunus serrulata</i>	25	25	22	poor	fair	deadwood, one-sided, thin		retain
21515	flowering cherry	<i>Prunus serrulata</i>	24	24	15	fair	fair	deadwood, one-sided, thin, epicormic branches		retain
21516	flowering cherry	<i>Prunus serrulata</i>	18	18	15	very poor	poor	deadwood, one-sided, thin	exempt (dead)	retain
21517	flowering cherry	<i>Prunus serrulata</i>	16	16	16	poor	fair	deadwood, one-sided, thin		remove
21518	flowering cherry	<i>Prunus serrulata</i>	17	17	16	fair	poor	one-sided, thin, only two leaders		remove
21520	Douglas-fir	<i>Pseudotsuga menziesii</i>	25	25	20	good	good			retain
21521	flowering cherry	<i>Prunus serrulata</i>	16	16	16	fair	fair	one-sided, thin, crossing leaders		retain
21522	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	24	18	good	good			retain
21523	Douglas-fir	<i>Pseudotsuga menziesii</i>	23	23	20	good	fair	one-sided		retain
21524	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	21	18	good	good			retain
21525	Douglas-fir	<i>Pseudotsuga menziesii</i>	20	20	15	poor	fair	deadwood, thin, high crown		remove
21526	flowering cherry	<i>Prunus serrulata</i>	16	16	12	poor	poor	deadwood, one-sided, thin, lower trunk oddity, only two leaders		remove
21527	flowering cherry	<i>Prunus serrulata</i>	15	15	18	fair	fair	one-sided, thin, only two leaders		remove
21528	flowering cherry	<i>Prunus serrulata</i>	17	17	20	good	fair	one-sided		remove
21529	flowering cherry	<i>Prunus serrulata</i>	25	25	18	good	fair	only two leaders		remove
21530	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	21	20	good	fair	one-sided		remove
21531	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	21	15	good	fair	high crown		remove
21532	Douglas-fir	<i>Pseudotsuga menziesii</i>	22	22	22	fair	fair	lean, one-sided, thin		remove
21533	flowering cherry	<i>Prunus serrulata</i>	18	18	14	poor	poor	deadwood, lean, one-sided, thin		remove
21534	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	24	25	good	fair	lean, one-sided		remove
21535	Douglas-fir	<i>Pseudotsuga menziesii</i>	27	27	20	good	fair	one-sided		remove
21641	flowering cherry	<i>Prunus serrulata</i>	4	4	6	good	good		exempt (<8" DBH)	remove
21642	flowering cherry	<i>Prunus serrulata</i>	15	15	12	good	fair	trunk decay		remove
21643	flowering cherry	<i>Prunus serrulata</i>	15	15	15	fair	good	deadwood		remove
21645	flowering cherry	<i>Prunus serrulata</i>	14	14	8	fair	fair	deadwood, lacks buttress roots on west side		remove
21646	flowering cherry	<i>Prunus serrulata</i>	15	15	12	good	fair	one-sided, lacks buttress roots on east side		remove
21647	flowering cherry	<i>Prunus serrulata</i>	10	10	10	fair	fair	thin, two leaders		remove
21660	flowering cherry	<i>Prunus serrulata</i>	2	2	2	good	good		exempt (<8" DBH)	remove
21661	flowering cherry	<i>Prunus serrulata</i>	2	2	2	good	good		exempt (<8" DBH)	remove
21663	flowering cherry	<i>Prunus serrulata</i>	14	14	10	fair	poor	basal decay, deadwood, thin, trunk decay		remove
21664	flowering cherry	<i>Prunus serrulata</i>	14	14	10	good	fair	burls at trunk base		remove
21664	flowering cherry	<i>Prunus serrulata</i>	15	15	12	good	fair	deadwood, trunk decay, surface root damage and possibly lifting on east side		remove
21665	flowering cherry	<i>Prunus serrulata</i>	12	12	15	good	fair	lean, lacks buttress roots on east side		remove
21743	flowering cherry	<i>Prunus serrulata</i>	21	21	25	fair	fair	deadwood, one-sided, thin		retain
21744	northern red oak	<i>Quercus rubra</i>	23	23	25	fair	fair	deadwood, lean, one-sided, thin		retain
21797	zelkova	<i>Zelkova serrulata</i>	20	20	25	good	fair	codominant leaders, diameter measured at 2.5', epicormic branches		retain
21800	zelkova	<i>Zelkova serrulata</i>	19	19	25	good	fair	codominant leaders, one-sided, diameter measured at 3.5'		retain
21935	Honey locust	<i>Gleditsia tricanthos</i>	5	5	5	poor	fair	deadwood, lean, one-sided, thin	exempt (<8" DBH)	retain
21938	Honey locust	<i>Gleditsia tricanthos</i>	2	2	8	fair	good	deadwood, thin	exempt (<8" DBH)	retain
21939	Honey locust	<i>Gleditsia tricanthos</i>	4	4	10	good	fair	lean	exempt (<8" DBH)	retain
21940	Honey locust	<i>Gleditsia tricanthos</i>	5	5	10	fair	fair	deadwood, lean	exempt (<8" DBH)	retain
21941	Honey locust	<i>Gleditsia tricanthos</i>	4	4	8	fair	fair	deadwood, thin	exempt (<8" DBH)	retain
21942	Honey locust	<i>Gleditsia tricanthos</i>	5	5	10	fair	fair	deadwood, thin	exempt (<8" DBH)	retain



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Tree No.	Common Name	Scientific Name	DBH <sup>1</sup>	Single DBH <sup>2</sup>	C-Rad <sup>3</sup>	Condition <sup>4</sup>	Structure <sup>4</sup>	Comments	Exempt (less than 8-inches DBH or dead)	Treatment
22042	Honey locust	<i>Gleditsia tricanthos</i>	3	3	1	very poor	very poor	deadwood, lean, trunk decay, irreversible state of decline	exempt (<8" DBH, dead)	retain
22043	Honey locust	<i>Gleditsia tricanthos</i>	6	6	8	good	good		exempt (<8" DBH)	retain
22044	Honey locust	<i>Gleditsia tricanthos</i>	6	6	8	fair	fair	deadwood, lean	exempt (<8" DBH)	retain
22045	Honey locust	<i>Gleditsia tricanthos</i>	3	3	4	poor	poor	deadwood, lean, thin	exempt (<8" DBH)	retain
22074	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	12	12	15	fair	fair	deadwood, lean, thin, lacks trunk flare		retain
22075	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	11	11	15	fair	good	deadwood, thin		retain
22076	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	9	9	15	fair	good	basal decay, deadwood, thin, missing bark on west side		retain
22077	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	13	13	16	good	good			retain
22131	Honey locust	<i>Gleditsia tricanthos</i>	5	5	7	fair	poor	deadwood, lean, thin	exempt (<8" DBH)	retain
22132	Honey locust	<i>Gleditsia tricanthos</i>	4	4	10	fair	fair	deadwood, lean, thin	exempt (<8" DBH)	retain
22133	Honey locust	<i>Gleditsia tricanthos</i>	6	6	10	fair	fair	deadwood, lean, thin	exempt (<8" DBH)	retain
22233	London planetree	<i>Platanus x acerifolia</i>	16	16	25	good	good			retain
22291	London planetree	<i>Platanus x acerifolia</i>	19	19	20	good	good			retain
22390	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	11	11	14	fair	fair	deadwood, lean		remove
22390	littleleaf linden	<i>Tilia cordata</i>	15	15	28	good	fair	one-sided		remove
22395	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	14	14	18	good	good			remove
22564	flowering cherry	<i>Prunus serrulata</i>	14	14	18	fair	fair	deadwood, one-sided, thin		remove
22565	flowering cherry	<i>Prunus serrulata</i>	23	23	12	fair	fair	deadwood, thin		remove
22566	flowering cherry	<i>Prunus serrulata</i>	21	21	15	fair	fair	deadwood, thin		remove
22567	flowering cherry	<i>Prunus serrulata</i>	17	17	16	good	good			remove
22568	flowering cherry	<i>Prunus serrulata</i>	22	22	18	fair	fair	deadwood, thin		remove
22569	flowering cherry	<i>Prunus serrulata</i>	22	22	18	fair	fair	deadwood, thin, trunk wound on south side		remove
22575	littleleaf linden	<i>Tilia cordata</i>	17	17	20	good	good			remove
22581	flowering cherry	<i>Prunus serrulata</i>	19	19	14	fair	good	deadwood		remove
22582	flowering cherry	<i>Prunus serrulata</i>	23	23	15	fair	fair	deadwood, crossing and fused leaders		remove
22583	flowering cherry	<i>Prunus serrulata</i>	3	3	5	good	good		exempt (<8" DBH)	remove
22584	flowering cherry	<i>Prunus serrulata</i>	3	3	4	good	good		exempt (<8" DBH)	remove
22585	flowering cherry	<i>Prunus serrulata</i>	3	3	4	good	good		exempt (<8" DBH)	remove
22586	flowering cherry	<i>Prunus serrulata</i>	16	16	16	good	fair	Crossing leaders, fused leaders, surface root damage		remove
22610	London planetree	<i>Platanus x acerifolia</i>	15	15	22	good	good			remove
22633	London planetree	<i>Platanus x acerifolia</i>	13	13	18	good	good			remove
22688	littleleaf linden	<i>Tilia cordata</i>	16	16	16	good	good			retain
22688.01	littleleaf linden	<i>Tilia cordata</i>	17	17	25	good	fair	codominant leaders, epicormic branches		retain
22688.02	littleleaf linden	<i>Tilia cordata</i>	13	13	15	good	fair	one-sided, epicormic branches off of trunk		retain
22688.03	littleleaf linden	<i>Tilia cordata</i>	15	15	18	good	fair	codominant leaders, lean, location approximated by arborist, closed trunk wound southeast side		retain
22688.04	littleleaf linden	<i>Tilia cordata</i>	12	12	18	fair	fair	one-sided, location approximated by arborist, epicormic branches off trunk		retain
22701	northern red oak	<i>Quercus rubra</i>	26	26	25	fair	good	thin, epicormic branches		retain
22702	northern red oak	<i>Quercus rubra</i>	27	27	30	good	fair	one-sided		retain
22774	littleleaf linden	<i>Tilia cordata</i>	11	11	20	good	good			retain
22791	northern red oak	<i>Quercus rubra</i>	25	25	18	good	good			retain
22792	littleleaf linden	<i>Tilia cordata</i>	16	16	26	good	fair	codominant leaders		retain
22819	northern red oak	<i>Quercus rubra</i>	26	26	20	good	good			retain
22830	northern red oak	<i>Quercus rubra</i>	13	13	20	good	fair	uneven bark on northwest side, three codominant leaders at 10'		retain
22833	northern red oak	<i>Quercus rubra</i>	14	14	20	good	fair	lean, one-sided		retain
22837	northern red oak	<i>Quercus rubra</i>	30	30	32	good	fair	girdling root northwest side, large diameter lateral leaders		retain
22870	littleleaf linden	<i>Tilia cordata</i>	13	13	20	good	fair	lean		retain
22871	littleleaf linden	<i>Tilia cordata</i>	14	14	20	good	good			retain
22898	littleleaf linden	<i>Tilia cordata</i>	15	15	18	good	fair	lean		retain
22940	London planetree	<i>Platanus x acerifolia</i>	10	10	15	fair	good	twig dieback		retain
22959	London planetree	<i>Platanus x acerifolia</i>	12	12	18	fair	good	thin, twig dieback		retain
22976	littleleaf linden	<i>Tilia cordata</i>	15	15	18	good	fair	one-sided		retain



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Tree No.	Common Name	Scientific Name	DBH <sup>1</sup>	Single DBH <sup>2</sup>	C-Rad <sup>3</sup>	Condition <sup>4</sup>	Structure <sup>4</sup>	Comments	Exempt (less than 8-inches DBH or dead)	Treatment
22980	littleleaf linden	<i>Tilia cordata</i>	16	16	20	good	fair	codominant leaders		retain
22985	littleleaf linden	<i>Tilia cordata</i>	14	14	16	good	good			retain
22987	littleleaf linden	<i>Tilia cordata</i>	15	15	18	good	fair	one-sided		retain
23097	littleleaf linden	<i>Tilia cordata</i>	14	14	20	good	fair	codominant leaders with inclusion, lean, one-sided		retain
23098	littleleaf linden	<i>Tilia cordata</i>	14	14	22	good	fair	codominant leaders with inclusion, one-sided		retain
23117	littleleaf linden	<i>Tilia cordata</i>	14	14	20	good	fair	one-sided, lacks trunk flare		retain
23120	littleleaf linden	<i>Tilia cordata</i>	13	13	18	good	good			retain
23276	littleleaf linden	<i>Tilia cordata</i>	16	16	22	good	fair	lean, one-sided, girdling roots		retain
23283	littleleaf linden	<i>Tilia cordata</i>	13	13	15	good	fair	codominant leaders, lean		retain
23284	littleleaf linden	<i>Tilia cordata</i>	13	13	20	good	fair	overextended limb		retain
23285	littleleaf linden	<i>Tilia cordata</i>	14	14	22	good	fair	codominant leaders, girdling roots		retain
23286	littleleaf linden	<i>Tilia cordata</i>	12	12	18	good	fair	codominant leaders		retain
23307	littleleaf linden	<i>Tilia cordata</i>	15	15	20	good	fair	fused and crossing leaders		retain
23307.01	littleleaf linden	<i>Tilia cordata</i>	14	14	18	good	fair	location approximated by arborist, fused and crossing leaders		retain
23308	littleleaf linden	<i>Tilia cordata</i>	13	13	18	good	fair	girdling roots		retain
23326	littleleaf linden	<i>Tilia cordata</i>	15	15	18	good	fair	one-sided		retain
23339	littleleaf linden	<i>Tilia cordata</i>	12	12	18	good	fair	codominant leaders, one-sided		retain
23389	littleleaf linden	<i>Tilia cordata</i>	17	17	25	good	good			retain
23391	littleleaf linden	<i>Tilia cordata</i>	16	16	23	good	fair	codominant leaders, girdling roots		retain
23392	littleleaf linden	<i>Tilia cordata</i>	16	16	20	good	fair	one-sided		retain
23393	littleleaf linden	<i>Tilia cordata</i>	12	12	18	good	fair	lean, one-sided		retain
23394	littleleaf linden	<i>Tilia cordata</i>	16	16	20	good	fair	codominant leaders, lean, one-sided		retain
23406	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	21	25	good	good			retain
23407	Douglas-fir	<i>Pseudotsuga menziesii</i>	23	23	25	good	good			retain
23408	Douglas-fir	<i>Pseudotsuga menziesii</i>	29	29	26	good	good			retain
23410	Douglas-fir	<i>Pseudotsuga menziesii</i>	29	29	30	good	good			retain
23411	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	11	10	fair	fair	deadwood, thin, suppressed		retain
23412	Douglas-fir	<i>Pseudotsuga menziesii</i>	27	27	25	good	good			retain
23413	Oregon white oak	<i>Quercus garryana</i>	32	32	25	fair	fair	trunk cavity, crowded leaders at 20, flush cuts		retain
23415	flowering cherry	<i>Prunus serrulata</i>	22	22	25	poor	fair	lean, trunk decay, overextended branches		retain
23416	flowering cherry	<i>Prunus serrulata</i>	23	23	30	poor	fair	lean, thin, overextended branches		retain
23417	Douglas-fir	<i>Pseudotsuga menziesii</i>	25	25	25	good	good			retain
23418	flowering cherry	<i>Prunus serrulata</i>	17	17	16	fair	fair	lean, one-sided		retain
23419	flowering cherry	<i>Prunus serrulata</i>	20	20	10	very poor	very poor	Fungal conk at base, two live leaders	exempt (dead)	retain
23420	flowering cherry	<i>Prunus serrulata</i>	17	17	20	fair	fair	basal decay, multiple burts		retain
23421	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	14	16	good	good			retain
23422	Douglas-fir	<i>Pseudotsuga menziesii</i>	22	22	22	good	good			retain
23429	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	14	15	good	good			remove
23432	Douglas-fir	<i>Pseudotsuga menziesii</i>	26	26	25	good	good			remove
23433	Douglas-fir	<i>Pseudotsuga menziesii</i>	44	44	28	good	good			retain
23434	Douglas-fir	<i>Pseudotsuga menziesii</i>	45	45	28	good	good			retain
23435	Douglas-fir	<i>Pseudotsuga menziesii</i>	31	31	30	good	good			retain
23474	Douglas-fir	<i>Pseudotsuga menziesii</i>	20	20	20	good	good			retain
23475	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	12	15	good	fair	one-sided		retain
23476	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	24	18	poor	good	thin		retain
23477	Douglas-fir	<i>Pseudotsuga menziesii</i>	20	20	18	good	good			retain
23478	Douglas-fir	<i>Pseudotsuga menziesii</i>	26	26	20	good	good			retain
23479	flowering cherry	<i>Prunus serrulata</i>	17	17	15	poor	poor	basal decay, deadwood, one-sided, thin, three leaders, change icon to deciduous		retain
23480	flowering cherry	<i>Prunus serrulata</i>	25	25	15	fair	fair	one-sided, thin		retain
23509	northern red oak	<i>Quercus rubra</i>	12	12	16	good	good			retain
23613	northern red oak	<i>Quercus rubra</i>	25	25	35	good	good			retain





Attachment 3 - Tree Inventory - All Trees  
LAM Research  
9/7/2022 9/8/2022

Tree No.	Common Name	Scientific Name	DBH <sup>1</sup>	Single DBH <sup>2</sup>	C-Rad <sup>3</sup>	Condition <sup>4</sup>	Structure <sup>4</sup>	Comments	Exempt (less than 8-inches DBH or dead)	Treatment
23613.01	northern red oak	<i>Quercus rubra</i>	20	20	25	fair	fair	lean, one-sided, thin, location approximated by arborist, location approximated by arborist		retain
23613.02	northern red oak	<i>Quercus rubra</i>	21	21	28	good	fair	one-sided, location approximated by arborist, location approximated by arborist		retain
23614	northern red oak	<i>Quercus rubra</i>	30	30	28	good	fair	one-sided		retain
23614.01	northern red oak	<i>Quercus rubra</i>	22	22	28	good	fair	one-sided, location approximated by arborist, location approximated by arborist		retain
23615	northern red oak	<i>Quercus rubra</i>	27	27	32	good	good			retain
23693	littleleaf linden	<i>Tilia cordata</i>	1	1	3	fair	good	thin, recommend removal of planting stakes and ties	exempt (<8" DBH)	retain
23715	northern red oak	<i>Quercus rubra</i>	11	11	12	poor	fair	codominant leaders, deadwood, thin, chlorotic		retain
23715.01	Japanese maple	<i>Acer palmatum</i>	11	11	12	good	good	location approximated by arborist, diameter measured at 1'		retain
23800	Douglas-fir	<i>Pseudotsuga menziesii</i>	49	49	25	good	good			retain
23801	bigleaf maple	<i>Acer macrophyllum</i>	6	6	15	fair	fair	lean, one-sided	exempt (<8" DBH)	retain
23803	Douglas-fir	<i>Pseudotsuga menziesii</i>	45	45	20	good	good			retain
23807	sweet cherry	<i>Prunus avium</i>	18	18	10	poor	fair	deadwood, lean, one-sided, thin		retain
24041	sweet cherry	<i>Prunus avium</i>	17	17	10	poor	fair	deadwood, lean, one-sided, thin		retain
24041.01	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	10	12	good	good	location approximated by arborist		retain
24041.02	sweet cherry	<i>Prunus avium</i>	18	18	15	fair	fair	lean, one-sided, heavy ivy load		retain
24042	bigleaf maple	<i>Acer macrophyllum</i>	10	10	20	good	fair	lean, one-sided		retain
24042.01	bigleaf maple	<i>Acer macrophyllum</i>	10,7	12	10	fair	fair	codominant leaders with inclusion, lean, thin, location approximated by arborist		retain
24042.02	bigleaf maple	<i>Acer macrophyllum</i>	17	17	28	fair	fair	basal decay, lean, one-sided, location approximated by arborist		retain
24042.03	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	14	14	fair	fair	lean, thin		retain
24049	cottonwood	<i>Populus trichocarpa</i>	30	30	20	good	good			retain
24049.01	cottonwood	<i>Populus trichocarpa</i>	18	18	15	good	fair	lean		retain
24049.02	cottonwood	<i>Populus trichocarpa</i>	26	26	20	good	fair	high crown		retain
24056	bigleaf maple	<i>Acer macrophyllum</i>	22	22	20	fair	fair	lean, one-sided, thin		retain
24057	bigleaf maple	<i>Acer macrophyllum</i>	10	10	15	fair	fair	one-sided, sweeping trunk		retain
24057.01	bigleaf maple	<i>Acer macrophyllum</i>	25	25	25	fair	poor	basal decay, codominant leaders, lean, trunk decay, location approximated by arborist, crossing leaders, standing leader, failed leader is a nurse log		retain
24057.02	Scoulers willow	<i>Salix scouleriana</i>	8,6,6	12	15	fair	poor	codominant leaders, lean, one-sided, location approximated by arborist		retain
24061	bigleaf maple	<i>Acer macrophyllum</i>	31	31	20	fair	fair	heavy ivy load distorts tree structure, diameter approximate		retain
24073	Scoulers willow	<i>Salix scouleriana</i>	18	18	10	good	fair	high crown		retain
3001	Douglas-fir	<i>Pseudotsuga menziesii</i>	26	26	32	good	fair	location approximated by arborist		retain
3002	bigleaf maple	<i>Acer macrophyllum</i>	16	16	30	poor	poor	location approximated by arborist		retain
3003	Douglas-fir	<i>Pseudotsuga menziesii</i>	26	26	20	good	good	location approximated by arborist		retain
3004	cottonwood	<i>Populus trichocarpa</i>	50	50	25	good	fair	location approximated by arborist		retain
3005	sweet cherry	<i>Prunus avium</i>	16	16	15	fair	fair	location approximated by arborist		retain
3006	bigleaf maple	<i>Acer macrophyllum</i>	8	8	12	fair	fair	location approximated by arborist		retain
3007	bigleaf maple	<i>Acer macrophyllum</i>	8	8	12	fair	fair	location approximated by arborist		retain
3008	Scoulers willow	<i>Salix scouleriana</i>	9	9	10	fair	fair	location approximated by arborist		retain
3009	Scoulers willow	<i>Salix scouleriana</i>	7	7	10	fair	poor	location approximated by arborist	exempt (<8" DBH)	retain
3010	bigleaf maple	<i>Acer macrophyllum</i>	17	17	20	poor	poor	location approximated by arborist		retain
3011	Douglas-fir	<i>Pseudotsuga menziesii</i>	17	17	20	poor	fair	location approximated by arborist		retain
3012	bigleaf maple	<i>Acer macrophyllum</i>	8	8	10	fair	poor	location approximated by arborist		retain
3013	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	11	8	poor	poor	location approximated by arborist		retain
3014	Douglas-fir	<i>Pseudotsuga menziesii</i>	42	42	25	poor	poor	location approximated by arborist	exempt (dead)	retain
3015	flowering cherry	<i>Prunus serrulata</i>	13	13	10	fair	fair	location approximated by arborist		remove
3016	flowering cherry	<i>Prunus serrulata</i>	11	11	12	good	poor	location approximated by arborist		remove
3017	flowering cherry	<i>Prunus serrulata</i>	17	17	10	fair	fair	location approximated by arborist		remove
3018	flowering cherry	<i>Prunus serrulata</i>	14	14	120	good	fair	location approximated by arborist		remove
3019	flowering cherry	<i>Prunus serrulata</i>	12	12	10	good	good	location approximated by arborist		remove
3020	Autumn Blaze red maple	<i>Acer x freemanii</i>	3	3	5	good	good	location approximated by arborist	exempt (<8" DBH)	remove
3021	northern red oak	<i>Quercus rubra</i>	26	26	35	good	good	location approximated by arborist		retain
3022	northern red oak	<i>Quercus rubra</i>	27	27	35	good	fair	codominant leaders with inclusion, location approximated by arborist		retain



Todd Prager & Associates  
LLC

Attachment 3 - Tree Inventory - All Trees

LAM Research

9/7/2022 9/8/2022

Tree No.	Common Name	Scientific Name	DBH <sup>1</sup>	Single DBH <sup>2</sup>	C-Rad <sup>3</sup>	Condition <sup>4</sup>	Structure <sup>4</sup>	Comments	Exempt (less than 8-inches DBH or dead)	Treatment
3023	zelkova	<i>Zelkova serrulata</i>	23	23	25	good	fair	diameter measured at 2', one-sided, crowded leaders at 6', location approximated by arborist		retain
3024	zelkova	<i>Zelkova serrulata</i>	14	14	16	good	fair	diameter measured at 4', codominant leaders, location approximated by arborist		retain
3025	northern red oak	<i>Quercus rubra</i>	22	22	28	good	fair	one-sided, location approximated by arborist		retain
3026	northern red oak	<i>Quercus rubra</i>	24	30	30	good	fair	one-sided, location approximated by arborist		retain
3027	northern red oak	<i>Quercus rubra</i>	19	19	20	fair	good	twig dieback, location approximated by arborist		retain
3028	northern red oak	<i>Quercus rubra</i>	25	25	30	good	fair	one-sided, crowded leader at 8', location approximated by arborist		retain
3029	northern red oak	<i>Quercus rubra</i>	19	19	28	fair	good	twig dieback, location approximated by arborist		retain
3030	northern red oak	<i>Quercus rubra</i>	20	20	35	good	fair	codominant leaders, location approximated by arborist		retain
3031	northern red oak	<i>Quercus rubra</i>	25	25	35	fair	good	twig dieback, location approximated by arborist		retain
3032	zelkova	<i>Zelkova serrulata</i>	18	18	30	fair	fair	diameter measured at 2', crowded leaders at 6', location approximated by arborist		retain
3033	zelkova	<i>Zelkova serrulata</i>	21	21	15	fair	fair	diameter measured at 2', crowded leaders at 6', location approximated by arborist		retain
3034	zelkova	<i>Zelkova serrulata</i>	22	22	30	good	fair	diameter measured at 3.5', crowded leaders at 6', location approximated by arborist		retain
3035	zelkova	<i>Zelkova serrulata</i>	18	18	30	good	fair	diameter measured at 4', crowded leaders at 6', location approximated by arborist		retain
3036	northern red oak	<i>Quercus rubra</i>	29	29	40	fair	fair	codominant leaders, twig dieback, location approximated by arborist		retain
3037	northern red oak	<i>Quercus rubra</i>	15	15	30	good	good	location approximated by arborist		retain
3038	northern red oak	<i>Quercus rubra</i>	18	18	25	fair	fair	twig dieback, one-sided, crowded leaders at 12', location approximated by arborist		retain

<sup>1</sup>DBH is the trunk diameter in inches.

<sup>2</sup>Single DBH is the trunk diameter of a multi-trunked tree converted to a single number according to the following formula: square root of the sum of all squared trunk diameters.

<sup>3</sup>C-Rad is the approximate crown radius in feet.

<sup>4</sup>Condition and Structure ratings range from very poor, poor, fair, to good.

## Attachment 4 Tree Protection Recommendations

The following recommendations will help to ensure that the trees to be retained are adequately protected:

### Before Construction Begins

1. Notify all contractors of tree protection procedures. For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection.
  - a. Hold a tree protection meeting with all contractors to explain the goals of tree protection.
  - b. Have all contractors sign memoranda of understanding regarding the goals of tree protection. The memoranda should include a penalty for violating the tree protection plan. The penalty should equal the resulting fines issued by the local jurisdiction plus the appraised value of the tree(s) within the violated tree protection zone per the current Trunk Formula Method as outlined in the current edition of the *Guide for Plant Appraisal* by the Council of Tree & Landscape Appraisers. The penalty should be paid to the owner of the property.
2. Fencing
  - a. Trees to remain on site will be protected by installation of tree protection fencing as shown in Attachment 1.
  - b. The fencing should be put in place before the ground is cleared to protect the trees and the soil around the trees from disturbances.
  - c. Fencing should be established by the project arborist based on the needs of the trees to be protected and to facilitate construction.
  - d. Fencing should consist of 6-foot high steel fencing on concrete blocks or 6-foot metal fencing secured to the ground with 8-foot metal posts to prevent it from being moved by contractors, sagging, or falling down.
  - e. Fencing should remain in the position that is established by the project arborist and not be moved without approval from the project arborist until final project approval.
3. Signage
  - a. All tree protection fencing should have signage as follows so that all contractors understand the purpose of the fencing:

**TREE PROTECTION ZONE**

**DO NOT REMOVE OR ADJUST THE LOCATION OF THIS  
TREE PROTECTION FENCING**

**UNAUTHORIZED ENCROACHMENT MAY RESULT IN FINES**

Please contact the project arborist if alterations to the location of the tree protection fencing are necessary.

Todd Prager, Project Arborist, 971-295-4835

- b. Signage should be placed every 75-feet or less.



### During Construction

1. Protection Guidelines Within the Tree Protection Zones:
  - a. No new buildings; grade change or cut and fill, during or after construction; new impervious surfaces; or utility or drainage field placement should be allowed within the tree protection zones.
  - b. No traffic should be allowed within the tree protection zones. This includes but is not limited to vehicle, heavy equipment, or even repeated foot traffic.
  - c. No storage of materials including but not limiting to soil, construction material, or waste from the site should be permitted within the tree protection zones. Waste includes but is not limited to concrete wash out, gasoline, diesel, paint, cleaner, thinners, etc.
  - d. Construction trailers should not to be parked/placed within the tree protection zones.
  - e. No vehicles should be allowed to park within the tree protection zones.
  - f. No other activities should be allowed that will cause soil compaction within the tree protection zones.
2. The trees should be protected from any cutting, skinning or breaking of branches, trunks or woody roots.
3. The project arborist should be notified prior to the cutting of woody roots from trees that are to be retained to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots should be immediately covered with soil or mulch to prevent them from drying out.
4. Trees that have woody roots cut should be provided supplemental water during the summer months.
5. Any necessary passage of utilities through the tree protection zones should be by means of tunneling under woody roots by hand digging or boring with oversight by the project arborist.
6. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

### After Construction

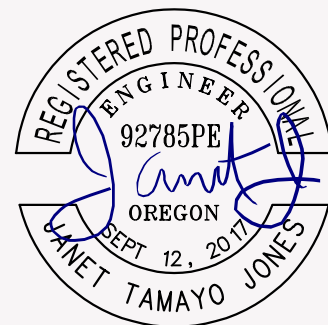
1. Carefully landscape the areas within the tree protection zones. Do not allow trenching for irrigation or other utilities within the tree protection zones.
2. Carefully plant new plants within the tree protection zones. Avoid cutting the woody roots of trees that are retained.
3. Do not install permanent irrigation within the tree protection zones unless it is drip irrigation to support a specific planting or the irrigation is approved by the project arborist.
4. Provide adequate drainage within the tree protection zones and do not alter soil hydrology significantly from existing conditions for the trees to be retained.
5. Provide for the ongoing inspection and treatment of insect and disease populations that are capable of damaging the retained trees and plants.
6. The retained trees may need to be fertilized if recommended by the project arborist.
7. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

## **Attachment 5**

### **Assumptions and Limiting Conditions**

1. Any legal description provided to the consultant is assumed to be correct. The site plans and construction information provided by Mackenzie was the basis of the information provided in this report.
2. It is assumed that this property is not in violation of any codes, statutes, ordinances, or other governmental regulations.
3. The consultant is not responsible for information gathered from others involved in various activities pertaining to this project. Care has been taken to obtain information from reliable sources.
4. Loss or alteration of any part of this delivered report invalidates the entire report.
5. Drawings and information contained in this report may not be to scale and are intended to be used as display points of reference only.
6. The consultant's role is only to make recommendations. Inaction on the part of those receiving the report is not the responsibility of the consultant.
7. The purpose of this report is to:
  - Provide tree removal findings and recommendations based on the proposed site and grading plans; and
  - Provide recommendations for adequately protecting the trees to be retained during construction.

# MACKENZIE.



EXPIRES: 6/30/23

## TRANSPORTATION IMPACT ANALYSIS

**To**  
City of Tualatin

**For**  
Lam Research

**Dated**  
August 12, 2022

**Project Number**  
2220087.00



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## I. INTRODUCTION

This Transportation Impact Analysis (TIA) has been prepared in support of the proposed new office building (Building G) at the Lam Research campus in Tualatin, Oregon. Figure 1 (in Appendix A) presents a vicinity map indicating the project location.

### Project Description

An approximately 120,000-square-foot (SF) office building is proposed just north of SW Leveton Drive between the existing Center and East Accesses. Up to 600 office staff are planned to occupy the proposed building. Fewer than 10% of the new office staff will work remotely. Surface parking for approximately 530 spaces is proposed along SW 108th Avenue. The buildout year for the new office building is assumed to be 2024.

The existing East Access on SW Leveton Drive is proposed to be limited to truck access. To accommodate the additional office trips, two (2) new driveways are proposed on SW 108th Avenue with direct access to the expanded parking area. The North Access is proposed to be aligned opposite the north driveway serving Olympic Controls. The South Access is proposed approximately 445 feet south of the North Access.

### Scope of Analysis

This TIA has been prepared in accordance with the *City of Tualatin Traffic Study Requirements* (updated March 16, 2022), Tualatin Development Code (TDC) Section 74.440, and the Oregon Department of Transportation's (ODOT) *Analysis Procedures Manual* (APM) Version 2. This study includes a summary of existing traffic conditions, crash review, proposed trip generation, and an analysis of intersection operations, sight distance, queuing, and signal and turn-lane warrants.

A TIS scoping letter dated June 30, 2022 was submitted to City staff and approved in a July 15, 2022 email. An additional study area intersection was requested in an August 2, 2022 email. The scoping letter and corresponding communications are provided in Appendix B for reference.

### Study Area

The City's *Traffic Study Requirements* document requires all intersections within a 1/4-mile radius of the project site be included as part of the study area. Washington County requires analysis for all intersections where project trips will exceed 10% of the existing average daily traffic (ADT). No Washington County intersections were found to meet this threshold. The following intersections are located within the 1/4-mile radius and were included in the study area:

1. Pacific Highway W (OR-99W)/SW 124th Avenue
2. SW Tualatin Road/SW 124th Avenue
3. SW Tualatin Road/SW 108th Avenue
4. SW 108th Avenue/North Access
5. SW 108th Avenue/South Access
6. SW Leveton Drive/SW 124th Avenue
7. SW Leveton Drive/SW 118th Avenue
8. SW Leveton Drive/West Access
9. SW Leveton Drive/Center Access
10. SW Leveton Drive/East Access



11. SW Leveton Drive/SW 108th Avenue
12. SW Herman Road/SW 108th Avenue
13. SW Tualatin Road/SW Teton Avenue

All study area intersections are located within City of Tualatin jurisdiction. The OR 99W/SW 124th Avenue intersection is located on an ODOT facility.

### ***Analysis Scenarios***

This TIS addresses AM and PM peak hour conditions for the following analysis scenarios:

- 2022 Seasonally Adjusted
- 2024 Pre-Development without proposed Office
- 2024 Post-Development with proposed Office

## II. EXISTING CONDITIONS

The existing conditions analysis is based on a current year 2022 inventory of transportation facilities and traffic data.

### Site Conditions

The project site is in Tualatin, Oregon within the Portland metropolitan area. The site is approximately 58.01 acres and consist of tax lots 100 of Washington County tax map 2S1 22AB, and tax lots 500 and 800 of tax map 2S1 22AA. The site is part of the City’s Manufacturing Park (MP) Planning District. The Novellus Industrial Master Plan (IMP) was approved in 2001 as a four-phase development consisting of 1,440,000 SF. The proposed office building is considered to be the last building of the IMP’s Phase 1. The proposed site plan is presented in Figure 2.

### Vehicular Transportation Facilities

Figure 3 presents existing lane configurations and traffic control devices for all study area intersections. Table 1 below summarizes roadway characteristics within the study area.

TABLE 1 – ROADWAY CHARACTERISTICS						
Roadway	Functional Classification	Posted Speed	Travel Lanes	Bike Lanes	On-Street Parking	Sidewalks
OR 99W (Pacific Highway W)	Major Arterial/ (Urban Principal Arterial)	45/55 mph	4	Yes	None	Intermittent
SW 124th Avenue	Major Arterial	45 mph	4/5	Yes	None	Yes
SW Tualatin Road	Major Collector	35 mph	3	Yes	None	Yes
SW Leveton Drive	Minor Arterial	35 mph	2	Yes	None	Yes
SW 108th Avenue	Minor Collector (north of SW Leveton Drive)	35 mph	2	Yes	None	Yes
SW Herman Road	Minor Arterial	35 mph	2	Yes	None	Yes
SW Teton Avenue	Minor Arterial	35 mph	2	Yes	None	Yes

### Pedestrian and Bicycle Facilities

The study area has nearly complete bicycle and pedestrian networks. Clearly marked bike lanes are provided on all study area roadways. Curb-tight sidewalks are provided on SW 108th Avenue and SW Tualatin Road, as well as some segments of the north side of SW Herman Road. Separated sidewalks are provided on all other study roadways and segments.

### Transit Facilities

The study area is served by TriMet Bus Lines 94 and 97 with stops on Pacific Highway W (OR 99W) and SW Tualatin Road. The Tualatin Shuttle also has a stop on SW Leveton Drive just south of the site. Transit maps and bus schedules are provided in Appendix C for reference.

## **Existing Traffic Counts**

Existing turning movement counts were collected on Thursday, June 9, 2022, during the AM and PM peak periods.

Historical traffic counts from Tuesday, May 11, 2021 for the SW Tualatin Road/SW Teton Avenue intersection were utilized as this intersection was requested for analysis by City staff while school was not in session. An adjustment of 1.30 was applied to the AM peak hour counts and an adjustment of 1.05 was applied to the PM peak hour counts at this location to reflect the growth from 2021 to 2022.

Figure 4 presents the existing AM and PM peak hour traffic volumes. Raw traffic count summaries are provided in Appendix D.

### ***Seasonal Adjustment***

Pacific Highway W (OR 99W) is a state facility which requires a seasonal adjustment as specified in the APM. There is no seasonal adjustment data available for this location as there is no nearby Automatic Traffic Recorder (ATR). Therefore, a seasonal adjustment of 1.01 derived from data presented in ODOT's 2020 Seasonal Trend Table for the "Commuter" trend was applied to 2022 existing through volumes on OR 99W. The 2020 Seasonal Trend Table relies on pre-COVID 2019 volumes and is therefore the best available data for 2022 traffic. The 2022 seasonally adjusted traffic volumes are presented in Figure 5. The seasonal adjustment calculation is provided in Appendix E for reference.

### ***Adjustment for Telecommuting***

Existing traffic counts collected on Thursday, June 9, 2022 reflect a portion of Lam office staff telecommuting. While a review of historical and existing traffic counts on I-5 just north of the Nyberg Street exit shows that existing traffic in the greater Tualatin area may be comparable to pre-COVID traffic, existing counts adjacent to the Lam site are lower due to some staff currently telecommuting.

Lam Research does not currently have a permanent hybrid work plan. Therefore, we propose to growth adjust existing traffic counts to match 100% on-site attendance by applying an adjustment factor of 1.92 in the AM peak hour and 1.28 in the PM peak hour to site trips. These adjustments were based on the actual 2018 and 2022 turning movement volumes at the site driveways. The AM peak adjustment is higher than the PM peak adjustment, likely due to office staff entering the site later in the day, outside the morning peak between 7 AM and 9 AM, while continuing to exit the site during the afternoon peak between 4 PM and 6 PM. These modified site trips were carried through the adjacent roadway network as needed, similar to in-process trips, to estimate traffic volumes without the current remote work scenario.



TABLE 2 – TRAFFIC ADJUSTMENT FOR TELECOMMUTING					
AM Peak Hour Site Trips			PM Peak Hour Site Trips		
2018 Historical	2022 Existing	Adjustment Factor	2018 Historical	2022 Existing	Adjustment Factor
Entering – 422 Exiting – 26 Total – 448	Entering – 221 Exiting – 50 Total – 271	1.92 (Entering Only)	Entering – 168 Exiting – 445 Total – 613	Entering – 149 Exiting – 349 Total – 498	1.28

Figure 6 presents the additional 2022 site trips for remote workers during the AM and PM peak hours.

### SW 108th Avenue Driveways

This TIA reviews the impact the proposed driveways on SW 108th Avenue will have on existing, nearby driveways. In order to estimate the possible queues along SW 108th Avenue, the trips generated by the existing Olympus Controls building were estimated using the Institute of Transportation Engineers’ (ITE) *Trip Generation Manual*, 11th Edition data for a “Warehouse” use (LUC 150). The proposed North Access will be aligned opposite the northern access serving Olympus Controls. The proposed South Access will be spaced approximately 130 feet north of the southern access serving Ascentec Engineering. The Olympus Controls building is estimated to generate 33 AM and 35 PM peak hour trips. These trip generation estimates and the existing traffic counts were used to estimate the volumes at the Olympus Controls driveways. Existing peak hour counts for the southern Ascentec Engineering access were collected and are provided in Appendix D.

### Crash Analysis

Historical crash data reported for the study area intersections were evaluated to identify patterns that might indicate a safety concern. Crash data for the 5-year period of 2016 through 2020 were obtained from ODOT’s online crash data system and used to review crash patterns and estimate intersection crash rates.

The crash evaluation is summarized in Table 3. The raw crash data are provided in Appendix F.

TABLE 3 – INTERSECTION CRASH RATES								
Intersection (Traffic Control Type)	Year					Total Crashes	ADT	Crash Rate
	2016	2017	2018	2019	2020			
Pacific Highway W/ SW 124th Avenue (Signalized)	7	6	7	7	2	29	49,000	0.32
SW Tualatin Road/ SW 124th Avenue (Signalized)	2	3	1	3	1	10	25,800	0.21
SW Tualatin Road/ SW 108th Avenue (TWSC)	2	0	0	0	1	3	13,100	0.13

TABLE 3 – INTERSECTION CRASH RATES								
Intersection (Traffic Control Type)	Year					Total Crashes	ADT	Crash Rate
	2016	2017	2018	2019	2020			
SW Leveton Drive/ SW 124th Avenue (Signalized)	0	2	1	4	1	8	17,500	0.25
SW Leveton Drive/ SW 118th Avenue (AWSC)	0	0	0	0	0	0	4,900	0.00
SW Leveton Drive/ SW 108th Avenue (TWSC)	1	2	0	0	0	3	3,100	0.53
SW Herman Road/ SW 108th Avenue (Signalized)	1	0	0	0	1	2	11,200	0.10
SW Tualatin Road/ SW Teton Avenue (TWSC)	1	1	1	2	0	5	14,600	0.19

### ***Crash Data Summary***

During the five-year study period, there were 29 collisions reported at the intersection of Pacific Highway W (OR 99W) and SW 124th Avenue. 21 of these were rear-end collisions, the majority of these being in the northbound through direction. Five (5) of the other crashes were turning movement collisions. These collisions were reported to be caused by drivers failing to avoid the vehicle ahead or improper turns and other improper driving. The remainder of crashes include two (2) angle collisions and one (1) fixed object collision. All of these collisions were reported to cause property damage (12 collisions) or minor injuries (15 collisions), with two (2) Injury B type crashes in 2016 and 2020.

Ten (10) collisions were reported at the intersection of SW Tualatin Road and SW 124h Avenue. Six (6) of these were turning movement collisions caused by a failure to yield by drivers completing the southbound left-turn movement. This may be the result of drivers running red lights due to a high turn volume and a short green phase. Five (5) of these collisions caused possible injuries (Injury Type C). There was one collision involving a pedestrian; a driver completing a westbound right turn failed to yield to a pedestrian in the crosswalk at the intersection. The other reported crashes were rear-end and fixed-object type collisions, mostly in the westbound direction.

At the intersection of SW Tualatin Road and SW 108th Avenue, all three (3) reported crashes were turning movement collisions caused by drivers failing to yield or drivers disregarding a traffic control device, and mostly by drivers completing the northbound left-turn movement. Again, this may be due to drivers running red lights due to a high turn volume and short green phase.

At the intersection of SW Leveton Drive and SW 124th Avenue, there were eight (8) reported crashes, five (5) of which were rear-end collisions. Four (4) of these crashes caused injuries of Type B or C. Six (6) of these collisions occurred in the southbound direction. Rear-end collisions are typical at signalized locations where drivers may stop abruptly at the onset of a yellow light.

At the intersection of SW Leveton Drive and SW 108th Avenue, there were three (3) reported crashes in the past five (5) years. Two (2) were turning movement collisions and the other one (1) was a rear-end collision. All three crashes occurred in the eastbound and westbound directions, and were caused by inattention or failure to yield.

During the study period, there have been two (2) rear-end collisions at the SW Herman Road/SW 108th Avenue intersection. These occurred in the eastbound and westbound directions, and were caused by inattention.

At the intersection of SW Tualatin Road and SW Teton Avenue, there have been five (5) reported crashes in the last five (5) years. Three (3) of these collisions were turning movement collisions for the northbound left-turn movement, caused by a failure to yield. This is likely due to drivers taking shorter gaps in traffic due to heavy through volumes on SW Tualatin Road. All of the crashes which occurred in the northbound left turn caused “property damage only” and no injury. The other two (2) collisions were one (1) rear-end in the northbound movement and one (1) fixed-object collision.

Overall, there were no fatalities or serious injury crashes reported in the least five (5) years at any study area intersections. There appear to be no safety deficiencies at any study area intersections that contribute to the historical crashes reviewed.

### ***Intersection Crash Rates***

Intersection crash rates were calculated as a measure of the number of crashes occurring per one million entering vehicles (MEV) per year. The intersection crash rate is calculated by dividing the average number of crashes per year by the MEV per year. An average daily traffic (ADT) volume was estimated by dividing the PM peak hour volume at each intersection by a peak-to-daily factor, or k-factor, of 0.09 obtained from ODOT’s 2020 traffic flow data on OR 99W just west of SW 124th Avenue.

All intersections have crash rates below 1.0 MEV. Therefore, no further analysis is recommended.



### III. PRE-DEVELOPMENT CONDITIONS

The pre-development conditions reflect build-out year conditions without the proposed development. This scenario includes existing year 2022 traffic volumes, a seasonal adjustment to traffic on OR 99W, a growth adjustment factor to account for telecommuting staff, background growth to year 2024, and in-process trips from nearby approved developments. The pre-development traffic without project trips will indicate if traffic issues are present before the addition of the proposed development.

#### Planned Transportation Improvements

The City of Tualatin Capital Improvement Plan 2021-2025 (CIP) was reviewed for any planned transportation improvements in the area that may affect capacity. The City plans to add a northbound turn lane at the SW Herman Road/SW 118th Avenue intersection. While this improvement is near the development site, it does not impact future capacity or trip routing for any study area intersections in this report.

#### Background Traffic Growth

Background traffic growth was applied to adjusted year 2022 traffic volumes to forecast future traffic demand. A linear 1% annual growth rate over two (2) years was applied to year 2022 traffic volumes to estimate 2024 background traffic volumes. This growth adjustment was based on ODOT traffic volume projections for OR 99W just south of SW 124th Avenue between years 2019 and 2040. Background growth was applied to all movements at all intersections, except driveways. Figure 7 presents the background growth from 2022 to 2024 for the AM and PM peak hours.

#### In-Process Traffic

In-process traffic volumes account for developments that have been approved or that are under construction at the time of a traffic study. These traffic volumes account for traffic that will be added to the external roadway network before buildout of the proposed development. Traffic volumes for the following developments were included as in-process:

- Tualatin Logistics Park
- Lu Pacific Development (Herman Road Industrial)
- Hedges Creek Industrial

Four (4) access scenarios were provided in the TIA prepared for the Tualatin Logistics Park project. The in-process trips included in this TIA reflect the volumes provided in Scenario 2, which is consistent with the approved access configuration. Figure 8 presents the in-process trips during the AM and PM peak hours.

#### Pre-Development Traffic

The 2024 pre-development analysis scenario is a combination of existing year 2022 traffic volumes, a seasonal adjustment factor on OR 99W, a growth adjustment factor to account for telecommuting staff, background growth of 1% over two (2) years, and in-process trips from nearby approved developments. Figure 9 presents the 2024 pre-development traffic volumes during the AM and PM peak hours.

#### IV. SITE DEVELOPMENT

The trip-making characteristics of the proposed development are described below.

##### Trip Generation

The proposed 120,000 SF office building will provide space for office staff generally working between 8 AM and 5 PM. Up to 600 employees will be added to the campus with the new office building. Most new office staff are anticipated to work from the office in the future. Trip generation estimates were developed with the use of the Institute of Transportation Engineers’ (ITE) *Trip Generation Manual*, 11th Edition. The City requires the reasonable worst case for trip generation be analyzed. Therefore, trip rates for ITE’s “General Office Building” (LUC 710) using building area were utilized in this study.

Table 4 presents the trip generation estimates for the proposed office building.

TABLE 4 – TRIP GENERATION										
ITE Code	ITE Land Use	Size	Trip Type	AM Peak Hour			PM Peak Hour			Daily
				In	Out	Total	In	Out	Total	
710	General Office Building	120.0 KSF	Total	172	24	196	33	160	193	1,360

##### Trip Distribution and Assignment

Trip distribution for the proposed office building was estimated by reviewing the existing distribution from recent and existing counts at the site driveways in conjunction with review of previous trip distribution assumptions for the Lam Research campus. The following trip distribution was assumed:

- 15% to/from the south on Highway 99W
- 25% to/from the north on Highway 99W
- 5% to/from the east on SW Tualatin Road
- 15% to/from the south on SW 124th Avenue
- 5% to/from the south on SW 118th Avenue
- 35% to/from the east on SW Herman Road

Figure 10 presents the trip distribution and traffic assignment for the AM and PM peak hours.

##### East Access Reroutes

With the proposed building, other site changes including additional parking along SW 108th Avenue, two (2) new driveways on SW 108th Avenue, and limiting the East Access on SW Leveton Drive to trucks are proposed. With the closure of the East Access to passenger vehicle traffic, existing site trips that currently utilize this driveway are anticipated to reroute to the proposed driveways on SW 108th Avenue to access the expanded parking area. Figure 11 presents the East Access trip reroutes for the AM and PM peak hours.

## **Post-Development Traffic**

Post-Development traffic volumes are the sum of the project trips and the pre-development traffic volumes. Figure 12 presents the 2024 post-development traffic volumes for the AM and PM peak hours.

## V. SITE ACCESS AND CIRCULATION

The on-site evaluation of traffic access and circulation and a review of sight distance at the existing site driveways are presented below.

### Site Access

The proposed development will have access to two (2) existing, full-movement driveways on SW Leveton Drive and two (2) proposed, full-movement driveways on SW 108th Avenue. The third driveway on SW Leveton Drive will be limited to trucks and will become directional (inbound or outbound only).

### Access Standards

The TDC includes several sections related to access standards. Chapter 75 of the TDC presents access standards relative to driveway widths and spacing on the site. Per Table 75-1 of the TDC, minimum driveway approach width for industrial driveways is 36 feet and the maximum is 40 feet for driveways providing access for over 250 parking spaces. The existing driveways for the site meet these standards. The proposed driveways on SW 108th Avenue will meet these standards at a proposed width of 36 feet.

Per TDC 75.120, driveways on Minor Collectors must be spaced a minimum of 100 feet. Driveways must be located at least 150 feet from the intersection of Collector or Arterial streets, as measured from the stop bar, per TDC 75.040(11)(a). Additionally, driveways must provide a minimum distance of 40 feet between on-site driveways per TDC 75.040(10).

TABLE 5 – ACCESS SPACING SUMMARY					
Access	Roadway	Functional Classification	Spacing Standard	Access Spacing Measured Edge-to-Edge	
				To North	To South
North Access	SW 108th Avenue	Minor Collector	150' to Arterial or Collector intersections/ 100' between driveways	635 feet	445 feet
South Access				445 feet	150 feet

The proposed site driveways on SW 108th Avenue will meet the City's access spacing standards as summarized in Table 5.

### On-Site Circulation

The site currently provides access to staff via three full-movement driveways on SW Leveton Drive. A fire access is provided on SW Tualatin Road opposite SW 115th Avenue and a construction access is provided on SW 108th Avenue approximately 300 feet south of SW Tualatin Road. Both of these driveways are gated.

With the proposed office building, the East Access on SW Leveton Drive will be limited to truck use. Two (2) new full-movement driveways are proposed on SW 108th Avenue. The North Access will be provided opposite the northern access to Olympus Controls. The South Access will be provided approximately 445 feet south of the North Access. Trucks will navigate to the new office building by entering the East Access on SW Leveton Drive and exiting the proposed South Access on SW 108th Avenue. All new office staff are



anticipated to access the site via the two (2) proposed driveways on SW 108th Avenue where an additional approximately 500 new parking spaces will be provided.

### Sight Distance Evaluation

Intersection sight distance was evaluated for the proposed site driveway locations. The American Association of State Highway and Transportation Officials’ (AASHTO) *A Policy on Geometric Design of Highways and Streets*, 7th Edition provides recommendations for intersection sight distance (ISD) based on roadway design speed. At minimum, stopping sight distance (SSD), also based on roadway design speed, must be provided.

A time gap of 7.5 seconds and 11.5 seconds were assumed for passenger vehicles and combination trucks completing a left turn from stop, respectively. SW 108th Avenue is relatively flat. Therefore, no grade adjustments were made for the ISD and SSD calculations. There is no posted speed on SW 108th Avenue north of SW Herman Road. Therefore, the design speed on SW 108th Avenue was assumed to be 5 mph over the posted speed of 35 mph for other Minor Collectors in the area, or 40 mph. The recommendations for ISD have been noted for left turns from stop on a stop-controlled minor approach (driveway). The sight distance evaluation for the site driveways is presented in Table 6.

TABLE 6 – SIGHT DISTANCE EVALUATION						
Access/ Intersection	Design Speed (mph)	Design Vehicle	Recommended Intersection Sight Distance (feet)	Required Stopping Sight Distance (feet)	Available Sight Distance (feet)	
					To North	To South
SW 108th Avenue/ North Access	40	Passenger	445	305	430	>500
SW 108th Avenue/ South Access	40	Passenger	445	305	>700	>700
		Combination Truck	680			

As presented in Table 6, the recommended ISD is available to the south from both proposed driveway locations, as well as to the north from the South Access for both passenger vehicles and combination trucks. From the proposed North Access location, there is a vertical crest to the north on SW 108th Avenue that precludes meeting the recommended ISD by 15 feet. However, both proposed site driveway locations are projected to meet the SSD requirement in both directions along SW 108th Avenue.

## VI. OPERATIONAL ANALYSIS

Two aspects of operational analysis were evaluated for the study area intersections: 1) intersection operations analysis, which evaluates how well an intersection processes traffic demand, and 2) queuing analysis, which compares intersection queues with available storage for different travel lanes.

### Intersection Operation Analysis

Intersection operations are generally measured by three (3) mobility standards: volume-to-capacity (v/c) ratio, level-of-service (LOS), and delay (measured in seconds). Signalized and all-way, stop-controlled (AWSC) intersections are measured by one (1) overall v/c ratio, LOS, and delay. Two-way, stop-controlled (TWSC) intersections are typically measured by a single v/c ratio, LOS, and delay representative of the worst stopped movement.

#### *Performance Measures*

All study area intersections are located within City of Tualatin jurisdiction but OR 99W is under ODOT's jurisdiction.

#### *City of Tualatin*

The TDC Section 74.440(3)(e) requires the following mobility standards for intersections within City jurisdiction:

- LOS D or better for signalized intersections
- LOS E or better for unsignalized intersections

#### *ODOT*

The *Oregon Highway Plan* (OHP) designates OR 99W as a Principal Arterial Route at SW 124th Avenue. Table 7 of the OHP establishes a v/c target of 0.99 for the OR 99W/SW 124th Avenue intersection.

#### *Methodology*

Intersection operations were analyzed with the use of Synchro 11 software, which utilizes the Transportation Research Board's *Highway Capacity Manual* (HCM) 2000, HCM 2010, and HCM 6 methodologies. Signalized study area intersections were reported using HCM 2000 reports for overall v/c ratio and HCM 6 reports for delay and LOS. Two-way, stop-controlled (TWSC) and AWSC intersections were reported using HCM 6 reports. Signal timing plans were obtained from the Washington County traffic plans database, as well as from ODOT staff, and are provided in Appendix H for reference.

#### *Findings*

The operations results for the intersection or critical movement at each study area intersection are presented in Table 7. The detailed Synchro capacity results are provided in Appendix I for reference.

TABLE 7 – PEAK HOUR INTERSECTION OPERATIONS				
Intersection (Control)	Peak Hour	Analysis Results (v/c-LOS-Delay in seconds)		
		2022 Existing	2024 Pre-Development	2024 Post-Development
Pacific Highway (OR-99)/SW 124th Avenue (Signalized)	AM	0.76-C-33.9	0.80-D-38.4	0.80-D-40.3
	PM	0.79-D-36.4	0.84-D-39.6	0.86-D-41.3
SW Tualatin Road/ SW 124th Avenue (Signalized)	AM	0.65-B-10.4	0.68-B-10.8	0.69-B-11.1
	PM	0.51-B-12.8	0.56-B-14.6	0.58-B-15.9
SW Tualatin Road/ SW 108th Avenue (TWSC)	AM	0.10-C-22.8 (NB)	0.11-C-24.7 (NB)	0.13-D-25.8 (NB)
	PM	0.24-C-24.6 (NB)	0.31-D-27.2 (NB)	0.37-D-29.1 (NB)
SW 108th Avenue/ North Access (TWSC)	AM	N/A	N/A	0.01-B-13.3 (EBL)
	PM	N/A	N/A	0.17-A-9.4 (EBL)
SW 108th Avenue/ South Access (TWSC)	AM	N/A	N/A	0.00-B-11.6 (EBL)
	PM	N/A	N/A	0.02-B-10.2 (EB)
SW 124th Avenue/ SW Leveton Drive (Signalized)	AM	0.36-B-10.4	0.40-B-10.8	0.42-B-11.6
	PM	0.32-B-14.4	0.37-B-15.4	0.40-B-16.4
SW Leveton Drive/ SW 118th Avenue (AWSC)	AM	0.28-A-8.5 (EB)	0.42-A-9.9 (EB)	0.54-B-11.8 (EB)
	PM	0.32-A-9.1 (WB)	0.40-A-10.0 (WB)	0.52-B-11.8 (WB)
SW Leveton Drive/ West Access (TWSC)	AM	0.03-B-12.0 (SBL)	0.04-C-15.8 (SBL)	0.05-C-18.3 (SBL)
	PM	0.14-B-11.8 (SBL)	0.20-B-13.3 (SBL)	0.23-C-15.2 (SBL)
SW Leveton Drive/ Center Access (TWSC)	AM	0.01-B-10.1 (SBL)	0.02-B-11.4 (SBL)	0.02-B-12.9 (SBL)
	PM	0.05-B-10.5 (SBL)	0.07-B-11.1 (SBL)	0.08-B-12.3 (SBL)
SW Leveton Drive/ East Access (TWSC)	AM	0.01-A-9.8 (SB)	0.01-B-10.8 (SB)	N/A
	PM	0.11-B-10.4 (SB)	0.15-B-11.1 (SB)	N/A
SW Leveton Drive/ SW 108th Avenue (TWSC)	AM	0.08-A-7.6 (NBL)	0.14-A-7.8 (NBL)	0.44-C-17.5 (EB)
	PM	0.18-A-9.5 (EB)	0.24-B-10.0 (EB)	0.27-B-11.8 (EB)
SW Herman Road/ SW 108th Avenue (Signalized)	AM	0.43-A-6.3	0.50-A-6.6	0.55-A-7.3
	PM	0.55-B-11.2	0.60-B-12.6	0.64-B-14.6

TABLE 7 – PEAK HOUR INTERSECTION OPERATIONS				
Intersection (Control)	Peak Hour	Analysis Results (v/c-LOS-Delay in seconds)		
		2022 Existing	2024 Pre-Development	2024 Post-Development
SW Tualatin Road/ SW Teton Avenue	AM	0.32-D-25.8 (NBL)	0.35-D-27.7 (NBL)	0.35-D-28.3 (NBL)
	PM	<b>0.96-F-99.1 (NBL, Synchro)</b> LOS E-26.5 (NBL, SimTraffic)	<b>1.03-F-122.6 (NBL, Synchro)</b> LOS E-29.9 (NBL, SimTraffic)	<b>1.05-F-128.2 (NBL, Synchro)</b> LOS E-38.5 (NBL, SimTraffic)

The East Access on SW Leveton Drive will be restricted to truck use, which will primarily occur outside the typical peak of the street. Therefore, site operations are listed as “N/A” under post-development conditions.

As presented in Table 7, all study area intersections currently meet the City’s mobility standards except the SW Tualatin Road/SW Teton Avenue intersection. The northbound left-turn movement currently operates at an LOS F during the PM peak hour and is projected to continue to fail in the future, per the Synchro analysis results. All other study intersections are projected to continue meeting standards with the proposed office building.

The estimated delay provided by Synchro software at the intersection of SW Tualatin Road/SW Teton Avenue appears to provide a conservative estimate of approximately 99 seconds for the northbound left-turn movement during the PM peak hour; however, a review of PM peak hour traffic at the intersection shows an observed delay of approximately 14 seconds. Additionally, the delay reported by SimTraffic software for this movement was approximately 27 seconds under existing conditions. The delay reported by SimTraffic appears to more accurately reflect actual conditions in the field. This may be because drivers completing the northbound left-turn movement at this intersection are taking shorter gaps due to the high volume on SW Tualatin Road than the gaps assumed in Synchro software. Therefore, we estimate this northbound left-turn movement will operate at an LOS E (corresponding with a 40-second delay) under 2024 post-development conditions, as reported by SimTraffic software.

### Intersection Queuing Analysis

An intersection queuing analysis was conducted for the study area intersections for both the AM and PM peak hours to evaluate any potential queue spillbacks.

#### **Methodology**

The 95th percentile queues during the AM and PM peak hours were estimated using Synchro and SimTraffic software. Queue demand results were rounded to the nearest 25 feet to represent average vehicle lengths. Because queues are based on an average of five (5) traffic simulations using random arrivals, some fluctuation in results can be anticipated, particularly for movements that are near or over-capacity.



Available queue lengths were estimated using Google Earth Pro software and rounded to the nearest 5 feet. For turn lanes, two (2) available storage values are stated: the first represents the striped storage and the second is the effective storage, or the length physically available regardless of striping, such as a center turn lane upstream of a striped left-turn lane at an intersection. Although travel lanes have no storage defined by striping, two (2) values are reported for through travel lane storage at signalized locations: the first is the distance to an upstream driveway; the second is the distance to an upstream public street intersection.

**Findings**

The 95th percentile queues obtained from SimTraffic for the AM and PM peak hours are presented in Table 8. The detailed SimTraffic reports are provided in Appendix J for reference.

TABLE 8 – 95TH PERCENTILE QUEUING ANALYSIS					
Intersection (Control)	Approach/Movement	Striped/Effective Storage (Feet)	AM/PM Peak Hour Queue (feet)		
			2022 Existing	2024 Pre-Development	2024 Post-Development
Highway 99W/ SW 124th Avenue (Signalized)	WBL	315/475	100/350	125/450	125/450
	WBL	315/475	125/350	125/475	125/475
	WBR	295/330	150/300	150/ <b>400</b>	150/ <b>425</b>
	WBR	295/315	150/250	150/ <b>325</b>	150/ <b>350</b>
	NBT	500	525/400	500/450	<b>600</b> /425
	NBT	500	500/375	475/425	<b>675</b> /400
	NBR	225/250	<b>375</b> /150	<b>400</b> /175	<b>450</b> /175
	SBL	550/770	500/350	700/400	<b>800</b> /400
	SBL	550/690	400/325	700/375	<b>800</b> /350
	SBT	50/>1,000	175/275	175/275	750/275
	SBT	50/>1,000	175/275	150/300	700/300
SW 124th Avenue/ SW Tualatin Road (Signalized)	WBL	310/350	100/50	100/150	100/75
	WBR	285/500	75/250	75/400	75/325
	NBT	995	100/200	100/250	100/250
	NBT	995	150/275	200/375	175/450
	NBR	145/230	50/75	50/150	50/150
	SBL	200/300	300/300	300/ <b>325</b>	300/ <b>325</b>
	SBT	450	200/75	175/75	200/100
	SBT	450	150/100	175/75	150/100

TABLE 8 – 95TH PERCENTILE QUEUING ANALYSIS					
Intersection (Control)	Approach/Movement	Striped/Effective Storage (Feet)	AM/PM Peak Hour Queue (feet)		
			2022 Existing	2024 Pre-Development	2024 Post-Development
SW Tualatin Road/ SW 108th Avenue (TWSC)	WBL	140	50/25	50/25	50/25
	NB	330	50/50	50/75	50/75
SW 108th Avenue/ North Access (TWSC)	EBL	60	N/A	N/A	25/50
	EBR	60	N/A	N/A	50/75
	NB	190/620	N/A	N/A	50/25
	SB	160/630	N/A	N/A	25/25
SW 108th Avenue/ South Access (TWSC)	EBL	60	N/A	N/A	25/25
	EBR	60	N/A	N/A	25/50
	NB	110/200	N/A	N/A	25/25
	SB	100/>1,000	N/A	N/A	25/25
SW 124th Avenue/ SW Leveton Drive (Signalized)	EBL	100/130	25/50	25/50	25/50
	EBT+R	270/580	75/75	75/75	75/75
	WBL	145/185	50/50	50/75	50/100
	WBT+R	490/>1,000	25/100	25/125	50/125
	NBL	155/230	50/50	50/50	50/50
	NBT	>1,000	75/125	75/125	75/125
	NBT+R	>1,000	125/175	175/200	175/225
	SBL	165/245	75/50	100/75	125/75
	SBT	>1,000	125/125	150/150	150/125
	SBT+R	995	150/150	175/175	175/175
SW Leveton Drive/ SW 118th Avenue (AWSC)	EB	240/>1,000	75/50	75/50	100/75
	WB	+1,000	50/75	50/75	50/75
	NB	525/>1,000	50/25	50/50	50/50
	SB	650	25/25	25/50	25/50
SW Leveton Drive/ West Access (TWSC)	EB	>1,000	25/50	50/50	50/50
	SBL	135	50/50	50/50	50/75
	SBR	135	50/75	50/75	50/100

TABLE 8 – 95TH PERCENTILE QUEUING ANALYSIS					
Intersection (Control)	Approach/Movement	Striped/Effective Storage (Feet)	AM/PM Peak Hour Queue (feet)		
			2022 Existing	2024 Pre-Development	2024 Post-Development
SW Leveton Drive/Center Access (TWSC)	EB	890	25/25	25/25	25/25
	SBL	125	25/50	25/50	25/50
	SBR	125	25/50	25/50	25/50
SW Leveton Drive/East Access (TWSC)	EB	400	25/25	25/25	N/A
	WB	550	25/25	25/25	25/25
	NB	25	25/50	25/50	25/50
	SB	105	25/50	25/75	N/A
SW Leveton Drive/SW 108th Avenue (TWSC)	EB	270	50/50	50/50	100/75
	NB	100	25/25	50/25	50/50
SW Herman Road/SW 108th Avenue (Signalized)	EBL	100/390	25/25	25/25	50/25
	EB	>1,000	100/100	100/100	125/125
	WB	350	125/175	125/200	175/225
	SBL	135/165	50/100	50/100	75/125
	SBR	115/790	25/25	25/25	25/25
SW Tualatin Road/SW Teton Avenue (Unsignalized)	WBL	260	50/25	50/25	75/50
	NBL	95/170	75/ <b>175</b>	75/ <b>175</b>	75/ <b>225</b>
	NBR	30/>1,000	75/50	75/50	75/50

As presented in Table 8, queues are projected to be accommodated within existing storage areas at most intersections. The OR 99W/SW124th Avenue, SW 124th Avenue/SW Tualatin Road, and SW Tualatin Road/SW Teton Avenue intersections are projected to have queues that exceed the available queue storage areas under 2024 post-development conditions. This is expected to occur during the peak 15-minute periods of the AM and PM peak hours. For the remainder of the peak hours, queues are mostly projected to be accommodated under existing storage areas, as presented in Table 9.

TABLE 9 – 95TH PERCENTILE QUEUING ANALYSIS (PEAK HOUR)				
Intersection (Control)	Approach/Movement	Striped/Effective Storage (Feet)	AM/PM Peak Hour Queue (feet)	
			2024 Post-Development (PHF=Varies)	2024 Post-Development (PHF=1.0)
Highway 99W/ SW 124th Avenue (Signalized)	WBL	315/475	125/450	100/425
	WBL	315/475	125/475	125/450
	WBR	295/330	150/ <b>425</b>	150/ <b>400</b>
	WBR	295/315	150/ <b>350</b>	150/ <b>325</b>
	NBT	500	<b>600</b> /425	500/425
	NBT	500	<b>675</b> /400	475/400
	NBR	225/250	<b>450</b> /175	<b>400</b> /150
	SBL	550/770	<b>800</b> /400	750/400
	SBL	550/690	<b>800</b> /350	325/350
	SBT	50/>1,000	750/275	275/300
	SBT	50/>1,000	700/300	250/300
SW 124th Avenue/ SW Tualatin Road (Signalized)	WBL	310/350	100/75	100/50
	WBR	285/500	75/325	75/325
	NBT	995	100/250	100/250
	NBT	995	175/450	150/425
	NBR	145/230	50/150	50/150
	SBL	200/300	300/ <b>325</b>	275/ <b>325</b>
	SBT	450	200/100	150/125
	SBT	450	150/100	150/125
SW Tualatin Road/ SW Teton Avenue (Unsignalized)	WBL	260	75/50	50/25
	NBL	95/170	75/ <b>225</b>	75/125
	NBR	30/>1,000	75/50	75/50

As presented in Table 9, the queues for the northbound left-turn movement at the SW Tualatin Road/SW Teton Avenue are projected to be accommodated within the existing storage area for the remainder of the PM peak hour. At the SW 124th Avenue/SW Tualatin Road intersection, the queues for the southbound left-turn movement during the PM peak hour are projected to exceed the available storage length for the remainder of the PM peak hour; however, this queue is not worsened by the addition of new Lam office trips. At the OR 99W/SW 124th Avenue intersection the queues for the southbound left-turn lanes are projected to be accommodated within the existing storage area during the remainder of the PM peak hour.



## VII. WARRANTS

The 2001 Novellus IMP approval identified that potential improvements may be needed at the SW Leveton Drive/SW 108th Avenue intersection and along SW 108th Avenue (left-turn lanes) with future development of the site. Therefore, traffic signal and turn-lane warrants were reviewed using 2024 post-development volumes for the AM and PM peak hours. The analysis summary for signal, left- and right-turn lane warrants is presented below. The warrant analysis calculations are provided in Appendix K for reference.

### Traffic Signal

The *Manual on Uniform Traffic Control Devices* (MUTCD), 2009 Edition, provides guidance and standards on the evaluation of traffic conditions to determine the need for traffic signalization at unsignalized intersections. A screening level comparison of peak traffic volumes with the lowest MUTCD volume threshold (100 vehicles per hour for the minor street approach) was performed to determine if a more detailed signal warrants analysis should be performed for the SW Leveton Drive/SW 108th Avenue intersection.

The MUTCD Warrant 3, Peak Hour volume thresholds are not met at the SW Leveton Drive/SW 108th Avenue intersection with the proposed office building. Therefore, no additional analysis was prepared.

We also reviewed hourly volumes for the SW Tualatin Road/SW Teton Avenue intersection to determine if a signal at this location is appropriate to mitigate the long delay for the northbound left-turn movement. The projected 2024 post-development that volumes at this location do not meet the thresholds for Warrant 1 (8-Hour Vehicular Volume), Warrant 2 (Four-Hour Vehicular Volume), and Warrant 3 (Peak Hour Vehicular Volume). Additionally, the crash analysis did not show excessive crashes at this intersection, nor any fatalities or pedestrian/bicyclist crashes within the last five (5) years of crash data. Because the SimTraffic analysis showed delays for the northbound left-turn movement are closer to the observed delays in the field, we don't recommend any improvements at this location.

### Turn Lanes

Turn-lane criteria were reviewed for the proposed driveways on SW 108th Avenue using the left- and right-turn lane criteria established by the Texas Transportation Institute (TTI) for unsignalized intersections.

SW 108th Avenue is currently a two-lane roadway with no existing turn lanes into the site. While the estimated left-turn volumes at the proposed site accesses are high, the opposing traffic volumes are projected to be well below the threshold for either left- or right-turn lanes. Additionally, the delays for the turn movements at the site driveways are estimated to be relatively low. Therefore, no turn lanes are proposed on SW 108th Avenue or on SW Leveton Drive.

## VIII. RECOMMENDATIONS AND MITIGATION

All study area intersections currently operate within City of Tualatin mobility standards except the SW Tualatin Road/SW Teton Avenue intersection. The northbound left-turn movement at this location currently has a delay greater than 90 seconds which exceeds the City's LOS E standard for an unsignalized intersection, as reported by Synchro software; however, video observations of existing conditions show delays for this movement are closer to 14 seconds. Similarly, the delay reported by SimTraffic for existing conditions is approximately 27 seconds. Therefore, we estimate the delay under 2024 post-development conditions will be approximately 40 seconds as reported by SimTraffic software, and corresponding with an LOS E.

All other study area intersections are projected to operate at acceptable levels, as reported by Synchro software. While queues during the peak 15-minute periods of the morning and afternoon show some queuing that exceeds available storage, queues for the remainder of the AM and PM peak hours are expected to be accommodated within existing queue storage areas. Therefore, no other improvements are recommended at this time.

## **IX. APPENDIX**

- Appendix A. Figures
- Appendix B. Scoping Material
- Appendix C. Transit Information
- Appendix D. Traffic Count Summaries
- Appendix E. Seasonal Adjustment Data
- Appendix F. Crash Data
- Appendix G. In-Process Data
- Appendix H. Signal Information
- Appendix I. Operations Calculations
- Appendix J. Queuing Analysis
- Appendix K. Warrants

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APPENDIX A.  
**FIGURES**





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## VICINITY MAP

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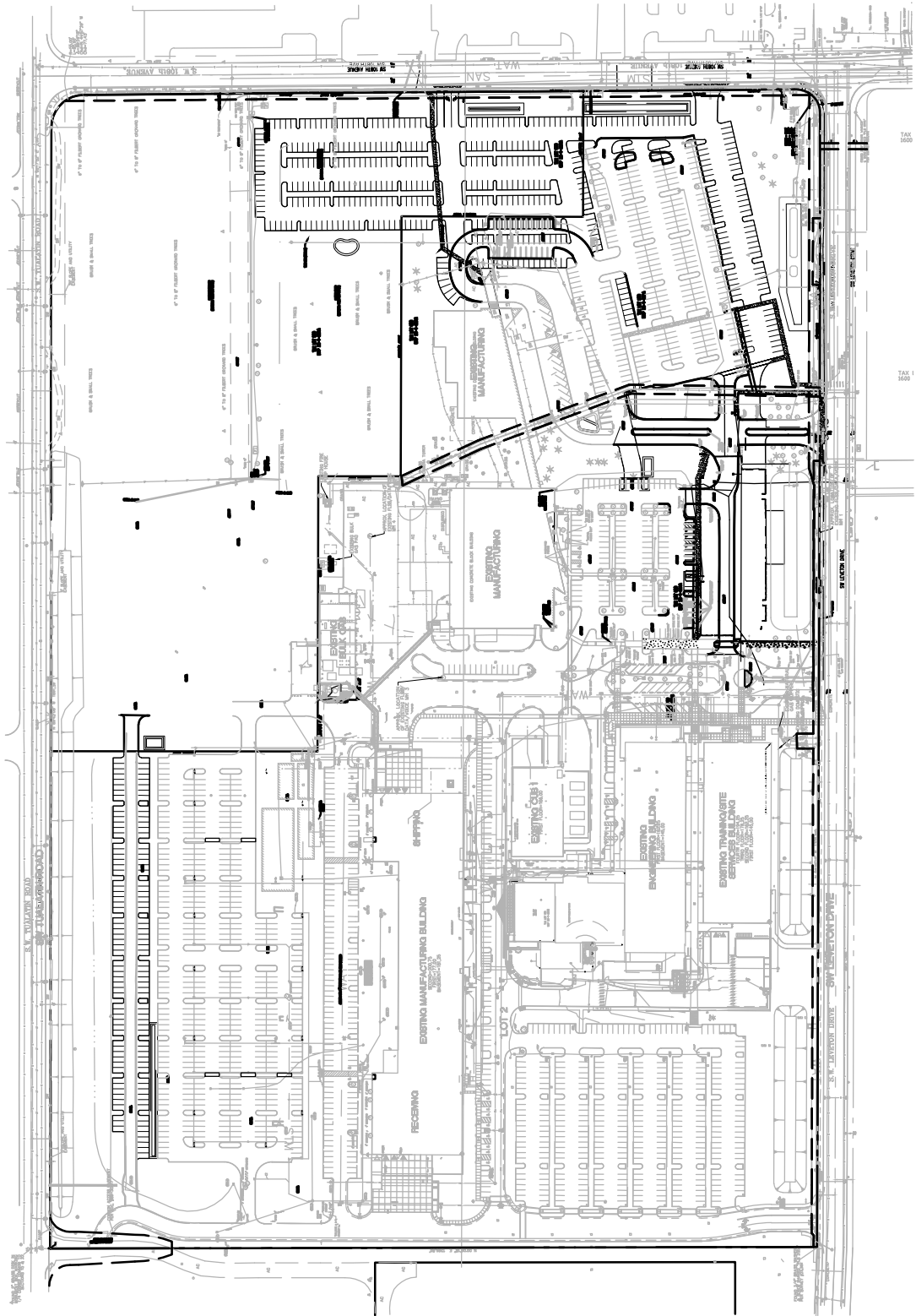
**FIGURE**

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SITE PLAN

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FIGURE

2

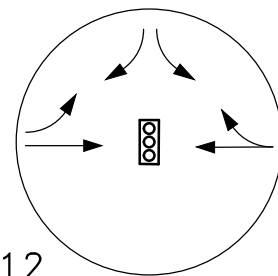
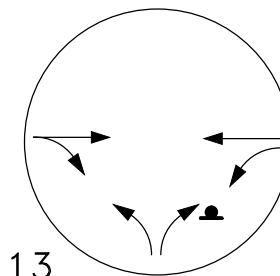
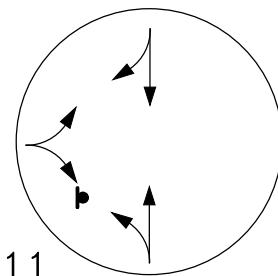
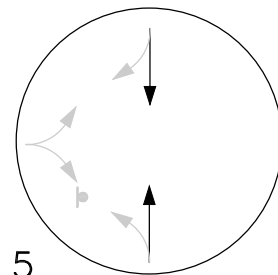
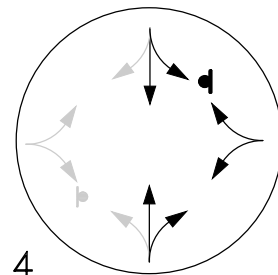
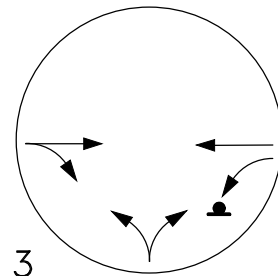
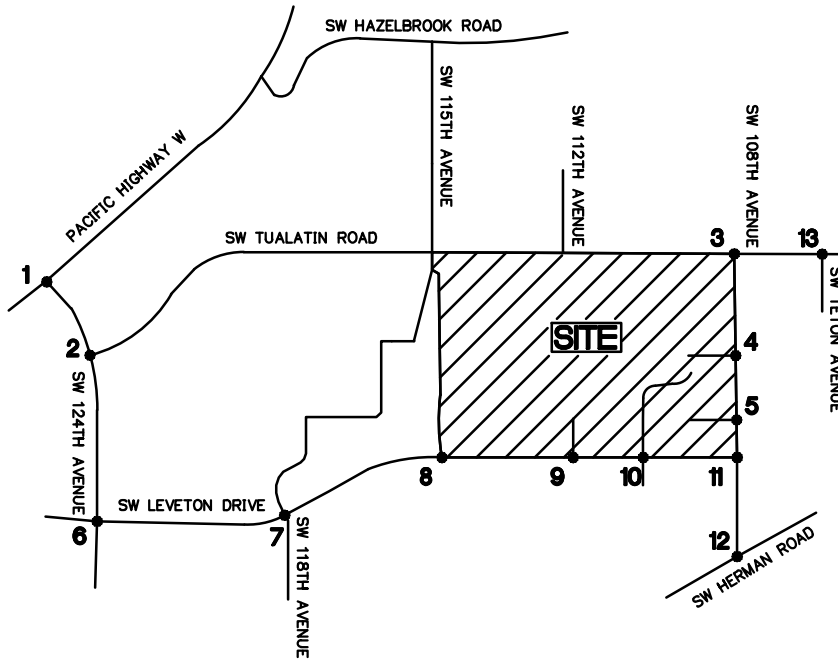
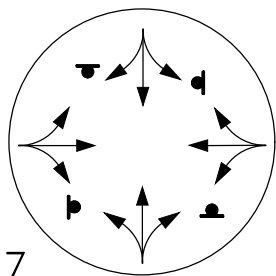
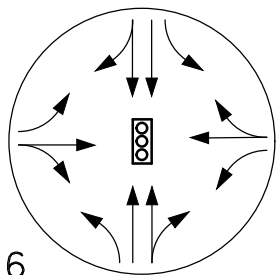
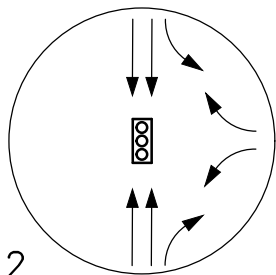
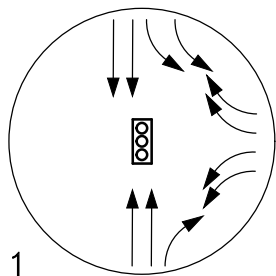
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**EXISTING + PLANNED  
 TRAFFIC CONTROL DEVICES  
 + LANE CONFIGURATIONS**

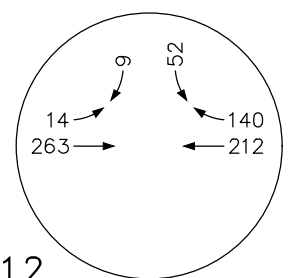
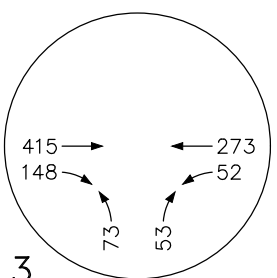
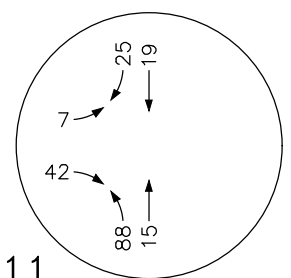
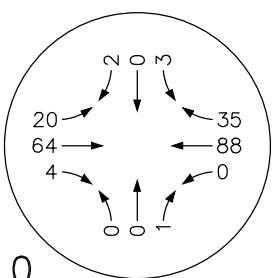
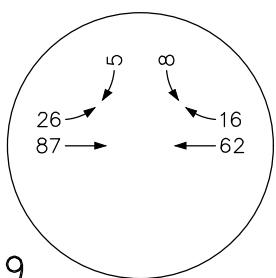
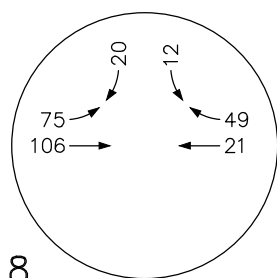
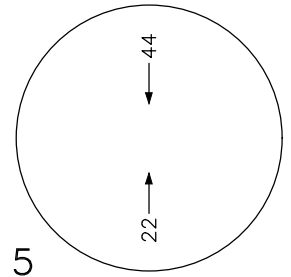
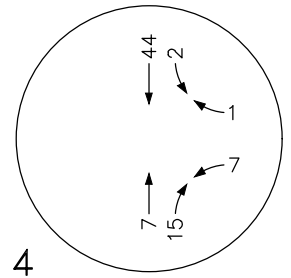
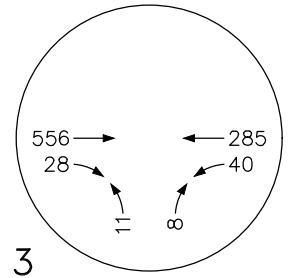
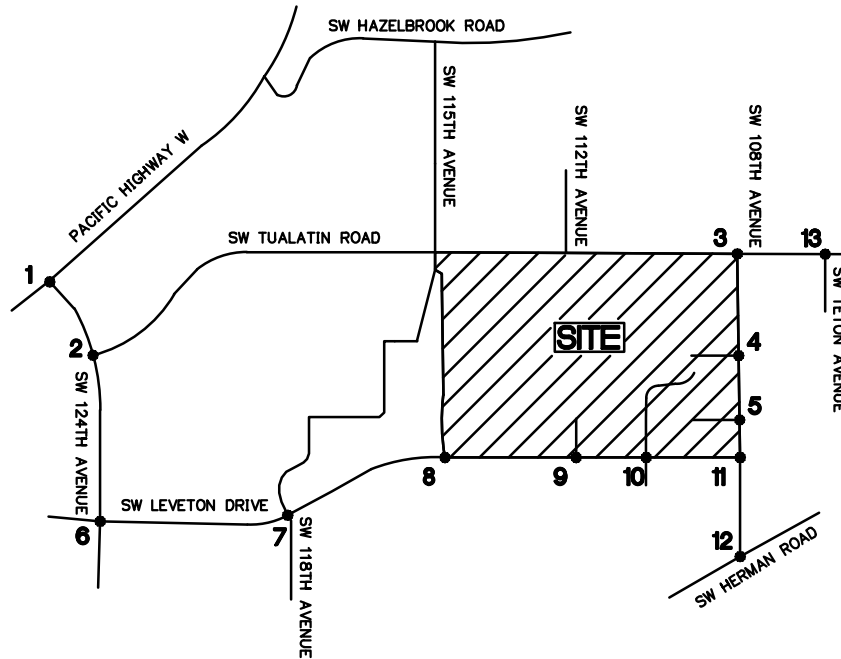
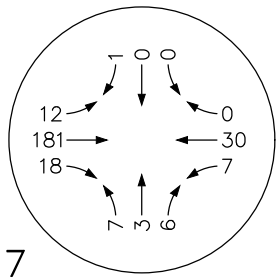
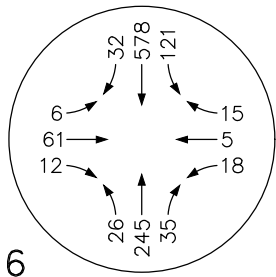
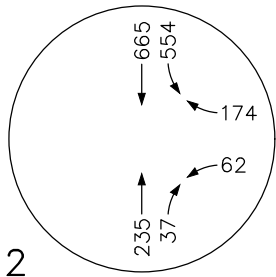
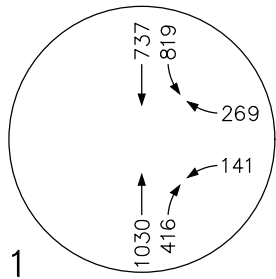
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**FIGURE  
 3**

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**2022 EXISTING TRAFFIC VOLUMES - AM PEAK HOUR**  
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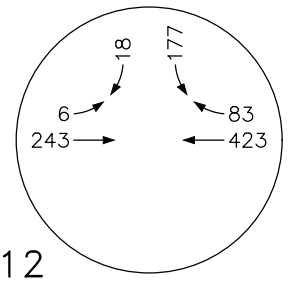
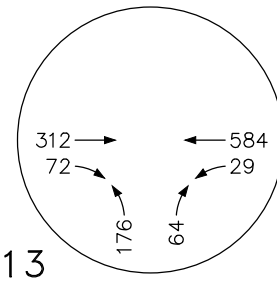
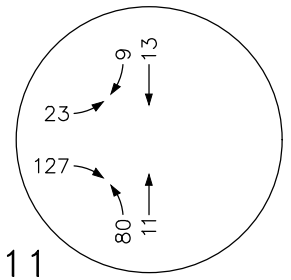
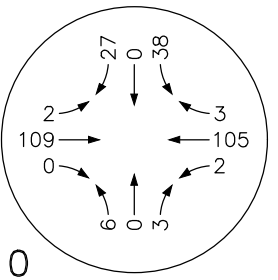
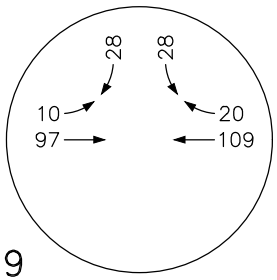
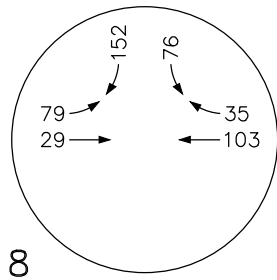
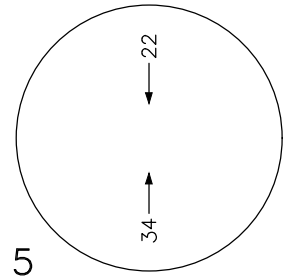
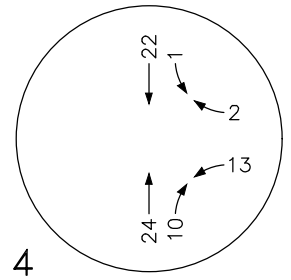
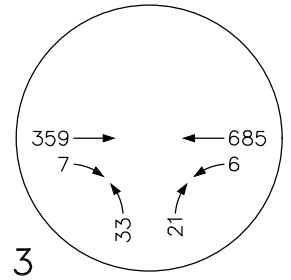
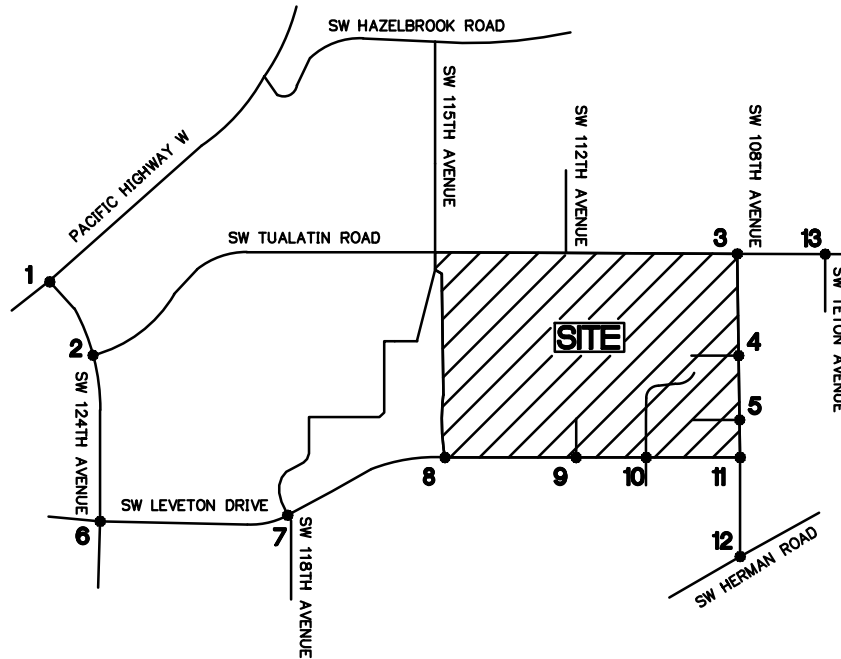
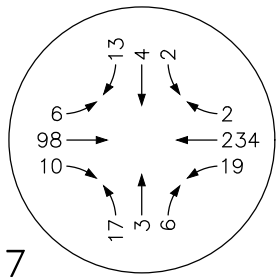
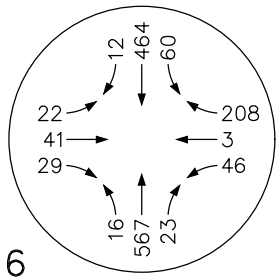
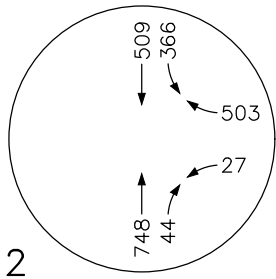
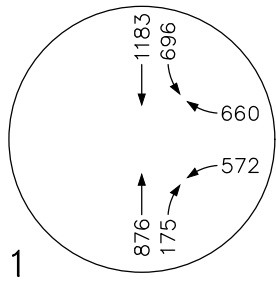
**FIGURE 4A**

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 TRAFFIC VOLUMES -  
 PM PEAK HOUR

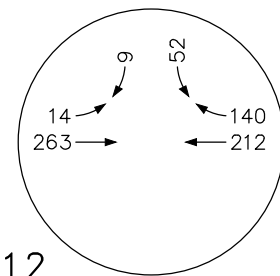
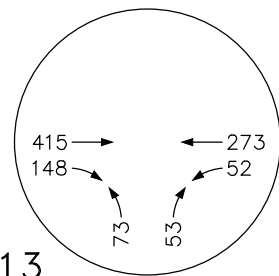
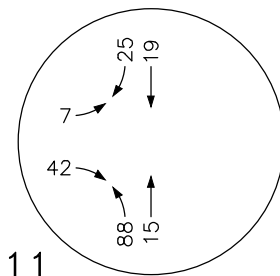
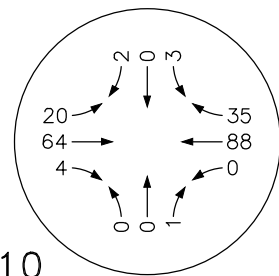
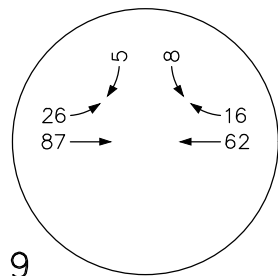
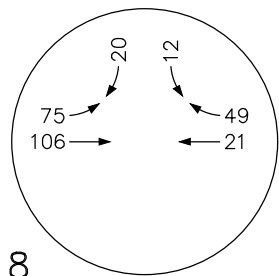
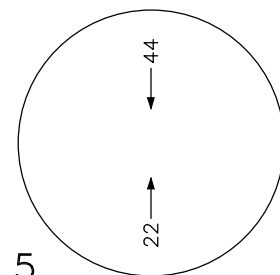
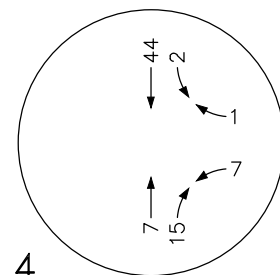
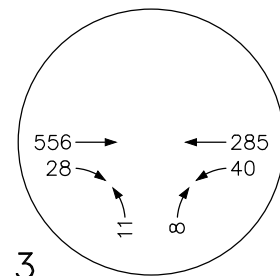
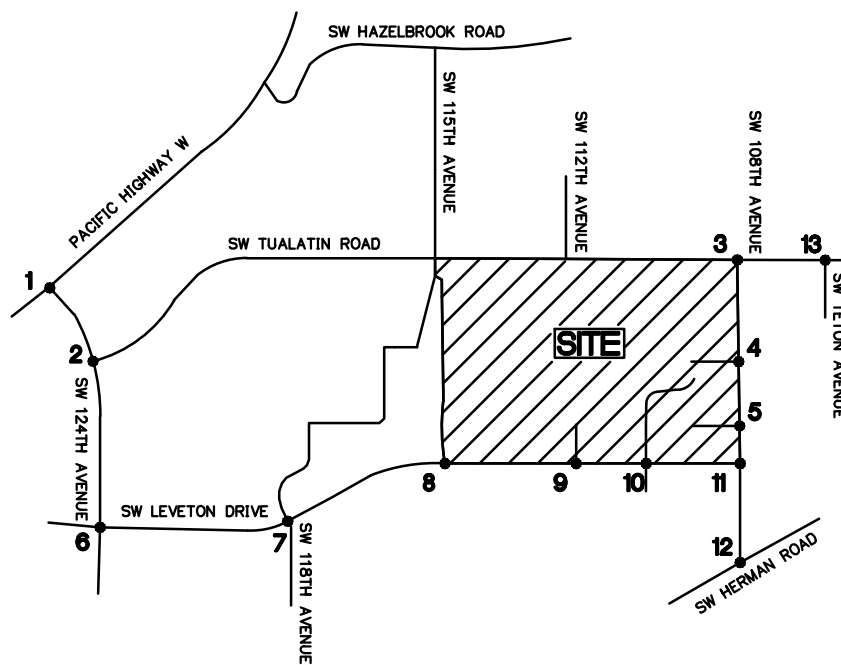
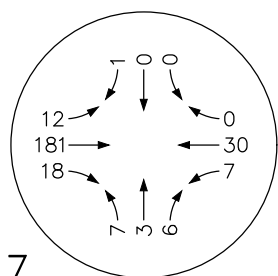
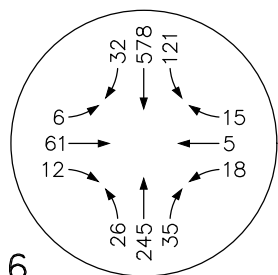
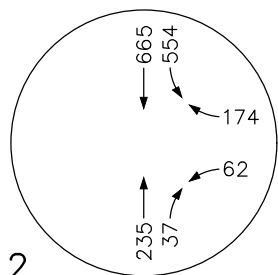
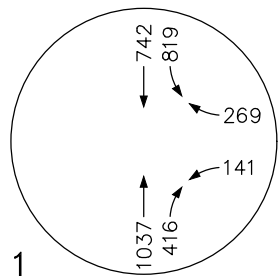
LAM RESEARCH NEW OFFICE BUILDING  
 TUALATIN, OREGON

FIGURE  
 4B

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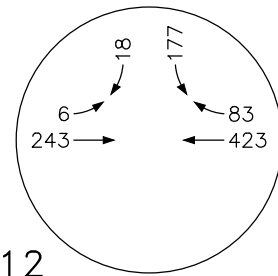
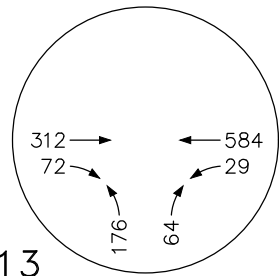
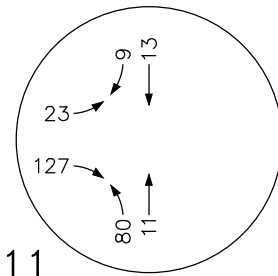
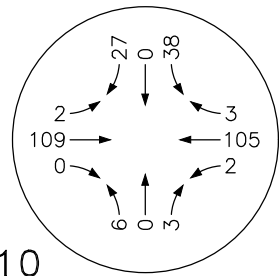
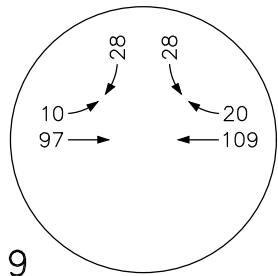
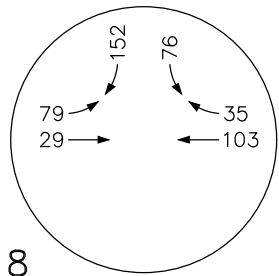
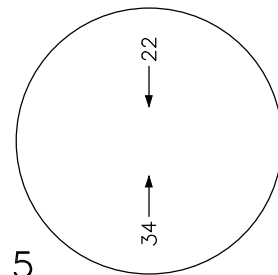
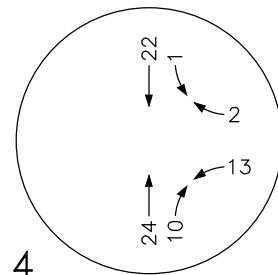
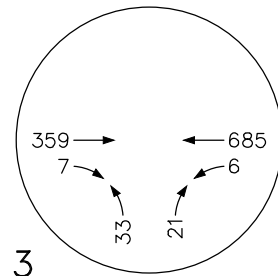
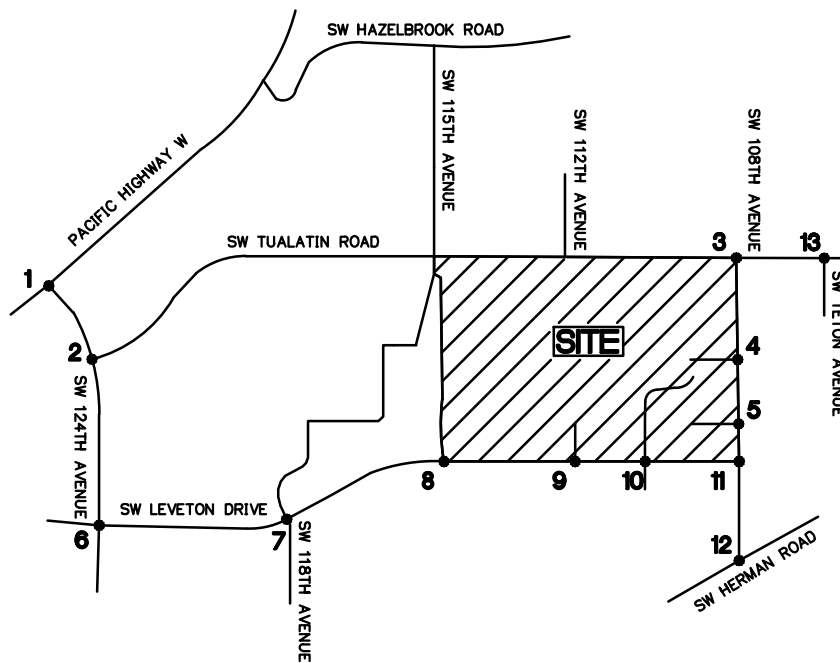
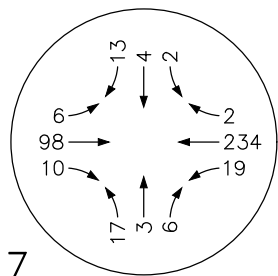
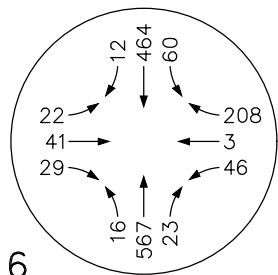
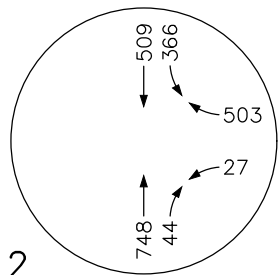
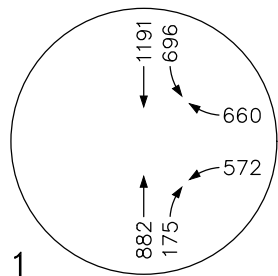
2022 SEASONALLY ADJUSTED  
TRAFFIC VOLUMES -  
AM PEAK HOUR

LAM RESEARCH NEW OFFICE BUILDING  
TUALATIN, OREGON

FIGURE  
5A



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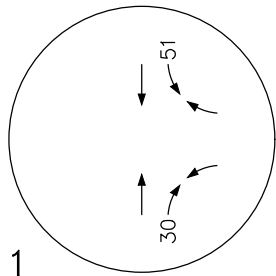
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 TRAFFIC VOLUMES -  
 PM PEAK HOUR

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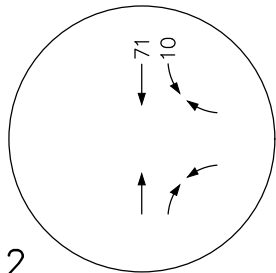
FIGURE  
 5B



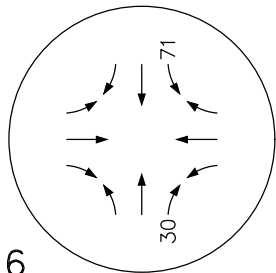
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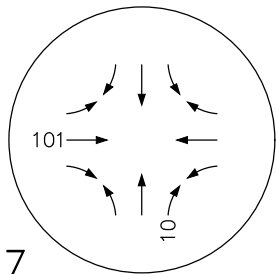
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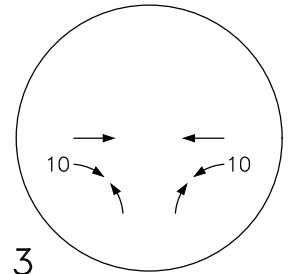
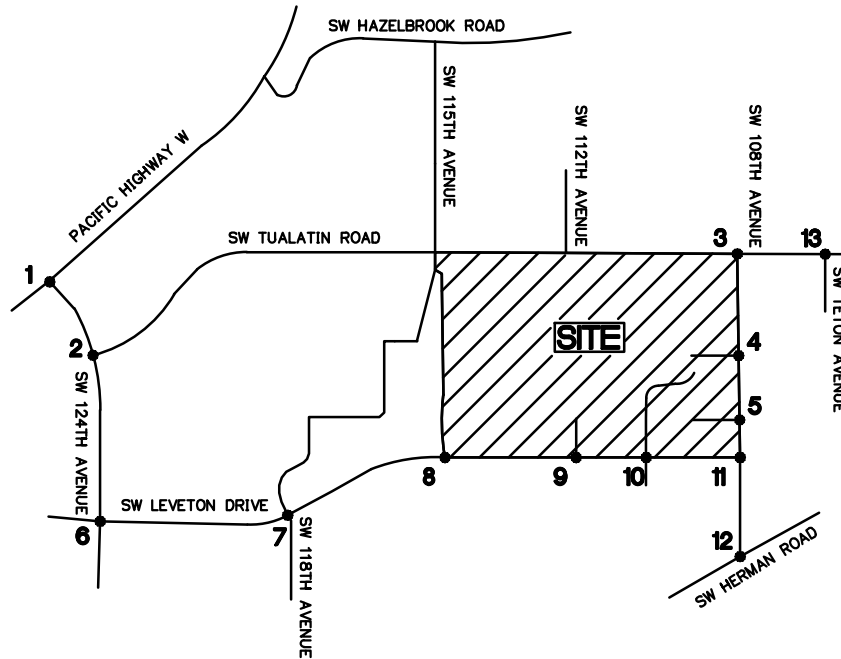
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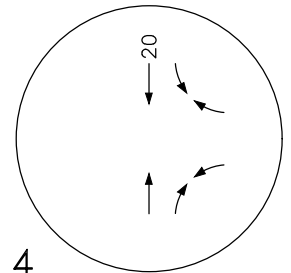
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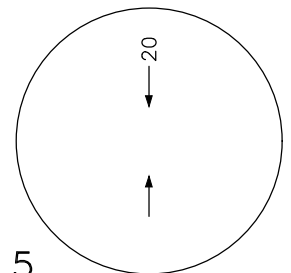
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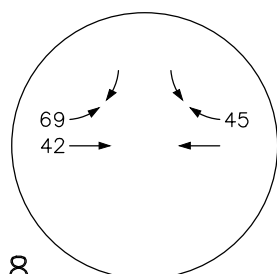
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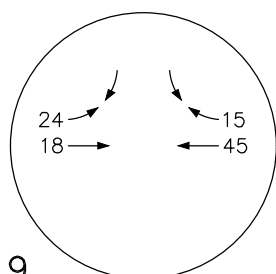
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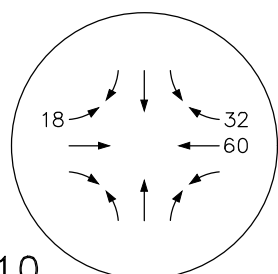
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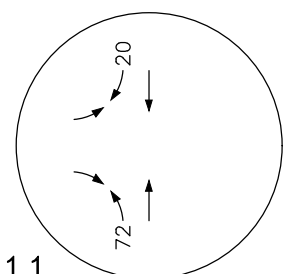
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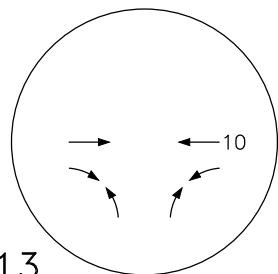
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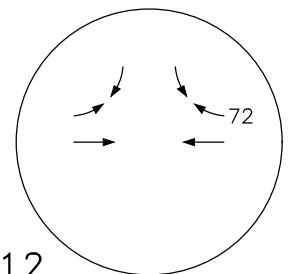
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AM PEAK HOUR

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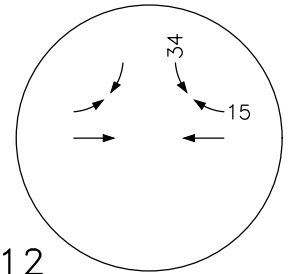
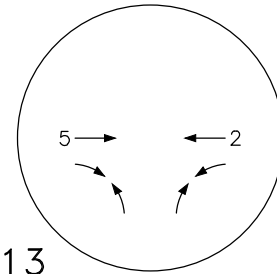
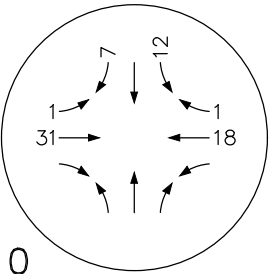
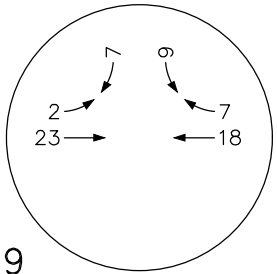
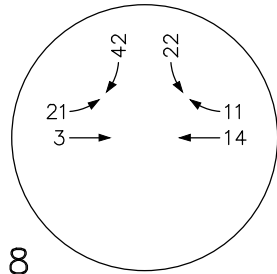
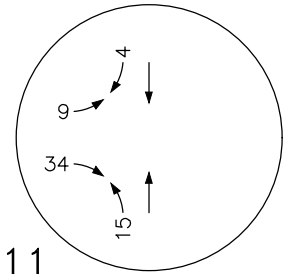
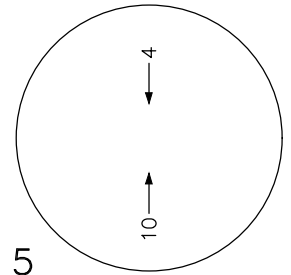
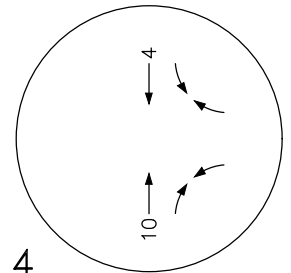
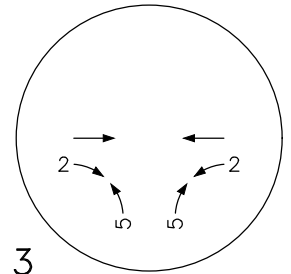
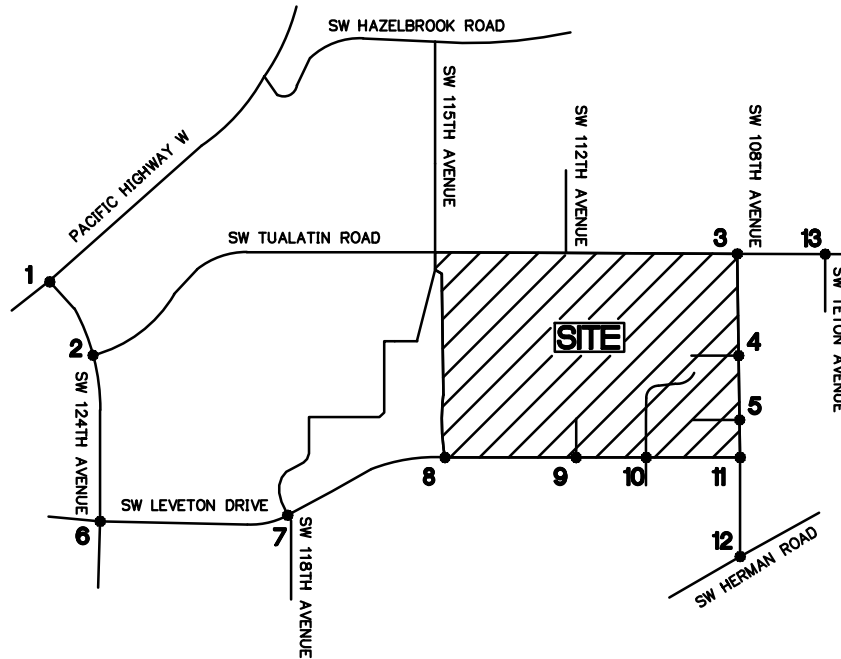
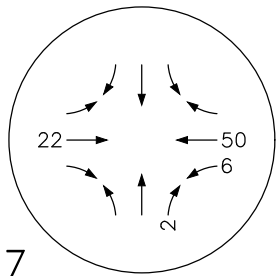
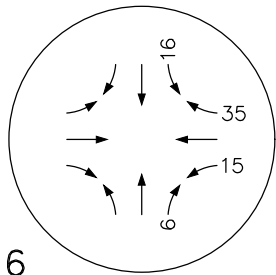
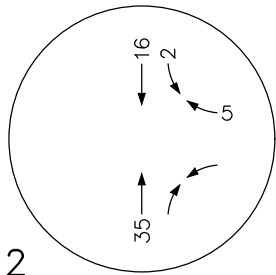
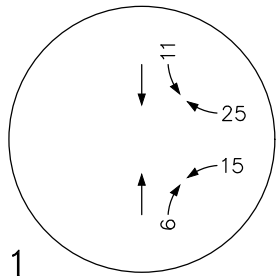
FIGURE  
6A

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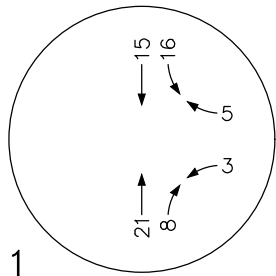
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TUALATIN, OREGON

FIGURE  
6B

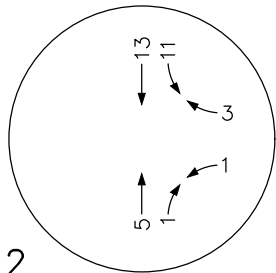
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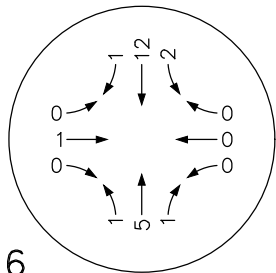
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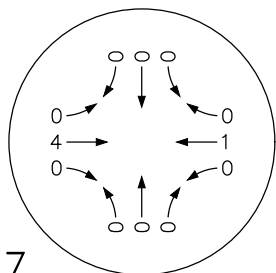
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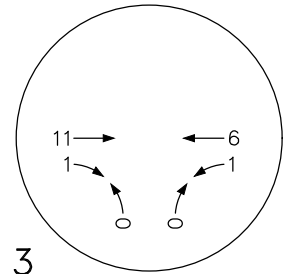
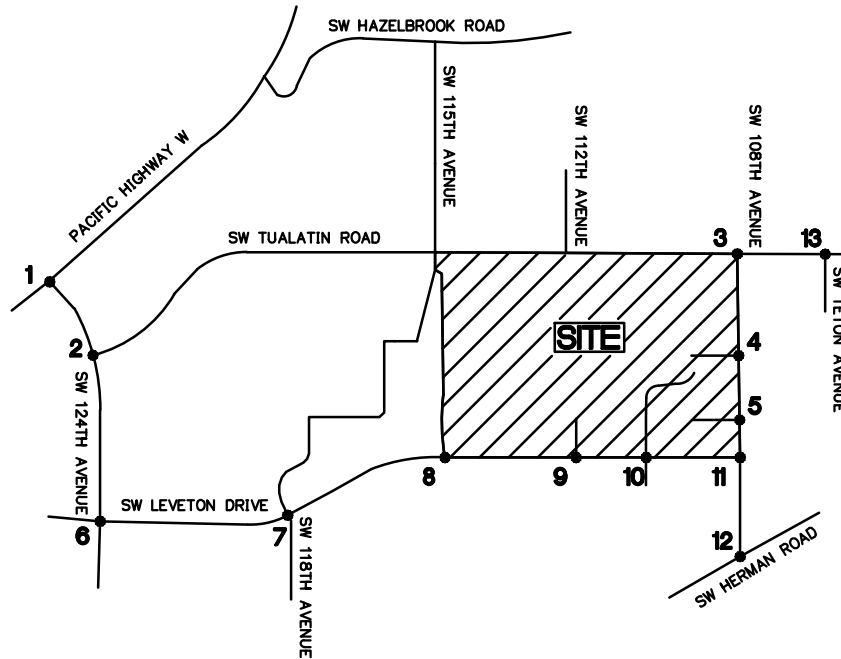
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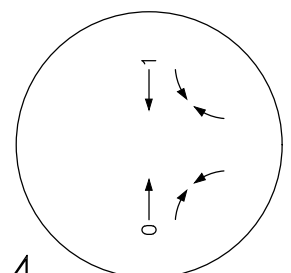
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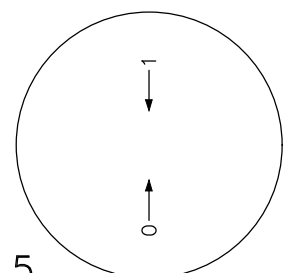
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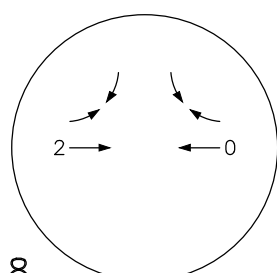
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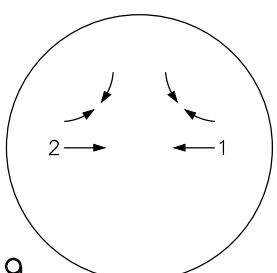
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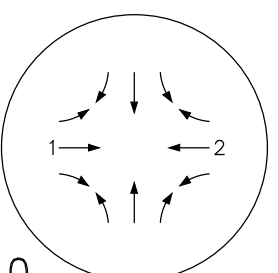
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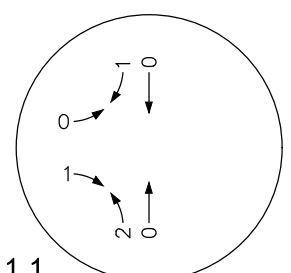
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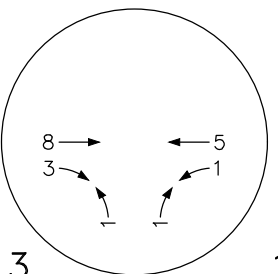
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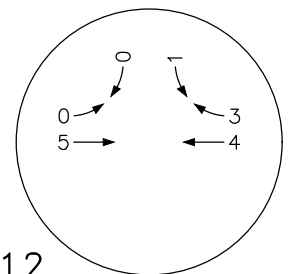
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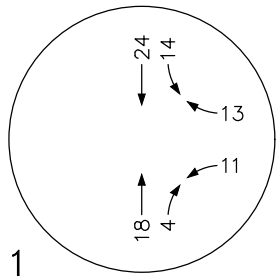
BACKGROUND TRAFFIC GROWTH,  
2 YEARS AT 1.0% PER YEAR -  
AM PEAK HOUR

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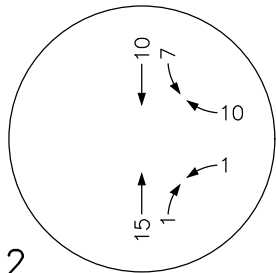
FIGURE  
7A



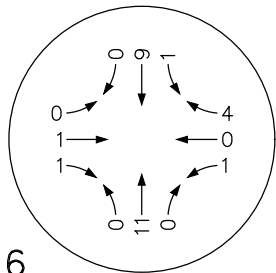
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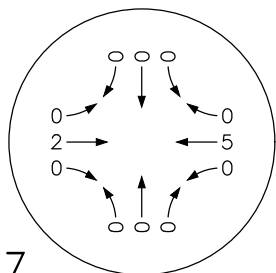
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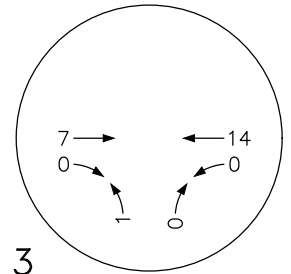
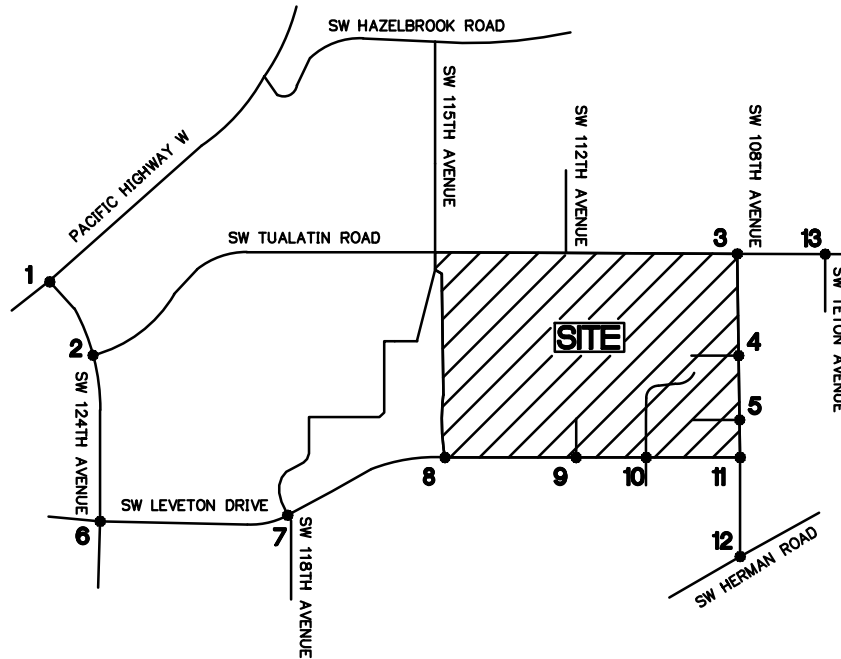
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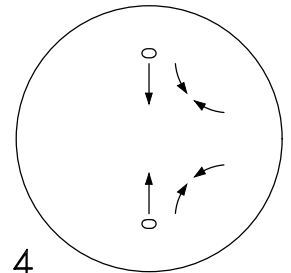
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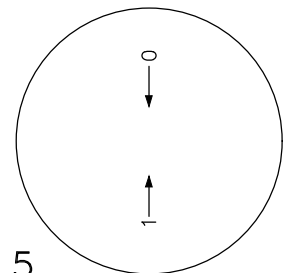
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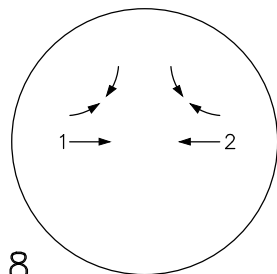
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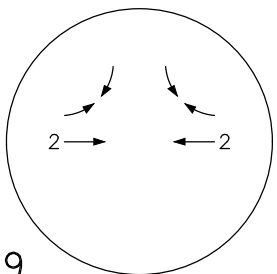
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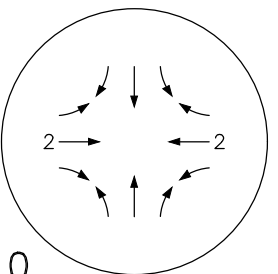
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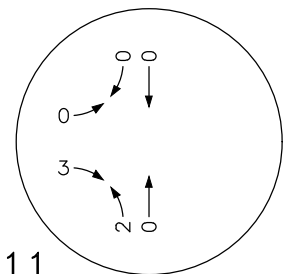
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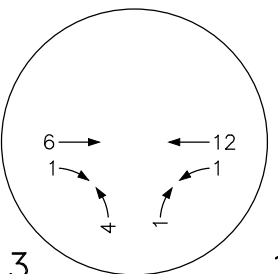
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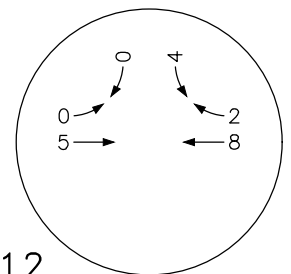
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11



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12



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BACKGROUND TRAFFIC GROWTH,  
 2 YEARS AT 1.0% PER YEAR -  
 PM PEAK HOUR

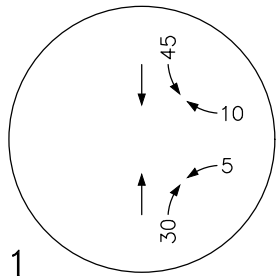
LAM RESEARCH NEW OFFICE BUILDING  
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FIGURE  
 7B

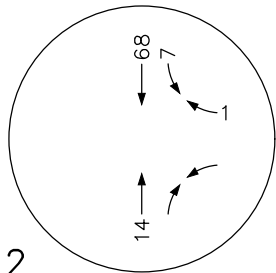
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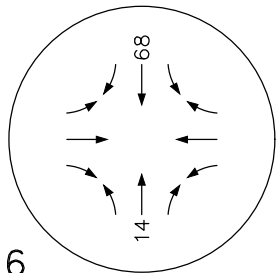
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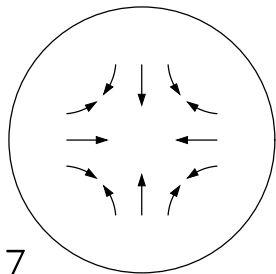
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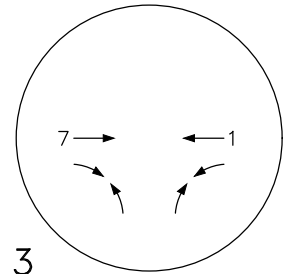
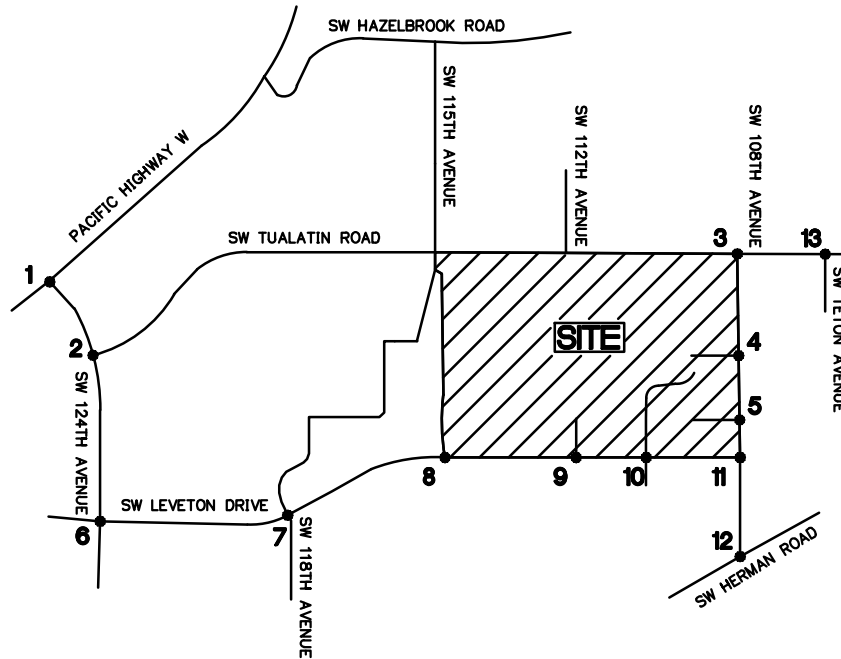
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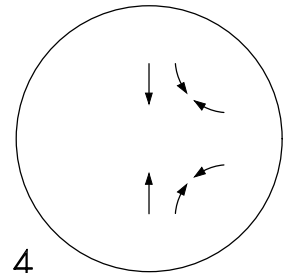
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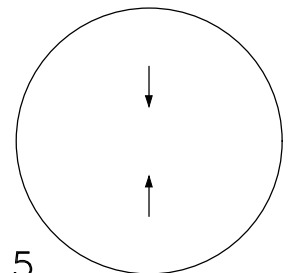
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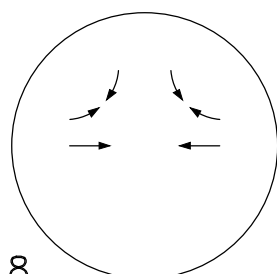
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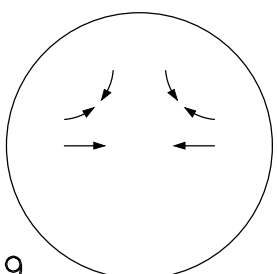
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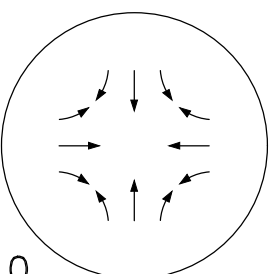
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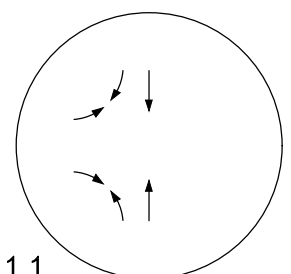
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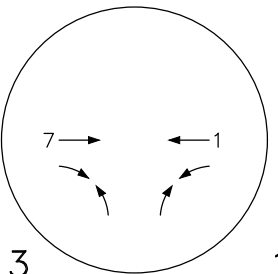
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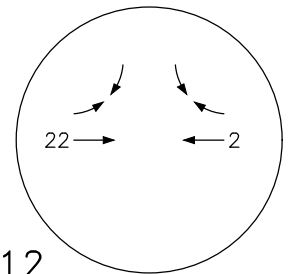
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11



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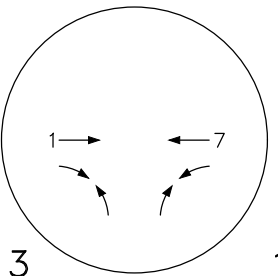
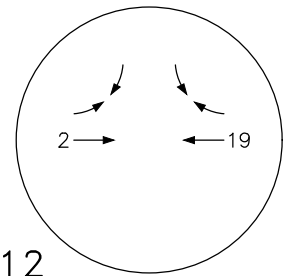
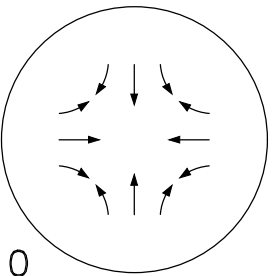
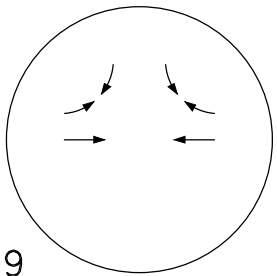
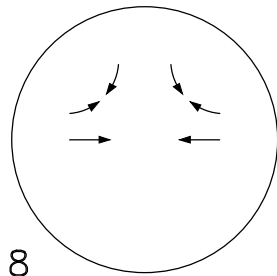
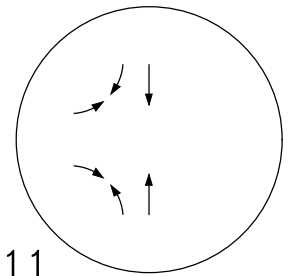
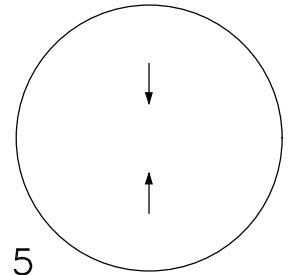
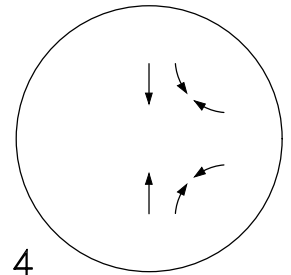
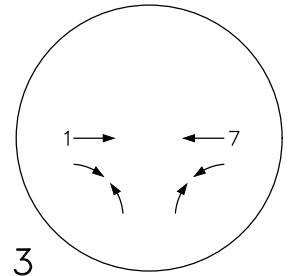
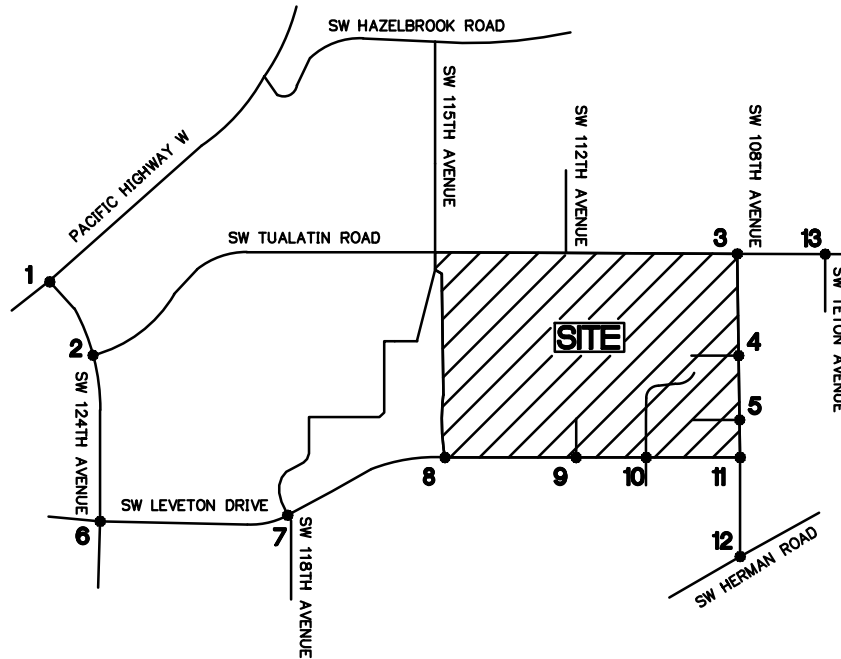
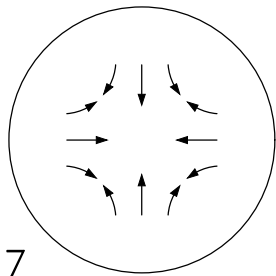
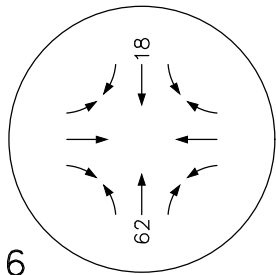
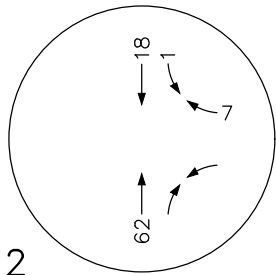
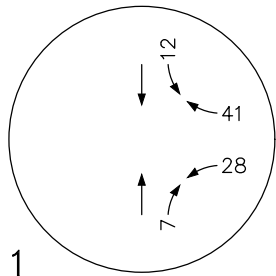
FIGURE  
 8A

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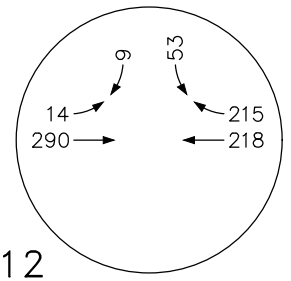
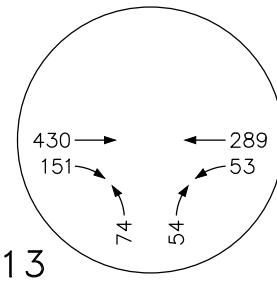
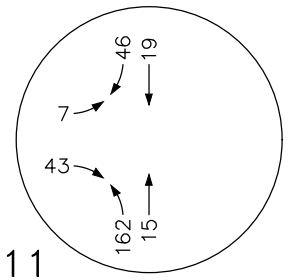
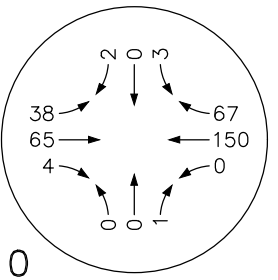
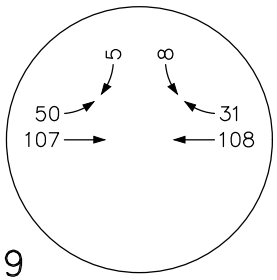
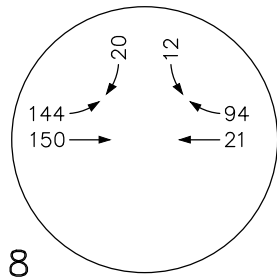
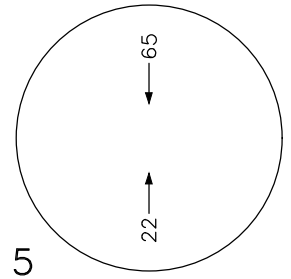
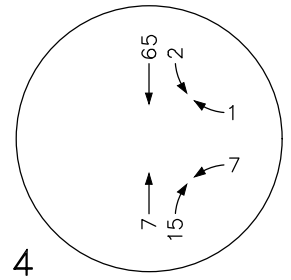
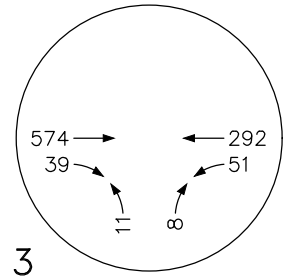
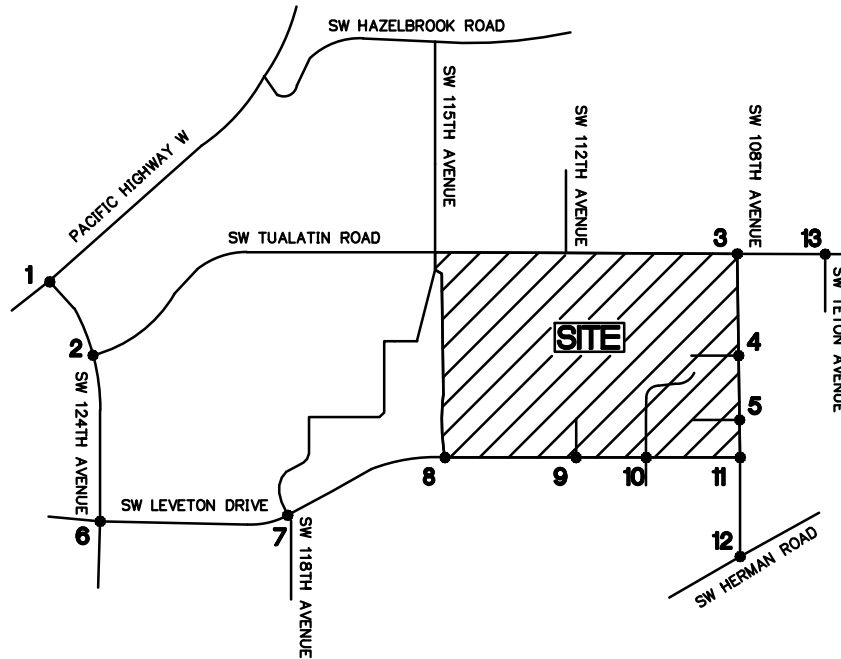
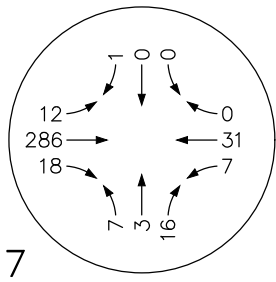
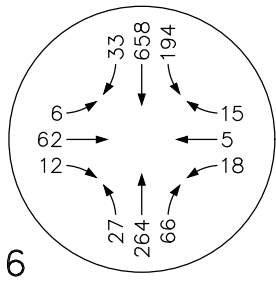
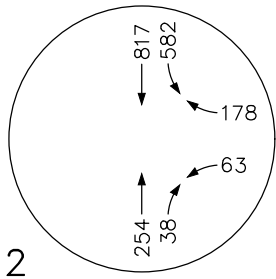
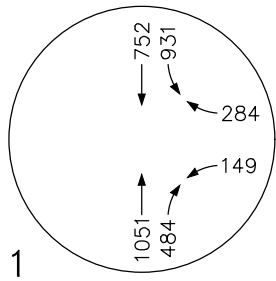
LAM RESEARCH NEW OFFICE BUILDING  
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FIGURE  
 8B

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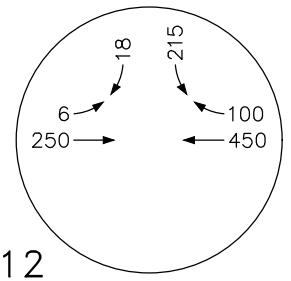
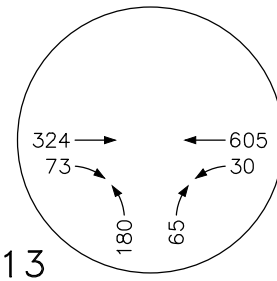
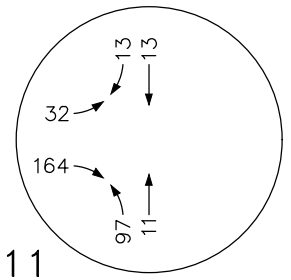
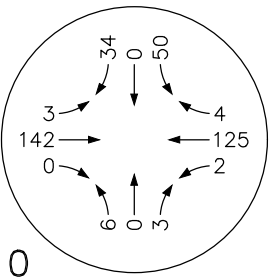
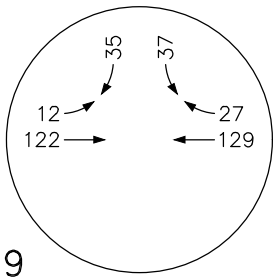
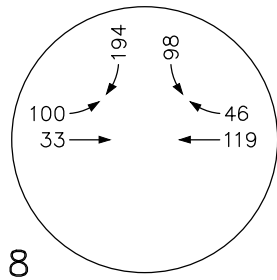
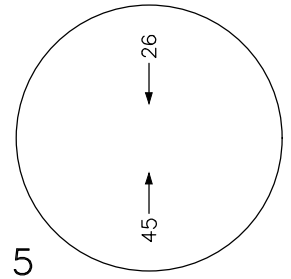
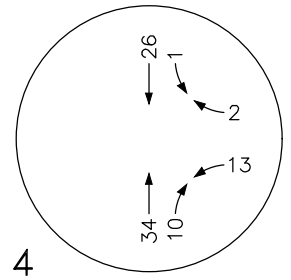
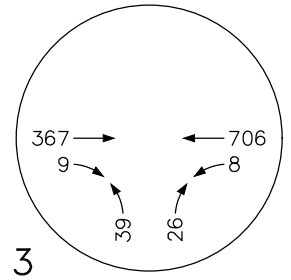
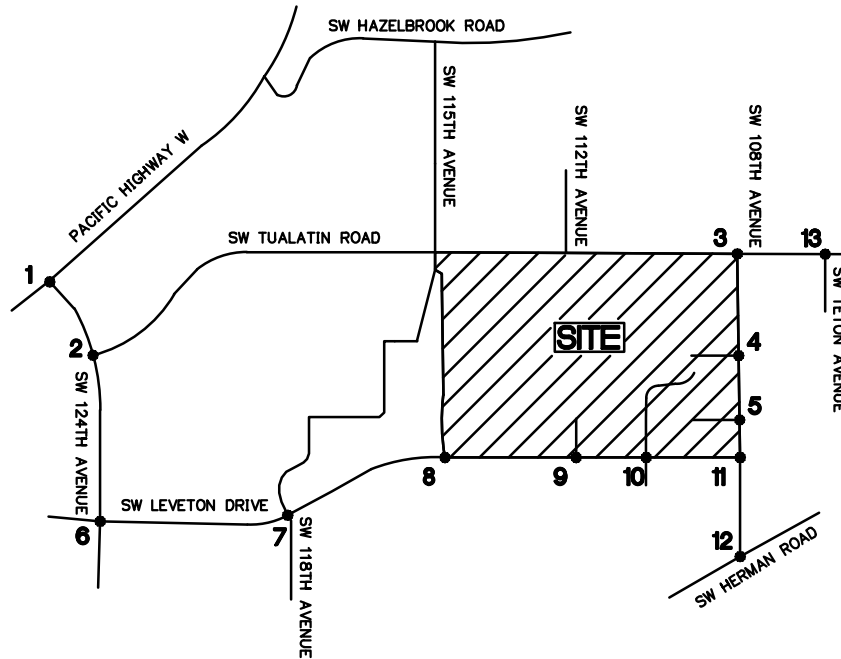
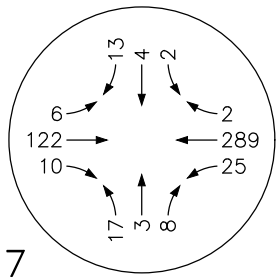
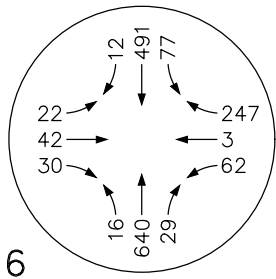
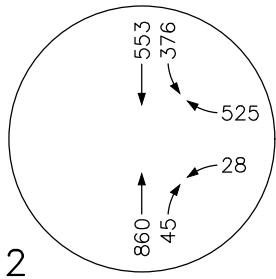
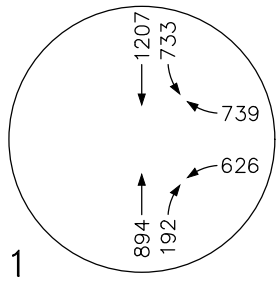
**2024 PRE-DEVELOPMENT**  
**TRAFFIC VOLUMES -**  
**AM PEAK HOUR**  
**LAM RESEARCH NEW OFFICE BUILDING**  
**TUALATIN, OREGON**

**FIGURE**  
**9A**

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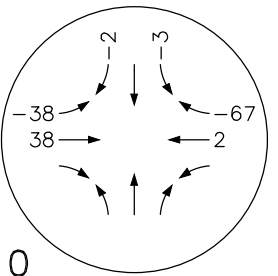
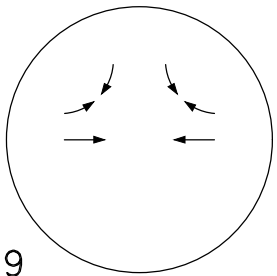
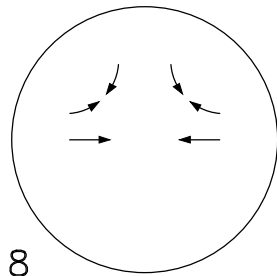
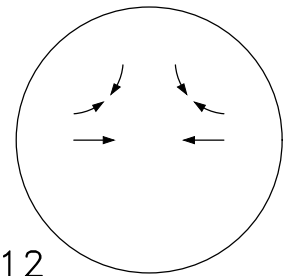
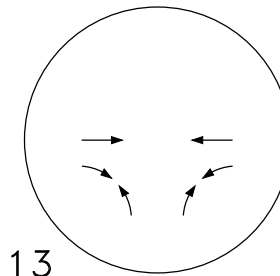
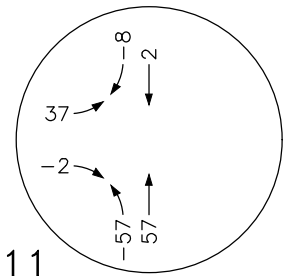
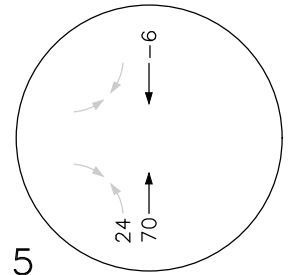
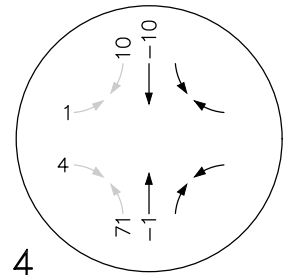
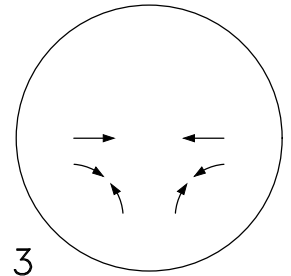
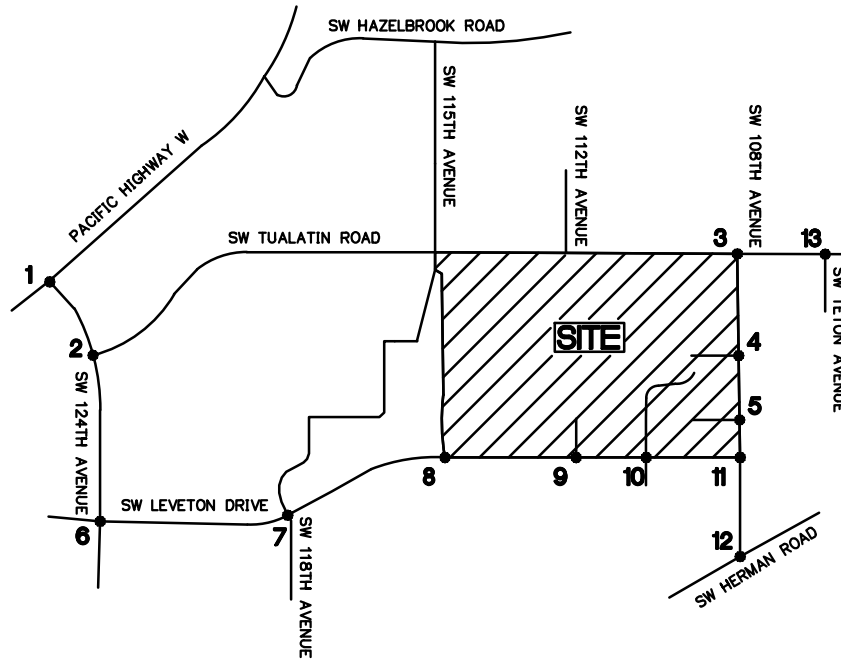
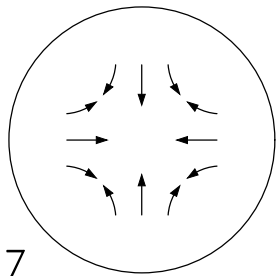
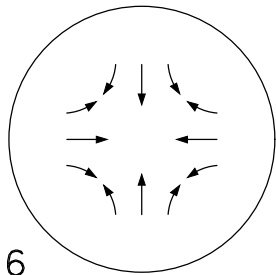
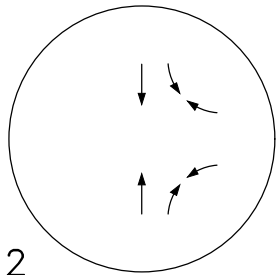
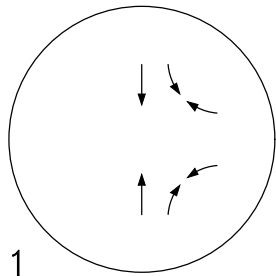
**2024 PRE-DEVELOPMENT**  
**TRAFFIC VOLUMES -**  
**PM PEAK HOUR**  
**LAM RESEARCH NEW OFFICE BUILDING**  
**TUALATIN, OREGON**

**FIGURE**  
**9B**

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**EAST ACCESS  
 REROUTED TRIPS -  
 AM PEAK HOUR**

**LAM RESEARCH NEW OFFICE BUILDING  
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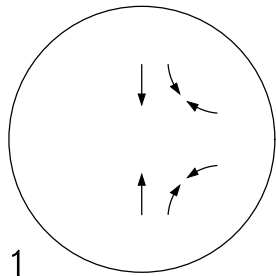
**FIGURE  
 10A**

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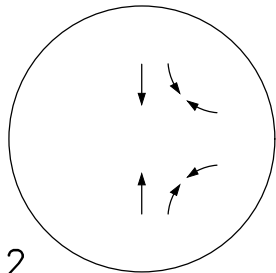




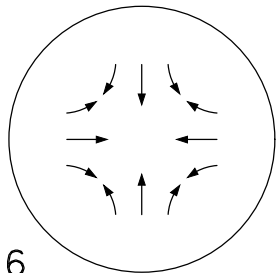
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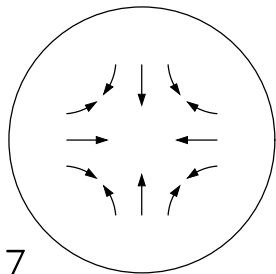
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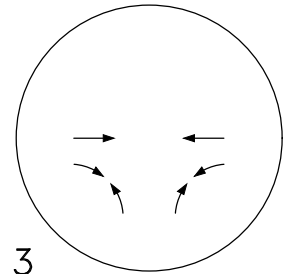
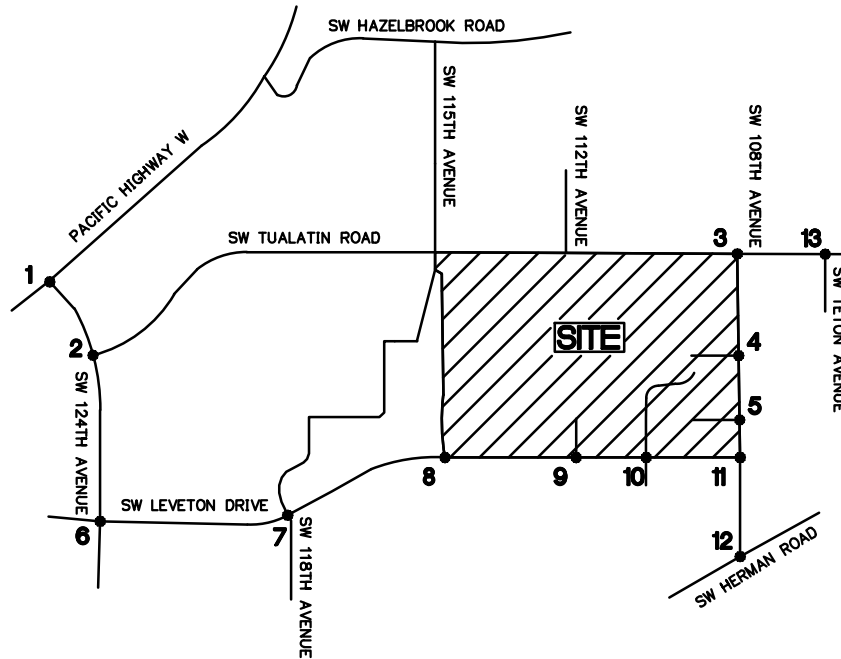
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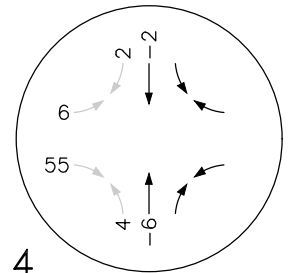
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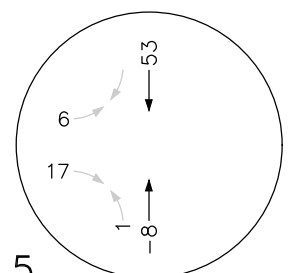
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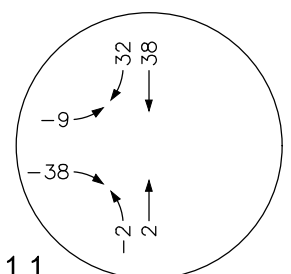
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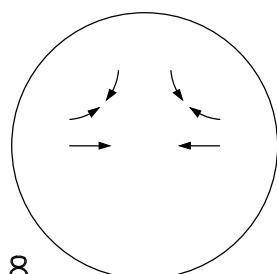
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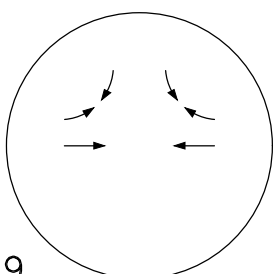
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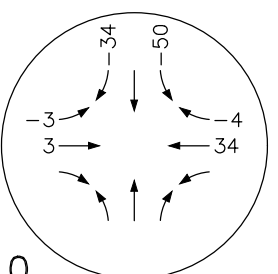
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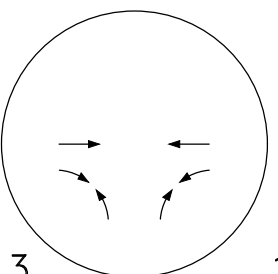
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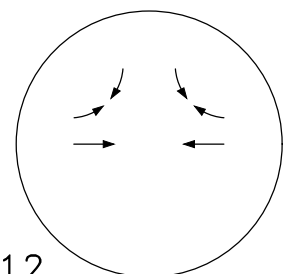
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10



13



12



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EAST ACCESS  
REROUTED TRIPS -  
PM PEAK HOUR

LAM RESEARCH NEW OFFICE BUILDING  
TUALATIN, OREGON

FIGURE  
10B

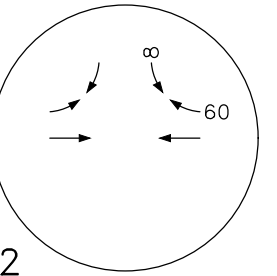
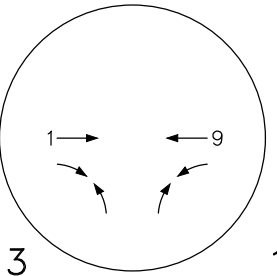
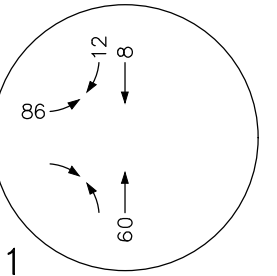
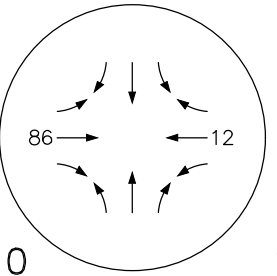
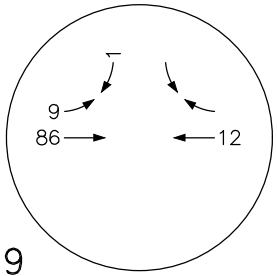
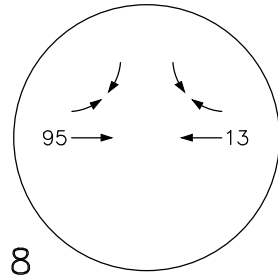
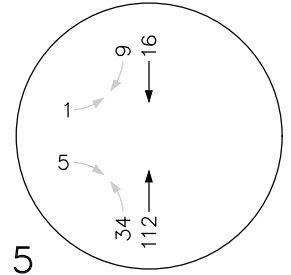
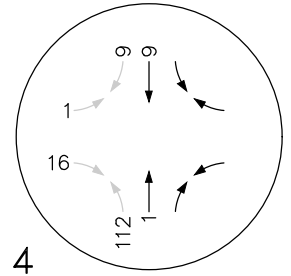
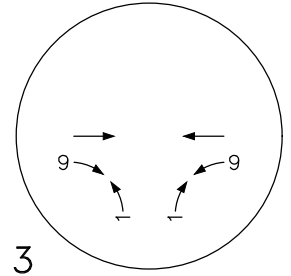
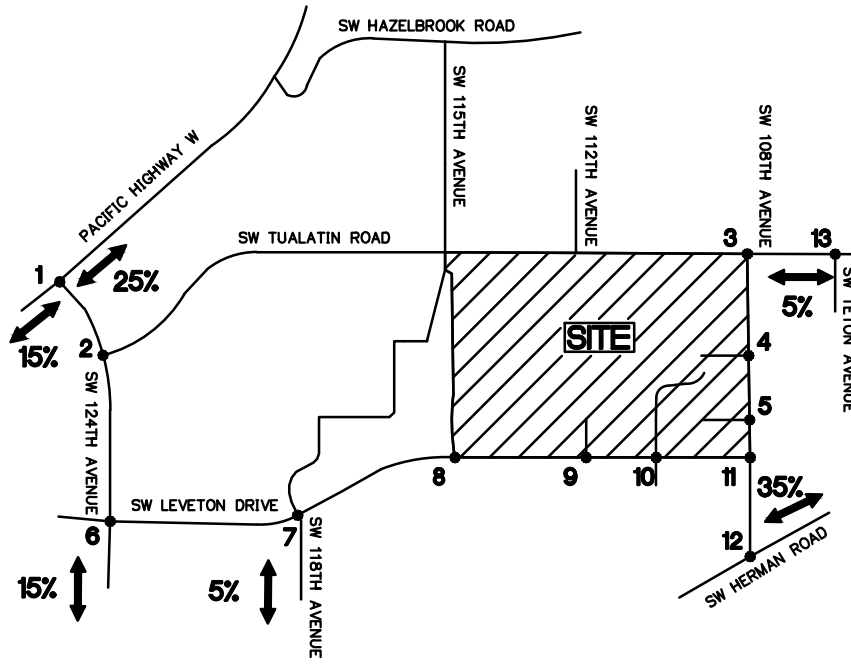
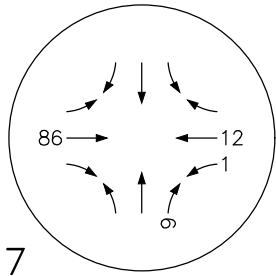
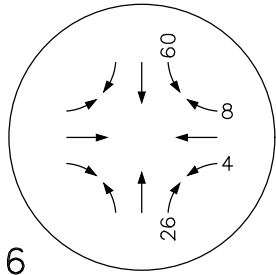
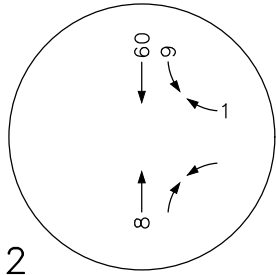
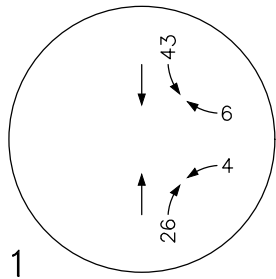
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### AM PEAK HOUR

Enter - 172  
Exit - 24  
Total - 196



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**PRIMARY TRIP DISTRIBUTION + TRAFFIC ASSIGNMENT - AM PEAK HOUR**  
**LAM RESEARCH NEW OFFICE BUILDING TUALATIN, OREGON**

**FIGURE 11A**

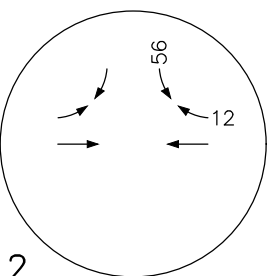
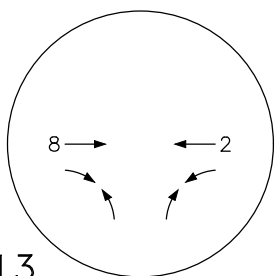
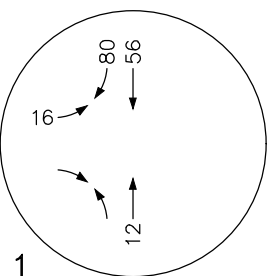
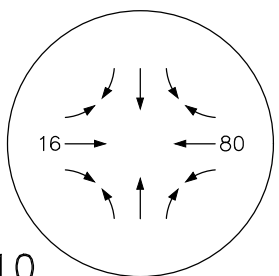
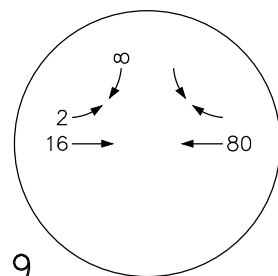
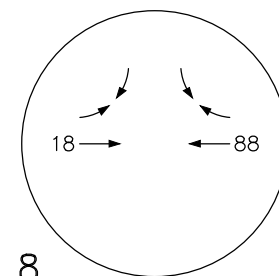
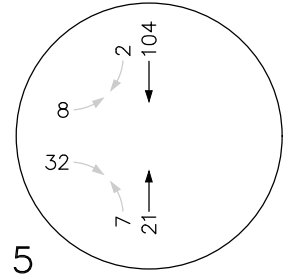
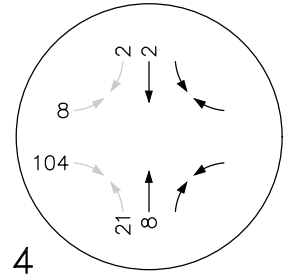
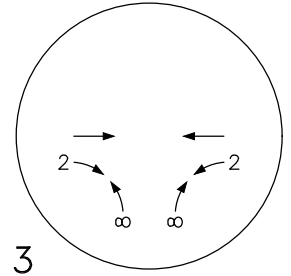
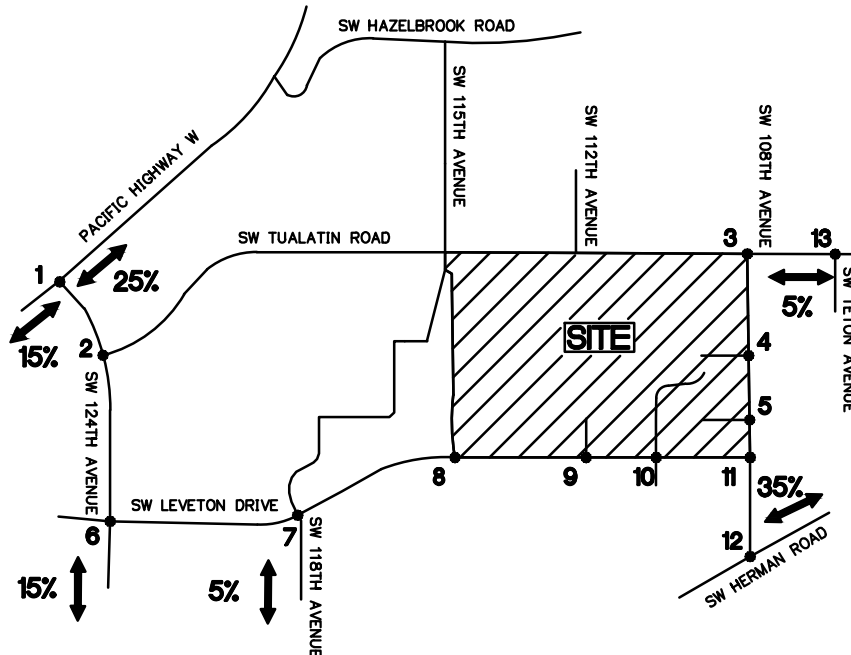
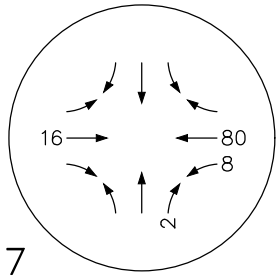
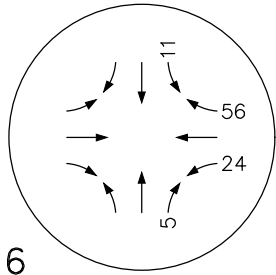
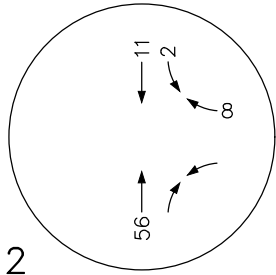
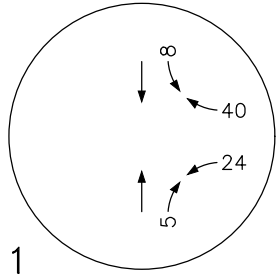
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### PM PEAK HOUR

Enter - 33  
Exit - 160  
Total - 193



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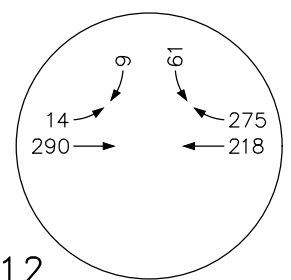
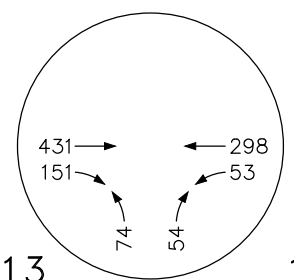
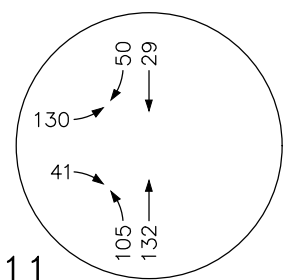
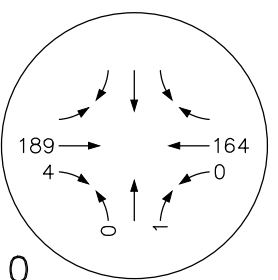
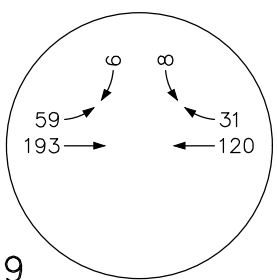
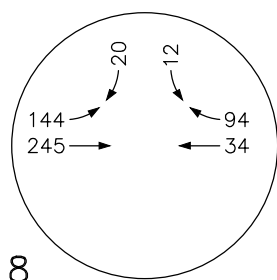
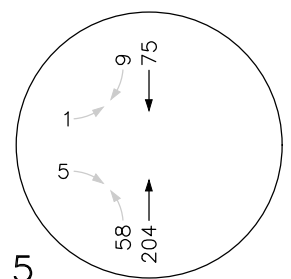
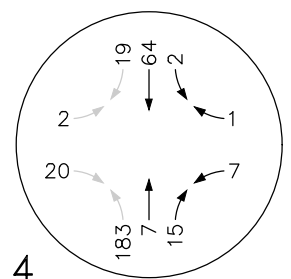
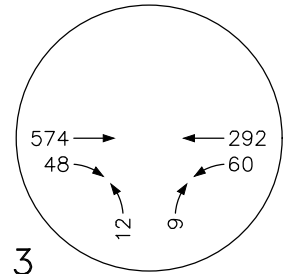
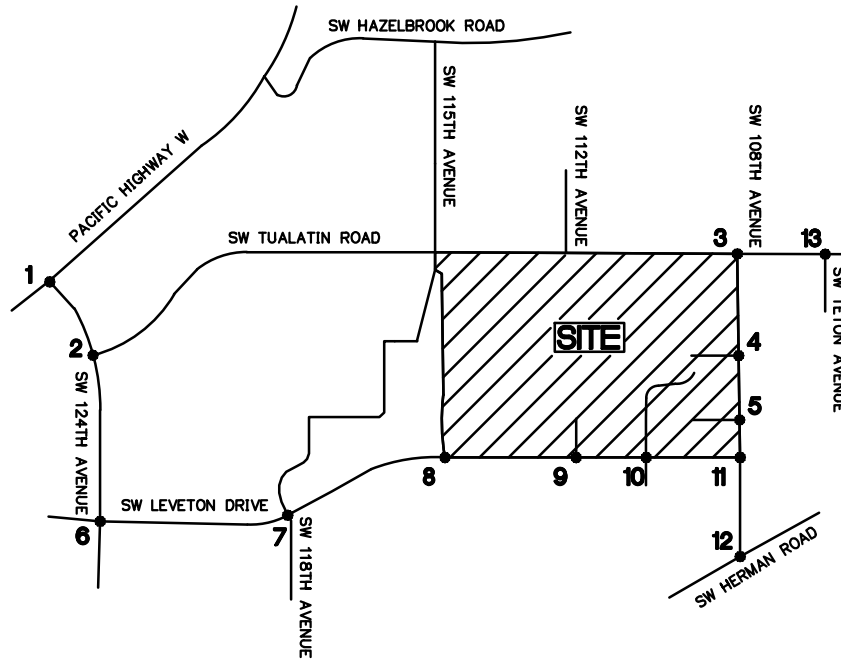
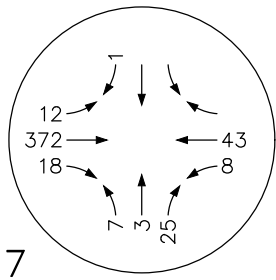
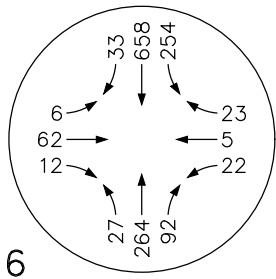
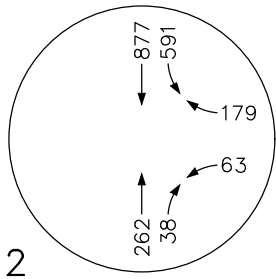
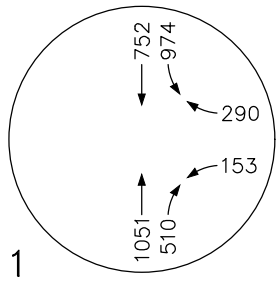
**PRIMARY TRIP DISTRIBUTION +  
 TRAFFIC ASSIGNMENT -  
 PM PEAK HOUR**  
 LAM RESEARCH NEW OFFICE BUILDING  
 TUALATIN, OREGON

**FIGURE  
 11B**

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**2024 POST-DEVELOPMENT  
 TRAFFIC VOLUMES -  
 AM PEAK HOUR**  
**LAM RESEARCH NEW OFFICE BUILDING  
 TUALATIN, OREGON**

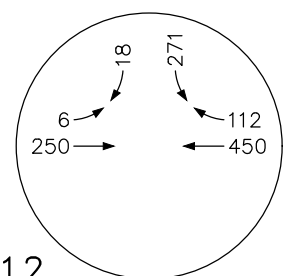
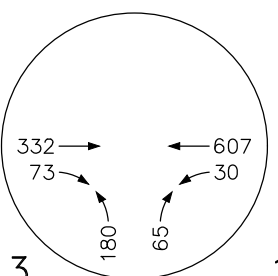
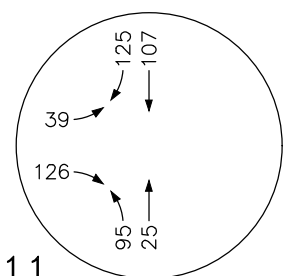
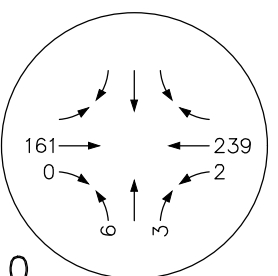
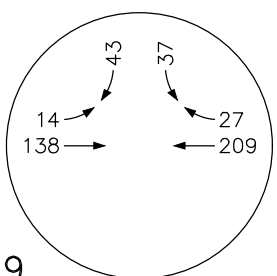
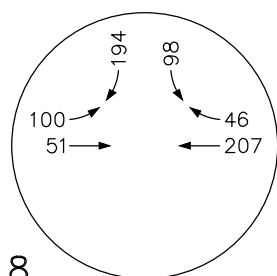
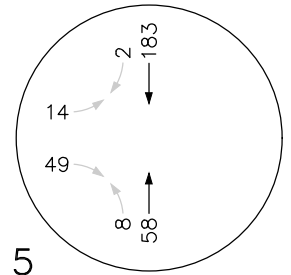
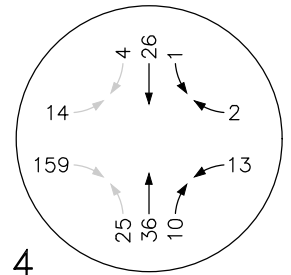
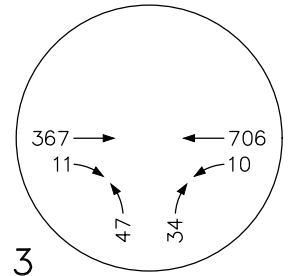
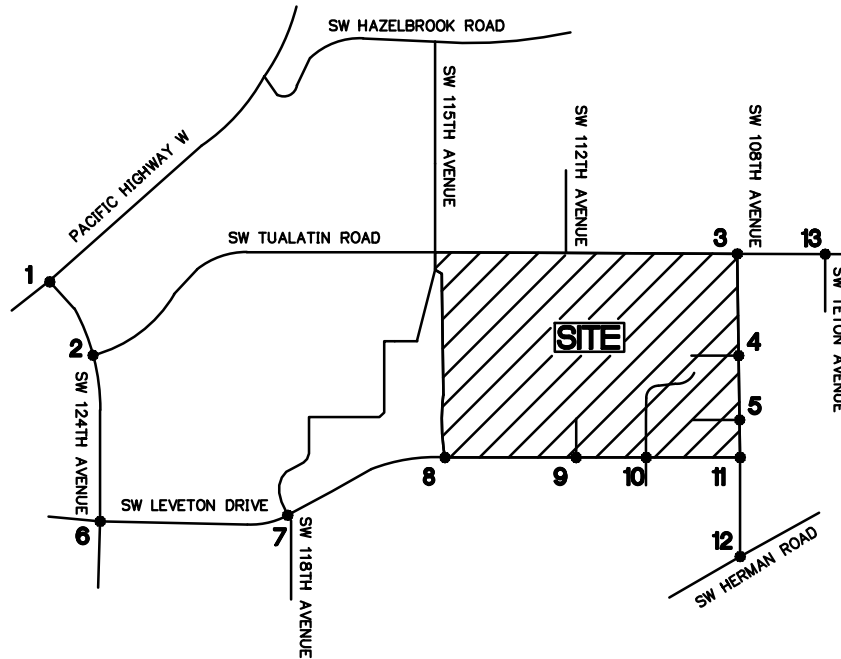
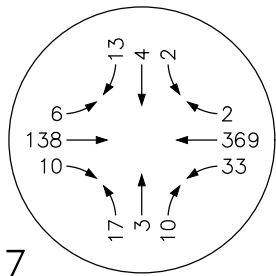
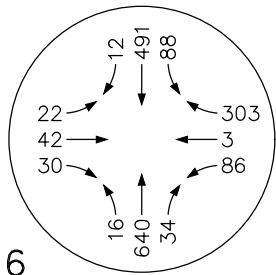
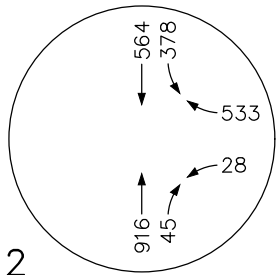
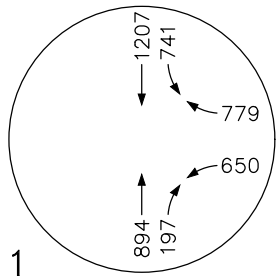
**FIGURE  
 12A**

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**2024 POST-DEVELOPMENT  
 TRAFFIC VOLUMES -  
 PM PEAK HOUR**  
**LAM RESEARCH NEW OFFICE BUILDING  
 TUALATIN, OREGON**

**FIGURE  
 12B**

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APPENDIX B.  
**SCOPING MATERIAL**

# MACKENZIE.

June 30, 2022

City of Tualatin  
Attention: Tony Doran  
18880 SW Martinazzi Avenue  
Tualatin, OR 97062

Re: **Lam Research New Office Building**  
*Transportation Impact Analysis Scoping*  
Project Number 2220087.00

Dear Tony:

Mackenzie has prepared this scoping letter in advance of preparing the required Transportation Impact Analysis (TIA) for the proposed new office building for the Lam Research campus in Tualatin, Oregon.

## SITE CONDITIONS

### Existing

The Lam Research campus is bounded by SW Tualatin Road to the north, SW 108th Avenue to the east, SW Leveton Drive to the south, and JAE Oregon to the west. The site currently has three full-movement driveways on SW Leveton Drive, a gated access on SW 108th Avenue, and a gated fire access from Quackenbush Lane, opposite SW 115th Avenue. The existing building area is currently 553,140 square feet (SF). There are currently approximately 1,270 seated/office staff and approximately 975 manufacturing staff working 5 AM to 5 PM and 5 PM to 5 AM.

### Proposed

An approximately 120,000 SF office building is proposed just north of SW Leveton Drive between the existing Center and East Access. Up to 600 office staff are planned to occupy the proposed building, with fewer than 10% working remotely. Additional surface parking for up to 500 spaces is proposed south of the existing surface parking and north along SW 108th Avenue. The buildout year for the new office building is assumed to be 2024.

The existing East Access is proposed to be narrowed and limited to trucks serving the new building. With loss of this access for employees, two (2) new driveways are proposed on SW 108th Avenue with direct access to the expanded parking area. The North Access is proposed to be aligned opposite the north driveway serving Olympic Controls. The South Access is proposed approximately 445 feet south of the North Access, between driveways for Ascentec Engineering.

## TRIP GENERATION

Trip generation estimates were developed with the use of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 11th Edition. The City requires the reasonable worst case for trip generation be analyzed. Therefore, data for ITE's "General Office Building" (LUC 710) was utilized to estimate trips for the proposed office.



**TABLE 1 – PROPOSED TRIP GENERATION**

ITE Code	Land Use	Size	Trip Type	AM Peak Hour			PM Peak Hour			Daily
				In	Out	Total	In	Out	Total	
710	General Office Building	600 Employees	Total	262	36	298	47	230	277	2,002

**TRIP DISTRIBUTION**

Site trip distribution has been modified slightly from the original master plan based on driveway counts from 2018 and 2022. The following trip distribution is proposed:

- 40% to/from the north on SW 124th Avenue (to access Highway 99W)
  - 25% to/from the north on Highway 99W
  - 15% to/from the south on Highway 99W
- 5% to/from the east on SW Tualatin Road
- 5% to/from the south on SW 118th Avenue
- 15% to/from the south on SW 124th Avenue
- 35% to/from the south on SW 108th Avenue via SW Herman Road

**STUDY AREA**

The City’s *Traffic Study Requirements* document requires that all intersections within a 1/4-mile radius of the project site be included as part of the study area. The following intersections, including site driveways, are located within a 1/4-mile radius:

- SW Leveton Drive/SW 118th Avenue
- SW Leveton Drive/SW 108th Avenue
- SW Tualatin Road/SW 108th Avenue
- SW Leveton Drive/West Access
- SW Leveton Drive/Center Access
- SW Leveton Drive/East Access
- SW 108th Avenue/North Access
- SW 108th Avenue/South Access

We will include a review of left turns to and from the existing driveway near the proposed South Access on SW 108th Avenue. No Washington County intersections are proposed because projected trips are not expected to meet the threshold of 10% impact of the roadway’s average daily traffic (ADT).

**TRANSPORTATION IMPACT ANALYSIS**

Based on the City’s traffic study requirements, as well as the required scope for the new Lam Research office building, the TIA will review AM and PM peak hour conditions at the study area intersections for the following scenarios:





- 2022 Existing
- 2024 Pre-Development without New Office Building
- 2024 Post-Development with New Office Building

Existing traffic counts collected on Thursday, June 9, 2022 reflect a portion of Lam office staff telecommuting. While a review of historical and existing traffic counts on I-5 just north of the Nyberg Street exit shows that existing traffic in the greater Tualatin area may be comparable to pre-COVID traffic, existing counts adjacent to the Lam site are lower due to some staff currently telecommuting.

Lam Research does not currently have a permanent hybrid work plan. Therefore, we propose to growth adjust existing traffic counts to match 100% on-site attendance by applying an adjustment factor of 1.92 in the AM peak hour and 1.28 in the PM peak hour to site trips. These adjustments were based on the actual 2018 and 2022 turning movement volumes at the site driveways. The AM peak adjustment is higher than the PM peak adjustment, likely due to office staff entering the site later in the day, outside the morning peak between 7 AM and 9 AM, while continuing to exit the site during the afternoon peak between 4 PM and 6 PM. These modified site trips will be carried through the adjacent roadway network as needed, similar to in-process trips, to estimate traffic volumes without the current remove work scenario.

The TIA will also include the following analysis components:

- 1% annual background growth per ODOT's 2040 Future Volumes table for OR 99W south of 124th Avenue.
- Intersection capacity analyses will be conducted at the study area intersections using the *Highway Capacity Manual* (HCM) 6 methodology.
- Crash data will be compiled and evaluated for safety concerns.
- Intersection sight distance evaluations will be based on AASHTO methodology for the proposed site access points.
- Intersection queuing, turn-lane warrants, and signal warrants will also be evaluated where appropriate.

Please confirm the proposed trip generation, trip distribution, study area, and TIA analysis components are acceptable for the required TIA.

Please contact me at [jjones@mcknze.com](mailto:jjones@mcknze.com) or 971-346-3741 if you have any questions or comments regarding the information presented in this scoping letter.

Sincerely,



Janet Jones, PE  
Associate | Traffic Engineer

Enclosure(s): Attachment A – Site Plan  
Attachment B – 2018 Turning Movement Counts  
Attachment C – 2022 Turning Movement Counts

c: Mike McCarthy – City of Tualatin  
Mike Rueter, Suzannah Stanley, Brent Nielsen, Brent Ahrend – Mackenzie



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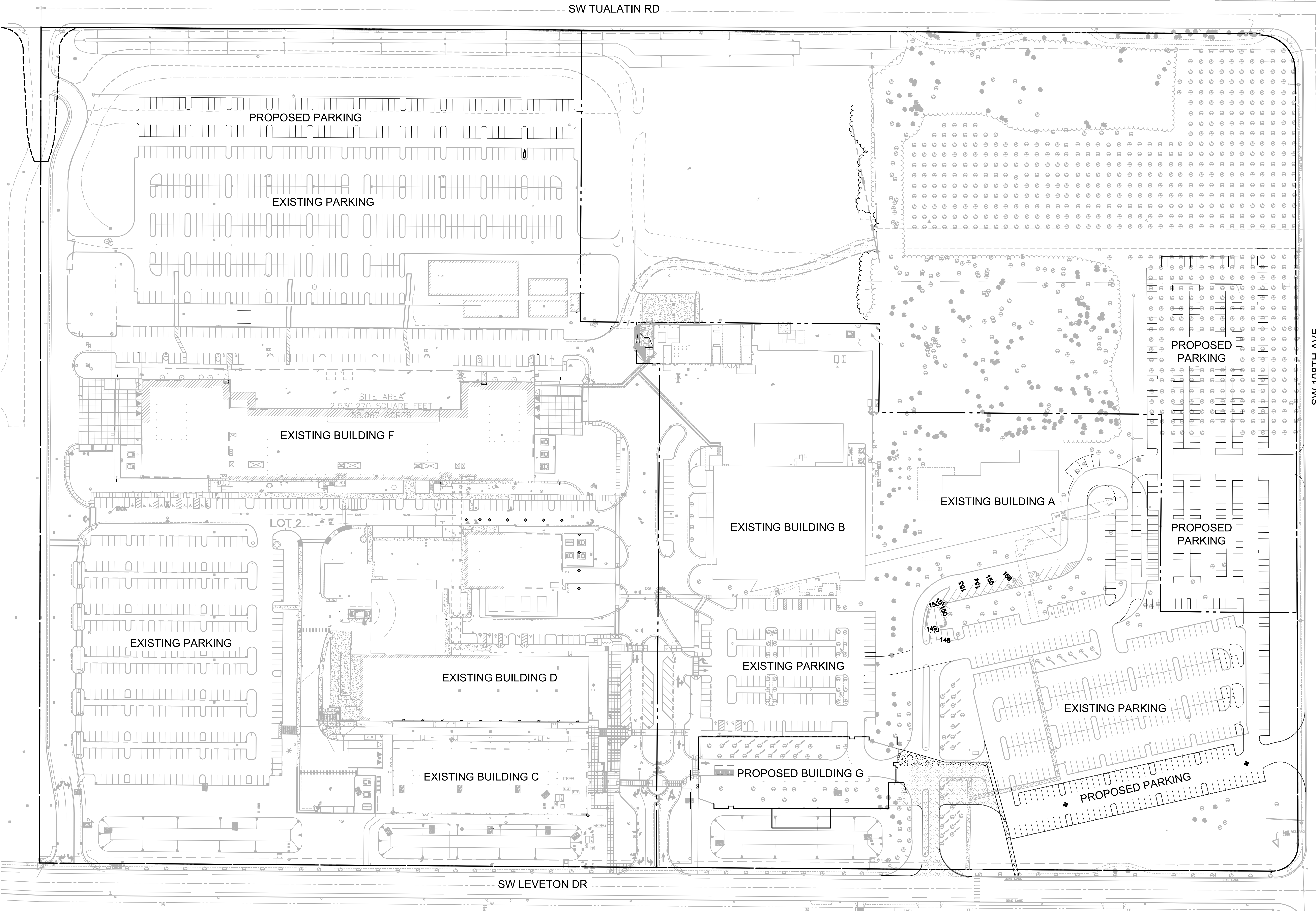
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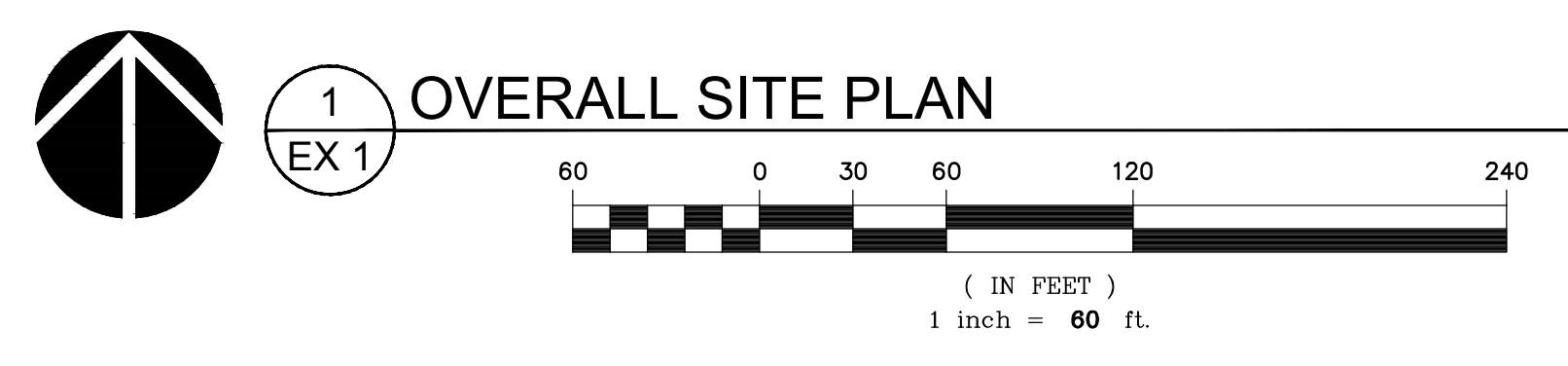
**NEW OFFICE BUILDING**



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WITHOUT PRIOR WRITTEN PERMISSION

REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**OVERALL  
SITE PLAN**



DRAWN BY: BDN

CHECKED BY: BDN

SHEET

**EX 1**

JOB NO. **2220087.00**

**PRELIMINARY ONLY**  
222008700\DRAWINGS\CIVIL\087-OVERALL SITE PLAN.DWG:4230 BDN 05/31/22 15:59 1/8"

## Clara Layton

---

**From:** Mike McCarthy <mmccarthy@tualatin.gov>  
**Sent:** Tuesday, August 2, 2022 8:52 AM  
**To:** Clara Layton; Tony Doran  
**Cc:** Mike Rueter; Brent Nielsen; Suzannah Stanley; Brent Ahrend; Kim McMillan; Janet T. Jones; 'Jennifer Danziger'; Steve Koper; Erin Engman  
**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Hi Clara,

In the Traffic Study area, please also include the intersection of Tualatin Road with Teton Avenue, which is just a bit to the east of the project. We have received concerns from the public about the effect of development traffic on the Tualatin/Teton intersection.

Thanks,

Mike McCarthy, P.E.  
Interim City Engineer  
City of Tualatin  
Office: 503-691-3674  
Mobile: 971-666-0000

---

**From:** Clara Layton <CLayton@mcknze.com>  
**Sent:** Thursday, July 28, 2022 1:50 PM  
**To:** Mike McCarthy <mmccarthy@tualatin.gov>; Tony Doran <TDORAN@tualatin.gov>  
**Cc:** Mike Rueter <MRueter@mcknze.com>; Brent Nielsen <BNielsen@mcknze.com>; Suzannah Stanley <SStanley@mcknze.com>; Brent Ahrend <BAhrend@mcknze.com>; Kim McMillan <kmcmillan@tualatin.gov>; Janet T. Jones <JTJ@mcknze.com>; 'Jennifer Danziger' <jennifer@lancastermoble.com>; Steve Koper <skoper@tualatin.gov>  
**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Mike,

Thanks so much for all of your scoping comments and in-process project information. We were able to obtain all relevant traffic studies from Jennifer Danzinger.

Clara Layton | she/her/hers  
D 971.254.9496 E [clayton@mcknze.com](mailto:clayton@mcknze.com)

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---

**From:** Mike McCarthy <mmccarthy@tualatin.gov>  
**Sent:** Wednesday, July 27, 2022 8:34 AM  
**To:** Mike McCarthy <mmccarthy@tualatin.gov>; Clara Layton <CLayton@mcknze.com>; Tony Doran <TDORAN@tualatin.gov>  
**Cc:** Mike Rueter <MRueter@mcknze.com>; Brent Nielsen <BNielsen@mcknze.com>; Suzannah Stanley <SStanley@mcknze.com>; Brent Ahrend <BAhrend@mcknze.com>; Kim McMillan <kmcmillan@tualatin.gov>; Janet T. Jones <JTJ@mcknze.com>; 'Jennifer Danziger' <jennifer@lancastermoble.com>; Steve Koper <skoper@tualatin.gov>  
**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Hi Clara,

Please also ask Jennifer about a project on Myslony St called Hedges Creek.

The River Ridge project need not be considered – they would need additional land use approvals before they could build something that would generate enough traffic to need to be studied.

Thanks,

Mike McCarthy, P.E.  
Interim City Engineer  
City of Tualatin  
Office: 503-691-3674  
Mobile: 971-666-0000

---

**From:** Mike McCarthy  
**Sent:** Tuesday, July 26, 2022 6:08 PM  
**To:** 'Clara Layton' <[CLayton@mcknze.com](mailto:CLayton@mcknze.com)>; Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>  
**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Kim McMillan <[kmcmillan@tualatin.gov](mailto:kmcmillan@tualatin.gov)>; Janet T. Jones <[JTJ@mcknze.com](mailto:JTJ@mcknze.com)>; 'Jennifer Danziger' <[jennifer@lancastermobley.com](mailto:jennifer@lancastermobley.com)>; Steve Koper <[skoper@tualatin.gov](mailto:skoper@tualatin.gov)>  
**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Hi Clara,

The numbers and intersections below seem reasonable.

The Herman Road project is under construction. The River Ridge project has not been built yet. The Columbia Roofing project is old enough it need not be considered.

Another in-process development is the Tualatin Logistics Park on the site of the Island Greens driving range/mini golf site. Please contact Jennifer Danziger at Lancaster-Mobley to get the latest numbers for it.

Tony – please chime in if there are other in-process developments that would affect this study area.

Thanks,

Mike McCarthy, P.E.  
Interim City Engineer  
City of Tualatin  
Office: 503-691-3674  
Mobile: 971-666-0000

---

**From:** Clara Layton <[CLayton@mcknze.com](mailto:CLayton@mcknze.com)>  
**Sent:** Tuesday, July 26, 2022 4:16 PM  
**To:** Mike McCarthy <[mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov)>; Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>  
**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Kim McMillan <[kmcmillan@tualatin.gov](mailto:kmcmillan@tualatin.gov)>; Janet T. Jones <[JTJ@mcknze.com](mailto:JTJ@mcknze.com)>  
**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping



Good afternoon!

We did some digging and found three projects that have been approved in the vicinity of our site. Can you confirm that the projects below have not been constructed, and include any additional projects relevant to our study area intersections?

AR-20-0002 Herman Road Industrial: <https://www.tualatinoregon.gov/planning/ar-20-0002-herman-road-industrial>

AR-18-0005 Columbia Roofing Building Addition: <https://www.tualatinoregon.gov/planning/ar18-0005-columbia-roofing-building-addition>

AR-19-0004 River Ridge Addition: <https://www.tualatinoregon.gov/planning/ar-19-0004-river-ridge-addition>

Thanks!

Clara Layton | she/her/hers

D 971.254.9496 E [clayton@mcknze.com](mailto:clayton@mcknze.com)

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---

**From:** Clara Layton

**Sent:** Friday, July 22, 2022 9:17 AM

**To:** Mike McCarthy <[mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov)>; Janet T. Jones <[JTJ@mcknze.com](mailto:JTJ@mcknze.com)>; Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>

**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley

<[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Kim McMillan <[kmcmillan@tualatin.gov](mailto:kmcmillan@tualatin.gov)>

**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Good morning, Mike!

I'm just following up to see if you've had a chance to review the trip generation information and proposed study area we provided.

With your comments, can you please include any relevant in-process projects, if any?

Thanks.

Clara Layton | she/her/hers

D 971.254.9496 E [clayton@mcknze.com](mailto:clayton@mcknze.com)

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---

**From:** Clara Layton

**Sent:** Tuesday, July 19, 2022 2:07 PM

**To:** Mike McCarthy <[mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov)>; Janet T. Jones <[JTJ@mcknze.com](mailto:JTJ@mcknze.com)>; Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>

**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley

<[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Kim McMillan <[kmcmillan@tualatin.gov](mailto:kmcmillan@tualatin.gov)>

**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Mike,

Good morning! My name's Clara Layton, I'm helping Janet with the TIA for the new Lam Research office building.

Thank you for providing comments on the TIA scoping materials. Attached are figures presenting our current trip distribution and traffic assignment assumptions, showing all new trips added to each study intersection. These trips are based on ITE Trip Generation data for a General Office Building land use based on the 120-KSF building area, as summarized below:

LUC	Land Use	Size	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
710	General Office Building	120 KSF	172	24	196	33	160	193	1,360

Based on the TIA requirements document you provided, we will be including all of the following intersections in our study area, as all (with the exception of Tualatin/108th, which is a key frontage intersection) will have at least 60 trips added in one hour:

1. Pacific Highway W (OR-99W)/SW 124th Avenue
2. SW Tualatin Road/SW 124th Avenue
3. SW Tualatin Road/SW 108th Avenue
4. SW 108th Avenue/North Access
5. SW 108th Avenue/South Access
6. SW Leveton Drive/SW 124th Avenue
7. SW Leveton Drive/SW 118th Avenue
8. SW Leveton Drive/West Access
9. SW Leveton Drive/Center Access
10. SW Leveton Drive/East Access
11. SW Leveton Drive/SW 108th Avenue
12. SW Herman Road/SW 108th Avenue

To your question, there is no current plan for site traffic to access off of NW Tualatin Road, so we do not plan to analyze the driveway opposite NW 115th Avenue.

While we continue to prepare our TIA report, are there any current in-process projects that the City anticipates will add trips to our study intersections?

Thanks.

Clara Layton | she/her/hers  
 D 971.254.9496 E [clayton@mcknze.com](mailto:clayton@mcknze.com)

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**From:** Mike McCarthy <[mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov)>  
**Sent:** Friday, July 15, 2022 3:14 PM  
**To:** Janet T. Jones <[JTJ@mcknze.com](mailto:JTJ@mcknze.com)>; Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>  
**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Clara Layton <[CLayton@mcknze.com](mailto:CLayton@mcknze.com)>; Kim McMillan <[kmcmillan@tualatin.gov](mailto:kmcmillan@tualatin.gov)>  
**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Hi Janet,

Thank you for sending in the TIA scoping letter for the new Lam Research office building.

The scoping letter for the LAM project generally looks good. A few notes/comments:

In case you haven't seen it already, our traffic study requirements have been recently posted on our website at:

[Tualatin Traffic Study Requirements | The City of Tualatin Oregon Official Website](#)

We typically use the ITE Trip Generation rates by the size of building, instead of the number of employees.

Our criteria for determining the study area is:

1. All proposed site access points to the public street system.
2. All roads and intersections along the frontage of the subject property.
3. Any road or intersection where the proposed development would be anticipated to generate more than 500 additional vehicle trips per day or more than 60 vehicle trips in a single hour. If a two-way-stop-controlled intersection functions acceptably and the proposed development would add less than 50 trips per day on the minor leg, it need not be included by this criterion.
4. The route(s) trucks would use from the site to the arterial system must be identified for all developments and analyzed for truck travel if used for more than 10 truck trips per day.
5. Walking and cycling routes to transit stops within ¼ mile, parks and retail areas within ½ mile and, for residential developments, schools within 1 mile.
6. Any other areas where, in staff judgement, traffic study is needed to protect the public interest.

Off-site intersections are typically identified for study based on the number of new trips that would be using them based on category 3 above – or as a truck route or walking/cycling route for category 4 or 5. Please send us your estimation of the new trips on the transportation network and let us know which intersections meet the 500/day or 60/hour new trip threshold. It appears this may include 124<sup>th</sup>/Tualatin Rd, 124<sup>th</sup>/Leveton, Herman/108<sup>th</sup>, and perhaps others such as 124<sup>th</sup>/Hwy 99W.

Is the plan for site traffic to use the driveway off of Tualatin Road opposite 115<sup>th</sup> Ave? If so, that location needs to be studied.

The methodology to adjust for full onsite attendance and for future growth appear to be acceptable.

Of course, please feel free to call or e-mail me with any questions.

Thanks,

Mike McCarthy, P.E.

Principal Transportation Engineer

City of Tualatin

Office: 503-691-3674

Mobile: 971-666-0000

---

**From:** Janet T. Jones <[JTJ@mcknze.com](mailto:JTJ@mcknze.com)>

**Sent:** Monday, July 11, 2022 9:04 AM

**To:** Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>; Mike McCarthy <[mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov)>

**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley

<[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Clara Layton <[CLayton@mcknze.com](mailto:CLayton@mcknze.com)>

**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Hi Tony,

Has City staff had a chance to review our proposed scope for the TIA? I am happy to hop on a call to discuss this.

Thank you,

**Janet Jones, PE** | she/her/hers  
Associate | Transportation Engineering  
D 971.346.3741 E [jjones@mcknze.com](mailto:jjones@mcknze.com)

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---

**From:** Janet T. Jones

**Sent:** Friday, July 1, 2022 8:37 AM

**To:** Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>; Mike McCarthy <[mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov)>

**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Clara Layton <[CLayton@mcknze.com](mailto:CLayton@mcknze.com)>

**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Thanks, Tony. We appreciate the confirmation and update.

Hope you have a great holiday weekend!

**Janet Jones, PE** | she/her/hers  
Associate | Transportation Engineering  
D 971.346.3741 E [jjones@mcknze.com](mailto:jjones@mcknze.com)

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**From:** Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>

**Sent:** Friday, July 1, 2022 8:26 AM

**To:** Janet T. Jones <[JTJ@mcknze.com](mailto:JTJ@mcknze.com)>; Mike McCarthy <[mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov)>

**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Clara Layton <[CLayton@mcknze.com](mailto:CLayton@mcknze.com)>

**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Janet,

Thank you. The link was received. Staff will likely attend to review of your requests after their 4<sup>th</sup> of July vacations.

Tony Doran  
Engineering Associate  
(503) 691-3035  
Tualatin City Services



10699 SW Herman Road  
City of Tualatin

---

**From:** Janet T. Jones <[JTJ@mcknze.com](mailto:JTJ@mcknze.com)>  
**Sent:** Friday, July 1, 2022 8:22 AM  
**To:** Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>; Mike McCarthy <[mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov)>  
**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Clara Layton <[CLayton@mcknze.com](mailto:CLayton@mcknze.com)>  
**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Hi Tony,

Thank you for the quick reply. I just resent that email with the link. Let me know if you don't receive it and I'll just email you the PDF as an attachment.

Thank you,

**Janet Jones, PE** | she/her/hers  
Associate | Transportation Engineering  
D 971.346.3741 E [jjones@mcknze.com](mailto:jjones@mcknze.com)

**MACKENZIE.**

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**From:** Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>  
**Sent:** Friday, July 1, 2022 7:19 AM  
**To:** Janet T. Jones <[JTJ@mcknze.com](mailto:JTJ@mcknze.com)>; Mike McCarthy <[mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov)>  
**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Clara Layton <[CLayton@mcknze.com](mailto:CLayton@mcknze.com)>  
**Subject:** RE: Lam Research New Office (PRE2-0017) - TIA Scoping

Janet,

Would you reply and attach the email with the link you stated you sent?

I've not received any additional email with a link and Mike is out today so confirmation he's received one or not is unavailable. If you provide your previous email as an attachment, our Information Services team could look into if communication is being blocked with our systems.

Tony Doran  
Engineering Associate  
(503) 691-3035  
Tualatin City Services  
10699 SW Herman Road  
City of Tualatin

---

**From:** Janet T. Jones <[JTJ@mcknze.com](mailto:JTJ@mcknze.com)>  
**Sent:** Thursday, June 30, 2022 8:31 PM  
**To:** Mike McCarthy <[mmccarthy@tualatin.gov](mailto:mmccarthy@tualatin.gov)>; Tony Doran <[TDORAN@tualatin.gov](mailto:TDORAN@tualatin.gov)>  
**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Brent Nielsen <[BNielsen@mcknze.com](mailto:BNielsen@mcknze.com)>; Suzannah Stanley

<[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Brent Ahrend <[BAhrend@mcknze.com](mailto:BAhrend@mcknze.com)>; Clara Layton <[CLayton@mcknze.com](mailto:CLayton@mcknze.com)>

**Subject:** Lam Research New Office (PRE2-0017) - TIA Scoping

Tony and Mike,

I just provided you with a link to download the TIA scoping letter for Lam's proposed new office building via a separate email. Please let me know if you did not receive the email or were unable to download the document.

We also wanted to confirm the frontage improvements that will be required for SW 108th Avenue. At the pre-app meeting you noted that a reverse planter strip design may be an option. I have copied our Civil Engineer, Brent Nielsen, who can provide more information once we receive additional survey data next week.

We appreciate your collaboration on this. I will be out of the office next week but Brent Ahrend and Clara Layton (both copied) will be available to answer questions as needed.

Thank you,

Janet Jones, PE | she/her/hers  
Associate | Transportation Engineering  
D 971.346.3741 E [jjones@mcknze.com](mailto:jjones@mcknze.com)

**MACKENZIE.**

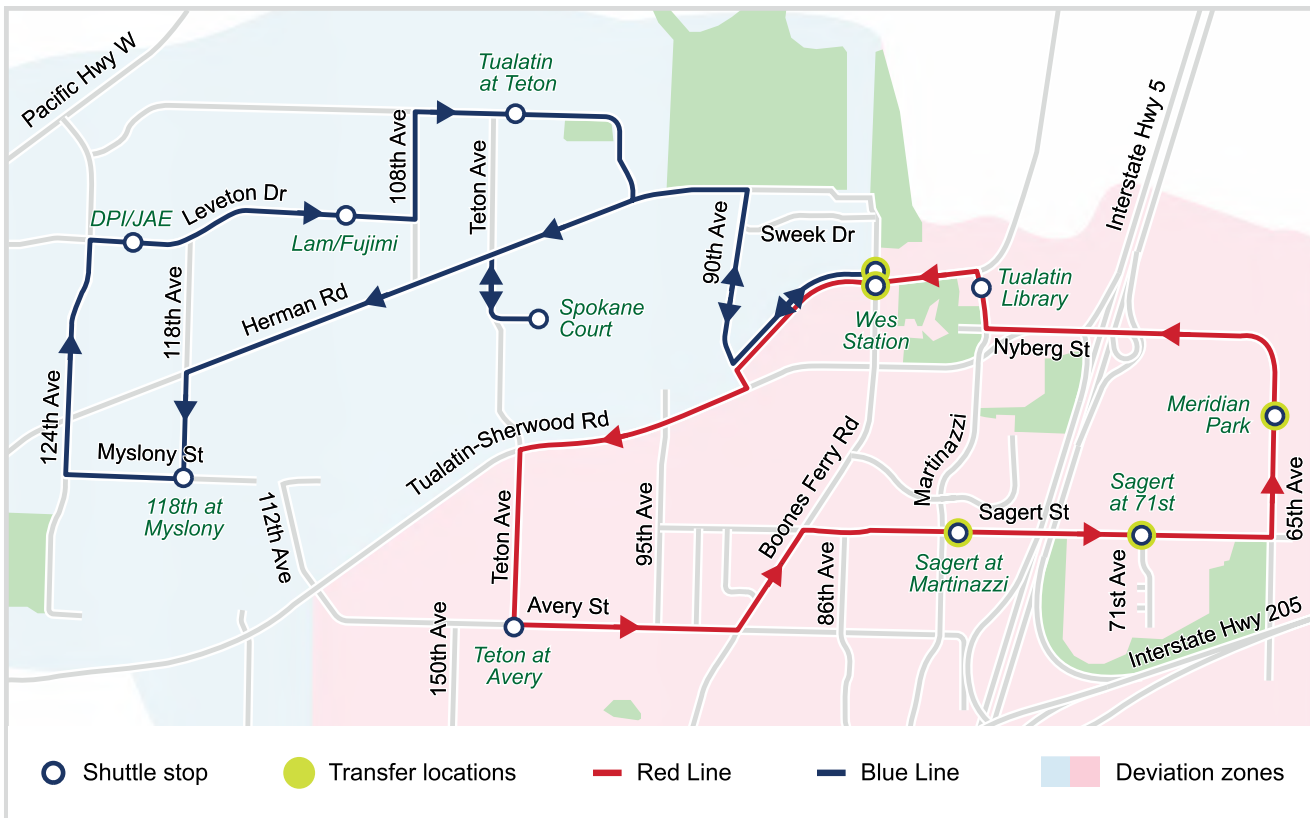
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LAND USE AND TRANSPORTATION PLANNING ▪ LANDSCAPE ARCHITECTURE

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APPENDIX C.  
**TRANSIT  
INFORMATION**



### CAR SEAT REQUIREMENT

Rear-facing car seats are required for passengers under two years old.



### HOLIDAY CLOSURES

Service will not be available on: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day. Limited service on Christmas and New Year's Eve. If a holiday falls on Saturday, there is no service on Friday; if a holiday falls on Sunday, there is no service on Monday. Information about closures available at [rideconnection.org](http://rideconnection.org)



### SEVERE WEATHER

Information about closures available at [rideconnection.org](http://rideconnection.org)



### COVID-19 SAFETY

All our vehicles and drivers follow CDC protocols for COVID safe practices.



### CONTACT US

503-226-0700 | TTY: 711  
[info@rideconnection.org](mailto:info@rideconnection.org)

Tualatin Shuttle is operated by:



To link accessible, responsive transportation alternatives with community and individual needs.

We respect civil rights. For a copy of our policy or to request a brochure in an alternate format call the number above.

We'll get you there.

Connect with

# Tualatin Shuttle

Free weekday service  
 open to the public  
 Connecting the Tualatin  
 community





## Blue Line Schedule

Southbound WES Arrival Time	Depart WES Station	Spokane Court	118th at Myslony	DP/JAE	LAM/Fujimi	Tualatin at Teton	Arrive WES Station	Northbound WES Departs
---	---							
6:25	5:41	5:48	5:51	5:54	5:55	5:57	6:17	6:56
7:10	7:11	7:18	7:21	7:24	7:25	7:27	7:47	
7:55	7:56	8:03	8:06	8:09	8:10	8:12	8:32	
8:40	8:41	8:48	8:51	8:54	8:55	8:57	9:17	
9:25	9:26	9:33	9:36	9:39	9:40	9:42	10:02	
	3:03	3:10	3:13	3:16	3:17	3:19	3:24	3:38
	3:33	3:40	3:43	3:46	3:47	3:49	4:09	4:23
	4:18	4:25	4:28	4:31	4:32	4:34	4:54	5:08
	5:03	5:10	5:13	5:16	5:17	5:19	5:39	5:53
	5:48	5:55	5:58	6:01	6:02	6:04	6:24	6:38
6:07	6:33	6:40	6:43	6:46	6:47	6:49	7:09	

## Red Line Schedule

Southbound WES Arrival Time	Depart WES Station	Teton at Avery	Sagert at Martinazzi	Sagert St. at 71st Ave.	Meridian Park	Tualatin Library	Arrive WES Station	Northbound WES Departs
---	---							
6:25	5:02	5:08	5:11	5:13	5:16	5:20	5:38	6:11
7:10	5:47	5:53	5:56	5:58	6:01	6:05	6:17	6:56
7:55	6:26	6:32	6:35	6:37	6:40	6:44	7:02	
8:40	7:11	7:17	7:20	7:22	7:25	7:29	7:47	
	7:56	8:02	8:05	8:07	8:10	8:14	8:32	
	8:41	8:47	8:50	8:52	8:55	8:59	9:17	
	3:03	3:09	3:12	3:14	3:17	3:21	3:24	3:38
	3:33	3:39	3:42	3:44	3:47	3:51	4:09	4:23
	4:18	4:24	4:27	4:29	4:32	4:36	4:54	5:08
	5:03	5:09	5:12	5:14	5:17	5:21	5:39	5:53
	5:48	5:54	5:57	5:59	6:02	6:06	6:24	6:38
6:07	6:33	6:39	6:42	6:44	6:47	6:51	7:09	

PM times in bold

Transfers  TriMet

# Tualatin Shuttle

### FLAG TUALATIN SHUTTLE DOWN



If you are on a residential street along the route, and not near a designated stop, you can “flag” or simply wave using your full arm to signal the Tualatin Shuttle bus driver to stop. Be sure to stand on the correct side of the road.

### SOCIAL DISTANCING

To allow for social distancing, Ride Connection is allowing only four passengers on the bus at one time. Sorry for the inconvenience.

### DEVIATIONS

We will deviate off the route to pick you up or drop you off for one leg of your trip. Deviation requests must be called in one day in advance. To call in for a deviation, please call 503-226-0700 between 7:30am and 5pm Monday-Friday. TTY: 711.

Deviations are not reservations. If the shuttle reaches capacity, we will make every effort to accommodate you.

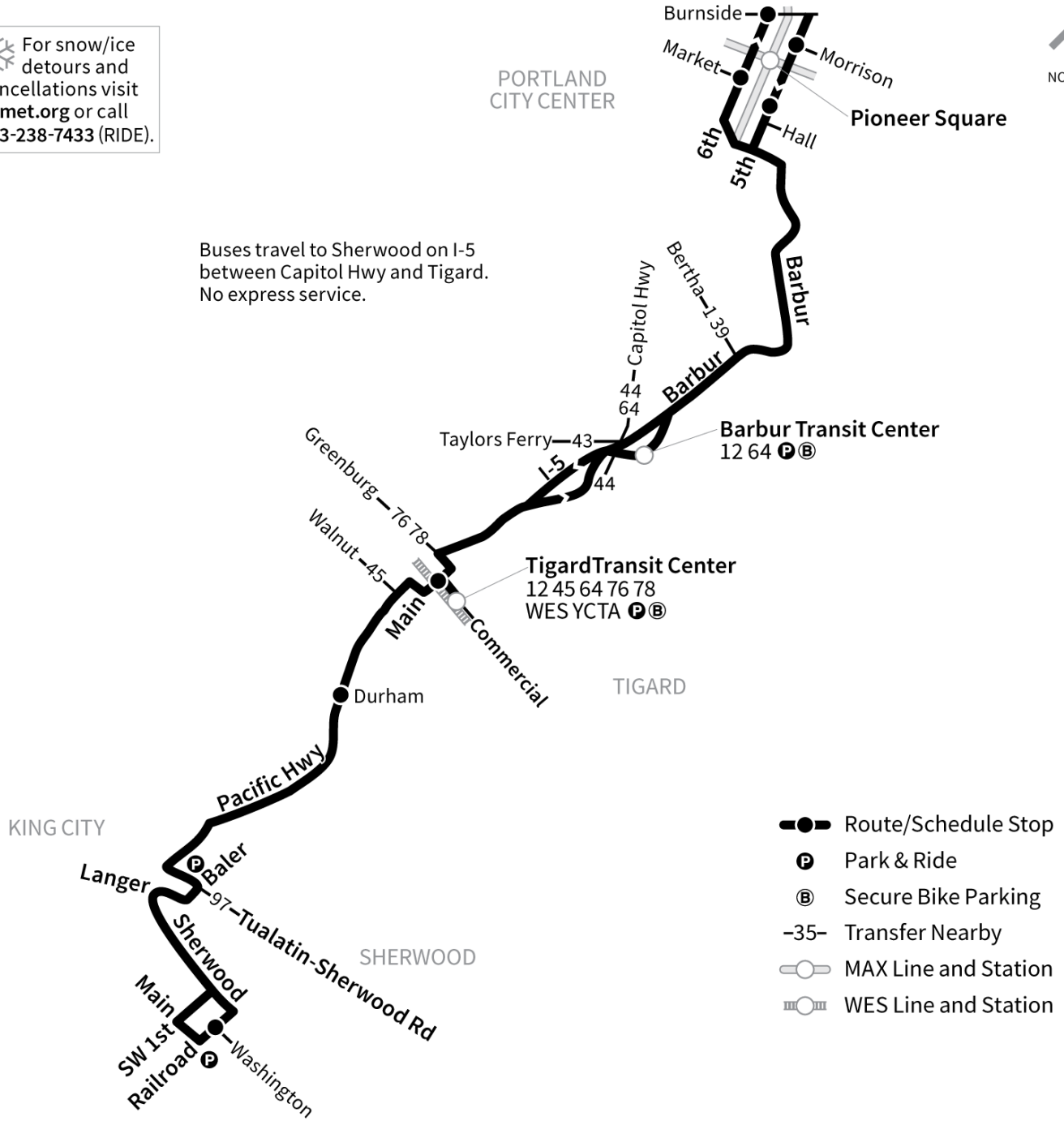
The service operates **Monday through Friday** and it's **free**.



# 94-Pacific Hwy/Sherwood

For snow/ice detours and cancellations visit [trimet.org](http://trimet.org) or call 503-238-7433 (RIDE).

Buses travel to Sherwood on I-5 between Capitol Hwy and Tigard. No express service.



- Route/Schedule Stop
- Ⓟ Park & Ride
- Ⓢ Secure Bike Parking
- 35— Transfer Nearby
- Ⓜ MAX Line and Station
- Ⓦ WES Line and Station



## 94-Pacific Hwy/Sherwood

Weekday		To Sherwood		
SW 5th & Morrison Stop ID 7625	Barbur Transit Center Stop ID 8213	SW Main & Commercial Stop ID 3656	SW Pacific Hwy & Durham Stop ID 8644	SW Pine & 2nd Stop ID 4452
—	—	6:03	6:11	6:26
6:26	6:40	6:51	7:00	7:17
6:56	7:11	7:22	7:31	7:49
7:25	7:40	7:52	8:01	8:19
7:52	8:07	8:19	8:28	8:46
8:22	8:37	8:47	8:56	9:14
8:52	9:07	9:17	9:26	9:44
9:22	9:37	9:47	9:56	10:14
9:52	10:07	10:17	10:27	10:45
10:22	10:37	10:47	10:57	11:15
10:52	11:07	11:17	11:27	11:45
11:22	11:37	11:47	11:57	12:15
11:52	12:07	12:17	12:28	12:46
12:22	12:37	12:47	12:58	1:16
12:52	1:07	1:17	1:28	1:46
1:22	1:37	1:47	1:58	2:16
1:52	2:07	2:17	2:29	2:47
2:22	2:37	2:48	3:00	3:18
2:52	3:08	3:19	3:31	3:49
3:22	3:38	3:49	4:01	4:19
3:37	3:53	4:04	4:16	4:34
3:52	4:08	4:19	4:31	4:49
4:08	4:25	4:36	4:48	5:06
4:23	4:40	4:52	5:04	5:23
4:38	4:55	5:07	5:19	5:38
4:53	5:10	5:22	5:34	5:52
5:08	5:25	5:37	5:49	6:07
5:23	5:40	5:52	6:04	6:21
5:53	6:09	6:20	6:31	6:48
6:32	6:47	6:57	7:07	7:24
7:22	7:37	7:47	7:57	8:14
8:22	8:37	8:47	8:57	9:13
9:21	9:36	9:46	9:56	10:11
10:16	10:31	10:41	10:51	11:07
11:12	11:27	11:37	11:47	12:02
—	—	12:17	12:24	—
—	—	1:03	1:10	—

**Note:** Line 94 buses to Sherwood serve: stops on SW 5th at Pine, Morrison, Madison, Market, Hall, and Broadway then travel express to Barbur & Bertha; then stop at: Barbur Blvd Transit Center; Pacific Hwy at 74th, SW Main in Tigard, then all stops to Sherwood.

Times in darker print are p.m.

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## 94-Pacific Hwy/Sherwood

Weekday To Portland City Center

SW Pine & 2nd Stop ID 4452	16200 Block SW Langer Stop ID 12849	SW Pacific Hwy & Durham Stop ID 8792	SW Main & Commercial Stop ID 13636	Barbur Transit Center Stop ID 212	SW 6th & Yamhill Stop ID 7807	SW 6th & W Burnside Stop ID 7751
4:31	4:34	4:45	—	—	—	—
5:11	5:14	5:25	—	—	—	—
5:39	5:42	5:53	6:02	6:13	6:28	6:31
6:01	6:05	6:16	6:26	6:37	6:52	6:55
6:22	6:26	6:37	6:47	7:00	7:16	7:19
6:32	6:36	6:48	7:00	7:14	7:31	7:35
6:26	6:50	7:02	7:15	7:29	7:46	7:49
6:59	7:03	7:15	7:28	7:42	8:01	8:05
7:13	7:17	7:29	7:42	7:56	8:16	8:19
7:30	7:34	7:46	7:58	8:11	8:31	8:35
7:45	7:49	8:01	8:13	8:26	8:46	8:49
8:17	8:21	8:33	8:45	8:58	9:16	9:19
8:50	8:54	9:06	9:17	9:30	9:46	9:49
9:20	9:24	9:36	9:47	10:00	10:16	10:19
9:50	9:54	10:06	10:17	10:30	10:46	10:49
9:44	10:24	10:36	10:47	11:00	11:16	11:19
10:14	10:54	11:06	11:17	11:30	11:46	11:49
10:45	11:23	11:36	11:47	<b>12:00</b>	<b>12:16</b>	<b>12:19</b>
11:15	11:52	<b>12:05</b>	<b>12:17</b>	<b>12:30</b>	<b>12:46</b>	<b>12:49</b>
11:45	<b>12:22</b>	<b>12:35</b>	<b>12:47</b>	<b>1:00</b>	<b>1:16</b>	<b>1:19</b>
<b>12:15</b>	<b>12:52</b>	<b>1:05</b>	<b>1:17</b>	<b>1:30</b>	<b>1:46</b>	<b>1:49</b>
<b>12:46</b>	<b>1:22</b>	<b>1:35</b>	<b>1:47</b>	<b>2:00</b>	<b>2:16</b>	<b>2:19</b>
<b>1:16</b>	<b>1:52</b>	<b>2:05</b>	<b>2:17</b>	<b>2:30</b>	<b>2:46</b>	<b>2:49</b>
<b>1:46</b>	<b>2:21</b>	<b>2:34</b>	<b>2:46</b>	<b>3:00</b>	<b>3:16</b>	<b>3:19</b>
<b>2:16</b>	<b>2:50</b>	<b>3:03</b>	<b>3:15</b>	<b>3:29</b>	<b>3:46</b>	<b>3:49</b>
<b>2:47</b>	<b>3:18</b>	<b>3:31</b>	<b>3:43</b>	<b>3:57</b>	<b>4:15</b>	<b>4:18</b>
<b>3:18</b>	<b>3:47</b>	<b>4:00</b>	<b>4:12</b>	<b>4:26</b>	<b>4:45</b>	<b>4:48</b>
<b>3:49</b>	<b>4:16</b>	<b>4:29</b>	<b>4:41</b>	<b>4:55</b>	<b>5:15</b>	<b>5:18</b>
<b>4:19</b>	<b>4:58</b>	<b>5:11</b>	<b>5:23</b>	<b>5:37</b>	<b>5:55</b>	<b>5:58</b>
<b>5:23</b>	<b>5:53</b>	<b>6:06</b>	<b>6:17</b>	<b>6:31</b>	<b>6:46</b>	<b>6:49</b>
<b>6:21</b>	<b>6:55</b>	<b>7:07</b>	<b>7:18</b>	<b>7:31</b>	<b>7:46</b>	<b>7:49</b>
<b>7:54</b>	<b>7:58</b>	<b>8:10</b>	<b>8:19</b>	<b>8:31</b>	<b>8:46</b>	<b>8:49</b>
<b>8:55</b>	<b>8:59</b>	<b>9:10</b>	<b>9:19</b>	<b>9:31</b>	<b>9:46</b>	<b>9:49</b>
<b>9:57</b>	<b>10:01</b>	<b>10:11</b>	<b>10:20</b>	<b>10:31</b>	<b>10:46</b>	<b>10:49</b>
<b>11:07</b>	<b>11:10</b>	<b>11:20</b>	—	—	—	—

**Note:** Buses to Portland City Center serve: all stops from Sherwood to Main & Commercial in Tigard, then Main & Scoffins, 99W & Main, 99W & 74th, Barbur Blvd & Capitol Hwy, Barbur Blvd Transit Center, Barbur & Bertha, then travel express with no stops to SW Broadway & 5th, SW 6th at Market, Jefferson, Yamhill, Oak, and Burnside.

**Times in darker print are p.m.**

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## 94-Pacific Hwy/Sherwood

Saturday		To Sherwood	
Tigard Transit Center Stop ID 8211	SW Pacific Hwy & Durham Stop ID 8644	SW Pine & 2nd Stop ID 4452	
6:03	6:11	6:26	
6:46	6:54	7:10	
7:28	7:36	7:52	
8:10	8:19	8:35	
8:53	9:02	9:19	
9:49	9:59	10:16	
10:19	10:30	10:47	
10:49	11:00	11:17	
11:19	11:30	11:47	
11:49	12:00	12:17	
12:19	12:30	12:47	
12:49	1:00	1:17	
1:19	1:30	1:47	
1:49	2:00	2:17	
2:19	2:30	2:47	
2:48	2:59	3:16	
3:19	3:30	3:47	
3:49	4:00	4:17	
4:19	4:30	4:47	
4:49	5:00	5:17	
5:19	5:30	5:47	
5:49	6:00	6:17	
6:19	6:30	6:47	
6:49	7:00	7:17	
7:19	7:30	7:47	
7:52	8:03	8:18	
8:34	8:44	8:59	
9:21	9:30	9:43	
10:07	10:15	10:28	
10:53	11:01	11:14	
11:38	11:45	11:58	
12:17	12:24	—	
1:03	1:10	—	

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## 94-Pacific Hwy/Sherwood

Saturday		To Tigard Transit Center	
SW Pine & 2nd Stop ID 4452	SW Pacific Hwy & Durham Stop ID 8792	Tigard Transit Center Stop ID 8211	
4:31	4:45	4:52	
5:11	5:25	5:32	
5:51	6:05	6:12	
6:23	6:39	6:46	
7:05	7:21	7:28	
7:46	8:02	8:10	
8:29	8:45	8:53	
9:02	9:19	9:27	
9:32	9:49	9:57	
10:01	10:18	10:27	
10:31	10:48	10:57	
11:01	11:18	11:27	
11:31	11:48	11:57	
12:00	12:17	12:27	
12:30	12:47	12:57	
1:00	1:17	1:27	
1:30	1:47	1:57	
1:59	2:16	2:27	
2:29	2:46	2:57	
2:59	3:16	3:27	
3:29	3:46	3:57	
3:59	4:16	4:27	
4:29	4:46	4:57	
4:59	5:16	5:27	
5:29	5:46	5:57	
6:00	6:17	6:27	
6:47	7:03	7:12	
7:32	7:48	7:57	
8:18	8:34	8:42	
9:09	9:24	9:32	
9:58	10:12	10:20	
10:47	11:00	11:07	
11:27	11:40	11:47	

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## 94-Pacific Hwy/Sherwood

Sunday	To Sherwood	
Tigard Transit Center Stop ID 8211	SW Pacific Hwy & Durham Stop ID 8644	SW Pine & 2nd Stop ID 4452
6:03	6:11	6:26
6:46	6:54	7:10
7:28	7:36	7:52
8:10	8:19	8:35
8:53	9:02	9:19
9:49	9:59	10:16
10:19	10:30	10:47
10:49	11:00	11:17
11:19	11:30	11:47
11:49	<b>12:00</b>	<b>12:17</b>
<b>12:19</b>	<b>12:30</b>	<b>12:47</b>
<b>12:49</b>	1:00	1:17
1:19	1:30	1:47
1:49	2:00	2:17
2:19	2:30	2:47
2:48	2:59	3:16
3:19	3:30	3:47
3:49	4:00	4:17
4:19	4:30	4:47
4:49	5:00	5:17
5:19	5:30	5:47
5:49	6:00	6:17
6:19	6:30	6:47
6:49	7:00	7:17
7:19	7:30	7:47
7:52	8:03	8:18
8:34	8:44	8:59
9:21	9:30	9:43
10:07	10:15	10:28
10:53	11:01	11:14
11:38	11:45	11:58
12:17	12:24	—
1:03	1:10	—

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## 94-Pacific Hwy/Sherwood

Sunday		To Tigard Transit Center	
SW Pine & 2nd Stop ID 4452	SW Pacific Hwy & Durham Stop ID 8792	Tigard Transit Center Stop ID 8211	
4:31	4:45	4:52	
5:11	5:25	5:32	
5:51	6:05	6:12	
6:23	6:39	6:46	
7:05	7:21	7:28	
7:46	8:02	8:10	
8:29	8:45	8:53	
9:02	9:19	9:27	
9:32	9:49	9:57	
10:01	10:18	10:27	
10:31	10:48	10:57	
11:01	11:18	11:27	
11:31	11:48	11:57	
12:00	12:17	12:27	
12:30	12:47	12:57	
1:00	1:17	1:27	
1:30	1:47	1:57	
1:59	2:16	2:27	
2:29	2:46	2:57	
2:59	3:16	3:27	
3:29	3:46	3:57	
3:59	4:16	4:27	
4:29	4:46	4:57	
4:59	5:16	5:27	
5:29	5:46	5:57	
6:00	6:17	6:27	
6:47	7:03	7:12	
7:32	7:48	7:57	
8:18	8:34	8:42	
9:09	9:24	9:32	
9:58	10:12	10:20	
10:47	11:00	11:07	
11:27	11:40	11:47	

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**Please note:** Schedules may change without notice by up to three minutes to relieve overcrowding or adjust to traffic conditions. Service can also be affected by construction, accidents and weather conditions. You can check for any current detours or service disruptions at [trimet.org/alerts](http://trimet.org/alerts) or call 503-238-RIDE (7433) for real-time arrival information from TransitTracker™. All buses, MAX trains and streetcars are accessible to people with disabilities.



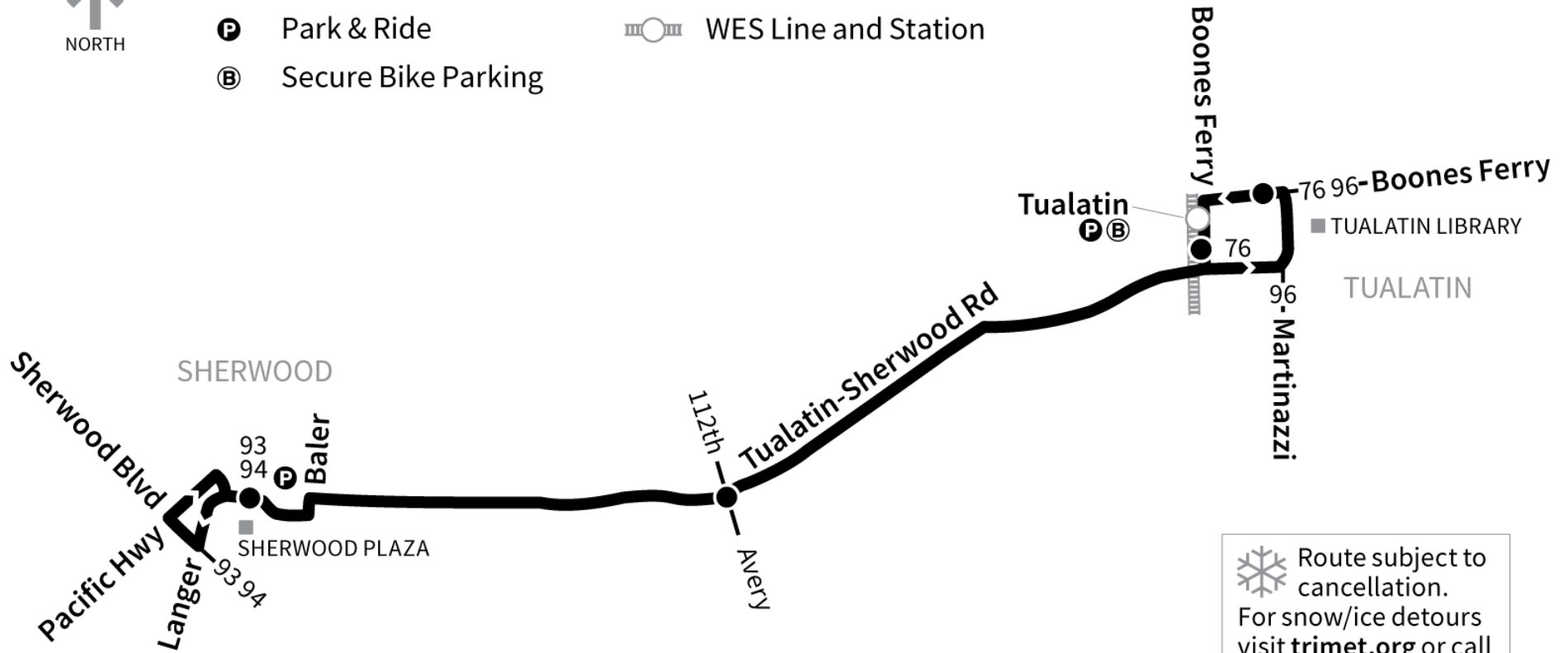
# 97-Tualatin-Sherwood Rd



NORTH

- Route/Schedule Stop
- Park & Ride
- Secure Bike Parking

- 35- Transfer Nearby
- WES Line and Station



Route subject to cancellation.  
For snow/ice detours visit [trimet.org](http://trimet.org) or call 503-238-RIDE (7433).



## 97-Tualatin-Sherwood Rd

Weekday To SW Langer Dr/Sherwood Plaza

SW Boones Ferry Rd & Nyberg Stop ID 13079	SW Tualatin-Sherwood Rd & 112th Stop ID 13830	SW Langer & Sherwood Plaza Stop ID 9188
6:18	6:23	6:32
7:18	7:23	7:32
8:18	8:23	8:32
9:18	9:23	9:32
<b>3:33</b>	<b>3:39</b>	<b>3:50</b>
4:43	4:49	5:00
5:53	5:59	6:10

Times in darker print are p.m.

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## 97-Tualatin-Sherwood Rd

Weekday		To Tualatin WES Station	
16100 Block SW Langer Stop ID 9190	SW Tualatin- Sherwood Rd & Avery Stop ID 13843	SW Boones Ferry Rd & Martinazzi Stop ID 13078	SW Boones Ferry Rd & Nyberg Stop ID 13079
6:58	7:06	7:16	7:18
8:00	8:08	8:16	8:18
9:00	9:08	9:16	9:18
<b>3:12</b>	<b>3:20</b>	<b>3:31</b>	<b>3:33</b>
<b>4:21</b>	<b>4:29</b>	<b>4:41</b>	<b>4:43</b>
5:30	5:38	5:51	5:53
<b>6:42</b>	<b>6:50</b>	<b>7:01</b>	<b>7:03</b>

Times in darker print are p.m.

**Please note:** Schedules may change without notice by up to three minutes to relieve overcrowding or adjust to traffic conditions. Service can also be affected by construction, accidents and weather conditions. You can check for any current detours or service disruptions at [trimet.org/alerts](http://trimet.org/alerts) or call 503-238-RIDE (7433) for real-time arrival information from TransitTracker™. All buses, MAX trains and streetcars are accessible to people with disabilities.

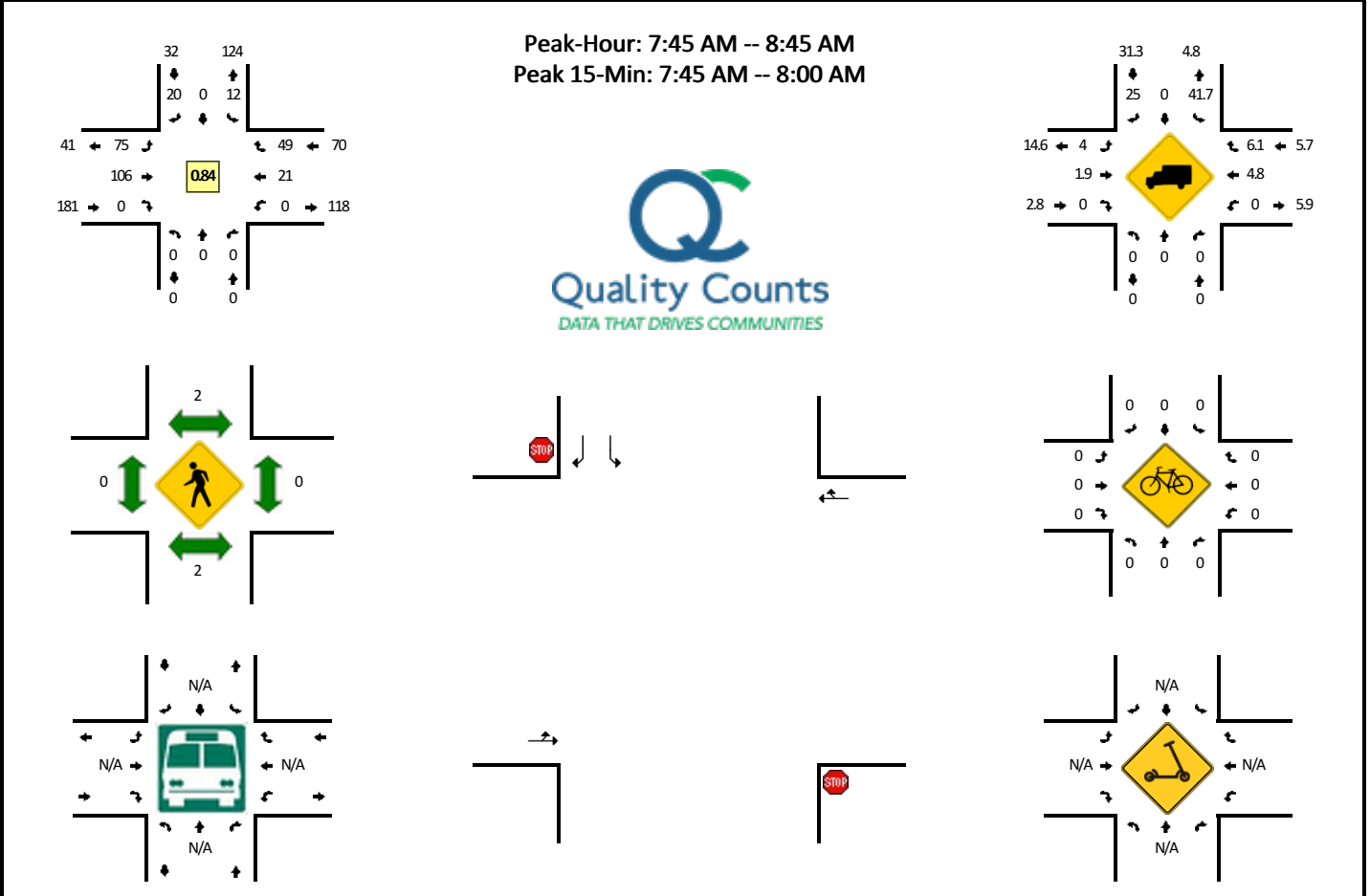
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APPENDIX D.  
**TRAFFIC COUNT  
SUMMARIES**



**LOCATION:** Western Lam Research Access -- SW Leveton Dr  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 15855809  
**DATE:** Thu, Jun 9 2022

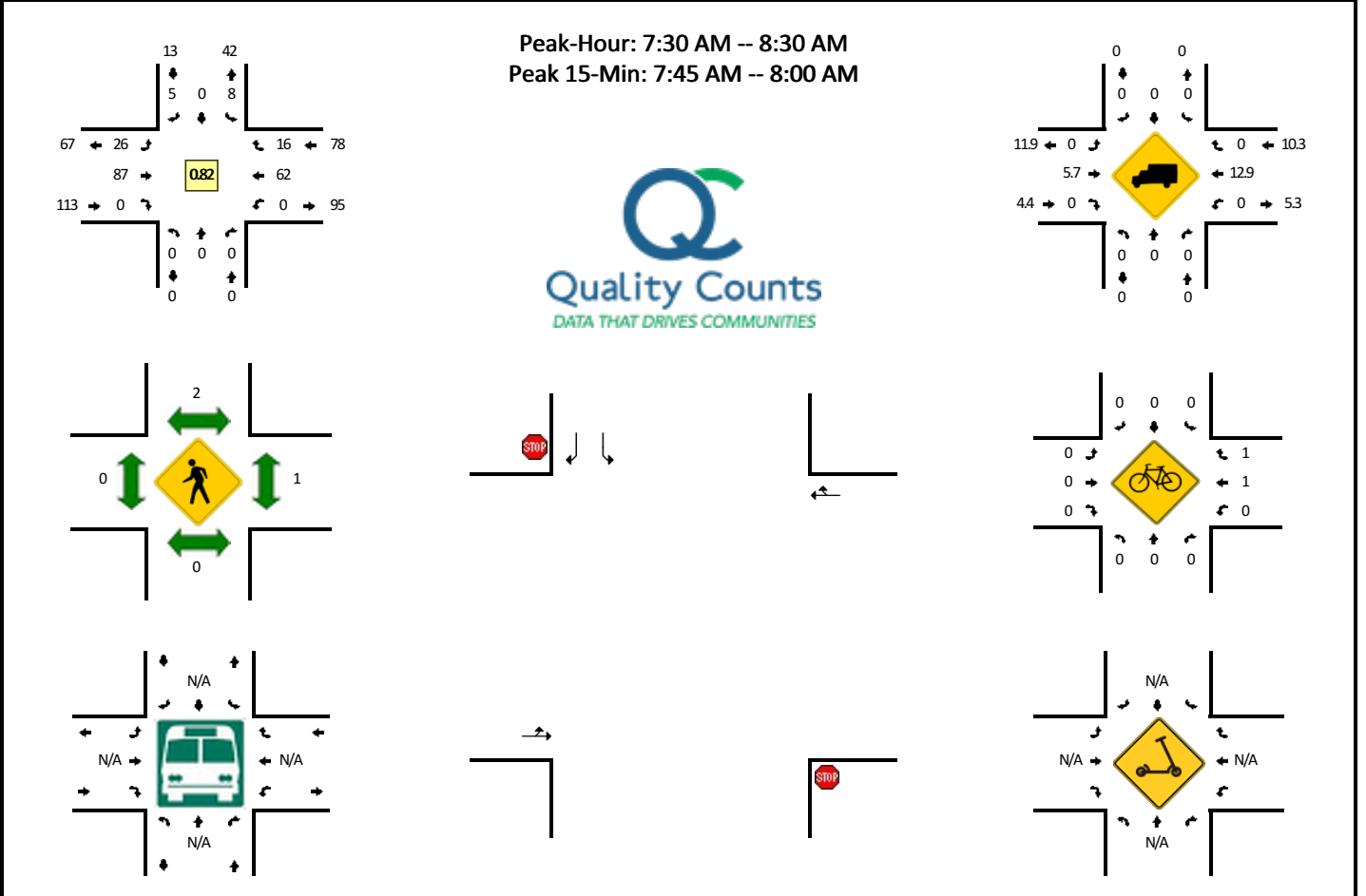


15-Min Count Period Beginning At	Western Lam Research Access (Northbound)				Western Lam Research Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	1	0	6	0	10	19	0	0	0	15	4	0	55	
7:15 AM	0	0	0	0	2	0	2	0	17	17	0	0	0	5	2	0	45	
7:30 AM	0	0	0	0	3	0	4	0	15	19	0	0	0	3	7	0	51	
7:45 AM	0	0	0	0	5	0	4	0	19	32	0	0	0	6	18	0	84	235
8:00 AM	0	0	0	0	0	0	9	0	22	34	0	0	0	3	11	0	79	259
8:15 AM	0	0	0	0	1	0	2	0	23	23	0	0	0	6	8	0	63	277
8:30 AM	0	0	0	0	6	0	5	0	11	17	0	0	0	6	12	0	57	283
8:45 AM	0	0	0	0	4	0	2	0	21	19	0	0	0	4	5	0	55	254
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	20	0	16	0	76	128	0	0	0	24	72	0	336	
Heavy Trucks	0	0	0	0	8	0	0	0	8	0	0	0	0	0	8	0	24	
Buses																		
Pedestrians		0				4				0				0			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

*Comments:*

**LOCATION:** Central Lam Research Access -- SW Leveton Dr  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 15855811  
**DATE:** Thu, Jun 9 2022

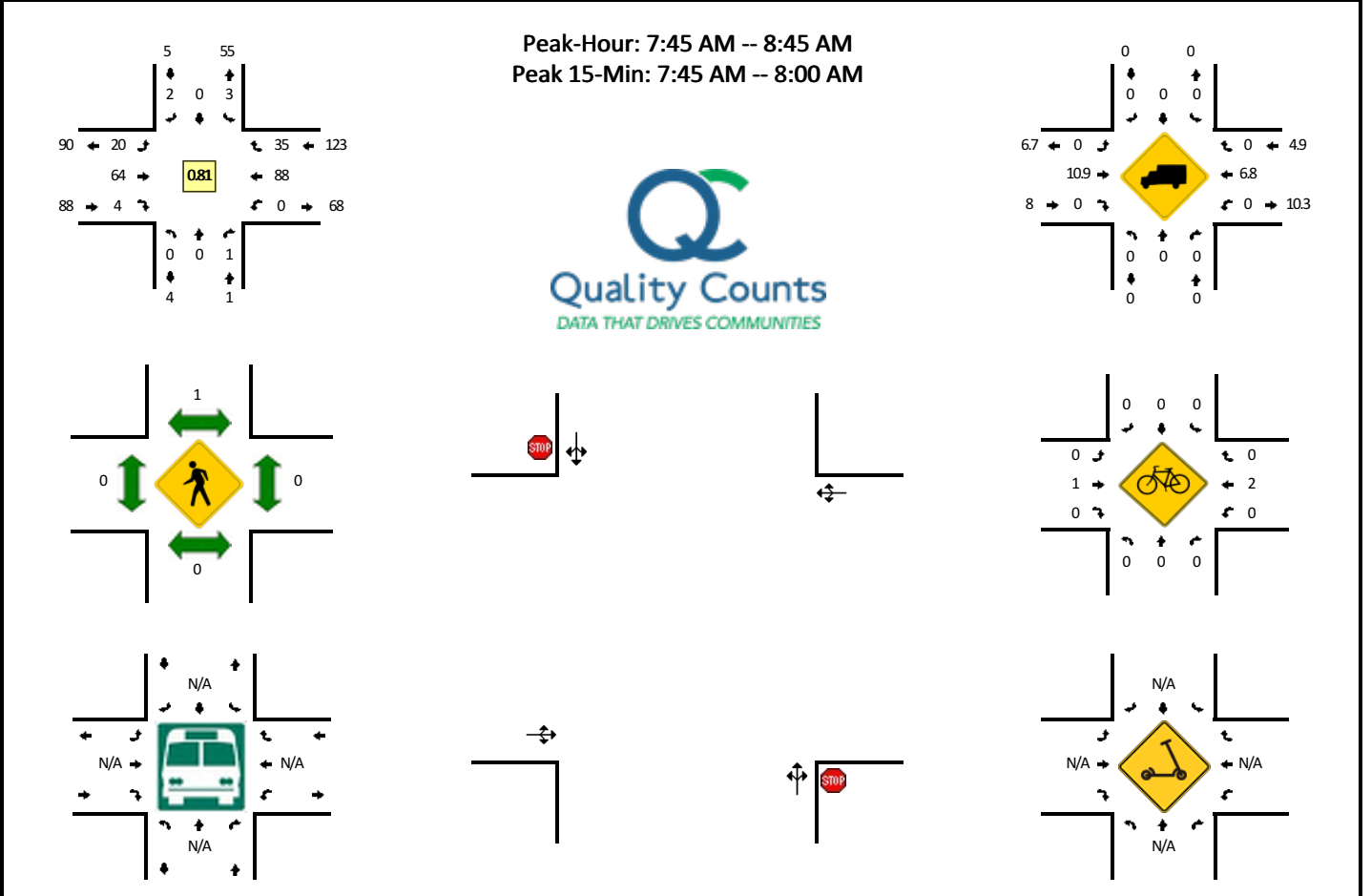


15-Min Count Period Beginning At	Central Lam Research Access (Northbound)				Central Lam Research Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	7	0	3	14	0	0	0	11	1	0	36	
7:15 AM	0	0	0	0	5	0	0	0	5	15	0	0	0	6	7	0	38	
7:30 AM	0	0	0	0	1	0	0	0	4	18	0	0	0	13	4	0	40	
7:45 AM	0	0	0	0	3	0	1	0	8	26	0	0	0	21	3	0	62	176
8:00 AM	0	0	0	0	2	0	2	0	9	24	0	0	0	14	4	0	55	195
8:15 AM	0	0	0	0	2	0	2	0	5	19	0	0	0	14	5	0	47	204
8:30 AM	0	0	0	0	0	0	5	0	4	17	0	0	0	10	4	0	40	204
8:45 AM	0	0	0	0	1	0	1	0	6	18	0	0	0	9	3	0	38	180
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	12	0	4	0	32	104	0	0	0	84	12	0	248	
Heavy Trucks	0	0	0	0	0	0	0	0	0	8	0	0	0	4	0	0	12	
Buses																		
Pedestrians		0				4				0				4			8	
Bicycles	0	0	0		0	0	0		0	0	0		0	4	0		4	
Scoters																		

Comments:

**LOCATION:** Eastern Lam Research Access -- SW Leveton Dr  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 15855813  
**DATE:** Thu, Jun 9 2022

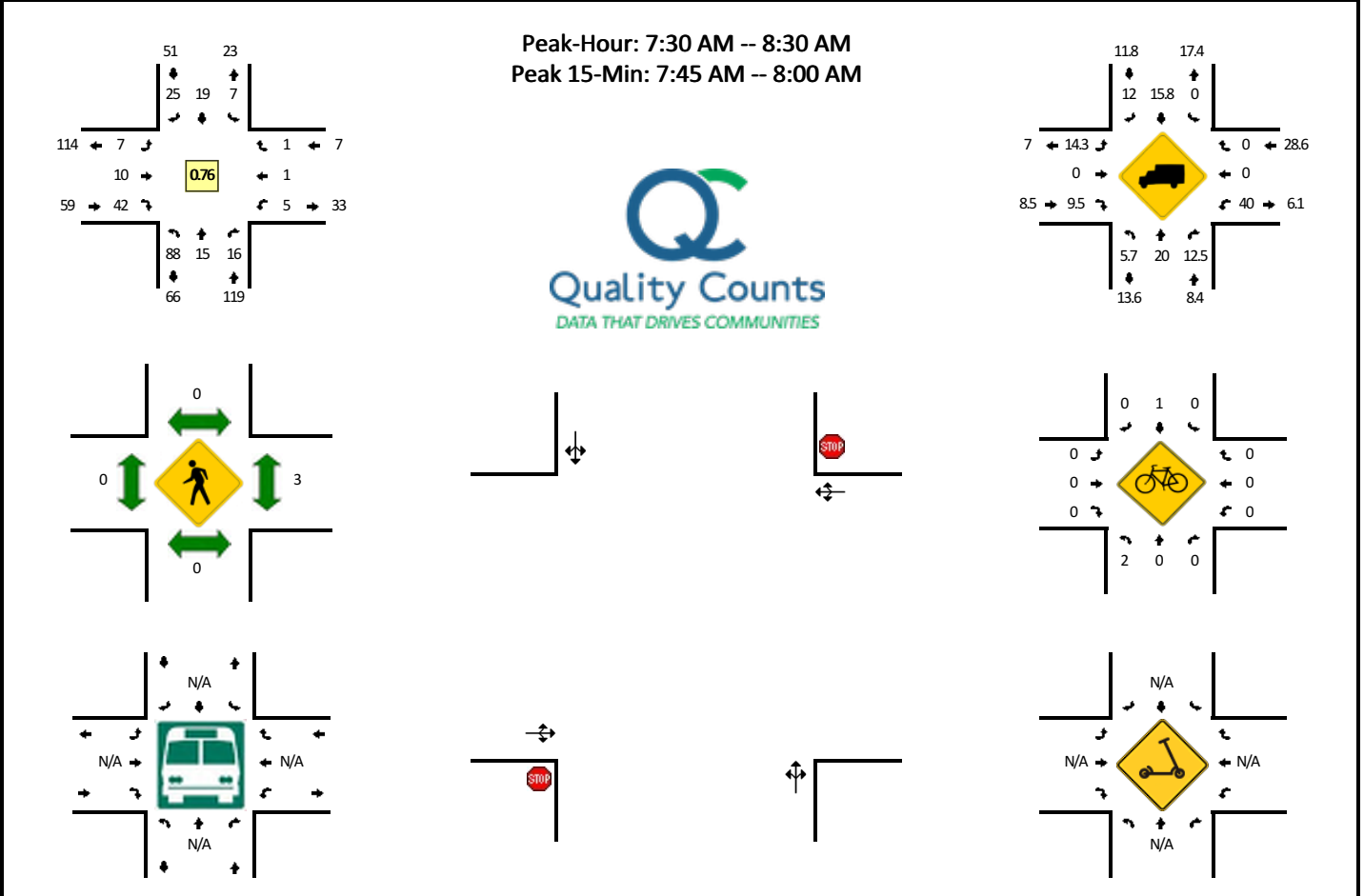


15-Min Count Period Beginning At	Eastern Lam Research Access (Northbound)				Eastern Lam Research Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	3	0	1	0	2	10	1	0	1	12	3	0	33	
7:15 AM	0	0	0	0	0	0	1	0	0	20	0	0	0	13	4	0	38	
7:30 AM	0	0	0	0	0	0	0	0	2	18	1	0	0	19	4	0	44	
7:45 AM	0	0	0	0	1	0	0	0	1	25	2	0	0	31	7	0	67	182
8:00 AM	0	0	0	0	1	0	0	0	7	15	1	0	0	21	8	0	53	202
8:15 AM	0	0	0	0	1	0	1	0	5	15	0	0	0	19	8	0	49	213
8:30 AM	0	0	1	0	0	0	1	0	7	9	1	0	0	17	12	0	48	217
8:45 AM	0	0	0	0	0	0	0	0	5	11	0	0	1	13	10	0	40	190
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	4	0	0	0	4	100	8	0	0	124	28	0	268	
Heavy Trucks	0	0	0	0	0	0	0	0	0	8	0	0	0	4	0	0	12	
Buses																		
Pedestrians		0				4				0				0			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	4	0		4	
Scoters																		

*Comments:*

**LOCATION:** SW 108th Ave -- SW Leveton Dr/Southern Ascentec Engineering Access  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 15855819  
**DATE:** Thu, Jun 9 2022



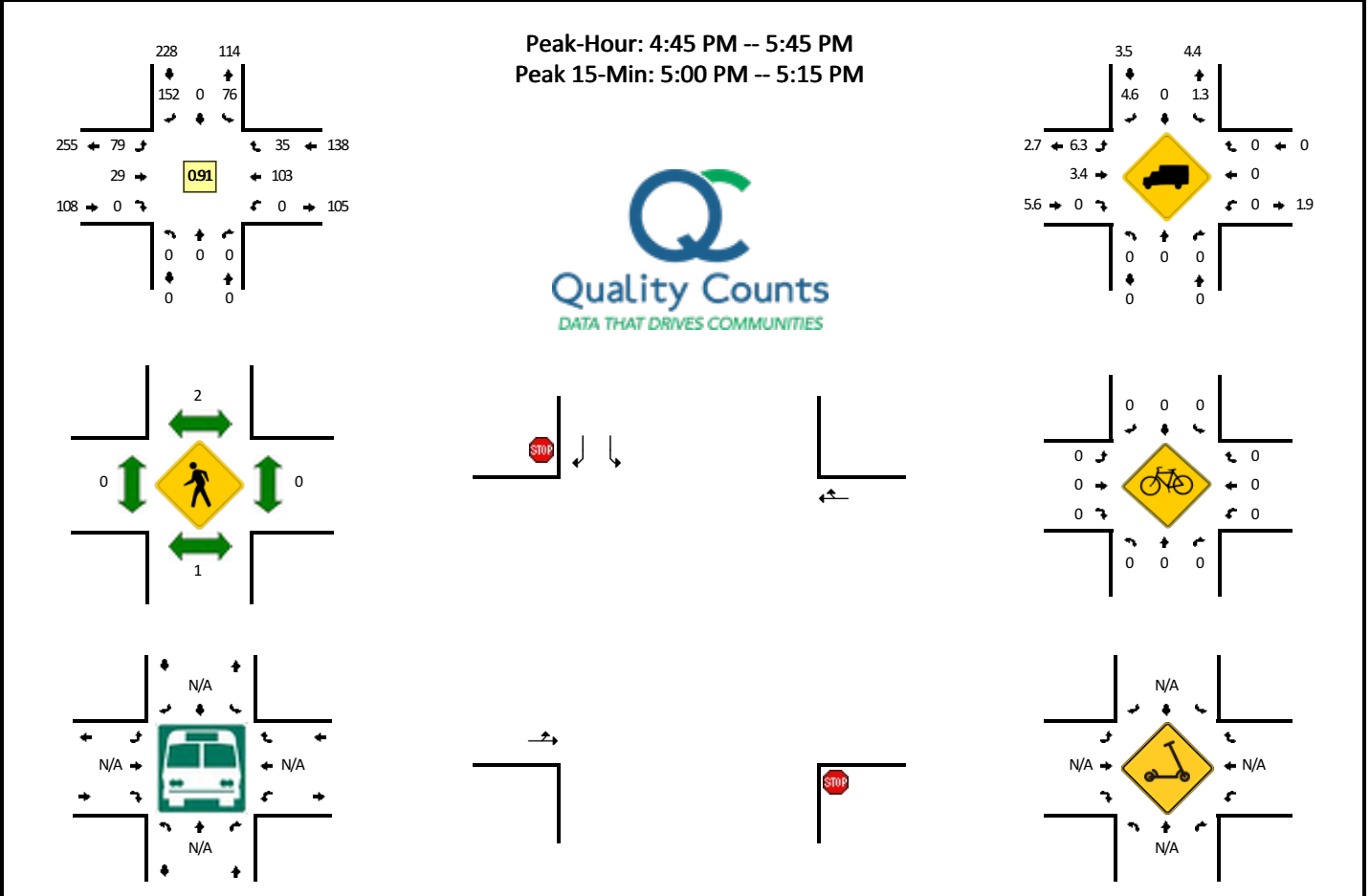
15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Leveton Dr/Southern Ascentec Engineering Access (Eastbound)				SW Leveton Dr/Southern Ascentec Engineering Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	16	6	3	0	1	6	0	0	0	3	9	0	0	0	0	0	44	
7:15 AM	17	2	4	0	2	4	1	0	3	2	17	0	0	0	1	0	53	
7:30 AM	16	3	4	0	2	8	5	0	0	2	12	0	2	0	0	0	54	
7:45 AM	27	2	7	0	5	4	12	0	2	5	14	0	0	0	0	0	78	229
8:00 AM	23	6	5	0	0	0	4	0	1	2	7	0	1	0	1	0	50	235
8:15 AM	22	4	0	0	0	7	4	0	4	1	9	0	2	1	0	0	54	236
8:30 AM	22	1	2	0	0	7	8	0	2	1	7	0	0	0	0	0	50	232
8:45 AM	19	4	0	0	2	3	6	0	3	3	5	0	1	0	0	0	46	200
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	108	8	28	0	20	16	48	0	8	20	56	0	0	0	0	0	312	
Heavy Trucks	8	4	0		0	0	0		0	0	8		0	0	0		20	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	4	0	0		0	4	0		0	0	0		0	0	0		8	
Scoters																		

*Comments:*



**LOCATION:** Western Lam Research Access -- SW Leveton Dr  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 15855810  
**DATE:** Thu, Jun 9 2022

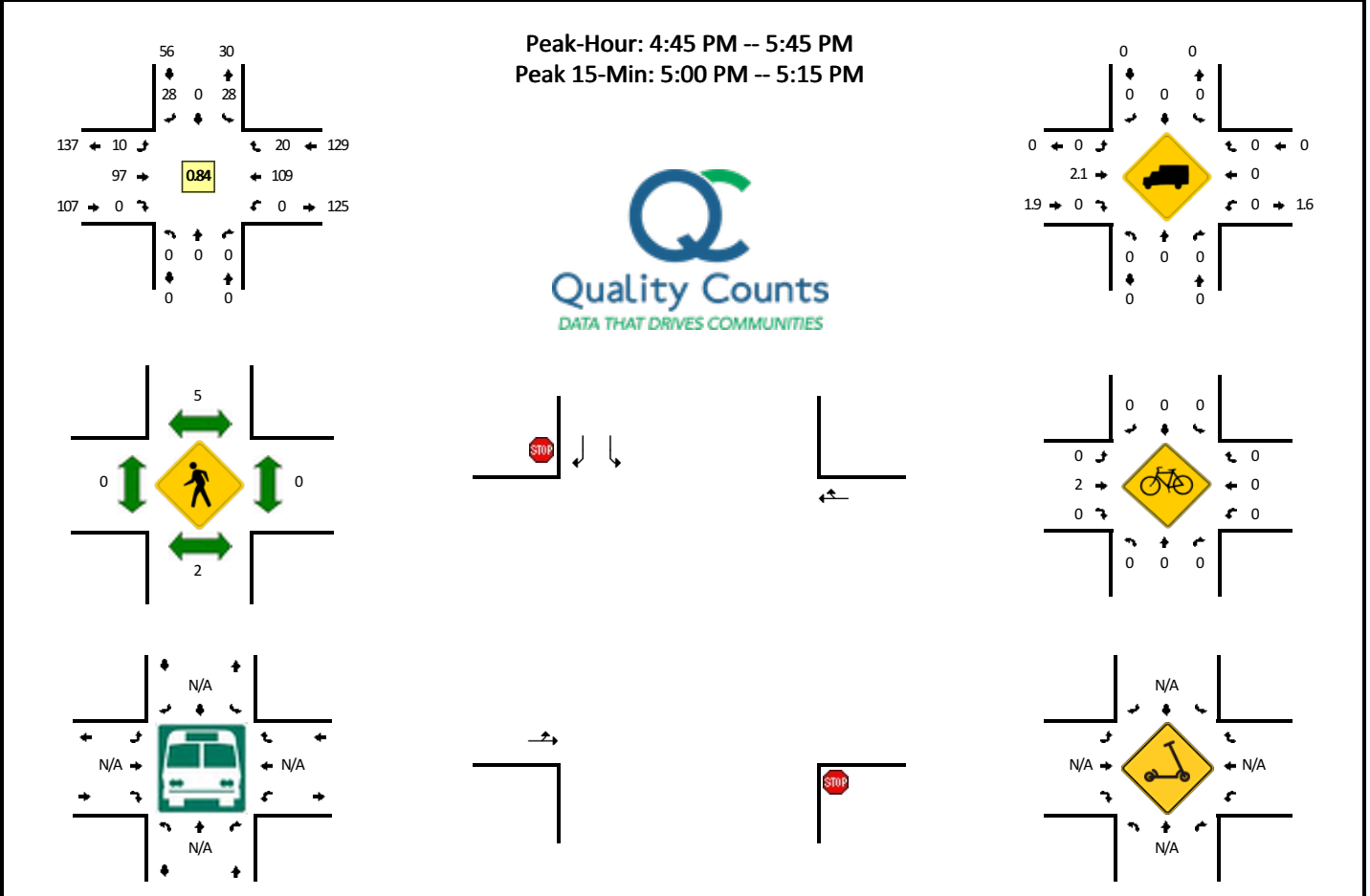


15-Min Count Period Beginning At	Western Lam Research Access (Northbound)				Western Lam Research Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	7	0	15	0	7	12	0	0	0	19	0	0	60	
4:15 PM	0	0	0	0	4	0	19	0	2	7	0	0	0	18	3	0	53	
4:30 PM	0	0	0	0	13	0	13	0	18	2	0	0	0	27	6	0	79	
4:45 PM	0	0	0	0	6	0	17	0	38	10	0	0	0	26	13	0	110	302
5:00 PM	0	0	0	0	18	0	31	0	22	7	0	0	0	40	12	0	130	372
5:15 PM	0	0	0	0	23	0	50	0	14	8	0	0	0	22	9	0	126	445
5:30 PM	0	0	0	0	29	0	54	0	5	4	0	0	0	15	1	0	108	474
5:45 PM	0	0	0	0	14	0	26	0	3	6	0	0	0	13	1	0	63	427
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	72	0	124	0	88	28	0	0	0	160	48	0	520	
Heavy Trucks	0	0	0	0	0	0	8	0	4	0	0	0	0	0	0	0	12	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scooters																		

Comments:

**LOCATION:** Central Lam Research Access -- SW Leveton Dr  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 15855812  
**DATE:** Thu, Jun 9 2022

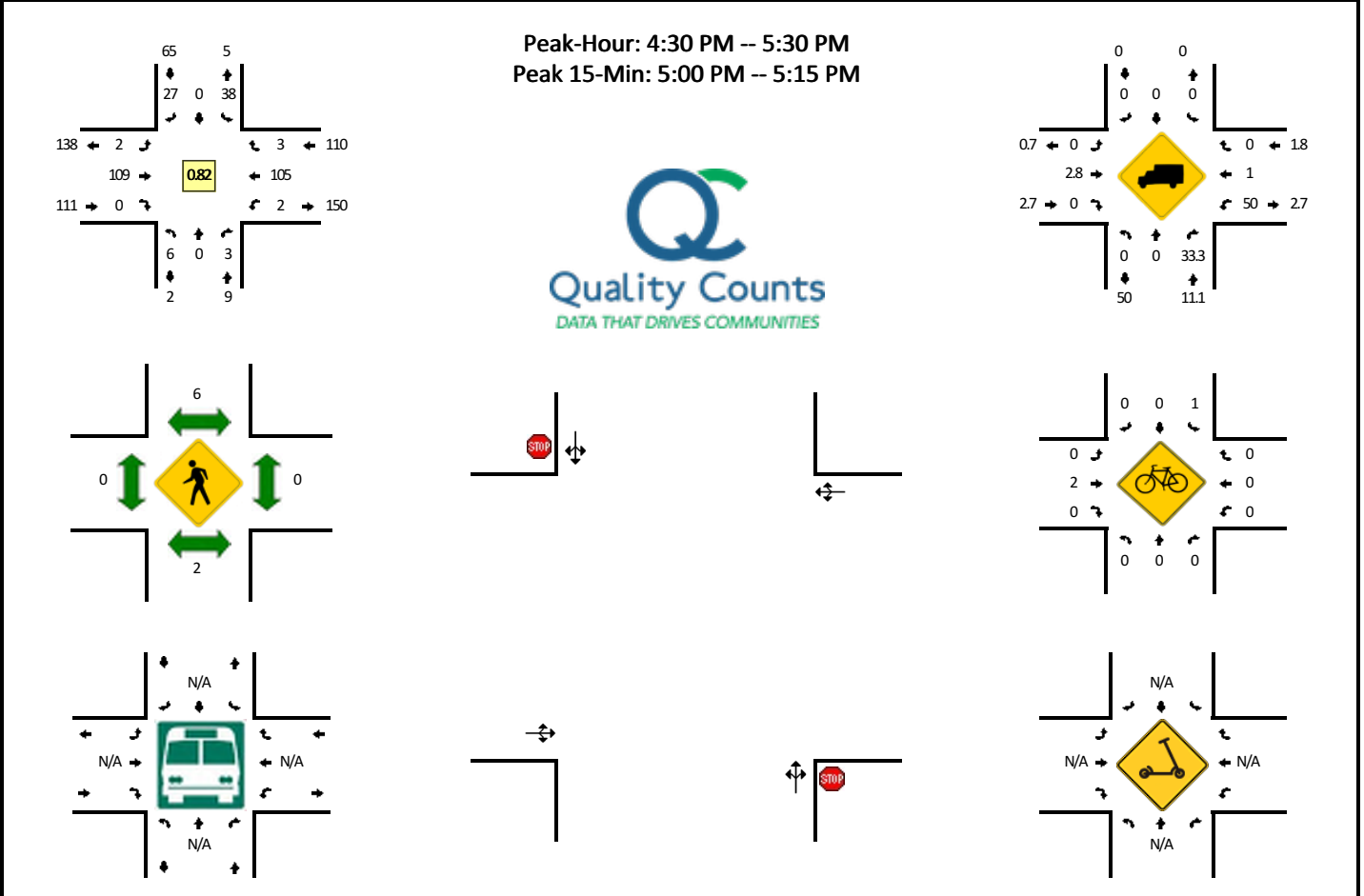


15-Min Count Period Beginning At	Central Lam Research Access (Northbound)				Central Lam Research Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	5	0	6	0	2	18	0	0	0	10	3	0	44	
4:15 PM	0	0	0	0	7	0	7	0	2	9	0	0	0	14	2	0	41	
4:30 PM	0	0	0	0	2	0	5	0	0	15	0	0	0	28	6	0	56	
4:45 PM	0	0	0	0	3	0	10	0	3	13	0	0	0	33	7	0	69	210
5:00 PM	0	0	0	0	8	0	11	0	3	22	0	0	0	37	6	0	87	253
5:15 PM	0	0	0	0	11	0	4	0	2	31	0	0	0	25	2	0	75	287
5:30 PM	0	0	0	0	6	0	3	0	2	31	0	0	0	14	5	0	61	292
5:45 PM	0	0	0	0	12	0	3	0	4	17	0	0	0	11	5	0	52	275
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	32	0	44	0	12	88	0	0	0	148	24	0	348	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																		
Pedestrians		0				12				0				0			12	
Bicycles	0	0	0		0	0	0		0	8	0		0	0	0		8	
Scoters																		

Comments:

**LOCATION:** Eastern Lam Research Access -- SW Leveton Dr  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 15855814  
**DATE:** Thu, Jun 9 2022

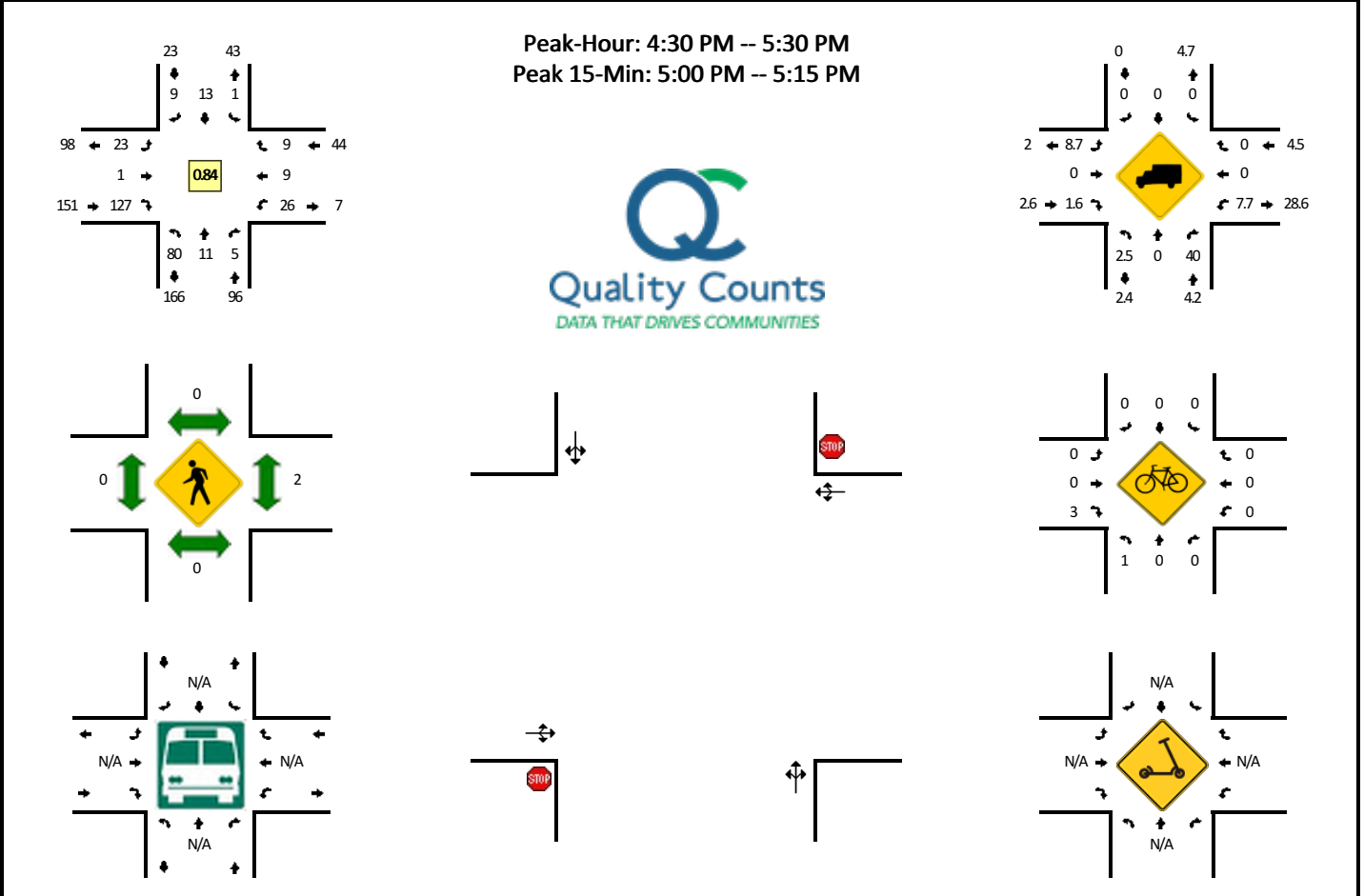


15-Min Count Period Beginning At	Eastern Lam Research Access (Northbound)				Eastern Lam Research Access (Southbound)				SW Leveton Dr (Eastbound)				SW Leveton Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	0	2	0	0	0	4	0	0	29	0	0	0	8	2	0	46	
4:15 PM	1	0	0	0	4	0	2	0	0	16	0	0	1	10	2	0	36	
4:30 PM	1	0	0	0	10	0	6	0	0	18	0	0	1	28	1	0	65	
4:45 PM	2	0	0	0	8	0	7	0	2	14	0	0	0	29	1	0	63	210
5:00 PM	2	0	0	0	15	0	9	0	0	32	0	0	1	30	1	0	90	254
5:15 PM	1	0	3	0	5	0	5	0	0	45	0	0	0	18	0	0	77	295
5:30 PM	0	0	0	0	3	0	6	0	0	38	0	0	0	13	0	0	60	290
5:45 PM	0	0	0	0	4	0	3	0	0	31	0	0	0	11	0	0	49	276
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	8	0	0	0	60	0	36	0	0	128	0	0	4	120	4	0	360	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	
Buses																		
Pedestrians		0				4				0				0			4	
Bicycles	0	0	0		0	0	0		0	8	0		0	0	0		8	
Scoters																		

*Comments:*

**LOCATION:** SW 108th Ave -- SW Leveton Dr/Southern Ascentec Engineering Access  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 15855820  
**DATE:** Thu, Jun 9 2022



15-Min Count Period Beginning At	SW 108th Ave (Northbound)				SW 108th Ave (Southbound)				SW Leveton Dr/Southern Ascentec Engineering Access (Eastbound)				SW Leveton Dr/Southern Ascentec Engineering Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	4	3	0	0	1	0	0	4	1	24	0	8	0	1	0	53	
4:15 PM	9	0	1	0	1	6	0	0	4	1	17	0	2	4	1	0	46	
4:30 PM	20	6	0	0	1	5	0	0	6	0	22	0	8	4	3	0	75	
4:45 PM	24	1	2	0	0	4	2	0	2	1	20	0	4	2	2	0	64	238
5:00 PM	25	2	1	0	0	3	4	0	9	0	37	0	8	1	3	0	93	278
5:15 PM	11	2	2	0	0	1	3	0	6	0	48	0	6	2	1	0	82	314
5:30 PM	6	2	2	0	0	2	0	0	8	1	33	0	1	3	0	0	58	297
5:45 PM	7	4	2	0	0	4	1	0	4	0	29	0	3	0	0	0	54	287
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	100	8	4	0	0	12	16	0	36	0	148	0	32	4	12	0	372	
Heavy Trucks	4	0	0		0	0	0		0	0	0		4	0	0		8	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	8		0	0	0		8	
Scooters																		

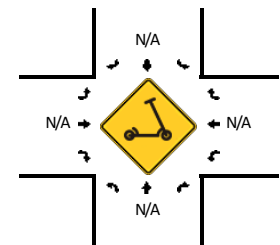
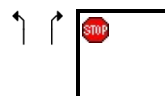
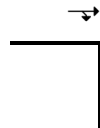
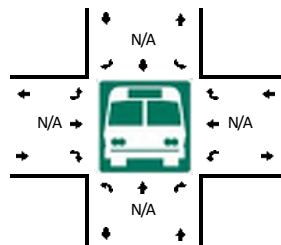
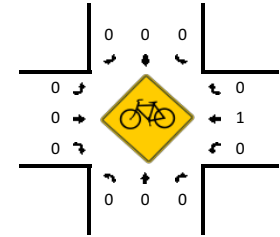
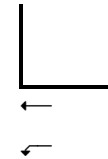
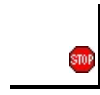
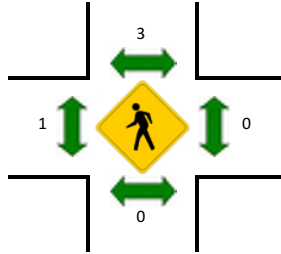
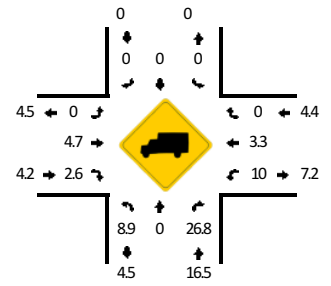
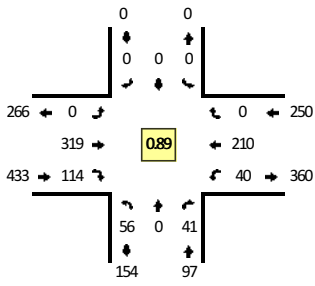
Comments:



**LOCATION:** SW Teton Ave -- SW Tualatin Rd  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 15442101  
**DATE:** Tue, May 11 2021

Peak-Hour: 7:50 AM -- 8:50 AM  
 Peak 15-Min: 7:50 AM -- 8:05 AM



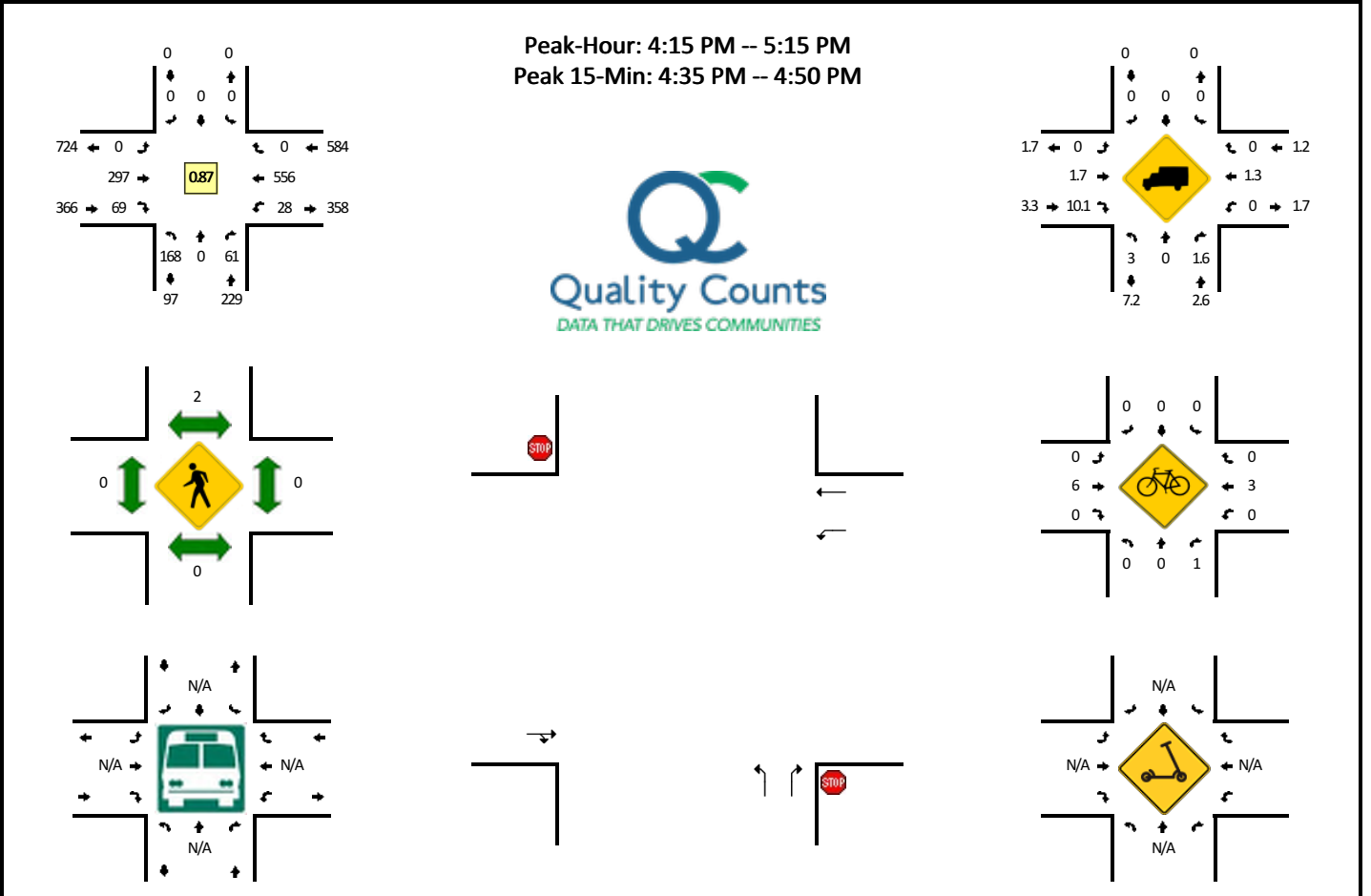
5-Min Count Period Beginning At	SW Teton Ave (Northbound)				SW Teton Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	1	0	0	0	0	0	0	0	0	9	5	0	1	6	0	0	22	
6:05 AM	1	0	0	0	0	0	0	0	0	14	3	0	0	10	0	0	28	
6:10 AM	3	0	1	0	0	0	0	0	0	8	5	0	1	7	0	0	25	
6:15 AM	0	0	0	0	0	0	0	0	0	8	4	0	0	10	0	0	22	
6:20 AM	1	0	3	0	0	0	0	0	0	9	2	0	1	17	0	0	33	
6:25 AM	5	0	1	0	0	0	0	0	0	15	4	0	0	15	0	0	40	
6:30 AM	4	0	1	0	0	0	0	0	0	19	5	0	0	11	0	0	40	
6:35 AM	1	0	0	0	0	0	0	0	0	20	3	0	3	12	0	0	39	
6:40 AM	3	0	0	0	0	0	0	0	0	23	7	0	0	15	0	0	48	
6:45 AM	3	0	1	0	0	0	0	0	0	25	10	0	1	17	0	0	57	
6:50 AM	0	0	0	0	0	0	0	0	0	20	8	0	0	12	0	0	40	
6:55 AM	1	0	1	0	0	0	0	0	0	25	10	0	2	9	0	0	48	442
7:00 AM	3	0	0	0	0	0	0	0	0	20	4	0	3	20	0	0	50	470
7:05 AM	1	0	0	0	0	0	0	0	0	17	3	0	0	9	0	0	30	472
7:10 AM	5	0	1	0	0	0	0	0	0	16	6	0	1	12	0	0	41	488
7:15 AM	2	0	2	0	0	0	0	0	0	23	5	0	5	10	0	0	47	513
7:20 AM	1	0	3	0	0	0	0	0	0	29	8	0	2	7	0	0	50	530
7:25 AM	3	0	1	0	0	0	0	0	0	24	7	0	4	14	0	0	53	543
7:30 AM	1	0	2	0	0	0	0	0	0	28	9	0	1	12	0	0	53	556
7:35 AM	1	0	2	0	0	0	0	0	0	38	10	0	5	13	0	0	69	586
7:40 AM	1	0	1	0	0	0	0	0	0	34	12	0	2	20	0	0	70	608
7:45 AM	4	0	0	0	0	0	0	0	0	30	11	0	2	13	0	0	60	611
7:50 AM	6	0	5	0	0	0	0	0	0	31	21	0	1	26	0	0	90	661
7:55 AM	2	0	5	0	0	0	0	0	0	29	11	0	4	21	0	0	72	685
8:00 AM	3	0	1	0	0	0	0	0	0	23	11	0	4	15	0	0	57	692
8:05 AM	2	0	1	0	0	0	0	0	0	23	6	0	2	13	0	0	47	709
8:10 AM	3	0	4	0	0	0	0	0	0	29	12	0	2	19	0	0	69	737
8:15 AM	5	0	3	0	0	0	0	0	0	35	11	0	2	11	0	0	67	757
8:20 AM	4	0	1	0	0	0	0	0	0	18	7	0	2	14	0	0	46	753
8:25 AM	4	0	1	0	0	0	0	0	0	26	7	0	5	13	0	0	56	756
8:30 AM	4	0	3	0	0	0	0	0	0	29	4	0	3	21	0	0	64	767
8:35 AM	6	0	3	0	0	0	0	0	0	23	5	0	6	21	0	0	64	762
8:40 AM	8	0	9	0	0	0	0	0	0	28	8	0	2	16	0	0	71	763
8:45 AM	9	0	5	0	0	0	0	0	0	25	11	0	7	20	0	0	77	780
8:50 AM	6	0	5	0	0	0	0	0	0	22	4	0	3	15	0	0	55	745
8:55 AM	3	0	3	0	0	0	0	0	0	30	1	0	5	19	0	0	61	734
9:00 AM	7	0	1	0	0	0	0	0	0	18	6	0	5	14	0	0	51	728
9:05 AM	6	0	2	0	0	0	0	0	0	16	1	0	0	17	0	0	42	723

5-Min Count Period Beginning At	SW Teton Ave (Northbound)				SW Teton Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
9:10 AM	6	0	0	0	0	0	0	0	0	25	3	0	1	13	0	0	48	702
9:15 AM	8	0	1	0	0	0	0	0	0	11	2	0	0	19	0	0	41	676
9:20 AM	9	0	1	0	0	0	0	0	0	9	1	0	0	7	0	0	27	657
9:25 AM	3	0	1	0	0	0	0	0	0	16	1	0	1	16	0	0	38	639
9:30 AM	6	0	0	0	0	0	0	0	0	20	3	0	0	13	0	0	42	617
9:35 AM	7	0	0	0	0	0	0	0	0	30	3	0	0	14	0	0	54	607
9:40 AM	2	0	2	0	0	0	0	0	0	20	5	0	2	17	0	0	48	584
9:45 AM	6	0	0	0	0	0	0	0	0	16	2	0	3	18	0	0	45	552
9:50 AM	3	0	0	0	0	0	0	0	0	19	2	0	1	12	0	0	37	534
9:55 AM	5	0	3	0	0	0	0	0	0	14	4	0	2	21	0	0	49	522
10:00 AM	4	0	0	0	0	0	0	0	0	15	1	0	2	19	0	0	41	512
10:05 AM	5	0	1	0	0	0	0	0	0	16	0	0	1	11	0	0	34	504
10:10 AM	5	0	0	0	0	0	0	0	0	16	2	0	1	16	0	0	40	496
10:15 AM	6	0	0	0	0	0	0	0	0	22	4	0	1	27	0	0	60	515
10:20 AM	1	0	1	0	0	0	0	0	0	19	2	0	3	16	0	0	42	530
10:25 AM	6	0	2	0	0	0	0	0	0	19	2	0	1	7	0	0	37	529
10:30 AM	3	0	0	0	0	0	0	0	0	10	2	0	1	17	0	0	33	520
10:35 AM	4	0	3	0	0	0	0	0	0	9	4	0	4	17	0	0	41	507
10:40 AM	4	0	2	0	0	0	0	0	0	25	1	0	3	18	0	0	53	512
10:45 AM	9	0	3	0	0	0	0	0	0	15	5	0	3	21	0	0	56	523
10:50 AM	1	0	2	0	0	0	0	0	0	22	5	0	1	14	0	0	45	531
10:55 AM	5	0	1	0	0	0	0	0	0	13	0	0	2	18	0	0	39	521
11:00 AM	11	0	3	0	0	0	0	0	0	13	0	0	1	18	0	0	46	526
11:05 AM	4	0	2	0	0	0	0	0	0	18	3	0	0	17	0	0	44	536
11:10 AM	6	0	5	0	0	0	0	0	0	20	4	0	3	19	0	0	57	553
11:15 AM	7	0	3	0	0	0	0	0	0	16	5	0	2	18	0	0	51	544
11:20 AM	2	0	0	0	0	0	0	0	0	21	5	0	3	20	0	0	51	553
11:25 AM	3	0	2	0	0	0	0	0	0	19	2	0	2	20	0	0	48	564
11:30 AM	6	0	1	0	0	0	0	0	0	25	3	0	0	15	0	0	50	581
11:35 AM	5	0	2	0	0	0	0	0	0	30	4	0	0	21	0	0	62	602
11:40 AM	2	0	3	0	0	0	0	0	0	21	4	0	2	12	0	0	44	593
11:45 AM	5	0	1	0	0	0	0	0	0	23	2	0	1	21	0	0	53	590
11:50 AM	7	0	1	0	0	0	0	0	0	22	7	0	3	26	0	0	66	611
11:55 AM	4	0	2	0	0	0	0	0	0	20	5	0	1	19	0	0	51	623
12:00 PM	5	0	2	0	0	0	0	0	0	20	6	0	2	19	0	0	54	631
12:05 PM	9	0	3	0	0	0	0	0	0	25	3	0	2	19	0	0	61	648
12:10 PM	5	0	2	0	0	0	0	0	0	20	5	0	1	24	0	0	57	648
12:15 PM	6	0	4	0	0	0	0	0	0	19	5	0	0	23	0	0	57	654
12:20 PM	4	0	2	0	0	0	0	0	0	18	4	0	1	22	0	0	51	654
12:25 PM	7	0	1	0	0	0	0	0	0	21	1	0	3	27	0	0	60	666
12:30 PM	4	0	2	0	0	0	0	0	0	22	6	0	4	22	0	0	60	676
12:35 PM	10	0	1	0	0	0	0	0	0	13	6	0	0	17	0	0	47	661
12:40 PM	6	0	3	0	0	0	0	0	0	22	4	0	1	38	0	0	74	691
12:45 PM	1	0	2	0	0	0	0	0	0	23	2	0	4	29	0	0	61	699
12:50 PM	6	0	2	0	0	0	0	0	0	31	1	0	6	19	0	0	65	698
12:55 PM	2	0	1	0	0	0	0	0	0	22	6	0	1	19	0	0	51	698
1:00 PM	5	0	0	0	0	0	0	0	0	29	5	0	1	18	0	0	58	702
1:05 PM	4	0	2	0	0	0	0	0	0	25	6	0	1	22	0	0	60	701
1:10 PM	3	0	2	0	0	0	0	0	0	17	3	0	1	27	0	0	53	697
1:15 PM	2	0	3	0	0	0	0	0	0	17	3	0	3	18	0	0	46	686
1:20 PM	2	0	3	0	0	0	0	0	0	19	6	0	1	22	0	0	53	688
1:25 PM	2	0	2	0	0	0	0	0	0	18	2	0	1	23	0	0	48	676
1:30 PM	7	0	1	0	0	0	0	0	0	10	1	0	1	27	0	0	47	663
1:35 PM	4	0	1	0	0	0	0	0	0	24	8	0	0	24	0	0	61	677
1:40 PM	4	0	1	0	0	0	0	0	0	22	4	0	2	20	0	0	53	656
1:45 PM	5	0	1	0	0	0	0	0	0	25	3	0	0	36	0	0	70	665
1:50 PM	2	0	0	0	0	0	0	0	0	17	3	0	1	25	0	0	48	648
1:55 PM	5	0	2	0	0	0	0	0	0	23	5	0	0	15	0	0	50	647
2:00 PM	6	0	3	0	0	0	0	0	0	19	0	0	0	27	0	0	55	644
2:05 PM	9	0	0	0	0	0	0	0	0	11	6	0	0	31	0	0	57	641
2:10 PM	12	0	1	0	0	0	0	0	0	20	3	0	0	24	0	0	60	648
2:15 PM	6	0	2	0	0	0	0	0	0	17	3	0	2	33	0	0	63	665
2:20 PM	11	0	0	0	0	0	0	0	0	21	5	0	12	21	0	0	70	682
2:25 PM	6	0	0	0	0	0	0	0	0	24	7	0	4	28	0	0	69	703
2:30 PM	10	0	0	0	0	0	0	0	0	22	5	0	7	31	0	0	75	731
2:35 PM	18	0	4	0	0	0	0	0	0	29	7	0	3	30	0	0	91	761
2:40 PM	9	0	4	0	0	0	0	0	0	21	7	0	1	32	0	0	74	782
2:45 PM	8	0	3	0	0	0	0	0	0	24	4	0	4	26	0	0	69	781
2:50 PM	15	0	1	0	0	0	0	0	0	20	2	0	1	31	0	0	70	803
2:55 PM	9	0	1	0	0	0	0	0	0	21	4	0	2	34	0	0	71	824
3:00 PM	10	0	2	0	0	0	0	0	0	21	8	0	1	27	0	0	69	838
3:05 PM	15	0	2	0	0	0	0	0	0	23	3	0	2	41	0	0	86	867
3:10 PM	14	0	3	0	0	0	0	0	0	27	4	0	1	29	0	0	78	885
3:15 PM	12	0	3	0	0	0	0	0	0	21	1	0	2	32	0	0	71	893
3:20 PM	14	0	5	0	0	0	0	0	0	29	3	0	1	31	0	0	83	906
3:25 PM	8	0	1	0	0	0	0	0	0	32	20	0	1	34	0	0	96	933
3:30 PM	17	0	1	0	0	0	0	0	0	27	11	0	1	39	0	0	96	954
3:35 PM	13	0	2	0	0	0	0	0	0	34	4	0	0	45	0	0	98	961
3:40 PM	14	0	1	0	0	0	0	0	0	27	6	0	1	56	0	0	105	992
3:45 PM	4	0	2	0	0	0	0	0	0	24	7	0	2	29	0	0	68	991
3:50 PM	8	0	0	0	0	0	0	0	0	17	3	0	1	36	0	0	65	986
3:55 PM	11	0	3	0	0	0	0	0	0	23	6	0	2	38	0	0	83	998
4:00 PM	11	0	3	0	0	0	0	0	0	33	4	0	3	35	0	0	89	1018
4:05 PM	17	0	1	0	0	0	0	0	0	24	7	0	4	55	0	0	108	1040
4:10 PM	11	0	0	0	0	0	0	0	0	22	4	0	2	48	0	0	87	1049
4:15 PM	13	0	2	0	0	0	0	0	0	28	7	0	5	48	0	0	103	1081
4:20 PM	16	0	0	0	0	0	0	0	0	25	3	0	2	32	0	0	78	1076
4:25 PM	12	0	2	0	0	0	0	0	0	20	11	0	1	42	0	0	88	1068
4:30 PM	16	0	2	0	0	0	0	0	0	25	4	0	1	43	0	0	91	1063

5-Min Count Period Beginning At	SW Teton Ave (Northbound)				SW Teton Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:35 PM	16	0	11	0	0	0	0	0	0	25	8	0	3	47	0	0	110	1075
4:40 PM	22	0	13	0	0	0	0	0	0	24	3	0	2	52	0	0	116	1086
4:45 PM	17	0	9	0	0	0	0	0	0	25	8	0	2	53	0	0	114	1132
4:50 PM	12	0	3	0	0	0	0	0	0	25	8	0	2	31	0	0	81	1148
4:55 PM	10	0	4	0	0	0	0	0	0	22	3	0	1	42	0	0	82	1147
5:00 PM	10	0	3	0	0	0	0	0	0	17	7	0	2	55	0	0	94	1152
5:05 PM	16	0	6	0	0	0	0	0	0	33	2	0	3	58	0	0	118	1162
5:10 PM	8	0	6	0	0	0	0	0	0	28	5	0	4	53	0	0	104	1179
5:15 PM	14	0	3	0	0	0	0	0	0	22	6	0	3	44	0	0	92	1168
5:20 PM	9	0	7	0	0	0	0	0	0	17	5	0	1	36	0	0	75	1165
5:25 PM	6	0	7	0	0	0	0	0	0	23	2	0	1	42	0	0	81	1158
5:30 PM	8	0	3	0	0	0	0	0	0	20	8	0	1	42	0	0	82	1149
5:35 PM	9	0	2	0	0	0	0	0	0	28	5	0	2	39	0	0	85	1124
5:40 PM	12	0	2	0	0	0	0	0	0	20	3	0	1	35	0	0	73	1081
5:45 PM	15	0	1	0	0	0	0	0	0	21	5	0	4	34	0	0	80	1047
5:50 PM	4	0	0	0	0	0	0	0	0	20	1	0	0	33	0	0	58	1024
5:55 PM	6	0	1	0	0	0	0	0	0	25	4	0	3	32	0	0	71	1013
6:00 PM	7	0	2	0	0	0	0	0	0	14	4	0	4	24	0	0	55	974
6:05 PM	10	0	1	0	0	0	0	0	0	17	4	0	0	35	0	0	67	923
6:10 PM	9	0	0	0	0	0	0	0	0	17	2	0	0	30	0	0	58	877
6:15 PM	9	0	5	0	0	0	0	0	0	13	1	0	0	27	0	0	55	840
6:20 PM	3	0	3	0	0	0	0	0	0	16	3	0	1	19	0	0	45	810
6:25 PM	4	0	3	0	0	0	0	0	0	9	4	0	2	20	0	0	42	771
6:30 PM	3	0	3	0	0	0	0	0	0	18	2	0	0	18	0	0	44	733
6:35 PM	9	0	2	0	0	0	0	0	0	12	1	0	4	18	0	0	46	694
6:40 PM	8	0	0	0	0	0	0	0	0	16	3	0	1	22	0	0	50	671
6:45 PM	6	0	1	0	0	0	0	0	0	15	0	0	3	19	0	0	44	635
6:50 PM	4	0	0	0	0	0	0	0	0	15	2	0	0	15	0	0	36	613
6:55 PM	6	0	2	0	0	0	0	0	0	12	3	0	1	14	0	0	38	580
7:00 PM	4	0	0	0	0	0	0	0	0	6	2	0	0	18	0	0	30	555
7:05 PM	3	0	1	0	0	0	0	0	0	10	6	0	1	22	0	0	43	531
7:10 PM	8	0	2	0	0	0	0	0	0	10	0	0	2	18	0	0	40	513
7:15 PM	4	0	0	0	0	0	0	0	0	12	3	0	2	19	0	0	40	498
7:20 PM	4	0	2	0	0	0	0	0	0	8	1	0	0	16	0	0	31	484
7:25 PM	2	0	2	0	0	0	0	0	0	7	2	0	0	22	0	0	35	477
7:30 PM	8	0	1	0	0	0	0	0	0	15	2	0	2	15	0	0	43	476
7:35 PM	7	0	0	0	0	0	0	0	0	11	2	0	0	13	0	0	33	463
7:40 PM	2	0	0	0	0	0	0	0	0	11	0	0	1	17	0	0	31	444
7:45 PM	5	0	2	0	0	0	0	0	0	9	2	0	1	10	0	0	29	429
7:50 PM	6	0	2	0	0	0	0	0	0	10	1	0	2	17	0	0	38	431
7:55 PM	6	0	2	0	0	0	0	0	0	9	0	0	0	16	0	0	33	426
8:00 PM	1	0	2	0	0	0	0	0	0	5	1	0	0	10	0	0	19	415
8:05 PM	3	0	0	0	0	0	0	0	0	7	0	0	1	16	0	0	27	399
8:10 PM	3	0	0	0	0	0	0	0	0	5	2	0	1	17	0	0	28	387
8:15 PM	0	0	2	0	0	0	0	0	0	3	0	0	1	17	0	0	23	370
8:20 PM	2	0	1	0	0	0	0	0	0	2	4	0	0	17	0	0	26	365
8:25 PM	0	0	0	0	0	0	0	0	0	7	1	0	1	16	0	0	25	355
8:30 PM	1	0	0	0	0	0	0	0	0	3	1	0	1	11	0	0	17	329
8:35 PM	2	0	1	0	0	0	0	0	0	2	1	0	0	7	0	0	13	309
8:40 PM	2	0	0	0	0	0	0	0	0	6	1	0	0	14	0	0	23	301
8:45 PM	5	0	0	0	0	0	0	0	0	10	1	0	0	14	0	0	30	302
8:50 PM	1	0	1	0	0	0	0	0	0	7	1	0	0	4	0	0	14	278
8:55 PM	3	0	0	0	0	0	0	0	0	6	1	0	0	9	0	0	19	264
9:00 PM	0	0	1	0	0	0	0	0	0	5	1	0	0	5	0	0	12	257
9:05 PM	0	0	1	0	0	0	0	0	0	6	1	0	1	10	0	0	19	249
9:10 PM	3	0	1	0	0	0	0	0	0	12	2	0	0	9	0	0	27	248
9:15 PM	8	0	1	0	0	0	0	0	0	2	0	0	1	5	0	0	17	242
9:20 PM	3	0	0	0	0	0	0	0	0	3	2	0	1	12	0	0	21	237
9:25 PM	2	0	0	0	0	0	0	0	0	9	1	0	0	6	0	0	18	230
9:30 PM	2	0	0	0	0	0	0	0	0	6	0	0	0	4	0	0	12	225
9:35 PM	6	0	1	0	0	0	0	0	0	3	1	0	0	9	0	0	20	232
9:40 PM	2	0	0	0	0	0	0	0	0	5	0	0	1	6	0	0	14	223
9:45 PM	1	0	0	0	0	0	0	0	0	4	1	0	0	6	0	0	12	205
9:50 PM	2	0	0	0	0	0	0	0	0	3	1	0	0	5	0	0	11	202
9:55 PM	1	0	0	0	0	0	0	0	0	6	1	0	0	9	0	0	17	200
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	44	0	44	0	0	0	0	0	0	332	172	0	36	248	0	0	876	
Heavy Trucks	4	0	4	0	0	0	0	0	0	16	8	0	8	8	0	0	48	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0			0	0		0	0	0		0	
Scoters																		
<i>Comments:</i>																		

**LOCATION:** SW Teton Ave -- SW Tualatin Rd  
**CITY/STATE:** Tualatin, OR

**QC JOB #:** 15442101  
**DATE:** Tue, May 11 2021



5-Min Count Period Beginning At	SW Teton Ave (Northbound)				SW Teton Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	1	0	0	0	0	0	0	0	0	9	5	0	1	6	0	0	22	
6:05 AM	1	0	0	0	0	0	0	0	0	14	3	0	0	10	0	0	28	
6:10 AM	3	0	1	0	0	0	0	0	0	8	5	0	1	7	0	0	25	
6:15 AM	0	0	0	0	0	0	0	0	0	8	4	0	0	10	0	0	22	
6:20 AM	1	0	3	0	0	0	0	0	0	9	2	0	1	17	0	0	33	
6:25 AM	5	0	1	0	0	0	0	0	0	15	4	0	0	15	0	0	40	
6:30 AM	4	0	1	0	0	0	0	0	0	19	5	0	0	11	0	0	40	
6:35 AM	1	0	0	0	0	0	0	0	0	20	3	0	3	12	0	0	39	
6:40 AM	3	0	0	0	0	0	0	0	0	23	7	0	0	15	0	0	48	
6:45 AM	3	0	1	0	0	0	0	0	0	25	10	0	1	17	0	0	57	
6:50 AM	0	0	0	0	0	0	0	0	0	20	8	0	0	12	0	0	40	
6:55 AM	1	0	1	0	0	0	0	0	0	25	10	0	2	9	0	0	48	442
7:00 AM	3	0	0	0	0	0	0	0	0	20	4	0	3	20	0	0	50	470
7:05 AM	1	0	0	0	0	0	0	0	0	17	3	0	0	9	0	0	30	472
7:10 AM	5	0	1	0	0	0	0	0	0	16	6	0	1	12	0	0	41	488
7:15 AM	2	0	2	0	0	0	0	0	0	23	5	0	5	10	0	0	47	513
7:20 AM	1	0	3	0	0	0	0	0	0	29	8	0	2	7	0	0	50	530
7:25 AM	3	0	1	0	0	0	0	0	0	24	7	0	4	14	0	0	53	543
7:30 AM	1	0	2	0	0	0	0	0	0	28	9	0	1	12	0	0	53	556
7:35 AM	1	0	2	0	0	0	0	0	0	38	10	0	5	13	0	0	69	586
7:40 AM	1	0	1	0	0	0	0	0	0	34	12	0	2	20	0	0	70	608
7:45 AM	4	0	0	0	0	0	0	0	0	30	11	0	2	13	0	0	60	611
7:50 AM	6	0	5	0	0	0	0	0	0	31	21	0	1	26	0	0	90	661
7:55 AM	2	0	5	0	0	0	0	0	0	29	11	0	4	21	0	0	72	685
8:00 AM	3	0	1	0	0	0	0	0	0	23	11	0	4	15	0	0	57	692
8:05 AM	2	0	1	0	0	0	0	0	0	23	6	0	2	13	0	0	47	709
8:10 AM	3	0	4	0	0	0	0	0	0	29	12	0	2	19	0	0	69	737
8:15 AM	5	0	3	0	0	0	0	0	0	35	11	0	2	11	0	0	67	757
8:20 AM	4	0	1	0	0	0	0	0	0	18	7	0	2	14	0	0	46	753
8:25 AM	4	0	1	0	0	0	0	0	0	26	7	0	5	13	0	0	56	756
8:30 AM	4	0	3	0	0	0	0	0	0	29	4	0	3	21	0	0	64	767
8:35 AM	6	0	3	0	0	0	0	0	0	23	5	0	6	21	0	0	64	762
8:40 AM	8	0	9	0	0	0	0	0	0	28	8	0	2	16	0	0	71	763
8:45 AM	9	0	5	0	0	0	0	0	0	25	11	0	7	20	0	0	77	780
8:50 AM	6	0	5	0	0	0	0	0	0	22	4	0	3	15	0	0	55	745
8:55 AM	3	0	3	0	0	0	0	0	0	30	1	0	5	19	0	0	61	734
9:00 AM	7	0	1	0	0	0	0	0	0	18	6	0	5	14	0	0	51	728
9:05 AM	6	0	2	0	0	0	0	0	0	16	1	0	0	17	0	0	42	723
9:10 AM	6	0	0	0	0	0	0	0	0	25	3	0	1	13	0	0	48	702



5-Min Count Period Beginning At	SW Teton Ave (Northbound)				SW Teton Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
9:15 AM	8	0	1	0	0	0	0	0	0	11	2	0	0	19	0	0	41	676
9:20 AM	9	0	1	0	0	0	0	0	0	9	1	0	0	7	0	0	27	657
9:25 AM	3	0	1	0	0	0	0	0	0	16	1	0	1	16	0	0	38	639
9:30 AM	6	0	0	0	0	0	0	0	0	20	3	0	0	13	0	0	42	617
9:35 AM	7	0	0	0	0	0	0	0	0	30	3	0	0	14	0	0	54	607
9:40 AM	2	0	2	0	0	0	0	0	0	20	5	0	2	17	0	0	48	584
9:45 AM	6	0	0	0	0	0	0	0	0	16	2	0	3	18	0	0	45	552
9:50 AM	3	0	0	0	0	0	0	0	0	19	2	0	1	12	0	0	37	534
9:55 AM	5	0	3	0	0	0	0	0	0	14	4	0	2	21	0	0	49	522
10:00 AM	4	0	0	0	0	0	0	0	0	15	1	0	2	19	0	0	41	512
10:05 AM	5	0	1	0	0	0	0	0	0	16	0	0	1	11	0	0	34	504
10:10 AM	5	0	0	0	0	0	0	0	0	16	2	0	1	16	0	0	40	496
10:15 AM	6	0	0	0	0	0	0	0	0	22	4	0	1	27	0	0	60	515
10:20 AM	1	0	1	0	0	0	0	0	0	19	2	0	3	16	0	0	42	530
10:25 AM	6	0	2	0	0	0	0	0	0	19	2	0	1	7	0	0	37	529
10:30 AM	3	0	0	0	0	0	0	0	0	10	2	0	1	17	0	0	33	520
10:35 AM	4	0	3	0	0	0	0	0	0	9	4	0	4	17	0	0	41	507
10:40 AM	4	0	2	0	0	0	0	0	0	25	1	0	3	18	0	0	53	512
10:45 AM	9	0	3	0	0	0	0	0	0	15	5	0	3	21	0	0	56	523
10:50 AM	1	0	2	0	0	0	0	0	0	22	5	0	1	14	0	0	45	531
10:55 AM	5	0	1	0	0	0	0	0	0	13	0	0	2	18	0	0	39	521
11:00 AM	11	0	3	0	0	0	0	0	0	13	0	0	1	18	0	0	46	526
11:05 AM	4	0	2	0	0	0	0	0	0	18	3	0	0	17	0	0	44	536
11:10 AM	6	0	5	0	0	0	0	0	0	20	4	0	3	19	0	0	57	553
11:15 AM	7	0	3	0	0	0	0	0	0	16	5	0	2	18	0	0	51	544
11:20 AM	2	0	0	0	0	0	0	0	0	21	5	0	3	20	0	0	51	553
11:25 AM	3	0	2	0	0	0	0	0	0	19	2	0	2	20	0	0	48	564
11:30 AM	6	0	1	0	0	0	0	0	0	25	3	0	0	15	0	0	50	581
11:35 AM	5	0	2	0	0	0	0	0	0	30	4	0	0	21	0	0	62	602
11:40 AM	2	0	3	0	0	0	0	0	0	21	4	0	2	12	0	0	44	593
11:45 AM	5	0	1	0	0	0	0	0	0	23	2	0	1	21	0	0	53	590
11:50 AM	7	0	1	0	0	0	0	0	0	22	7	0	3	26	0	0	66	611
11:55 AM	4	0	2	0	0	0	0	0	0	20	5	0	1	19	0	0	51	623
12:00 PM	5	0	2	0	0	0	0	0	0	20	6	0	2	19	0	0	54	631
12:05 PM	9	0	3	0	0	0	0	0	0	25	3	0	2	19	0	0	61	648
12:10 PM	5	0	2	0	0	0	0	0	0	20	5	0	1	24	0	0	57	648
12:15 PM	6	0	4	0	0	0	0	0	0	19	5	0	0	23	0	0	57	654
12:20 PM	4	0	2	0	0	0	0	0	0	18	4	0	1	22	0	0	51	654
12:25 PM	7	0	1	0	0	0	0	0	0	21	1	0	3	27	0	0	60	666
12:30 PM	4	0	2	0	0	0	0	0	0	22	6	0	4	22	0	0	60	676
12:35 PM	10	0	1	0	0	0	0	0	0	13	6	0	0	17	0	0	47	661
12:40 PM	6	0	3	0	0	0	0	0	0	22	4	0	1	38	0	0	74	691
12:45 PM	1	0	2	0	0	0	0	0	0	23	2	0	4	29	0	0	61	699
12:50 PM	6	0	2	0	0	0	0	0	0	31	1	0	6	19	0	0	65	698
12:55 PM	2	0	1	0	0	0	0	0	0	22	6	0	1	19	0	0	51	698
1:00 PM	5	0	0	0	0	0	0	0	0	29	5	0	1	18	0	0	58	702
1:05 PM	4	0	2	0	0	0	0	0	0	25	6	0	1	22	0	0	60	701
1:10 PM	3	0	2	0	0	0	0	0	0	17	3	0	1	27	0	0	53	697
1:15 PM	2	0	3	0	0	0	0	0	0	17	3	0	3	18	0	0	46	686
1:20 PM	2	0	3	0	0	0	0	0	0	19	6	0	1	22	0	0	53	688
1:25 PM	2	0	2	0	0	0	0	0	0	18	2	0	1	23	0	0	48	676
1:30 PM	7	0	1	0	0	0	0	0	0	10	1	0	1	27	0	0	47	663
1:35 PM	4	0	1	0	0	0	0	0	0	24	8	0	0	24	0	0	61	677
1:40 PM	4	0	1	0	0	0	0	0	0	22	4	0	2	20	0	0	53	656
1:45 PM	5	0	1	0	0	0	0	0	0	25	3	0	0	36	0	0	70	665
1:50 PM	2	0	0	0	0	0	0	0	0	17	3	0	1	25	0	0	48	648
1:55 PM	5	0	2	0	0	0	0	0	0	23	5	0	0	15	0	0	50	647
2:00 PM	6	0	3	0	0	0	0	0	0	19	0	0	0	27	0	0	55	644
2:05 PM	9	0	0	0	0	0	0	0	0	11	6	0	0	31	0	0	57	641
2:10 PM	12	0	1	0	0	0	0	0	0	20	3	0	0	24	0	0	60	648
2:15 PM	6	0	2	0	0	0	0	0	0	17	3	0	2	33	0	0	63	665
2:20 PM	11	0	0	0	0	0	0	0	0	21	5	0	12	21	0	0	70	682
2:25 PM	6	0	0	0	0	0	0	0	0	24	7	0	4	28	0	0	69	703
2:30 PM	10	0	0	0	0	0	0	0	0	22	5	0	7	31	0	0	75	731
2:35 PM	18	0	4	0	0	0	0	0	0	29	7	0	3	30	0	0	91	761
2:40 PM	9	0	4	0	0	0	0	0	0	21	7	0	1	32	0	0	74	782
2:45 PM	8	0	3	0	0	0	0	0	0	24	4	0	4	26	0	0	69	781
2:50 PM	15	0	1	0	0	0	0	0	0	20	2	0	1	31	0	0	70	803
2:55 PM	9	0	1	0	0	0	0	0	0	21	4	0	2	34	0	0	71	824
3:00 PM	10	0	2	0	0	0	0	0	0	21	8	0	1	27	0	0	69	838
3:05 PM	15	0	2	0	0	0	0	0	0	23	3	0	2	41	0	0	86	867
3:10 PM	14	0	3	0	0	0	0	0	0	27	4	0	1	29	0	0	78	885
3:15 PM	12	0	3	0	0	0	0	0	0	21	1	0	2	32	0	0	71	893
3:20 PM	14	0	5	0	0	0	0	0	0	29	3	0	1	31	0	0	83	906
3:25 PM	8	0	1	0	0	0	0	0	0	32	20	0	1	34	0	0	96	933
3:30 PM	17	0	1	0	0	0	0	0	0	27	11	0	1	39	0	0	96	954
3:35 PM	13	0	2	0	0	0	0	0	0	34	4	0	0	45	0	0	98	961
3:40 PM	14	0	1	0	0	0	0	0	0	27	6	0	1	56	0	0	105	992
3:45 PM	4	0	2	0	0	0	0	0	0	24	7	0	2	29	0	0	68	991
3:50 PM	8	0	0	0	0	0	0	0	0	17	3	0	1	36	0	0	65	986
3:55 PM	11	0	3	0	0	0	0	0	0	23	6	0	2	38	0	0	83	998
4:00 PM	11	0	3	0	0	0	0	0	0	33	4	0	3	35	0	0	89	1018
4:05 PM	17	0	1	0	0	0	0	0	0	24	7	0	4	55	0	0	108	1040
4:10 PM	11	0	0	0	0	0	0	0	0	22	4	0	2	48	0	0	87	1049
4:15 PM	13	0	2	0	0	0	0	0	0	28	7	0	5	48	0	0	103	1081
4:20 PM	16	0	0	0	0	0	0	0	0	25	3	0	2	32	0	0	78	1076
4:25 PM	12	0	2	0	0	0	0	0	0	20	11	0	1	42	0	0	88	1068

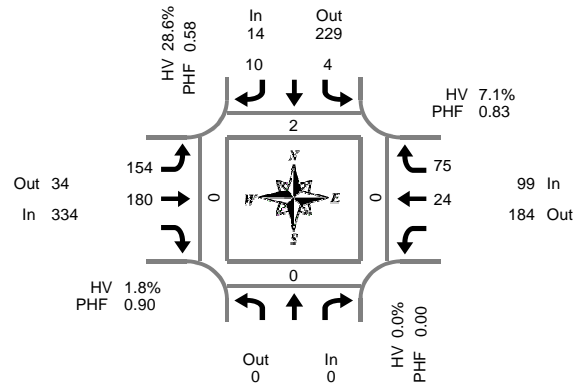
5-Min Count Period Beginning At	SW Teton Ave (Northbound)				SW Teton Ave (Southbound)				SW Tualatin Rd (Eastbound)				SW Tualatin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:30 PM	16	0	2	0	0	0	0	0	0	25	4	0	1	43	0	0	91	1063
4:35 PM	16	0	11	0	0	0	0	0	0	25	8	0	3	47	0	0	110	1075
4:40 PM	22	0	13	0	0	0	0	0	0	24	3	0	2	52	0	0	116	1086
4:45 PM	17	0	9	0	0	0	0	0	0	25	8	0	2	53	0	0	114	1132
4:50 PM	12	0	3	0	0	0	0	0	0	25	8	0	2	31	0	0	81	1148
4:55 PM	10	0	4	0	0	0	0	0	0	22	3	0	1	42	0	0	82	1147
5:00 PM	10	0	3	0	0	0	0	0	0	17	7	0	2	55	0	0	94	1152
5:05 PM	16	0	6	0	0	0	0	0	0	33	2	0	3	58	0	0	118	1162
5:10 PM	8	0	6	0	0	0	0	0	0	28	5	0	4	53	0	0	104	1179
5:15 PM	14	0	3	0	0	0	0	0	0	22	6	0	3	44	0	0	92	1168
5:20 PM	9	0	7	0	0	0	0	0	0	17	5	0	1	36	0	0	75	1165
5:25 PM	6	0	7	0	0	0	0	0	0	23	2	0	1	42	0	0	81	1158
5:30 PM	8	0	3	0	0	0	0	0	0	20	8	0	1	42	0	0	82	1149
5:35 PM	9	0	2	0	0	0	0	0	0	28	5	0	2	39	0	0	85	1124
5:40 PM	12	0	2	0	0	0	0	0	0	20	3	0	1	35	0	0	73	1081
5:45 PM	15	0	1	0	0	0	0	0	0	21	5	0	4	34	0	0	80	1047
5:50 PM	4	0	0	0	0	0	0	0	0	20	1	0	0	33	0	0	58	1024
5:55 PM	6	0	1	0	0	0	0	0	0	25	4	0	3	32	0	0	71	1013
6:00 PM	7	0	2	0	0	0	0	0	0	14	4	0	4	24	0	0	55	974
6:05 PM	10	0	1	0	0	0	0	0	0	17	4	0	0	35	0	0	67	923
6:10 PM	9	0	0	0	0	0	0	0	0	17	2	0	0	30	0	0	58	877
6:15 PM	9	0	5	0	0	0	0	0	0	13	1	0	0	27	0	0	55	840
6:20 PM	3	0	3	0	0	0	0	0	0	16	3	0	1	19	0	0	45	810
6:25 PM	4	0	3	0	0	0	0	0	0	9	4	0	2	20	0	0	42	771
6:30 PM	3	0	3	0	0	0	0	0	0	18	2	0	0	18	0	0	44	733
6:35 PM	9	0	2	0	0	0	0	0	0	12	1	0	4	18	0	0	46	694
6:40 PM	8	0	0	0	0	0	0	0	0	16	3	0	1	22	0	0	50	671
6:45 PM	6	0	1	0	0	0	0	0	0	15	0	0	3	19	0	0	44	635
6:50 PM	4	0	0	0	0	0	0	0	0	15	2	0	0	15	0	0	36	613
6:55 PM	6	0	2	0	0	0	0	0	0	12	3	0	1	14	0	0	38	580
7:00 PM	4	0	0	0	0	0	0	0	0	6	2	0	0	18	0	0	30	555
7:05 PM	3	0	1	0	0	0	0	0	0	10	6	0	1	22	0	0	43	531
7:10 PM	8	0	2	0	0	0	0	0	0	10	0	0	2	18	0	0	40	513
7:15 PM	4	0	0	0	0	0	0	0	0	12	3	0	2	19	0	0	40	498
7:20 PM	4	0	2	0	0	0	0	0	0	8	1	0	0	16	0	0	31	484
7:25 PM	2	0	2	0	0	0	0	0	0	7	2	0	0	22	0	0	35	477
7:30 PM	8	0	1	0	0	0	0	0	0	15	2	0	2	15	0	0	43	476
7:35 PM	7	0	0	0	0	0	0	0	0	11	2	0	0	13	0	0	33	463
7:40 PM	2	0	0	0	0	0	0	0	0	11	0	0	1	17	0	0	31	444
7:45 PM	5	0	2	0	0	0	0	0	0	9	2	0	1	10	0	0	29	429
7:50 PM	6	0	2	0	0	0	0	0	0	10	1	0	2	17	0	0	38	431
7:55 PM	6	0	2	0	0	0	0	0	0	9	0	0	0	16	0	0	33	426
8:00 PM	1	0	2	0	0	0	0	0	0	5	1	0	0	10	0	0	19	415
8:05 PM	3	0	0	0	0	0	0	0	0	7	0	0	1	16	0	0	27	399
8:10 PM	3	0	0	0	0	0	0	0	0	5	2	0	1	17	0	0	28	387
8:15 PM	0	0	2	0	0	0	0	0	0	3	0	0	1	17	0	0	23	370
8:20 PM	2	0	1	0	0	0	0	0	0	2	4	0	0	17	0	0	26	365
8:25 PM	0	0	0	0	0	0	0	0	0	7	1	0	1	16	0	0	25	355
8:30 PM	1	0	0	0	0	0	0	0	0	3	1	0	1	11	0	0	17	329
8:35 PM	2	0	1	0	0	0	0	0	0	2	1	0	0	7	0	0	13	309
8:40 PM	2	0	0	0	0	0	0	0	0	6	1	0	0	14	0	0	23	301
8:45 PM	5	0	0	0	0	0	0	0	0	10	1	0	0	14	0	0	30	302
8:50 PM	1	0	1	0	0	0	0	0	0	7	1	0	0	4	0	0	14	278
8:55 PM	3	0	0	0	0	0	0	0	0	6	1	0	0	9	0	0	19	264
9:00 PM	0	0	1	0	0	0	0	0	0	5	1	0	0	5	0	0	12	257
9:05 PM	0	0	1	0	0	0	0	0	0	6	1	0	1	10	0	0	19	249
9:10 PM	3	0	1	0	0	0	0	0	0	12	2	0	0	9	0	0	27	248
9:15 PM	8	0	1	0	0	0	0	0	0	2	0	0	1	5	0	0	17	242
9:20 PM	3	0	0	0	0	0	0	0	0	3	2	0	1	12	0	0	21	237
9:25 PM	2	0	0	0	0	0	0	0	0	9	1	0	0	6	0	0	18	230
9:30 PM	2	0	0	0	0	0	0	0	0	6	0	0	0	4	0	0	12	225
9:35 PM	6	0	1	0	0	0	0	0	0	3	1	0	0	9	0	0	20	232
9:40 PM	2	0	0	0	0	0	0	0	0	5	0	0	1	6	0	0	14	223
9:45 PM	1	0	0	0	0	0	0	0	0	4	1	0	0	6	0	0	12	205
9:50 PM	2	0	0	0	0	0	0	0	0	3	1	0	0	5	0	0	11	202
9:55 PM	1	0	0	0	0	0	0	0	0	6	1	0	0	9	0	0	17	200
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	220	0	132	0	0	0	0	0	0	296	76	0	28	608	0	0	1360	
Heavy Trucks	12	0	4	0	0	0	0	0	0	8	8	0	0	4	0	0	36	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	8	0		0	0	0		8	
Scooters																		

Comments:

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## West Driveway & SW Leveton Dr

Wednesday, June 06, 2018  
7:00 AM to 9:00 AM

**Peak Hour Summary**  
7:45 AM to 8:45 AM

### 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound West Driveway				Southbound West Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Bikes	L	T	Bikes	T	R	Bikes	T	R	Bikes	North	South	East		West			
7:00 AM	0	4	4	0	15	22	0	4	4	1	53	0	0	0	0						
7:15 AM	0	2	3	0	20	31	0	14	19	1	89	0	0	0	0						
7:30 AM	0	2	1	0	22	31	0	8	15	0	79	0	0	0	0						
7:45 AM	0	0	2	0	34	58	0	7	18	0	119	0	0	0	0						
8:00 AM	0	1	0	0	39	54	0	7	22	0	123	1	0	0	0						
8:15 AM	0	1	4	0	41	38	0	5	25	0	114	1	0	0	0						
8:30 AM	0	2	4	0	40	30	0	5	10	0	91	0	0	0	0						
8:45 AM	0	1	0	0	23	18	0	5	16	0	63	0	0	0	0						
Total Survey	0	13	18	0	234	282	0	55	129	2	731	2	0	0	0						

### Peak Hour Summary

7:45 AM to 8:45 AM

By Approach	Northbound West Driveway				Southbound West Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	14	229	243	0	334	34	368	0	99	184	283	0	447	2	0	0	0
%HV	0.0%				28.6%				1.8%				7.1%				3.8%				
PHF	0.00				0.58				0.90				0.83				0.91				

By Movement	Northbound West Driveway				Southbound West Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total
	Total	L	R	Bikes	Total	L	T	Bikes	Total	L	T	Bikes	Total	T	R	Bikes	
Volume	0	4	10	14	154	180	334	0	24	75	99	447	24	75	99		
%HV	NA	NA	NA	0.0%	50.0%	NA	20.0%	28.6%	0.0%	3.3%	NA	1.8%	NA	25.0%	1.3%	7.1%	3.8%
PHF	0.00	0.50	0.63	0.58	0.94	0.78	0.90	0.90	0.86	0.75	0.83	0.91	0.86	0.75	0.83		

### Rolling Hour Summary

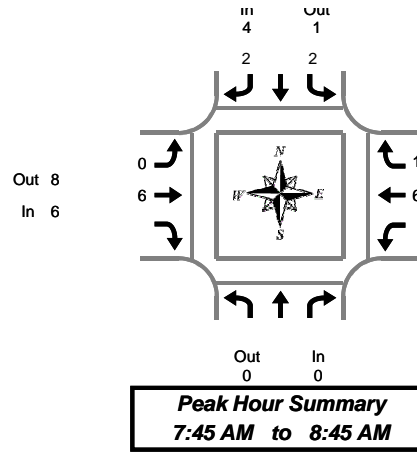
7:00 AM to 9:00 AM

Interval Start Time	Northbound West Driveway				Southbound West Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Bikes	L	T	Bikes	T	R	Bikes	T	R	Bikes	North	South	East		West			
7:00 AM	0	8	10	0	91	142	0	33	56	2	340	0	0	0	0						
7:15 AM	0	5	6	0	115	174	0	36	74	1	410	1	0	0	0						
7:30 AM	0	4	7	0	136	181	0	27	80	0	435	2	0	0	0						
7:45 AM	0	4	10	0	154	180	0	24	75	0	447	2	0	0	0						
8:00 AM	0	5	8	0	143	140	0	22	73	0	391	2	0	0	0						

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## West Driveway & SW Leveton Dr

Wednesday, June 06, 2018  
7:00 AM to 9:00 AM

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound West Driveway			Southbound West Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total	
	Total	L	R	Total	L	T	Total	L	T	Total	T	R		Total
7:00 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	3
7:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	2
7:30 AM	0	0	0	0	0	0	0	0	0	1	1	1	1	1
7:45 AM	0	0	1	1	0	1	1	3	1	4	3	1	4	6
8:00 AM	0	0	0	0	0	2	2	1	0	1	1	0	1	3
8:15 AM	0	1	0	1	0	0	0	1	0	1	1	0	1	2
8:30 AM	0	1	1	2	0	3	3	1	0	1	1	0	1	6
8:45 AM	0	0	0	0	2	1	3	1	0	1	1	0	1	4
Total Survey	0	3	2	5	2	11	13	7	2	9	7	2	9	27

### Heavy Vehicle Peak Hour Summary 7:45 AM to 8:45 AM

By Approach	Northbound West Driveway			Southbound West Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	4	1	5	6	8	14	7	8	15	17
PHF	0.00			0.33			0.25			0.29			0.35

By Movement	Northbound West Driveway			Southbound West Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total	
	Total	L	R	Total	L	T	Total	L	T	Total	T	R		Total
Volume	0	2		4	0	6	6	6	1	7	6	1	7	17
PHF	0.00	0.25		0.50	0.33	0.00	0.30	0.25	0.30	0.13	0.29	0.29	0.35	

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound West Driveway			Southbound West Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total	
	Total	L	R	Total	L	T	Total	L	T	Total	T	R		Total
7:00 AM	0	1	1	2	0	5	5	3	2	5	3	2	5	12
7:15 AM	0	0	1	1	0	5	5	4	2	6	4	2	6	12
7:30 AM	0	1	1	2	0	3	3	5	2	7	5	2	7	12
7:45 AM	0	2	2	4	0	6	6	6	1	7	6	1	7	17
8:00 AM	0	2	1	3	2	6	8	4	0	4	4	0	4	15



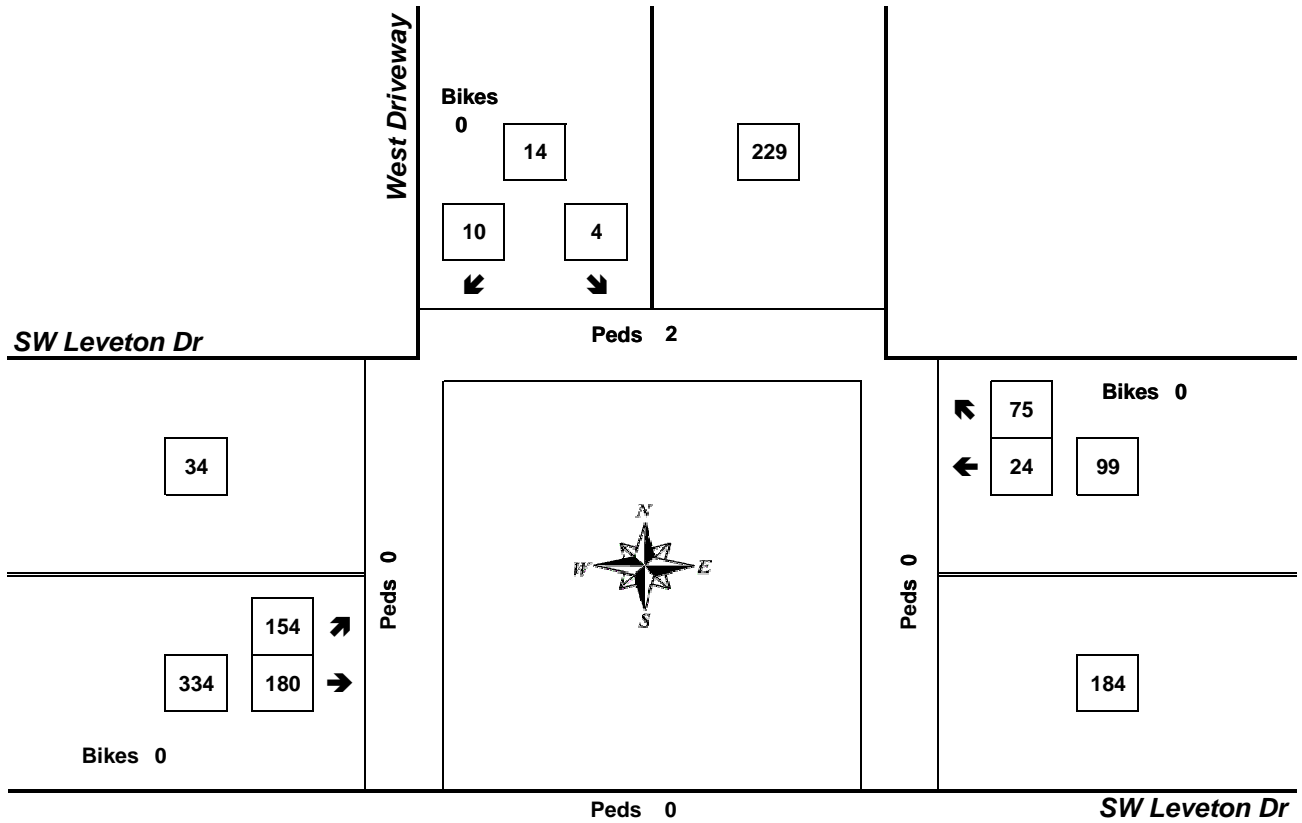
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## West Driveway & SW Leveton Dr

7:45 AM to 8:45 AM  
Wednesday, June 06, 2018



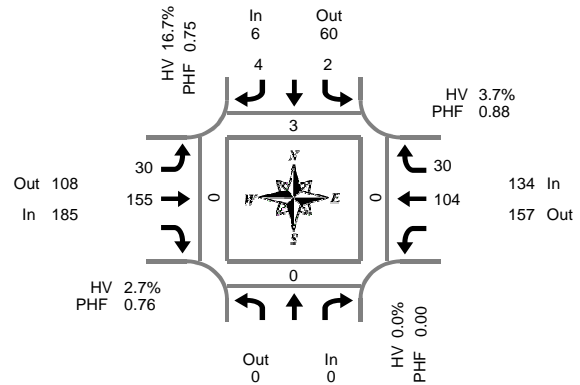
Approach	PHF	HV%	Volume
EB	0.90	1.8%	334
WB	0.83	7.1%	99
NB	0.00	0.0%	0
SB	0.58	28.6%	14
<b>Intersection</b>	<b>0.91</b>	<b>3.8%</b>	<b>447</b>

Count Period: 7:00 AM to 9:00 AM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## Center Driveway & SW Leveton Dr

Wednesday, June 06, 2018  
7:00 AM to 9:00 AM

**Peak Hour Summary**  
7:30 AM to 8:30 AM

### 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Center Driveway				Southbound Center Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Bikes	L	T	Bikes	L	T	Bikes	T	R	Bikes	North	South	East		West			
7:00 AM	0	2	1	0	5	19	0	9	8	1	44	2	0	0	0						
7:15 AM	0	0	4	0	3	25	0	27	11	1	70	1	0	0	0						
7:30 AM	0	0	1	0	7	31	0	22	8	0	69	0	0	0	0						
7:45 AM	0	1	1	0	6	37	0	25	5	0	75	0	0	0	0						
8:00 AM	0	0	2	0	7	54	0	27	9	0	99	2	0	0	0						
8:15 AM	0	1	0	0	10	33	1	30	8	0	82	1	0	0	0						
8:30 AM	0	0	1	0	5	27	2	15	7	0	55	0	0	0	0						
8:45 AM	0	2	1	0	4	18	0	24	11	0	60	3	0	0	0						
Total Survey	0	6	11	0	47	244	3	179	67	2	554	9	0	0	0						

### Peak Hour Summary

7:30 AM to 8:30 AM

By Approach	Northbound Center Driveway				Southbound Center Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	6	60	66	0	185	108	293	1	134	157	291	0	325	3	0	0	0
%HV	0.0%				16.7%				2.7%				3.7%				3.4%				
PHF	0.00				0.75				0.76				0.88				0.82				

By Movement	Northbound Center Driveway				Southbound Center Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total
	Total	L	R	Bikes	Total	L	T	Bikes	Total	L	T	Bikes	Total	T	R	Bikes	
Volume	0	2	4	6	30	155	185	NA	104	30	134	325	NA	104	30	134	
%HV	NA	0.0%	0.0%	NA	25.0%	16.7%	0.0%	3.2%	NA	2.7%	4.8%	0.0%	3.7%	4.8%	0.0%	3.4%	
PHF	0.00	0.50	0.50	0.75	0.75	0.72	0.76	NA	0.87	0.83	0.88	0.82	NA	0.87	0.83	0.88	

### Rolling Hour Summary

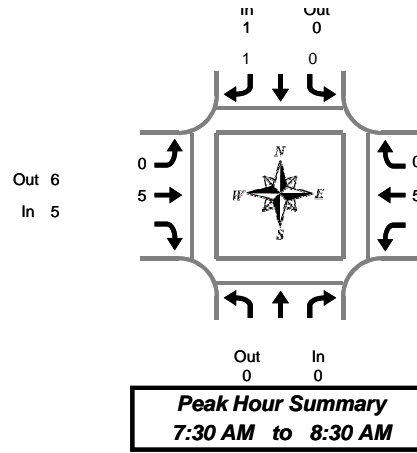
7:00 AM to 9:00 AM

Interval Start Time	Northbound Center Driveway				Southbound Center Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Bikes	L	T	Bikes	L	T	Bikes	T	R	Bikes	North	South	East		West			
7:00 AM	0	3	7	0	21	112	0	83	32	2	258	3	0	0	0						
7:15 AM	0	1	8	0	23	147	0	101	33	1	313	3	0	0	0						
7:30 AM	0	2	4	0	30	155	1	104	30	0	325	3	0	0	0						
7:45 AM	0	2	4	0	28	151	3	97	29	0	311	3	0	0	0						
8:00 AM	0	3	4	0	26	132	3	96	35	0	296	6	0	0	0						

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Center Driveway & SW Leveton Dr

Wednesday, June 06, 2018  
7:00 AM to 9:00 AM

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound Center Driveway			Southbound Center Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total	
	Total	L	R	Total	L	R	Total	L	T	Total	T	R		Total
7:00 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	3
7:15 AM	0	0	0	0	0	0	0	1	0	1	0	1	1	2
7:30 AM	0	0	0	0	0	0	0	1	1	1	1	0	1	2
7:45 AM	0	0	0	0	0	0	0	1	1	1	3	0	3	4
8:00 AM	0	0	0	1	1	0	2	2	0	0	0	0	0	3
8:15 AM	0	0	0	0	0	0	0	1	1	1	1	0	1	2
8:30 AM	0	0	0	0	0	1	3	4	1	3	1	0	1	5
8:45 AM	0	0	0	0	0	0	1	1	1	1	1	0	1	2
Total Survey	0	0	0	1	1	1	13	14	7	1	8	1	8	23

### Heavy Vehicle Peak Hour Summary 7:30 AM to 8:30 AM

By Approach	Northbound Center Driveway			Southbound Center Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	1	0	1	5	6	11	5	5	10	11
PHF	0.00			0.25			0.18			0.25			0.28

By Movement	Northbound Center Driveway			Southbound Center Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total	
	Total	L	R	Total	L	R	Total	L	T	Total	T	R		Total
Volume	0	0	0	1	1	0	5	0	5	5	5	0	5	11
PHF	0.00	0.00		0.25	0.25	0.00	0.21	0.18		0.31	0.00	0.25	0.28	

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound Center Driveway			Southbound Center Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total	
	Total	L	R	Total	L	R	Total	L	T	Total	T	R		Total
7:00 AM	0	0	0	0	0	0	0	6	0	6	4	1	5	11
7:15 AM	0	0	0	1	1	0	5	5	0	5	4	1	5	11
7:30 AM	0	0	0	1	1	0	5	5	0	5	5	0	5	11
7:45 AM	0	0	0	1	1	1	7	8	0	8	5	0	5	14
8:00 AM	0	0	0	1	1	1	7	8	1	7	3	0	3	12

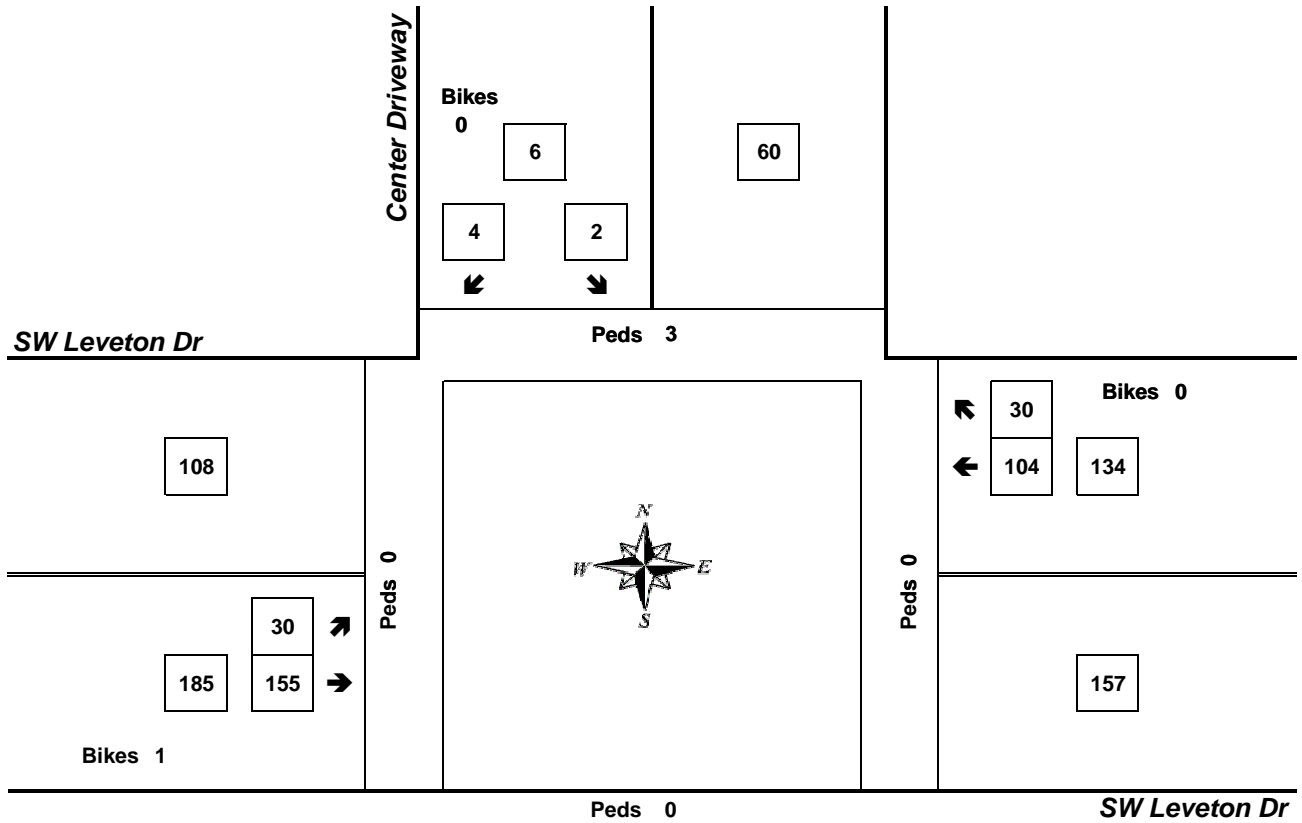
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## Center Driveway & SW Leveton Dr

7:30 AM to 8:30 AM  
Wednesday, June 06, 2018



Approach	PHF	HV%	Volume
EB	0.76	2.7%	185
WB	0.88	3.7%	134
NB	0.00	0.0%	0
SB	0.75	16.7%	6
<b>Intersection</b>	<b>0.82</b>	<b>3.4%</b>	<b>325</b>

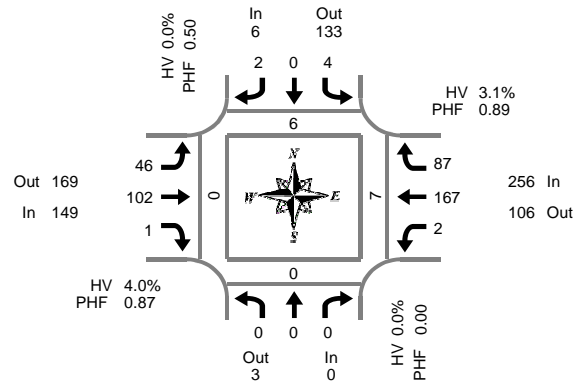
Count Period: 7:00 AM to 9:00 AM



# Total Vehicle Summary



Clay Carney  
(503) 833-2740



**Peak Hour Summary**  
7:30 AM to 8:30 AM

## East Access & SW Leveton Dr

Thursday, June 07, 2018  
7:00 AM to 9:00 AM

### 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	2	0	0	0	3	20	0	0	1	21	3	0	50	2	1	1	0
7:15 AM	0	0	0	0	3	0	1	0	3	19	0	0	1	44	11	0	82	1	0	4	0
7:30 AM	0	0	0	0	1	0	0	0	2	24	0	0	0	42	16	0	85	2	0	1	0
7:45 AM	0	0	0	0	3	0	0	0	7	36	0	1	0	46	13	0	105	1	0	0	0
8:00 AM	0	0	0	0	0	0	2	0	16	26	1	2	2	38	27	1	112	2	0	2	0
8:15 AM	0	0	0	0	0	0	0	0	21	16	0	3	0	41	31	0	109	1	0	4	0
8:30 AM	0	0	0	0	0	0	3	0	15	11	0	2	0	27	14	0	70	3	2	1	1
8:45 AM	0	0	0	0	0	0	0	0	11	7	0	0	0	28	28	1	74	9	3	5	0
Total Survey	0	0	0	0	9	0	6	0	78	159	1	8	4	287	143	2	687	21	6	18	1

### Peak Hour Summary

7:30 AM to 8:30 AM

By Approach	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	3	3	0	6	133	139	0	149	169	318	6	256	106	362	1	411	6	0	7	0
%HV	0.0%				0.0%				4.0%				3.1%				3.4%				
PHF	0.00				0.50				0.87				0.89				0.92				

By Movement	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	4	0	2	6	46	102	1	149	2	167	87	256	411
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	#####	4.0%	0.0%	4.2%	1.1%	3.1%	3.4%
PHF	0.00	0.00	0.00	0.00	0.33	0.00	0.25	0.50	0.55	0.71	0.25	0.87	0.25	0.91	0.70	0.89	0.92

### Rolling Hour Summary

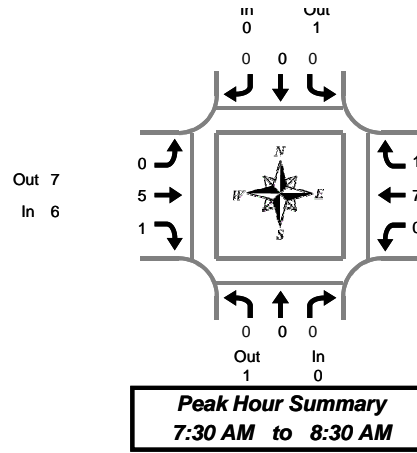
7:00 AM to 9:00 AM

Interval Start Time	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	9	0	1	0	15	99	0	1	2	153	43	0	322	6	1	6	0
7:15 AM	0	0	0	0	7	0	3	0	28	105	1	3	3	170	67	1	384	6	0	7	0
7:30 AM	0	0	0	0	4	0	2	0	46	102	1	6	2	167	87	1	411	6	0	7	0
7:45 AM	0	0	0	0	3	0	5	0	59	89	1	8	2	152	85	1	396	7	2	7	1
8:00 AM	0	0	0	0	0	0	5	0	63	60	1	7	2	134	100	2	365	15	5	12	1

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## East Access & SW Leveton Dr

Thursday, June 07, 2018  
7:00 AM to 9:00 AM

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	2	1	3	0	5	0	5
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	0	0	0	0	0	0	7	1	8	0	8	1	9

### Heavy Vehicle Peak Hour Summary 7:30 AM to 8:30 AM

By Approach	Northbound East Access			Southbound East Access			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	1	1	0	1	1	6	7	13	8	5	13	14
PHF	0.00			0.00			0.30			0.29			0.29

By Movement	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	0	0	0	0	0	0	5	1	6	0	7	1	8
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.25	0.30	0.00	0.25	0.25	0.29

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	3	0	3	0	2	1	3
7:15 AM	0	0	0	0	0	0	0	0	0	0	5	1	6	0	6	1	7
7:30 AM	0	0	0	0	0	0	0	0	0	0	5	1	6	0	7	1	8
7:45 AM	0	0	0	0	0	0	0	0	0	0	5	1	6	0	7	0	7
8:00 AM	0	0	0	0	0	0	0	0	0	0	4	1	5	0	6	0	6

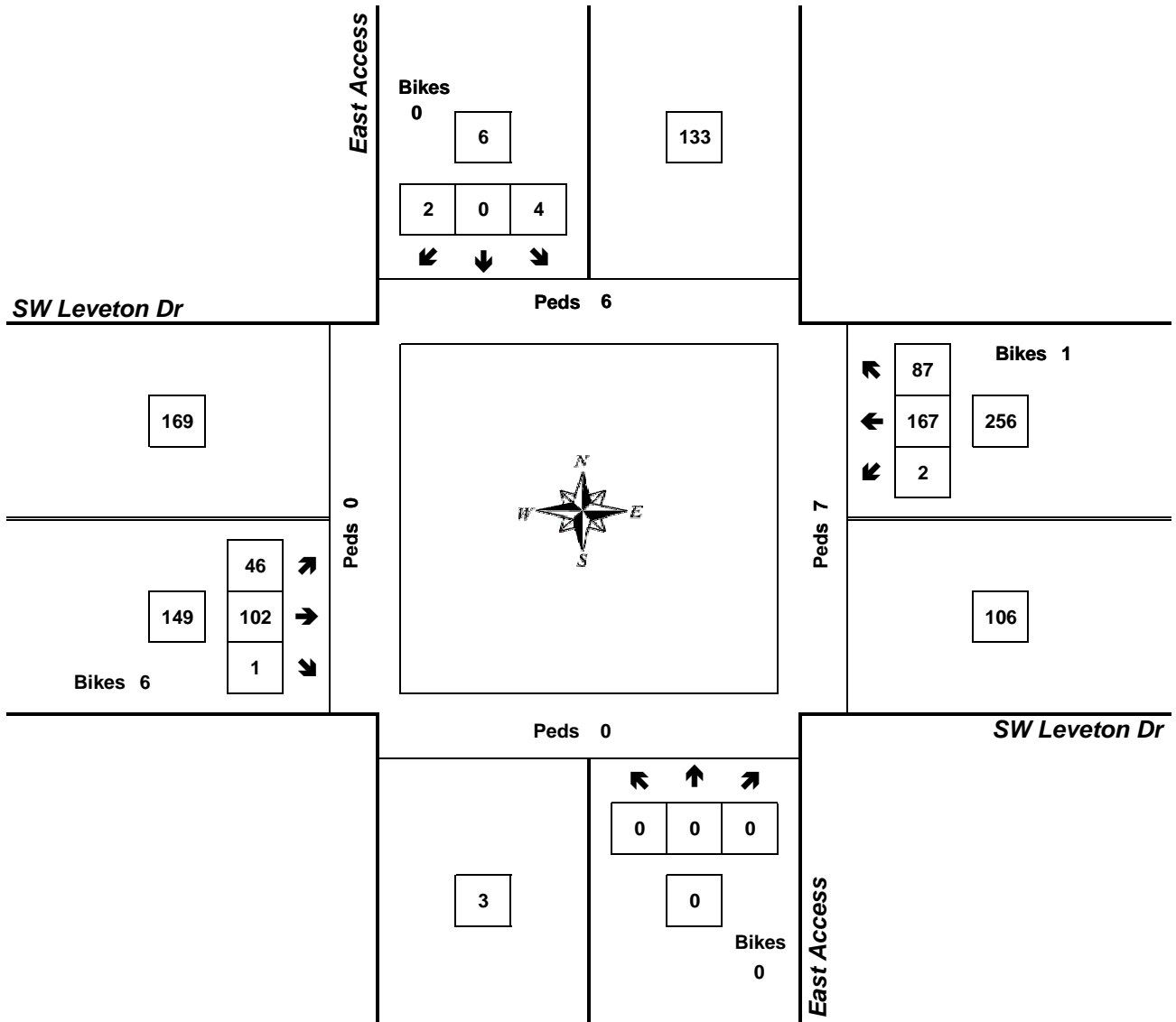
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## East Access & SW Leveton Dr

7:30 AM to 8:30 AM  
Thursday, June 07, 2018



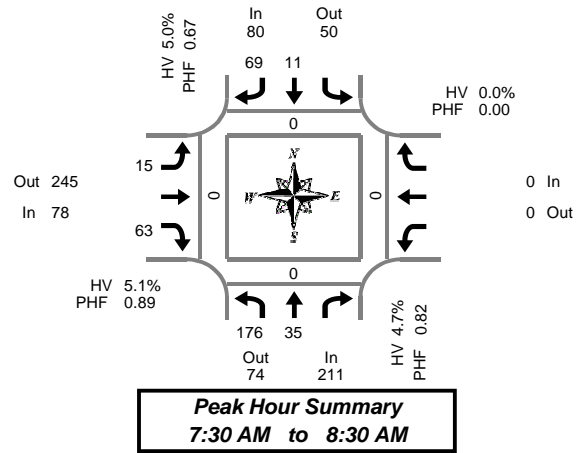
Approach	PHF	HV%	Volume
EB	0.87	4.0%	149
WB	0.89	3.1%	256
NB	0.00	0.0%	0
SB	0.50	0.0%	6
<b>Intersection</b>	<b>0.92</b>	<b>3.4%</b>	<b>411</b>

Count Period: 7:00 AM to 9:00 AM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## SW 108th Ave & SW Leveton Dr

Wednesday, June 06, 2018  
7:00 AM to 9:00 AM

### 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes	In	Out	Bikes		North	South	East	West
7:00 AM	21	9	1	3	5	0	6	12	0	0	0	0	56	0	0	0	0
7:15 AM	34	4	0	5	11	1	3	16	0	0	0	0	73	1	0	0	0
7:30 AM	33	8	0	1	8	0	3	19	0	0	0	0	72	0	0	0	0
7:45 AM	40	11	0	3	21	0	3	18	0	0	0	0	96	0	0	0	0
8:00 AM	54	10	0	2	15	0	7	10	0	0	0	0	98	0	0	0	0
8:15 AM	49	6	0	5	25	2	2	16	1	0	0	0	103	0	0	0	0
8:30 AM	27	6	0	5	11	0	3	9	1	0	0	0	61	0	0	0	0
8:45 AM	53	6	0	3	16	0	3	10	0	0	0	0	91	0	0	0	0
Total Survey	311	60	1	27	112	3	30	110	2	0	0	0	650	1	0	0	0

### Peak Hour Summary

7:30 AM to 8:30 AM

By Approach	Northbound SW 108th Ave				Southbound SW 108th Ave				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	211	74	285	0	80	50	130	2	78	245	323	1	0	0	0	0	0	0	0	0	
%HV	4.7%				5.0%				5.1%				0.0%				4.9%				
PHF	0.82				0.67				0.89				0.00				0.90				

By Movement	Northbound SW 108th Ave				Southbound SW 108th Ave				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total
	L	T		Total	T	R	Total	L		R	Total			Total			
Volume	176	35		211	11	69	80	15		63	78			0			369
%HV	3.4%	11.4%	NA	4.7%	NA	27.3%	1.4%	5.0%	13.3%	NA	3.2%	5.1%	NA	NA	NA	0.0%	4.9%
PHF	0.81	0.80		0.82	0.55	0.69	0.67	0.54		0.83	0.89			0.00			0.90

### Rolling Hour Summary

7:00 AM to 9:00 AM

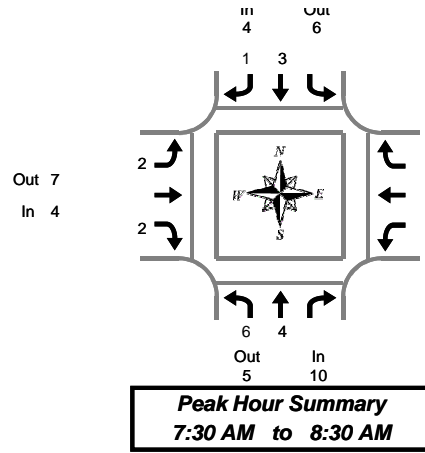
Interval Start Time	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes			Bikes		North	South	East	West
7:00 AM	128	32	1	12	45	1	15	65	0	0	0	0	297	1	0	0	0
7:15 AM	161	33	0	11	55	1	16	63	0	0	0	0	339	1	0	0	0
7:30 AM	176	35	0	11	69	2	15	63	1	0	0	0	369	0	0	0	0
7:45 AM	170	33	0	15	72	2	15	53	2	0	0	0	358	0	0	0	0
8:00 AM	183	28	0	15	67	2	15	45	2	0	0	0	353	0	0	0	0



# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## SW 108th Ave & SW Leveton Dr

Wednesday, June 06, 2018  
7:00 AM to 9:00 AM

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
7:00 AM	0	0	0	2	0	2	1	3	4			0	6
7:15 AM	2	0	2	1	0	1	0	1	1			0	4
7:30 AM	1	0	1	0	0	0	1	0	1			0	2
7:45 AM	4	1	5	2	1	3	0	1	1			0	9
8:00 AM	0	1	1	0	0	0	1	0	1			0	2
8:15 AM	1	2	3	1	0	1	0	1	1			0	5
8:30 AM	0	0	0	1	0	1	0	2	2			0	3
8:45 AM	2	0	2	2	0	2	1	2	3			0	7
Total Survey	10	4	14	9	1	10	4	10	14			0	38

### Heavy Vehicle Peak Hour Summary 7:30 AM to 8:30 AM

By Approach	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	10	5	15	4	6	10	4	7	11	0	0	0	18
PHF	0.28			0.25			0.17			0.00			0.28

By Movement	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	L	T	Total	T	R	Total	L	R	Total			Total	
Volume	6	4	10	3	1	4	2	2	4			0	18
PHF	0.21	0.25	0.28	0.19	0.25	0.25	0.25	0.10	0.17			0.00	0.28

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
7:00 AM	7	1	8	5	1	6	2	5	7			0	21
7:15 AM	7	2	9	3	1	4	2	2	4			0	17
7:30 AM	6	4	10	3	1	4	2	2	4			0	18
7:45 AM	5	4	9	4	1	5	1	4	5			0	19
8:00 AM	3	3	6	4	0	4	2	5	7			0	17

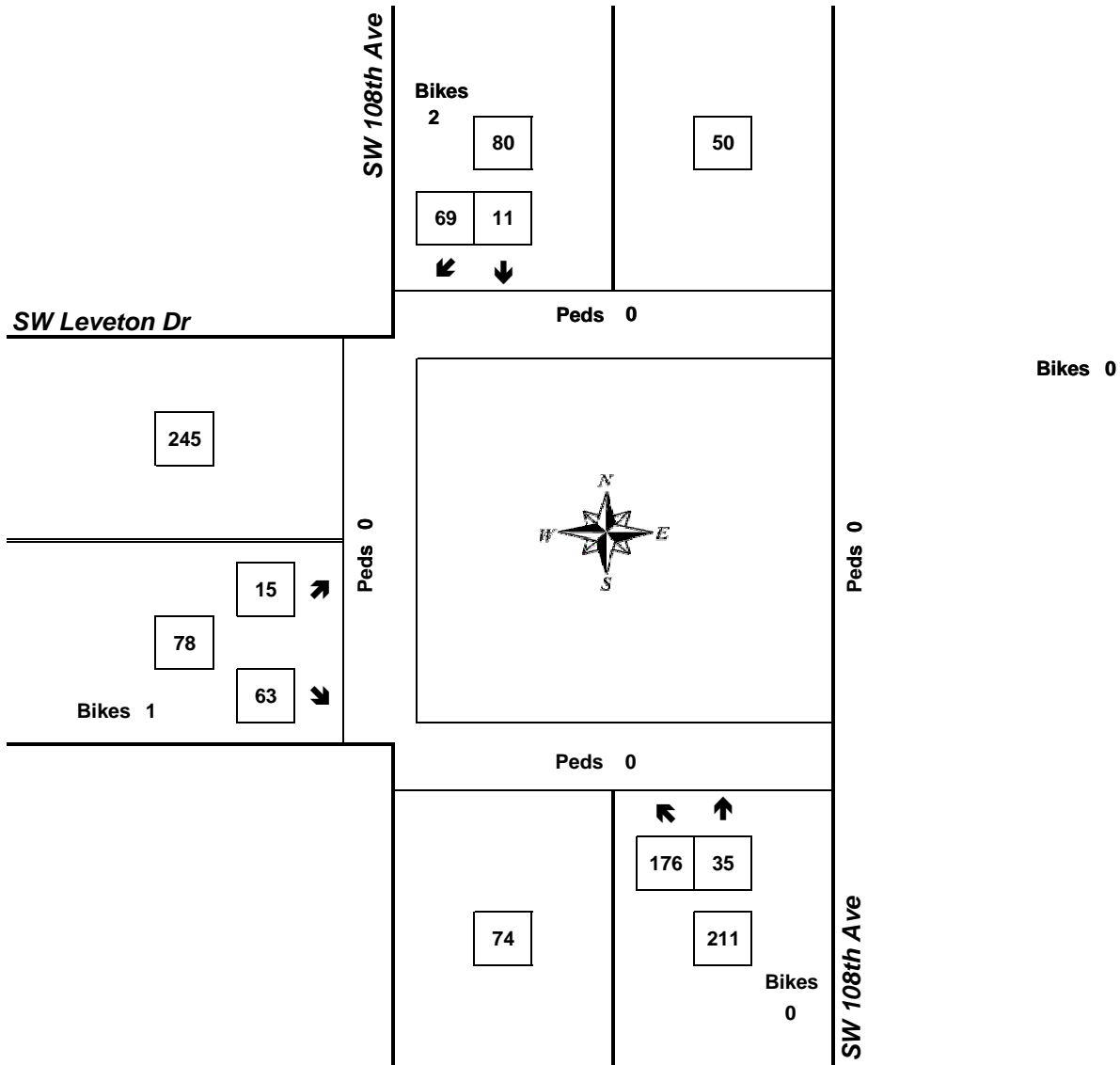
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## SW 108th Ave & SW Leveton Dr

7:30 AM to 8:30 AM  
Wednesday, June 06, 2018



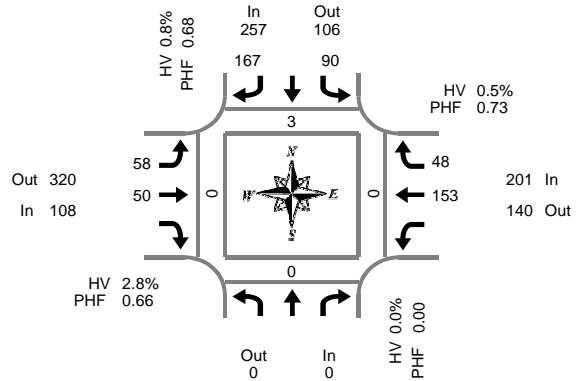
Approach	PHF	HV%	Volume
EB	0.89	5.1%	78
WB	0.00	0.0%	0
NB	0.82	4.7%	211
SB	0.67	5.0%	80
<b>Intersection</b>	<b>0.90</b>	<b>4.9%</b>	<b>369</b>

Count Period: 7:00 AM to 9:00 AM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## West Driveway & SW Leveton Dr

Tuesday, June 05, 2018  
4:00 PM to 6:00 PM

**Peak Hour Summary**  
4:45 PM to 5:45 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound West Driveway				Southbound West Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
4:00 PM				0	11		15	0	5	13		0	30	0	0	74	0	0	0	0	
4:15 PM				0	8		25	0	9	13		0	24	10	0	89	1	0	0	0	
4:30 PM				0	12		31	0	23	15		0	23	10	0	114	1	0	0	0	
4:45 PM				0	9		21	1	26	15		0	21	23	0	115	1	0	0	0	
5:00 PM				0	23		37	0	22	13		0	56	13	1	164	0	0	0	0	
5:15 PM				0	33		61	0	3	9		0	48	3	0	157	1	0	0	0	
5:30 PM				0	25		48	0	7	13		0	28	9	0	130	1	0	0	0	
5:45 PM				0	16		35	0	2	11		0	15	1	0	80	0	0	0	0	
Total Survey				0	137		273	1	97	102		0	245	69	1	923	5	0	0	0	

### Peak Hour Summary

4:45 PM to 5:45 PM

By Approach	Northbound West Driveway				Southbound West Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	257	106	363	1	108	320	428	0	201	140	341	1	566	3	0	0	0
%HV	0.0%				0.8%				2.8%				0.5%				1.1%				
PHF	0.00				0.68				0.66				0.73				0.86				

By Movement	Northbound West Driveway				Southbound West Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total				
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes					
Volume			0	0	90		167	257	58	50		108		153	48	201	566				
%HV	NA	NA	NA	0.0%	1.1%	NA	0.6%	0.8%	1.7%	4.0%	NA	2.8%	NA	0.0%	2.1%	0.5%	1.1%				
PHF			0.00	0.68		0.68	0.68	0.56	0.83		0.66		0.68	0.52	0.73	0.86					

### Rolling Hour Summary

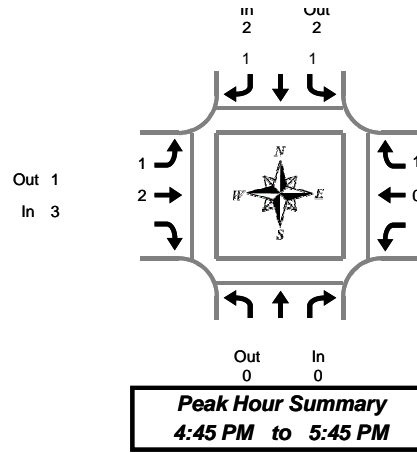
4:00 PM to 6:00 PM

Interval Start Time	Northbound West Driveway				Southbound West Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
4:00 PM				0	40		92	1	63	56		0	98	43	0	392	3	0	0	0	
4:15 PM				0	52		114	1	80	56		0	124	56	1	482	3	0	0	0	
4:30 PM				0	77		150	1	74	52		0	148	49	1	550	3	0	0	0	
4:45 PM				0	90		167	1	58	50		0	153	48	1	566	3	0	0	0	
5:00 PM				0	97		181	0	34	46		0	147	26	1	531	2	0	0	0	

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## West Driveway & SW Leveton Dr

Tuesday, June 05, 2018  
4:00 PM to 6:00 PM

### Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound West Driveway			Southbound West Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total
	Total	L	R	Total	L	R	Total	T	Total	T	R	Total	
4:00 PM	0	0	1	1	0	0	0	0	0	2	0	2	3
4:15 PM	0	0	0	0	0	0	0	1	1	2	0	2	3
4:30 PM	0	1	0	1	0	1	0	0	0	1	0	1	2
4:45 PM	0	0	0	0	0	1	0	1	1	0	1	1	2
5:00 PM	0	1	1	2	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	1	1	0	0	0	1
5:30 PM	0	0	0	0	0	0	1	0	1	0	0	0	1
5:45 PM	0	0	0	0	0	0	1	0	1	0	0	0	1
Total Survey	0	2	2	4	2	3	5	3	5	1	6	15	

### Heavy Vehicle Peak Hour Summary 4:45 PM to 5:45 PM

By Approach	Northbound West Driveway			Southbound West Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	2	2	4	3	1	4	1	3	4	6
PHF	0.00			0.17			0.25			0.05			0.19

By Movement	Northbound West Driveway			Southbound West Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	Total	L	R	Total	L	R	Total	T	Total	T	R	Total	
Volume	0	1	1	2	1	2	3	2	3	0	1	1	6
PHF	0.00	0.13	0.25	0.17	0.13	0.25	0.25	0.25	0.25	0.00	0.25	0.05	0.19

### Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound West Driveway			Southbound West Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total
	Total	L	R	Total	L	R	Total	T	Total	T	R	Total	
4:00 PM	0	1	1	2	0	2	2	2	2	5	1	6	10
4:15 PM	0	2	1	3	0	2	2	2	2	3	1	4	9
4:30 PM	0	2	1	3	0	2	2	2	2	1	1	2	7
4:45 PM	0	1	1	2	1	2	3	2	3	0	1	1	6
5:00 PM	0	1	1	2	2	1	3	1	3	0	0	0	5



# Peak Hour Summary

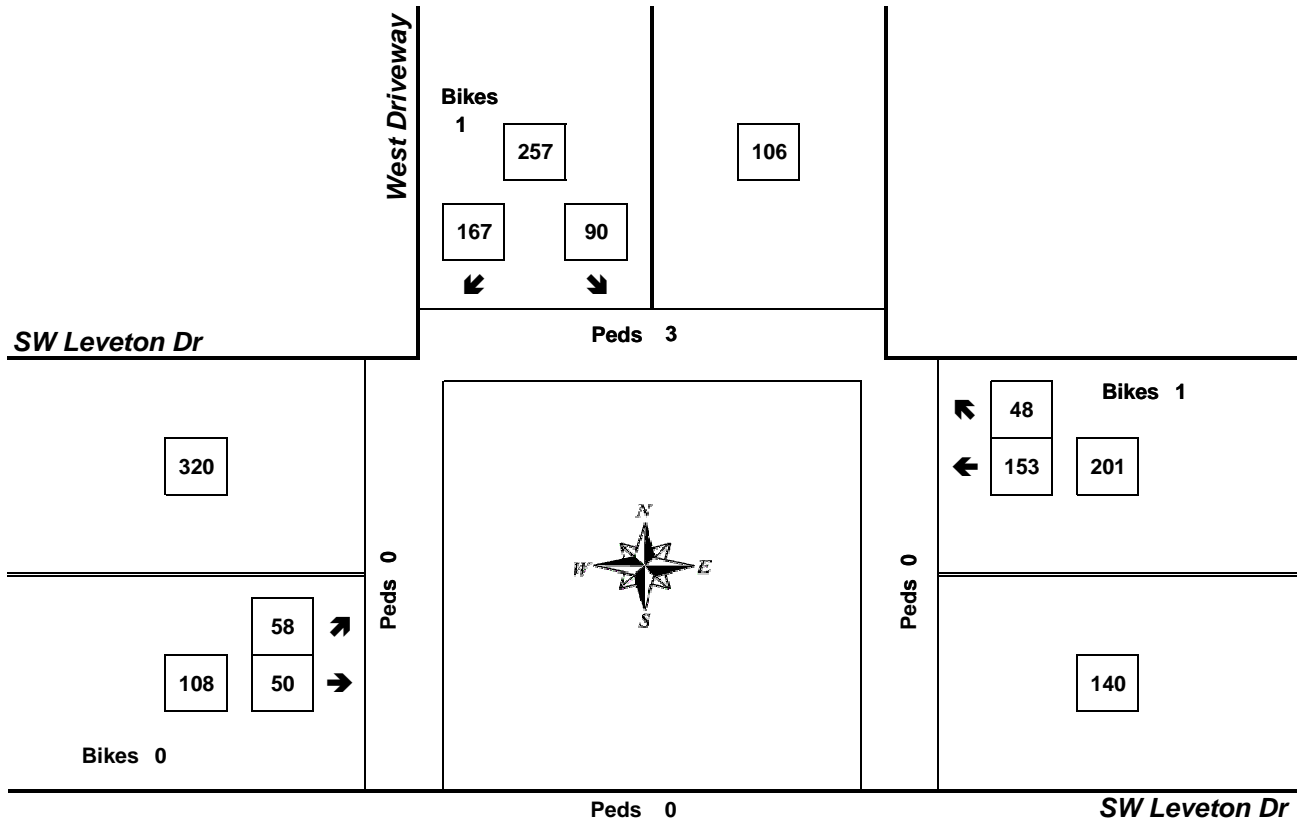


Clay Carney  
(503) 833-2740

## West Driveway & SW Leveton Dr

4:45 PM to 5:45 PM

Tuesday, June 05, 2018



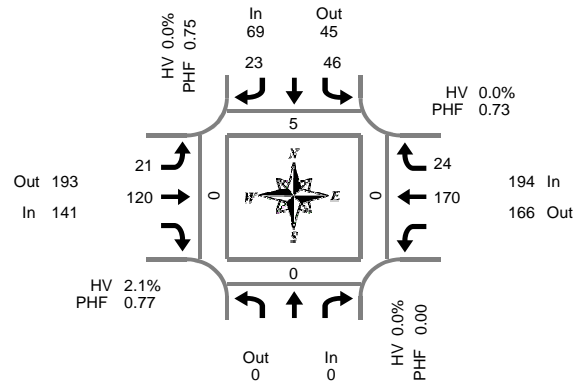
Approach	PHF	HV%	Volume
EB	0.66	2.8%	108
WB	0.73	0.5%	201
NB	0.00	0.0%	0
SB	0.68	0.8%	257
<b>Intersection</b>	<b>0.86</b>	<b>1.1%</b>	<b>566</b>

Count Period: 4:00 PM to 6:00 PM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



**Peak Hour Summary**  
4:45 PM to 5:45 PM

## Center Driveway & SW Leveton Dr

Tuesday, June 05, 2018  
4:00 PM to 6:00 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Center Driveway				Southbound Center Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Bikes	L	T	Bikes	T	R	Bikes	T	R	Bikes	North	South	East		West			
4:00 PM	0	12	5	0	2	22	0	26	3	1	70	5	0	0	0						
4:15 PM	0	4	5	0	3	22	1	28	4	0	66	2	0	1	0						
4:30 PM	0	10	2	0	5	23	0	29	9	0	78	1	0	1	0						
4:45 PM	0	7	1	0	8	15	0	36	9	0	76	4	0	0	0						
5:00 PM	0	15	8	0	2	32	0	59	7	0	123	1	0	0	0						
5:15 PM	0	14	9	0	2	44	0	40	2	0	111	0	0	0	0						
5:30 PM	0	10	5	0	9	29	0	35	6	0	94	0	0	0	0						
5:45 PM	0	11	5	0	8	23	0	20	5	0	72	4	0	0	0						
Total Survey	0	83	40	0	39	210	1	273	45	1	690	17	0	2	0						

### Peak Hour Summary

4:45 PM to 5:45 PM

By Approach	Northbound Center Driveway				Southbound Center Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	69	45	114	0	141	193	334	0	194	166	360	0	404	5	0	0	0
%HV	0.0%				0.0%				2.1%				0.0%				0.7%				
PHF	0.00				0.75				0.77				0.73				0.82				

By Movement	Northbound Center Driveway				Southbound Center Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total
	Total	L	R	Bikes	Total	L	T	Bikes	Total	L	T	Bikes	Total	T	R	Total	
Volume	0	46	23	69	21	120	141	170	24	194	404						
%HV	NA	NA	NA	0.0%	0.0%	NA	0.0%	0.0%	0.0%	2.5%	NA	2.1%	NA	0.0%	0.0%	0.0%	0.7%
PHF	0.00	0.77	0.64	0.75	0.58	0.68	0.77	0.72	0.67	0.73	0.82						

### Rolling Hour Summary

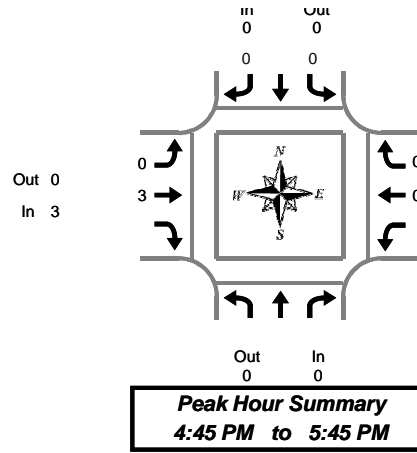
4:00 PM to 6:00 PM

Interval Start Time	Northbound Center Driveway				Southbound Center Driveway				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Bikes	L	T	Bikes	T	R	Bikes	T	R	Bikes	North	South	East		West			
4:00 PM	0	33	13	0	18	82	1	119	25	1	290	12	0	2	0						
4:15 PM	0	36	16	0	18	92	1	152	29	0	343	8	0	2	0						
4:30 PM	0	46	20	0	17	114	0	164	27	0	388	6	0	1	0						
4:45 PM	0	46	23	0	21	120	0	170	24	0	404	5	0	0	0						
5:00 PM	0	50	27	0	21	128	0	154	20	0	400	5	0	0	0						

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Center Driveway & SW Leveton Dr

Tuesday, June 05, 2018  
4:00 PM to 6:00 PM

### Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound Center Driveway			Southbound Center Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total	
	Total	L	R	Total	L	R	Total	L	T	Total	T	R		Total
4:00 PM	0	1	0	1	0	0	1	0	0	0	2	1	3	4
4:15 PM	0	0	0	0	0	0	0	0	1	1	2	0	2	3
4:30 PM	0	0	0	0	0	0	0	0	1	1	1	0	1	2
4:45 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	1	0	1	0	1	0	5	5	5	5	1	6	12

### Heavy Vehicle Peak Hour Summary 4:45 PM to 5:45 PM

By Approach	Northbound Center Driveway			Southbound Center Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	3	0	3	0	3	3	3
PHF	0.00			0.00			0.25			0.00			0.08

By Movement	Northbound Center Driveway			Southbound Center Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total	
	Total	L	R	Total	L	R	Total	L	T	Total	T	R		Total
Volume	0	0	0	0	0	0	0	0	3	3	0	0	0	3
PHF	0.00	0.00		0.00	0.00		0.00	0.25	0.25		0.00	0.00	0.00	0.08

### Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound Center Driveway			Southbound Center Driveway			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total	
	Total	L	R	Total	L	R	Total	L	T	Total	T	R		Total
4:00 PM	0	1	0	1	0	0	1	0	3	3	5	1	6	10
4:15 PM	0	0	0	0	0	0	0	0	4	4	3	0	3	7
4:30 PM	0	0	0	0	0	0	0	0	4	4	1	0	1	5
4:45 PM	0	0	0	0	0	0	0	0	3	3	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	2

# Peak Hour Summary

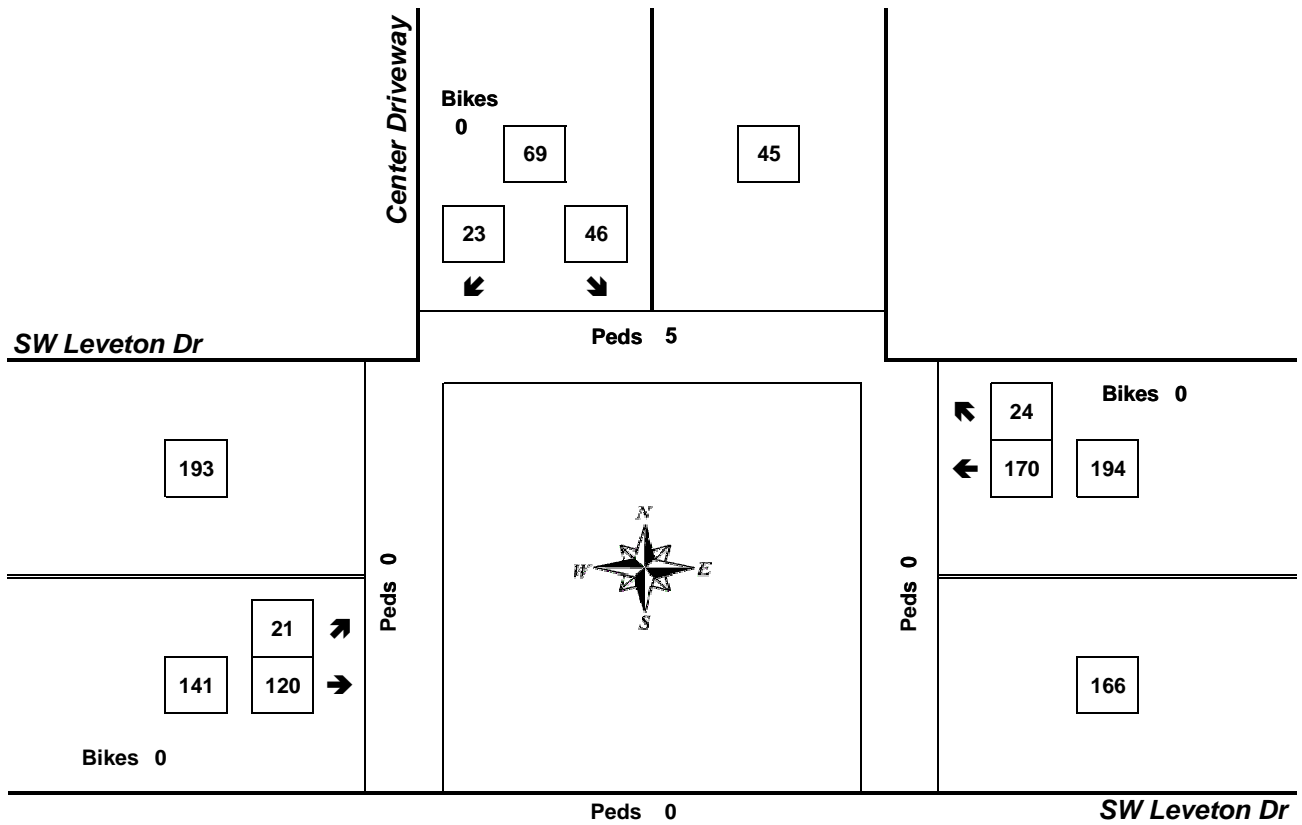


Clay Carney  
(503) 833-2740

## Center Driveway & SW Leveton Dr

4:45 PM to 5:45 PM

Tuesday, June 05, 2018



Approach	PHF	HV%	Volume
EB	0.77	2.1%	141
WB	0.73	0.0%	194
NB	0.00	0.0%	0
SB	0.75	0.0%	69
<b>Intersection</b>	<b>0.82</b>	<b>0.7%</b>	<b>404</b>

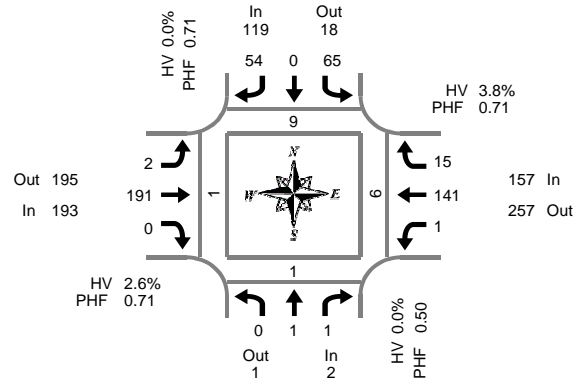
Count Period: 4:00 PM to 6:00 PM



# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## East Access & SW Leveton Dr

Wednesday, June 06, 2018  
4:00 PM to 6:00 PM

**Peak Hour Summary**  
4:30 PM to 5:30 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	1	0	7	0	3	0	1	33	0	0	0	20	4	0	69	2	1	1	0
4:15 PM	0	0	0	0	6	0	6	0	0	28	0	0	1	28	1	0	70	0	2	2	0
4:30 PM	0	0	1	0	5	0	13	0	1	41	0	0	0	48	7	0	116	3	0	2	0
4:45 PM	0	0	0	0	15	0	11	0	1	30	0	0	0	47	4	0	108	2	0	1	0
5:00 PM	0	0	0	0	25	0	17	0	0	52	0	0	0	32	2	0	128	4	1	2	1
5:15 PM	0	1	0	0	20	0	13	0	0	68	0	1	1	14	2	0	119	0	0	1	0
5:30 PM	0	0	0	0	13	0	6	1	0	60	0	0	0	12	1	0	92	1	1	3	0
5:45 PM	0	0	0	0	13	0	12	0	2	30	0	0	0	23	2	0	82	2	2	1	0
Total Survey	0	1	2	0	104	0	81	1	5	342	0	1	2	224	23	0	784	14	7	13	1

### Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	2	1	3	0	119	18	137	0	193	195	388	1	157	257	414	0	471	9	1	6	1
%HV	0.0%				0.0%				2.6%				3.8%				2.3%				
PHF	0.50				0.71				0.71				0.71				0.92				

By Movement	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	1	1	2	65	0	54	119	2	191	0	193	1	141	15	157	471
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%	0.0%	2.6%	0.0%	4.3%	0.0%	3.8%	2.3%
PHF	0.00	0.25	0.25	0.50	0.65	0.00	0.79	0.71	0.50	0.70	0.00	0.71	0.25	0.73	0.54	0.71	0.92

### Rolling Hour Summary

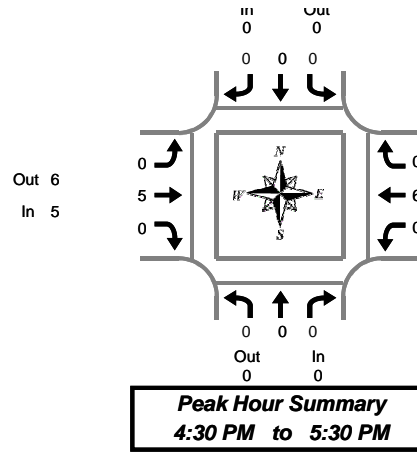
4:00 PM to 6:00 PM

Interval Start Time	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	2	0	33	0	33	0	3	132	0	0	1	143	16	0	363	7	3	6	0
4:15 PM	0	0	1	0	51	0	47	0	2	151	0	0	1	155	14	0	422	9	3	7	1
4:30 PM	0	1	1	0	65	0	54	0	2	191	0	1	1	141	15	0	471	9	1	6	1
4:45 PM	0	1	0	0	73	0	47	1	1	210	0	1	1	105	9	0	447	7	2	7	1
5:00 PM	0	1	0	0	71	0	48	1	2	210	0	1	1	81	7	0	421	7	4	7	1

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## East Access & SW Leveton Dr

Wednesday, June 06, 2018  
4:00 PM to 6:00 PM

### Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	3
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	4
Total Survey	0	0	0	0	0	0	0	0	0	0	11	0	11	0	9	0	20

### Heavy Vehicle Peak Hour Summary 4:30 PM to 5:30 PM

By Approach	Northbound East Access			Southbound East Access			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	5	6	11	6	5	11	11
PHF	0.00			0.00			0.25			0.30			0.31

By Movement	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	0	0	0	0	0	5	0	5	0	6	0	6	11
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.30	0.00	0.30	0.31

### Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound East Access				Southbound East Access				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	4	0	4	0	7	0	7	11
4:15 PM	0	0	0	0	0	0	0	0	0	5	0	5	0	6	0	6	11
4:30 PM	0	0	0	0	0	0	0	0	0	5	0	5	0	6	0	6	11
4:45 PM	0	0	0	0	0	0	0	0	0	5	0	5	0	4	0	4	9
5:00 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	2	0	2	9

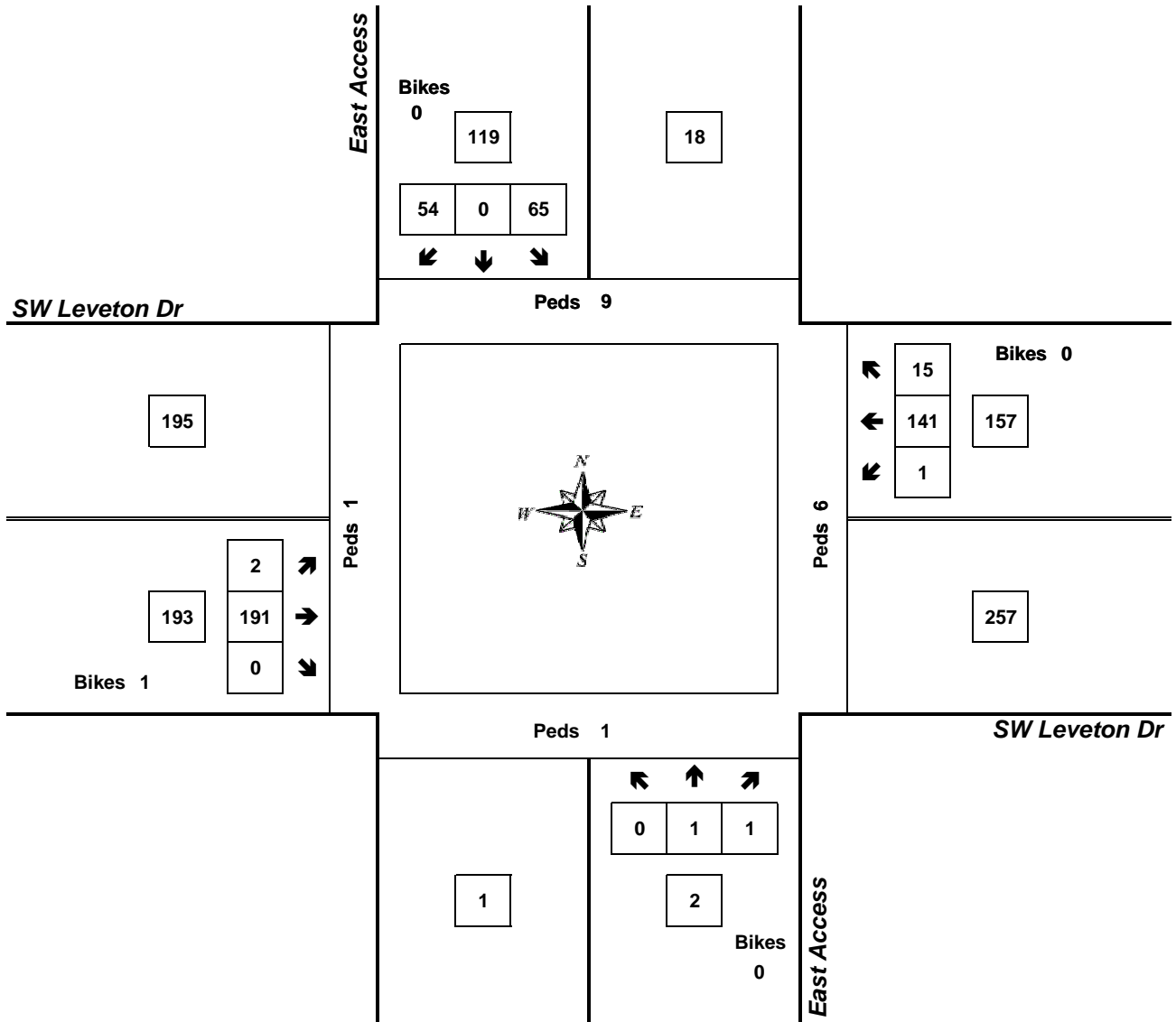
# Peak Hour Summary



Clay Carney  
(503) 833-2740

## East Access & SW Leveton Dr

4:30 PM to 5:30 PM  
Wednesday, June 06, 2018



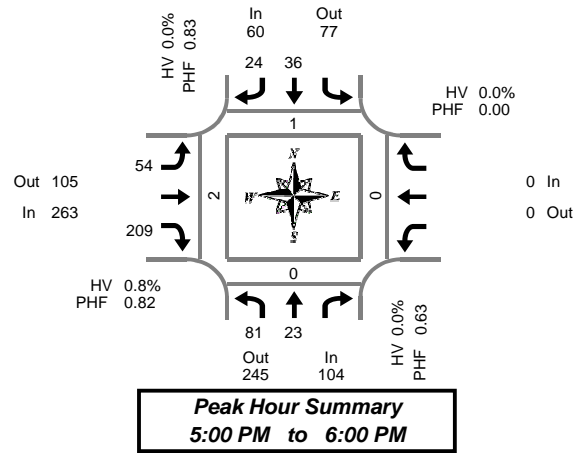
Approach	PHF	HV%	Volume
EB	0.71	2.6%	193
WB	0.71	3.8%	157
NB	0.50	0.0%	2
SB	0.71	0.0%	119
<b>Intersection</b>	<b>0.92</b>	<b>2.3%</b>	<b>471</b>

Count Period: 4:00 PM to 6:00 PM

# Total Vehicle Summary



Clay Carney  
(503) 833-2740



## SW 108th Ave & SW Leveton Dr

Tuesday, June 05, 2018  
4:00 PM to 6:00 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total	Pedestrians Crosswalk				
	L	T	Bikes	T	R	Bikes	L		R	Bikes				Bikes	North	South	East	West
4:00 PM	15	6	0	6	4	1	5		40	0			0	76	0	0	0	0
4:15 PM	19	8	0	8	1	0	6		27	1			0	69	0	0	0	1
4:30 PM	28	5	0	7	4	0	12		34	0			0	90	0	0	0	0
4:45 PM	31	4	0	15	5	0	10		23	0			0	88	0	0	0	0
5:00 PM	30	11	0	11	7	0	11		51	1			0	121	1	0	0	1
5:15 PM	14	6	0	7	3	0	20		60	0			0	110	0	0	0	0
5:30 PM	21	3	0	8	9	1	14		48	0			0	103	0	0	0	0
5:45 PM	16	3	0	10	5	1	9		50	0			0	93	0	0	0	1
Total Survey	174	46	0	72	38	3	87		333	2			0	750	1	0	0	3

### Peak Hour Summary

5:00 PM to 6:00 PM

By Approach	Northbound SW 108th Ave				Southbound SW 108th Ave				Eastbound SW Leveton Dr				Westbound SW Leveton Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	104	245	349	0	60	77	137	2	263	105	368	1	0	0	0	0	427	1	0	0	2
%HV	0.0%				0.0%				0.8%				0.0%				0.5%				
PHF	0.63				0.83				0.82				0.00				0.88				

By Movement	Northbound SW 108th Ave			Total	Southbound SW 108th Ave			Total	Eastbound SW Leveton Dr			Total	Westbound SW Leveton Dr			Total	
	L	T			T	R			L		R						
Volume	81	23		104	36	24		60	54	209		263	0	0		0	427
%HV	0.0%	0.0%	NA	0.0%	0.0%	0.0%	0.0%	1.9%	NA	0.5%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
PHF	0.68	0.52		0.63	0.82	0.67		0.83	0.68	0.87	0.82	0.00	0.00		0.00	0.88	

### Rolling Hour Summary

4:00 PM to 6:00 PM

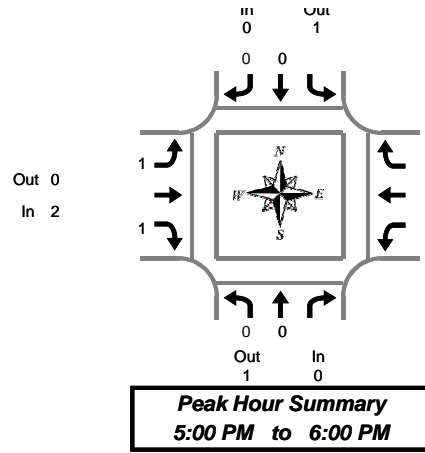
Interval Start Time	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total	Pedestrians Crosswalk				
	L	T	Bikes	T	R	Bikes	L		R	Bikes				Bikes	North	South	East	West
4:00 PM	93	23	0	36	14	1	33		124	1			0	323	0	0	0	1
4:15 PM	108	28	0	41	17	0	39		135	2			0	368	1	0	0	2
4:30 PM	103	26	0	40	19	0	53		168	1			0	409	1	0	0	1
4:45 PM	96	24	0	41	24	1	55		182	1			0	422	1	0	0	1
5:00 PM	81	23	0	36	24	2	54		209	1			0	427	1	0	0	2



# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## SW 108th Ave & SW Leveton Dr

Tuesday, June 05, 2018  
4:00 PM to 6:00 PM

### Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
4:00 PM	2	0	2	0	1	1	1	0	1	1	0	0	4
4:15 PM	2	0	2	1	0	1	1	1	0	1	0	0	4
4:30 PM	1	0	1	0	0	0	0	0	1	1	0	0	2
4:45 PM	1	0	1	0	0	0	0	1	0	1	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	1
5:15 PM	0	0	0	0	0	0	0	1	0	1	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	6	0	6	1	1	2	4	2	6	0	0	0	14

### Heavy Vehicle Peak Hour Summary 5:00 PM to 6:00 PM

By Approach	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	1	1	0	1	1	2	0	2	0	0	0	2
PHF	0.00			0.00			0.17			0.00			0.05

By Movement	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
Volume	0	0	0	0	0	0	1	1	2	0	0	0	2
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.17	0.00	0.00	0.00	0.05

### Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SW 108th Ave			Southbound SW 108th Ave			Eastbound SW Leveton Dr			Westbound SW Leveton Dr			Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
4:00 PM	6	0	6	1	1	2	3	1	4	0	0	0	12
4:15 PM	4	0	4	1	0	1	2	2	4	0	0	0	9
4:30 PM	2	0	2	0	0	0	2	2	4	0	0	0	6
4:45 PM	1	0	1	0	0	0	2	1	3	0	0	0	4
5:00 PM	0	0	0	0	0	0	1	1	2	0	0	0	2

# Peak Hour Summary

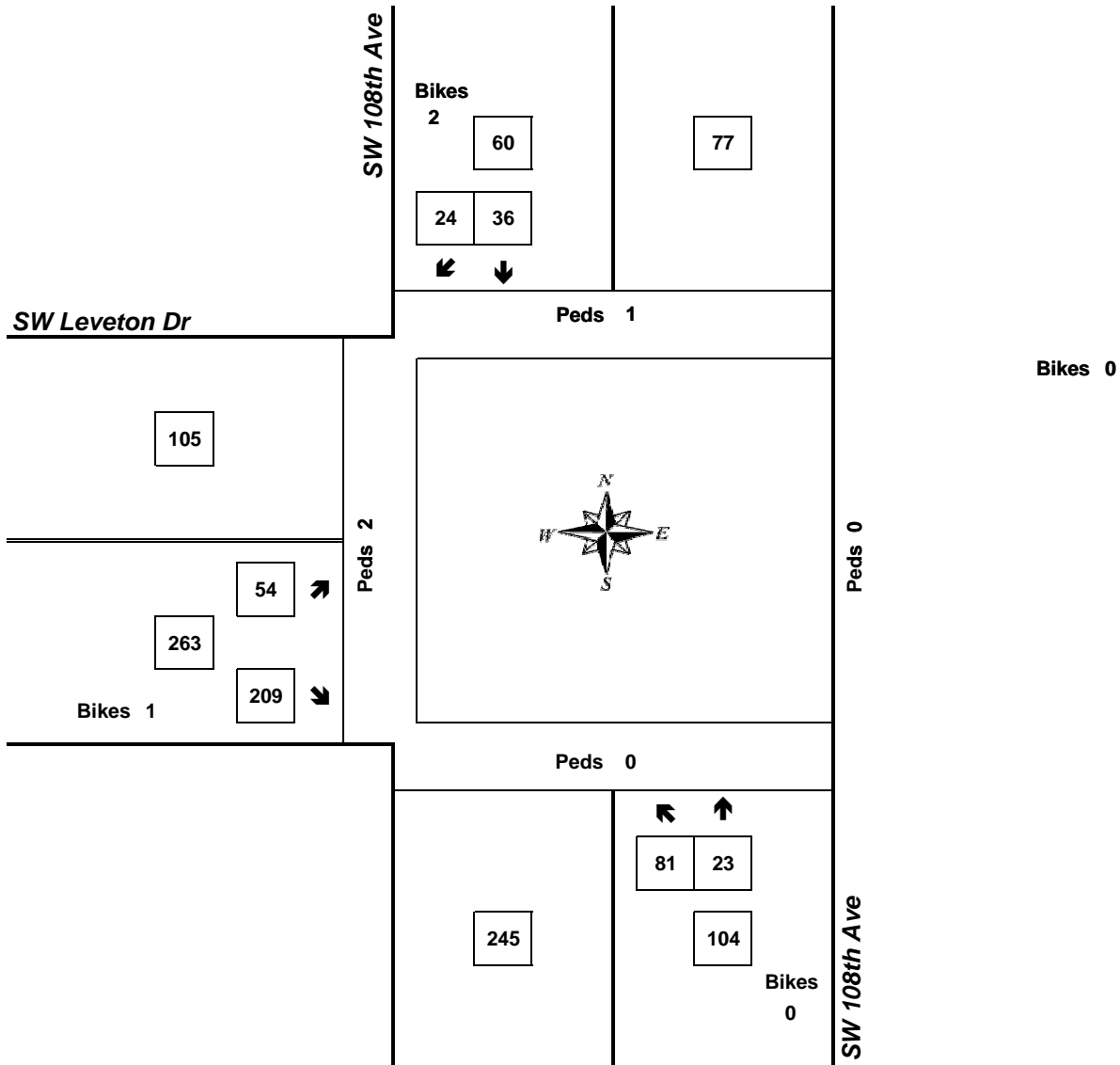


Clay Carney  
(503) 833-2740

## SW 108th Ave & SW Leveton Dr

5:00 PM to 6:00 PM

Tuesday, June 05, 2018



Approach	PHF	HV%	Volume
EB	0.82	0.8%	263
WB	0.00	0.0%	0
NB	0.63	0.0%	104
SB	0.83	0.0%	60
<b>Intersection</b>	<b>0.88</b>	<b>0.5%</b>	<b>427</b>

Count Period: 4:00 PM to 6:00 PM

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APPENDIX E.  
**TRAFFIC COUNT  
ADJUSTMENT**

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APPENDIX F.  
**CRASH DATA**



OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 12.4 to 12.8 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

1 - 4 of 29 Crash records shown.

SER#	S D M				COUNTY	RD# FC	CONN#	RD CHAR	INT-TYPE	SPCL USE	MOVE	A S	PED	ERROR	ACT	EVENT	CAUSE																								
	P	R	J	S																																					
INVEST	E	A	U	I	C	O	D	A	Y																																
RD DPT	E	L	G	N	H	R	T	IME																																	
UNLOC?	D	C	S	V	L	K	L	A	T																																
06085	N	N	N	N	N	N	N	09/30/2017	WASHINGTON	1	14																														
CITY	T	A	L	A	T	I	N		TUALATIN	MN	0	SW	PACIFIC HY 99W	ALLEY	NE	(RSDMD)	NONE	N	R	A	I	N	A	N	A	01	NONE	9	TURN-R	NW-SW			018	02	No yield						
N		6A							PORTLAND UA	12.58	SW	124TH AVE	03						N	D	A	W		P	S	N	GR	C	A	R			000	000	00						
N	✓	45	23	24.05	-122	48	15.64		009100100S00				(04)																												
04125	N	Y	N	N	N	N	N	08/14/2019	WASHINGTON	1	14																														
CITY	W	E							TUALATIN	MN	0	SW	PACIFIC HY 99W	ALLEY	NE	(RSDMD)	UNKNOWN	N	N	C	L	D	S	-	1	T	U	R	N	01	NONE	0	STRGHT	NE-SW			000	07	Following		
N	✓	9P							PORTLAND UA	12.58	SW	124TH AVE	03						N	D	L	I	T																		
N	✓	45	23	24.04	-122	48	15.63		009100100S00				(04)																												
05219	N	N	N	N	N	N	N	08/06/2016	WASHINGTON	1	14																														
CITY	S	A							TUALATIN	MN	0	SW	PACIFIC HY 99W	STRGHT	NE	(DIVMD)	N	T	R	F	S	I	G	N	A	L		01	NONE	0	STRGHT	NE-SW			000	07	Following				
N		4P							PORTLAND UA	12.62	SW	124TH AVE	06						N	D	A	Y																			
N	✓	45	23	22.75	-122	48	17.94		009100100S00				(06)																												
06220	N	N	N	N	N	N	N	11/26/2019	WASHINGTON	1	14																														
NONE	T								TUALATIN	MN	0	SW	PACIFIC HY 99W	STRGHT	NE	(DIVMD)	UNKNOWN	N	N	R	A	I	N	S	-	S	T	R	G	H	T	01	NONE	0	STRGHT	NE-SW			000	29	Failed to avoid
N		5P							PORTLAND UA	12.62	SW	124TH AVE	06						N	D	L	I	T																		
N	✓	45	23	22.73	-122	48	17.92		009100100S00				(06)																												

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 12.4 to 12.8 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

5 - 8 of 29 Crash records shown.

SER#	P	R	J	S	W	DATE	COUNTY	RD#	FC	CONN#	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	A	S	CAUSE															
INVEST	E	A	U	I	C	DAY	CITY	COMPNT	FIRST STREET	DIRECT	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	FROM	G	E	LICNS	PED														
RD DPT	E	L	G	N	H	R	URBAN AREA	MLG	TYP	SECOND STREET	LOCTN	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	TO	X	RES	LOC	ERROR														
UNLOC?	D	C	S	V	L	K	LONG	MILEPNT	LRS	(#LANES)	CONTRL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	RES	LOC	ERROR	ACT	EVENT	CAUSE									
04779	N	N	N	N	N	N	WASHINGTON	1	14		STRGHT	N		N	CLR	S-1STOP	01	NONE	0			29,32														
CITY						WE	TUALATIN	MN	0	SW	PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN		REAR	PRVTE	NE-SW			000	00	Failed to avoid, Careless													
N						9A	PORTLAND UA	12.63	SW	124TH AVE	03			N	DAY	INJ	PSNGR	CAR			01	DRVR	INJC	84	F	OR-Y	026,052	000	29,32							
N						45 23 22.42	-122 48 18.52				009100100S00	(04)											OR<25													
																	01	NONE	0																	
																	PRVTE	NE-SW					000	00												
																	PSNGR	CAR					02	PSNG	INJC	76	M		000	000	00					
																	02	NONE	0																	
																	PRVTE	NE-SW					01	DRVR	INJB	61	F	OR-Y	000	011	00					
																	PSNGR	CAR					02	PSNG	INJC	39	F	OR<25	000	000	00					
																	02	NONE	0																	
																	PRVTE	NE-SW					01	DRVR	NONE	40	M	OR-Y	000	022	00					
																	PSNGR	CAR					01	DRVR	NONE	40	M	OR-Y	000	000	00					
01671	N	N	N	N	N	N	WASHINGTON	1	14		STRGHT	Y		N	RAIN	S-1STOP	01	NONE	0			013	07													
CITY						TU	TUALATIN	MN	0	SW	PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN	N	WET	REAR	PRVTE	NE-SW			000	00	Following												
N						9A	PORTLAND UA	12.63	SW	124TH AVE	03			N	DAY	INJ	PSNGR	CAR				01	DRVR	NONE	33	M	OR-Y	043	000	00	07					
N						45 23 22.42	-122 48 18.52				009100100S00	(04)													OR>25											
																	02	NONE	0																	
																	PRVTE	NE-SW					01	DRVR	INJC	19	F	OR-Y	000	011	013	00				
																	PSNGR	CAR					03	DRVR	NONE	40	M	OR-Y	000	022	00	00				
																	PSNGR	CAR					01	DRVR	NONE	40	M	OR-Y	000	000	00	00				
04446	N	N	N	N	N	N	WASHINGTON	1	14		STRGHT	Y		N	CLR	S-1STOP	01	NONE	0			07	Following													
CITY						WE	TUALATIN	MN	0	SW	PACIFIC HY 99W	NE	(DIVMD)	TRF SIGNAL	N	DRY	REAR	PRVTE	NE-SW			000	00													
N						9A	PORTLAND UA	12.63	SW	124TH AVE	03			N	DAY	INJ	PSNGR	CAR				01	DRVR	NONE	66	M	OR-Y	043	000	00	07					
N						45 23 22.42	-122 48 18.52				009100100S00	(04)														OR<25										
																	02	NONE	0																	
																	PRVTE	NE-SW					01	DRVR	INJC	57	F	OR-Y	000	011	000	00	00			
																	PSNGR	CAR					01	DRVR	NONE	66	M	OR-Y	043	000	000	00	00			
03708	N	N	N	N	N	N	WASHINGTON	1	14		STRGHT	N		N	CLR	S-1STOP	01	NONE	9			29	Failed to avoid													
NONE						WE	TUALATIN	MN	0	SW	PACIFIC HY 99W	NE	(RSDMD)	UNKNOWN	N	DRY	REAR	N/A	NE-SW			000	00													
N						1P	PORTLAND UA	12.63	SW	124TH AVE	03			N	DAY	PDO	PSNGR	CAR				01	DRVR	NONE	00	Unk	UNK	000	000	000	00	00				
N						45 23 22.42	-122 48 18.52				009100100S00	(04)																								
																	02	NONE	9																	
																	N/A	NE-SW					01	DRVR	NONE	00	Unk	UNK	000	011	000	000	00	00		
																	PSNGR	CAR					01	DRVR	NONE	00	Unk	UNK	000	000	000	00	00			

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 12.4 to 12.8 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

9 - 13 of 29 Crash records shown.

SER#	P	R	J	S	W	DATE	COUNTY	RD#	FC	CONN#	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR	QTY	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE				
INVEST	E	A	U	I	C	O	CITY	COMPNT	FIRST	STREET	DIRECT	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE	FROM											
RD DPT	E	L	G	N	H	R	URBAN AREA	MLG	TYP	SECOND	STREET	LOCTN	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM												
UNLOC?	D	C	S	V	L	K	LONG	MILEPNT	LR			(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
07753	N	N	N	N	N	12/05/2017	WASHINGTON	1	14		STRGHT	Y		N	CLR	S-1STOP	01	NONE	9	STRGHT							29,40				
COUNTY						TU	TUALATIN	MN	0	SW	PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN		DRY	REAR	N/A		NE-SW						000	00	Failed to avoid, view obscured			
N	✓					3P	PORTLAND UA	12.63		SW	124TH AVE	03		N	DAY	PDO	PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00			
N						45 23 22.42	-122 48 18.52					009100100S00																			
04789	N	N	N	N	N	12/28/2020	WASHINGTON	1	14		STRGHT	Y		N	CLR	S-1STOP	01	NONE	0	STRGHT						013	29,27				
CITY						MO	TUALATIN	MN	0	SW	PACIFIC HY 99W	NE	(DIVMD)	UNKNOWN		DRY	REAR	PRVTE		NE-SW						000	00				
N	✓					3P	PORTLAND UA	12.63		SW	124TH AVE	04		N	DAY	INJ	PSNGR	CAR		01	DRVR	INJB	72	F	OR-Y	016,026	038	29,27			
N						45 23 22.41	-122 48 18.54					009100100S00																			Failed to avoid, inattention
08340	N	N	N	N	N	12/26/2017	WASHINGTON	1	14		INTER	3-LEG	N		CLR	S-OTHER	01	NONE	9	TURN-L						08					
NONE						TU	TUALATIN	MN	0	SW	PACIFIC HY 99W	SE	TRF SIGNAL	N	WET	TURN	N/A			NE-SE						000	00	Improper turn			
N	✓					10A	PORTLAND UA	12.66		SW	124TH AVE	05	1	N	DAY	PDO	PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00			
N						45 23 21.44	-122 48 20.25					009100100S00																			
03031	Y	N	N	N	N	08/17/2020	WASHINGTON	1	14		INTER	3-LEG	N		CLR	FIX OBJ	01	NONE	9	TURN-L						058	01				
CITY						MO	TUALATIN	MN	0	SW	PACIFIC HY 99W	SW	TRF SIGNAL	N	DRY	FIX	N/A			SE-SW						000	00	Too fast			
N	✓					4P	PORTLAND UA	12.66		SW	124TH AVE	05	0	N	DAY	PDO	PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00			
N						45 23 21.43	-122 48 20.24					009100100S00																			
04216	N	N	N	N	N	08/15/2018	WASHINGTON	1	14		INTER	3-LEG	N		CLR	ANGL-OTH	01	NONE	0	STRGHT						04					
CITY						WE	TUALATIN	MN	0	SW	PACIFIC HY 99W	CN	TRF SIGNAL	N	DRY	TURN	PRVTE			SW-NE						000	00	Disregard signal			
N	✓					5P	PORTLAND UA	12.66		SW	124TH AVE	02	1	N	DAY	INJ	PSNGR	CAR		01	DRVR	NONE	82	M	OR-Y	020	000	04			
N						45 23 21.44	-122 48 20.25					009100100S00																			

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 12.4 to 12.8 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

14 - 17 of 29 Crash records shown.

SER#	P	R	J	S	W	DATE	COUNTY	RD#	FC	CONN#	RD CHAR	INT-TYPE	OFFRD	WTHR	CRASH	SPCL USE	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE													
INVEST	E	A	U	I	C	O	CITY	COMPNT	FIRST	STREET	DIRECT	(MEDIAN)	INT-REL	RNDBT	SURF	COLL	TRLR	QTY	FROM	G	E	LICNS	LOC	ERROR	ACT	EVENT	CAUSE										
RD DPT	E	L	G	N	H	R	URBAN AREA	MLG	TYP	SECOND	STREET	LOCTN	LEGS	TRAF-	CONTL	DRVBY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE					
UNLOC?	D	C	S	V	L	K	LONG	MILEPNT	LRS			(#LANES)	CONTL	DRVBY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE							
05817	N	N	N	N	N	11/06/2019	WASHINGTON	1	14		ALLEY	N	N	CLR	S-OTHER	01	NONE	9	TURN-L						000		08					Improper turn					
	NONE					WE	TUALATIN	MN	0	SW	PACIFIC HY 99W	SW	(DIVMD)	STOP	SIGN	N	N/A									000	000										
N	✓					3P	PORTLAND UA	12.77	SW	124TH AVE	03			DAY	PDO		PSNGR	CAR							000	000											
N						45 23 17.89	-122 48 26.63				009100100S00		(04)																								
																	02	NONE	9	STOP							012	00									
																	PSNGR	CAR								000	000										
00592	N	N	N	N	N	02/01/2017	WASHINGTON	2	14		INTER	3-LEG	N	CLD	S-1STOP	01	NONE	0	STRGHT							17,29											
COUNTY						WE	TUALATIN	MN	0	SW	PACIFIC HY 99W	SW	TRF SIGNAL	DRY	REAR		PRVTE									000	000										
N	✓					10A	PORTLAND UA	12.66	SW	124TH AVE	06	1		DAY	INJ		PSNGR	CAR							026	028											
N						45 23 20.82	-122 48 19.67				009100200S00																										
																	02	NONE	0	STOP							011	00							Physical illness, Failed to avoid		
																	PSNGR	CAR								000	000										
00847	N	N	N	N	N	02/17/2018	WASHINGTON	2	14		INTER	3-LEG	N	CLD	S-1STOP	01	NONE	0	STRGHT								27,07										
CITY						SA	TUALATIN	MN	0	SW	PACIFIC HY 99W	SW	TRF SIGNAL	DRY	REAR		PRVTE									000	000										
N	✓					5P	PORTLAND UA	12.66	SW	124TH AVE	06	1		DAY	INJ		PSNGR	CAR							016,043	038											
N						45 23 20.82	-122 48 19.67				009100200S00																										
																	02	NONE	0	STOP																	
																	PRVTE										011	000									
																	PSNGR	CAR								000	000										
																	02	NONE	0	STOP																	
																	PRVTE										011	013									
																	PSNGR	CAR								000	000										
																	03	NONE	0	STOP																	
																	PRVTE										022	000									
																	PSNGR	CAR								000	000										
05197	N	N	N	N	N	10/10/2019	WASHINGTON	2	14		INTER	3-LEG	N	CLD	S-1STOP	01	NONE	0	STRGHT								013	29						Failed to avoid			
NONE						TH	TUALATIN	MN	0	SW	PACIFIC HY 99W	SW	TRF SIGNAL	DRY	REAR		PRVTE									000	000										
N	✓					5P	PORTLAND UA	12.66	SW	124TH AVE	06	1		DAY	INJ		PSNGR	CAR							026	000											
N						45 23 20.82	-122 48 19.67				009100200S00																										
																	02	NONE	0	STOP																	
																	PRVTE										011	013									
																	PSNGR	CAR								000	000										
																	03	NONE	0	STOP																	
																	PRVTE										022	000									
																	PSNGR	CAR								000	000										

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 12.4 to 12.8 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

18 - 22 of 29 Crash records shown.

SER#	P R J S W DATE	COUNTY	RD# FC CONN#	RD CHAR	INT-TYPE	SPCL USE												
INVEST	E A U I C O DAY	CITY	COMPNT FIRST STREET	DIRECT	(MEDIAN) INT-REL	OFFRD WTHR CRASH	TRLR QTY	MOVE			A S							
RD DPT	E L G N H R TIME	URBAN AREA	MLG TYP SECOND STREET	LOCTN	LEGS TRAF-	RNDBT SURF COLL	OWNER	FROM			G E LICNS	PED						
UNLOC?	D C S V L K LAT	LONG	MILEPNT LRS		(#LANES) CONTL	DRVWY LIGHT SVRVTY	V# TYPE	TO	P#	TYPE	SVRVTY	E X RES	LOC	ERROR	ACT	EVENT	CAUSE	
02288	N N N N 05/08/2019	WASHINGTON	2 14	INTER	3-LEG	N	01	NONE	9	STRGHT							29	
NONE	WE	WASHING	MN 0 SW PACIFIC HY 99W	SW		N/A	N/A	STRGHT									00	Failed to avoid
N	5P	PORTLAND UA	12.66 SW 124TH AVE	06	1	N	DAY	PSNGR CAR	01	DRVR	NONE	00	Unk	UNK	000	000	00	
N	45 23 20.82	-122 48 19.67	009100200S00														00	
							02	NONE	9	STOP							011	00
							PSNGR CAR	SW-NE	01	DRVR	NONE	00	Unk	UNK	000	000	00	
																	00	
02885	N N N N N 05/03/2016	WASHINGTON	2 14	INTER	CROSS	N	01	NONE	0	STRGHT							04	
CITY	TU	TUALATIN	MN 0 SW PACIFIC HY 99W	CN	L-GRN-SIG	N	PRVTE	NE-SW									00	Disregard signal
N	2P	PORTLAND UA	12.66 SW 124TH AVE	03	1	N	DAY	INJ	PSNGR CAR	01	DRVR	INJC	78 M	OTH-Y	020	000	04	
N	45 23 20.82	-122 48 19.67	009100200S00														00	
							02	NONE	0	TURN-L							000	00
							PSNGR CAR	SE-SW	01	DRVR	NONE	69 M	OR-Y	OR<25	000	000	00	
																	00	
07122	N N N N N 12/23/2018	WASHINGTON	2 14	INTER	3-LEG	N	01	NONE	0	STRGHT							04	
CITY	SU	TUALATIN	MN 0 SW PACIFIC HY 99W	CN	TRF SIGNAL	N	PRVTE	SW-NE									00	Disregard signal
N	6A	PORTLAND UA	12.66 SW 124TH AVE	03	1	N	DAY	INJ	PSNGR CAR	01	DRVR	NONE	18 M	OR-Y	020	000	04	
N	45 23 20.82	-122 48 19.67	009100200S00														00	
							02	NONE	0	TURN-L							000	00
							PSNGR CAR	NE-SE	01	DRVR	INJC	69 F	OR-Y	OR<25	000	000	00	
																	00	
02114	N N N N N 03/30/2017	WASHINGTON	2 14	STRGHT		N	01	NONE	9	STRGHT							07	
CITY	TH	TUALATIN	MN 0 SW PACIFIC HY 99W	SW	(DIVMD)	UNKNOWN	N/A	SW-NE									00	Following
N	12P	PORTLAND UA	12.68 SW 124TH AVE	03			N	DAY	PSNGR CAR	01	DRVR	NONE	00	Unk	UNK	000	000	00
N	45 23 20.22	-122 48 20.74	009100200S00		(04)												00	
							02	NONE	9	STOP							011	00
							PSNGR CAR	SW-NE	01	DRVR	NONE	00	Unk	UNK	000	000	00	
																	00	
05391	N N N N 08/12/2016	WASHINGTON	2 14	STRGHT		Y	01	NONE	9	STRGHT							29	
NONE	FR	TUALATIN	MN 0 SW PACIFIC HY 99W	SW	(DIVMD)	UNKNOWN	N/A	SW-NE									00	Failed to avoid
N	6P	PORTLAND UA	12.68 SW 124TH AVE	04			N	DAY	PSNGR CAR	01	DRVR	NONE	00	Unk	UNK	000	000	00
N	45 23 20.22	-122 48 20.74	009100200S00		(04)												00	
							02	NONE	9	STOP							011	00
							PSNGR CAR	SW-NE	01	DRVR	NONE	00	Unk	UNK	000	000	00	
																	00	

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 12.4 to 12.8 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

23 - 26 of 29 Crash records shown.

SER#	S	D	M	P	R	J	S	W	DATE	COUNTY	RD#	FC	CONN#	RD CHAR	INT-TYPE	SPCL USE	TRLR	QTY	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE											
INVEST	E	A	U	I	C	O	DAY			CITY	COMPNT	FIRST STREET	DIRECT	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	FROM																		
RD DPT	E	L	G	N	H	R	TIME			URBAN AREA	MLG TYP	SECOND STREET	LOCTN	LEGS	TRAF-CONTL	RNDBT	SURF	COLL	OWNER																		
UNLOC?	D	C	S	V	L	K	LAT			LONG	MILEPNT	LR		(#LANES)		DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC									
02345	N	N	N	N			05/10/2018			WASHINGTON	2	14		STRGHT	Y	N	CLR	S-1STOP	01	NONE	0					29											
NONE							TH			TUALATIN	MN	0	SW PACIFIC HY 99W	SW	(DIVMD)	UNKNOWN	DRY	REAR	PRVTE						000	00	Failed to avoid										
N							8A			PORTLAND UA	12.68	SW 124TH AVE	05			N	DAY	INJ	PSNGR	CAR		01	DRVR	NONE	32	M	UNK		026	000	29						
N	✓						45 23 20.22			-122 48 20.74			009100200S00		(05)																						
																			02	NONE	0																
																			PRVTE																		
																			PSNGR	CAR		01	DRVR	INJC	35	F	OR-Y		000	011	000	00					
01397	N	N	N	N			03/19/2018			WASHINGTON	2	14		STRGHT	N	N	CLR	S-1STOP	01	NONE	9				29												
NO RPT							MO			TUALATIN	MN	0	SW PACIFIC HY 99W	SW	(DIVMD)	UNKNOWN	DRY	REAR	N/A						000	00	Failed to avoid										
N							5P			PORTLAND UA	12.69	SW 124TH AVE	04			N	DAY	PDO	PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00						
N	✓						45 23 19.91			-122 48 21.27			009100200S00		(04)																						
																			02	NONE	9																
																			N/A																		
																			PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	011	000	00					
07277	N	N	Y	N	N	N	10/25/2016			WASHINGTON	2	14		STRGHT	Y	N	CLD	S-1STOP	01	NONE	0				29												
CITY							TU			TUALATIN	MN	0	SW PACIFIC HY 99W	SW	(DIVMD)	UNKNOWN	WET	REAR	PRVTE						000	00	Failed to avoid										
N							6A			PORTLAND UA	12.70	SW 124TH AVE	03			N	DARK	INJ	PSNGR	CAR		01	DRVR	NONE	61	M	OR-Y		026	000	29						
N	✓						45 23 19.62			-122 48 21.81			009100200S00		(04)																						
																			02	NONE	0																
																			UNK																		
																			PSNGR	CAR		01	DRVR	INJC	37	M	OTH-Y		000	011	000	00					
03438	N	N	N	N			06/21/2019			WASHINGTON	2	14		STRGHT	Y	N	CLR	S-1STOP	01	NONE	0				29												
NO RPT							FR			TUALATIN	MN	0	SW PACIFIC HY 99W	SW	(DIVMD)	UNKNOWN	DRY	REAR	PRVTE						000	00	Failed to avoid										
N							6P			PORTLAND UA	12.71	SW 124TH AVE	04			N	DAY	INJ	PSNGR	CAR		01	DRVR	INJC	29	F	OR-Y		026	000	000	29					
N	✓						45 23 19.3			-122 48 22.34			009100200S00		(04)																						
																			02	NONE	0																
																			PRVTE																		
																			PSNGR	CAR		01	DRVR	INJC	26	F	OR-Y		000	011	013	00					
																			03	NONE	0																
																			PRVTE																		
																			PSNGR	CAR		01	DRVR	INJC	53	M	OR-Y		000	022	000	00					
03346	N	N	N	N	N	N	06/29/2018			WASHINGTON	2	14		STRGHT	N	N	CLR	S-STRGHT	01	NONE	9				29, 32												
CITY							FR			TUALATIN	MN	0	SW PACIFIC HY 99W	SW	(DIVMD)	NONE	DRY	REAR	N/A						000	00	Failed to avoid										
N							10A			PORTLAND UA	12.77	SW 124TH AVE	04			N	DAY	PDO	PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000	000	00					
N	✓						45 23 17.5			-122 48 25.57			009100200S00		(04)																						

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

091: PACIFIC HIGHWAY WEST

Highway 091 ALL ROAD TYPES, MP 12.4 to 12.8 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

27 - 29 of 29 Crash records shown.

SER#	P	R	J	S	W	DATE	COUNTY	RD#	FC	CONN#	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE				
INVEST	E	A	U	I	C	O	CITY	COMPNT	FIRST STREET	DIRECT	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE						
RD DPT	E	L	G	N	H	R	URBAN AREA	MLG TYP	SECOND STREET	LOCTN	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE			
UNLOC?	D	C	S	V	L	K	LONG	MILEPNT	LRS	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE		
																	02	NONE	9	STRGHT										
																	N/A	SW-NE								000	000	00		
																	PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00		
02017	N	N	N	N	N	04/23/2018	WASHINGTON	2	14		ALLEY	N		N	CLR	S-1STOP	01	NONE	9	STRGHT								29		
NONE						MO	TUALATIN	MN	0	SW	PACIFIC HY 99W	SW	(NONE)	UNKNOWN	N	DRY	REAR	N/A	SW-NE								000	000	00	
N	✓					7A	PORTLAND UA	12.78	SW	124TH AVE	04			N	DAY	PDO	PSNGR	CAR									000	000	00	
N						45 23 17.19	-122 48 26.1				009100200S00	(04)																		
																	02	NONE	9	STOP										
																	N/A	SW-NE									011	000	00	
																	PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00		
03506	N	N	N	N	N	07/09/2019	WASHINGTON	2	14		ALLEY	N		Y	CLD	ANGL-STP	01	NONE	0	STRGHT								10		
CITY						TU	TUALATIN	MN	0	SW	PACIFIC HY 99W	SW	(DIVMD)	NONE	N	DRY	ANGL	PRVTE	SW-NE								000	000	00	
Y	✓					2P	PORTLAND UA	12.78	SW	124TH AVE	05			N	DAY	INJ	PSNGR	CAR									080	000	10	
N						45 23 17.18	-122 48 26.09				009100200S00	(04)																		
																	02	NONE	0	STOP										
																	PRVTE	SE-NW									011	000	00	
																	PSNGR	CAR		01	DRVR	INJC	60	M	OR-Y	OR<25	000	000	00	

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at TUALATIN RD, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020

1 - 7 of 22 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	ACT	EVENT	CAUSE																	
INVEST	E	A	U	I	C	O	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFERD	WTHR	CRASH	TRLR QTY	MOVE	A	S												
RD DPT	E	L	G	N	H	R	TIME	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED								
UNLOC?	D	C	S	V	L	K	LAT	LONG	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE		
03294	N	N	N			06/04/2017	16	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	0	STRGHT											29	
NONE						SU	0	SW 124TH AVE	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S											000	00	
N						6P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	16	F	OR-Y		026		000	29		
N						45 23 16.36	-122 48	15.23																						
																02	NONE	0	STOP											
																PRVTE	N -S											012	00	
																PSNGR CAR		01	DRVR	INJC	58	F	OR-Y		000		000	00		
00365	Y	N	N			01/06/2011	17	SW TUALATIN RD	INTER	3-LEG	N	Y	UNK	FIX OBJ	01	NONE	0	TURN-L											062,124	01
NONE						SA	0	SW 124TH AVE	E		TRF SIGNAL	N	ICE	FIX		PRVTE	N -E											088	062,124	00
N						6A			05	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		047,080,081	017		01		
N						45 23 16.3986408	-122 48	15.242514																						
03194	Y	N	N			04/18/2011	17	SW TUALATIN RD	INTER	3-LEG	N	Y	CLD	FIX OBJ	01	NONE	0	TURN-L											050,062	32,01
CITY						SA	0	SW 124TH AVE	E		TRF SIGNAL	N	WET	FIX		PRVTE	N -E											000	050,062	00
N						2P			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		083,047,081	017		32,01		
N						45 23 16.3986408	-122 48	15.242514																						
04706	N	N	N			09/01/2011	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	0	STRGHT												07
COUNTY						TH	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W											000	00	
N						5P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	36	F	OTH-Y		026		000	07		
N						45 23 16.3986408	-122 48	15.242514																						
																02	NONE	0	STOP										011	00
																PRVTE	E -W												000	00
																PSNGR CAR		01	DRVR	NONE	69	F	OR-Y		000		000	00		
05973	Y	N	N			10/31/2012	17	SW TUALATIN RD	INTER	3-LEG	N	Y	RAIN	FIX OBJ	01	NONE	0	TURN-L											044,062,040	08,01
CITY						WE	0	SW 124TH AVE	E		TRF SIGNAL	N	WET	FIX		PRVTE	N -E											000	044,062,040	00
N						3P			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	25	M	SUSP		002,047,081	088		08,01		
N						45 23 16.3623155	-122 48	15.2345731																						
01534	Y	N	N			03/23/2015	16	SW TUALATIN RD	INTER	3-LEG	N	Y	CLD	FIX OBJ	01	NONE	0	TURN-L											079	01,08
CITY						MO	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	FIX		PRVTE	N -E											000	079	00
N						12P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	39	F	SUSP		047,001,081	000		01,08		
N						45 23 16.36	-122 48	15.23																						
06122	N	N	N			10/29/2018	16	SW TUALATIN RD	INTER	3-LEG	N	Y	RAIN	FIX OBJ	01	NONE	9	TURN-L											040,062	25
NONE						MO	0	SW 124TH AVE	E		TRF SIGNAL	N	WET	FIX		N/A	N -E											000	00	
N						UNK			05	0		N	UNK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000		000	00		
N						45 23 16.36	-122 48	15.23																						

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at TUALATIN RD, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020

8 - 12 of 22 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE					
INVEST	E	A	U	I	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE					
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	TO	P#	TYPE	INJ	G	E	LICNS	LOC	ERROR	ACT	EVENT	CAUSE	
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	INJ	G	E	LICNS	LOC	ERROR	ACT	EVENT	CAUSE	
01730	N	N	N			02/01/2019	16	SW TUALATIN RD	INTER	3-LEG	N		N	RAIN	S-1STOP	01 NONE	0	STRGHT											29	
NONE						FR	0	SW 124TH AVE	E			TRF SIGNAL	N	WET	REAR	PRVTE		E -W										000	00	
N						UNK			06	0			N	UNK	INJ	PSNGR CAR			01	DRVR	INJC	34	M	OR-Y		026	000	00	29	
N						45 23 16.36	-122 48	15.23																						
																02 NONE	0	STOP										011	00	
																UNKN		E -W									000	000	00	
																PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	00	
02835	N	N	N			08/07/2020	16	SW TUALATIN RD	INTER	3-LEG	N		N	CLR	S-1STOP	01 NONE	0	STRGHT											29	
NONE						FR	0	SW 124TH AVE	E			TRF SIGNAL	N	DRY	REAR	PRVTE		E -W										000	00	
N						3P			06	0			N	DAY	INJ	PSNGR CAR			01	DRVR	NONE	18	F	OR-Y		026	000	00	29	
N						45 23 16.36	-122 48	15.23																						
																02 NONE	0	STOP										012	00	
																PRVTE		E -W									000	000	00	
																PSNGR CAR			01	DRVR	INJC	53	M	OR-Y		000	000	00	00	
01317	N	N	N			03/07/2017	16	SW TUALATIN RD	INTER	3-LEG	N		N	CLR	ANIMAL	01 NONE	9	STRGHT											035	12
NONE						TU	0	SW 124TH AVE	S			UNKNOWN	N	DRY	OTH	N/A		S -N										000	00	
N						12A			06	0			N	DLIT	PDO	PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	00	
N						45 23 16.36	-122 48	15.23																						
00739	N	N	N			02/09/2011	16	SW TUALATIN RD	INTER	3-LEG	N		N	CLR	O-1 L-TURN	01 NONE	0	TURN-L											02	
CITY						WE	0	SW 124TH AVE	CN			TRF SIGNAL	N	DRY	TURN	PRVTE		N -E										000	00	
N						4P			04	0			N	DAY	INJ	PSNGR CAR			01	DRVR	INJC	52	F	OR-Y		004,028	000	00	02	
N						45 23 16.3693398	-122 48 15.2361085																							
																02 NONE	0	STRGHT										000	00	
																PRVTE		S -N									000	000	00	
																PSNGR CAR			01	DRVR	INJC	63	M	OR-Y		000	000	00	00	
01155	N	N	N			02/28/2011	16	SW TUALATIN RD	INTER	3-LEG	N		N	RAIN	O-1 L-TURN	01 NONE	0	STRGHT											02	
CITY						MO	0	SW 124TH AVE	CN			TRF SIGNAL	N	WET	TURN	PRVTE		S -N										000	00	
N						3P			04	0			N	DAY	INJ	PSNGR CAR			01	DRVR	INJC	34	M	OR-Y		000	000	00	00	
N						45 23 16.3986408	-122 48 15.242514																							
																02 NONE	0	TURN-L										000	00	
																PRVTE		N -E									004,028	000	00	
																PSNGR CAR			01	DRVR	NONE	46	M	OR-Y		000	000	00	02	

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

TUALATIN RD at 108TH AVE, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020

1 - 3 of 6 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR	QTY	MOVE	A	S	LOC	ERROR	ACT	EVENT	CAUSE					
INVEST	E	A	U	I	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR	QTY	MOVE	A	S	LOC	ERROR	ACT	EVENT	CAUSE					
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	P#	TYPE	INJ	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE			
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE		
02490	N	N	N	N	N	05/16/2013	17	SW TUALATIN RD	INTER	3-LEG	N	N	N	CLD	ANGL-OTH	01 NONE	0	TURN-L								083	02				
CITY		WE					0	SW 108TH AVE	CN			STOP SIGN	N	WET	TURN	PRVTE		S -W								015	00				
N		3P						02	0				N	DAY	INJ	PSNGR CAR				01	DRVR	NONE	56	M	OR-Y	028	000	083	02		
N		45 23					-122 47																								
N		23.110044					15.8194319																								
																02 NONE	0	STRGHT									000	00			
																PRVTE		E -W													
																PSNGR CAR				01	DRVR	INJA	47	F	OR-Y	000	000	00	00		
02911	N	N	N	N	N	05/23/2014	17	SW TUALATIN RD	INTER	3-LEG	N	N	N	CLD	ANGL-OTH	01 NONE	0	STRGHT								02					
CITY		FR					0	SW 108TH AVE	CN			STOP SIGN	N	DRY	TURN	PRVTE		W -E								000	00				
N		3P						04	0				N	DAY	INJ	PSNGR CAR				01	DRVR	INJC	30	F	OR-Y	000	000	00	00		
N		45 23 23.11					-122 47																								
N		15.82																													
																01 NONE	0	STRGHT									000	00			
																PRVTE		W -E													
																PSNGR CAR				02	PSNG	NO<5	04	F		000	000	00	00		
																01 NONE	0	STRGHT								000	00				
																PRVTE		W -E													
																PSNGR CAR				03	PSNG	INJC	07	F		000	000	00	00		
																02 NONE	0	TURN-L								015	00				
																PRVTE		S -W													
																PSNGR CAR				01	DRVR	NONE	27	M	OR-Y	028	000	02			
01117	N	N	N	N	N	03/02/2015	17	SW TUALATIN RD	INTER	3-LEG	N	N	N	CLR	S-STRGHT	01 NONE	0	STRGHT								07					
CITY		MO					0	SW 108TH AVE	CN			UNKNOWN	N	DRY	REAR	PRVTE		E -W								000	00				
N		4P						02	0				N	DAY	INJ	PSNGR CAR				01	DRVR	INJC	30	F	OR-Y	043	000	07	07		
N		45 23 23.11					-122 47																								
N		15.82																													
																02 NONE	0	STRGHT									006	00			
																PRVTE		E -W													
																PSNGR CAR				01	DRVR	INJC	42	F	OR-Y	000	000	00	00		
																02 NONE	0	STRGHT									006	00			
																PRVTE		E -W													
																PSNGR CAR				02	PSNG	INJC	08	M		000	000	00	00		
01086	N	N	N	N	N	02/17/2016	17	SW TUALATIN RD	INTER	3-LEG	N	N	N	RAIN	ANGL-OTH	01 NONE	9	TURN-L								02					
NONE		WE					0	SW 108TH AVE	CN			STOP SIGN	N	WET	TURN	N/A		S -W								000	00				
N		6P						04	0				N	DUSK	PDO	PSNGR CAR				01	DRVR	NONE	00	Unk	UNK	000	000	00	00		
N		45 23 23.11					-122 47																								
N		15.82																													

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

**108TH AVE and Intersectional Crashes at 108TH AVE, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020**

1 - 5 of 23 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	A	S	P	T	C	R	E	L	L	P	E	D	C	A	S				
INVEST	E	A	U	I	C	O	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFERD	WTHR	CRASH	TRLR	QTY	MOVE												
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM												
UNLOC?	D	C	S	V	L	K	LAT	LONG	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
03790	N	N	N	N	N	07/23/2012	17	SW NEIRMAN LN	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT								02			
CITY						MO	0	SW 108TH AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	N-S									000		00	
N						6P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	38	F	OR-Y		000	000		00	
N						45 21	-122.47																						
N						45.1661504	15.5016984																						
																02	NONE	0	TURN-L										
																PRVTE	W-N										015		00
																PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		028	000		02	
08370	N	N	N	N	N	12/08/2016	18	SW 108TH AVE	STRGHT		N	N	SNOW	O-STRGHT	01	NONE	0	STRGHT								124		05	
CITY						TH	25	SW KOLLER ST	N	(NONE)	UNKNOWN	N	SNO	HEAD		PRVTE	N-S									000	124	00	
N						1P			06			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		044	017		05	
N						45 21 37.86	-122.47			(02)																			
N						45.1661504	15.39																						
																02	NONE	0	STRGHT										
																PRVTE	S-N										000		00
																PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		000	000		00	
																02	NONE	0	STRGHT										
																PRVTE	S-N										000		00
																PSNGR CAR		02	PSNG	INJC	56	F	OR-Y		000	000		00	
03511	N	N	N	N	N	09/25/2020	18	SW WILLOW ST	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE	9	STRGHT								004		29	
CITY						FR	0	SW 108TH AVE	N		UNKNOWN	N	WET	REAR		N/A	N-S									000		00	
N						4P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00	
N						45 21 46.88	-122.47																						
N						15.5																							
																02	NONE	9	STOP										
																N/A	N-S										011		00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00	
01122	N	N	N	N	N	02/19/2016	18	SW MARILYN ST	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE	9	TURN-L										02	
CITY						FR	0	SW 108TH AVE	CN		STOP SIGN	N	WET	TURN		N/A	W-N									000		00	
N						3P			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00	
N						45 21 26.75	-122.47																						
N						15.41																							
																02	NONE	9	STRGHT										
																N/A	S-N										000		00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00	
00260	Y	N	N	N	N	01/15/2012	17	SW BLAKE ST	INTER	2-LEG	N	Y	RAIN	FIX OBJ	01	NONE	0	TURN-L									072,040		01
COUNTY						SU	0	SW 108TH AVE	S		CURVE	N	ICE	FIX		PRVTE	E-S									088	072,088,040	00	
N						1A			05	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	44	F	OR-Y		083,047,081	017		01	
N						45 21	-122.47																						
N						51.676058	15.276585																						

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

108TH AVE and Intersectional Crashes at 108TH AVE, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020

6 - 11 of 23 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	ACT	EVENT	CAUSE																
INVEST	E	A	U	I	C	O	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFERD	WTHR	CRASH	TRLR	QTY	MOVE	A	S										
RD DPT	E	L	G	N	H	R	TIME	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED							
UNLOC?	D	C	S	V	L	K	LAT	LONG	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
00823	Y	N	N			02/07/2014	17	SW BLAKE ST	INTER	2-LEG	N	Y	SNOW	FIX OBJ	01	NONE	0	STRGHT									058,128,124	01	
NONE						FR	0	SW 108TH AVE	S		UNKNOWN	N	SNO	FIX		PRVTE	N -S									000	058,128,124	00	
N						5P			05	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	68	M	OR-Y		047,081	000		01	
N						45 21 51.676056	-122 47 15.276588																						
02698	Y	N	N	N	N	04/24/2016	18	SW BLAKE ST	INTER	2-LEG	N	Y	RAIN	FIX OBJ	01	NONE	9	STRGHT									058,121	01	
CITY						SU	0	SW 108TH AVE	CN		CURVE	N	WET	FIX		N/A	N -S									000		00	
N						12P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00	
N						45 21 51.68 15.28	-122 47 15.28																						
04116	Y	N	N	N	N	06/23/2016	18	SW BLAKE ST	INTER	2-LEG	N	Y	CLD	FIX OBJ	01	NONE	9	TURN-L									040	01	
CITY						TH	0	SW 108TH AVE	CN		UNKNOWN	N	WET	FIX		N/A	E -S									000		00	
N						8P			01	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00	
N						45 21 51.68 15.28	-122 47 15.28																						
94645	Y	Y	N	N	N	07/30/2017	18	SW BLAKE ST	INTER	2-LEG	N	Y	CLR	FIX OBJ	01	NONE	0	UNK									121	01	
CITY						SU	0	SW 108TH AVE	CN		UNKNOWN	N	DRY	FIX		PRVTE	UN-UN									000	121	00	
N						1A			04	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		047,081	000		01	
N						45 21 51.68 15.28	-122 47 15.28																						
04604	N	N	N			09/09/2019	18	SW BLAKE ST	INTER	2-LEG	N	N	CLD	O-STRGHT	01	NONE	9	STRGHT										05	
CITY						MO	0	SW 108TH AVE	CN		UNKNOWN	N	WET	HEAD		N/A	S -N									000		00	
N						8A			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00	
N						45 21 51.68 15.28	-122 47 15.28																						
																02	NONE	9	STRGHT								000	000	00
																N/A	N -S		01	DRVR	NONE	00	Unk	UNK		000	000	00	
																SCHL	BUS												
08384	N	N	N			12/29/2017	18	SW DOGWOOD ST	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	0	TURN-L									02		
CITY						FR	0	SW 108TH AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	E -S									015	00		
N						10P			02	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	16	F	OR-Y		028	000		02	
N						45 21 20.74 15.29	-122 47 15.29																						
																02	NONE	0	STRGHT								000	000	00
																PRVTE	S -N		01	DRVR	INJC	17	M	OR-Y		000	000	00	
																PSNGR CAR													
81019	N	N	N			01/16/2014	17	SW HERMAN RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	0	STRGHT									07		
NONE						TH	0	SW 108TH AVE	N		TRE SIGNAL	N	DRY	REAR		PRVTE	S -N									000	00		
N						3P			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	31	M	OR-Y		026	000		07	
N						45 23 1.115232	-122 47 15.5239439																						

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

**108TH AVE and Intersectional Crashes at 108TH AVE, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020**

12 - 17 of 23 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	ACT	EVENT	CAUSE																			
INVEST	E	A	U	I	C	O	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE	A	S													
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED									
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	F#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE			
																02	NONE	0	STOP													
																	PRVTE	S -N									000	000	011	00		
																	PSNGR	CAR	01	DRVR	NONE	00	F	UNK	OR<25					000		
00130	N	N	N			01/07/2020	17	SW HERMAN RD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE	9	STRGHT												29		
	NONE					TU	0	SW 108TH AVE	NE			TRF SIGNAL	N	WET	REAR	N/A	NE-SW													000	00	
	N					4P			06	0		N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK					000	000	00	
	N					45 23 1.12	-122 47	15.52																								
																	02	NONE	9	STOP												
																	N/A	NE-SW												011	00	
																	PSNGR	CAR	01	DRVR	NONE	00	Unk	UNK					000	000	00	
06105	N	N	N	N	N	09/11/2016	17	SW HERMAN RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	0	STRGHT												27,07		
	CITY					SU	0	SW 108TH AVE	SW			TRF SIGNAL	N	DRY	REAR	PRVTE	SW-NE													000	00	
	N					11A			06	0		N	DAY	INJ		PSNGR	CAR		01	DRVR	NONE	19	M	OR-Y	OR<25		016,043	038	27,07			
	N					45 23 1.12	-122 47	15.52																								
																	02	NONE	0	STOP												
																	PRVTE	SW-NE													011	00
																	PSNGR	CAR	01	DRVR	INJC	46	F	OR-Y	OR<25		000	000	000	00		
01561	N	N	N	N	N	03/29/2019	18	SW IBACH ST	INTER	3-LEG	N	Y	CLR	FIX OBJ	01	NONE	9	STRGHT												045	03	
	CITY					FR	0	SW 108TH AVE	CN			STOP SIGN	N	DRY	FIX	N/A	E -W													000	00	
	N					7P			01	0		N	DUSK	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK					000	000	00	
	N					45 21 38.87	-122 47	15.39																								
04694	N	N	N			08/01/2017	17	SW LEVETON DR	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	9	STRGHT													29	
	NONE					TU	0	SW 108TH AVE	W			STOP SIGN	N	DRY	REAR	N/A	W -E													000	00	
	N					5P			06	0		N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK					000	000	00	
	N					45 23 9.64	-122 47	15.67																								
																	02	NONE	9	STOP												
																	N/A	W -E													011	00
																	PSNGR	CAR	01	DRVR	NONE	00	Unk	UNK					000	000	00	
07964	N	N	N			11/21/2016	17	SW LEVETON DR	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	9	TURN-L													02	
	NONE					MO	0	SW 108TH AVE	CN			STOP SIGN	N	DRY	TURN	N/A	W -N													000	00	
	N					12P			04	0		N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK					000	000	00	
	N					45 23 9.64	-122 47	15.67																								
																	02	NONE	9	TURN-L												
																	N/A	S -W													000	00
																	PSNGR	CAR	01	DRVR	NONE	00	Unk	UNK					000	000	00	

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

108TH AVE and Intersectional Crashes at 108TH AVE, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020

18 - 20 of 23 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	A	S	ACT	EVENT	CAUSE						
INVEST	E	A	U	I	C	O	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	A	S	ACT	EVENT	CAUSE							
RD DPT	E	L	G	N	H	R	TIME	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED	CAUSE						
UNLOC?	D	C	S	V	L	K	LAT	LONG	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
02490	N	N	N	N	N	05/15/2013	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLD	ANGL-OTH	01 NONE	0	TURN-L					083	02						
CITY						WE	0	SW 108TH AVE	CN		STOP SIGN	N	WET	TURN	PRVTE	S -W							015	00					
N						3P			02	0		N	DAY	INJ	PSNGR CAR			01	DRVR	NONE	56	M	OR-Y	028	000	083	02		
N						45 23	-122 47																						
N						23.110044	15.8194319																						
															02 NONE	0	STRGHT												
															PRVTE		E -W										000	000	00
															PSNGR CAR				01	DRVR	INJA	47	F	OR-Y	000	000	000	00	
02911	N	N	N	N	N	05/23/2014	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLD	ANGL-OTH	01 NONE	0	STRGHT						02						
CITY						FR	0	SW 108TH AVE	CN		STOP SIGN	N	DRY	TURN	PRVTE	W -E							000	00					
N						3P			04	0		N	DAY	INJ	PSNGR CAR			01	DRVR	INJC	30	F	OR-Y	000	000	000	00		
N						45 23 23.11	-122 47																						
N						15.82																							
															01 NONE	0	STRGHT												
															PRVTE		W -E										000	000	00
															PSNGR CAR				02	PSNG	NO<5	04	F	000	000	000	00		
															01 NONE	0	STRGHT												
															PRVTE		W -E										000	000	00
															PSNGR CAR				03	PSNG	INJC	07	F	000	000	000	00		
															02 NONE	0	TURN-L												
															PRVTE		S -W										015	000	02
															PSNGR CAR				01	DRVR	NONE	27	M	OR-Y	028	000	000	02	
01117	N	N	N	N	N	03/02/2015	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	S-STRGHT	01 NONE	0	STRGHT						07						
CITY						MO	0	SW 108TH AVE	CN		UNKNOWN	N	DRY	REAR	PRVTE	E -W							000	00					
N						4P			02	0		N	DAY	INJ	PSNGR CAR			01	DRVR	INJC	30	F	OR-Y	043	000	000	07		
N						45 23 23.11	-122 47																						
N						15.82																							
															02 NONE	0	STRGHT												
															PRVTE		E -W										006	000	00
															PSNGR CAR				01	DRVR	INJC	42	F	OR-Y	000	000	000	00	
															02 NONE	0	STRGHT												
															PRVTE		E -W										006	000	00
															PSNGR CAR				02	PSNG	INJC	08	M	000	000	000	00		
01086	N	N	N	N	N	02/17/2016	17	SW TUALATIN RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01 NONE	9	TURN-L						02						
NONE						WE	0	SW 108TH AVE	CN		STOP SIGN	N	WET	TURN	N/A	S -W							000	00					
N						6P			04	0		N	DUSK	PDO	PSNGR CAR			01	DRVR	NONE	00	Unk	UNK	000	000	000	00		
N						45 23 23.11	-122 47																						
N						15.82																							

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

108TH AVE and Intersectional Crashes at 108TH AVE, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020

21 - 23 of 23 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	ACT	EVENT	CAUSE																		
INVEST	E	A	U	I	C	O	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFERD	WTHR	CRASH	TRLR	QTY	MOVE	A	S												
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED								
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	F#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE		
																02	NONE	9	STRGHT												
																N/A		W -E													
																PSNGR	CAR			01	DRVR	NONE	00	Unk	UNK		000	000		00	
03923	N	N	N	N	N	06/15/2016	17	SW TUALATIN RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE	0	TURN-L												03	
CITY						WE	0	SW 108TH AVE	CN		STOP SIGN	N	WET	TURN		PRVTE		S -W											000	00	
N						2P			04	0		N	DAY	INJ		PSNGR	CAR			01	DRVR	NONE	49	F	OR-Y		021	000		03	
N						45 23 23.11	-122 47	15.82																							
																02	NONE	0	STRGHT												
																PRVTE		W -E												000	00
																PSNGR	CAR			01	DRVR	INJC	46	F	OR-Y		000	000		00	
01097	N	N	N	N	N	02/25/2020	17	SW TUALATIN RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT													02
CITY						TU	0	SW 108TH AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE		W -E												000	00
N						11P			04	0		N	DLIT	INJ		PSNGR	CAR			01	DRVR	NONE	55	M	OR-Y		000	000		00	
N						45 23 23.11	-122 47	15.82																							
																02	NONE	0	TURN-L												
																PRVTE		S -W												015	00
																PSNGR	CAR			01	DRVR	INJC	22	M	OR-Y		028	000		02	

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CITY OF TUALATIN, WASHINGTON COUNTY

**LEVETON DR and Intersectional Crashes at LEVETON DR, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020**

1 - 5 of 23 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE						
INVEST	E	A	U	I	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE						
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	TO	P#	TYPE	INJ	G	E	LICNS	LOC	ERROR	ACT	EVENT	CAUSE		
UNLOC?	D	C	S	V	L	K	LAT	LONG	LOCTN	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE		
04694	N	N	N			08/01/2017	17	SW LEVETON DR	INTER		3-LEG	N	N	CLR	S-1STOP	01 NONE	9	STRGHT											29		
NONE						TU	0	SW 108TH AVE	W			STOP SIGN	N	DRY	REAR	N/A		W -E										000	00		
N						5P			06		0		N	DAY	PDO	PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	00		
N						45 23 9.64	-122 47	15.67																							
																02 NONE	9	STOP											011	00	
																N/A		W -E										000	000	00	
																PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	00		
07964	N	N	N			11/21/2016	17	SW LEVETON DR	INTER		3-LEG	N	N	CLR	ANGL-OTH	01 NONE	9	TURN-L											02		
NONE						MO	0	SW 108TH AVE	CN			STOP SIGN	N	DRY	TURN	N/A		W -N										000	00		
N						12P			04		0		N	DAY	PDO	PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	00		
N						45 23 9.64	-122 47	15.67																							
																02 NONE	9	TURN-L											000	000	00
																N/A		S -W										000	000	00	
																PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	00		
07143	N	N	N	N	N	11/11/2017	17	SW LEVETON DR	ALLEY			N	N	CLD	S-1TURN	01 NONE	9	STRGHT											06,32		
CITY						SA	300	SW 108TH AVE	W		(NONE)	UNKNOWN	N	WET	TURN	N/A		E -W										000	00		
N						6A			08				N	DLIT	PDO	PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	00		
N						45 23 9.65	-122 47	20.16			(02)																				
																02 NONE	9	TURN-L											019	00	
																N/A		E -S										000	000	00	
																PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	00		
<del>01382</del>	<del>I</del>	<del>N</del>	<del>N</del>	<del>N</del>	<del>N</del>	<del>03/14/2015</del>	<del>17</del>	<del>SW LEVETON DR</del>	<del>INTER</del>	<del></del>	<del>3-LEG</del>	<del>N</del>	<del>Y</del>	<del>RAIN</del>	<del>FIX OBJ</del>	<del>01 NONE</del>	<del>0</del>	<del>TURN-L</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>040,062</del>	<del>01</del>		
<del>CITY</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>SA</del>	<del>0</del>	<del>SW 118TH AVE</del>	<del>W</del>	<del></del>	<del></del>	<del>STOP SIGN</del>	<del>N</del>	<del>WET</del>	<del>FIX</del>	<del>PRVTE</del>	<del></del>	<del>S -W</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>015</del>	<del>040,062</del>	<del>00</del>		
<del>N</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>4P</del>	<del></del>	<del></del>	<del>05</del>	<del></del>	<del>0</del>	<del></del>	<del>N</del>	<del>DAY</del>	<del>PDO</del>	<del>PSNGR CAR</del>	<del></del>	<del></del>	<del>01</del>	<del>DRVR</del>	<del>NONE</del>	<del>19</del>	<del>M</del>	<del>OR-Y</del>	<del></del>	<del>047,080,081</del>	<del>000</del>	<del>00</del>	<del>01</del>		
<del>N</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>45 23 6.18</del>	<del>-122 47</del>	<del>56.73</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	
<del>06642</del>	<del>N</del>	<del>N</del>	<del>N</del>	<del></del>	<del></del>	<del>11/03/2015</del>	<del>17</del>	<del>SW LEVETON DR</del>	<del>INTER</del>	<del></del>	<del>3-LEG</del>	<del>N</del>	<del>N</del>	<del>RAIN</del>	<del>S-STRGHT</del>	<del>01 NONE</del>	<del>0</del>	<del>STRGHT</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>07</del>		
<del>NONE</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>TU</del>	<del>0</del>	<del>SW 118TH AVE</del>	<del>W</del>	<del></del>	<del></del>	<del>STOP SIGN</del>	<del>N</del>	<del>WET</del>	<del>REAR</del>	<del>PRVTE</del>	<del></del>	<del>W -E</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>000</del>	<del>00</del>		
<del>N</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>6A</del>	<del></del>	<del></del>	<del>06</del>	<del></del>	<del>0</del>	<del></del>	<del>N</del>	<del>DARK</del>	<del>PDO</del>	<del>PSNGR CAR</del>	<del></del>	<del></del>	<del>01</del>	<del>DRVR</del>	<del>NONE</del>	<del>26</del>	<del>M</del>	<del>OR-Y</del>	<del></del>	<del>042</del>	<del>000</del>	<del>000</del>	<del>07</del>		
<del>N</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>45 23 6.18</del>	<del>-122 47</del>	<del>56.73</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	
<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>02 NONE</del>	<del>0</del>	<del>STRGHT</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>000</del>	<del>000</del>	<del>00</del>	
<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>PRVTE</del>	<del></del>	<del>W -E</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>000</del>	<del>000</del>	<del>00</del>	
<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del>PSNGR CAR</del>	<del></del>	<del></del>	<del>01</del>	<del>DRVR</del>	<del>NONE</del>	<del>00</del>	<del>M</del>	<del>OR-Y</del>	<del></del>	<del>000</del>	<del>000</del>	<del>000</del>	<del>000</del>	<del>00</del>	
<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	

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CITY OF TUALATIN, WASHINGTON COUNTY

**LEVETON DR and Intersectional Crashes at LEVETON DR, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020**

12 - 16 of 23 Crash records shown.

SER#	S	D	M	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	OFFRD	WTHR	CRASH	SPCL USE	MOVE	A	S	ACT	EVENT	CAUSE															
INVEST	E	A	U	I	C	O	D	A	Y	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	RNDBT	SURF	COLL	TRLR QTY	OWNR	FROM	PRTC	INJ	G	E	LICNS	PED											
RD DPT	E	L	G	N	H	R	T	M	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	DRVBY	LIGHT	SVRTY	V#	TYPE	TO	F#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE						
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVBY	LIGHT	SVRTY	V#	TYPE	TO	F#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE								
01479	Y	N	N						03/22/2012	17	SW LEVETON DR	CURVE			SNOW	FIX OBJ	01 NONE	0													059,054	01					
									TH	255	SW 118TH AVE	W			SNO	FIX	PRVTE			W-E										088	059,054,124	00					
									11P			08			DLIT	PDO	PSNGR CAR				01	DRVR	NONE	25	M	OR-Y					047,080,081	017	01				
									45 23																												
									5.5072383																												
00094	N	N	N						01/07/2011	16	LEVETON DR	INTER			RAIN	S-1STOP	01 NONE	0																			
									FR	0	124TH AVE	N			WET	REAR	PRVTE			N-S													000	00			
									10A			06	0		DAY	PDO	PSNGR CAR				01	DRVR	NONE	52	M	OR-Y					016,026	038	27				
									45 23																												
									5.680052		14.943782																										
																	02 UNKN	0		STOP													011	00			
																	PRVTE			N-S													000	00			
																	PSNGR CAR				01	DRVR	NONE	54	F	OR-Y								000	00		
02441	N	N	N						04/27/2017	16	SW LEVETON DR	INTER			CLR	S-1STOP	01 NONE	0																			
									TH	0	124TH AVE	N			DRY	REAR	PRVTE			N-S														000	00		
									8A			06	0		DAY	INJ	PSNGR CAR				01	DRVR	NONE	69	M	OR-Y					026	000	29				
									45 23 5.63																												
									14.95																												
																	02 NONE	0		STOP																	
																	PRVTE			N-S														012	00		
																	PSNGR CAR				01	DRVR	INJC	35	F	OR-Y							000	000	00		
04377	N	N	N						N 07/19/2017	16	SW LEVETON DR	INTER			CLR	S-1STOP	01 NONE	0																			
									WE	0	124TH AVE	N			DRY	REAR	PRVTE			N-S																000	00
									7A			06	0		DAY	INJ	PSNGR CAR				01	DRVR	NONE	24	M	OR-Y					043	000	07				
									45 23 5.63																												
									14.95																												
																	02 NONE	0		STOP																	
																	PRVTE			N-S															011	00	
																	PSNGR CAR				01	DRVR	INJC	51	F	OR-Y							000	000	00		
																	02 NONE	0		STOP																	
																	PRVTE			N-S															011	00	
																	PSNGR CAR				02	PSNG	INJB	19	F								000	000	00		
05935	N	N	N						11/12/2019	16	SW LEVETON DR	INTER			RAIN	S-1STOP	01 NONE	9																			
									TU	0	124TH AVE	N			WET	REAR	N/A			N-S														000	00		
									8A			06	0		DAY	PDO	PSNGR CAR				01	DRVR	NONE	00	Unk	UNK							000	000	00		
									45 23 5.63																												
									14.95																												
																	02 NONE	9		STOP																	
																	N/A			N-S														011	00		
																	PSNGR CAR				01	DRVR	NONE	00	Unk	UNK							000	000	00		

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

LEVETON DR and Intersectional Crashes at LEVETON DR, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020

17 - 21 of 23 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	ACT	EVENT	CAUSE																			
INVEST	E	A	U	I	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE	A	S												
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED									
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE			
04719	N	N	N	N		12/22/2020	16	SW LEVETON DR	INTER	CROSS	N	N	N	CLR	S-1STOP	01	NONE	9	STRGHT											29		
NONE						TU	0	124TH AVE	N			TRF SIGNAL	N	DRY	REAR	N/A		N -S											000	00		
N						12P			06	0			N	DAY	PDO	PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000		000	00	00		
N						45 23 5.63	-122 48	14.95																								
																02	NONE	9	STOP										011	00		
																N/A		N -S										000	000	00		
																PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000		000	00	00		
02597	N	N	N	N		05/23/2018	16	SW LEVETON DR	INTER	CROSS	N	N	N	CLR	S-1STOP	01	NONE	9	STRGHT											27,07		
CITY						WE	0	124TH AVE	E			TRF SIGNAL	N	DRY	REAR	N/A		E -W											000	00		
N						5P			06	0			N	DAY	PDO	PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000		000	00	00		
N						45 23 5.63	-122 48	14.95																								
																02	NONE	9	STOP										011	00		
																N/A		E -W										000	000	00	00	
																PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000		000	00	00		
04159	Y	N	N	N		08/16/2019	16	SW LEVETON DR	INTER	CROSS	N	N	N	CLR	OVERTURN	01	NONE	0	TURN-L											01		
CITY						FR	0	124TH AVE	E			TRF SIGNAL	N	DRY	NCOL	PRVTE		N -E											000	00		
N						6P			05	0			N	DAY	INJ	TRUCK			01	DRVR	INJB	25	M	OTH-Y		047		000	00	01		
N						45 23 5.63	-122 48	14.95																								
<del>06999</del>	<del>N</del>	<del>N</del>	<del>N</del>	<del>N</del>		<del>11/19/2015</del>	<del>16</del>	<del>SW LEVETON DR</del>	<del>INTER</del>	<del>CROSS</del>	<del>N</del>	<del>N</del>	<del>N</del>	<del>RAIN</del>	<del>O-1 L-TURN</del>	<del>01</del>	<del>NONE</del>	<del>0</del>	<del>STRGHT</del>											<del>02</del>		
<del>CITY</del>						<del>TH</del>	<del>0</del>	<del>124TH AVE</del>	<del>CN</del>			<del>TRF SIGNAL</del>	<del>N</del>	<del>WET</del>	<del>TURN</del>	<del>PRVTE</del>		<del>S -N</del>											<del>000</del>	<del>00</del>		
<del>N</del>						<del>7A</del>			<del>04</del>	<del>0</del>			<del>N</del>	<del>DAY</del>	<del>INJ</del>	<del>PSNGR CAR</del>			<del>01</del>	<del>DRVR</del>	<del>INJC</del>	<del>45</del>	<del>F</del>	<del>OR-Y</del>		<del>000</del>		<del>000</del>	<del>00</del>	<del>00</del>		
<del>N</del>						<del>45 23 5.63</del>	<del>-122 48</del>	<del>14.95</del>																								
																02	NONE	0	TURN-L											000	00	
																PRVTE		N -E											000	00		
																PSNGR CAR			01	DRVR	NONE	58	M	OR-Y		004,028		000	00	02		
05424	N	N	N	N		10/04/2019	16	SW LEVETON DR	INTER	CROSS	N	N	N	RAIN	ANGL-OTH	01	NONE	0	STRGHT											04		
NO RPT						FR	0	124TH AVE	CN			TRF SIGNAL	N	WET	TURN	PRVTE		W -E											000	00		
N						11A			04	0			N	DAY	INJ	PSNGR CAR			01	DRVR	INJC	57	M	OR-Y		020		000	00	04		
N						45 23 5.63	-122 48	14.95																								
																02	NONE	0	TURN-L										000	00		
																PRVTE		S -W											000	00		
																PSNGR CAR			01	DRVR	INJC	63	F	OR-Y		000		000	00	00		

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

LEVETON DR and Intersectional Crashes at LEVETON DR, City of Tualatin, Washington County, 01/01/2011 to 12/31/2020

22 - 23 of 23 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE				
INVEST	E	A	U	I	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	A	S	PED	ERROR	ACT	EVENT	CAUSE				
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE		
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE
01884	N	N	N				04/15/2019	16	SW LEVETON DR	INTER	CROSS	N	N	CLR	O-1 L-TURN	01 NONE	9	TURN-L									02		
NO RPT							MO	0	124TH AVE	CN		TRF SIGNAL	N	DRY	TURN	N/A		N-E								000	00		
N							2P			04	0		N	DAY	PDO	PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	
N							45 23 5.63	-122 48 14.95																					
																02 NONE	9	STRGHT									000	000	00
																N/A		S -N											
																PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	
06169	Y	N	N				N N 10/20/2015	17	SW LEVETON DR	STRGHT	(NONE)	UNKNOWN	Y	CLD	FIX OBJ	01 NONE	0	STRGHT								040,062	01		
CITY							TU	150	124TH AVE	E	(NONE)	UNKNOWN	N	DRY	FIX	PRVTE		E -W								000	040,062	00	
Y							3P			08			N	DAY	INJ	SEMI TRK			01	DRVR	INJC	28	M	OR-Y		047,080,081	000	01	
N							45 23 5.57	-122 48 12.24			(02)																		

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OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

**HERMAN RD at 108TH AVE, City of Tualatin, Washington County, 01/01/2016 to 12/31/2020**

1 - 2 of 2 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	ACT	EVENT	CAUSE																	
INVEST	E	A	U	I	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE	A	S	LOC	ERROR	ACT	EVENT	CAUSE					
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED							
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
00130	N	N	N				01/07/2020	17	SW HERMAN RD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE	9	STRGHT											29
NONE							TU	0	SW 108TH AVE	NE		TRF SIGNAL	N	WET	REAR	N/A		NE-SW											000	00
N							4P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000		000		00
N							45 23 1.12	-122 47 15.52									02	NONE	9	STOP									011	00
																	N/A		NE-SW										000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000		000		00
06105	N	N	N				N N 09/11/2016	17	SW HERMAN RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	0	STRGHT											27,07
CITY							SU	0	SW 108TH AVE	SW		TRF SIGNAL	N	DRY	REAR		PRVTE		SW-NE										000	00
N							11A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		016,043		038		27,07
N							45 23 1.12	-122 47 15.52									02	NONE	0	STOP									011	00
																	PRVTE		SW-NE										000	00
																	PSNGR CAR		01	DRVR	INJC	46	F	OR-Y		000		000		00

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.



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APPENDIX G.  
**IN-PROCESS**



lancaster  
**moblely**

## Tualatin Logistics Park

### Transportation Impact Analysis

### Tualatin, Oregon

Date:

December 15, 2021

Prepared for:

Peter Skei, Specht Development, Inc.

Prepared by:

Nick Mesler, EIT

Jennifer Danziger, PE



## Site Trips

### Trip Generation

To estimate trips that will be generated by the redevelopment, trip rates from the *Trip Generation Manual*<sup>1</sup> were used based on the number of existing driving range tees, number of golf holes, and the proposed square footage.

#### Existing Site Development

The site is currently occupied by Tualatin Island Greens Golf Center and Grill. The golf facilities include a driving range and an 18-hole miniature golf course. The driving range includes 43 tees with synthetic mats for year-round use and additional grass tees available in the spring and summer. These facilities are open from 9:00 AM to 8:00 PM, September through March, and from 9:00 AM to 9:00 PM, April through August. The site also includes a restaurant with hours from 10:30 to 6:30 PM, September through March, and 10:30 AM to 7:30 PM, April 9:00 AM to 8:00 PM from September to March through August.

Trip generation was estimated based on the golf facilities; the restaurant is assumed to be used primarily by the golfing customers. Trip data for both types of golf facilities are limited; therefore, the following assumptions were made to estimate trips for the site:

- The trip data for the miniature golf land use code (ITE LUC 431) is limited to a single survey during the weekday PM peak period. No activity is assumed during the morning peak hour. The weekday PM peak hour trip rate is very low and may vary over the year with more activity during summer months and less during winter months. However, we suggest that credit for the facility should be included in the trip generation for the site. No daily data is available; therefore, the weekday rate was assumed to be 10 times the daily rate.
- The trip data for a driving range (ITE LUC 432) is limited to a single survey for the morning and weekday periods but has seven surveys for the weekday PM peak period. While the driving range does not open until 9:00 AM, retail and maintenance staff need to be on site before 9:00 AM. Two of the ITE survey sites also had staff data available with counts of 14 and 15 employees. Additionally, food service deliveries also typically occur in the morning. Therefore, the morning peak hour trips were included in the trip generation estimates. Trip estimates were prepared based on the 43 year-round tees.

One of the concerns that was raised about prior trip generation estimates is that the golf site peaks may occur later than the peaks of the street traffic or the peaks of industrial development. To acknowledge this may be the case for the traffic study, a 20 percent discount in peak hour trips is proposed.

The resulting trip generation is presented in Table 3.

---

<sup>1</sup> Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

**Table 3: Trip Generation Summary – Existing Land Uses**

Land Use	ITE Code	Size	AM Peak Hour			PM Peak Hour			Weekday Total
			In	Out	Total	In	Out	Total	
Driving Range	432	43 Tees	10	7	17	24	30	54	586
Miniature Golf	431	18 Holes	0	0	0	2	4	6	60
<i>20% Discount for Offset Peak Hour</i>			-2	-1	-3	-5	-7	-12	-130
<b>Total</b>			<b>8</b>	<b>6</b>	<b>14</b>	<b>21</b>	<b>27</b>	<b>48</b>	<b>516</b>

**Proposed Site Development**

Specht Properties, Inc. proposes to redevelop the site with a single industrial building enclosing 452,795 SF of gross floor area with 115 dock doors and 4 grade doors. As proposed, the site includes 197 parking spaces and 133 trailer parking spaces. Some accessory office space is included in the building layout.

The proposed development is speculative with flexible space that could accommodate a single tenant or multiple tenants. Specht has developed similar properties in the Portland metropolitan area. The locations, sizes, and tenant descriptions are attached to this memorandum, each with a recent photo of the site. The sites range from a single 290,000-SF building to three buildings totaling more than 733,000 SF. Only two of the sites have any manufacturing tenants and a portion of those operations are warehousing and distribution. Of the total 1.87 million SF of space, approximately 18 percent is leased to tenants whose operations include manufacturing.

A range of potential industrial land use assumptions was considered to estimate the trip generation for the site. Trip estimates were lowest for ITE LUC 154, High-Cube Transload and Short-Term Storage Warehouse, and highest for LUC 110, General Light Industrial, and LUC 156, High-Cube Parcel Hub Warehouse. Table 4 summarizes the total and truck trip generation for the range of industrial uses.

While the original traffic scoping suggested a mix of 85 percent warehouse and 15 percent manufacturing based on the available site parking, a much more conservative assumption of general light industrial is assumed for this TIA. A parcel hub warehouse would generate the same number of trips but with a substantially different directional distribution from other industrial uses. The truck trip generation of general light industrial is slightly lower than other uses; however, the variation in the number of trucks generated during the peak hours for the industrial uses is small and the percentage of overall site-generated traffic is very low. Truck percentages for the trip generation were compared with those on the existing roadway and were found to be very similar to the truck percentages on the adjacent roadways.



Table 4: Trip Generation Summary – Potential Industrial Land Uses

Land Use	ITE Code	AM Peak Hour			PM Peak Hour			Weekday Total	Employee Equivalent*
		In	Out	Total	In	Out	Total		
<b>Total Vehicle Trips based on 452,795 SF Industrial Building</b>									
General Light Industrial	110	295	40	335	41	253	294	2,206	636
Manufacturing	140	234	74	308	104	231	335	2,150	1,022
Warehousing	150	59	18	77	23	59	82	774	125
High-Cube Transload and Short-Term Storage Warehouse	154	28	8	36	13	32	45	634	NA
High-Cube Fulfillment Center Warehouse - Non-Sort	155	55	13	68	28	44	72	820	487
High-Cube Parcel Hub Warehouse	156	159	158	317	197	93	290	2,096	NA
<b>Truck Trips based on 452,795 SF Industrial Building</b>									
General Light Industrial	110	3	2	5	3	3	5	114	-
Manufacturing	140	8	6	14	6	8	14	204	-
Warehousing	150	5	4	9	7	7	14	272	-
High-Cube Transload and Short-Term Storage Warehouse	154	4	5	9	2	3	5	100	-
High-Cube Fulfillment Center Warehouse - Non-Sort	155	5	5	9	2	3	5	104	-
High-Cube Parcel Hub Warehouse	156	NA	NA	41	NA	NA	27	262	-

\* Estimated as average number of employees needed to generate the equivalent number of vehicle trips based on KSF

**Total Site Trip Generation**

Table 5 summarizes the estimated net trip generation of the site with the assumptions discussed above.

Table 5: Trip Generation Summary (Warehousing)

Land Use	AM Peak Hour			PM Peak Hour			Weekday Total
	In	Out	Total	In	Out	Total	
Existing Land Use	-8	-6	-14	-21	-27	-48	-516
Proposed Land Use	295	40	335	41	253	294	2,206
Net Increase	287	34	321	20	227	246	1,690

The trip generation calculations show that the Tualatin Logistics site assuming general light industrial for the site is projected to generate an additional 321 net trips during the morning peak hour, 246 net trips during the evening peak hour, and 1,690 net trips during the average weekday.



## Trip Distribution and Assignment

The directional distribution of site trips to/from the project site is necessary to identify intersections to be included in the study area of the TIA. The following trip distribution was estimated based on the locations of likely trip destinations and locations of major transportation facilities in the site vicinity:

- Approximately 30 percent of site trips will travel to/from the south along SW 124<sup>th</sup> Avenue
- Approximately 20 percent of site trips will travel to/from the west along SW Tualatin-Sherwood Road
- Approximately 30 percent of site trips will travel to/from the east along SW Tualatin-Sherwood Road
- Approximately 5 percent of site trips will travel to/from the north along SW Cipole Road
- Approximately 15 percent of site trips will travel to/from the north along SW 124<sup>th</sup> Avenue

Trip distribution at the site accesses will depend on the location and configuration of the accesses.

### **Access Scenario 1**

With the first scenario assuming an access on SW 124<sup>th</sup> Avenue at the southeast corner of the site and an access on SW Cipole Road, the split of traffic between the two accesses is assumed to be 50 percent at each access. A detailed illustration of the distribution for this scenario was presented in the scoping memorandum, which has been included in Appendix A.

The resulting trip assignment is shown in Figure 2.

### **Access Scenario 2**

With the second scenario assuming a limited access on SW 124<sup>th</sup> Avenue at the northeast corner of the site, the split of traffic is assumed to be 65 to 70 percent using the SW Cipole Road access while 30 to 35 percent using the limited access at SW 124<sup>th</sup> Avenue. A detailed illustration of the distribution for this scenario was presented in the scoping memorandum, which has been included in Appendix A.

The resulting trip assignment is shown in Figure 3.

### **Access Scenario 3**

With the third scenario assuming a full access on SW 124<sup>th</sup> Avenue at the northeast corner of the site, the split of traffic is assumed to be approximately 65 percent using the SW Cipole Road access and 35 percent using the access on SW 124<sup>th</sup> Avenue.

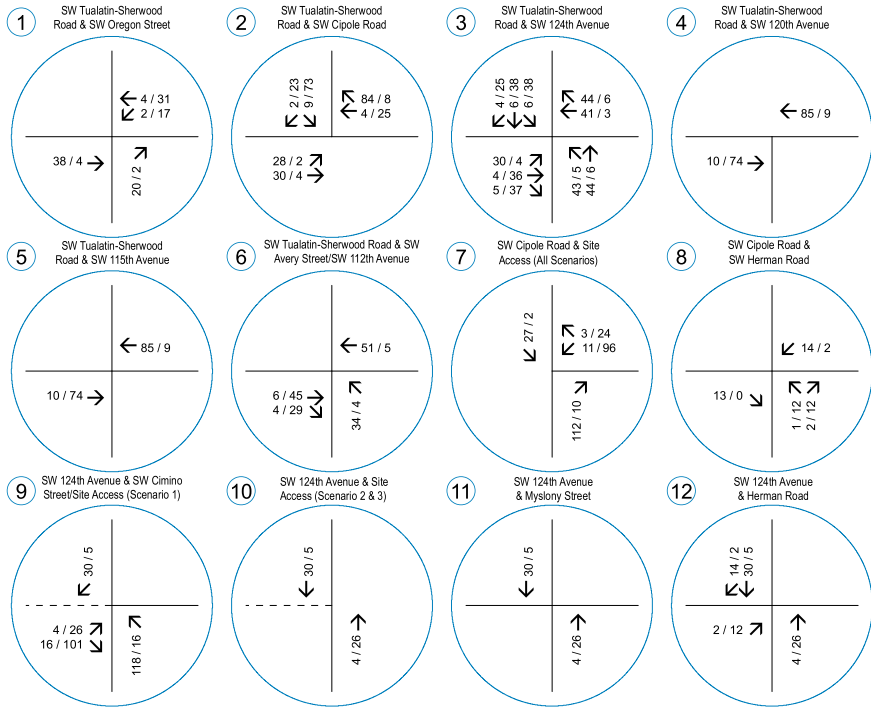
The resulting trip assignment is shown in Figure 4.

### **Access Scenario 4**

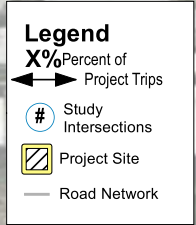
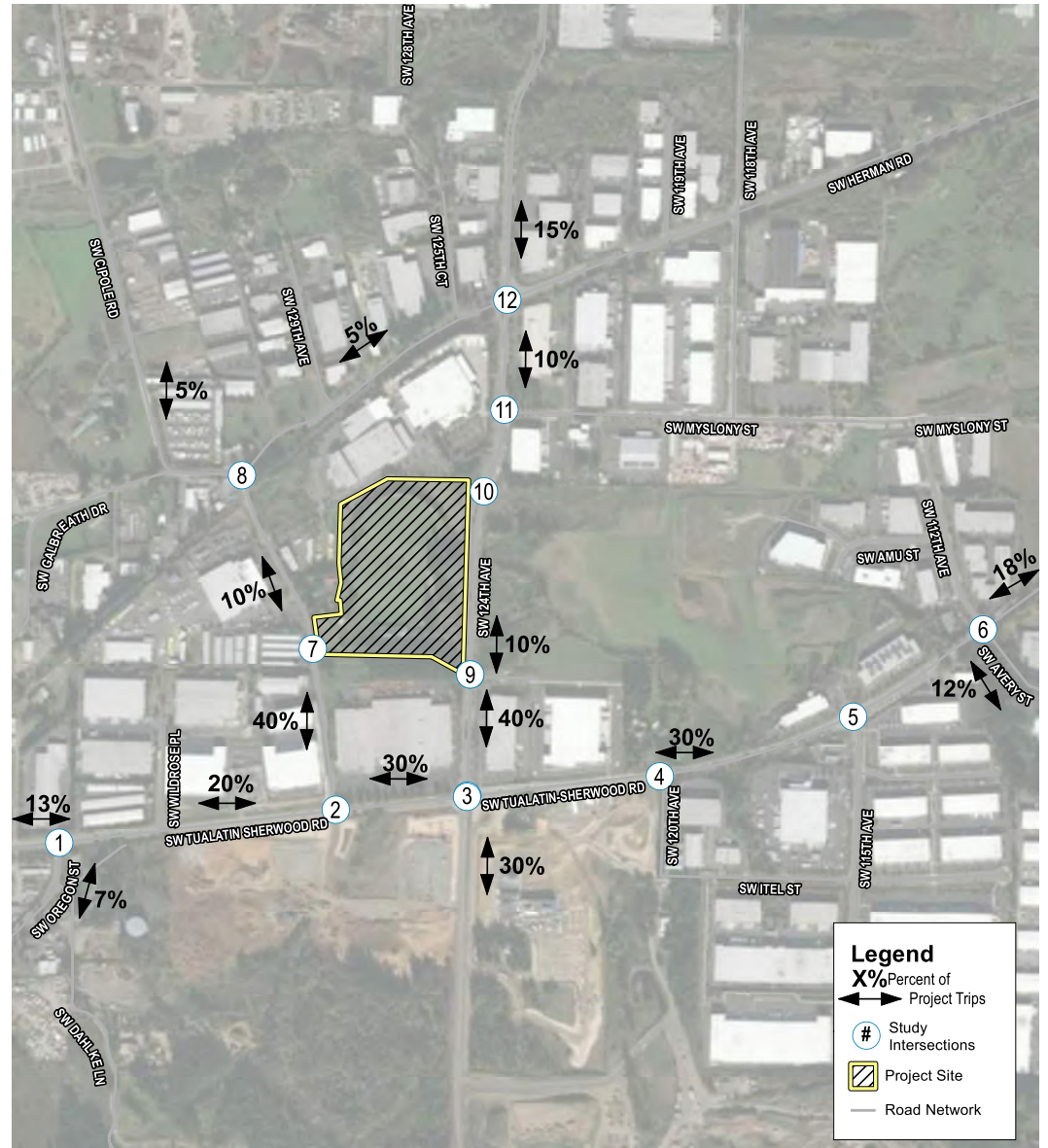
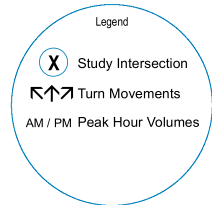
The fourth scenario assumes a full access on SW 124<sup>th</sup> Avenue at the southeast corner of the site and a limited access on SW 124<sup>th</sup> Avenue at the northeast corner of the site. The split of traffic is assumed to be approximately 35 percent using the SW Cipole Road access, 35 percent using the access on SW 124<sup>th</sup> Avenue opposite SW Cimino Street, and 30 percent using the limited access at the northeast corner of the site.

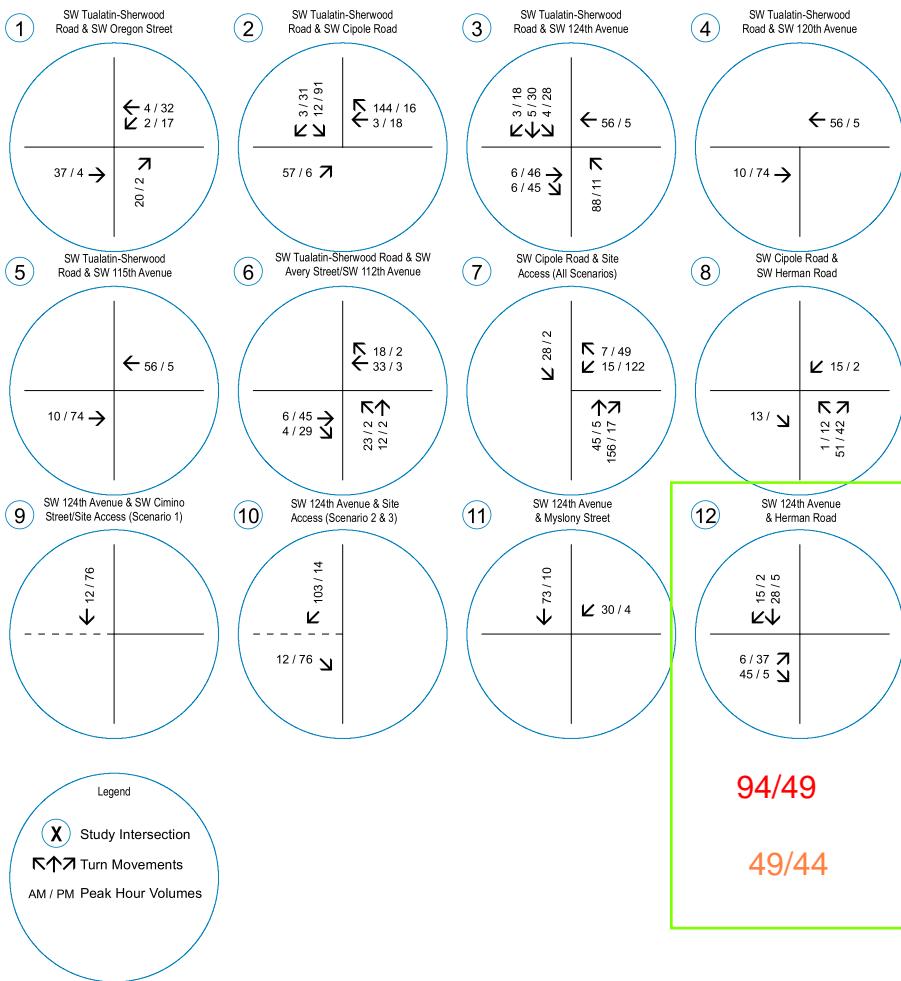
The resulting trip assignment is shown in Figure 5.



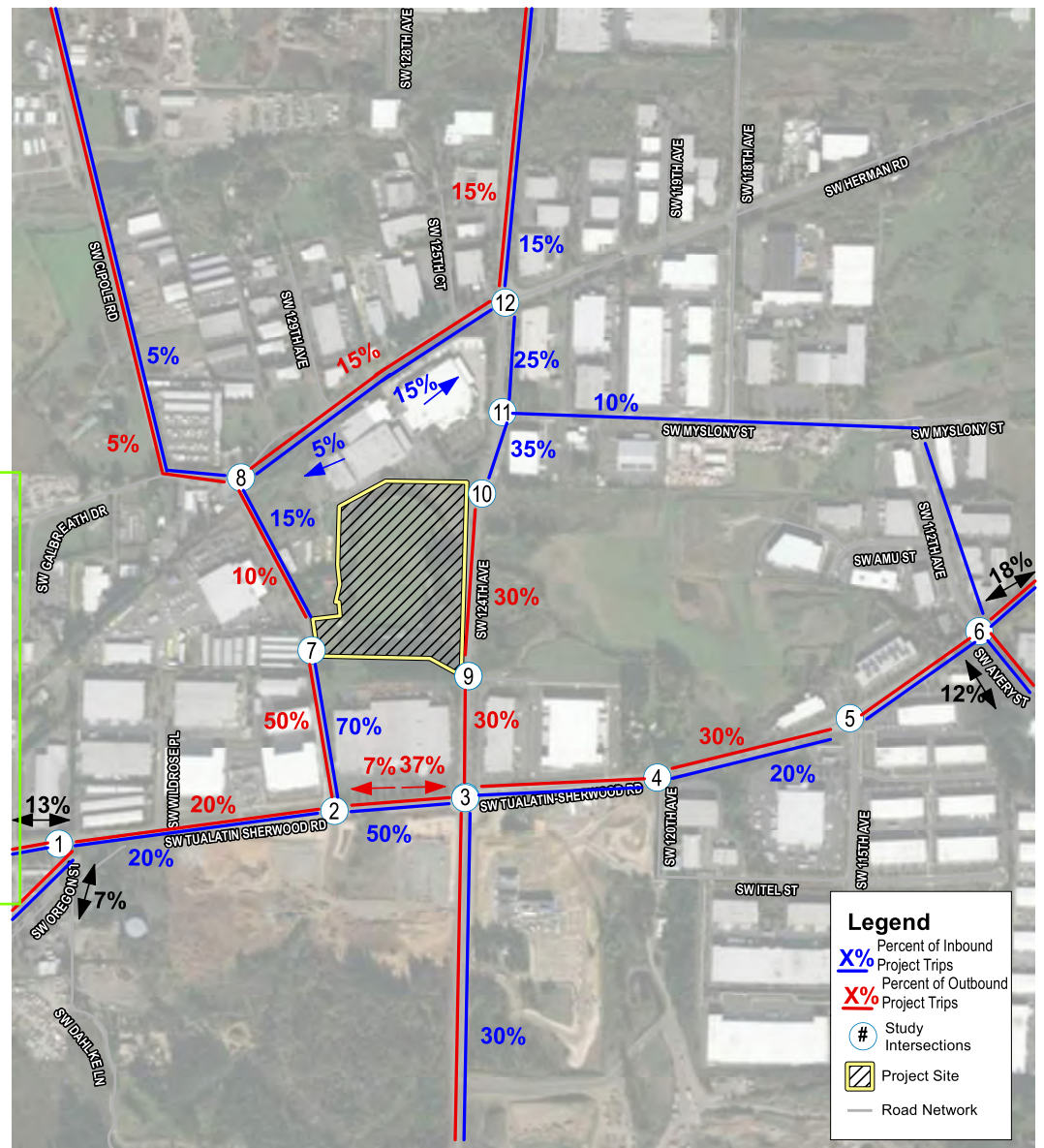


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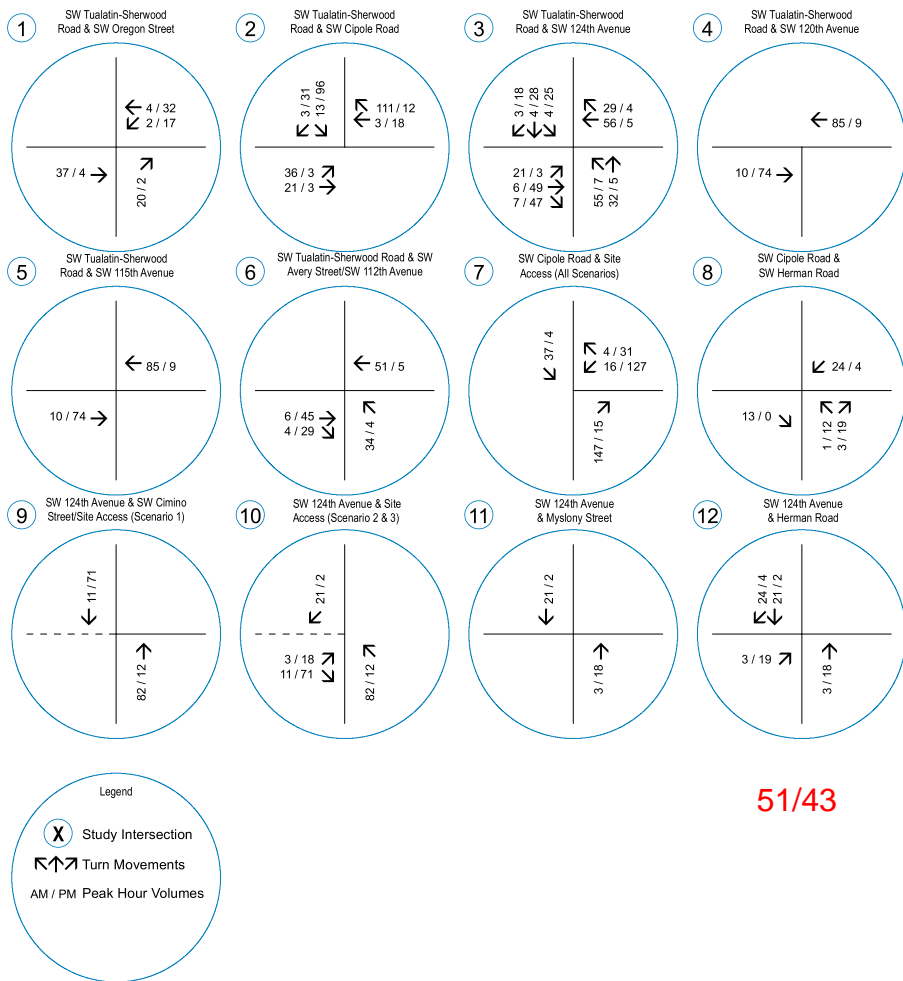




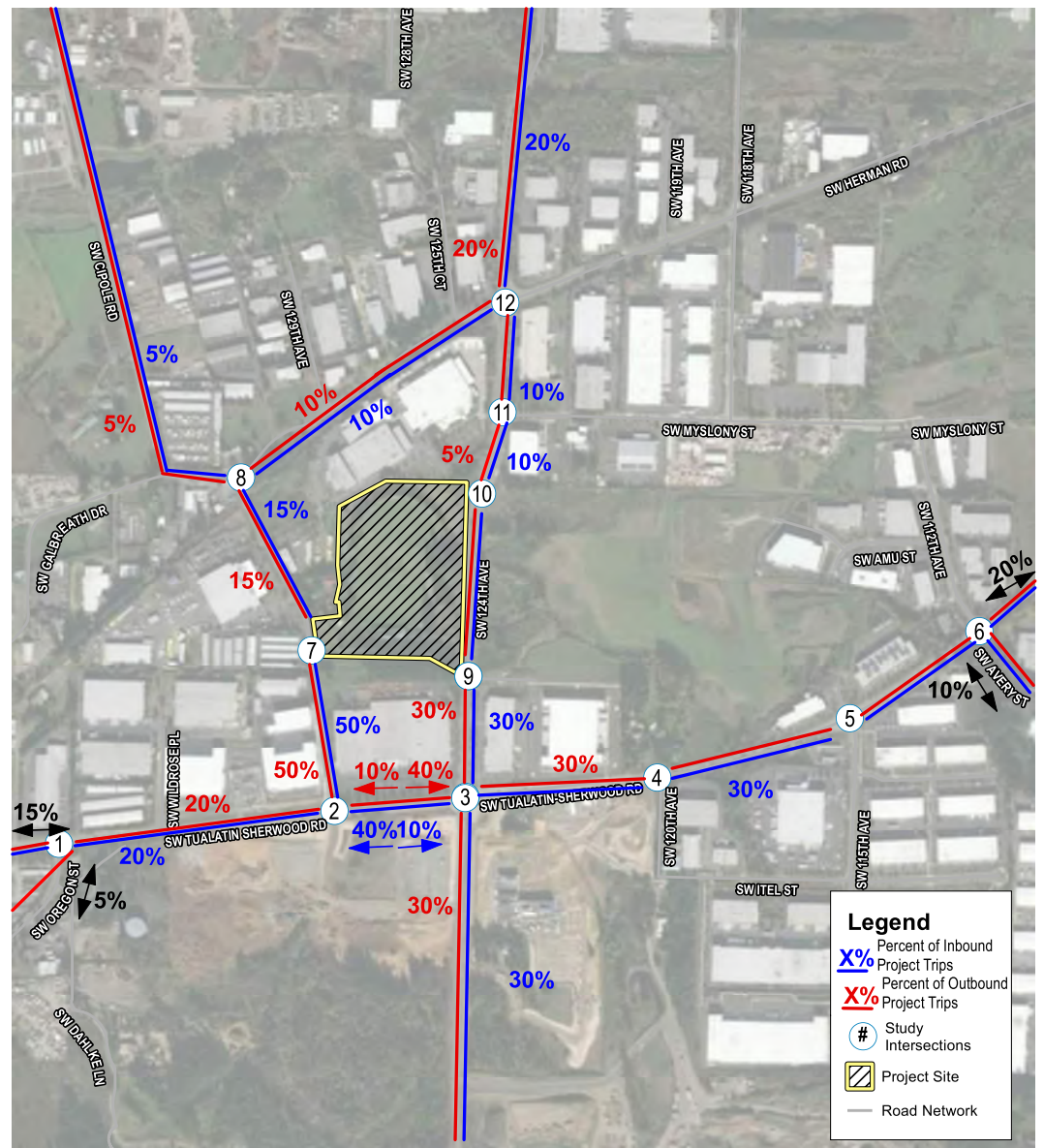
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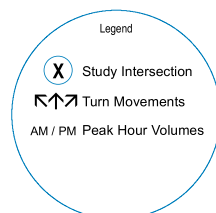
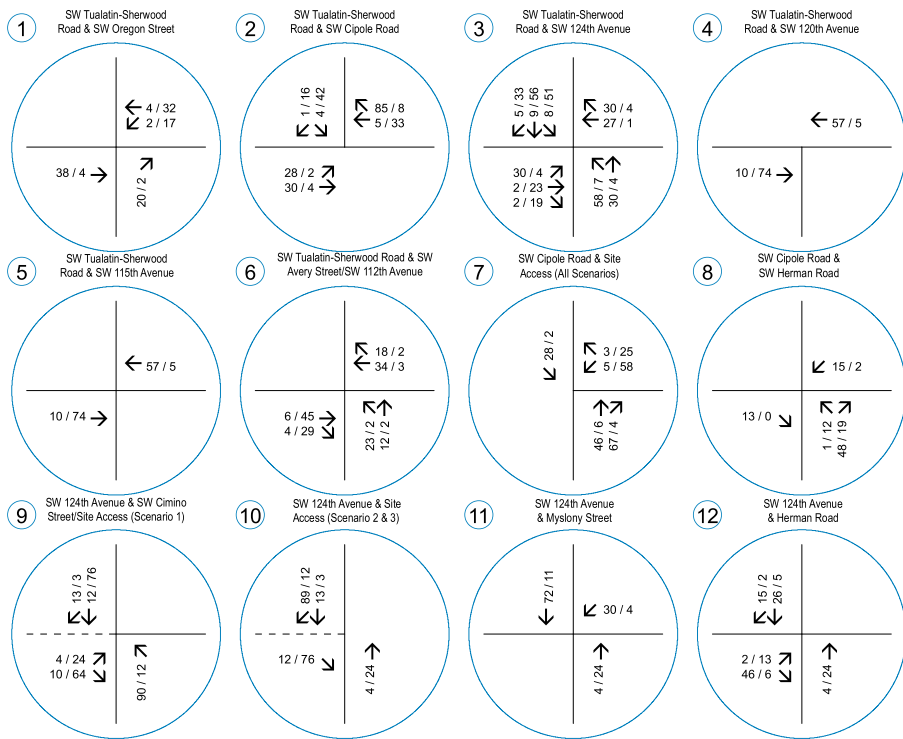




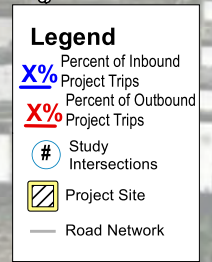
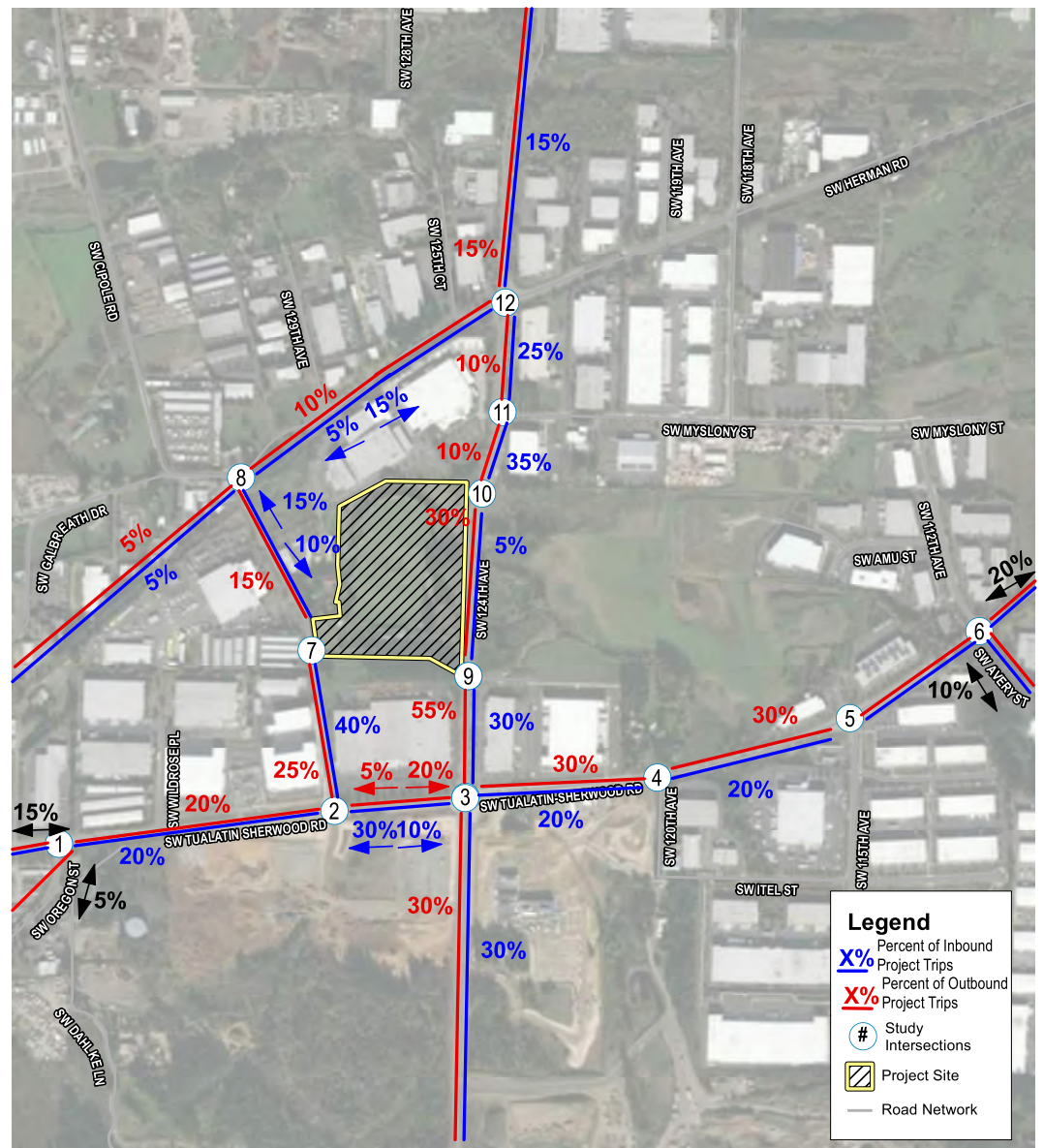


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93/50  
37/44







**Lu Pacific Development**  
Transportation Impact Study  
Tualatin, Oregon



Date:  
August 31, 2020

Prepared for:  
Angela Qi  
Lu Pacific Properties, LLC

Prepared by:  
Daniel Stumpf, PE  
Terrington Smith, EIT

## Site Trips

### Trip Generation

#### Total Trips

The proposed Lu Pacific Development will include the construction of two industrial buildings totaling approximately 131,600 square-feet, where approximately 40 percent of the square-footage will be dedicated as manufacturing and approximately 60 percent as warehouse. To estimate the number of trips that will be generated by the proposed development, trip rates from the *Trip Generation Manual*<sup>1</sup> were used. Specifically, data from land use codes 140, *Manufacturing*, and 150, *Warehousing*, were used based on the square-footage of the gross building floor area.

The trip generation calculations show that the proposed development is projected to generate 46 morning peak hour trips, 50 evening peak hour trips, and 344 average weekday trips. The trip generation estimates for the proposed development are summarized in Table 3. Detailed trip generation calculations are included in the technical appendix to this report.

Table 3: Trip Generation Summary (Proposed Development)

	ITE Code	Size/Rate	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Manufacturing	140	52,600 SF	25	8	33	11	24	35	206
Warehouse	150	79,000 SF	10	3	13	4	11	15	138
<b>Total</b>			<b>35</b>	<b>11</b>	<b>46</b>	<b>15</b>	<b>35</b>	<b>50</b>	<b>344</b>

Although the aforementioned land uses reflect what the applicant is proposing for development, City of Tualatin staff have requested that analysis be based using trip generation data from land use code 110, *General Light Industrial*. The reason for using this land use code is to reflect potential, conservative impacts to the transportation system which may occur due to a high traffic generating tenant(s) that could lease space within the proposed development.

Utilizing data from land use code 110, based on the square-footage of the gross building floor area, the proposed development could generate up to 92 morning peak hour trips, 83 evening peak hour trips, and 652 average weekday trips. The trip generation estimates for the proposed development, using data from land use code 110, are summarized in Table 4. Detailed trip generation calculations are included in the technical appendix to this report.

<sup>1</sup> Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10<sup>th</sup> Edition, 2017.

Table 4: Trip Generation Summary (Based on Land Use Code 110)

	ITE Code	Size/Rate	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
<b>General Light Industrial</b>									
Total Trips	110	131,600 SF	81	11	92	11	72	83	652
Truck Trips	-	20%	16	2	18	2	15	17	130
Standard Vehicle Trips	-	-	65	9	74	9	57	66	522

For the remainder of this study, analyses are performed based on the trip generation presented in Table 4.

### Truck Trips

Per the *Trip Generation Handbook*<sup>2</sup>, relevant data pertaining to truck trip generation is provided for land use codes 130, *Industrial Park*, 150, *Warehousing*, and 152, *High-Cube Warehouse/Distribution Center*. For land use code 130, truck trips accounted for an average of approximately 13 percent of site trips generated, while for code 150 were approximately 20 percent of site trips were considered truck trips. For land use code 152, the majority of truck trips generated were noted to typically occur during off-peak hours, but on average would account for between 9 to 29 percent of peak hour traffic. No specific data pertaining to manufacturing or general light industrial uses is available.

For the purposes of simplicity, it is assumed that approximately 20 percent of the total site trip generation may consist of truck trips. Accordingly, the proposed development is projected to generate 18 morning peak hour truck trips, 17 evening peak hour truck trips, and 130 average weekday truck trips, based on land use code 110. See Table 4 for details regarding the truck trip generation.

Given the surrounding site vicinity is predominately industrial in character, the nearby transportation system was constructed accordingly to best serve the needs of existing and future industrial development. As such, it is expected that a significant majority of truck trips would utilize SW Herman Road, SW Teton Avenue, and SW Tualatin Road to access the major transportation corridors of SW Tualatin-Sherwood Road and SW 124<sup>th</sup> Avenue. From SW Tualatin-Sherwood Road and SW 124<sup>th</sup> Avenue, access to regional transportation facilities, such as SW Pacific Highway, Interstate 5, and Interstate 205, are available.

<sup>2</sup> Institute of Transportation Engineers (ITE), *Trip Generation Handbook*, 3<sup>rd</sup> Edition, 2014.

## Trip Distribution

Based on correspondence and input from City of Tualatin staff, the following trip distribution was estimated and used for analysis:

### Standards Vehicle Trips

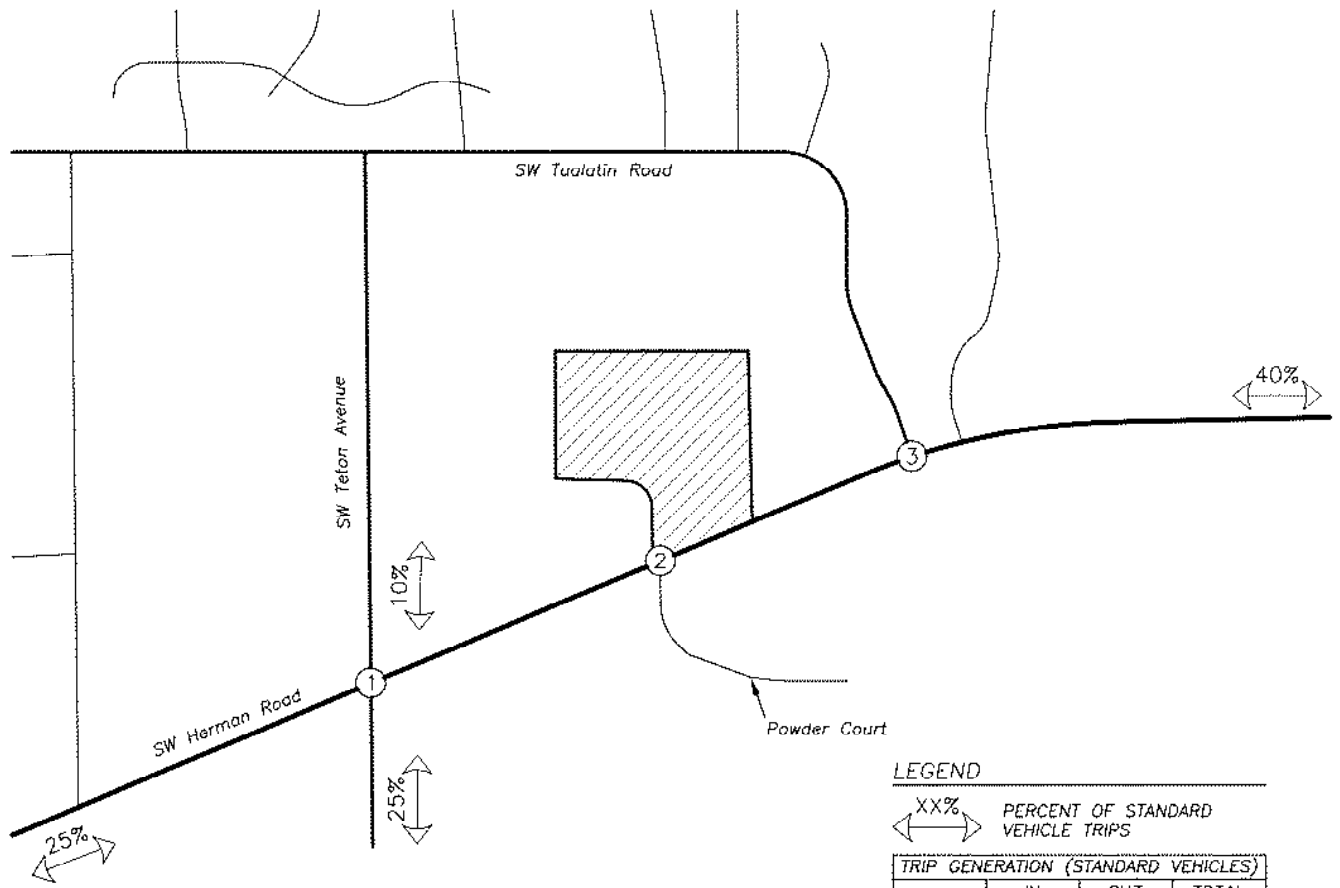
- Approximately 40 percent of site trips will travel to/from the east along SW Herman Road;
- Approximately 25 percent of site trips will travel to/from the west along SW Herman Road;
- Approximately 25 percent of site trips will travel from the south along SW Teton Avenue; and
- Approximately 10 percent of site trips will travel to the north along SW Teton Avenue.

### Truck Trips

- Approximately 35 percent of site trips will travel to/from the east along SW Herman Road;
- Approximately 30 percent of site trips will travel to/from the west along SW Herman Road;
- Approximately 30 percent of site trips will travel from the south along SW Teton Avenue; and
- Approximately 5 percent of site trips will travel to the north along SW Teton Avenue.

The trip distribution and assignment for the site trips generated by the proposed development during the morning and evening peak hours is shown in Figure 2 through Figure 4. Figure 2 presents site trip assignment for standard vehicles, Figure 3 presents site trip assignment for trucks, and Figure 4 presents site trip assignment for the total trips generated.

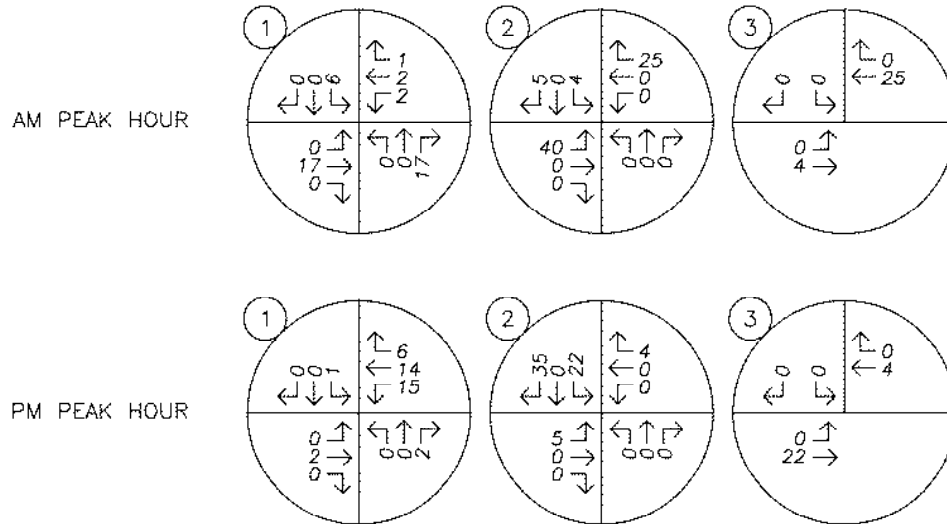




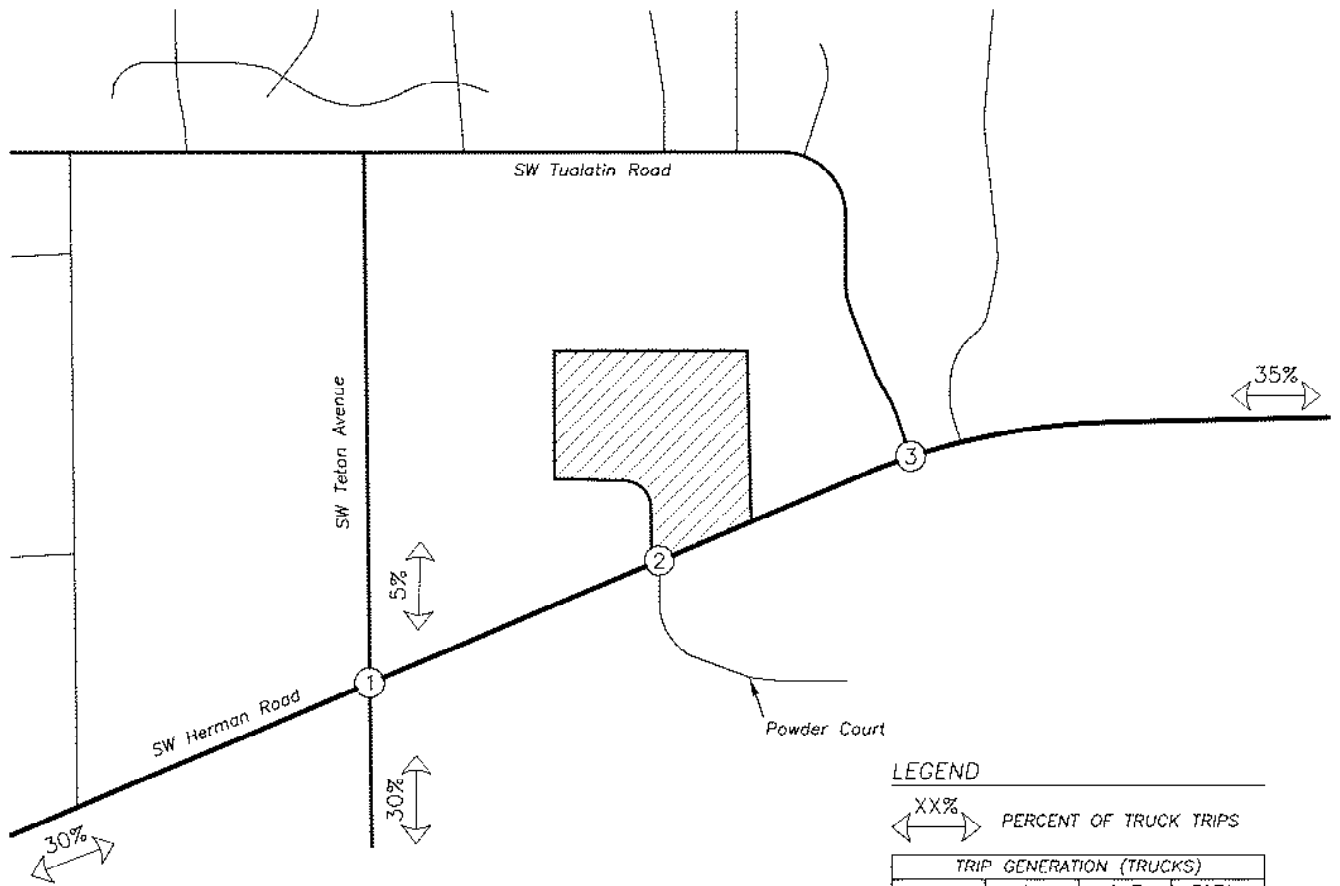
**LEGEND**

XX% PERCENT OF STANDARD VEHICLE TRIPS

TRIP GENERATION (STANDARD VEHICLES)			
	IN	OUT	TOTAL
AM	65	9	74
PM	9	57	66



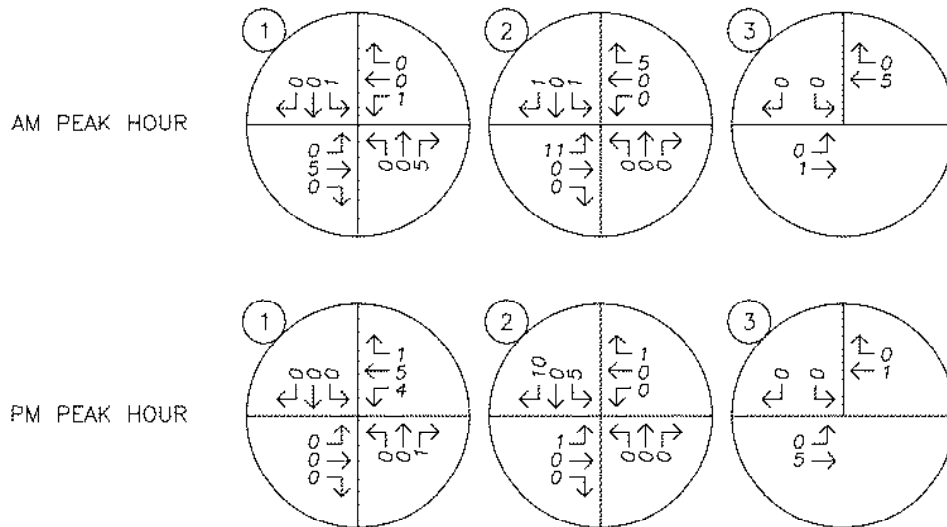
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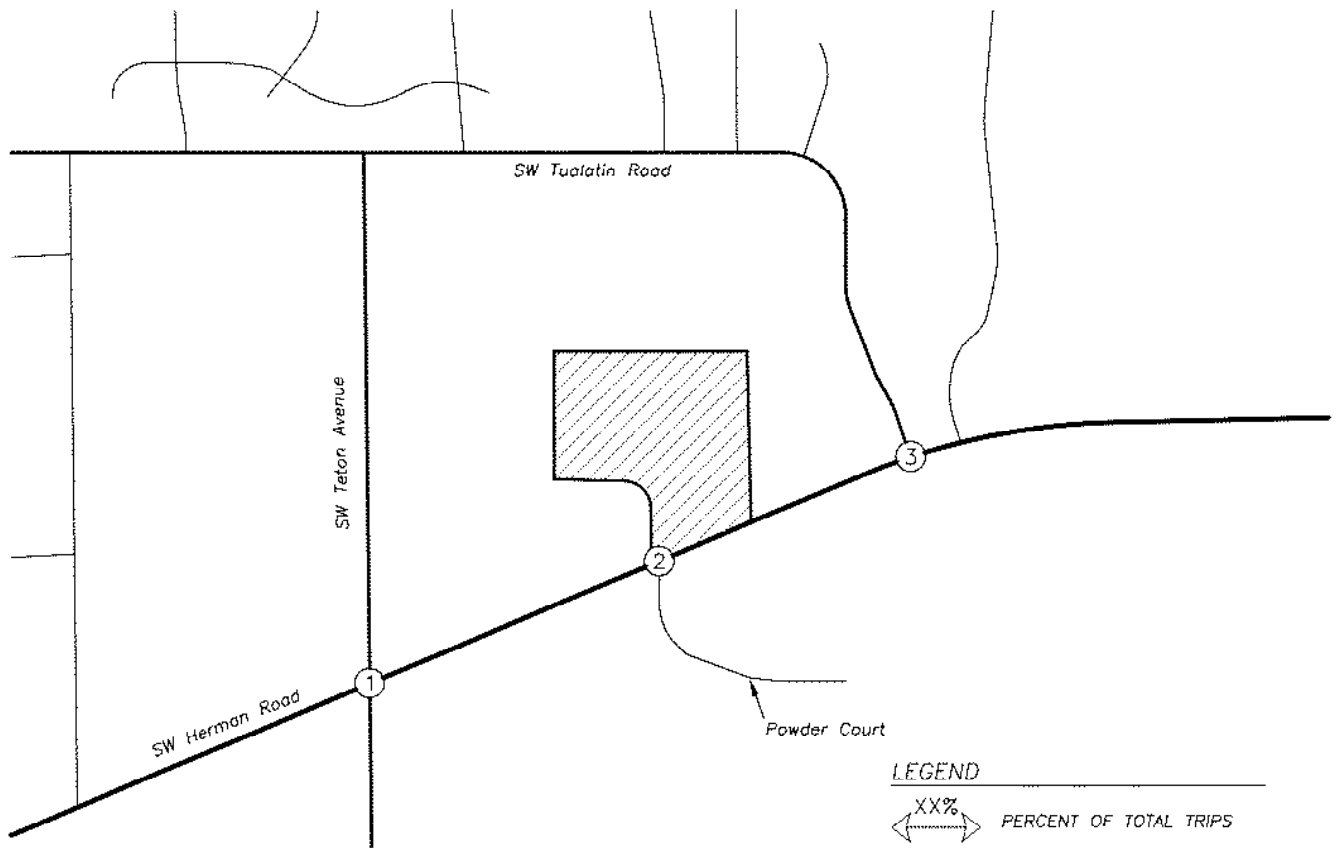


**LEGEND**

XX% PERCENT OF TRUCK TRIPS

TRIP GENERATION (TRUCKS)			
	IN	OUT	TOTAL
AM	16	2	18
PM	2	15	17

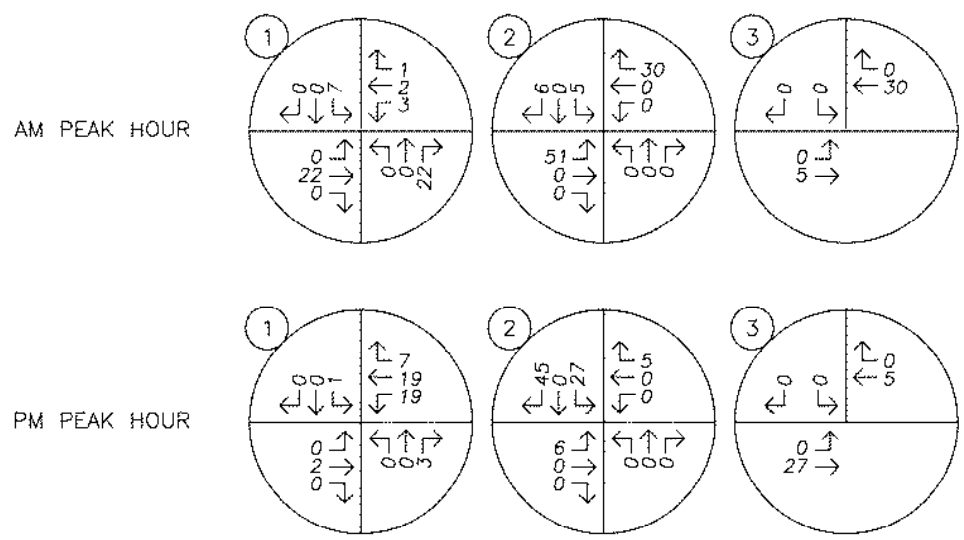




**LEGEND**

XX% PERCENT OF TOTAL TRIPS

TRIP GENERATION (TOTAL)			
	IN	OUT	TOTAL
AM	81	11	92
PM	11	72	83





lancaster  
**moble**

# Hedges Creek Industrial Transportation Impact Study Tualatin, Oregon

Date:  
January 6, 2022

Prepared for:  
Sarah Every  
Phelan Development

Prepared by:  
Daniel Stumpf, PE



RENEWS: 6/30/2022



## Site Trips

### Trip Generation

The proposed Hedges Creek Industrial development will include the construction of three industrial buildings, totaling approximately 442,035 square feet, where approximately 40 percent of the development will consist of manufacturing land uses while the remaining 60 percent will consist of warehousing space. To estimate the number of trips that will be generated by the proposed use, trip rates from the *Trip Generation Manual*<sup>1</sup> were used. Specifically, data from land use codes 140, *Manufacturing*, and 150, *Warehousing*, were used based on the square-footage of the gross building floor area.

The trip generation calculations show that the proposed use is projected to generate a total of 165 morning peak hour trips, 179 evening peak hour trips, and 1,294 average weekday trips. Of these trips, the proposed use is projected to generate 10 morning peak hour truck trips, 13 evening peak hour truck trips, and 240 average weekday truck trips. The trip generation estimates associated with the proposed development are summarized in Table 3 and detailed trip generation calculations are included in the appendix.

**Table 3: Trip Generation Summary**

	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
<b>Total Trip Generation</b>									
Manufacturing	140	176,814 SF	91	29	120	41	90	131	840
Warehousing	150	265,221 SF	35	10	45	13	35	48	454
Total Trips		442,035 SF	126	39	165	54	125	179	1,294
<b>Truck Trip Generation</b>									
Manufacturing	140	176,814 SF	3	2	5	2	3	5	80
Warehousing	150	265,221 SF	3	2	5	4	4	8	160
Total Trips		442,035 SF	6	4	10	6	7	13	240
<b>Passenger Vehicle Trip Generation</b>									
Manufacturing	140	176,814 SF	88	27	115	39	87	126	760
Warehousing	150	265,221 SF	32	8	40	9	31	40	294
Total Trips		442,035 SF	120	35	155	48	118	166	1,054

<sup>1</sup> Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11<sup>th</sup> Edition, 2021.

## Trip Distribution

The directional distribution of site trips to/from the project site was estimated based on the locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and existing travel patterns at the study intersections. Based on correspondence with City of Tualatin staff and their consulting transportation engineer, the following trip distribution was confirmed and utilized:

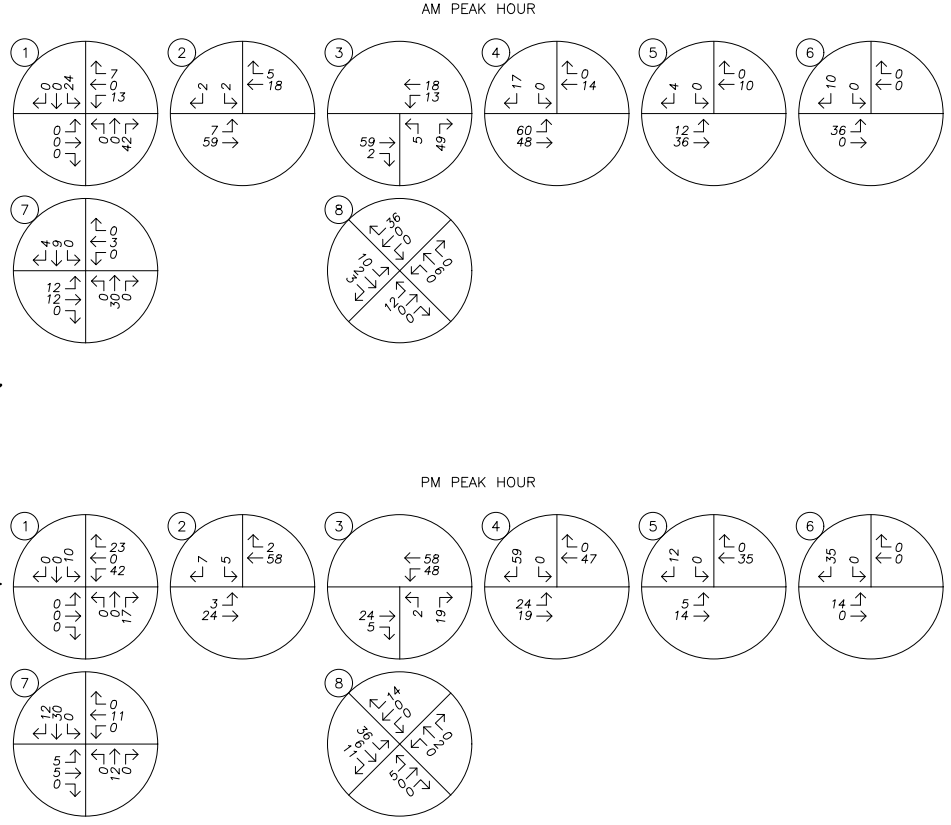
- Approximately 30 percent of site trips will travel to/from the east along SW Tualatin-Sherwood Road;
- Approximately 25 percent of site trips will travel to/from the south along SW 124<sup>th</sup> Avenue (via SW Myslony Street);
- Approximately 20 percent of site trips will travel to/from the west along SW Tualatin-Sherwood Road (split distribution between SW 124<sup>th</sup> Avenue/SW Myslony Street and SW 112<sup>th</sup> Avenue);
- Approximately 20 percent of site trips will travel to/from the north along SW 124<sup>th</sup> Avenue (via Myslony); and
- Approximately 5 percent of site trips will travel to/from the east along SW Avery Street.

Based on the site plan layout, site trip as assumed to utilize the site access driveways as follows:

2. West Truck Access at SW Myslony Street:
  - Approximately 25 percent of truck trips will utilize this access.
  - Approximately 10 percent of passenger vehicle trips will utilize this access.
4. West General Access at SW Myslony Street:
  - Approximately 50 percent of passenger vehicle trips will utilize this access.
5. East Truck Access at SW Myslony Street:
  - Approximately 75 percent of truck trips will utilize this access.
  - Approximately 10 percent of passenger vehicle trips will utilize this access.
6. East General Access at SW Myslony Street:
  - Approximately 30 percent of passenger vehicle trips will utilize this access.

The trip distribution and assignment for the site trips generated during the morning and evening peak hours is shown in the following figures:

- Figure 3 – Passenger Vehicle Trips
- Figure 4 – Truck Trips
- Figure 5 – Total Trips



**LEGEND**

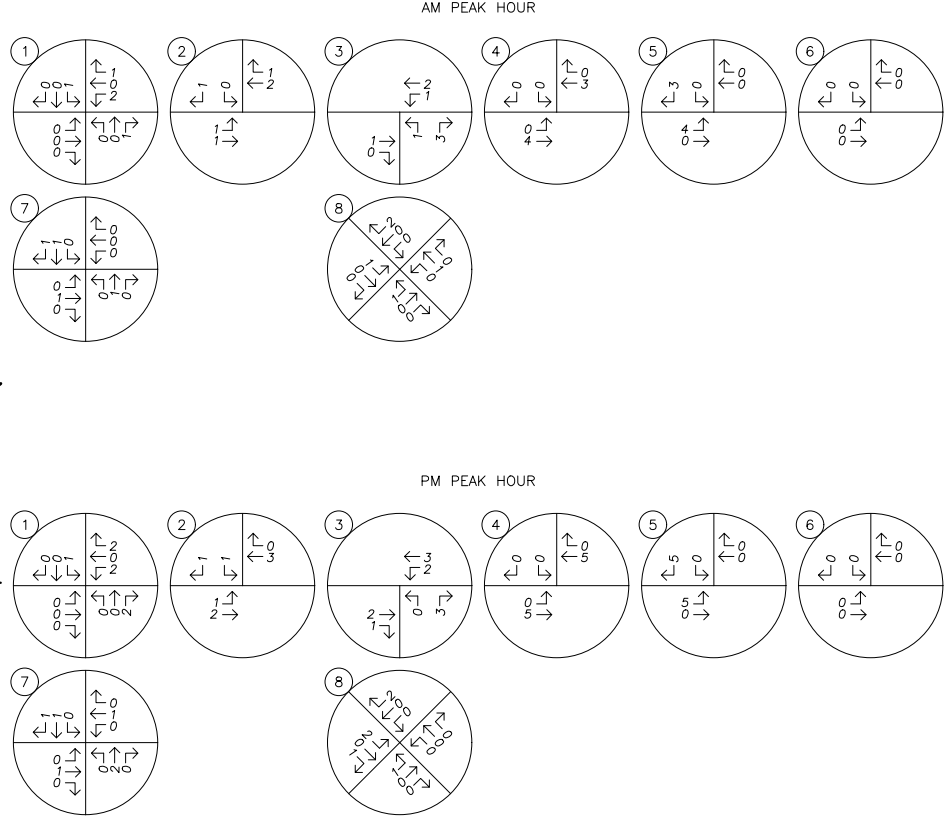
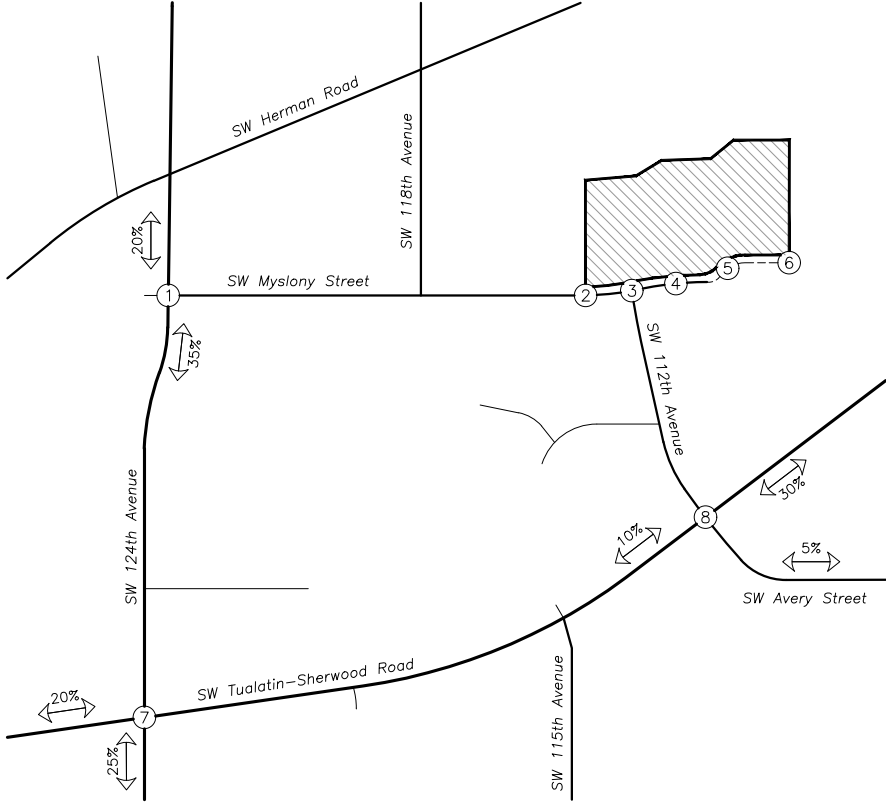
XX% PERCENT OF PROJECT TRIPS

	IN	OUT	TOTAL
AM	120	35	155
PM	48	118	166



**SITE TRIP DISTRIBUTION & ASSIGNMENT**

Proposed Development Plan - Passenger Vehicle Trips  
AM & PM Peak Hours



**LEGEND**

XX% PERCENT OF PROJECT TRIPS

TRUCK TRIP GENERATION			
	IN	OUT	TOTAL
AM	6	4	10
PM	6	7	13



**SITE TRIP DISTRIBUTION & ASSIGNMENT**

Proposed Development Plan - Truck Trips

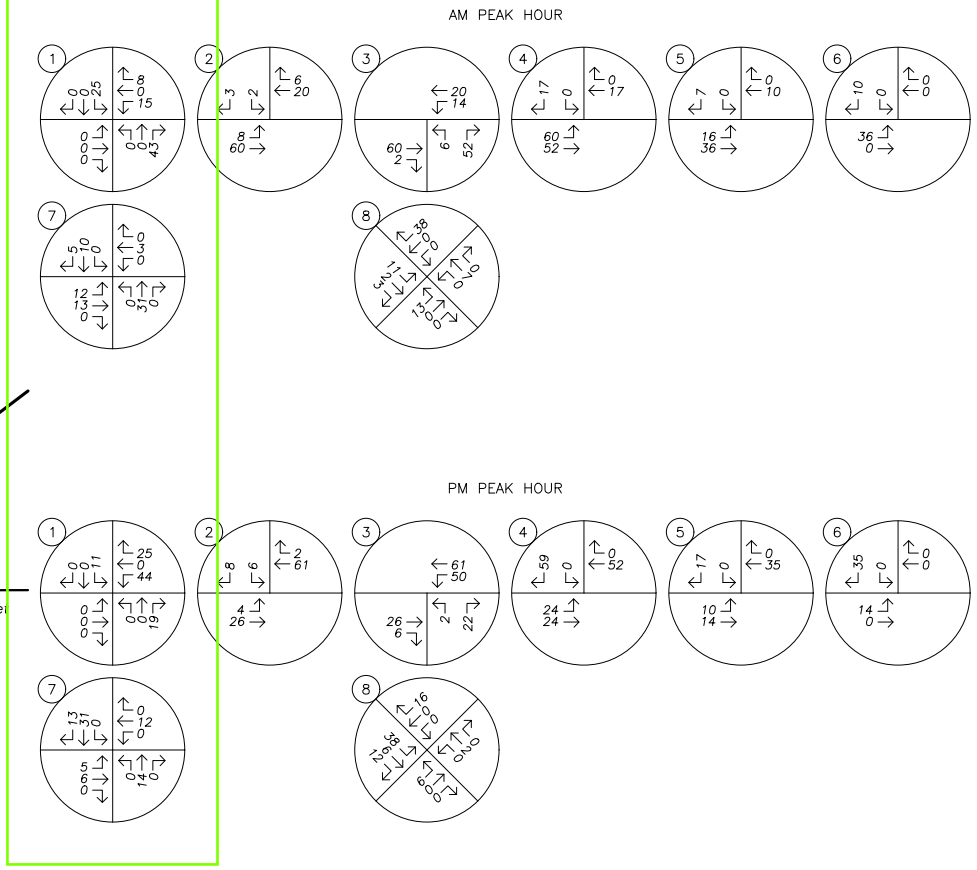
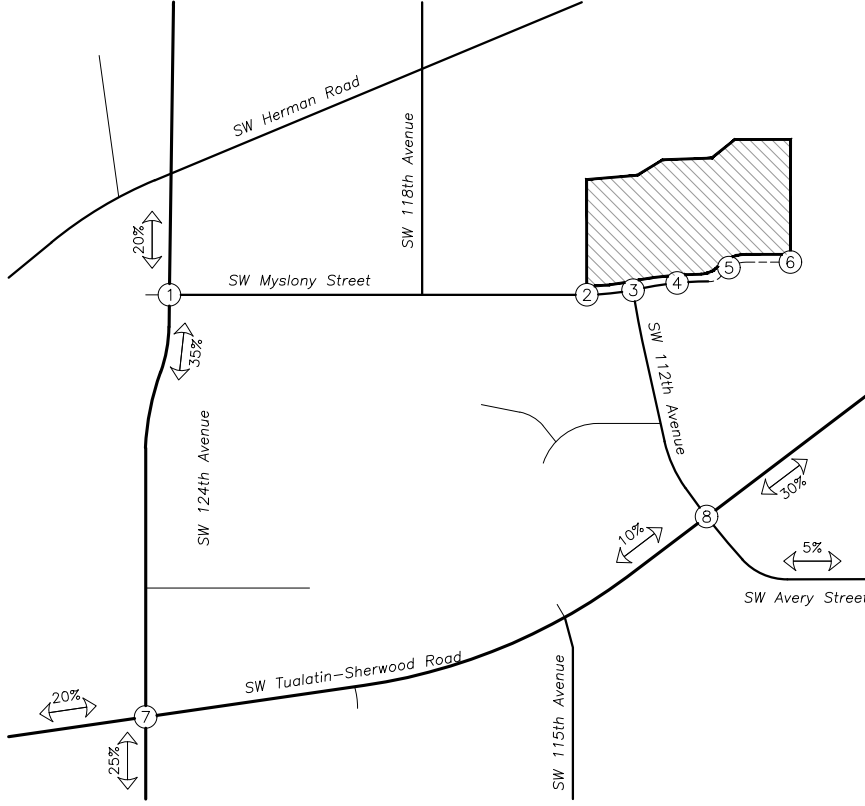
AM & PM Peak Hours

Figure 4

Hedges Creek Industrial

1/6/2022





**LEGEND**

XX% PERCENT OF PROJECT TRIPS

TOTAL TRIP GENERATION			
	IN	OUT	TOTAL
AM	126	39	165
PM	54	125	179




---

APPENDIX H.  
**SIGNAL  
INFORMATION**

LEGEND


CONTROLLERS

 Retain and protect existing 332 cabinet


POLES


 Retain and protect existing traffic signal mast arm pole

 Retain and protect existing traffic signal mast arm pole with luminaire arm extension


 Retain and protect existing traffic signal mast arm


 Retain and protect existing luminaire arm


 Remove and relocate existing pedestrian signal pedestal with frangible base

 Remove and relocate existing pedestrian signal pedestal with frangible base


SIGNALS


 Retain and protect existing phase (PH=phase) vehicle signal

 Retain and protect existing pedestrian signal, pushbutton and instructions

 Install phase (PH=phase) vehicle signal


 Remove and relocate existing phase (PH=phase) vehicle signal


 Remove and relocate existing pedestrian signal, pushbutton and instructions

 Reinstall existing phase (PH=phase) vehicle signal

 Reinstall existing pedestrian signal, pushbutton and instructions


SIGNS

 Retain and protect existing aluminum sign

 Retain and protect existing street name sign


LEGEND CONTINUED

CABINETS

 Retain and protect existing remote power source

 Retain and protect existing service cabinet


 Retain and protect existing meter base


 Retain and protect existing terminal cabinet

JUNCTION BOXES


 Retain and protect existing junction box


 Remove existing junction box

 Install 22"x12"x12" (min. dimension) precast concrete junction box


 Install 30"x17"x12" (min. dimension) precast concrete junction box with concrete apron


VIDEO DETECTION


 Video detection zone for phase (PH).


 Retain and protect existing video detection camera


WIRES

 Retain and protect existing wiring

 Remove existing wiring


 Reinstall existing wiring

 Install (N=number) No. 12 type THWN (Pedestrian signal system common)


 Install (N=number) No. (G=AWG wire size) type THWN wires


LEGEND CONTINUED


CONDUITS

 Retain and protect existing electrical conduit


 Abandon existing electrical conduit

 Install (S=size) inch electrical conduit

 Interconnect conduit (See Interconnect Plan)


 Splice new electrical conduit to existing electrical conduit


FIRE PREEMPTION

 Retain and protect existing fire preemption detector

MISCELLANEOUS

 Retain and protect existing high pressure sodium luminaire

 Retain and protect existing photoelectric control

 Install crosswalk closure barricades with signs (both sides of barricade)

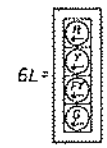
SIGNAL MOUNTING OPTIONS

B = Adjustable bracket assembly w/rain cap(s) (Install 1" metallic chase nipple in lieu of tenon when required for wiring)

SIGNAL HEAD TYPES

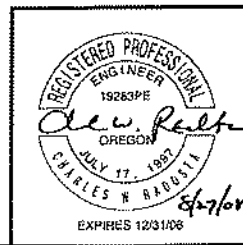
Z = 12" R, 12" Y, 12" G

GL = 12" GLTA, 12" YLTA, 12" FYLTA, 12" GLTA

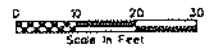
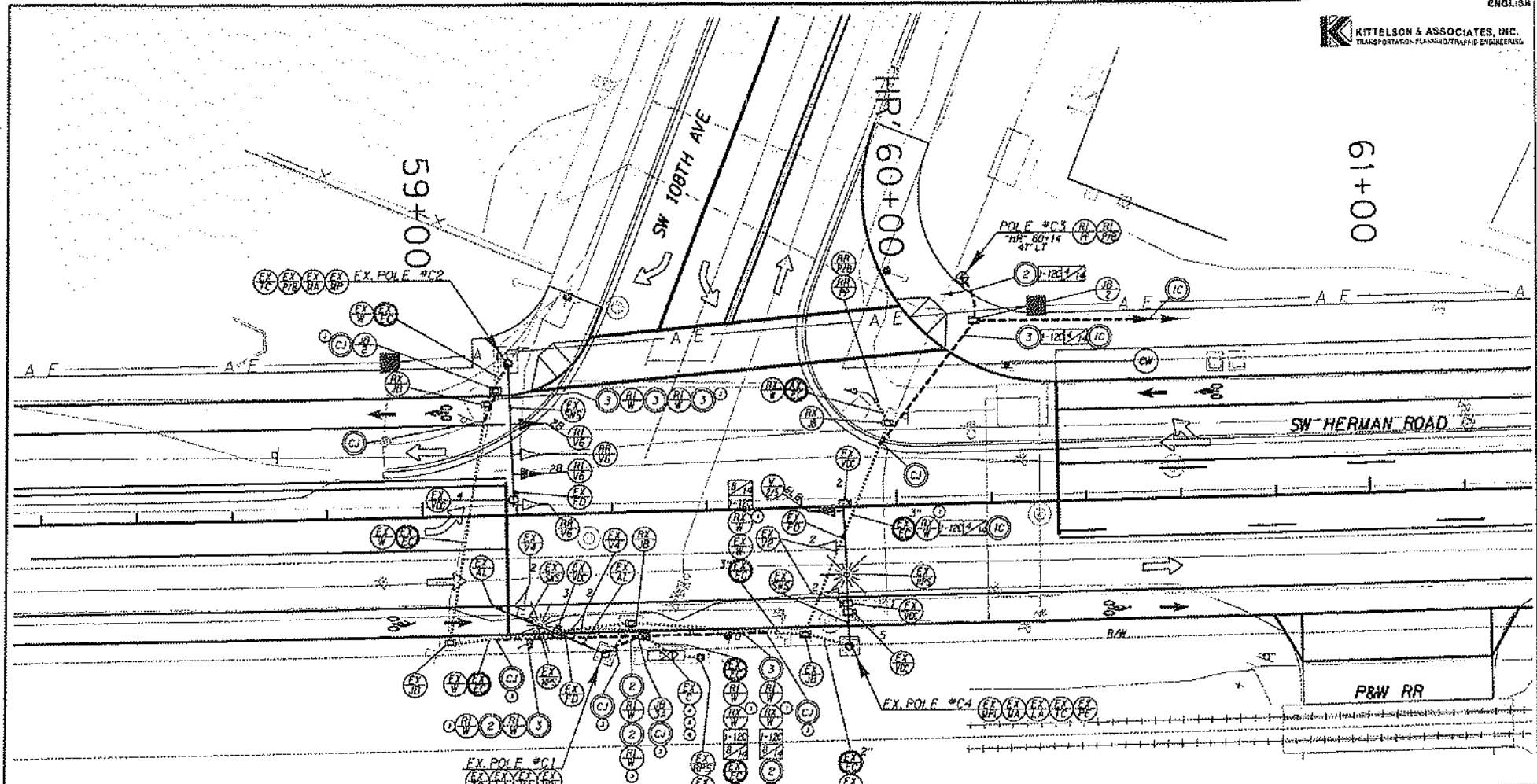


CONSTRUCTION NOTES:

- ① Remove existing wiring for existing pedestrian post. Retain all other existing wiring.
- ① Install 4-#14 wires to operate the Eastbound left-turn signal.
- ① Intercept existing conduit and install junction box. Relocate existing wiring into new conduit as shown. Abandon existing unused conduit.
- ① Replace existing controller unit with a new 2070L unit.
- ① Terminate phase 5 flashing yellow indication to phase 6 pedestrian yellow switchpack output. Terminate Conflict Monitor channel 11 (pin 5) wire to Output File terminal 120.
- ① Re-establish telephone connection with local company after completion of utility pole relocation.



<b>TUALATIN DEVELOPMENT COMMISSION</b>	
S.W. HERMAN RD. - S.W. 124TH AVE. TO S.W. TETON AVE.	
WASHINGTON COUNTY	
Reviewed By - C. Rodato Designed By - C. Thibler Drafted By - J. Hanrahan	
SW HERMAN RD/SW 108TH AVE LEGEND SHEET	SHEET NO. TS-11



REGISTERED PROFESSIONAL  
ENGINEER  
19283PE  
*Charles W. Babolin*  
OREGON  
JULY 17, 1997  
CHARLES W. BABOLIN  
612768  
EXPIRES 12/31/08

TUALATIN DEVELOPMENT  
COMMISSION

S.W. HERMAN RD. - S.W. 124TH AVE. TO  
S.W. TETON AVE.  
WASHINGTON COUNTY

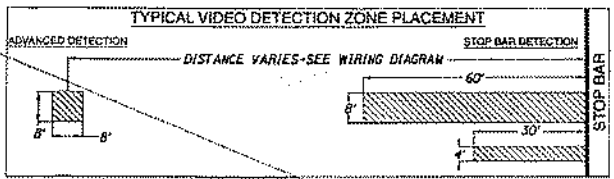
Reviewed By - C. Rodolfo  
Designed By - C. Tisdler  
Drafted By - J. Jerviksen

SW HERMAN RD/SW 108TH AVE  
SIGNAL PLAN

SHEET  
NO. TS-12



**KITTELSON & ASSOCIATES, INC.**  
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING

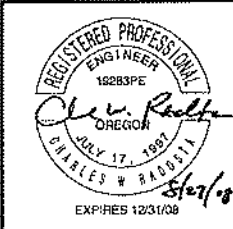
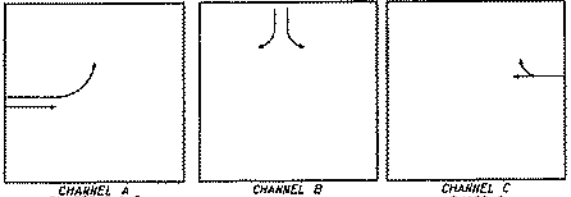
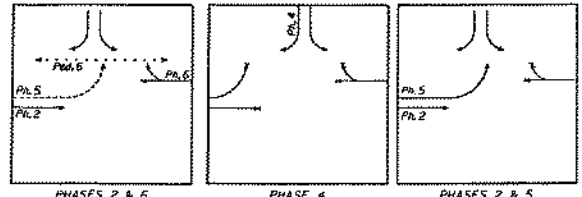
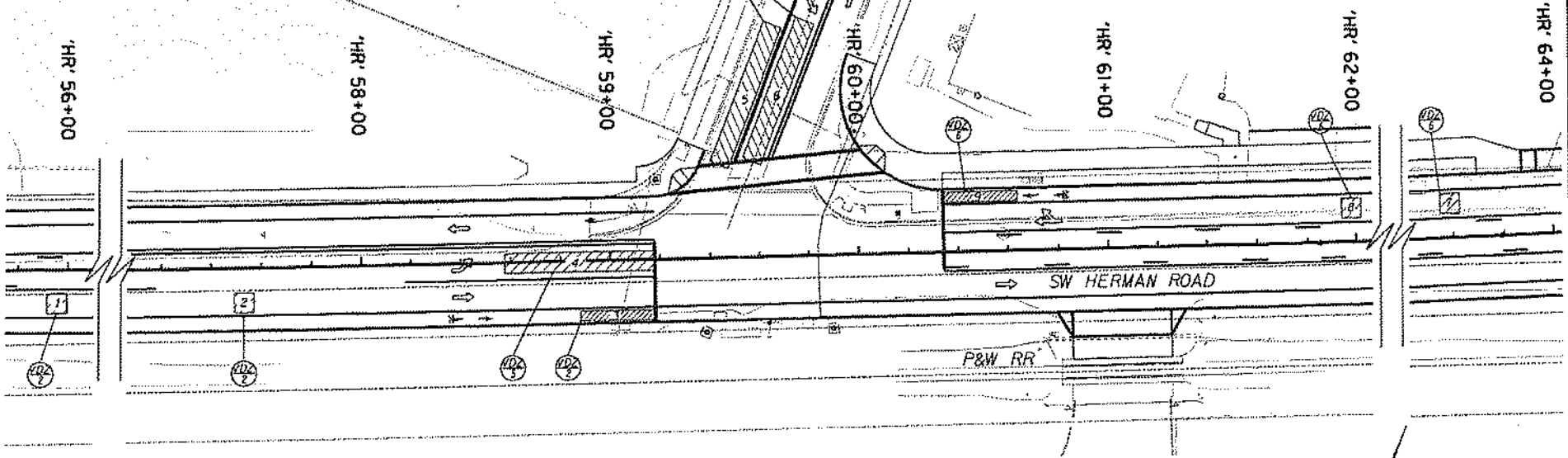


**VIDEO DETECTION WIRING DIAGRAM**

CAMERA	DETECTION EDGE	DISTANCE (FEET)	PHASE	SLOT
1	1	370	2	2U
2	2	160	2	2U
2	3	160	2	2U
2	4	160	2	2U
3	0	0	4	4U
3	0	0	4	4U
3	0	0	4	4U
4	7	300	6	6U
5	8	180	6	6U
6	8	180	6	6U

**DESIGN APPROACH SPEEDS**

PHASE	APPROACH	OPERATING SPEED
HERMAN RD	EASTBOUND	45 MPH
	WESTBOUND	45 MPH
124TH AVE	SOUTHBOUND	35 MPH
	NORTHBOUND	35 MPH



**TUALATIN DEVELOPMENT COMMISSION**

S.W. HERMAN RD. - S.W. 124TH AVE. TO S.W. TETON AVE.  
WASHINGTON COUNTY

Reviewed By - C. Radostka  
Designed By - C. Treoler  
Drafted By - J. Hernandez

**SW HERMAN RD/SW 108TH AVE DETECTOR PLAN**

SHEET NO. TS-13



(9+KEY)

FUNCTIONS	KEY	VALUE
Short Power Down	0	0
Long Power Down	1	0
EVA Delay Type	2	1
EVB Delay Type	3	1
EVC Delay Type	4	1
EVD Delay Type	5	0
RR Delay Type	6	0
Ped Inhibit	7	0
OLA Green	8	0.0
OLA Yellow	9	0.0
OLB Green	A	0.0
OLB Yellow	B	0.0
OLC Green	C	0.0
OLC Yellow	D	0.0
OLD Green	E	0.0
OLD Yellow	F	0.0

(C+F+KEY)

FUNCTIONS	KEY	VALUE
Page ID	0	0
Future	1	0
Future	2	0
Future	3	0
OLA Red	4	0.0
OLB Red	5	0.0
OLC Red	6	0.0
OLD Red	7	0.0
Overlap E	8	_____
Overlap F	9	_____
Red Rest	A	_____
Max Recall	B	_____
Flash Green	C	_____
Flash Walk	D	_____
Advance Walk	E	_____
Restrictive Phase	F	_____

(D+C+9+KEY)

FUNCTIONS	KEY	VALUE
Short Power Down	0	0
Long Power Down	1	0
EVA Delay Type	2	0
EVB Delay Type	3	0
EVC Delay Type	4	0
EVD Delay Type	5	0
RR Delay Type	6	0
Ped Inhibit	7	0
OLA Green	8	0.0
OLA Yellow	9	0.0
OLB Green	A	0.0
OLB Yellow	B	0.0
OLC Green	C	0.0
OLC Yellow	D	0.0
OLD Green	E	0.0
OLD Yellow	F	0.0

(D+C+B+KEY)

FUNCTIONS	KEY	VALUE
Page ID	0	1
Future	1	0
Future	2	0
Future	3	0
OLA Red	4	0.0
OLB Red	5	0.0
OLC Red	6	0.0
OLD Red	7	0.0
Overlap E	8	_____
Overlap F	9	_____
Red Rest	A	_____
Max Recall	B	_____
Flash Green	C	_____
Flash Walk	D	_____
Advance Walk	E	_____
Restrictive Phase	F	_____

(D+D+9+KEY)

FUNCTIONS	KEY	VALUE
Short Power Down	0	0
Long Power Down	1	0
EVA Delay Type	2	0
EVB Delay Type	3	0
EVC Delay Type	4	0
EVD Delay Type	5	0
RR Delay Type	6	0
Ped Inhibit	7	0
OLA Green	8	0.0
OLA Yellow	9	0.0
OLB Green	A	0.0
OLB Yellow	B	0.0
OLC Green	C	0.0
OLC Yellow	D	0.0
OLD Green	E	0.0
OLD Yellow	F	0.0

(D+D+B+KEY)

FUNCTIONS	KEY	VALUE
Page ID	0	2
Future	1	0
Future	2	0
Future	3	0
OLA Red	4	0.0
OLB Red	5	0.0
OLC Red	6	0.0
OLD Red	7	0.0
Overlap E	8	_____
Overlap F	9	_____
Red Rest	A	_____
Max Recall	B	_____
Flash Green	C	_____
Flash Walk	D	_____
Advance Walk	E	_____
Restrictive Phase	F	_____

W4IKS Table 3

Date: Wednesday, July 25, 2012 Time: 09:52 AM  
 Intersection #125 HERMAN RD @ 108TH

(C+KEY)

FUNCTIONS	KEY	VALUE
Year	0	12
Month	1	7
Day of Month	2	24
Day of Week	3	4
Hour	4	9
Minute	5	47
Second	6	13
Reserved	7	4
Trigs On In Flash	8	0
Startup Yellow	9	
EVA Phases	A	2 5
EVB Phases	B	4 7
EVC Phases	C	1 6
EVD Phases	D	3 8
Handicap Ped	E	

(E+KEY)

FUNCTIONS	KEY	VALUE
EVA Delay	0	0
EVA Min	1	1
EVB Delay	2	0
EVB Min	3	1
EVC Delay	4	0
EVC Min	5	1
EVD Delay	6	0
EVD Min	7	1
OL Red Revert	8	5.0
RR Delay	9	0
RR Clear	A	0
RR Clear Phases	B	
RR Permit	C	
RR OL Permit	D	
NEMA Rold Phases	E	

W4IKS Table 4 Part 1

Date: Wednesday, July 25, 2012 Time: 09:52 AM  
 Intersection #125 HERMAN RD @ 108TH

(D+COL+KEY)

DETECTOR TYPE	DELAY				CARRYOVER			
	2	3	4	5	PH	TIME	PH	TIME
FUNCTIONSKEY	PH	TIME	PH	TIME	PH	TIME	PH	TIME
----- (1)0	1	0.0	5	10.0	1	0.0	5	0.0
Upper (9)1	1	0.0	5	5.0	1	0.0	5	0.0
Upper (2)2	2	0.0	6	0.0	2	2.0	6	2.0
Lower (2)3	2	0.0	6	0.0	2	0.0	6	0.0
Upper (3)4	2	0.0	6	0.0	2	0.0	6	0.0
Lower (3)5	2	0.0	6	0.0	2	0.0	6	0.0
----- (4)6	2	0.0	6	0.0	2*	0.0	6*	0.0
----- (5)7	3	0.0	7	0.0	3	0.0	7	0.0
Lower (9)8	3	0.0	7	0.0	3	0.0	7	0.0
Upper (6)9	4	0.0	8	0.0	4	1.6	8	0.0
Lower (6)A	4	0.0	8	0.0	4	0.0	8	0.0
Upper (7)B	4	0.0	8	0.0	4	0.0	8	0.0
Lower (7)C	4	0.0	8	0.0	4	0.0	8	0.0
----- (8)D	4	0.0	8	0.0	4*	0.0	8*	0.0
CABINET FILE	I		J		I		J	

Note: ( ) = Slot Number \* = Set Type 3 Detector

W4IKS Table 4 Part 2

Date: Wednesday, July 25, 2012 Time: 09:52 AM  
 Intersection #125 HERMAN RD @ 108TH

(D+9+4+KEY)

FUNCTIONS	KEY	VALUE
Detector Fail On	0	0
Detector Fail Off	1	0
Fail Det Backup	2	0
Max II In Delay	3	0
Max II In Carryover	4	0
Plan 9 In Delay	5	0
Plan 9 In Carryover	6	0
Plan 16 In Delay	7	0
Plan 16 In Carryover	8	0
TT Page 1 Delay	9	0
TT Page 1 Carryover	A	0
TT Page 2 Delay	B	0
TT Page 2 Carryover	C	0
NOVRAM	D	0
Computran	E	217
Release	F	0

(D+9+5+KEY)

FUNCTIONS	KEY	VALUE
DF 01 Min	0	0
DF 02 Min	1	0
DF 03 Min	2	0
DF 04 Min	3	0
DF 05 Min	4	0
DF 06 Min	5	0
DF 07 Min	6	0
DF 08 Min	7	0
DF 01 Max	8	0
DF 02 Max	9	0
DF 03 Max	A	0
DF 04 Max	B	0
DF 05 Max	C	0
DF 06 Max	D	0
DF 07 Max	E	0
DF 08 Max	F	0



W4IKS Table 5 Sheet 1  
 Date: Wednesday, July 25, 2012 Time: 09:52 AM  
 Intersection #125 HERMAN RD @ 108TH

(A+CODE)

EVENT	1234567	HR	MIN	FUNC	CODE	EVENT	1234567	HR	MIN	FUNC	CODE
1	_____	0	0	0	80-83	17	_____	0	0	0	CC-C3
2	_____	0	0	0	84-87	18	_____	0	0	0	C4-C7
3	_____	0	0	0	88-8B	19	_____	0	0	0	C8-CB
4	_____	0	0	0	8C-8F	20	_____	0	0	0	CC-CF
5	_____	0	0	0	90-93	21	_____	0	0	0	D0-D3
6	_____	0	0	0	94-97	22	_____	0	0	0	D4-D7
7	_____	0	0	0	98-9B	23	_____	0	0	0	D8-DB
8	_____	0	0	0	9C-9F	24	_____	0	0	0	DC-DF
9	_____	0	0	0	A0-A3	25	_____	0	0	0	E0-E3
10	_____	0	0	0	A4-A7	26	_____	0	0	0	E4-E7
11	_____	0	0	0	A8-AB	27	_____	0	0	0	E8-EB
12	_____	0	0	0	AC-AF	28	_____	0	0	0	EC-EF
13	_____	0	0	0	B0-B3	29	_____	0	0	0	F0-F3
14	_____	0	0	0	B4-B7	30	_____	0	0	0	F4-F7
15	_____	0	0	0	B8-BB	31	_____	0	0	0	F8-FB
16	_____	0	0	0	BC-BF	32	_____	0	0	0	FC-FF

W4IKS Table 5 Sheet 2  
 Date: Wednesday, July 25, 2012 Time: 09:52 AM  
 Intersection #125 HERMAN RD @ 108TH

(D+8+CODE)

EVENT	1234567	HR	MIN	FUNC	CODE	EVENT	1234567	HR	MIN	FUNC	CODE
33	_____	0	0	0	80-83	49	_____	0	0	0	CC-C3
34	_____	0	0	0	84-87	50	_____	0	0	0	C4-C7
35	_____	0	0	0	88-8B	51	_____	0	0	0	C8-CB
36	_____	0	0	0	8C-8F	52	_____	0	0	0	CC-CF
37	_____	0	0	0	90-93	53	_____	0	0	0	D0-D3
38	_____	0	0	0	94-97	54	_____	0	0	0	D4-D7
39	_____	0	0	0	98-9B	55	_____	0	0	0	D8-DB
40	_____	0	0	0	9C-9F	56	_____	0	0	0	DC-DF
41	_____	0	0	0	A0-A3	57	_____	0	0	0	E0-E3
42	_____	0	0	0	A4-A7	58	_____	0	0	0	E4-E7
43	_____	0	0	0	A8-AB	59	_____	0	0	0	E8-EB
44	_____	0	0	0	AC-AF	60	_____	0	0	0	EC-EF
45	_____	0	0	0	B0-B3	61	_____	0	0	0	F0-F3
46	_____	0	0	0	B4-B7	62	_____	0	0	0	F4-F7
47	_____	0	0	0	B8-BB	63	_____	0	0	0	F8-FB
48	_____	0	0	0	BC-BF	64	_____	0	0	0	FC-FF

W4IKS Table 6  
 Date: Wednesday, July 25, 2012 Time: 09:52 AM  
 Intersection #125 HERMAN RD @ 108TH

(B+0+KEY)

FUNCTIONS	KEY	VALUE
Present Plan	0	0
TOD/DOW Plan	1	0
Hardware Plan	2	0
Modem Plan	3	0
Mode (0-4)	4	0
Master (0-OFF)	5	0
Master Clock	6	0
Local Clock	7	0
Dwell Clock	8	0
Future	9	0
Future	A	0
Future	B	0
Future	C	_____
NEMA CNA Phases	D	_____
Adv Warning Phases	E	_____
MRI Phases	F	2_4_6_

(D+KEY1+KEY2)

FUNCTIONS	KEY	VALUE
Floating Ped	2E	0
ID Number	2F	125
No Coord Ped Recall	3E	0
Rest In Walk	3F	0
Adv Warning EOG	4E	0
Adv Warning SOG	4F	0
RR Red Clear	5E	0
RR Clear Color	5F	0
Bus Delay	6D	0.0
Bus Free T1	6E	0
Bus Free T3	6F	0
EV Mir Aft Clear	7E	0
EV Indicators	7F	0
NEMA Inputs	66	0.0

W4IKS Table 7 Sheet 1  
 Date: Wednesday, July 25, 2012 Time: 09:52 AM  
 Intersection #125 HERMAN RD @ 108TH

(B+PLAN+KEY)

FUNCTION	KEY	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7	Plan 8	Plan 9
Cycle Length	0	0	0	0	0	0	0	0	0	0
Forceoff 01	1	0	0	0	0	0	0	0	0	0
Forceoff 02	2	0	0	0	0	0	0	0	0	0
Forceoff 03	3	0	0	0	0	0	0	0	0	0
Forceoff 04	4	0	0	0	0	0	0	0	0	0
Forceoff 05	5	0	0	0	0	0	0	0	0	0
Forceoff 06	6	0	0	0	0	0	0	0	0	0
Forceoff 07	7	0	0	0	0	0	0	0	0	0
Forceoff 08	8	0	0	0	0	0	0	0	0	0
Offset	9	0	0	0	0	0	0	0	0	0
Perm Length	A	0	0	0	0	0	0	0	0	0
Max Dwell	B	0	0	0	0	0	0	0	0	0
Lead Phases	C									
Coord Phases	D									
Perm 2 Phases	E									
Min Recall	F									

W4IKS Table 7 Sheet 2  
 Date: Wednesday, July 25, 2012 Time: 09:52 AM  
 Intersection #125 HERMAN RD @ 108TH

(B+D+KEY1+KEY2)

FUNCTION	KEY1	7	8	9	A	B	C	D	E	F
Cycle Length	KEY2	Plan 10	Plan 11	Plan 12	Plan 13	Plan 14	Plan 15	Plan 16	Plan 17	Plan 18
Forceoff 01	1	0	0	0	0	0	0	0	0	0
Forceoff 02	2	0	0	0	0	0	0	0	0	0
Forceoff 03	3	0	0	0	0	0	0	0	0	0
Forceoff 04	4	0	0	0	0	0	0	0	0	0
Forceoff 05	5	0	0	0	0	0	0	0	0	0
Forceoff 06	6	0	0	0	0	0	0	0	0	0
Forceoff 07	7	0	0	0	0	0	0	0	0	0
Forceoff 08	8	0	0	0	0	0	0	0	0	0
Offset	9	0	0	0	0	0	0	0	0	0
Perm Length	A	0	0	0	0	0	0	0	0	0
Max Dwell	B	0	0	0	0	0	0	0	0	0
Lead Phases	C									
Coord Phases	D									
Perm 2 Phases	E									
Min Recall	F									

W4IKS Table 8  
 Date: Wednesday, July 25, 2012 Time: 09:52 AM  
 Intersection #125 HERMAN RD @ 108TH

(B+A+KEY)

(B+B+KEY)

(B+C+KEY)

FUNCTIONS	KEY	VALUE	FUNCTIONS	KEY	VALUE	FUNCTIONS	KEY	VALUE
Bus P1 T1	0	0	Bus P4 T1	0	0	Bus P7 T1	0	0
Bus P1 T2	1	0	Bus P4 T2	1	0	Bus P7 T2	1	0
Bus P1 T3	2	0	Bus P4 T3	2	0	Bus P7 T3	2	0
Bus P2 T1	3	0	Bus P5 T1	3	0	Bus P8 T1	3	0
Bus P2 T2	4	0	Bus P5 T2	4	0	Bus P8 T2	4	0
Bus P2 T3	5	0	Bus P5 T3	5	0	Bus P8 T3	5	0
Bus P3 T1	6	0	Bus P6 T1	6	0	Bus P9 T1	6	0
Bus P3 T2	7	0	Bus P6 T2	7	0	Bus P9 T2	7	0
Bus P3 T3	8	0	Bus P6 T3	8	0	Bus P9 T3	8	0
Perm 2 P1	9	0	Perm 2 P4	9	0	Perm 2 P7	9	0
Perm 2 P2	A	0	Perm 2 P5	A	0	Perm 2 P8	A	0
Perm 2 P3	B	0	Perm 2 P6	B	0	Perm 2 P9	B	0
Flash Yellow	C		OL Flash Yellow	C		Coord Max	C	
Flash Circuit	D		OL Flash Clear	D		TOD Red Rest	D	
TOD/DOW Max	E		TOD/DOW Ped	E		OLA Switchpack	E	
OLB Switchpack	F		OLC Switchpack	F		OLD Switchpack	F	

(A+4+KEY)

C1	PIN	KEY	CODE
39	0	0	0
40	1	0	0
41	2	0	0
42	3	0	0
43	4	0	0
44	5	0	0
45	6	0	0
46	7	0	0
47	8	0	0
48	9	0	0
49	A	0	0
50	B	0	0
51	C	0	0
52	D	0	0
53	E	0	0
54	F	0	0

(A+5+KEY)

C1	PIN	KEY	CODE
55	0	0	0
56	1	0	0
57	2	0	0
58	3	0	0
59	4	0	0
60	5	0	0
61	6	0	0
62	7	0	0
	8	0	0
	9	0	0
	A	0	0
	B	0	0
63	C	0	0
64	D	0	0
65	E	0	0
66	F	0	0

(A+6+KEY)

C1	PIN	KEY	CODE
67	0	0	0
68	1	0	0
69	2	0	0
70	3	0	0
71	4	0	0
72	5	0	0
73	6	0	0
74	7	0	0
75	8	0	0
76	9	0	0
77	A	0	0
78	B	0	0
79	C	0	0
80	D	0	0
81	E	0	0
82	F	0	0

(D+A+4+KEY)

C1	PIN	KEY	CODE
39	0	0	0
40	1	0	0
41	2	0	0
42	3	0	0
43	4	0	0
44	5	0	0
45	6	0	0
46	7	0	0
47	8	0	0
48	9	0	0
49	A	0	0
50	B	0	0
51	C	0	0
52	D	0	0
53	E	0	0
54	F	0	0

(D+A+5+KEY)

C1	PIN	KEY	CODE
55	0	0	0
56	1	0	0
57	2	0	0
58	3	0	0
59	4	0	0
60	5	0	0
61	6	0	0
62	7	0	0
	8	0	0
	9	0	0
	A	0	0
	B	0	0
63	C	0	0
64	D	0	0
65	E	0	0
66	F	0	0

(D+A+6+KEY)

C1	PIN	KEY	CODE
67	0	0	0
68	1	0	0
69	2	0	0
70	3	0	0
71	4	0	0
72	5	0	0
73	6	0	0
74	7	0	0
75	8	0	0
76	9	0	0
77	A	0	0
78	B	0	0
79	C	0	0
80	D	0	0
81	E	0	0
82	F	0	0

(D+A+B+KEY)

C1	PIN	KEY	CODE
39	0	0	0
40	1	0	0
41	2	0	0
42	3	0	0
43	4	0	0
44	5	0	0
45	6	0	0
46	7	0	0
47	8	0	0
48	9	0	0
49	A	0	0
50	B	0	0
51	C	0	0
52	D	0	0
53	E	0	0
54	F	0	0

(D+A+C+KEY)

C1	PIN	KEY	CODE
55	0	0	0
56	1	0	0
57	2	0	0
58	3	0	0
59	4	0	0
60	5	0	0
61	6	0	0
62	7	0	0
	8	0	0
	9	0	0
	A	0	0
	B	0	0
63	C	0	0
64	D	0	0
65	E	0	0
66	F	0	0

(D+A+D+KEY)

C1	PIN	KEY	CODE
67	0	0	0
68	1	0	0
69	2	0	0
70	3	0	0
71	4	0	0
72	5	0	0
73	6	0	0
74	7	0	0
75	8	0	0
76	9	0	0
77	A	0	0
78	B	0	0
79	C	0	0
80	D	0	0
81	E	0	0
82	F	0	0

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(A+0+KEY)			(A+1+KEY)			(A+2+KEY)			(A+3+KEY)		
FUNCTION	KEY	CODE	FUNCTION	KEY	CODE	FUNCTION	KEY	CODE	FUNCTION	KEY	CODE
04 D/W	0	0	08 D/W	0	0	02 Ped Y	0	0	01 D/W	0	0
04 Walk	1	0	08 Walk	1	0	06 Ped Y	1	99	01 Walk	1	0
04 Red	2	0	08 Red	2	0	04 Ped Y	2	0	0LB Red	2	0
04 Yellow	3	0	08 Yellow	3	0	06 Ped Y	3	0	0LB Yellow	3	0
04 Green	4	0	08 Green	4	0	03 Ped Y	4	0	0LB Green	4	0
03 Red	5	0	07 Red	5	0	01 Ped Y	5	0	0LA Red	5	0
03 Yellow	6	0	07 Yellow	6	0	Flash	6	0	0LA Yellow	6	0
03 Green	7	0	07 Green	7	0	Watchdog	7	0	0LA Green	7	0
02 D/W	8	0	06 D/W	8	0	03 D/W	8	0		8	0
02 Walk	9	0	06 Walk	9	0	03 Walk	9	0	SD	9	0
02 Red	A	0	06 Red	A	0	0LD Red	A	0	LTT	A	0
02 Yellow	B	0	06 Yellow	B	0	0LD Yellow	B	0			
02 Green	C	0	06 Green	C	0	0LD Green	C	0	High Byte IDC		0
01 Red	D	0	05 Red	D	99	0LC Red	D	0			
01 Yellow	E	0	05 Yellow	E	99	0LC Yellow	E	0			
01 Green	F	0	05 Green	F	99	0LC Green	F	0			

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(D+A+0+KEY)			(D+A+1+KEY)			(D+A+2+KEY)			(D+A+3+KEY)		
FUNCTION	KEY	CODE	FUNCTION	KEY	CODE	FUNCTION	KEY	CODE	FUNCTION	KEY	CODE
04 D/W	0	0	08 D/W	0	0	02 Ped Y	0	0	01 D/W	0	0
04 Walk	1	0	08 Walk	1	0	06 Ped Y	1	0	01 Walk	1	0
04 Red	2	0	08 Red	2	0	04 Ped Y	2	0	0LB Red	2	0
04 Yellow	3	0	08 Yellow	3	0	06 Ped Y	3	0	0LB Yellow	3	0
04 Green	4	0	08 Green	4	0	03 Ped Y	4	0	0LB Green	4	0
03 Red	5	0	07 Red	5	0	01 Ped Y	5	0	0LA Red	5	0
03 Yellow	6	0	07 Yellow	6	0	Flash	6	0	0LA Yellow	6	0
03 Green	7	0	07 Green	7	0	Watchdog	7	0	0LA Green	7	0
02 D/W	8	0	06 D/W	8	0	03 D/W	8	0		8	0
02 Walk	9	0	06 Walk	9	0	03 Walk	9	0	SD	9	0
02 Red	A	0	06 Red	A	0	0LD Red	A	0	LTT	A	0
02 Yellow	B	0	06 Yellow	B	0	0LD Yellow	B	0			
02 Green	C	0	06 Green	C	0	0LD Green	C	0			
01 Red	D	0	05 Red	D	0	0LC Red	D	0			
01 Yellow	E	0	05 Yellow	E	0	0LC Yellow	E	0			
01 Green	F	0	05 Green	F	0	0LC Green	F	0			

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(D+A+7+KEY)			(D+A+8+KEY)			(D+A+9+KEY)			(D+A+A+KEY)		
FUNCTION	KEY	CODE	FUNCTION	KEY	CODE	FUNCTION	KEY	CODE	FUNCTION	KEY	CODE
04 D/W	0	0	06 D/W	0	0	02 Ped Y	0	0	01 D/W	0	0
04 Walk	1	0	08 Walk	1	0	06 Ped Y	1	0	01 Walk	1	0
04 Red	2	0	08 Red	2	0	04 Ped Y	2	0	0LB Red	2	0
04 Yellow	3	0	08 Yellow	3	0	08 Ped Y	3	0	0LB Yellow	3	0
04 Green	4	0	08 Green	4	0	03 Ped Y	4	0	0LB Green	4	0
03 Red	5	0	07 Red	5	0	01 Ped Y	5	0	0LA Red	5	0
03 Yellow	6	0	07 Yellow	6	0	Flash	6	0	0LA Yellow	6	0
03 Green	7	0	07 Green	7	0	Watchdog	7	0	0LA Green	7	0
02 D/W	8	0	06 D/W	8	0	03 D/W	8	0		8	0
02 Walk	9	0	06 Walk	9	0	03 Walk	9	0	SD	9	0
02 Red	A	0	06 Red	A	0	0LD Red	A	0	LTT	A	0
02 Yellow	B	0	06 Yellow	B	0	0LD Yellow	B	0			
02 Green	C	0	06 Green	C	0	0LD Green	C	0			
01 Red	D	0	05 Red	D	0	0LC Red	D	0			
01 Yellow	E	0	05 Yellow	E	0	0LC Yellow	E	0			
01 Green	F	0	05 Green	F	0	0LC Green	F	0			



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(D+B+0+KEY)			(D+B+1+KEY)			(D+B+2+KEY)		
FUNCTIONS	KEY	VALUE	FUNCTIONS	KEY	VALUE	FUNCTIONS	KEY	VALUE
05 D/W	0	0	OLE Green	0	0	Cycle 2	0	0
05 Walk	1	0	OLF Green	1	0	Cycle 3	1	0
OLL Red	2	0	OLE Yellow	2	0	Offset 1	2	0
OLL Yellow	3	0	OLF Yellow	3	0	Offset 2	3	0
OLL Green	4	0	Adv Warning	4	0	Offset 3	4	0
OLK Red	5	0	RR Fl Yellow	5	0	-----	5	0
OLK Yellow	6	0	Det Reset	6	0	Free	6	0
OLK Green	7	0	RR On	7	0	Flash	7	0
07 D/W	8	0	EVA On	8	0	Coord Plan 1 2 3	8	0
07 Walk	9	0	EVB On	9	0	Coord Plan 4 5 6	9	0
OLJ Red	A	0	EVC On	A	0	Coord Plan 7 8 9	A	0
OLJ Yellow	B	0	EVD On	B	0	Coord Plan 10 11 12 B	B	0
OLJ Green	C	0	Ring 1 Bit B	C	0	Coord Plan 13 14 15 C	C	0
OLH Red	D	0	Ring 1 Bit C	D	0	Coord Plan 16 17 18 D	D	0
OLH Yellow	E	0	Ring 2 Bit B	E	0	Future	E	0
OLH Green	F	0	Ring 2 Bit C	F	0	Future	F	0

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(D+B+4+KEY)			(D+B+5+KEY)			(D+B+6+KEY)		
FUNCTIONS	KEY	VALUE	FUNCTIONS	KEY	VALUE	FUNCTIONS	KEY	VALUE
05 D/W	0	0	OLE Green	0	0	Cycle 2	0	0
05 Walk	1	0	OLF Green	1	0	Cycle 3	1	0
OLL Red	2	0	OLE Yellow	2	0	Offset 1	2	0
OLL Yellow	3	0	OLF Yellow	3	0	Offset 2	3	0
OLL Green	4	0	Adv Warning	4	0	Offset 3	4	0
OLK Red	5	0	RR Fl Yellow	5	0	-----	5	0
OLK Yellow	6	0	Det Reset	6	0	Free	6	0
OLK Green	7	0	RR On	7	0	Flash	7	0
07 D/W	8	0	EVA On	8	0	Coord Plan 1 2 3	8	0
07 Walk	9	0	EVB On	9	0	Coord Plan 4 5 6	9	0
OLJ Red	A	0	EVC On	A	0	Coord Plan 7 8 9	A	0
OLJ Yellow	B	0	EVD On	B	0	Coord Plan 10 11 12 B	B	0
OLJ Green	C	0	Ring 1 Bit B	C	0	Coord Plan 13 14 15 C	C	0
OLH Red	D	0	Ring 1 Bit C	D	0	Coord Plan 16 17 18 D	D	0
OLH Yellow	E	0	Ring 2 Bit B	E	0	Future	E	0
OLH Green	F	0	Ring 2 Bit C	F	0	Future	F	0

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 Intersection #125 HERMAN RD @ 108TH

(D+B+8+KEY)			(D+B+9+KEY)			(D+B+A+KEY)		
FUNCTIONS	KEY	VALUE	FUNCTIONS	KEY	VALUE	FUNCTIONS	KEY	VALUE
05 D/W	0	0	OLE Green	0	0	Cycle 2	0	0
05 Walk	1	0	OLF Green	1	0	Cycle 3	1	0
OLL Red	2	0	OLE Yellow	2	0	Offset 1	2	0
OLL Yellow	3	0	OLF Yellow	3	0	Offset 2	3	0
OLL Green	4	0	Adv Warning	4	0	Offset 3	4	0
OLK Red	5	0	RR Fl Yellow	5	0	-----	5	0
OLK Yellow	6	0	Det Reset	6	0	Free	6	0
OLK Green	7	0	RR On	7	0	Flash	7	0
07 D/W	8	0	EVA On	8	0	Coord Plan 1 2 3	8	0
07 Walk	9	0	EVB On	9	0	Coord Plan 4 5 6	9	0
OLJ Red	A	0	EVC On	A	0	Coord Plan 7 8 9	A	0
OLJ Yellow	B	0	EVD On	B	0	Coord Plan 10 11 12 B	B	0
OLJ Green	C	0	Ring 1 Bit B	C	0	Coord Plan 13 14 15 C	C	0
OLH Red	D	0	Ring 1 Bit C	D	0	Coord Plan 16 17 18 D	D	0
OLH Yellow	E	0	Ring 2 Bit B	E	0	Future	E	0
OLH Green	F	0	Ring 2 Bit C	F	0	Future	F	0

W4IKS Table 12

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 Intersection #125 HERMAN RD @ 108TH

(D+S+KEY1+KEY2)

KEY1 = 0			KEY1 = 1			KEY1 = 2			KEY1 = 3		
FUNCTION	KEY2	VALUE	FUNCTION	KEY2	VALUE	FUNCTION	KEY2	VALUE	FUNCTION	KEY2	VALUE
1/Month	0	0	3/Hour On	0	0	5/Hour Off	0	0	7/Plan	0	0
1/DOM	1	0	3/Min On	1	0	5/Min Off	1	0	8/Month	1	0
1/Hour On	2	0	3/Hour Off	2	0	5/Plan	2	0	8/DOM	2	0
1/Min On	3	0	3/Min Off	3	0	6/Month	3	0	8/Hour On	3	0
1/Hour Off	4	0	3/Plan	4	0	6/DOM	4	0	8/Min On	4	0
1/Min Off	5	0	4/Month	5	0	6/Hour On	5	0	8/Hour Off	5	0
1/Plan	6	0	4/DOM	6	0	6/Min On	6	0	8/Min Off	6	0
2/Month	7	0	4/Hour On	7	0	6/Hour Off	7	0	8/Plan	7	0
2/DOM	8	0	4/Min On	8	0	6/Min Off	8	0	9/Month	8	0
2/Hour On	9	0	4/Hour Off	9	0	6/Plan	9	0	9/DOM	9	0
2/Min On	A	0	4/Min Off	A	0	7/Month	A	0	9/Hour On	A	0
2/Hour Off	B	0	4/Plan	B	0	7/DOM	B	0	9/Min On	B	0
2/Min Off	C	0	5/Month	C	0	7/Hour On	C	0	9/Hour Off	C	0
2/Plan	D	0	5/DOM	D	0	7/Min On	D	0	9/Min Off	D	61
3/Month	E	0	5/Hour On	E	0	7/Hour Off	E	0	9/Plan	E	0
3/DOM	F	0	5/Min On	F	0	7/Min Off	F	0			

W4IKS Table 13

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 Intersection #125 HERMAN RD @ 108TH

(D+9+0+KEY)

(D+9+3+KEY)

(E+F+KEY)

FUNCTION	KEY	VALUE	FUNCTION	KEY	VALUE	FUNCTION	KEY	VALUE
Overlap H	0	0.0	OLH Green	0	0.0	RR Max II	0	0
Overlap J	1	0.0	OLH Yellow	1	0.0	Ped Perm Pl 1	1	0
Overlap K	2	0.0	OLH Red	2	0.0	Ped Perm Pl 2	2	0
Overlap L	3	0.0	OLJ Green	3	0.0	Ped Perm Pl 3	3	0
OLH Switchpack	4	0.0	OLJ Yellow	4	0.0	Ped Perm Pl 4	4	0
OLJ Switchpack	5	0.0	OLJ Red	5	0.0	Ped Perm Pl 5	5	0
OLK Switchpack	6	0.0	OLK Green	6	0.0	Ped Perm Pl 6	6	0
OLL Switchpack	7	0.0	OLK Yellow	7	0.0	Ped Perm Pl 7	7	0
Reserved	8	0.0	OLK Red	8	0.0	Ped Perm Pl 8	8	0
Reserved	9	0.0	OLL Green	9	0.0	Ped Perm Pl 9	9	0
All Red Before EV	A	0.0	OLL Yellow	A	0.0	# of Lng Pwrouts	A	0
			OLL Red	B	0.0	# pf Sht Pwrouts	B	0
						Failed Det	C	0
						Max II On	D	0
						Nc Daylite Save	E	0
						Revision Level	F	17

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(D+9+KEY1+KEY2)

KEY1 = 8		KEY1 = 9		KEY1 = A		KEY1 = B	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	205	0	205	0	6	0	23
1	146	1	146	1	14	1	67
2	23	2	23	2	20	2	20
3	45	3	66	3	23	3	26
4	20	4	205	4	68	4	6
5	27	5	146	5	20	5	205
6	5	6	21	6	24	6	148
7	205	7	5	7	27	7	21
8	146	8	14	8	5	8	5
9	21	9	20	9	205	9	11
A	6	A	21	A	147	A	209
B	14	B	5	B	21	B	5
C	20	C	13	C	5	C	24
D	24	D	205	D	12	D	21
E	25	E	11	E	205	E	6
F	6	F	21	F	147	F	14

W4IKS Table 14 Sheet 2  
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 Intersection #125 HERMAN RD @ 108TH

(D+9+KEY1+KEY2)

KEY1 = C		KEY1 = D		KEY1 = E		KEY1 = F	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	209	0	29	0	0	0	0
1	6	1	7	1	0	1	0
2	24	2	20	2	0	2	0
3	27	3	24	3	0	3	0
4	5	4	25	4	0	4	0
5	208	5	6	5	0	5	0
6	5	6	210	6	0	6	0
7	30	7	6	7	0	7	0
8	26	8	24	8	0	8	0
9	5	9	21	9	0	9	0
A	210	A	6	A	0	A	0
B	5	B	14	B	0	B	0
C	23	C	0	C	0	C	0
D	45	D	0	D	0	D	0
E	20	E	0	E	0	E	0
F	24	F	0	F	0	F	0

W4IKS Table 14 Sheet 3  
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 Intersection #125 HERMAN RD @ 108TH

(D+E+KEY1+KEY2)

KEY1 = 0		KEY1 = 1		KEY1 = 2		KEY1 = 3	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	0	0	0	0	0	0	0
1	0	1	0	1	0	1	0
2	0	2	0	2	0	2	0
3	0	3	0	3	0	3	0
4	0	4	0	4	0	4	0
5	0	5	0	5	0	5	0
6	0	6	0	6	0	6	0
7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0
9	0	9	0	9	0	9	0
A	0	A	0	A	0	A	0
B	0	B	0	B	0	B	0
C	0	C	0	C	0	C	0
D	0	D	0	D	0	D	0
E	0	E	0	E	0	E	0
F	0	F	0	F	0	F	0

W4IKS Table 14 Sheet 4  
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 Intersection #125 HERMAN RD @ 108TH

(D+E+KEY1+KEY2)

KEY1 = 4		KEY1 = 5		KEY1 = 6		KEY1 = 7	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	0	0	0	0	0	0	0
1	0	1	0	1	0	1	0
2	0	2	0	2	0	2	0
3	0	3	0	3	0	3	0
4	0	4	0	4	0	4	0
5	0	5	0	5	0	5	0
6	0	6	0	6	0	6	0
7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0
9	0	9	0	9	0	9	0
A	0	A	0	A	0	A	0
B	0	B	0	B	0	B	0
C	0	C	0	C	0	C	0
D	0	D	0	D	0	D	0
E	0	E	0	E	0	E	0
F	0	F	0	F	0	F	0

W4IKS Table 14 Sheet 5  
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 Intersection #125 HERMAN RD @ 108TH

(D+E+KEY1+KEY2)

KEY1 = 8		KEY1 = 9		KEY1 = A		KEY1 = B	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	0	0	0	0	0	0	0
1	0	1	0	1	0	1	0
2	0	2	0	2	0	2	0
3	0	3	0	3	0	3	0
4	0	4	0	4	0	4	0
5	0	5	0	5	0	5	0
6	0	6	0	6	0	6	0
7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0
9	0	9	0	9	0	9	0
A	0	A	0	A	0	A	0
B	0	B	0	B	0	B	0
C	0	C	0	C	0	C	0
D	0	D	0	D	0	D	0
E	0	E	0	E	0	E	0
F	0	F	0	F	0	F	0

W4IKS Table 14 Sheet 6  
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 Intersection #125 HERMAN RD @ 108TH

(D+E+KEY1+KEY2)

KEY1 = C		KEY1 = D		KEY1 = E		KEY1 = F	
KEY2	CODE	KEY2	CODE	KEY2	CODE	KEY	CODE
0	0	0	0	0	0	0	0
1	0	1	0	1	0	1	0
2	0	2	0	2	0	2	0
3	0	3	0	3	0	3	0
4	0	4	0	4	0	4	0
5	0	5	0	5	0	5	0
6	0	6	0	6	0	6	0
7	0	7	0	7	0	7	0
8	0	8	0	8	0	8	0
9	0	9	0	9	0	9	0
A	0	A	0	A	0	A	0
B	0	B	0	B	0	B	0
C	0	C	0	C	0	C	0
D	0	D	0	D	0	D	0
E	0	E	0	E	0	E	0
F	0	F	0	F	0	F	0



(D+B+3+KEY)

FUNCTION	KEY	VALUE
CB Output #1	0	0
CB Output #2	1	0
CB Output #3	2	0
CB Output #4	3	0
CB Output #5	4	0
CB Output #6	5	0
CB Output #7	6	0
CB Output #8	7	0
CB Flash Out #9	8	0
CB Flash Out #10	9	0
CB Flash Out #11	A	52
CB Flash Out #12	B	0

(D+B+7+KEY)

FUNCTION	KEY	VALUE
CB Output #1	0	0
CB Output #2	1	0
CB Output #3	2	0
CB Output #4	3	0
CB Output #5	4	0
CB Output #6	5	0
CB Output #7	6	0
CB Output #8	7	0
CB Flash Out #9	8	0
CB Flash Out #10	9	0
CB Flash Out #11	A	0
CB Flash Out #12	B	0

(D+B+B+KEY)

FUNCTION	KEY	VALUE
CB Output #1	0	0
CB Output #2	1	0
CB Output #3	2	0
CB Output #4	3	0
CB Output #5	4	0
CB Output #6	5	0
CB Output #7	6	0
CB Output #8	7	0
CB Flash Out #9	8	0
CB Flash Out #10	9	0
CB Flash Out #11	A	0
CB Flash Out #12	B	0

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APPENDIX I.  
**OPERATIONS  
CALCULATIONS**

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 99W/Highway 99 W & SW 124th Avenue

07/25/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	141	269	1037	416	819	742
Future Volume (vph)	141	269	1037	416	819	742
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.3	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.95	1.00	*1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3155	2515	3406	1547	3438	3282
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3155	2515	3406	1547	3438	3282
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	160	306	1178	473	931	843
RTOR Reduction (vph)	0	0	0	147	0	0
Lane Group Flow (vph)	160	306	1178	326	931	843
Confl. Peds. (#/hr)		5		1	1	
Heavy Vehicles (%)	11%	13%	6%	3%	5%	10%
Turn Type	custom	pt+ov	NA	Perm	Prot	NA
Protected Phases	8	1 4	2		1	6
Permitted Phases	4			2		
Actuated Green, G (s)	17.9	51.7	53.4	53.4	39.5	98.5
Effective Green, g (s)	21.9	49.3	55.4	55.4	41.1	100.5
Actuated g/C Ratio	0.16	0.37	0.42	0.42	0.31	0.75
Clearance Time (s)	6.0		6.0	6.0	5.6	6.0
Vehicle Extension (s)	2.3		5.4	5.4	2.3	5.4
Lane Grp Cap (vph)	612	929	1414	642	1059	2472
v/s Ratio Prot	c0.02	0.12	c0.35		c0.27	0.26
v/s Ratio Perm	0.03			0.21		
v/c Ratio	0.26	0.33	0.83	0.51	0.88	0.34
Uniform Delay, d1	49.1	30.2	34.9	28.9	43.8	5.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	5.0	1.5	8.3	0.2
Delay (s)	49.2	30.3	39.8	30.4	52.1	5.7
Level of Service	D	C	D	C	D	A
Approach Delay (s)	36.8		37.1			30.0
Approach LOS	D		D			C

### Intersection Summary

HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	133.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: SW 124th Avenue & SW Tualatin Road

07/25/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	62	174	235	37	554	665
Future Volume (vph)	62	174	235	37	554	665
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1641	1553	3059	1503	1768	3406
Flt Permitted	0.95	1.00	1.00	1.00	0.41	1.00
Satd. Flow (perm)	1641	1553	3059	1503	769	3406
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	78	218	294	46	692	831
RTOR Reduction (vph)	0	98	0	36	0	0
Lane Group Flow (vph)	78	120	294	10	693	831
Confl. Peds. (#/hr)				2	2	
Heavy Vehicles (%)	10%	4%	18%	5%	2%	6%
Turn Type	Prot	pm+ov	NA	Perm	pm+pt	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		6	2	
Actuated Green, G (s)	6.9	40.6	15.5	15.5	54.2	54.2
Effective Green, g (s)	7.9	42.6	16.5	16.5	55.2	55.2
Actuated g/C Ratio	0.10	0.55	0.21	0.21	0.72	0.72
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.9	3.9	3.0	3.0
Lane Grp Cap (vph)	168	858	654	321	1000	2438
v/s Ratio Prot	c0.05	0.06	0.10		c0.31	0.24
v/s Ratio Perm		0.01		0.01	c0.18	
v/c Ratio	0.46	0.14	0.45	0.03	0.69	0.34
Uniform Delay, d1	32.6	8.4	26.4	24.0	5.7	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.1	0.7	0.1	2.1	0.1
Delay (s)	34.6	8.4	27.0	24.0	7.8	4.2
Level of Service	C	A	C	C	A	A
Approach Delay (s)	15.3		26.6			5.8
Approach LOS	B		C			A

### Intersection Summary

HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	77.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



HCM 6th TWSC

3: SW 108th Avenue/Residential Driveway & SW Tualatin Road

07/25/2022

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	556	28	40	285	0	11	0	8	0	0	0
Future Vol, veh/h	0	556	28	40	285	0	11	0	8	0	0	0
Conflicting Peds, #/hr	4	0	1	1	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	3	7	8	6	0	9	0	38	0	0	0
Mvmt Flow	0	662	33	48	339	0	13	0	10	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	343	0	0	696	0	0	1115	1119	680	1123	1135	343
Stage 1	-	-	-	-	-	-	680	680	-	439	439	-
Stage 2	-	-	-	-	-	-	435	439	-	684	696	-
Critical Hdwy	4.1	-	-	4.18	-	-	7.19	6.5	6.58	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.19	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.19	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.272	-	-	3.581	4	3.642	3.5	4	3.3
Pot Cap-1 Maneuver	1227	-	-	873	-	-	179	209	394	185	204	704
Stage 1	-	-	-	-	-	-	430	454	-	601	582	-
Stage 2	-	-	-	-	-	-	586	582	-	442	446	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1222	-	-	872	-	-	171	196	394	172	192	701
Mov Cap-2 Maneuver	-	-	-	-	-	-	171	196	-	172	192	-
Stage 1	-	-	-	-	-	-	430	454	-	599	548	-
Stage 2	-	-	-	-	-	-	554	548	-	431	446	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			1.2			22.8			0		
HCM LOS							C			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	225	1222	-	-	872	-	-	-
HCM Lane V/C Ratio	0.101	-	-	-	0.055	-	-	-
HCM Control Delay (s)	22.8	0	-	-	9.4	-	-	0
HCM Lane LOS	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	-

HCM 6th TWSC  
4: SW 108th Avenue & North Access

07/25/2022

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵		↵	↵		↵		↕			↕	
Traffic Vol, veh/h	0	0	0	1	0	7	0	7	15	2	44	0
Future Vol, veh/h	0	0	0	1	0	7	0	7	15	2	44	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	92	90	92	92	92	90	90	92	92	90	90
Heavy Vehicles, %	0	2	0	2	2	2	0	9	2	2	3	0
Mvmt Flow	0	0	0	1	0	8	0	8	16	2	49	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	73	-	49	69	-	16	49	0	0	24	0	0
Stage 1	53	-	-	16	-	-	-	-	-	-	-	-
Stage 2	20	-	-	53	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	-	6.2	7.12	-	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	-	3.3	3.518	-	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	923	0	1025	923	0	1063	1571	-	-	1591	-	-
Stage 1	965	0	-	1004	0	-	-	-	-	-	-	-
Stage 2	1004	0	-	960	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	916	-	1025	922	-	1063	1571	-	-	1591	-	-
Mov Cap-2 Maneuver	916	-	-	922	-	-	-	-	-	-	-	-
Stage 1	965	-	-	1004	-	-	-	-	-	-	-	-
Stage 2	997	-	-	959	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.5	0	0.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1571	-	-	-	-	922	1063	1591	-	-
HCM Lane V/C Ratio	-	-	-	-	-	0.001	0.007	0.001	-	-
HCM Control Delay (s)	0	-	-	0	0	8.9	8.4	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	0	0	-	-

HCM 6th TWSC  
5: SW 108th Avenue & South Access

07/25/2022

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	22	44	0
Future Vol, veh/h	0	0	0	22	44	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	24	48	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	72	48	48	0	-	0
Stage 1	48	-	-	-	-	-
Stage 2	24	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	932	1021	1559	-	-	-
Stage 1	974	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	932	1021	1559	-	-	-
Mov Cap-2 Maneuver	932	-	-	-	-	-
Stage 1	974	-	-	-	-	-
Stage 2	999	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1559	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	0	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-

# HCM Signalized Intersection Capacity Analysis

## 6: SW 124th Avenue & SW Leveton Drive

07/25/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Traffic Volume (vph)	6	61	12	18	5	15	26	245	35	121	578	32
Future Volume (vph)	6	61	12	18	5	15	26	245	35	121	578	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.89		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1081	1801		1480	1656		1467	3064		1752	3353	
Flt Permitted	0.72	1.00		0.70	1.00		0.39	1.00		0.48	1.00	
Satd. Flow (perm)	823	1801		1097	1656		608	3064		893	3353	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	68	13	20	6	17	29	272	39	134	642	36
RTOR Reduction (vph)	0	8	0	0	15	0	0	9	0	0	3	0
Lane Group Flow (vph)	7	73	0	20	8	0	29	302	0	134	675	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	67%	2%	8%	22%	2%	2%	23%	17%	6%	3%	6%	19%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.7	7.0		7.3	6.8		25.8	23.6		36.3	29.1	
Effective Green, g (s)	9.7	8.0		9.3	7.8		27.8	24.6		37.3	30.1	
Actuated g/C Ratio	0.16	0.14		0.16	0.13		0.47	0.42		0.63	0.51	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	143	245		183	219		334	1281		693	1716	
v/s Ratio Prot	0.00	c0.04		c0.00	0.00		0.00	0.10		c0.03	c0.20	
v/s Ratio Perm	0.01			0.01			0.04			0.09		
v/c Ratio	0.05	0.30		0.11	0.04		0.09	0.24		0.19	0.39	
Uniform Delay, d1	20.6	22.9		21.1	22.2		8.3	11.0		4.4	8.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.7		0.3	0.1		0.1	0.1		0.1	0.1	
Delay (s)	20.8	23.6		21.4	22.3		8.4	11.1		4.5	8.9	
Level of Service	C	C		C	C		A	B		A	A	
Approach Delay (s)		23.3			21.9			10.9			8.2	
Approach LOS		C			C			B			A	

Intersection Summary		
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.36	B
Actuated Cycle Length (s)	58.8	Sum of lost time (s)
Intersection Capacity Utilization	38.8%	16.0
Analysis Period (min)	15	ICU Level of Service
		A

c Critical Lane Group



HCM 6th AWSC  
7: SW 118th Drive/JAE Access & SW Leveton Drive

07/25/2022

**Intersection**

Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	181	18	7	30	0	7	3	6	0	0	1
Future Vol, veh/h	12	181	18	7	30	0	7	3	6	0	0	1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	2	2	11	57	7	2	14	2	33	2	2	2
Mvmt Flow	14	215	21	8	36	0	8	4	7	0	0	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.5	8.5	7.8	7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	44%	6%	19%	0%
Vol Thru, %	19%	86%	81%	0%
Vol Right, %	38%	9%	0%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	16	211	37	1
LT Vol	7	12	7	0
Through Vol	3	181	30	0
RT Vol	6	18	0	1
Lane Flow Rate	19	251	44	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.025	0.276	0.063	0.001
Departure Headway (Hd)	4.654	3.962	5.132	4.007
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	774	904	694	898
Service Time	2.654	1.998	3.194	2.008
HCM Lane V/C Ratio	0.025	0.278	0.063	0.001
HCM Control Delay	7.8	8.5	8.5	7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	1.1	0.2	0

HCM 6th TWSC  
8: SW Leveton Drive & West Driveway

07/25/2022

**Intersection**

Int Delay, s/veh 3.1

**Movement** EBL EBT WBT WBR SBL SBR

Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	75	106	21	49	12	20
Future Vol, veh/h	75	106	21	49	12	20
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	5	6	42	25
Mvmt Flow	89	126	25	58	14	24

**Major/Minor** Major1 Major2 Minor2

Conflicting Flow All	85	0	-	0	360	56
Stage 1	-	-	-	-	56	-
Stage 2	-	-	-	-	304	-
Critical Hdwy	4.14	-	-	-	6.82	6.45
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.236	-	-	-	3.878	3.525
Pot Cap-1 Maneuver	1499	-	-	-	566	949
Stage 1	-	-	-	-	874	-
Stage 2	-	-	-	-	666	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1496	-	-	-	528	947
Mov Cap-2 Maneuver	-	-	-	-	528	-
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	665	-

**Approach** EB WB SB

HCM Control Delay, s	3.1	0	10.1
HCM LOS			B

**Minor Lane/Major Mvmt** EBL EBT WBT WBR SBLn1 SBLn2

Capacity (veh/h)	1496	-	-	-	528	947
HCM Lane V/C Ratio	0.06	-	-	-	0.027	0.025
HCM Control Delay (s)	7.6	0	-	-	12	8.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	0.1

HCM 6th TWSC  
9: SW Leveton Drive & Center Driveway

07/25/2022

**Intersection**

Int Delay, s/veh 1.6

**Movement** EBL EBT WBT WBR SBL SBR

Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	26	87	62	16	8	5
Future Vol, veh/h	26	87	62	16	8	5
Conflicting Peds, #/hr	2	0	0	2	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	6	13	2	2	2
Mvmt Flow	32	106	76	20	10	6

**Major/Minor** Major1 Major2 Minor2

Conflicting Flow All	98	0	-	0	259	88
Stage 1	-	-	-	-	88	-
Stage 2	-	-	-	-	171	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1495	-	-	-	730	970
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	859	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1492	-	-	-	710	968
Mov Cap-2 Maneuver	-	-	-	-	710	-
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	857	-

**Approach** EB WB SB

HCM Control Delay, s	1.7	0	9.6
HCM LOS			A

**Minor Lane/Major Mvmt** EBL EBT WBT WBR SBLn1 SBLn2

Capacity (veh/h)	1492	-	-	-	710	968
HCM Lane V/C Ratio	0.021	-	-	-	0.014	0.006
HCM Control Delay (s)	7.5	0	-	-	10.1	8.7
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0

HCM 6th TWSC  
 10: Calmax Driveway/East Driveway & SW Leveton Drive

07/25/2022

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	64	4	0	88	35	0	0	1	3	0	2
Future Vol, veh/h	20	64	4	0	88	35	0	0	1	3	0	2
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	11	2	2	7	2	2	2	2	2	2	2
Mvmt Flow	25	79	5	0	109	43	0	0	1	4	0	2

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	153	0	0	84
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1428	-	-	1513
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1427	-	-	1513
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0	8.7	9.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	978	1427	-	-	1513	-	-	757
HCM Lane V/C Ratio	0.001	0.017	-	-	-	-	-	0.008
HCM Control Delay (s)	8.7	7.6	0	-	0	-	-	9.8
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0



HCM 6th TWSC  
 11: SW 108th Avenue & SW Leveton Drive

07/25/2022

Intersection						
Int Delay, s/veh	5.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	7	42	88	15	19	25
Future Vol, veh/h	7	42	88	15	19	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	14	10	6	20	16	12
Mvmt Flow	9	55	116	20	25	33

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	294	42	58	0	0
Stage 1	42	-	-	-	-
Stage 2	252	-	-	-	-
Critical Hdwy	6.54	6.3	4.16	-	-
Critical Hdwy Stg 1	5.54	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-
Follow-up Hdwy	3.626	3.39	2.254	-	-
Pot Cap-1 Maneuver	672	1006	1521	-	-
Stage 1	951	-	-	-	-
Stage 2	763	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	620	1006	1521	-	-
Mov Cap-2 Maneuver	620	-	-	-	-
Stage 1	878	-	-	-	-
Stage 2	763	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	6.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1521	-	924	-	-
HCM Lane V/C Ratio	0.076	-	0.07	-	-
HCM Control Delay (s)	7.6	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-

# HCM Signalized Intersection Capacity Analysis

## 12: SW Herman Road & SW 108th Avenue

07/25/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷		↶	↷
Traffic Volume (vph)	14	263	212	140	52	9
Future Volume (vph)	14	263	212	140	52	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.95		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1491	1583	1596		1543	1455
Flt Permitted	0.40	1.00	1.00		0.95	1.00
Satd. Flow (perm)	622	1583	1596		1543	1455
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	17	321	259	171	63	11
RTOR Reduction (vph)	0	0	25	0	0	9
Lane Group Flow (vph)	17	321	405	0	63	2
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	21%	20%	16%	5%	17%	11%
Turn Type	pm+pt	NA	NA		Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases	2					
Actuated Green, G (s)	29.5	29.5	23.5		4.4	4.4
Effective Green, g (s)	30.9	30.9	24.9		6.9	6.9
Actuated g/C Ratio	0.67	0.67	0.54		0.15	0.15
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	457	1068	867		232	219
v/s Ratio Prot	0.00	c0.20	c0.25		c0.04	0.00
v/s Ratio Perm	0.02					
v/c Ratio	0.04	0.30	0.47		0.27	0.01
Uniform Delay, d1	2.9	3.0	6.4		17.2	16.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	0.4		0.5	0.0
Delay (s)	2.9	3.2	6.8		17.7	16.5
Level of Service	A	A	A		B	B
Approach Delay (s)		3.2	6.8		17.5	
Approach LOS		A	A		B	

### Intersection Summary

HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	45.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th TWSC  
 13: SW Teton Street & SW Tualatin Road

08/15/2022

Intersection

Int Delay, s/veh 3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	415	148	52	273	73	53
Future Vol, veh/h	415	148	52	273	73	53
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	3	10	3	9	27
Mvmt Flow	466	166	58	307	82	60

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	632	0	973
Stage 1	-	-	-	-	549
Stage 2	-	-	-	-	424
Critical Hdwy	-	-	4.2	-	6.49
Critical Hdwy Stg 1	-	-	-	-	5.49
Critical Hdwy Stg 2	-	-	-	-	5.49
Follow-up Hdwy	-	-	2.29	-	3.581
Pot Cap-1 Maneuver	-	-	913	-	272
Stage 1	-	-	-	-	565
Stage 2	-	-	-	-	645
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	913	-	254
Mov Cap-2 Maneuver	-	-	-	-	254
Stage 1	-	-	-	-	565
Stage 2	-	-	-	-	603

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	20.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	254	490	-	-	913	-
HCM Lane V/C Ratio	0.323	0.122	-	-	0.064	-
HCM Control Delay (s)	25.8	13.4	-	-	9.2	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.3	0.4	-	-	0.2	-

HCM Signalized Intersection Capacity Analysis  
 1: Highway 99W/Highway 99 W & SW 124th Avenue

07/25/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	572	660	882	175	696	1191
Future Volume (vph)	572	660	882	175	696	1191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.3	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.95	1.00	*1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	2787	3539	1533	3471	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	2787	3539	1533	3471	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	602	695	928	184	733	1254
RTOR Reduction (vph)	0	0	0	94	0	0
Lane Group Flow (vph)	602	695	928	90	733	1254
Confl. Peds. (#/hr)		11				
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	2%	2%	2%	4%	4%	2%
Turn Type	Prot	pt+ov	NA	Perm	Prot	NA
Protected Phases	8	1 4	2		1	6
Permitted Phases				2		
Actuated Green, G (s)	26.3	43.2	40.0	40.0	32.1	77.7
Effective Green, g (s)	28.3	40.8	42.0	42.0	33.7	79.7
Actuated g/C Ratio	0.22	0.32	0.33	0.33	0.27	0.63
Clearance Time (s)	6.0		6.0	6.0	5.6	6.0
Vehicle Extension (s)	2.3		5.4	5.4	2.3	5.4
Lane Grp Cap (vph)	764	894	1169	506	920	2219
v/s Ratio Prot	c0.18	c0.25	c0.26		c0.21	0.35
v/s Ratio Perm				0.06		
v/c Ratio	0.79	0.78	0.79	0.18	0.80	0.57
Uniform Delay, d1	46.6	39.0	38.6	30.3	43.5	13.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	4.0	4.5	0.4	4.6	0.6
Delay (s)	51.7	43.1	43.1	30.7	48.1	14.3
Level of Service	D	D	D	C	D	B
Approach Delay (s)	47.1		41.0			26.8
Approach LOS	D		D			C

Intersection Summary

HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	127.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 2: SW 124th Avenue & SW Tualatin Road

07/25/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	27	503	748	44	366	509
Future Volume (vph)	27	503	748	44	366	509
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1626	1583	3539	1542	1769	3406
Flt Permitted	0.95	1.00	1.00	1.00	0.20	1.00
Satd. Flow (perm)	1626	1583	3539	1542	374	3406
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	28	529	787	46	385	536
RTOR Reduction (vph)	0	273	0	19	0	0
Lane Group Flow (vph)	28	256	787	27	385	536
Confl. Peds. (#/hr)	1			4	4	
Heavy Vehicles (%)	11%	2%	2%	2%	2%	6%
Turn Type	Prot	pm+ov	NA	Perm	pm+pt	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		6	2	
Actuated Green, G (s)	2.4	27.3	27.2	27.2	57.1	57.1
Effective Green, g (s)	3.4	29.3	28.2	28.2	58.1	58.1
Actuated g/C Ratio	0.05	0.39	0.38	0.38	0.78	0.78
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.9	3.9	3.0	3.0
Lane Grp Cap (vph)	73	620	1334	581	773	2645
v/s Ratio Prot	0.02	c0.14	c0.22		c0.17	0.16
v/s Ratio Perm		0.02		0.02	0.21	
v/c Ratio	0.38	0.41	0.59	0.05	0.50	0.20
Uniform Delay, d1	34.7	16.5	18.7	14.8	5.8	2.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	0.4	0.8	0.0	0.5	0.0
Delay (s)	38.0	17.0	19.4	14.8	6.3	2.3
Level of Service	D	B	B	B	A	A
Approach Delay (s)	18.0		19.2			3.9
Approach LOS	B		B			A

### Intersection Summary

HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	74.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th TWSC

3: SW 108th Avenue/Residential Driveway & SW Tualatin Road

07/25/2022

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	0	359	7	6	685	0	33	0	21	0	0	0
Future Vol, veh/h	0	359	7	6	685	0	33	0	21	0	0	0
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	5	14	2	2	0	2	0	5	0	0	0
Mvmt Flow	0	390	8	7	745	0	36	0	23	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	751	0	0	400	0	0	1155	1161	396	1171	1165	751
Stage 1	-	-	-	-	-	-	396	396	-	765	765	-
Stage 2	-	-	-	-	-	-	759	765	-	406	400	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.5	6.25	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4	3.345	3.5	4	3.3
Pot Cap-1 Maneuver	868	-	-	1159	-	-	174	197	647	171	196	414
Stage 1	-	-	-	-	-	-	629	607	-	399	415	-
Stage 2	-	-	-	-	-	-	399	415	-	626	605	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	863	-	-	1157	-	-	173	194	646	163	193	412
Mov Cap-2 Maneuver	-	-	-	-	-	-	173	194	-	163	193	-
Stage 1	-	-	-	-	-	-	628	606	-	397	410	-
Stage 2	-	-	-	-	-	-	397	410	-	604	604	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			24.6			0		
HCM LOS							C			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	242	863	-	-	1157	-	-	-
HCM Lane V/C Ratio	0.243	-	-	-	0.006	-	-	-
HCM Control Delay (s)	24.6	0	-	-	8.1	-	-	0
HCM Lane LOS	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.9	0	-	-	0	-	-	-

HCM 6th TWSC  
4: SW 108th Avenue & North Access

07/25/2022

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↗	↖		↗		↕			↕	
Traffic Vol, veh/h	0	0	0	2	0	13	0	24	10	1	22	0
Future Vol, veh/h	0	0	0	2	0	13	0	24	10	1	22	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	92	90	92	92	92	90	90	92	92	90	90
Heavy Vehicles, %	0	2	0	2	2	2	0	9	2	2	3	0
Mvmt Flow	0	0	0	2	0	14	0	27	11	1	24	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	66	-	24	59	-	33	24	0	0	38	0	0
Stage 1	26	-	-	33	-	-	-	-	-	-	-	-
Stage 2	40	-	-	26	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	-	6.2	7.12	-	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	-	3.3	3.518	-	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	932	0	1058	937	0	1041	1604	-	-	1572	-	-
Stage 1	997	0	-	983	0	-	-	-	-	-	-	-
Stage 2	980	0	-	992	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	919	-	1058	936	-	1041	1604	-	-	1572	-	-
Mov Cap-2 Maneuver	919	-	-	936	-	-	-	-	-	-	-	-
Stage 1	997	-	-	983	-	-	-	-	-	-	-	-
Stage 2	967	-	-	991	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.6	0	0.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1604	-	-	-	-	936	1041	1572	-	-
HCM Lane V/C Ratio	-	-	-	-	-	0.002	0.014	0.001	-	-
HCM Control Delay (s)	0	-	-	0	0	8.9	8.5	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	0	0	-	-

HCM 6th TWSC  
5: SW 108th Avenue & South Access

07/25/2022

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	34	22	0
Future Vol, veh/h	0	0	0	34	22	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	37	24	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	61	24	24	0	0
Stage 1	24	-	-	-	-
Stage 2	37	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	945	1052	1591	-	-
Stage 1	999	-	-	-	-
Stage 2	985	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	945	1052	1591	-	-
Mov Cap-2 Maneuver	945	-	-	-	-
Stage 1	999	-	-	-	-
Stage 2	985	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1591	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	0	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-



# HCM Signalized Intersection Capacity Analysis

## 6: SW 124th Avenue & SW Leveton Drive

07/25/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Traffic Volume (vph)	22	41	29	46	3	208	16	567	23	60	464	12
Future Volume (vph)	22	41	29	46	3	208	16	567	23	60	464	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1769	1739		1626	1554		1107	3451		1769	3378	
Flt Permitted	0.59	1.00		0.64	1.00		0.47	1.00		0.29	1.00	
Satd. Flow (perm)	1100	1739		1089	1554		548	3451		546	3378	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	23	43	30	48	3	217	17	591	24	62	483	12
RTOR Reduction (vph)	0	23	0	0	161	0	0	3	0	0	2	0
Lane Group Flow (vph)	23	50	0	48	59	0	17	612	0	63	494	0
Confl. Peds. (#/hr)	1		1	1		1			2	2		
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	2%	2%	2%	11%	67%	2%	63%	3%	26%	2%	5%	58%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.7	12.9		16.9	14.5		22.1	21.2		28.5	24.4	
Effective Green, g (s)	15.7	13.9		18.9	15.5		24.1	22.2		30.5	25.4	
Actuated g/C Ratio	0.26	0.23		0.31	0.26		0.40	0.37		0.50	0.42	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	304	398		369	397		235	1264		377	1415	
v/s Ratio Prot	0.00	0.03		c0.01	c0.04		0.00	c0.18		c0.01	0.15	
v/s Ratio Perm	0.02			0.03			0.03			0.07		
v/c Ratio	0.08	0.13		0.13	0.15		0.07	0.48		0.17	0.35	
Uniform Delay, d1	16.9	18.5		14.8	17.4		11.2	14.8		8.3	12.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.2	0.2		0.1	0.3		0.2	0.2	
Delay (s)	17.0	18.7		15.0	17.6		11.3	15.1		8.5	12.1	
Level of Service	B	B		B	B		B	B		A	B	
Approach Delay (s)		18.3			17.1			15.0			11.7	
Approach LOS		B			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

**Intersection**

Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	98	10	19	234	2	17	3	6	2	4	13
Future Vol, veh/h	6	98	10	19	234	2	17	3	6	2	4	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	5	20	2	3	2	6	2	17	2	25	2
Mvmt Flow	7	107	11	21	254	2	18	3	7	2	4	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	9.1	8.1	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	65%	5%	7%	11%
Vol Thru, %	12%	86%	92%	21%
Vol Right, %	23%	9%	1%	68%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	26	114	255	19
LT Vol	17	6	19	2
Through Vol	3	98	234	4
RT Vol	6	10	2	13
Lane Flow Rate	28	124	277	21
Geometry Grp	1	1	1	1
Degree of Util (X)	0.038	0.148	0.317	0.026
Departure Headway (Hd)	4.893	4.29	4.122	4.453
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	735	841	862	807
Service Time	2.902	2.29	2.197	2.462
HCM Lane V/C Ratio	0.038	0.147	0.321	0.026
HCM Control Delay	8.1	8	9.1	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.5	1.4	0.1

HCM 6th TWSC  
8: SW Leveton Drive & West Driveway

07/25/2022

**Intersection**

Int Delay, s/veh 6.3

**Movement** EBL EBT WBT WBR SBL SBR

Lane Configurations		↕	↔		↕	↕
Traffic Vol, veh/h	79	29	103	35	76	152
Future Vol, veh/h	79	29	103	35	76	152
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	6	3	2	2	2	5
Mvmt Flow	87	32	113	38	84	167

**Major/Minor** Major1 Major2 Minor2

Conflicting Flow All	153	0	-	0	340	134
Stage 1	-	-	-	-	134	-
Stage 2	-	-	-	-	206	-
Critical Hdwy	4.16	-	-	-	6.42	6.25
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.254	-	-	-	3.518	3.345
Pot Cap-1 Maneuver	1403	-	-	-	656	907
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	829	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1400	-	-	-	612	905
Mov Cap-2 Maneuver	-	-	-	-	612	-
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	827	-

**Approach** EB WB SB

HCM Control Delay, s	5.7	0	10.5
HCM LOS			B

**Minor Lane/Major Mvmt** EBL EBT WBT WBR SBLn1 SBLn2

Capacity (veh/h)	1400	-	-	-	612	905
HCM Lane V/C Ratio	0.062	-	-	-	0.136	0.185
HCM Control Delay (s)	7.7	0	-	-	11.8	9.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5	0.7

HCM 6th TWSC  
 9: SW Leveton Drive & Center Driveway

07/25/2022

**Intersection**

Int Delay, s/veh 2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	10	97	109	20	28	28
Future Vol, veh/h	10	97	109	20	28	28
Conflicting Peds, #/hr	5	0	0	5	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	115	130	24	33	33

**Major/Minor**

	Major1	Major2	Minor2		
Conflicting Flow All	159	0	-	0	286
Stage 1	-	-	-	-	147
Stage 2	-	-	-	-	139
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1420	-	-	-	704
Stage 1	-	-	-	-	880
Stage 2	-	-	-	-	888
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1413	-	-	-	691
Mov Cap-2 Maneuver	-	-	-	-	691
Stage 1	-	-	-	-	868
Stage 2	-	-	-	-	884

**Approach**

	EB	WB	SB
HCM Control Delay, s	0.7	0	9.9
HCM LOS			A

**Minor Lane/Major Mvmt**

	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1413	-	-	-	691	896
HCM Lane V/C Ratio	0.008	-	-	-	0.048	0.037
HCM Control Delay (s)	7.6	0	-	-	10.5	9.2
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.1



**Intersection**

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	109	0	2	105	3	6	0	3	38	0	27
Future Vol, veh/h	2	109	0	2	105	3	6	0	3	38	0	27
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	3	2	50	1	2	2	2	33	2	2	2
Mvmt Flow	2	133	0	2	128	4	7	0	4	46	0	33

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	138	0	0	135
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.6
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.65
Pot Cap-1 Maneuver	1446	-	-	1201
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1438	-	-	1199
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	10.3	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	690	1438	-	-	1199	-	-	747
HCM Lane V/C Ratio	0.016	0.002	-	-	0.002	-	-	0.106
HCM Control Delay (s)	10.3	7.5	0	-	8	0	-	10.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.4

HCM 6th TWSC  
 11: SW 108th Avenue & SW Leveton Drive

07/25/2022

Intersection						
Int Delay, s/veh	7.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	23	127	80	11	13	9
Future Vol, veh/h	23	127	80	11	13	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	9	2	3	2	2	2
Mvmt Flow	27	151	95	13	15	11

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	224	21	26	0	0
Stage 1	21	-	-	-	-
Stage 2	203	-	-	-	-
Critical Hdwy	6.49	6.22	4.13	-	-
Critical Hdwy Stg 1	5.49	-	-	-	-
Critical Hdwy Stg 2	5.49	-	-	-	-
Follow-up Hdwy	3.581	3.318	2.227	-	-
Pot Cap-1 Maneuver	749	1056	1582	-	-
Stage 1	984	-	-	-	-
Stage 2	815	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	704	1056	1582	-	-
Mov Cap-2 Maneuver	704	-	-	-	-
Stage 1	925	-	-	-	-
Stage 2	815	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	6.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1582	-	981	-	-
HCM Lane V/C Ratio	0.06	-	0.182	-	-
HCM Control Delay (s)	7.4	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	-	-

# HCM Signalized Intersection Capacity Analysis

## 12: SW Herman Road & SW 108th Avenue

07/25/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	243	423	83	177	18
Future Volume (vph)	6	243	423	83	177	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1543	1792	1735		1770	1524
Flt Permitted	0.27	1.00	1.00		0.95	1.00
Satd. Flow (perm)	441	1792	1735		1770	1524
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	6	245	427	84	179	18
RTOR Reduction (vph)	0	0	9	0	0	13
Lane Group Flow (vph)	6	245	502	0	179	5
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	17%	6%	7%	5%	2%	6%
Turn Type	pm+pt	NA	NA		Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases	2					
Actuated Green, G (s)	25.4	25.4	19.4		10.3	10.3
Effective Green, g (s)	26.8	26.8	20.8		12.8	12.8
Actuated g/C Ratio	0.56	0.56	0.44		0.27	0.27
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	294	1008	758		475	409
v/s Ratio Prot	0.00	c0.14	c0.29		c0.10	0.00
v/s Ratio Perm	0.01					
v/c Ratio	0.02	0.24	0.66		0.38	0.01
Uniform Delay, d1	5.8	5.3	10.6		14.2	12.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.1	2.2		0.4	0.0
Delay (s)	5.8	5.4	12.8		14.5	12.8
Level of Service	A	A	B		B	B
Approach Delay (s)		5.4	12.8		14.4	
Approach LOS		A	B		B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			11.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.55			
Actuated Cycle Length (s)			47.6		Sum of lost time (s)	12.0
Intersection Capacity Utilization			43.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th TWSC  
 13: SW Teton Street & SW Tualatin Road

08/15/2022

**Intersection**

Int Delay, s/veh 14.9

**Movement** EBT EBR WBL WBT NBL NBR

Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	312	72	29	584	176	64
Future Vol, veh/h	312	72	29	584	176	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	10	2	2	7	3
Mvmt Flow	359	83	33	671	202	74

**Major/Minor** Major1 Major2 Minor1

Conflicting Flow All	0	0	442	0	1138	401
Stage 1	-	-	-	-	401	-
Stage 2	-	-	-	-	737	-
Critical Hdwy	-	-	4.12	-	6.47	6.23
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	-	-	2.218	-	3.563	3.327
Pot Cap-1 Maneuver	-	-	1118	-	218	647
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	464	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1118	-	211	647
Mov Cap-2 Maneuver	-	-	-	-	211	-
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	450	-

**Approach** EB WB NB

HCM Control Delay, s	0	0.4	75.7
HCM LOS			F

**Minor Lane/Major Mvmt** NBLn1 NBLn2 EBT EBR WBL WBT

Capacity (veh/h)	211	647	-	-	1118	-
HCM Lane V/C Ratio	0.959	0.114	-	-	0.03	-
HCM Control Delay (s)	99.1	11.3	-	-	8.3	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	8.2	0.4	-	-	0.1	-



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13: SW Teton Street & SW Tualatin Road Performance by movement

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Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Denied Del/Veh (s)	0.0	0.0	3.3	0.5	0.2	0.1	0.4
Total Delay (hr)	0.1	0.0	0.0	0.1	1.4	0.1	1.8
Total Del/Veh (s)	1.2	1.1	4.4	0.8	26.5	7.4	5.1
Stop Delay (hr)	0.0	0.0	0.0	0.0	1.2	0.1	1.2
Stop Del/Veh (s)	0.0	0.0	1.1	0.0	22.5	3.9	3.5

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 99W/Highway 99 W & SW 124th Avenue

07/27/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	149	284	1051	484	931	752
Future Volume (vph)	149	284	1051	484	931	752
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.3	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.95	1.00	*1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3155	2515	3406	1547	3438	3282
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3155	2515	3406	1547	3438	3282
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	169	323	1194	550	1058	855
RTOR Reduction (vph)	0	0	0	143	0	0
Lane Group Flow (vph)	169	323	1194	407	1058	855
Confl. Peds. (#/hr)		5		1	1	
Heavy Vehicles (%)	11%	13%	6%	3%	5%	10%
Turn Type	custom	pt+ov	NA	Perm	Prot	NA
Protected Phases	8	1 4	2		1	6
Permitted Phases	4			2		
Actuated Green, G (s)	18.0	56.9	54.8	54.8	44.8	105.2
Effective Green, g (s)	22.0	54.5	56.8	56.8	46.4	107.2
Actuated g/C Ratio	0.16	0.39	0.41	0.41	0.33	0.76
Clearance Time (s)	6.0		6.0	6.0	5.6	6.0
Vehicle Extension (s)	2.3		5.4	5.4	2.3	5.4
Lane Grp Cap (vph)	585	977	1379	626	1137	2509
v/s Ratio Prot	c0.03	0.13	c0.35		c0.31	0.26
v/s Ratio Perm	0.03			0.26		
v/c Ratio	0.29	0.33	0.87	0.65	0.93	0.34
Uniform Delay, d1	52.6	30.1	38.2	33.7	45.3	5.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	6.6	3.4	13.2	0.2
Delay (s)	52.8	30.2	44.8	37.1	58.5	5.4
Level of Service	D	C	D	D	E	A
Approach Delay (s)	37.9		42.4			34.8
Approach LOS	D		D			C

### Intersection Summary

HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: SW 124th Avenue & SW Tualatin Road

07/27/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	63	178	254	38	582	817
Future Volume (vph)	63	178	254	38	582	817
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1641	1553	3059	1503	1769	3406
Flt Permitted	0.95	1.00	1.00	1.00	0.38	1.00
Satd. Flow (perm)	1641	1553	3059	1503	716	3406
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	79	222	318	48	728	1021
RTOR Reduction (vph)	0	98	0	38	0	0
Lane Group Flow (vph)	79	125	318	10	728	1021
Confl. Peds. (#/hr)				2	2	
Heavy Vehicles (%)	10%	4%	18%	5%	2%	6%
Turn Type	Prot	pm+ov	NA	Perm	pm+pt	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		6	2	
Actuated Green, G (s)	7.0	42.6	15.6	15.6	56.2	56.2
Effective Green, g (s)	8.0	44.6	16.6	16.6	57.2	57.2
Actuated g/C Ratio	0.10	0.56	0.21	0.21	0.72	0.72
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.9	3.9	3.0	3.0
Lane Grp Cap (vph)	165	873	640	314	1002	2456
v/s Ratio Prot	c0.05	0.07	0.10		c0.34	0.30
v/s Ratio Perm		0.01		0.01	c0.19	
v/c Ratio	0.48	0.14	0.50	0.03	0.73	0.42
Uniform Delay, d1	33.7	8.3	27.7	25.0	6.3	4.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.1	0.8	0.1	2.7	0.1
Delay (s)	35.9	8.3	28.5	25.0	8.9	4.5
Level of Service	D	A	C	C	A	A
Approach Delay (s)	15.5		28.0			6.3
Approach LOS	B		C			A

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	79.3	Sum of lost time (s)	14.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	0	574	39	51	292	0	11	0	8	0	0	0
Future Vol, veh/h	0	574	39	51	292	0	11	0	8	0	0	0
Conflicting Peds, #/hr	4	0	1	1	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	3	7	8	6	0	9	0	38	0	0	0
Mvmt Flow	0	683	46	61	348	0	13	0	10	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	352	0	0	730	0	0	1177	1181	707	1185	1204	352
Stage 1	-	-	-	-	-	-	707	707	-	474	474	-
Stage 2	-	-	-	-	-	-	470	474	-	711	730	-
Critical Hdwy	4.1	-	-	4.18	-	-	7.19	6.5	6.58	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.19	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.19	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.272	-	-	3.581	4	3.642	3.5	4	3.3
Pot Cap-1 Maneuver	1218	-	-	847	-	-	163	192	380	167	186	696
Stage 1	-	-	-	-	-	-	415	441	-	575	561	-
Stage 2	-	-	-	-	-	-	561	561	-	427	431	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1213	-	-	846	-	-	154	177	380	153	172	693
Mov Cap-2 Maneuver	-	-	-	-	-	-	154	177	-	153	172	-
Stage 1	-	-	-	-	-	-	415	441	-	573	518	-
Stage 2	-	-	-	-	-	-	521	518	-	416	431	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.4	24.7	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	205	1213	-	-	846	-	-	-
HCM Lane V/C Ratio	0.11	-	-	-	0.072	-	-	-
HCM Control Delay (s)	24.7	0	-	-	9.6	-	-	0
HCM Lane LOS	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	-



HCM 6th TWSC  
4: SW 108th Avenue & North Access

07/27/2022

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↗	↖		↗		↕			↕	
Traffic Vol, veh/h	0	0	0	7	0	1	0	7	15	2	65	0
Future Vol, veh/h	0	0	0	7	0	1	0	7	15	2	65	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	92	90	92	92	92	90	90	92	92	90	90
Heavy Vehicles, %	0	2	0	2	2	2	0	9	2	2	3	0
Mvmt Flow	0	0	0	8	0	1	0	8	16	2	72	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	93	-	72	92	-	16	72	0	0	24	0	0
Stage 1	76	-	-	16	-	-	-	-	-	-	-	-
Stage 2	17	-	-	76	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	-	6.2	7.12	-	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	-	3.3	3.518	-	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	895	0	996	892	0	1063	1541	-	-	1591	-	-
Stage 1	938	0	-	1004	0	-	-	-	-	-	-	-
Stage 2	1008	0	-	933	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	893	-	996	891	-	1063	1541	-	-	1591	-	-
Mov Cap-2 Maneuver	893	-	-	891	-	-	-	-	-	-	-	-
Stage 1	938	-	-	1004	-	-	-	-	-	-	-	-
Stage 2	1007	-	-	932	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	9	0	0.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1541	-	-	-	-	891	1063	1591	-	-
HCM Lane V/C Ratio	-	-	-	-	-	0.009	0.001	0.001	-	-
HCM Control Delay (s)	0	-	-	0	0	9.1	8.4	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	0	0	-	-

HCM 6th TWSC  
5: SW 108th Avenue & South Access

07/27/2022

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	22	65	0
Future Vol, veh/h	0	0	0	22	65	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	24	71	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	95	71	71	0	-	0
Stage 1	71	-	-	-	-	-
Stage 2	24	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	905	991	1529	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	905	991	1529	-	-	-
Mov Cap-2 Maneuver	905	-	-	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	999	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1529	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	0	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-

# HCM Signalized Intersection Capacity Analysis

## 6: SW 124th Avenue & SW Leveton Drive

07/27/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Traffic Volume (vph)	6	62	12	18	5	15	27	264	66	194	658	33
Future Volume (vph)	6	62	12	18	5	15	27	264	66	194	658	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.89		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1081	1802		1480	1656		1467	3050		1752	3358	
Flt Permitted	0.72	1.00		0.70	1.00		0.36	1.00		0.44	1.00	
Satd. Flow (perm)	824	1802		1096	1656		557	3050		818	3358	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	69	13	20	6	17	30	293	73	216	731	37
RTOR Reduction (vph)	0	8	0	0	15	0	0	19	0	0	2	0
Lane Group Flow (vph)	7	74	0	20	8	0	30	347	0	216	766	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	67%	2%	8%	22%	2%	2%	23%	17%	6%	3%	6%	19%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.8	7.1		7.4	6.9		24.0	21.8		38.0	30.8	
Effective Green, g (s)	9.8	8.1		9.4	7.9		26.0	22.8		39.0	31.8	
Actuated g/C Ratio	0.16	0.13		0.16	0.13		0.43	0.38		0.64	0.52	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	140	240		179	215		287	1147		714	1762	
v/s Ratio Prot	0.00	c0.04		c0.00	0.00		0.01	0.11		c0.06	c0.23	
v/s Ratio Perm	0.01			0.01			0.04			0.13		
v/c Ratio	0.05	0.31		0.11	0.04		0.10	0.30		0.30	0.43	
Uniform Delay, d1	21.4	23.7		21.9	23.0		10.1	13.3		4.6	8.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.7		0.3	0.1		0.2	0.1		0.2	0.2	
Delay (s)	21.6	24.5		22.2	23.1		10.2	13.5		4.8	9.0	
Level of Service	C	C		C	C		B	B		A	A	
Approach Delay (s)		24.2			22.7			13.2			8.1	
Approach LOS		C			C			B			A	

### Intersection Summary

HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th AWSC  
7: SW 118th Drive/JAE Access & SW Leveton Drive

07/27/2022

Intersection

Intersection Delay, s/veh 9.6  
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	286	18	7	31	0	7	3	16	0	0	1
Future Vol, veh/h	12	286	18	7	31	0	7	3	16	0	0	1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	2	2	11	57	7	2	14	2	33	2	2	2
Mvmt Flow	14	340	21	8	37	0	8	4	19	0	0	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.9	8.7	8	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	27%	4%	18%	0%
Vol Thru, %	12%	91%	82%	0%
Vol Right, %	62%	6%	0%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	26	316	38	1
LT Vol	7	12	7	0
Through Vol	3	286	31	0
RT Vol	16	18	0	1
Lane Flow Rate	31	376	45	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.041	0.418	0.066	0.001
Departure Headway (Hd)	4.753	3.998	5.248	4.3
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	758	895	674	837
Service Time	2.753	2.046	3.348	2.302
HCM Lane V/C Ratio	0.041	0.42	0.067	0.001
HCM Control Delay	8	9.9	8.7	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	2.1	0.2	0



HCM 6th TWSC  
 8: SW Leveton Drive & West Driveway

07/27/2022

**Intersection**

Int Delay, s/veh 3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	144	150	21	94	12	20
Future Vol, veh/h	144	150	21	94	12	20
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	5	6	42	25
Mvmt Flow	171	179	25	112	14	24

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	139	0	-	0	604 83
Stage 1	-	-	-	-	83 -
Stage 2	-	-	-	-	521 -
Critical Hdwy	4.14	-	-	-	6.82 6.45
Critical Hdwy Stg 1	-	-	-	-	5.82 -
Critical Hdwy Stg 2	-	-	-	-	5.82 -
Follow-up Hdwy	2.236	-	-	-	3.878 3.525
Pot Cap-1 Maneuver	1432	-	-	-	402 916
Stage 1	-	-	-	-	849 -
Stage 2	-	-	-	-	522 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1429	-	-	-	347 914
Mov Cap-2 Maneuver	-	-	-	-	347 -
Stage 1	-	-	-	-	734 -
Stage 2	-	-	-	-	521 -

Approach	EB	WB	SB
HCM Control Delay, s	3.9	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1429	-	-	-	347	914
HCM Lane V/C Ratio	0.12	-	-	-	0.041	0.026
HCM Control Delay (s)	7.9	0	-	-	15.8	9
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.1	0.1

HCM 6th TWSC  
9: SW Leveton Drive & Center Driveway

07/27/2022

**Intersection**

Int Delay, s/veh 1.7

**Movement** EBL EBT WBT WBR SBL SBR

Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	50	107	108	31	8	5
Future Vol, veh/h	50	107	108	31	8	5
Conflicting Peds, #/hr	2	0	0	2	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	6	13	2	2	2
Mvmt Flow	61	130	132	38	10	6

**Major/Minor** Major1 Major2 Minor2

Conflicting Flow All	172	0	-	0	406	153
Stage 1	-	-	-	-	153	-
Stage 2	-	-	-	-	253	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1405	-	-	-	601	893
Stage 1	-	-	-	-	875	-
Stage 2	-	-	-	-	789	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1402	-	-	-	570	891
Mov Cap-2 Maneuver	-	-	-	-	570	-
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	787	-

**Approach** EB WB SB

HCM Control Delay, s	2.4	0	10.5
HCM LOS			B

**Minor Lane/Major Mvmt** EBL EBT WBT WBR SBLn1 SBLn2

Capacity (veh/h)	1402	-	-	-	570	891
HCM Lane V/C Ratio	0.043	-	-	-	0.017	0.007
HCM Control Delay (s)	7.7	0	-	-	11.4	9.1
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0

HCM 6th TWSC  
 10: Calmax Driveway/East Driveway & SW Leveton Drive

07/27/2022

**Intersection**

Int Delay, s/veh 1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	38	65	4	0	150	67	0	0	1	3	0	2
Future Vol, veh/h	38	65	4	0	150	67	0	0	1	3	0	2
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	11	2	2	7	2	2	2	2	2	2	2
Mvmt Flow	47	80	5	0	185	83	0	0	1	4	0	2

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	269	0	0	85
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1295	-	-	1512
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1294	-	-	1512
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.8	0	8.7	10.8
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	976	1294	-	-	1512	-	-	622
HCM Lane V/C Ratio	0.001	0.036	-	-	-	-	-	0.01
HCM Control Delay (s)	8.7	7.9	0	-	0	-	-	10.8
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0

HCM 6th TWSC  
 11: SW 108th Avenue & SW Leveton Drive

07/27/2022

Intersection						
Int Delay, s/veh	6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	43	162	15	19	46
Future Vol, veh/h	7	43	162	15	19	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	14	10	6	20	16	12
Mvmt Flow	9	57	213	20	25	61

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	502	56	86	0	0
Stage 1	56	-	-	-	-
Stage 2	446	-	-	-	-
Critical Hdwy	6.54	6.3	4.16	-	-
Critical Hdwy Stg 1	5.54	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-
Follow-up Hdwy	3.626	3.39	2.254	-	-
Pot Cap-1 Maneuver	508	988	1485	-	-
Stage 1	937	-	-	-	-
Stage 2	620	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	434	988	1485	-	-
Mov Cap-2 Maneuver	434	-	-	-	-
Stage 1	801	-	-	-	-
Stage 2	620	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	7.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1485	-	838	-	-
HCM Lane V/C Ratio	0.144	-	0.079	-	-
HCM Control Delay (s)	7.8	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.5	-	0.3	-	-



# HCM Signalized Intersection Capacity Analysis

## 12: SW Herman Road & SW 108th Avenue

07/27/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	14	290	218	215	53	9
Future Volume (vph)	14	290	218	215	53	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1492	1583	1586		1543	1455
Flt Permitted	0.34	1.00	1.00		0.95	1.00
Satd. Flow (perm)	534	1583	1586		1543	1455
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	17	354	266	262	65	11
RTOR Reduction (vph)	0	0	35	0	0	9
Lane Group Flow (vph)	17	354	493	0	65	2
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	21%	20%	16%	5%	17%	11%
Turn Type	pm+pt	NA	NA		Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases	2					
Actuated Green, G (s)	32.6	32.6	26.6		4.6	4.6
Effective Green, g (s)	34.0	34.0	28.0		7.1	7.1
Actuated g/C Ratio	0.69	0.69	0.57		0.14	0.14
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	408	1096	904		223	210
v/s Ratio Prot	0.00	c0.22	c0.31		c0.04	0.00
v/s Ratio Perm	0.03					
v/c Ratio	0.04	0.32	0.55		0.29	0.01
Uniform Delay, d1	3.1	3.0	6.6		18.8	18.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	0.7		0.6	0.0
Delay (s)	3.2	3.2	7.3		19.3	18.0
Level of Service	A	A	A		B	B
Approach Delay (s)		3.2	7.3		19.1	
Approach LOS		A	A		B	

### Intersection Summary

HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	49.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th TWSC  
 13: SW Teton Street & SW Tualatin Road

08/15/2022

**Intersection**

Int Delay, s/veh 3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	430	151	53	289	74	54
Future Vol, veh/h	430	151	53	289	74	54
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	3	10	3	9	27
Mvmt Flow	483	170	60	325	83	61

**Major/Minor**

	Major1	Major2	Minor1		
Conflicting Flow All	0	0	653	0	1014 568
Stage 1	-	-	-	-	568 -
Stage 2	-	-	-	-	446 -
Critical Hdwy	-	-	4.2	-	6.49 6.47
Critical Hdwy Stg 1	-	-	-	-	5.49 -
Critical Hdwy Stg 2	-	-	-	-	5.49 -
Follow-up Hdwy	-	-	2.29	-	3.581 3.543
Pot Cap-1 Maneuver	-	-	897	-	257 478
Stage 1	-	-	-	-	553 -
Stage 2	-	-	-	-	631 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	897	-	240 478
Mov Cap-2 Maneuver	-	-	-	-	240 -
Stage 1	-	-	-	-	553 -
Stage 2	-	-	-	-	588 -

**Approach**

	EB	WB	NB
HCM Control Delay, s	0	1.4	21.8
HCM LOS			C

**Minor Lane/Major Mvmt**

	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	240	478	-	-	897	-
HCM Lane V/C Ratio	0.346	0.127	-	-	0.066	-
HCM Control Delay (s)	27.7	13.6	-	-	9.3	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.5	0.4	-	-	0.2	-

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 99W/Highway 99 W & SW 124th Avenue

07/27/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	626	739	894	192	733	1207
Future Volume (vph)	626	739	894	192	733	1207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.3	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.95	1.00	*1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	2787	3539	1533	3471	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	2787	3539	1533	3471	3471
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	659	778	941	202	772	1271
RTOR Reduction (vph)	0	0	0	104	0	0
Lane Group Flow (vph)	659	778	941	98	772	1271
Confl. Peds. (#/hr)		11				
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%
Turn Type	Prot	pt+ov	NA	Perm	Prot	NA
Protected Phases	8	1 4	2		1	6
Permitted Phases				2		
Actuated Green, G (s)	27.8	45.8	40.6	40.6	34.7	80.9
Effective Green, g (s)	29.8	43.4	42.6	42.6	36.3	82.9
Actuated g/C Ratio	0.23	0.33	0.32	0.32	0.28	0.63
Clearance Time (s)	6.0		6.0	6.0	5.6	6.0
Vehicle Extension (s)	2.3		5.4	5.4	2.3	5.4
Lane Grp Cap (vph)	776	917	1143	495	955	2183
v/s Ratio Prot	c0.19	c0.28	c0.27		0.22	0.37
v/s Ratio Perm				0.06		
v/c Ratio	0.85	0.85	0.82	0.20	0.81	0.58
Uniform Delay, d1	48.8	41.1	41.1	32.3	44.5	14.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.4	7.2	5.6	0.5	4.9	0.7
Delay (s)	57.3	48.3	46.7	32.7	49.4	15.0
Level of Service	E	D	D	C	D	B
Approach Delay (s)	52.4		44.3			28.0
Approach LOS	D		D			C

### Intersection Summary

HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	131.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: SW 124th Avenue & SW Tualatin Road

07/27/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	28	525	860	45	376	553
Future Volume (vph)	28	525	860	45	376	553
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1626	1583	3539	1542	1769	3406
Flt Permitted	0.95	1.00	1.00	1.00	0.16	1.00
Satd. Flow (perm)	1626	1583	3539	1542	303	3406
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	553	905	47	396	582
RTOR Reduction (vph)	0	269	0	16	0	0
Lane Group Flow (vph)	29	284	905	31	396	582
Confl. Peds. (#/hr)				4	4	
Heavy Vehicles (%)	11%	2%	2%	2%	2%	6%
Turn Type	Prot	pm+ov	NA	Perm	pm+pt	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		6	2	
Actuated Green, G (s)	2.5	28.8	31.0	31.0	62.3	62.3
Effective Green, g (s)	3.5	30.8	32.0	32.0	63.3	63.3
Actuated g/C Ratio	0.04	0.38	0.40	0.40	0.79	0.79
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.9	3.9	3.0	3.0
Lane Grp Cap (vph)	70	607	1410	614	737	2684
v/s Ratio Prot	0.02	c0.16	c0.26		c0.18	0.17
v/s Ratio Perm		0.02		0.02	0.24	
v/c Ratio	0.41	0.47	0.64	0.05	0.54	0.22
Uniform Delay, d1	37.4	18.6	19.5	14.8	9.6	2.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.6	1.1	0.0	0.8	0.0
Delay (s)	41.3	19.2	20.6	14.9	10.4	2.2
Level of Service	D	B	C	B	B	A
Approach Delay (s)	20.3		20.3			5.5
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	80.3	Sum of lost time (s)	14.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↵		↵	↵			↕			↕	
Traffic Vol, veh/h	0	367	9	8	706	0	39	0	26	0	0	0
Future Vol, veh/h	0	367	9	8	706	0	39	0	26	0	0	0
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	5	14	2	2	0	2	0	5	0	0	0
Mvmt Flow	0	399	10	9	767	0	42	0	28	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	773	0	0	411	0	0	1191	1197	406	1209	1202	773
Stage 1	-	-	-	-	-	-	406	406	-	791	791	-
Stage 2	-	-	-	-	-	-	785	791	-	418	411	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.5	6.25	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4	3.345	3.5	4	3.3
Pot Cap-1 Maneuver	851	-	-	1148	-	-	164	187	638	161	186	402
Stage 1	-	-	-	-	-	-	622	601	-	386	404	-
Stage 2	-	-	-	-	-	-	386	404	-	616	598	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	846	-	-	1146	-	-	163	184	637	152	183	400
Mov Cap-2 Maneuver	-	-	-	-	-	-	163	184	-	152	183	-
Stage 1	-	-	-	-	-	-	621	600	-	384	398	-
Stage 2	-	-	-	-	-	-	383	398	-	589	597	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			27.2			0		
HCM LOS							D			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	232	846	-	-	1146	-	-	-
HCM Lane V/C Ratio	0.305	-	-	-	0.008	-	-	-
HCM Control Delay (s)	27.2	0	-	-	8.2	-	-	0
HCM Lane LOS	D	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	1.2	0	-	-	0	-	-	-

HCM 6th TWSC  
4: SW 108th Avenue & North Access

07/27/2022

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↗	↖		↗		↕			↕	
Traffic Vol, veh/h	0	0	0	13	0	2	0	34	10	1	26	0
Future Vol, veh/h	0	0	0	13	0	2	0	34	10	1	26	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	92	90	92	92	92	90	90	92	92	90	90
Heavy Vehicles, %	0	2	0	2	2	2	0	9	2	2	3	0
Mvmt Flow	0	0	0	14	0	2	0	38	11	1	29	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	76	-	29	75	-	44	29	0	0	49	0	0
Stage 1	31	-	-	44	-	-	-	-	-	-	-	-
Stage 2	45	-	-	31	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	-	6.2	7.12	-	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	-	3.3	3.518	-	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	919	0	1052	915	0	1026	1597	-	-	1558	-	-
Stage 1	991	0	-	970	0	-	-	-	-	-	-	-
Stage 2	974	0	-	986	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	916	-	1052	914	-	1026	1597	-	-	1558	-	-
Mov Cap-2 Maneuver	916	-	-	914	-	-	-	-	-	-	-	-
Stage 1	991	-	-	970	-	-	-	-	-	-	-	-
Stage 2	972	-	-	985	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.9	0	0.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1597	-	-	-	-	914	1026	1558	-	-
HCM Lane V/C Ratio	-	-	-	-	-	0.015	0.002	0.001	-	-
HCM Control Delay (s)	0	-	-	0	0	9	8.5	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	0	0	-	-

HCM 6th TWSC  
5: SW 108th Avenue & South Access

07/27/2022

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	45	26	0
Future Vol, veh/h	0	0	0	45	26	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	49	28	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	77	28	28	0	-	0
Stage 1	28	-	-	-	-	-
Stage 2	49	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	926	1047	1585	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	973	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	926	1047	1585	-	-	-
Mov Cap-2 Maneuver	926	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	973	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1585	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	0	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-

# HCM Signalized Intersection Capacity Analysis

## 6: SW 124th Avenue & SW Leveton Drive

07/27/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Traffic Volume (vph)	22	42	30	62	3	247	16	640	29	77	491	12
Future Volume (vph)	22	42	30	62	3	247	16	640	29	77	491	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1769	1738		1626	1555		1107	3445		1769	3381	
Flt Permitted	0.42	1.00		0.69	1.00		0.46	1.00		0.24	1.00	
Satd. Flow (perm)	781	1738		1177	1555		534	3445		449	3381	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	23	44	31	65	3	257	17	667	30	80	511	12
RTOR Reduction (vph)	0	24	0	0	201	0	0	3	0	0	2	0
Lane Group Flow (vph)	23	51	0	65	59	0	17	694	0	80	522	0
Confl. Peds. (#/hr)	1		1	1		1			2	2		
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	2%	2%	2%	11%	67%	2%	63%	3%	26%	2%	5%	58%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.6	12.5		15.4	12.9		23.4	22.5		33.9	28.0	
Effective Green, g (s)	16.6	13.5		17.4	13.9		25.4	23.5		34.9	29.0	
Actuated g/C Ratio	0.26	0.21		0.27	0.22		0.40	0.37		0.55	0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	250	367		345	338		229	1266		398	1534	
v/s Ratio Prot	0.00	0.03		c0.01	0.04		0.00	c0.20		c0.02	c0.15	
v/s Ratio Perm	0.02			c0.04			0.03			0.09		
v/c Ratio	0.09	0.14		0.19	0.17		0.07	0.55		0.20	0.34	
Uniform Delay, d1	17.9	20.5		17.6	20.3		11.8	16.0		7.8	11.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.3	0.2		0.1	0.5		0.3	0.1	
Delay (s)	18.0	20.6		17.9	20.6		11.9	16.5		8.1	11.4	
Level of Service	B	C		B	C		B	B		A	B	
Approach Delay (s)		20.0			20.0			16.4			11.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	63.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



**Intersection**

Intersection Delay, s/veh 9.4  
 Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	122	10	25	289	2	17	3	8	2	4	13
Future Vol, veh/h	6	122	10	25	289	2	17	3	8	2	4	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	5	20	2	3	2	6	2	17	2	25	2
Mvmt Flow	7	133	11	27	314	2	18	3	9	2	4	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	10	8.3	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	61%	4%	8%	11%
Vol Thru, %	11%	88%	91%	21%
Vol Right, %	29%	7%	1%	68%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	28	138	316	19
LT Vol	17	6	25	2
Through Vol	3	122	289	4
RT Vol	8	10	2	13
Lane Flow Rate	30	150	343	21
Geometry Grp	1	1	1	1
Degree of Util (X)	0.043	0.182	0.396	0.027
Departure Headway (Hd)	5.056	4.369	4.147	4.663
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	711	825	855	771
Service Time	3.067	2.378	2.24	2.674
HCM Lane V/C Ratio	0.042	0.182	0.401	0.027
HCM Control Delay	8.3	8.3	10	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.7	1.9	0.1

HCM 6th TWSC  
8: SW Leveton Drive & West Driveway

07/27/2022

**Intersection**

Int Delay, s/veh 7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	100	33	119	46	98	194
Future Vol, veh/h	100	33	119	46	98	194
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	6	3	2	2	2	5
Mvmt Flow	110	36	131	51	108	213

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	184	0	-	0	415 159
Stage 1	-	-	-	-	159 -
Stage 2	-	-	-	-	256 -
Critical Hdwy	4.16	-	-	-	6.42 6.25
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.254	-	-	-	3.518 3.345
Pot Cap-1 Maneuver	1367	-	-	-	594 878
Stage 1	-	-	-	-	870 -
Stage 2	-	-	-	-	787 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1364	-	-	-	543 876
Mov Cap-2 Maneuver	-	-	-	-	543 -
Stage 1	-	-	-	-	797 -
Stage 2	-	-	-	-	785 -

Approach	EB	WB	SB
HCM Control Delay, s	5.9	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1364	-	-	-	543	876
HCM Lane V/C Ratio	0.081	-	-	-	0.198	0.243
HCM Control Delay (s)	7.9	0	-	-	13.3	10.4
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.7	1

HCM 6th TWSC  
 9: SW Leveton Drive & Center Driveway

07/27/2022

**Intersection**

Int Delay, s/veh 2.3

**Movement** EBL EBT WBT WBR SBL SBR

Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	12	122	129	27	37	35
Future Vol, veh/h	12	122	129	27	37	35
Conflicting Peds, #/hr	5	0	0	5	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	145	154	32	44	42

**Major/Minor** Major1 Major2 Minor2

Conflicting Flow All	191	0	-	0	348	175
Stage 1	-	-	-	-	175	-
Stage 2	-	-	-	-	173	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1383	-	-	-	649	868
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	857	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1376	-	-	-	635	864
Mov Cap-2 Maneuver	-	-	-	-	635	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	853	-

**Approach** EB WB SB

HCM Control Delay, s	0.7	0	10.3
HCM LOS			B

**Minor Lane/Major Mvmt** EBL EBT WBT WBR SBLn1 SBLn2

Capacity (veh/h)	1376	-	-	-	635	864
HCM Lane V/C Ratio	0.01	-	-	-	0.069	0.048
HCM Control Delay (s)	7.6	0	-	-	11.1	9.4
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.2

**Intersection**

Int Delay, s/veh 2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	142	0	2	125	4	6	0	3	50	0	34
Future Vol, veh/h	3	142	0	2	125	4	6	0	3	50	0	34
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	3	2	50	1	2	2	2	33	2	2	2
Mvmt Flow	4	173	0	2	152	5	7	0	4	61	0	41

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	163	0	0	175
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.6
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.65
Pot Cap-1 Maneuver	1416	-	-	1158
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1408	-	-	1156
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	10.9	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	623	1408	-	-	1156	-	-	688
HCM Lane V/C Ratio	0.018	0.003	-	-	0.002	-	-	0.149
HCM Control Delay (s)	10.9	7.6	0	-	8.1	0	-	11.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.5



HCM 6th TWSC  
 11: SW 108th Avenue & SW Leveton Drive

07/27/2022

Intersection						
Int Delay, s/veh	8.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	32	164	97	11	13	13
Future Vol, veh/h	32	164	97	11	13	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	9	2	3	2	2	2
Mvmt Flow	38	195	115	13	15	15

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	266	23	30	0	0
Stage 1	23	-	-	-	-
Stage 2	243	-	-	-	-
Critical Hdwy	6.49	6.22	4.13	-	-
Critical Hdwy Stg 1	5.49	-	-	-	-
Critical Hdwy Stg 2	5.49	-	-	-	-
Follow-up Hdwy	3.581	3.318	2.227	-	-
Pot Cap-1 Maneuver	708	1054	1576	-	-
Stage 1	982	-	-	-	-
Stage 2	781	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	656	1054	1576	-	-
Mov Cap-2 Maneuver	656	-	-	-	-
Stage 1	909	-	-	-	-
Stage 2	781	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	6.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1576	-	959	-	-
HCM Lane V/C Ratio	0.073	-	0.243	-	-
HCM Control Delay (s)	7.5	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1	-	-

# HCM Signalized Intersection Capacity Analysis

## 12: SW Herman Road & SW 108th Avenue

07/27/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	250	450	100	215	18
Future Volume (vph)	6	250	450	100	215	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1543	1792	1731		1770	1524
Flt Permitted	0.24	1.00	1.00		0.95	1.00
Satd. Flow (perm)	387	1792	1731		1770	1524
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	6	253	455	101	217	18
RTOR Reduction (vph)	0	0	10	0	0	13
Lane Group Flow (vph)	6	253	546	0	217	5
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	17%	6%	7%	5%	2%	6%
Turn Type	pm+pt	NA	NA		Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases	2					
Actuated Green, G (s)	27.0	27.0	21.1		11.9	11.9
Effective Green, g (s)	28.4	28.4	22.5		14.4	14.4
Actuated g/C Ratio	0.56	0.56	0.44		0.28	0.28
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	259	1001	766		501	432
v/s Ratio Prot	0.00	c0.14	c0.32		c0.12	0.00
v/s Ratio Perm	0.01					
v/c Ratio	0.02	0.25	0.71		0.43	0.01
Uniform Delay, d1	6.5	5.8	11.5		14.9	13.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.1	3.2		0.5	0.0
Delay (s)	6.6	5.9	14.7		15.3	13.1
Level of Service	A	A	B		B	B
Approach Delay (s)		5.9	14.7		15.2	
Approach LOS		A	B		B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			12.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			50.8		Sum of lost time (s)	12.0
Intersection Capacity Utilization			48.3%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th TWSC  
 13: SW Teton Street & SW Tualatin Road

08/15/2022

Intersection

Int Delay, s/veh 18.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	324	73	30	605	180	65
Future Vol, veh/h	324	73	30	605	180	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	10	2	2	7	3
Mvmt Flow	372	84	34	695	207	75

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	456
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1105
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1105
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	93.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	200	636	-	-	1105	-
HCM Lane V/C Ratio	1.034	0.117	-	-	0.031	-
HCM Control Delay (s)	122.6	11.4	-	-	8.4	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	9.2	0.4	-	-	0.1	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

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13: SW Teton Street & SW Tualatin Road Performance by movement

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Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Denied Del/Veh (s)	0.0	0.0	3.1	0.6	0.2	0.2	0.4
Total Delay (hr)	0.1	0.0	0.0	0.1	1.5	0.1	2.0
Total Del/Veh (s)	1.2	1.0	4.6	0.8	29.9	7.3	5.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	1.3	0.1	1.4
Stop Del/Veh (s)	0.0	0.0	1.1	0.0	26.0	3.7	3.9



HCM Signalized Intersection Capacity Analysis  
 1: Highway 99W/Highway 99 W & SW 124th Avenue

07/27/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	153	290	1051	510	974	752
Future Volume (vph)	153	290	1051	510	974	752
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.3	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.95	1.00	*1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3155	2515	3406	1547	3438	3282
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3155	2515	3406	1547	3438	3282
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	174	330	1194	580	1107	855
RTOR Reduction (vph)	0	0	0	143	0	0
Lane Group Flow (vph)	174	330	1194	437	1107	855
Confl. Peds. (#/hr)		5		1	1	
Heavy Vehicles (%)	11%	13%	6%	3%	5%	10%
Turn Type	custom	pt+ov	NA	Perm	Prot	NA
Protected Phases	8	1 4	2		1	6
Permitted Phases	4			2		
Actuated Green, G (s)	18.0	59.0	54.9	54.9	46.9	107.4
Effective Green, g (s)	22.0	56.6	56.9	56.9	48.5	109.4
Actuated g/C Ratio	0.15	0.40	0.40	0.40	0.34	0.77
Clearance Time (s)	6.0		6.0	6.0	5.6	6.0
Vehicle Extension (s)	2.3		5.4	5.4	2.3	5.4
Lane Grp Cap (vph)	576	999	1360	618	1170	2521
v/s Ratio Prot	c0.03	0.13	c0.35		c0.32	0.26
v/s Ratio Perm	0.03			0.28		
v/c Ratio	0.30	0.33	0.88	0.71	0.95	0.34
Uniform Delay, d1	53.9	29.8	39.5	35.8	45.7	5.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	7.4	4.9	15.0	0.2
Delay (s)	54.0	29.9	46.9	40.7	60.7	5.4
Level of Service	D	C	D	D	E	A
Approach Delay (s)	38.2		44.9			36.6
Approach LOS	D		D			D

Intersection Summary

HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	142.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: SW 124th Avenue & SW Tualatin Road

07/27/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	63	179	262	38	591	877
Future Volume (vph)	63	179	262	38	591	877
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1641	1553	3059	1502	1769	3406
Flt Permitted	0.95	1.00	1.00	1.00	0.37	1.00
Satd. Flow (perm)	1641	1553	3059	1502	697	3406
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	79	224	328	48	739	1096
RTOR Reduction (vph)	0	98	0	38	0	0
Lane Group Flow (vph)	79	126	328	10	739	1096
Confl. Peds. (#/hr)				2	2	
Heavy Vehicles (%)	10%	4%	18%	5%	2%	6%
Turn Type	Prot	pm+ov	NA	Perm	pm+pt	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		6	2	
Actuated Green, G (s)	7.1	43.3	15.8	15.8	57.0	57.0
Effective Green, g (s)	8.1	45.3	16.8	16.8	58.0	58.0
Actuated g/C Ratio	0.10	0.56	0.21	0.21	0.72	0.72
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.9	3.9	3.0	3.0
Lane Grp Cap (vph)	165	876	639	314	1000	2460
v/s Ratio Prot	c0.05	0.07	0.11		c0.34	0.32
v/s Ratio Perm		0.01		0.01	c0.19	
v/c Ratio	0.48	0.14	0.51	0.03	0.74	0.45
Uniform Delay, d1	34.1	8.3	28.1	25.3	6.9	4.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.1	0.9	0.1	2.9	0.1
Delay (s)	36.3	8.4	29.0	25.3	9.8	4.7
Level of Service	D	A	C	C	A	A
Approach Delay (s)	15.7		28.6			6.7
Approach LOS	B		C			A

### Intersection Summary

HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.3	Sum of lost time (s)	14.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

**Intersection**

Int Delay, s/veh 1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	0	574	48	60	292	0	12	0	9	0	0	0
Future Vol, veh/h	0	574	48	60	292	0	12	0	9	0	0	0
Conflicting Peds, #/hr	4	0	1	1	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	3	7	8	6	0	9	0	38	0	0	0
Mvmt Flow	0	683	57	71	348	0	14	0	11	0	0	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	352	0	0	741
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.1	-	-	4.18
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.272
Pot Cap-1 Maneuver	1218	-	-	839
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1213	-	-	838
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.7	25.8	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	198	1213	-	-	838	-	-	-
HCM Lane V/C Ratio	0.126	-	-	-	0.085	-	-	-
HCM Control Delay (s)	25.8	0	-	-	9.7	-	-	0
HCM Lane LOS	D	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.4	0	-	-	0.3	-	-	-

HCM 6th TWSC  
4: SW 108th Avenue & North Access

07/27/2022

Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↗	↖		↗		↕		↕		↕
Traffic Vol, veh/h	2	0	20	7	0	1	183	7	15	2	64	19
Future Vol, veh/h	2	0	20	7	0	1	183	7	15	2	64	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	2	2	2	0	9	2	2	3	0
Mvmt Flow	2	0	22	8	0	1	199	8	16	2	70	21

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	500	-	81	510	-	16	91	0	0	24	0	0
Stage 1	85	-	-	414	-	-	-	-	-	-	-	-
Stage 2	415	-	-	96	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	-	6.2	7.12	-	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	-	3.3	3.518	-	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	484	0	985	474	0	1063	1517	-	-	1591	-	-
Stage 1	928	0	-	616	0	-	-	-	-	-	-	-
Stage 2	619	0	-	911	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	434	-	985	416	-	1063	1517	-	-	1591	-	-
Mov Cap-2 Maneuver	434	-	-	416	-	-	-	-	-	-	-	-
Stage 1	805	-	-	534	-	-	-	-	-	-	-	-
Stage 2	536	-	-	890	-	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	9.1		13.1		6.9			0.2		
HCM LOS	A		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1517	-	-	434	985	416	1063	1591	-	-
HCM Lane V/C Ratio	0.131	-	-	0.005	0.022	0.018	0.001	0.001	-	-
HCM Control Delay (s)	7.7	0	-	13.3	8.7	13.8	8.4	7.3	0	-
HCM Lane LOS	A	A	-	B	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0	0.1	0.1	0	0	-	-



HCM 6th TWSC  
5: SW 108th Avenue & South Access

07/27/2022

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	58	204	75	9
Future Vol, veh/h	1	5	58	204	75	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	63	222	82	10

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	435	87	92	0	0
Stage 1	87	-	-	-	-
Stage 2	348	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	578	971	1503	-	-
Stage 1	936	-	-	-	-
Stage 2	715	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	550	971	1503	-	-
Mov Cap-2 Maneuver	550	-	-	-	-
Stage 1	891	-	-	-	-
Stage 2	715	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	1.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1503	-	550	971	-	-
HCM Lane V/C Ratio	0.042	-	0.002	0.006	-	-
HCM Control Delay (s)	7.5	0	11.6	8.7	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	0	-	-

# HCM Signalized Intersection Capacity Analysis

## 6: SW 124th Avenue & SW Leveton Drive

07/27/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Traffic Volume (vph)	6	62	12	22	5	23	27	264	92	254	658	33
Future Volume (vph)	6	62	12	22	5	23	27	264	92	254	658	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.88		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1081	1802		1480	1636		1467	3040		1752	3358	
Flt Permitted	0.74	1.00		0.66	1.00		0.36	1.00		0.41	1.00	
Satd. Flow (perm)	838	1802		1025	1636		557	3040		760	3358	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	69	13	24	6	26	30	293	102	282	731	37
RTOR Reduction (vph)	0	8	0	0	22	0	0	31	0	0	2	0
Lane Group Flow (vph)	7	74	0	24	10	0	30	364	0	282	766	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	67%	2%	8%	22%	2%	2%	23%	17%	6%	3%	6%	19%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.4	7.7		9.6	8.3		22.5	20.5		37.8	30.8	
Effective Green, g (s)	10.4	8.7		11.6	9.3		24.5	21.5		38.8	31.8	
Actuated g/C Ratio	0.17	0.14		0.19	0.15		0.40	0.35		0.63	0.51	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	147	253		209	246		264	1057		690	1727	
v/s Ratio Prot	0.00	c0.04		c0.00	0.01		0.01	0.12		c0.09	c0.23	
v/s Ratio Perm	0.01			0.02			0.04			0.17		
v/c Ratio	0.05	0.29		0.11	0.04		0.11	0.34		0.41	0.44	
Uniform Delay, d1	21.5	23.8		20.7	22.4		11.5	14.9		5.4	9.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.6		0.2	0.1		0.2	0.2		0.4	0.2	
Delay (s)	21.6	24.4		21.0	22.5		11.7	15.1		5.8	9.6	
Level of Service	C	C		C	C		B	B		A	A	
Approach Delay (s)		24.2			21.8			14.9			8.6	
Approach LOS		C			C			B			A	

### Intersection Summary

HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	61.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

**Intersection**

Intersection Delay, s/veh 11.2  
 Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	372	18	8	43	0	7	3	25	0	0	1
Future Vol, veh/h	12	372	18	8	43	0	7	3	25	0	0	1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	2	2	11	57	7	2	14	2	33	2	2	2
Mvmt Flow	14	443	21	10	51	0	8	4	30	0	0	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.8	9	8.2	7.6
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	3%	16%	0%
Vol Thru, %	9%	93%	84%	0%
Vol Right, %	71%	4%	0%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	402	51	1
LT Vol	7	12	8	0
Through Vol	3	372	43	0
RT Vol	25	18	0	1
Lane Flow Rate	42	479	61	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.057	0.536	0.092	0.002
Departure Headway (Hd)	4.943	4.033	5.473	4.583
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	728	885	658	784
Service Time	2.947	2.108	3.482	2.59
HCM Lane V/C Ratio	0.058	0.541	0.093	0.001
HCM Control Delay	8.2	11.8	9	7.6
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.2	3.3	0.3	0

HCM 6th TWSC  
8: SW Leveton Drive & West Driveway

07/27/2022

**Intersection**

Int Delay, s/veh 2.8

**Movement** EBL EBT WBT WBR SBL SBR

Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	144	245	34	94	12	20
Future Vol, veh/h	144	245	34	94	12	20
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	5	6	42	25
Mvmt Flow	171	292	40	112	14	24

**Major/Minor** Major1 Major2 Minor2

Conflicting Flow All	154	0	-	0	732	98
Stage 1	-	-	-	-	98	-
Stage 2	-	-	-	-	634	-
Critical Hdwy	4.14	-	-	-	6.82	6.45
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.236	-	-	-	3.878	3.525
Pot Cap-1 Maneuver	1414	-	-	-	335	899
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	460	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1411	-	-	-	285	897
Mov Cap-2 Maneuver	-	-	-	-	285	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	459	-

**Approach** EB WB SB

HCM Control Delay, s	2.9	0	12.5
HCM LOS			B

**Minor Lane/Major Mvmt** EBL EBT WBT WBR SBLn1 SBLn2

Capacity (veh/h)	1411	-	-	-	285	897
HCM Lane V/C Ratio	0.121	-	-	-	0.05	0.027
HCM Control Delay (s)	7.9	0	-	-	18.3	9.1
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.2	0.1



HCM 6th TWSC  
 9: SW Leveton Drive & Center Driveway

07/27/2022

**Intersection**

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	59	193	120	31	8	6
Future Vol, veh/h	59	193	120	31	8	6
Conflicting Peds, #/hr	2	0	0	2	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	6	13	2	2	2
Mvmt Flow	72	235	146	38	10	7

**Major/Minor**

	Major1	Major2	Minor2		
Conflicting Flow All	186	0	-	0	547
Stage 1	-	-	-	-	167
Stage 2	-	-	-	-	380
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1388	-	-	-	498
Stage 1	-	-	-	-	863
Stage 2	-	-	-	-	691
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1385	-	-	-	466
Mov Cap-2 Maneuver	-	-	-	-	466
Stage 1	-	-	-	-	809
Stage 2	-	-	-	-	690

**Approach**

	EB	WB	SB
HCM Control Delay, s	1.8	0	11.3
HCM LOS			B

**Minor Lane/Major Mvmt**

	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1385	-	-	-	466	875
HCM Lane V/C Ratio	0.052	-	-	-	0.021	0.008
HCM Control Delay (s)	7.7	0	-	-	12.9	9.1
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	0

HCM 6th TWSC  
 10: Calmax Driveway/East Driveway & SW Leveton Drive

07/27/2022

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	189	4	0	164	0	0	0	1	0	0	0
Future Vol, veh/h	0	189	4	0	164	0	0	0	1	0	0	0
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	11	2	2	7	2	2	2	2	2	2	2
Mvmt Flow	0	233	5	0	202	0	0	0	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	203	0	0	238	0	0	438	439	236	439	441	203
Stage 1	-	-	-	-	-	-	236	236	-	203	203	-
Stage 2	-	-	-	-	-	-	202	203	-	236	238	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1369	-	-	1329	-	-	529	512	803	528	510	838
Stage 1	-	-	-	-	-	-	767	710	-	799	733	-
Stage 2	-	-	-	-	-	-	800	733	-	767	708	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1368	-	-	1329	-	-	529	511	803	527	509	837
Mov Cap-2 Maneuver	-	-	-	-	-	-	529	511	-	527	509	-
Stage 1	-	-	-	-	-	-	767	710	-	798	732	-
Stage 2	-	-	-	-	-	-	800	732	-	766	708	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			9.5			0		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	803	1368	-	-	1329	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-	-	-	-	-
HCM Control Delay (s)	9.5	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	-

HCM 6th TWSC  
 11: SW 108th Avenue & SW Leveton Drive

07/27/2022

Intersection						
Int Delay, s/veh	7.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	130	41	105	132	29	50
Future Vol, veh/h	130	41	105	132	29	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	14	10	6	20	16	12
Mvmt Flow	171	54	138	174	38	66

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	521	71	104	0	0
Stage 1	71	-	-	-	-
Stage 2	450	-	-	-	-
Critical Hdwy	6.54	6.3	4.16	-	-
Critical Hdwy Stg 1	5.54	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-
Follow-up Hdwy	3.626	3.39	2.254	-	-
Pot Cap-1 Maneuver	495	970	1463	-	-
Stage 1	922	-	-	-	-
Stage 2	618	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	444	970	1463	-	-
Mov Cap-2 Maneuver	444	-	-	-	-
Stage 1	826	-	-	-	-
Stage 2	618	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.5	3.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1463	-	510	-	-
HCM Lane V/C Ratio	0.094	-	0.441	-	-
HCM Control Delay (s)	7.7	0	17.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.3	-	2.2	-	-

# HCM Signalized Intersection Capacity Analysis

## 12: SW Herman Road & SW 108th Avenue

07/27/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷		↶	↷
Traffic Volume (vph)	14	290	218	275	61	9
Future Volume (vph)	14	290	218	275	61	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.92		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1492	1583	1579		1543	1455
Flt Permitted	0.30	1.00	1.00		0.95	1.00
Satd. Flow (perm)	474	1583	1579		1543	1455
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	17	354	266	335	74	11
RTOR Reduction (vph)	0	0	42	0	0	9
Lane Group Flow (vph)	17	354	559	0	74	2
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	21%	20%	16%	5%	17%	11%
Turn Type	pm+pt	NA	NA		Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases	2					
Actuated Green, G (s)	35.2	35.2	29.2		4.9	4.9
Effective Green, g (s)	36.6	36.6	30.6		7.4	7.4
Actuated g/C Ratio	0.70	0.70	0.59		0.14	0.14
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	372	1114	929		219	207
v/s Ratio Prot	0.00	c0.22	c0.35		c0.05	0.00
v/s Ratio Perm	0.03					
v/c Ratio	0.05	0.32	0.60		0.34	0.01
Uniform Delay, d1	3.4	2.9	6.8		20.1	19.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	1.1		0.7	0.0
Delay (s)	3.5	3.1	7.9		20.8	19.2
Level of Service	A	A	A		C	B
Approach Delay (s)		3.1	7.9		20.6	
Approach LOS		A	A		C	

### Intersection Summary

HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	52.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



HCM 6th TWSC  
 13: SW Teton Street & SW Tualatin Road

08/15/2022

**Intersection**

Int Delay, s/veh 3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	431	151	53	298	74	54
Future Vol, veh/h	431	151	53	298	74	54
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	3	10	3	9	27
Mvmt Flow	484	170	60	335	83	61

**Major/Minor**

	Major1	Major2	Minor1		
Conflicting Flow All	0	0	654	0	1025 569
Stage 1	-	-	-	-	569 -
Stage 2	-	-	-	-	456 -
Critical Hdwy	-	-	4.2	-	6.49 6.47
Critical Hdwy Stg 1	-	-	-	-	5.49 -
Critical Hdwy Stg 2	-	-	-	-	5.49 -
Follow-up Hdwy	-	-	2.29	-	3.581 3.543
Pot Cap-1 Maneuver	-	-	896	-	253 477
Stage 1	-	-	-	-	553 -
Stage 2	-	-	-	-	624 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	896	-	236 477
Mov Cap-2 Maneuver	-	-	-	-	236 -
Stage 1	-	-	-	-	553 -
Stage 2	-	-	-	-	582 -

**Approach**

	EB	WB	NB
HCM Control Delay, s	0	1.4	22.1
HCM LOS			C

**Minor Lane/Major Mvmt**

	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	236	477	-	-	896	-
HCM Lane V/C Ratio	0.352	0.127	-	-	0.066	-
HCM Control Delay (s)	28.3	13.6	-	-	9.3	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.5	0.4	-	-	0.2	-

HCM Signalized Intersection Capacity Analysis  
 1: Highway 99W/Highway 99 W & SW 124th Avenue

07/27/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	650	779	894	197	741	1207
Future Volume (vph)	650	779	894	197	741	1207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.3	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.95	1.00	*1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	2787	3539	1533	3471	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	2787	3539	1533	3471	3471
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	684	820	941	207	780	1271
RTOR Reduction (vph)	0	0	0	107	0	0
Lane Group Flow (vph)	684	820	941	100	780	1271
Confl. Peds. (#/hr)		11				
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%
Turn Type	Prot	pt+ov	NA	Perm	Prot	NA
Protected Phases	8	1 4	2		1	6
Permitted Phases				2		
Actuated Green, G (s)	28.5	47.1	40.7	40.7	36.0	82.3
Effective Green, g (s)	30.5	44.7	42.7	42.7	37.6	84.3
Actuated g/C Ratio	0.23	0.33	0.32	0.32	0.28	0.63
Clearance Time (s)	6.0		6.0	6.0	5.6	6.0
Vehicle Extension (s)	2.3		5.4	5.4	2.3	5.4
Lane Grp Cap (vph)	781	930	1128	488	974	2185
v/s Ratio Prot	c0.20	c0.29	c0.27		0.22	0.37
v/s Ratio Perm				0.07		
v/c Ratio	0.88	0.88	0.83	0.21	0.80	0.58
Uniform Delay, d1	49.9	42.1	42.3	33.2	44.7	14.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.6	9.7	6.2	0.5	4.6	0.7
Delay (s)	60.5	51.8	48.5	33.7	49.3	15.2
Level of Service	E	D	D	C	D	B
Approach Delay (s)	55.8		45.8			28.1
Approach LOS	E		D			C

Intersection Summary

HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	133.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: SW 124th Avenue & SW Tualatin Road

07/27/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	28	533	916	45	378	564
Future Volume (vph)	28	533	916	45	378	564
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1626	1583	3539	1541	1769	3406
Flt Permitted	0.95	1.00	1.00	1.00	0.14	1.00
Satd. Flow (perm)	1626	1583	3539	1541	269	3406
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	561	964	47	398	594
RTOR Reduction (vph)	0	266	0	15	0	0
Lane Group Flow (vph)	29	295	964	32	398	594
Confl. Peds. (#/hr)				4	4	
Heavy Vehicles (%)	11%	2%	2%	2%	2%	6%
Turn Type	Prot	pm+ov	NA	Perm	pm+pt	NA
Protected Phases	4	5	6		5	2
Permitted Phases		4		6	2	
Actuated Green, G (s)	4.0	30.5	33.4	33.4	64.9	64.9
Effective Green, g (s)	5.0	32.5	34.4	34.4	65.9	65.9
Actuated g/C Ratio	0.06	0.38	0.41	0.41	0.78	0.78
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.9	3.9	3.0	3.0
Lane Grp Cap (vph)	96	608	1439	626	697	2653
v/s Ratio Prot	0.02	c0.16	c0.27		c0.19	0.17
v/s Ratio Perm		0.03		0.02	0.26	
v/c Ratio	0.30	0.49	0.67	0.05	0.57	0.22
Uniform Delay, d1	38.1	19.7	20.5	15.2	12.3	2.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.6	1.3	0.0	1.1	0.0
Delay (s)	39.9	20.3	21.8	15.3	13.4	2.5
Level of Service	D	C	C	B	B	A
Approach Delay (s)	21.3		21.5			6.9
Approach LOS	C		C			A

### Intersection Summary

HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

**Intersection**

Int Delay, s/veh 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	0	367	11	10	706	0	47	0	34	0	0	0
Future Vol, veh/h	0	367	11	10	706	0	47	0	34	0	0	0
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	5	14	2	2	0	2	0	5	0	0	0
Mvmt Flow	0	399	12	11	767	0	51	0	37	0	0	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	773	0	0	413
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.1	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.218
Pot Cap-1 Maneuver	851	-	-	1146
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	846	-	-	1144
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	29.1	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	236	846	-	-	1144	-	-	-
HCM Lane V/C Ratio	0.373	-	-	-	0.01	-	-	-
HCM Control Delay (s)	29.1	0	-	-	8.2	-	-	0
HCM Lane LOS	D	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	1.6	0	-	-	0	-	-	-

HCM 6th TWSC  
4: SW 108th Avenue & North Access

07/27/2022

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↗	↖		↗		↕		↕		↕
Traffic Vol, veh/h	14	0	159	13	0	2	25	36	10	1	26	4
Future Vol, veh/h	14	0	159	13	0	2	25	36	10	1	26	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	92	90	92	92	92	90	90	92	92	90	90
Heavy Vehicles, %	0	2	0	2	2	2	0	9	2	2	3	0
Mvmt Flow	16	0	177	14	0	2	28	40	11	1	29	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	136	-	31	224	-	46	33	0	0	51	0	0
Stage 1	33	-	-	102	-	-	-	-	-	-	-	-
Stage 2	103	-	-	122	-	-	-	-	-	-	-	-
Critical Hdwy	7.1	-	6.2	7.12	-	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	-	3.3	3.518	-	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	840	0	1049	732	0	1023	1592	-	-	1555	-	-
Stage 1	988	0	-	904	0	-	-	-	-	-	-	-
Stage 2	908	0	-	882	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	826	-	1049	600	-	1023	1592	-	-	1555	-	-
Mov Cap-2 Maneuver	826	-	-	600	-	-	-	-	-	-	-	-
Stage 1	970	-	-	888	-	-	-	-	-	-	-	-
Stage 2	890	-	-	733	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.1		10.8		2.6		0.2	
HCM LOS	A		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1592	-	-	826	1049	600	1023	1555	-	-
HCM Lane V/C Ratio	0.017	-	-	0.019	0.168	0.024	0.002	0.001	-	-
HCM Control Delay (s)	7.3	0	-	9.4	9.1	11.1	8.5	7.3	0	-
HCM Lane LOS	A	A	-	A	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.6	0.1	0	0	-	-



HCM 6th TWSC  
5: SW 108th Avenue & South Access

07/27/2022

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	49	8	58	183	2
Future Vol, veh/h	14	49	8	58	183	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	53	9	63	199	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	281	200	201	0	-
Stage 1	200	-	-	-	-
Stage 2	81	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	709	841	1371	-	-
Stage 1	834	-	-	-	-
Stage 2	942	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	704	841	1371	-	-
Mov Cap-2 Maneuver	704	-	-	-	-
Stage 1	828	-	-	-	-
Stage 2	942	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1371	-	704	841	-	-
HCM Lane V/C Ratio	0.006	-	0.022	0.063	-	-
HCM Control Delay (s)	7.6	0	10.2	9.6	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.2	-	-

# HCM Signalized Intersection Capacity Analysis

## 6: SW 124th Avenue & SW Leveton Drive

07/27/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Traffic Volume (vph)	22	42	30	86	3	303	16	640	34	88	491	12
Future Volume (vph)	22	42	30	86	3	303	16	640	34	88	491	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1769	1738		1626	1557		1107	3436		1769	3381	
Flt Permitted	0.37	1.00		0.64	1.00		0.46	1.00		0.23	1.00	
Satd. Flow (perm)	686	1738		1093	1557		534	3436		429	3381	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	23	44	31	90	3	316	17	667	35	92	511	12
RTOR Reduction (vph)	0	24	0	0	238	0	0	3	0	0	2	0
Lane Group Flow (vph)	23	51	0	90	81	0	17	699	0	92	522	0
Confl. Peds. (#/hr)	1		1	1		1			2	2		
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	2%	2%	2%	11%	67%	2%	63%	3%	26%	2%	5%	58%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.8	13.7		19.0	15.3		23.5	22.5		33.8	27.8	
Effective Green, g (s)	17.8	14.7		21.0	16.3		25.5	23.5		34.8	28.8	
Actuated g/C Ratio	0.27	0.22		0.32	0.25		0.39	0.35		0.53	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	235	385		384	383		223	1219		373	1470	
v/s Ratio Prot	0.00	0.03		c0.02	0.05		0.00	c0.20		c0.03	0.15	
v/s Ratio Perm	0.02			c0.06			0.03			0.10		
v/c Ratio	0.10	0.13		0.23	0.21		0.08	0.57		0.25	0.36	
Uniform Delay, d1	18.1	20.6		16.4	19.8		12.7	17.3		8.9	12.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.3	0.3		0.1	0.7		0.3	0.1	
Delay (s)	18.3	20.8		16.7	20.1		12.9	17.9		9.3	12.6	
Level of Service	B	C		B	C		B	B		A	B	
Approach Delay (s)		20.2			19.4			17.8			12.1	
Approach LOS		C			B			B			B	

Intersection Summary		
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.40	B
Actuated Cycle Length (s)	66.2	Sum of lost time (s)
Intersection Capacity Utilization	54.7%	16.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		A

**Intersection**

Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	138	10	33	369	2	17	3	10	2	4	13
Future Vol, veh/h	6	138	10	33	369	2	17	3	10	2	4	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	5	20	2	3	2	6	2	17	2	25	2
Mvmt Flow	7	150	11	36	401	2	18	3	11	2	4	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	11.8	8.6	8.1
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	57%	4%	8%	11%
Vol Thru, %	10%	90%	91%	21%
Vol Right, %	33%	6%	0%	68%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	154	404	19
LT Vol	17	6	33	2
Through Vol	3	138	369	4
RT Vol	10	10	2	13
Lane Flow Rate	33	167	439	21
Geometry Grp	1	1	1	1
Degree of Util (X)	0.048	0.208	0.522	0.028
Departure Headway (Hd)	5.267	4.48	4.276	4.915
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	679	802	848	727
Service Time	3.307	2.503	2.276	2.956
HCM Lane V/C Ratio	0.049	0.208	0.518	0.029
HCM Control Delay	8.6	8.7	11.8	8.1
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.2	0.8	3.1	0.1

HCM 6th TWSC  
8: SW Leveton Drive & West Driveway

07/27/2022

Intersection						
Int Delay, s/veh	6.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	100	51	207	46	98	194
Future Vol, veh/h	100	51	207	46	98	194
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	6	3	2	2	2	5
Mvmt Flow	110	56	227	51	108	213

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	280	0	-	0	531
Stage 1	-	-	-	-	255
Stage 2	-	-	-	-	276
Critical Hdwy	4.16	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.254	-	-	-	3.518
Pot Cap-1 Maneuver	1260	-	-	-	509
Stage 1	-	-	-	-	788
Stage 2	-	-	-	-	771
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1258	-	-	-	461
Mov Cap-2 Maneuver	-	-	-	-	461
Stage 1	-	-	-	-	716
Stage 2	-	-	-	-	769

Approach	EB	WB	SB
HCM Control Delay, s	5.4	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1258	-	-	-	461	775
HCM Lane V/C Ratio	0.087	-	-	-	0.234	0.275
HCM Control Delay (s)	8.1	0	-	-	15.2	11.4
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.9	1.1

HCM 6th TWSC  
 9: SW Leveton Drive & Center Driveway

07/27/2022

**Intersection**

Int Delay, s/veh 2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	14	138	209	27	37	43
Future Vol, veh/h	14	138	209	27	37	43
Conflicting Peds, #/hr	5	0	0	5	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	164	249	32	44	51

**Major/Minor**

	Major1	Major2	Minor2		
Conflicting Flow All	286	0	-	0	468 270
Stage 1	-	-	-	-	270 -
Stage 2	-	-	-	-	198 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1276	-	-	-	553 769
Stage 1	-	-	-	-	775 -
Stage 2	-	-	-	-	835 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1270	-	-	-	539 765
Mov Cap-2 Maneuver	-	-	-	-	539 -
Stage 1	-	-	-	-	760 -
Stage 2	-	-	-	-	831 -

**Approach**

	EB	WB	SB
HCM Control Delay, s	0.7	0	11.1
HCM LOS			B

**Minor Lane/Major Mvmt**

	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1270	-	-	-	539	765
HCM Lane V/C Ratio	0.013	-	-	-	0.082	0.067
HCM Control Delay (s)	7.9	0	-	-	12.3	10
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0.2



HCM 6th TWSC  
 10: Calmax Driveway/East Driveway & SW Leveton Drive

07/27/2022

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	161	0	2	239	0	6	0	3	0	0	0
Future Vol, veh/h	0	161	0	2	239	0	6	0	3	0	0	0
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	3	2	50	1	2	2	2	33	2	2	2
Mvmt Flow	0	196	0	2	291	0	7	0	4	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	297	0	0	198	0	0	493	499	198	499	499	297
Stage 1	-	-	-	-	-	-	198	198	-	301	301	-
Stage 2	-	-	-	-	-	-	295	301	-	198	198	-
Critical Hdwy	4.12	-	-	4.6	-	-	7.12	6.52	6.53	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.65	-	-	3.518	4.018	3.597	3.518	4.018	3.318
Pot Cap-1 Maneuver	1264	-	-	1134	-	-	486	473	770	482	473	742
Stage 1	-	-	-	-	-	-	804	737	-	708	665	-
Stage 2	-	-	-	-	-	-	713	665	-	804	737	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1257	-	-	1132	-	-	485	468	769	476	468	738
Mov Cap-2 Maneuver	-	-	-	-	-	-	485	468	-	476	468	-
Stage 1	-	-	-	-	-	-	802	736	-	704	660	-
Stage 2	-	-	-	-	-	-	712	660	-	800	736	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			11.6			0		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	553	1257	-	-	1132	-	-	-
HCM Lane V/C Ratio	0.02	-	-	-	0.002	-	-	-
HCM Control Delay (s)	11.6	0	-	-	8.2	0	-	0
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

HCM 6th TWSC  
 11: SW 108th Avenue & SW Leveton Drive

07/27/2022

Intersection						
Int Delay, s/veh	5.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	39	126	95	25	107	125
Future Vol, veh/h	39	126	95	25	107	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	9	2	3	2	2	2
Mvmt Flow	46	150	113	30	127	149

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	458	202	276	0	0
Stage 1	202	-	-	-	-
Stage 2	256	-	-	-	-
Critical Hdwy	6.49	6.22	4.13	-	-
Critical Hdwy Stg 1	5.49	-	-	-	-
Critical Hdwy Stg 2	5.49	-	-	-	-
Follow-up Hdwy	3.581	3.318	2.227	-	-
Pot Cap-1 Maneuver	548	839	1281	-	-
Stage 1	815	-	-	-	-
Stage 2	771	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	499	839	1281	-	-
Mov Cap-2 Maneuver	499	-	-	-	-
Stage 1	742	-	-	-	-
Stage 2	771	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	6.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1281	-	723	-	-
HCM Lane V/C Ratio	0.088	-	0.272	-	-
HCM Control Delay (s)	8.1	0	11.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-

# HCM Signalized Intersection Capacity Analysis

## 12: SW Herman Road & SW 108th Avenue

07/27/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	250	450	112	271	18
Future Volume (vph)	6	250	450	112	271	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1543	1792	1727		1770	1524
Flt Permitted	0.21	1.00	1.00		0.95	1.00
Satd. Flow (perm)	335	1792	1727		1770	1524
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	6	253	455	113	274	18
RTOR Reduction (vph)	0	0	12	0	0	12
Lane Group Flow (vph)	6	253	556	0	274	6
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	17%	6%	7%	5%	2%	6%
Turn Type	pm+pt	NA	NA		Prot	Prot
Protected Phases	5	2	6		4	4
Permitted Phases	2					
Actuated Green, G (s)	26.1	26.1	20.2		13.7	13.7
Effective Green, g (s)	27.5	27.5	21.6		16.2	16.2
Actuated g/C Ratio	0.53	0.53	0.42		0.31	0.31
Clearance Time (s)	5.4	5.4	5.4		6.5	6.5
Vehicle Extension (s)	2.0	3.1	3.1		2.6	2.6
Lane Grp Cap (vph)	222	953	721		554	477
v/s Ratio Prot	0.00	c0.14	c0.32		c0.15	0.00
v/s Ratio Perm	0.01					
v/c Ratio	0.03	0.27	0.77		0.49	0.01
Uniform Delay, d1	7.6	6.6	12.9		14.4	12.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	5.2		0.5	0.0
Delay (s)	7.6	6.8	18.1		15.0	12.2
Level of Service	A	A	B		B	B
Approach Delay (s)		6.8	18.1		14.8	
Approach LOS		A	B		B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			14.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.64			
Actuated Cycle Length (s)			51.7		Sum of lost time (s)	12.0
Intersection Capacity Utilization			52.2%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th TWSC  
 13: SW Teton Street & SW Tualatin Road

08/15/2022

Intersection

Int Delay, s/veh 18.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	332	73	30	607	180	65
Future Vol, veh/h	332	73	30	607	180	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	10	2	2	7	3
Mvmt Flow	382	84	34	698	207	75

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	466
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1095
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1095
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	97.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	197	628	-	-	1095	-
HCM Lane V/C Ratio	1.05	0.119	-	-	0.031	-
HCM Control Delay (s)	128.2	11.5	-	-	8.4	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	9.4	0.4	-	-	0.1	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

13: SW Teton Street & SW Tualatin Road Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Denied Del/Veh (s)	0.0	0.0	3.0	0.6	0.2	0.2	0.4
Total Delay (hr)	0.2	0.0	0.0	0.1	1.9	0.1	2.4
Total Del/Veh (s)	1.7	1.0	4.2	0.8	38.5	4.8	6.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	1.8	0.1	1.9
Stop Del/Veh (s)	0.0	0.1	2.0	0.0	36.2	4.3	5.2



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APPENDIX J.  
**QUEUING ANALYSIS**

Queuing and Blocking Report  
2022 Existing

07/26/2022

Intersection: 1: Highway 99W/Highway 99 W & SW 124th Avenue

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	R	R	T	T	R	L	L	T	T
Maximum Queue (ft)	127	136	168	159	497	520	425	582	478	180	198
Average Queue (ft)	53	59	70	71	299	281	174	340	266	68	77
95th Queue (ft)	110	113	139	135	451	443	344	538	421	147	155
Link Distance (ft)	499	499			1713	1713				1724	1724
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			300	300			225	700	700		
Storage Blk Time (%)						15	5	0			
Queuing Penalty (veh)						65	26	0			

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	130	118	100	193	52	371	384	228
Average Queue (ft)	42	35	38	78	18	139	49	49
95th Queue (ft)	91	73	86	146	46	302	213	143
Link Distance (ft)		2433	1020	1020			499	499
Upstream Blk Time (%)							0	
Queuing Penalty (veh)							1	
Storage Bay Dist (ft)	300				140	200		
Storage Blk Time (%)				2		4	0	
Queuing Penalty (veh)				1		15	2	

Intersection: 3: SW 108th Avenue/Residential Driveway & SW Tualatin Road

Movement	EB	WB	NB
Directions Served	TR	L	LTR
Maximum Queue (ft)	4	56	75
Average Queue (ft)	0	12	19
95th Queue (ft)	3	40	54
Link Distance (ft)	1483		615
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		50	
Storage Blk Time (%)	0	0	
Queuing Penalty (veh)	0	1	

Intersection: 4: SW 108th Avenue & North Access

Movement	WB	WB
Directions Served	L	R
Maximum Queue (ft)	6	31
Average Queue (ft)	0	7
95th Queue (ft)	6	28
Link Distance (ft)	308	308
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: SW 108th Avenue & South Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 6: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	64	87	63	39	79	92	182	96	182	192
Average Queue (ft)	7	39	15	12	19	27	57	37	51	69
95th Queue (ft)	36	74	47	36	53	66	125	74	128	149
Link Distance (ft)		1012		1222		626	626		1020	1020
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		145		155			165		
Storage Blk Time (%)		0							0	
Queuing Penalty (veh)		0							0	

Intersection: 7: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	77	71	43	17
Average Queue (ft)	44	26	11	1
95th Queue (ft)	67	59	33	9
Link Distance (ft)	1222	997	1700	258
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: SW Leveton Drive & West Driveway

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	47	10	64	73
Average Queue (ft)	7	1	13	20
95th Queue (ft)	31	6	47	58
Link Distance (ft)	997	840	632	632
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: SW Leveton Drive & Center Driveway

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	30	31	31
Average Queue (ft)	3	6	6
95th Queue (ft)	16	25	27
Link Distance (ft)	840	642	642
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report  
2022 Existing

07/26/2022

Intersection: 10: Calmax Driveway/East Driveway & SW Leveton Drive

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	38	24	31
Average Queue (ft)	3	1	5
95th Queue (ft)	19	10	23
Link Distance (ft)	377	195	312
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: SW 108th Avenue & SW Leveton Drive

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	67	31
Average Queue (ft)	27	3
95th Queue (ft)	56	17
Link Distance (ft)	535	766
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: SW Herman Road & SW 108th Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	52	143	120	62	33
Average Queue (ft)	7	41	49	23	6
95th Queue (ft)	32	104	101	51	23
Link Distance (ft)		1535	2089		766
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			130	
Storage Blk Time (%)		1			
Queuing Penalty (veh)		0			

Zone Summary

Zone wide Queuing Penalty: 111



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Intersection: 13: SW Teton Street & SW Tualatin Road

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Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	6	61	102	84
Average Queue (ft)	0	18	41	38
95th Queue (ft)	4	46	79	74
Link Distance (ft)	929	570	645	645
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

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Zone Summary

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Zone wide Queuing Penalty: 112

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Queuing and Blocking Report  
2022 Existing

07/26/2022

Intersection: 1: Highway 99W/Highway 99 W & SW 124th Avenue

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	R	R	T	T	R	L	L	T	T
Maximum Queue (ft)	363	372	338	296	452	414	260	395	348	312	319
Average Queue (ft)	218	226	191	176	288	258	65	254	220	173	185
95th Queue (ft)	339	348	289	261	407	372	148	353	318	272	279
Link Distance (ft)	498	498			1283	1283				1425	1425
Upstream Blk Time (%)		0									
Queuing Penalty (veh)		1									
Storage Bay Dist (ft)			300	300			225	700	700		
Storage Blk Time (%)		3	0	0		14					
Queuing Penalty (veh)		22	1	1		24					

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	68	298	236	327	220	355	143	152
Average Queue (ft)	23	142	112	160	20	132	16	25
95th Queue (ft)	58	241	198	267	86	291	77	92
Link Distance (ft)		2433	1020	1020			498	498
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	300				140	200		
Storage Blk Time (%)		0		13		5		
Queuing Penalty (veh)		0		6		14		

Intersection: 3: SW 108th Avenue/Residential Driveway & SW Tualatin Road

Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	29	76
Average Queue (ft)	1	31
95th Queue (ft)	11	55
Link Distance (ft)		610
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report  
2022 Existing

07/26/2022

Intersection: 4: SW 108th Avenue & North Access

Movement	WB	WB
Directions Served	L	R
Maximum Queue (ft)	19	31
Average Queue (ft)	1	12
95th Queue (ft)	8	36
Link Distance (ft)	299	299
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: SW 108th Avenue & South Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 6: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	47	72	70	116	72	161	234	68	148	207
Average Queue (ft)	14	34	27	55	16	57	86	26	47	67
95th Queue (ft)	39	63	60	99	53	117	170	55	117	146
Link Distance (ft)		1012		1222		626	626		1020	1020
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		145		155			165		
Storage Blk Time (%)		0		0		0			0	
Queuing Penalty (veh)		0		0		0			0	

Intersection: 7: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	70	72	38	37
Average Queue (ft)	37	43	13	11
95th Queue (ft)	61	66	33	35
Link Distance (ft)	1222	997	1700	258
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: SW Leveton Drive & West Driveway

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	40	64	108
Average Queue (ft)	12	33	49
95th Queue (ft)	38	56	83
Link Distance (ft)	997	632	632
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: SW Leveton Drive & Center Driveway

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	24	44	51
Average Queue (ft)	1	20	19
95th Queue (ft)	11	46	47
Link Distance (ft)	840	642	642
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report  
2022 Existing

07/26/2022

Intersection: 10: Calmax Driveway/East Driveway & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	6	10	61	62
Average Queue (ft)	0	0	12	31
95th Queue (ft)	4	7	43	55
Link Distance (ft)	377	535	195	312
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: SW 108th Avenue & SW Leveton Drive

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	72	24
Average Queue (ft)	36	2
95th Queue (ft)	56	13
Link Distance (ft)	535	766
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: SW Herman Road & SW 108th Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	46	133	211	113	31
Average Queue (ft)	5	56	95	53	5
95th Queue (ft)	26	106	174	96	18
Link Distance (ft)		1535	2089		766
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			130	
Storage Blk Time (%)		1		0	
Queuing Penalty (veh)		0		0	

Zone Summary

Zone wide Queuing Penalty: 67



Queuing and Blocking Report  
2022 Existing

08/08/2022

Intersection: 13: SW Teton Street & SW Tualatin Road

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	10	40	193	62
Average Queue (ft)	0	8	82	32
95th Queue (ft)	5	32	167	58
Link Distance (ft)	924		481	481
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		50		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		1		

Intersection: 1: Highway 99W/Highway 99 W & SW 124th Avenue

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	R	R	T	T	R	L	L	T	T
Maximum Queue (ft)	143	130	218	186	616	651	422	742	698	391	255
Average Queue (ft)	60	61	71	71	352	346	231	425	348	77	84
95th Queue (ft)	117	117	161	147	571	601	433	698	629	259	201
Link Distance (ft)	499	499			1713	1713				1724	1724
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			300	300			225	700	700		
Storage Blk Time (%)							22	9	3	1	
Queuing Penalty (veh)							108	47	13	5	

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	110	99	143	238	67	362	214	231
Average Queue (ft)	41	36	44	89	21	145	43	57
95th Queue (ft)	85	74	99	187	54	290	135	157
Link Distance (ft)		2433	1020	1020			499	499
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	300				140	200		
Storage Blk Time (%)				3		4	0	
Queuing Penalty (veh)				1		17	1	

Intersection: 3: SW 108th Avenue/Residential Driveway & SW Tualatin Road

Movement	EB	WB	WB	NB
Directions Served	TR	L	TR	LTR
Maximum Queue (ft)	4	71	21	61
Average Queue (ft)	0	21	1	19
95th Queue (ft)	3	51	16	52
Link Distance (ft)	1483		952	615
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		50		
Storage Blk Time (%)	0	1		
Queuing Penalty (veh)	0	2		

Queuing and Blocking Report  
2024 Pre-Development

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Intersection: 4: SW 108th Avenue & North Access

Movement	WB	WB
Directions Served	L	R
Maximum Queue (ft)	31	31
Average Queue (ft)	5	2
95th Queue (ft)	24	13
Link Distance (ft)	308	308
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: SW 108th Avenue & South Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 6: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	72	96	62	43	63	97	186	134	188	243
Average Queue (ft)	7	43	15	15	19	30	73	57	59	78
95th Queue (ft)	37	77	48	40	53	74	146	107	147	173
Link Distance (ft)		1012		1222		626	626		1020	1020
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		145		155			165		
Storage Blk Time (%)	0	1				0		0	0	
Queuing Penalty (veh)	0	0				0		0	1	

Intersection: 7: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	90	66	58	22
Average Queue (ft)	52	29	17	1
95th Queue (ft)	79	59	45	11
Link Distance (ft)	1222	997	1700	258
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: SW Leveton Drive & West Driveway

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	64	24	70	66
Average Queue (ft)	18	1	13	22
95th Queue (ft)	50	12	47	57
Link Distance (ft)	997	840	632	632
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: SW Leveton Drive & Center Driveway

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	44	31	31
Average Queue (ft)	6	6	5
95th Queue (ft)	27	26	24
Link Distance (ft)	840	642	642
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Calmax Driveway/East Driveway & SW Leveton Drive

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	43	6	31
Average Queue (ft)	7	0	5
95th Queue (ft)	31	7	22
Link Distance (ft)	377	195	312
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: SW 108th Avenue & SW Leveton Drive

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	74	48
Average Queue (ft)	31	13
95th Queue (ft)	64	43
Link Distance (ft)	535	766
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: SW Herman Road & SW 108th Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	59	161	221	81	59
Average Queue (ft)	8	42	61	27	7
95th Queue (ft)	35	110	147	62	30
Link Distance (ft)		1535	2089		766
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			130	
Storage Blk Time (%)		1			
Queuing Penalty (veh)		0			

Zone Summary

Zone wide Queuing Penalty: 195



Intersection: 13: SW Teton Street & SW Tualatin Road

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	35	57	97	83
Average Queue (ft)	1	19	42	38
95th Queue (ft)	16	48	79	74
Link Distance (ft)	929	570	645	645
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 168

Intersection: 1: Highway 99W/Highway 99 W & SW 124th Avenue

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	R	R	T	T	R	L	L	T	T
Maximum Queue (ft)	472	502	398	328	500	464	366	424	414	298	320
Average Queue (ft)	300	312	256	208	320	292	74	280	246	183	201
95th Queue (ft)	456	477	410	315	448	414	183	393	374	271	293
Link Distance (ft)	498	498			1283	1283				1425	1425
Upstream Blk Time (%)	1	2									
Queuing Penalty (veh)	8	12									
Storage Bay Dist (ft)			300	300			225	700	700		
Storage Blk Time (%)		15	1	1		19					
Queuing Penalty (veh)		112	4	3		37					

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	197	442	314	477	266	330	120	128
Average Queue (ft)	33	201	140	212	34	159	15	23
95th Queue (ft)	141	408	259	380	145	315	70	82
Link Distance (ft)		2433	1020	1020			498	498
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	300				140	200		
Storage Blk Time (%)		6		22		8	0	
Queuing Penalty (veh)		2		10		21	0	

Intersection: 3: SW 108th Avenue/Residential Driveway & SW Tualatin Road

Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	34	88
Average Queue (ft)	3	34
95th Queue (ft)	19	65
Link Distance (ft)		610
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

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Intersection: 4: SW 108th Avenue & North Access

Movement	WB	WB
Directions Served	L	R
Maximum Queue (ft)	36	31
Average Queue (ft)	10	4
95th Queue (ft)	35	21
Link Distance (ft)	298	298
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: SW 108th Avenue & South Access

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 6: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	55	96	84	140	70	149	244	89	196	201
Average Queue (ft)	16	37	35	68	17	67	112	33	57	79
95th Queue (ft)	43	72	71	119	57	126	208	71	149	164
Link Distance (ft)		1012		1222		626	626		1020	1020
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		145		155			165		
Storage Blk Time (%)		0		0		0			1	
Queuing Penalty (veh)		0		0		0			0	

Intersection: 7: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	74	80	57	49
Average Queue (ft)	40	47	16	13
95th Queue (ft)	62	70	39	38
Link Distance (ft)	1222	997	1700	258
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: SW Leveton Drive & West Driveway

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	57	13	71	96
Average Queue (ft)	19	1	35	53
95th Queue (ft)	51	7	60	84
Link Distance (ft)	997	840	632	632
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: SW Leveton Drive & Center Driveway

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	24	11	57	49
Average Queue (ft)	2	0	23	21
95th Queue (ft)	16	6	50	48
Link Distance (ft)	840	377	642	642
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10: Calmax Driveway/East Driveway & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	17	15	57	82
Average Queue (ft)	1	1	10	37
95th Queue (ft)	8	8	38	64
Link Distance (ft)	377	535	195	312
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: SW 108th Avenue & SW Leveton Drive

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	78	24
Average Queue (ft)	39	2
95th Queue (ft)	62	16
Link Distance (ft)	535	766
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: SW Herman Road & SW 108th Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	39	139	227	126	44
Average Queue (ft)	5	56	114	57	6
95th Queue (ft)	25	105	197	102	25
Link Distance (ft)		1535	2089		766
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			130	
Storage Blk Time (%)		1		0	
Queuing Penalty (veh)		0		0	

Zone Summary

Zone wide Queuing Penalty: 209



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Intersection: 13: SW Teton Street & SW Tualatin Road

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Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	38	210	72
Average Queue (ft)	9	88	32
95th Queue (ft)	32	178	57
Link Distance (ft)		481	481
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	50		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	1		

Queuing and Blocking Report  
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Intersection: 1: Highway 99W/Highway 99 W & SW 124th Avenue

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	R	R	T	T	R	L	L	T	T
Maximum Queue (ft)	128	140	188	192	629	648	425	792	802	699	706
Average Queue (ft)	56	63	74	73	351	347	254	523	426	137	124
95th Queue (ft)	109	118	145	144	549	570	439	830	801	602	493
Link Distance (ft)	499	499			1713	1713				1724	1724
Upstream Blk Time (%)										0	0
Queuing Penalty (veh)										0	0
Storage Bay Dist (ft)			300	300			225	700	700		
Storage Blk Time (%)						22	12	9	2	0	
Queuing Penalty (veh)						112	66	35	8	0	

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	121	110	138	242	70	360	251	219
Average Queue (ft)	44	37	39	89	20	147	46	57
95th Queue (ft)	90	76	95	179	52	294	150	143
Link Distance (ft)		2433	1020	1020			499	499
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	300				140	200		
Storage Blk Time (%)				3		4	0	
Queuing Penalty (veh)				1		16	2	

Intersection: 3: SW 108th Avenue/Residential Driveway & SW Tualatin Road

Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	56	71
Average Queue (ft)	23	16
95th Queue (ft)	50	46
Link Distance (ft)		615
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	1	
Queuing Penalty (veh)	3	

Queuing and Blocking Report  
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Intersection: 4: SW 108th Avenue & North Access

Movement	EB	EB	WB	WB	NB
Directions Served	L	R	L	R	LTR
Maximum Queue (ft)	12	31	31	24	62
Average Queue (ft)	1	15	5	2	13
95th Queue (ft)	8	40	24	13	44
Link Distance (ft)	450	450	308	308	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: SW 108th Avenue & South Access

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	TR
Maximum Queue (ft)	12	31	34	22
Average Queue (ft)	0	5	3	1
95th Queue (ft)	4	23	19	12
Link Distance (ft)	464	464	170	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	61	96	67	46	58	98	204	183	171	190
Average Queue (ft)	6	42	18	15	17	33	85	69	52	74
95th Queue (ft)	32	79	50	41	47	74	162	129	124	152
Link Distance (ft)		1012		1222		626	626		1020	1020
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		145		155			165		
Storage Blk Time (%)		0				0		0	0	
Queuing Penalty (veh)		0				0		1	1	

Intersection: 7: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	145	83	59	11
Average Queue (ft)	63	30	20	0
95th Queue (ft)	104	62	51	6
Link Distance (ft)	1222	997	1700	258
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: SW Leveton Drive & West Driveway

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	83	13	59	76
Average Queue (ft)	22	1	10	20
95th Queue (ft)	65	7	42	57
Link Distance (ft)	997	840	632	632
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: SW Leveton Drive & Center Driveway

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	62	36	31
Average Queue (ft)	10	6	6
95th Queue (ft)	39	28	27
Link Distance (ft)	840	642	642
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report  
2024 Post-Development

07/27/2022

Intersection: 10: Calmax Driveway/East Driveway & SW Leveton Drive

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	24
Average Queue (ft)	1
95th Queue (ft)	10
Link Distance (ft)	195
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: SW 108th Avenue & SW Leveton Drive

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	121	64
Average Queue (ft)	56	9
95th Queue (ft)	96	40
Link Distance (ft)	535	766
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: SW Herman Road & SW 108th Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	42	161	230	80	33
Average Queue (ft)	7	42	72	26	4
95th Queue (ft)	29	112	161	56	19
Link Distance (ft)		1535	2089		766
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			130	
Storage Blk Time (%)		1			
Queuing Penalty (veh)		0			

Zone Summary

Zone wide Queuing Penalty: 244



Queuing and Blocking Report  
2024 Post-Development

08/08/2022

Intersection: 13: SW Teton Street & SW Tualatin Road

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	50	64	107	74
Average Queue (ft)	3	20	45	38
95th Queue (ft)	17	52	80	75
Link Distance (ft)	929	570	645	645
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 311

Queuing and Blocking Report  
2024 Post-Development

07/27/2022

Intersection: 1: Highway 99W/Highway 99 W & SW 124th Avenue

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	R	R	T	T	R	L	L	T	T
Maximum Queue (ft)	457	499	399	339	452	430	279	437	402	303	338
Average Queue (ft)	289	309	276	222	298	271	75	273	238	185	196
95th Queue (ft)	459	487	423	339	413	390	167	393	361	282	295
Link Distance (ft)	498	498			1283	1283				1425	1425
Upstream Blk Time (%)	1	1									
Queuing Penalty (veh)	4	11									
Storage Bay Dist (ft)			300	300			225	700	700		
Storage Blk Time (%)		14	2	1		15					
Queuing Penalty (veh)		110	8	4		29					

Intersection: 2: SW 124th Avenue & SW Tualatin Road

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	130	383	316	542	225	360	160	178
Average Queue (ft)	24	189	137	237	36	160	17	25
95th Queue (ft)	84	317	242	454	155	313	88	101
Link Distance (ft)		2433	1020	1020			498	498
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	300				140	200		
Storage Blk Time (%)		2		24		8	0	
Queuing Penalty (veh)		0		11		22	1	

Intersection: 3: SW 108th Avenue/Residential Driveway & SW Tualatin Road

Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	30	102
Average Queue (ft)	3	44
95th Queue (ft)	16	85
Link Distance (ft)		610
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Queuing and Blocking Report  
2024 Post-Development

07/27/2022

Intersection: 4: SW 108th Avenue & North Access

Movement	EB	EB	WB	WB	NB
Directions Served	L	R	L	R	LTR
Maximum Queue (ft)	40	77	31	24	29
Average Queue (ft)	12	42	13	1	1
95th Queue (ft)	38	66	37	11	11
Link Distance (ft)	450	450	298	298	184
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: SW 108th Avenue & South Access

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	TR
Maximum Queue (ft)	31	58	18	6
Average Queue (ft)	10	27	0	0
95th Queue (ft)	33	51	6	4
Link Distance (ft)	464	464	166	139
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: SW 124th Avenue & SW Leveton Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	64	87	101	165	66	175	248	112	164	204
Average Queue (ft)	16	38	47	82	19	75	125	42	56	82
95th Queue (ft)	45	74	88	135	59	137	214	83	137	168
Link Distance (ft)		1012		1222		626	626		1020	1020
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		145		155			165		
Storage Blk Time (%)		0		1		0		0	0	
Queuing Penalty (veh)		0		1		0		0	0	

Intersection: 7: SW 118th Drive/JAE Access & SW Leveton Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	85	95	50	39
Average Queue (ft)	43	56	17	14
95th Queue (ft)	68	81	39	38
Link Distance (ft)	1222	997	1700	258
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: SW Leveton Drive & West Driveway

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	81	8	80	98
Average Queue (ft)	21	0	39	53
95th Queue (ft)	57	4	66	88
Link Distance (ft)	997	840	632	632
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: SW Leveton Drive & Center Driveway

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	47	11	60	63
Average Queue (ft)	5	0	25	28
95th Queue (ft)	28	4	54	56
Link Distance (ft)	840	377	642	642
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
2024 Post-Development

07/27/2022

Intersection: 10: Calmax Driveway/East Driveway & SW Leveton Drive

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	60
Average Queue (ft)	11
95th Queue (ft)	39
Link Distance (ft)	195
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: SW 108th Avenue & SW Leveton Drive

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	81	52	18
Average Queue (ft)	40	21	1
95th Queue (ft)	63	49	7
Link Distance (ft)	535	766	166
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: SW Herman Road & SW 108th Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	39	150	269	141	32
Average Queue (ft)	5	64	134	74	5
95th Queue (ft)	24	117	234	124	21
Link Distance (ft)		1535	2089		766
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100			130	
Storage Blk Time (%)		1		0	
Queuing Penalty (veh)		0		0	

Zone Summary

Zone wide Queuing Penalty: 201
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Queuing and Blocking Report  
2024 Post-Development

08/08/2022

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Intersection: 13: SW Teton Street & SW Tualatin Road

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Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	24	56	279	57
Average Queue (ft)	1	11	100	31
95th Queue (ft)	11	39	217	51
Link Distance (ft)	924		481	481
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		50		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		1		

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Zone Summary

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Zone wide Queuing Penalty: 261

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APPENDIX K.  
**WARRANTS**

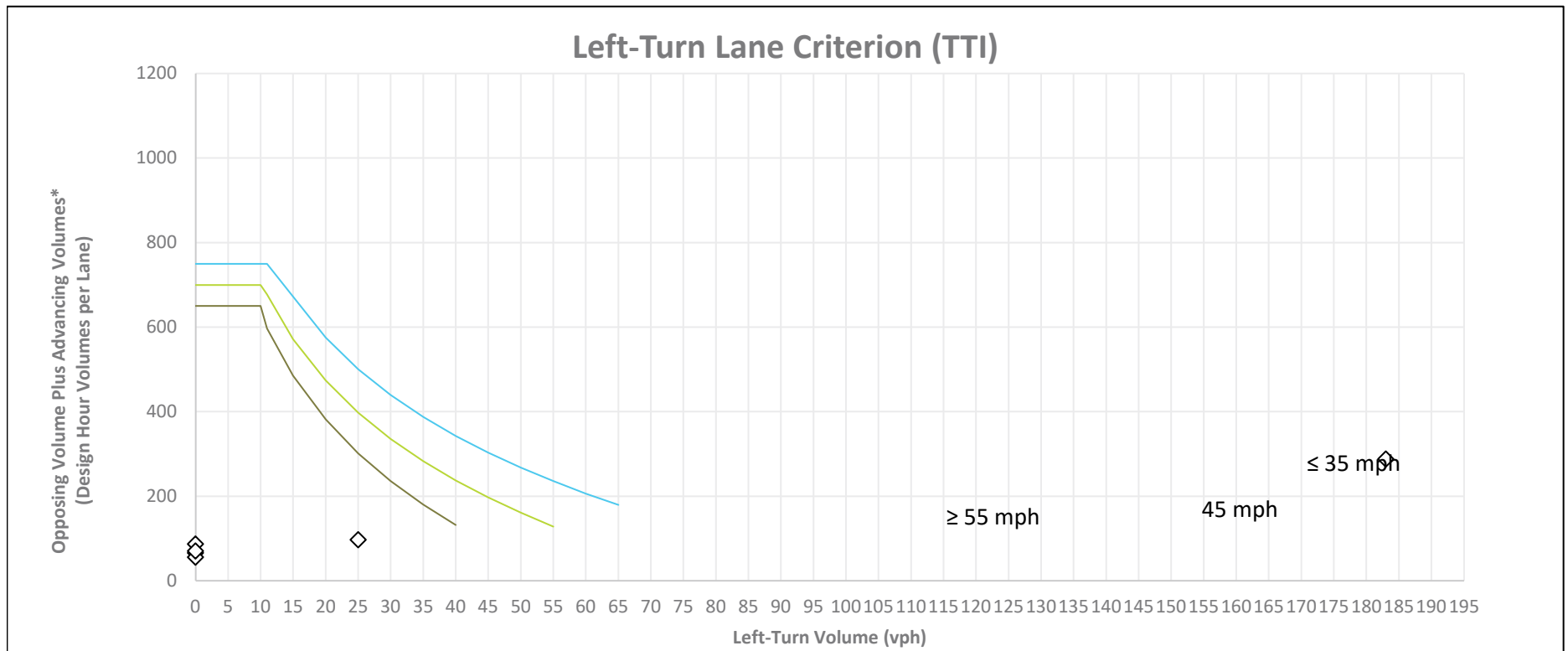
**Project:** Lam Research New Building

**Job #:** 2220087.00

**Date:** 8/15/2022

**Subject:** Left-Turn Lane Evaluation - 108th at North Site Access

Condition	Posted Speed	AM Peak Hour						PM Peak Hour					
		Approaching		Opposing		Left	Result	Approaching		Opposing		Left	Result
		Vol	Lanes	Vol	Lanes			Vol	Lanes	Vol	Lanes		
Existing	40	22	1	44	1	0	None	34	1	22	1	0	None
Pre-Dev	40	22	1	65	1	0	None	44	1	26	1	0	None
Post-Dev	40	205	1	83	1	183	Possible Lane	71	1	26	1	25	None



Source: Texas Transportation Institute

\* ((Advancing volume/number of advancing through lanes) + (opposing volume/number of opposing through lanes))



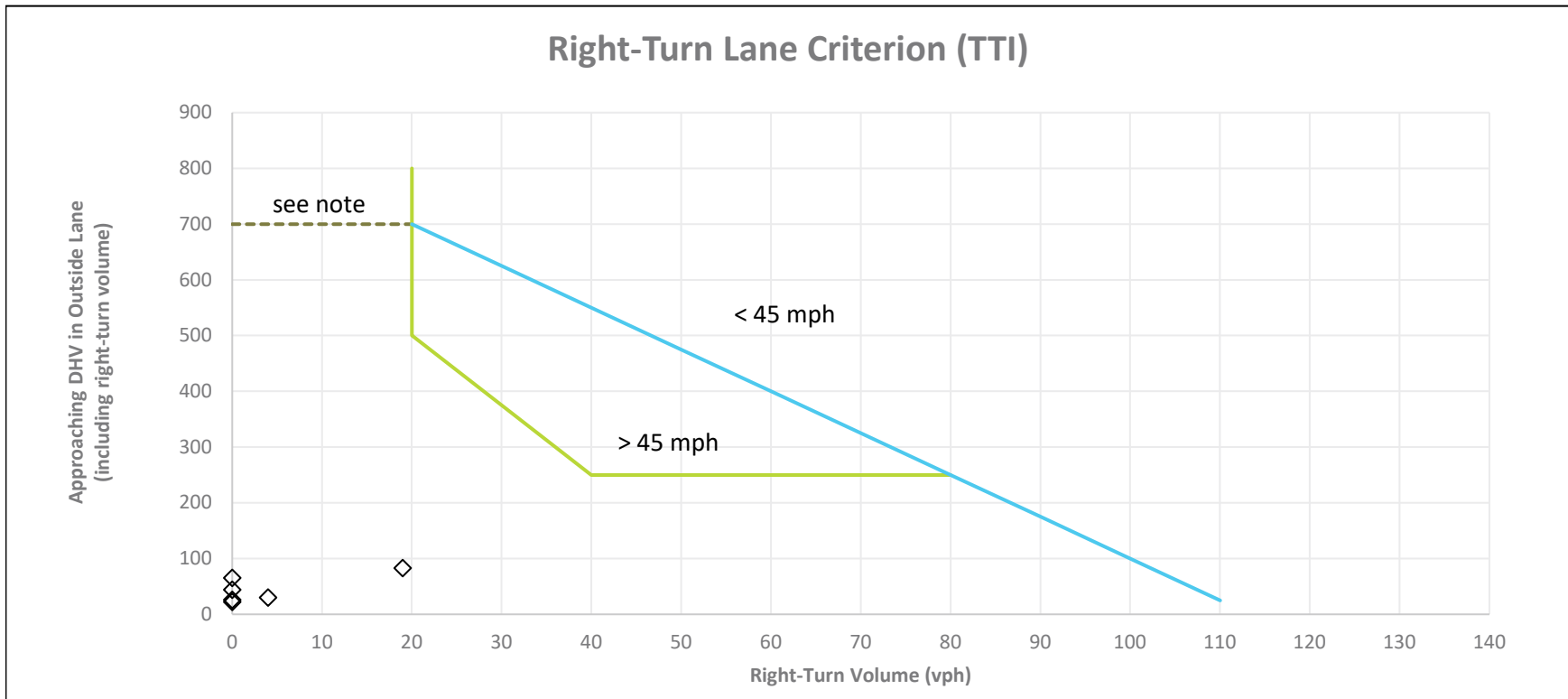
**Project:** Lam Research New Building

**Job #:** 2220087.00

**Date:** 8/15/2022

**Subject:** Right-Turn Lane Evaluation - 108th at North Site Access

Condition	Posted Speed	AM Peak Hour			PM Peak Hour		
		Volume		Result	Volume		Result
		Approaching	Right		Approaching	Right	
Existing	40	44	0	None	22	0	None
2024 Pre	40	65	0	None	26	0	None
2024 Post	40	83	19	None	30	4	None



Source: Texas Transportation Institute

Note: If there is no right-turn lane, a shoulder needs to be provided.



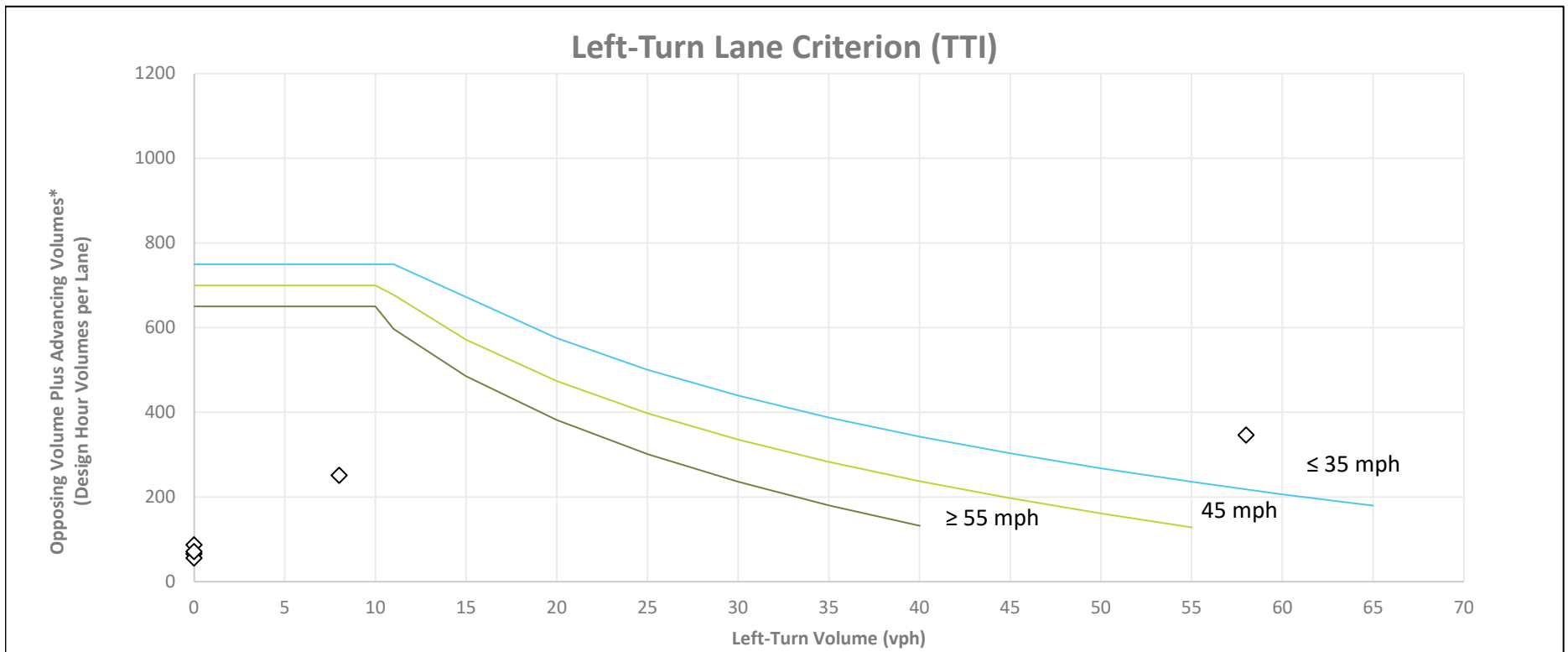
**Project:** Lam Research New Building

**Job #:** 2220087.00

**Date:** 8/15/2022

**Subject:** Left-Turn Lane Evaluation - 108th at South Site Access

Condition	Posted Speed	AM Peak Hour						PM Peak Hour					
		Approaching		Opposing		Left	Result	Approaching		Opposing		Left	Result
		Vol	Lanes	Vol	Lanes			Vol	Lanes	Vol	Lanes		
Existing	40	22	1	44	1	0	None	34	1	22	1	0	None
Pre-Dev	40	22	1	65	1	0	None	45	1	26	1	0	None
Post-Dev	40	262	1	84	1	58	Possible Lane	66	1	185	1	8	None



Source: Texas Transportation Institute

\* ((Advancing volume/number of advancing through lanes) + (opposing volume/number of opposing through lanes))





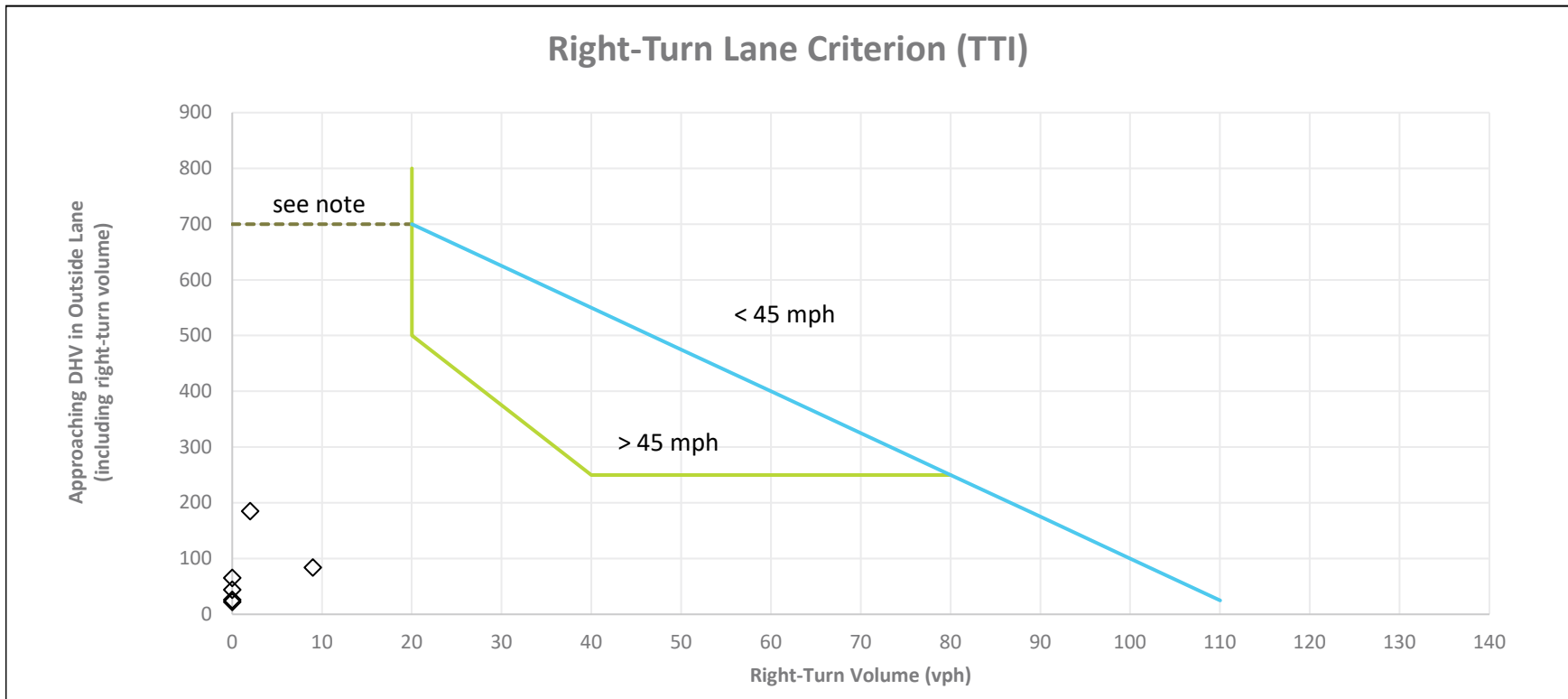
**Project:** Lam Research New Building

**Job #:** 2220087.00

**Date:** 8/15/2022

**Subject:** Right-Turn Lane Evaluation - 108th at South Site Access

Condition	Posted Speed	AM Peak Hour			PM Peak Hour		
		Volume		Result	Volume		Result
		Approaching	Right		Approaching	Right	
Existing	40	44	0	None	22	0	None
2024 Pre	40	65	0	None	26	0	None
2024 Post	40	84	9	None	185	2	None



Source: Texas Transportation Institute

Note: If there is no right-turn lane, a shoulder needs to be provided.



INTERSECTION INFORMATION						
City:	Tualatin		Condition:	Future 2024 with New Lam Office		
Population:	27,000					
Intersection Location: (Rural/Urban)	Urban					
Major Street Name:	SW 108th Avenue		Minor Street Name:	SW Leveton Drive		
Number of Moving Lanes for Each Approach:	1		Number of Moving Lanes for Each Approach:	1		
Speed:	40 mph		Speed:	40 mph		
Street Width:	36 ft		Street Width:	36 ft		
Direction:	NB	SB	Direction:	EB	WB	Total
Hour Beginning:			Hour Beginning:			
12:00 AM			12:00 AM			0
1:00 AM			1:00 AM			0
2:00 AM			2:00 AM			0
3:00 AM			3:00 AM			0
4:00 AM			4:00 AM			0
5:00 AM			5:00 AM			0
6:00 AM			6:00 AM			0
7:00 AM	237	79	7:00 AM	171		487
8:00 AM			8:00 AM			0
9:00 AM			9:00 AM			0
10:00 AM			10:00 AM			0
11:00 AM			11:00 AM			0
12:00 PM			12:00 PM			0
1:00 PM			1:00 PM			0
2:00 PM			2:00 PM			0
3:00 PM			3:00 PM			0
4:00 PM	120	232	4:00 PM	165		517
5:00 PM			5:00 PM			0
6:00 PM			6:00 PM			0
7:00 PM			7:00 PM			0
8:00 PM			8:00 PM			0
9:00 PM			9:00 PM			0
10:00 PM			10:00 PM			0
11:00 PM			11:00 PM			0
24-hour Total	357	311	24-hour Total	336	0	1,004

**Warrants Evaluated:**

- Warrant 1, 8-Hour Vehicular Volume - Evaluated for Conditions A & B
- Warrant 2, 4-Hour Vehicular Volume - Evaluated
- Warrant 3, Peak Hour - Evaluated for Conditions A-2, A-3 (A-1 needs to be evaluated separately), and Condition B
- Warrant 4, Pedestrian Volume - Not Analyzed
- Warrant 5, School Crossing - Not Analyzed
- Warrant 6, Coordinated Signal System - Not Analyzed
- Warrant 7, Accident Experience - Not Analyzed
- Warrant 8, Roadway Network - Not Analyzed
- Warrant 9, Intersection Near a Grade Crossing - Not Analyzed



WARRANT 3, PEAK HOUR VEHICULAR VOLUME									
	MAJOR			MINOR			Calculated Threshold (B)	A-2&3	B
	NB	SB	Total	EB	WB	Max			
4:00 PM	120	232	352	165	0	165	522	N	N
7:00 AM	237	79	316	171	0	171	551	N	N
12:00 AM	0	0	0	0	0	0	885	N	N
1:00 PM	0	0	0	0	0	0	885	N	N

**Warrant Requirements:**  
 Major Street Lanes: 1  
 Minor Street Lanes: 1

**CONDITION A-1 - Stopped Delay**  
 Cannot be evaluated based on volumes alone. Condition met if traffic on one minor-street approach (one direction only) controlled by STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach.

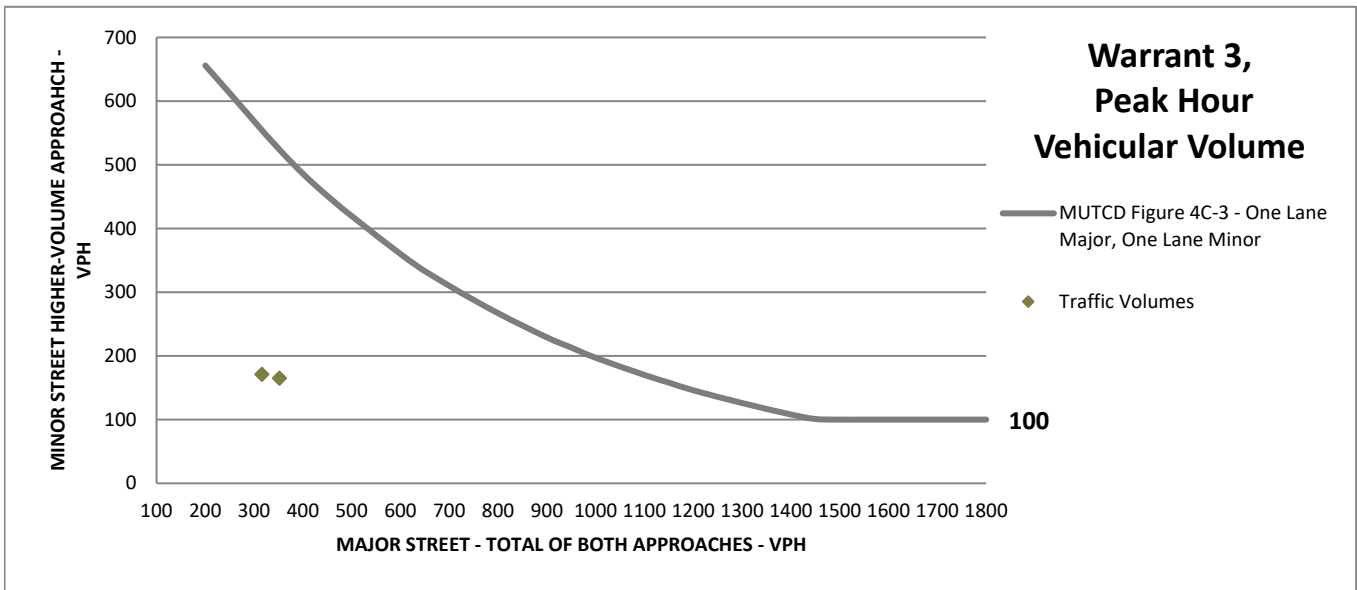
**CONDITION A-2 - Minor Street Volume**  
 Minimum Volume on Higher Minor Street Approach: 100

**CONDITION A-3 - Total Approach Volume**  
 Minimum Volume of Total Approaches: 650

**CONDITION B - Plot of Minor Street Volume (high vol approach) vs. Major Street Volume (Both approaches)**

**ARE CONDITIONS A-2 AND A-3 OF SIGNAL WARRANT 3 MET? NO**  
 Note: All 3 subsections of Condition A must be met to warrant signal.

**IS CONDITION B OF SIGNAL WARRANT 3 MET? NO**  
 Note: Signal Warrant 3 is met if either Condition A or Condition B is met.



INTERSECTION INFORMATION						
City:	Tualatin		Condition:	2024 Post-Development		
Population:	27,000					
Intersection Location: (Rural/Urban)	Urban					
Major Street Name:	SW Tualatin Road		Minor Street Name:	SW Teton Avenue		
Number of Moving Lanes for Each Approach:	1		Number of Moving Lanes for Each Approach:	2		
Speed:	35 mph		Speed:	35 mph		
Street Width:	36 ft		Street Width:	36 ft		
Direction:	EB	WB	Direction:	NB	SB	Total
Hour Beginning:			Hour Beginning:			
12:00 AM			12:00 AM			0
1:00 AM			1:00 AM			0
2:00 AM			2:00 AM			0
3:00 AM			3:00 AM			0
4:00 AM			4:00 AM			0
5:00 AM			5:00 AM			0
6:00 AM	353	205	6:00 AM	41		599
7:00 AM	576	282	7:00 AM	69		927
8:00 AM	538	328	8:00 AM	128		994
9:00 AM	334	268	9:00 AM	105		707
10:00 AM	311	305	10:00 AM	90		706
11:00 AM	396	333	11:00 AM	115		844
12:00 PM	413	414	12:00 PM	119		946
1:00 PM	400	396	1:00 PM	84		880
2:00 PM	333	419	2:00 PM	148		900
3:00 PM	420	494	3:00 PM	176		1,090
4:00 PM	406	608	4:00 PM	239		1,253
5:00 PM	361	576	5:00 PM	169		1,106
6:00 PM	223	302	6:00 PM	107		632
7:00 PM	154	234	7:00 PM	79		467
8:00 PM	85	172	8:00 PM	33		290
9:00 PM	83	98	9:00 PM	38		219
10:00 PM			10:00 PM			0
11:00 PM			11:00 PM			0
24-hour Total	5,386	5,434	24-hour Total	1,740	0	12,560

**Warrants Evaluated:**

- Warrant 1, 8-Hour Vehicular Volume - Evaluated for Conditions A & B
- Warrant 2, 4-Hour Vehicular Volume - Evaluated
- Warrant 3, Peak Hour - Evaluated for Conditions A-2, A-3 (A-1 needs to be evaluated separately), and Condition B
- Warrant 4, Pedestrian Volume - Not Analyzed
- Warrant 5, School Crossing - Not Analyzed
- Warrant 6, Coordinated Signal System - Not Analyzed
- Warrant 7, Accident Experience - Not Analyzed
- Warrant 8, Roadway Network - Not Analyzed
- Warrant 9, Intersection Near a Grade Crossing - Not Analyzed



**WARRANT 1, 8-HOUR VEHICULAR VOLUME**

	MAJOR			MINOR			<u>A</u>	<u>B</u>
	EB	WB	Total	NB	SB	Max		
4:00 PM	406	608	1014	239	0	239	Y	Y
5:00 PM	361	576	937	169	0	169	N	Y
3:00 PM	420	494	914	176	0	176	N	Y
8:00 AM	538	328	866	128	0	128	N	Y
12:00 PM	413	414	827	119	0	119	N	Y
7:00 AM	576	282	858	69	0	69	N	N
2:00 PM	333	419	752	148	0	148	N	Y
1:00 PM	400	396	796	84	0	84	N	N
11:00 AM	396	333	729	115	0	115	N	N
9:00 AM	334	268	602	105	0	105	N	N
10:00 AM	311	305	616	90	0	90	N	N
6:00 PM	223	302	525	107	0	107	N	N

**Warrant Requirements:**

Major Street Lanes: 1  
 Minor Street Lanes: 2

**CONDITION A - Minimum Vehicular Volume**

Minimum Volume on Combined Major Street Approaches: 500  
 Minimum Volume on Higher Minor Street Approach: 200

**CONDITION B - Interruption of Continuous Traffic**

Minimum Volume on Combined Major Street Approaches: 750  
 Minimum Volume on Higher Minor Street Approach: 100

**IS CONDITION A OF SIGNAL WARRANT 1 MET? NO**

**IS CONDITION B OF SIGNAL WARRANT 1 MET? NO**

**IS COMBINED CONDITIONS A & B MET AT 80% LEVEL? NO**

Note: Signal Warrant 1 is met if either Condition A or Condition B is met.

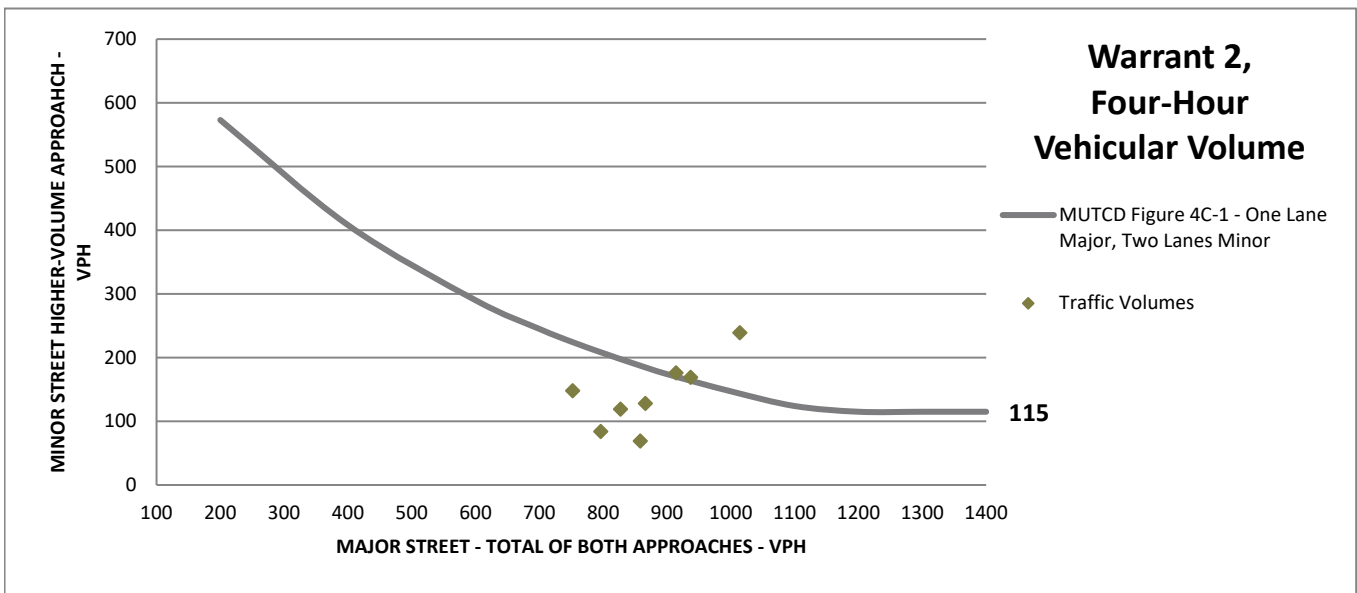




WARRANT 2, FOUR HOUR VEHICULAR VOLUME								
	MAJOR			MINOR			Calculated	
	EB	WB	Total	NB	SB	Max	Threshold	
4:00 PM	406	608	1,014	239	0	239	144	Y
5:00 PM	361	576	937	169	0	169	164	Y
3:00 PM	420	494	914	176	0	176	170	Y
8:00 AM	538	328	866	128	0	128	185	N
12:00 PM	413	414	827	119	0	119	197	N
7:00 AM	576	282	858	69	0	69	187	N
2:00 PM	333	419	752	148	0	148	224	N
1:00 PM	400	396	796	84	0	84	208	N

**Warrant Requirements:**  
 Major Street Lanes: 1  
 Minor Street Lanes: 2

**IS SIGNAL WARRANT 2 MET? NO**



WARRANT 3, PEAK HOUR VEHICULAR VOLUME										
	MAJOR			MINOR			Calculated Threshold (B)	A-2&3	B	
	EB	WB	Total	NB	SB	Max				
4:00 PM	406	608	1,014	239	0	239	280	Y	N	
5:00 PM	361	576	937	169	0	169	309	Y	N	
3:00 PM	420	494	914	176	0	176	318	Y	N	
8:00 AM	538	328	866	128	0	128	339	N	N	

**Warrant Requirements:**  
 Major Street Lanes: 1  
 Minor Street Lanes: 2

**CONDITION A-1 - Stopped Delay**  
 Cannot be evaluated based on volumes alone. Condition met if traffic on one minor-street approach (one direction only) controlled by STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach.

**CONDITION A-2 - Minor Street Volume**  
 Minimum Volume on Higher Minor Street Approach: 150

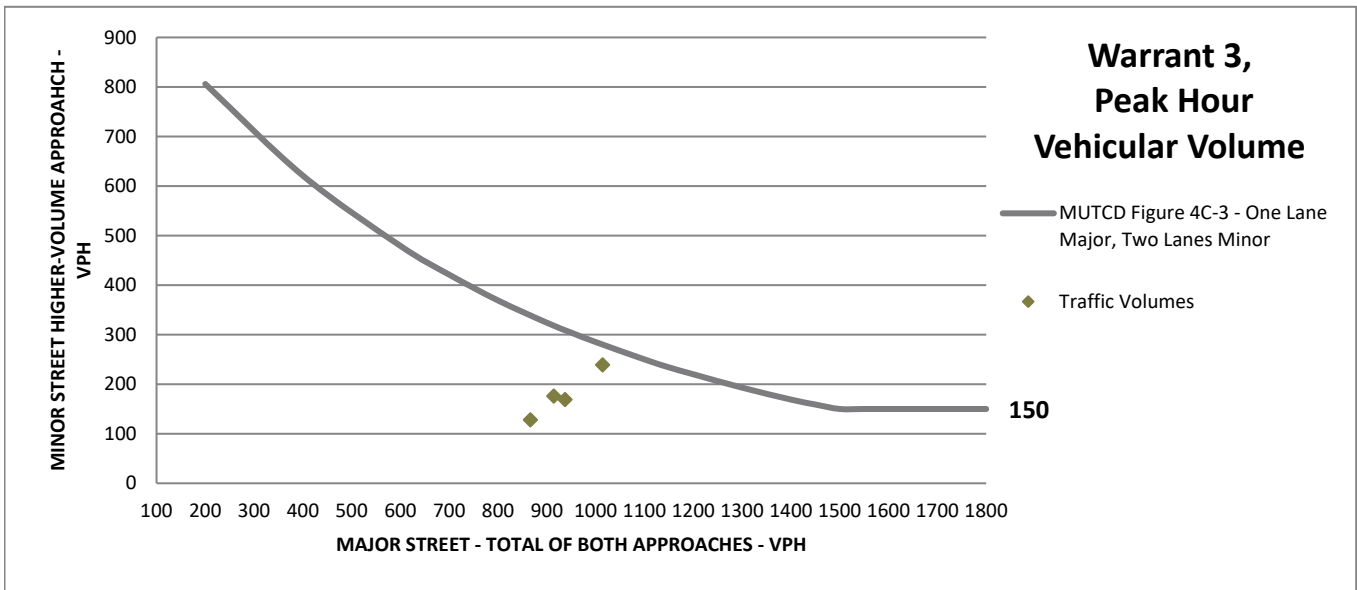
**CONDITION A-3 - Total Approach Volume**  
 Minimum Volume of Total Approaches: 650

**CONDITION B - Plot of Minor Street Volume (high vol approach) vs. Major Street Volume (Both approaches)**

**ARE CONDITIONS A-2 AND A-3 OF SIGNAL WARRANT 3 MET?** YES *Stopped Delay Needs to be Checked*  
 Note: All 3 subsections of Condition A must be met to warrant signal.

**IS CONDITION B OF SIGNAL WARRANT 3 MET?** NO

Note: Signal Warrant 3 is met if either Condition A or Condition B is met.





## PRELIMINARY STORMWATER DRAINAGE REPORT

**To**  
City of Tualatin

**For**  
Lam Research Building G  
Architectural Review

**Dated**  
August 16, 2022

**Project Number**  
2220087.00



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## APPENDICES

- A. Storm Basin Maps
- B. Water Quality Sizing
- C. Detention Calculations
- D. Proposed Site Plans
- E. 2001 Novellus Storm Drainage Report





Stormwater drainage and treatment will be provided in accordance with current Clean Water Services and City of Tualatin standards through a series of facilities across campus:

- NW Parking, west side: one (1) new vegetated swale
- NW Parking, east side: one (1) new vegetated rain garden
- NE Parking: one (1) new vegetated rain garden
- SE Parking: two (2) new vegetated swales
- Pedestrian plaza: two (2) new vegetated rain gardens and one (1) modified existing rain garden
- Three (3) existing extended dry basins to remain and one (1) extended dry basin to be expanded with additional detention storage

The following summarizes the design for the proposed stormwater management approach.

## II. STORMWATER QUALITY TREATMENT

Water quality treatment at the new development on the Lam Campus will be provided through a collection of existing, modified, and new facilities. The following summarizes the facilities within each drainage basin on site:

### Drainage Basin A

Proposed improvements within Basin A include new parking along the existing north drive aisle, located in areas that are currently surfaced with vegetation, gravel, and paving. Runoff from new paved areas will be captured in catch basins and routed to a swale at the west end of the new parking.

- New impervious area: 31,704 sf
- WQV: 951 cf
- WQF: 0.07 cfs
- Swale residence time: 19.1 minutes

Swale calculations are provided in Appendix B of this report.

### Drainage Basin B

Proposed improvements within Basin B include new parking along the existing north drive aisle, located in areas that are currently surfaced with vegetation, gravel, and paving. Runoff from new paved areas will be captured in catch basins and routed to a rain garden at the east end of the new parking. Rain Garden B-1 is sized using the Simplified Method:

- New impervious area: 9,770 sf
- 6% minimum facility size: 586 sf
- Provided facility size: 816 sf

Rain Garden calculations are provided in Appendix B of this report.

### Drainage Basin C

Proposed improvements within Basin C include new parking, re-paved parking, a pedestrian plaza, and the proposed Building G footprint. Runoff from the new impervious surfaces will be routed to existing and new storm treatment facilities.

#### ***Basin C Rain Gardens***

Existing Rain Garden C-1 was designed circa 2016 to treat runoff from approximately 9,967 sf modified parking south of Building A, which resulted in a facility footprint of approximately 698 sf. The rain garden is proposed to be modified to accommodate a new pedestrian path, and will be reduced to approximately 385 sf, which would result in a treatment capacity of approximately 6,417 sf. This leaves approximately 3,550 sf of existing impervious area capacity to be restored in Basin C.

Proposed Rain Garden C-2 and C-3 will be added to treat runoff from the adjacent parking and plaza improvements, as well as handle treatment lost from the Rain Garden C-1 modification.

Proposed Rain Garden C-4 will be added to treat runoff from new parking northeast of Building A.

Each of the new Basin C rain gardens is sized per the Simplified Method guidelines, using a 6-percent sizing factor on the design impervious area.

TABLE 1: RAIN GARDEN SIZING SUMMARY			
	Design Impervious Area (sf)	Minimum Rain Garden Size per 6% Factor (sf)	Provided Rain Garden Size (sf)
Existing Rain Garden C-1	9,967	598	385
Rain Garden C-2	6,319	379	615
Rain Garden C-3	9,108	546	559
Rain Garden C-4	14,116	847	978
Total	39,510	2,370	2,537

As demonstrated above, the proposed rain garden sizing within Basin C provides treatment capacity within the basin to accommodate approximately 39,510 sf of impervious area and make up for the reduced capacity of Rain Garden C-1.

**Existing Pond C**

The existing Pond C extended dry basin was designed circa 2001 and was sized at the time to accommodate the planned build-out of the campus, which included up to approximately 12.55 acres of total impervious area within Basin C. The water quality design storm has not been changed from the 0.36 inches rainfall that was used in the 2001 calculations.

Current site review indicates the existing Basin C comprises approximately 7.45 acres of impervious area, resulting in approximately 5.10 acres of impervious area runoff capacity available in the existing Pond C.

The proposed improvements result in a total impervious area coverage of approximately 8.43 acres. Per Table 1 above, approximately 0.91 acres of impervious area runoff is handled in the new rain garden facilities in Basin C. Therefore, the added design impervious surface to Pond C is calculated as:

$$\Delta A = (8.43 - 0.91) - 7.45 = 0.07 \text{ ac}$$

Therefore, Pond C water quality treatment capacity has approximately 5.03 acres of available impervious area coverage on site after the proposed development is completed.

**Drainage Basin D**

Proposed improvements within Basin D include new parking to expand the existing southeast parking lot. Runoff from the new impervious surfaces will be routed to existing and new storm treatment facilities.

**Basin D Swales**

Proposed Swales D-1 and D-2 will be added to treat runoff from the adjacent parking lots along the east side of the Lam campus.

**TABLE 2: SWALE TABLE SIZING SUMMARY**

Development Site	Swale D-1	Swale D-2
Design Impervious Area (sf)	36,094	49,985
Water Quality Volume (cf)	1,083	1,500
Water Quality Flow (cfs)	0.08	0.10
Residence Time (min)	9.27	9.16

**Existing Pond D**

The existing Pond D extended dry basin was designed circa 2016 and was constructed to handle runoff from the new southeast parking lot and adjacent paving area comprising approximately 66,647 sf of impervious area.

The proposed improvements will add approximately 39,695 sf resulting in a total impervious area flowing to Pond D of approximately 106,342 sf. The water quality volume for Pond D is calculated as:

$$WQV = A \cdot \frac{0.36 \text{ in}}{12 \frac{\text{ft}}{\text{in}}} = 106342 \cdot \frac{0.36 \text{ in}}{12 \frac{\text{ft}}{\text{in}}} = 3,190 \text{ cf}$$

The existing Pond D provides approximately 2,003 cf of storage, so the pond will be expanded to the west approximately 80 feet to provide additional water quality storage volume in the pond. The existing outlet structure location at the east end of the pond will remain.

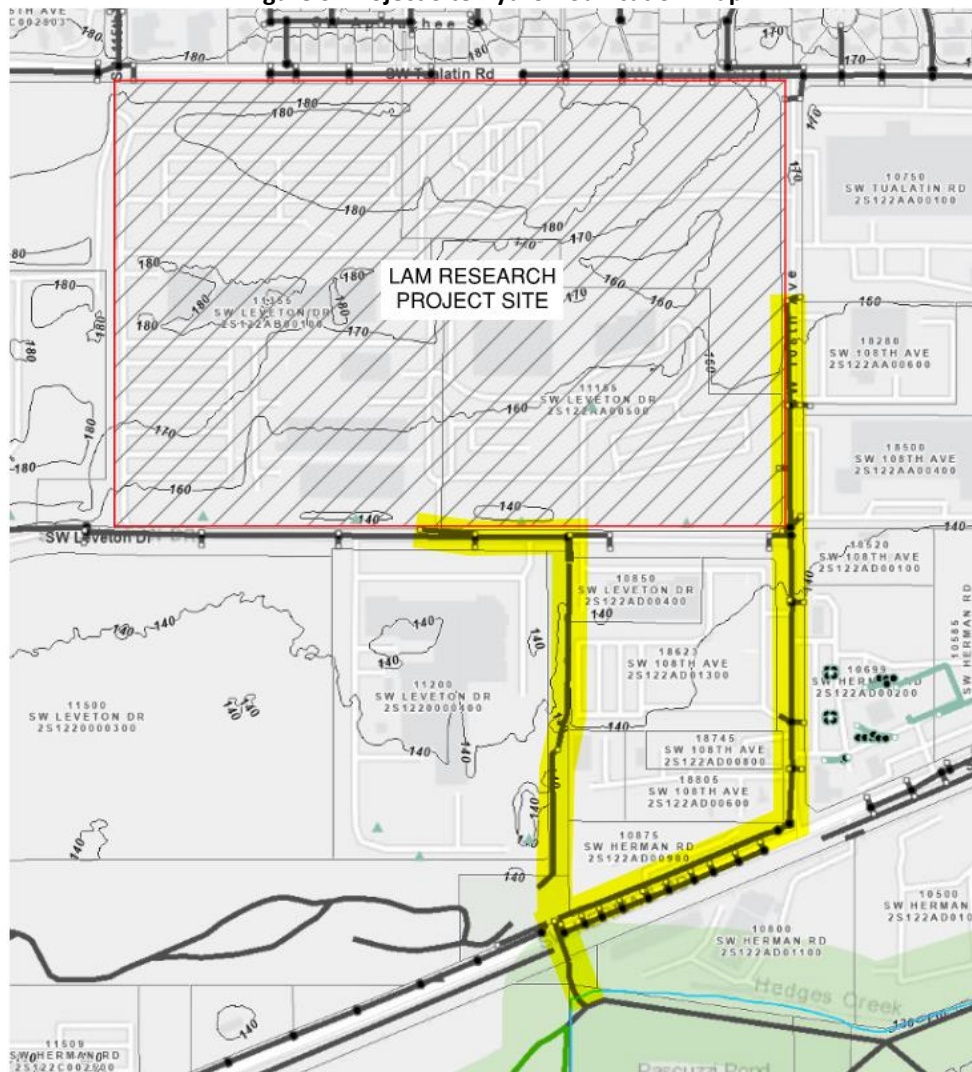
### III. STORMWATER QUANTITY MANAGEMENT

The proposed development at the Lam Research campus will add impervious surface to each of the four (4) drainage basins on site. Mitigation of increased peak flows will be provided through increased detention capacity in Pond D, which will be expanded toward the west.

Ponds A, B, and C, and D were designed in 2001 and 2017 under prior Clean Water Services regulations which required that runoff from the developed Lam Research site be mitigated through detention to match the pre-development peak rates for the 2-year through 25-year storm events.

Current standards require assessment of hydromodification risk based on the project site and development footprint. Per Clean Water Services standards, the proposed development falls into Category 2.

**Figure 3: Project Site Hydromodification Map**





**Figure 4: Hydromodification Risk Assessment**

<b>Development Class/ Risk Level</b>	<b>Small Project 1,000 – 12,000 SF</b>	<b>Medium Project &gt;12,000 – 80,000 SF</b>	<b>Large Project &gt; 80,000 SF</b>
Expansion/High	Category 1	Category 3	Category 3
Expansion/ Moderate		Category 2	
Expansion/ Low		Category 3	
Developed/ High		Category 2	
Developed/ Moderate		Category 2	Category 2
Developed/ Low			Category 2

Under current Clean Water Services Category 2 hydromodification standards, new development shall provide detention to reduce the 2-year storm developed peak flow to match one-half of the pre-developed 2-year storm peak runoff, and to match pre-development peak flows for larger storm events.

In order to calculate the required detention and mitigated release rate from the campus development under blended standards, we calculated the allowable peak flows from existing (pre-2019) development on campus and new (2022 proposed) development. Pre-development peak flows are calculated using on a curve number of 73. The following table summarizes the allowed peak flow from the site.

<b>TABLE 3: PRE-DEVELOPMENT PEAK FLOWS</b>			
<b>Site Coverage</b>	<b>Basin Area (ac)</b>	<b>2-year Storm Pre-Developed Maximum Allowed Flow (cfs)</b>	<b>25-year Storm Pre-Developed Maximum Allowed Flow (cfs)</b>
Pre-2019 Existing Campus	51.54	3.184	1.681
Proposed 2022 Development Area	6.47	0.200	13.39
Total Campus	58.01	3.384	15.07

Post-development runoff is calculated using curve numbers of 98 for impervious areas (building roofs, paving, gravel), 76 for existing landscape areas, and 74 for new landscape areas. The runoff from each drainage basin on site is calculated based on the proposed site coverage, and calculated for flow through the existing detention ponds.

**TABLE 4: POST-DEVELOPMENT SITE COVERAGE SUMMARY**

	Basin A (ac)	Basin B (ac)	Basin C (ac)	Basin D (ac)	Total Site (ac)
Impervious	10.13	10.59	8.43	4.42	33.57
Existing Landscape	5.89	4.19	10.09	1.04	21.21
New Landscape	0	0	1.43	1.80	3.23
Total Area	16.02	14.78	19.95	7.26	58.01

The overall site flow is calculated as the combined flow from the four ponds, and the Pond D storage will be adjusted to reduce the post-development total flow to match the pre-development limits listed above. The following table summarizes the flow from each pond and the total site outflow.

**TABLE 5: DETAINED RELEASE FLOW SUMMARY**

	Pond A (ac)	Pond B (ac)	Pond C (ac)	Pond D	Total Site (ac)
Post-Development Flow (cfs)	2-yr: 5.92	2-yr: 6.20	2-yr: 5.15	2-yr: 2.51	2-yr: 19.76
	10-yr: 9.58	10-yr: 9.63	10-yr: 9.30	10-yr: 4.14	10-yr: 32.64
	25-yr: 11.34	25-yr: 11.26	25-yr: 11.38	25-yr: 4.94	25-yr: 38.91
Detained Release Flow (cfs)	2-yr: 0.93	2-yr: 1.02	2-yr: 1.11	2-yr: 0.32	2-yr: 3.32
	10-yr: 2.76	10-yr: 1.35	10-yr: 1.58	10-yr: 1.25	10-yr: 6.74
	25-yr: 4.15	25-yr: 1.48	25-yr: 1.91	25-yr: 2.10	25-yr: 9.04

The existing Ponds A, B, and C will remain as-is, and Pond D will be expanded to provide additional detention storage. Approximately 20,600 cf of additional storage is required within Pond D, which is provided by extending the west edge of the pond approximately 80 feet. No modifications to the existing outlet structure or orifice are required. Detailed detention calculations are provided in Appendix C of this report.

#### **IV. CONCLUSION**

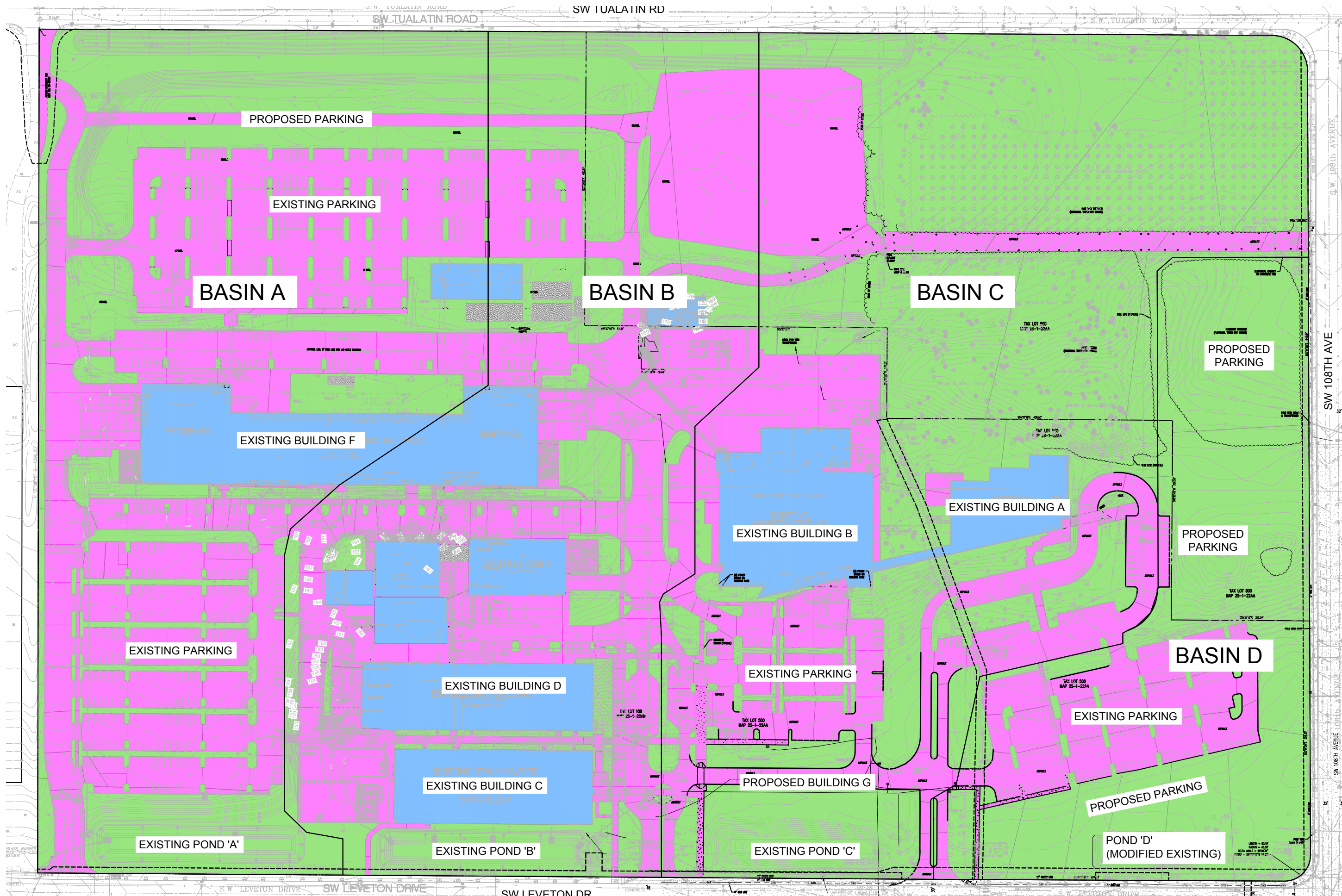
The proposed building and parking expansion at Lam Research will increase the impervious area coverage on campus by approximately 4.27 ac. Stormwater runoff from the new impervious area will be treated for water quality through existing extended dry basins, new swales, and new rain gardens.

Detention will be provided to new Clean Water Services standards to meet hydromodification requirements for new impervious area. The existing detention ponds will be supplemented with expansion at Pond D to provide storage to meet new detention requirements.

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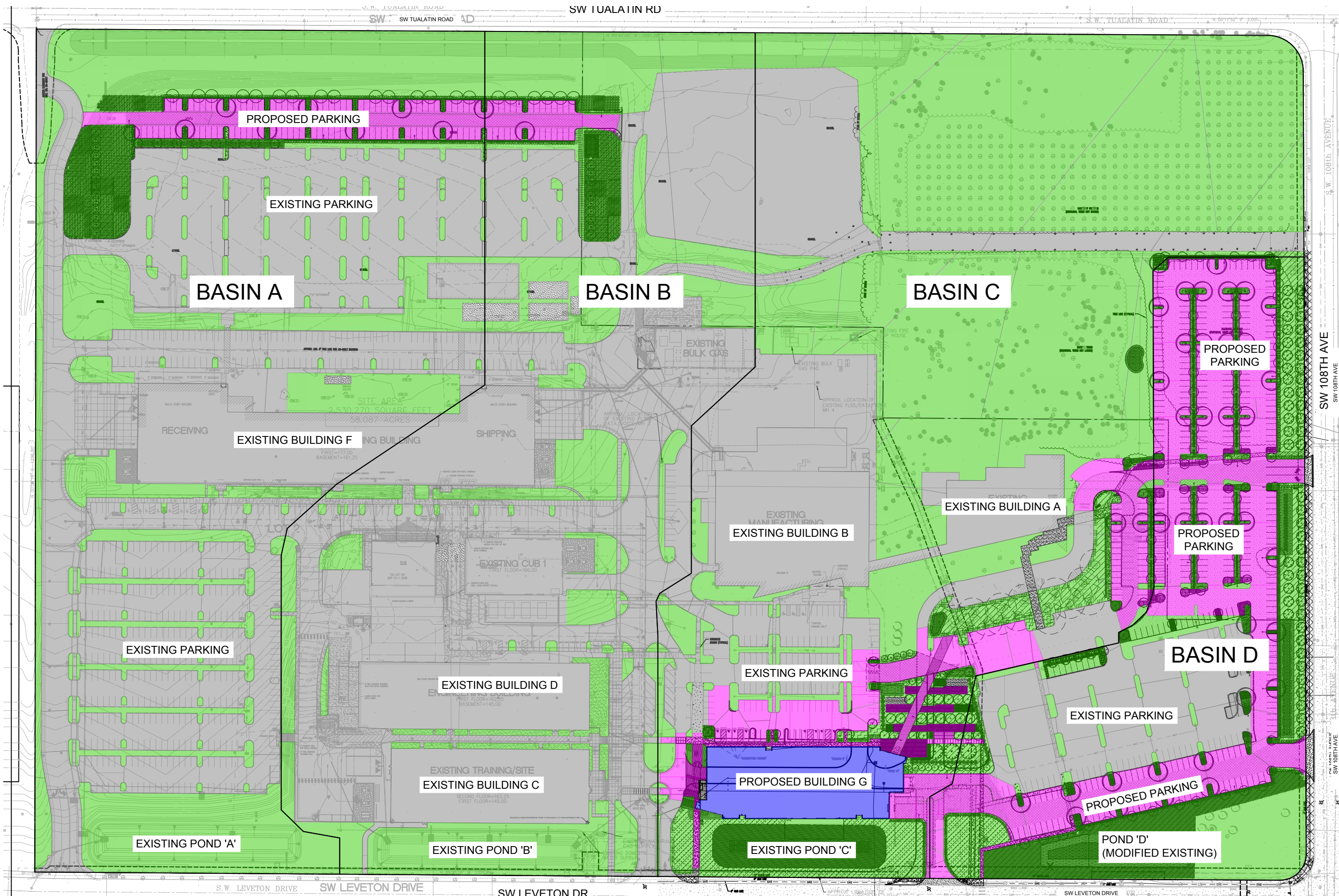
APPENDIX A  
**BASIN MAPS**





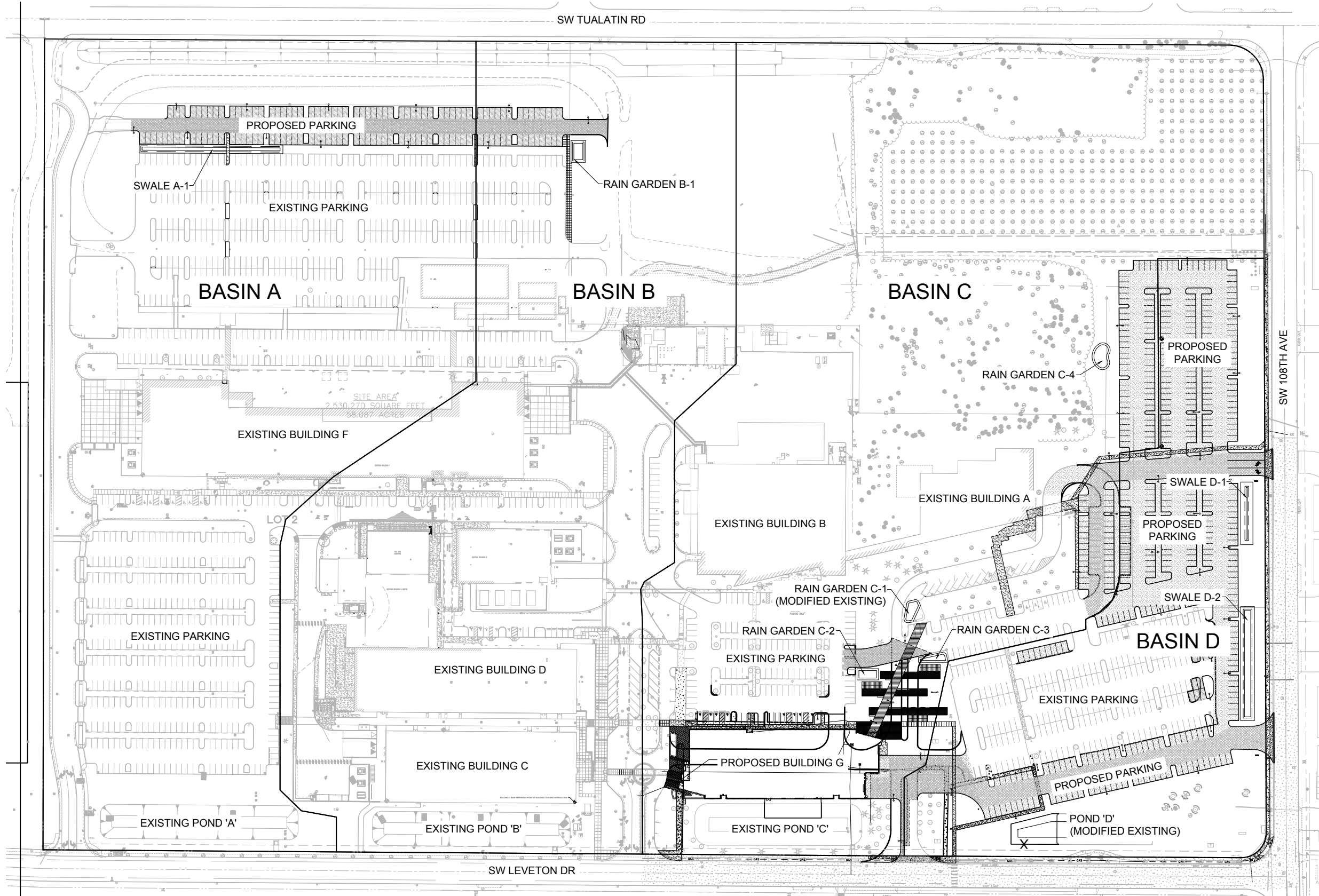
**EXISTING CONDITIONS BASIN MAP**





**PROPOSED CONDITIONS BASIN MAP**





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REVISION SCHEDULE		
Delta	Issued As	Issue Date

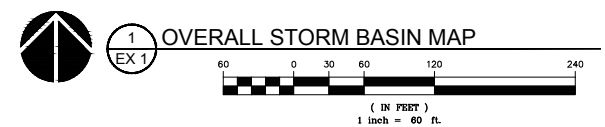
SHEET TITLE:  
**OVERALL  
STORM BASIN  
MAP**

DRAWN BY: BDN  
CHECKED BY: BDN  
SHEET

**EX 1**

JOB NO. **2220087.00**

**STORM FACILITIES BASIN MAP**



---

APPENDIX B  
**WATER QUALITY  
SIZING**

# Clean Water Services

## Vegetated Swale Calculator

Per 2019 Clean Water Services Design & Construction Standards (D&CS)

Project Name:	Lam Research - Swale A-1	By:	SJS	Checked:	BDN
Project Number:	2220087.00	Date:	8/15/2022	Date:	8/16/2022

### From WQF and WQV Calculator

Required Treatment Area (A):	A =	31,704 ft <sup>2</sup>
Water Quality Volume (WQV):	WQV =	951 ft <sup>3</sup>
Water Quality Flow (WQF):	WQF =	0.07 ft <sup>3</sup> /s

### User Entry Variables

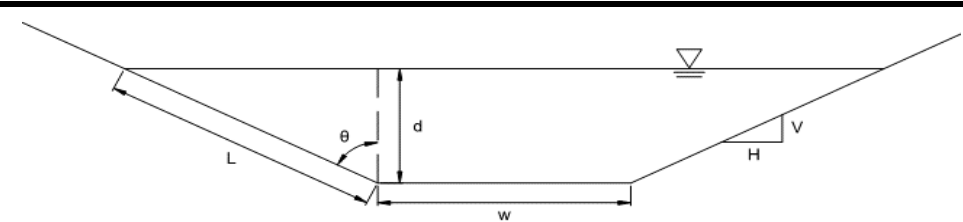
Slope	S =	0.016	ft/ft
Side Slopes	H =	4	
	V =	1	
Swale Length	L <sub>s</sub> =	220	ft
Swale Bottom Width	w =	2.5	ft
Manning's N-Value	n =	0.24	

### Calculations

Swale Cross-Sectional Area	A =	0.34	ft <sup>2</sup>
	θ =	76	°
	L =	0.16	ft
Water Quality Depth	d =	0.133	ft
Velocity	v =	0.19	ft/s
Residence time	t =	19.12	min.
Manning's Equation	AR <sup>2/3</sup> =	0.084	
Manning's Equation	AR <sup>2/3</sup> =	0.085	

### Equations

$$AR^{2/3} = \frac{Q * n}{1.49\sqrt{S}} \quad A = (d * w) + d^2 \tan\theta \quad R = \frac{wd + Hd^2}{w + 2dH}$$



### Vegetated Swale Design Criteria

Minimum Slope =	0.005	<a href="#">D&amp;CS 4.09.4.c.4</a>
Maximum Side Slopes =	4 :1	<a href="#">D&amp;CS 4.09.4.c.8A</a>
Minimum Swale Length =	100 feet	<a href="#">D&amp;CS 4.09.4.c.3</a>
Minimum Flat Bottom Width =	2 feet	<a href="#">D&amp;CS 4.09.4.c.5</a>
Manning's n-value =	0.24	<a href="#">D&amp;CS 4.09.4.b.5</a>
Minimum Freeboard =	1 foot	<a href="#">D&amp;CS 4.09.4.b.4</a>
Maximum Depth =	6 inches	<a href="#">D&amp;CS 4.09.4.c.6</a>
Maximum Velocity =	2 ft/s	<a href="#">D&amp;CS 4.09.4.b.6</a>
Minimum Residence Time =	9 minutes	<a href="#">D&amp;CS 4.09.4.b.2</a>

$$AR^{2/3} = \frac{Q * n}{1.49\sqrt{S}}$$

$$AR^{2/3} = dw + d^2 \tan\theta \left[ \frac{dw + d^2 \tan\theta}{\left(w + 2 \frac{d}{\cos\theta}\right)^{2/3}} \right]$$

# Clean Water Services

## Simplified LIDA Sizing

Per 2019 Clean Water Services Design & Construction Standards

Project Name:	Lam Research - Rain Garden B-1	By:	SJS	Checked:	BDN
Project Number:	2220087.00	Date:	8/15/2022	Date:	8/16/2022

<b>User Entry Variables</b>	
Impervious Area	9,770 ft <sup>2</sup>
Infiltration Rate	0.5 in/hr

<b>Notes/Design Criteria</b>	
Maximum Contributing Impervious Area	15,000 ft <sup>2</sup>
Sizing factors assume a maximum infiltration rate of	2 in/hr
If infiltration rate exceeds 2 in/hr, the simplified method may be oversizing your facility	
Sizing factor = 6%	CWS Design & Construction Standards - Section 4.08.4b
Sizing factor = 12%	CWS Design & Construction Standards - Section 4.08.4c

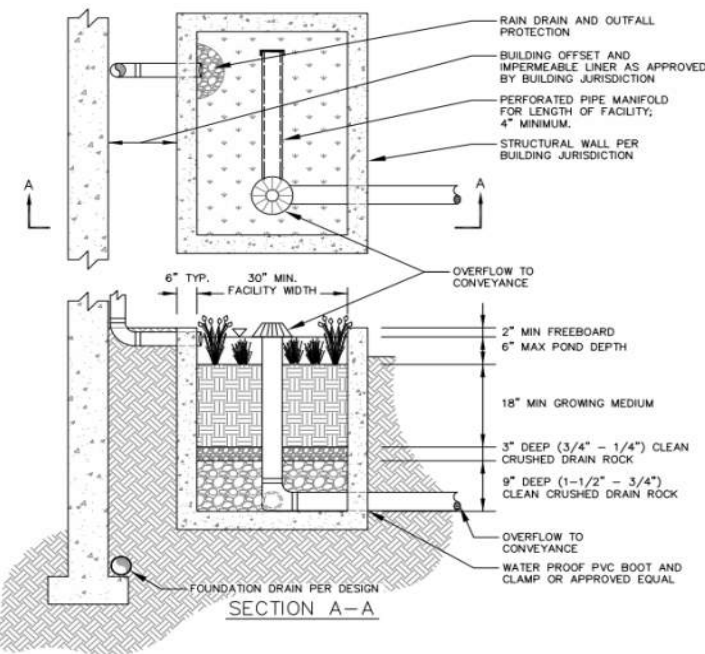
<b>From WQF and WQV Calculator</b>	
Required Treatment Area (A):	9,770 ft <sup>2</sup>

<b>Calculations</b>	
LIDA Facility Size (WQ ONLY)	586 ft <sup>2</sup>
LIDA Facility Size (WQ + Hydromodification)	1,172 ft <sup>2</sup>

### LIDA Facilities to be used with Simplified Sizing

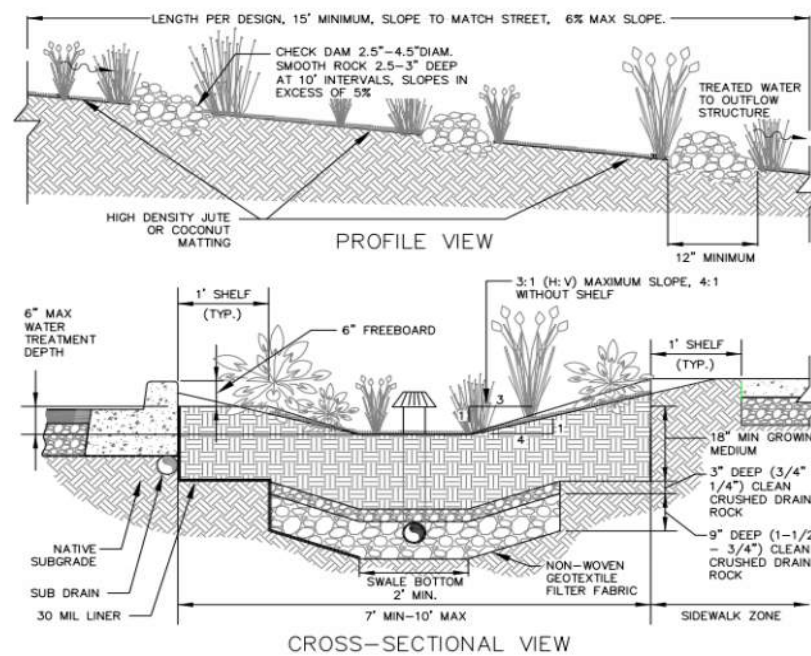
#### Flow-Through Planter

CWS LIDA Handbook Dwg No 794 (2016)



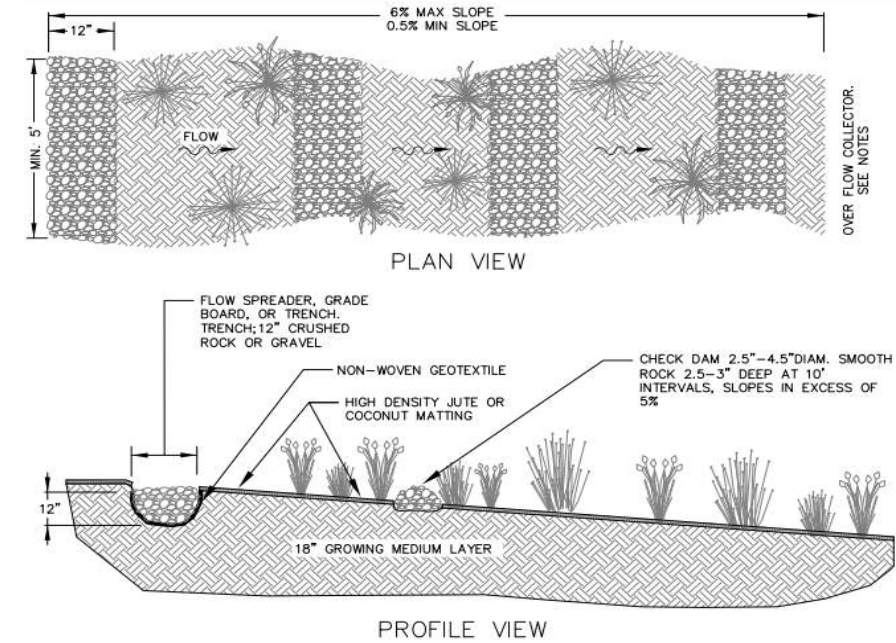
#### LIDA Swale

CWS LIDA Handbook Dwg No 795 (2016)



#### Vegetated Filter Strip

CWS LIDA Handbook Dwg No 796 (2016)





# Clean Water Services

## Simplified LIDA Sizing

Per 2019 Clean Water Services Design & Construction Standards

Project Name:	Lam Research - Rain Garden C-2	By:	SJS	Checked:	BDN
Project Number:	2220087.00	Date:	8/15/2022	Date:	8/16/2022

<b>User Entry Variables</b>	
Impervious Area	6,319 ft <sup>2</sup>
Infiltration Rate	0.5 in/hr

<b>Notes/Design Criteria</b>	
Maximum Contributing Impervious Area	15,000 ft <sup>2</sup>
Sizing factors assume a maximum infiltration rate of	2 in/hr
If infiltration rate exceeds 2 in/hr, the simplified method may be oversizing your facility	
Sizing factor = 6%	CWS Design & Construction Standards - Section 4.08.4b
Sizing factor = 12%	CWS Design & Construction Standards - Section 4.08.4c

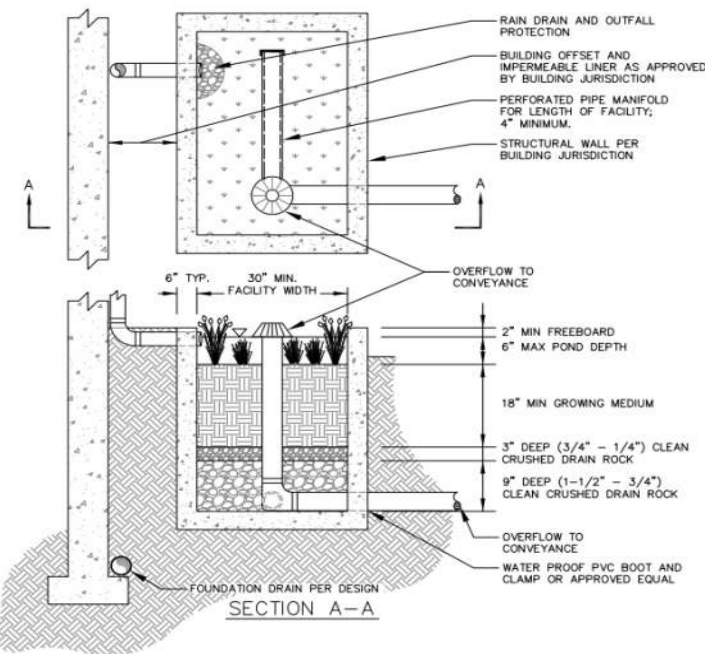
<b>From WQF and WQV Calculator</b>	
Required Treatment Area (A):	6,319 ft <sup>2</sup>

<b>Calculations</b>	
LIDA Facility Size (WQ ONLY)	379 ft <sup>2</sup>
LIDA Facility Size (WQ + Hydromodification)	758 ft <sup>2</sup>

### LIDA Facilities to be used with Simplified Sizing

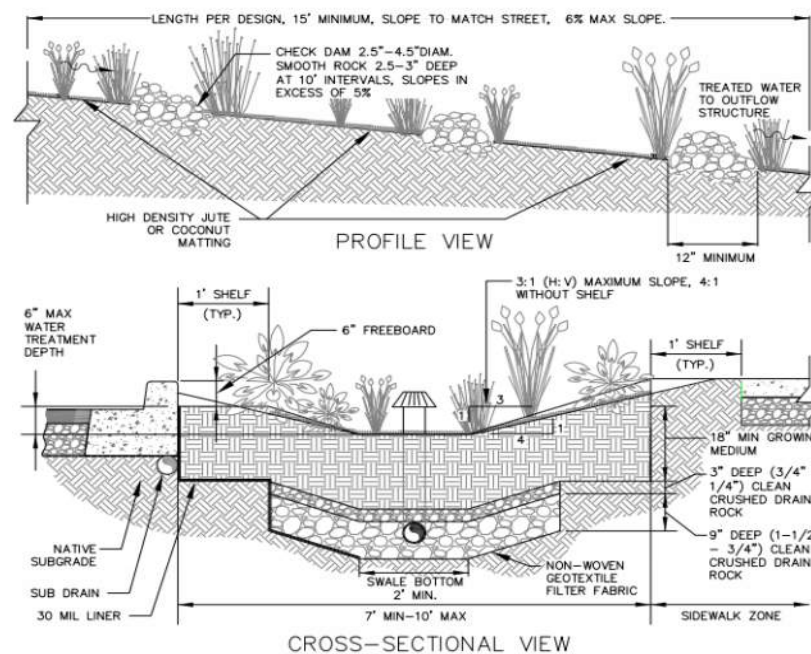
#### Flow-Through Planter

CWS LIDA Handbook Dwg No 794 (2016)



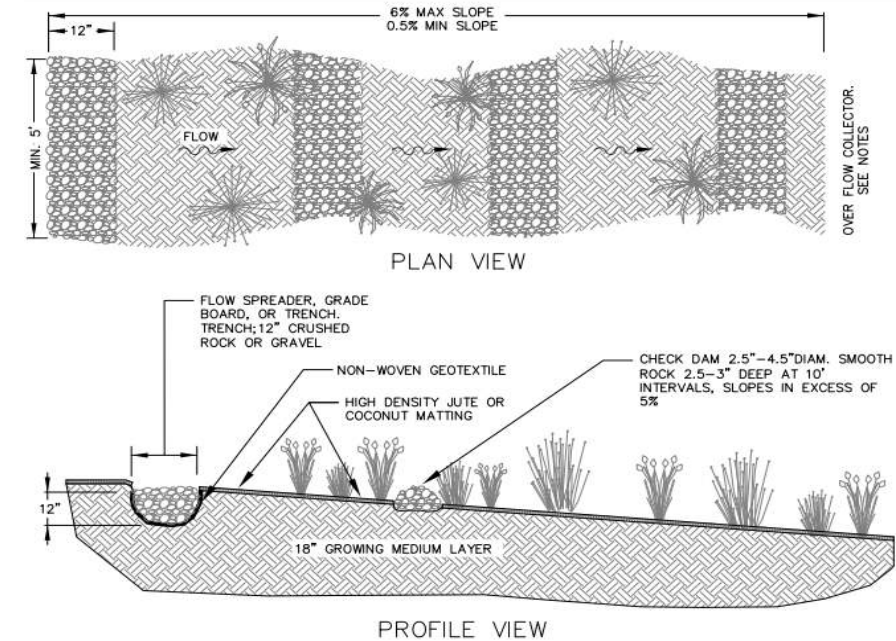
#### LIDA Swale

CWS LIDA Handbook Dwg No 795 (2016)



#### Vegetated Filter Strip

CWS LIDA Handbook Dwg No 796 (2016)



# Clean Water Services

## Simplified LIDA Sizing

Per 2019 Clean Water Services Design & Construction Standards

Project Name:	Lam Research - Rain Garden C-3	By:	SJS	Checked:	BDN
Project Number:	2220087.00	Date:	8/15/2022	Date:	8/16/2022

<b>User Entry Variables</b>	
Impervious Area	9,108 ft <sup>2</sup>
Infiltration Rate	0.5 in/hr

<b>Notes/Design Criteria</b>	
Maximum Contributing Impervious Area	15,000 ft <sup>2</sup>
Sizing factors assume a maximum infiltration rate of	2 in/hr
If infiltration rate exceeds 2 in/hr, the simplified method may be oversizing your facility	
Sizing factor = 6%	CWS Design & Construction Standards - Section 4.08.4b
Sizing factor = 12%	CWS Design & Construction Standards - Section 4.08.4c

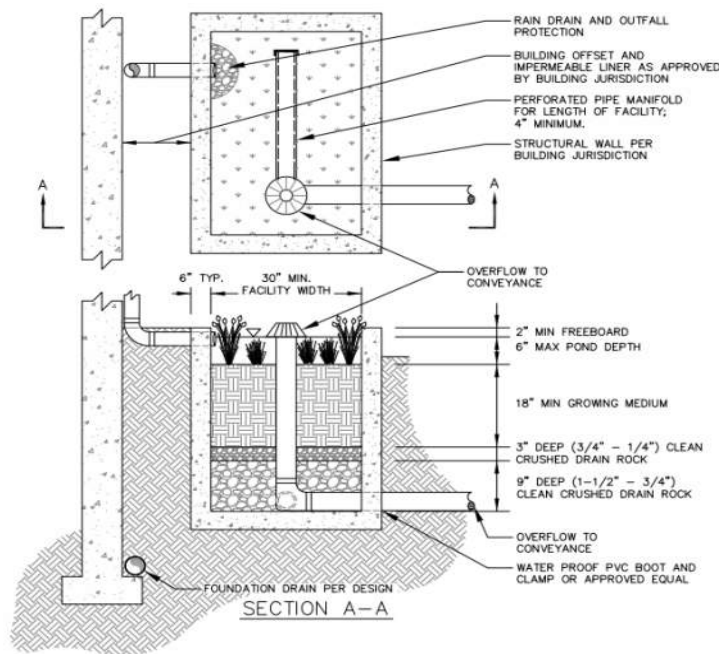
<b>From WQF and WQV Calculator</b>	
Required Treatment Area (A):	9,108 ft <sup>2</sup>

<b>Calculations</b>	
LIDA Facility Size (WQ ONLY)	546 ft <sup>2</sup>
LIDA Facility Size (WQ + Hydromodification)	1,093 ft <sup>2</sup>

### LIDA Facilities to be used with Simplified Sizing

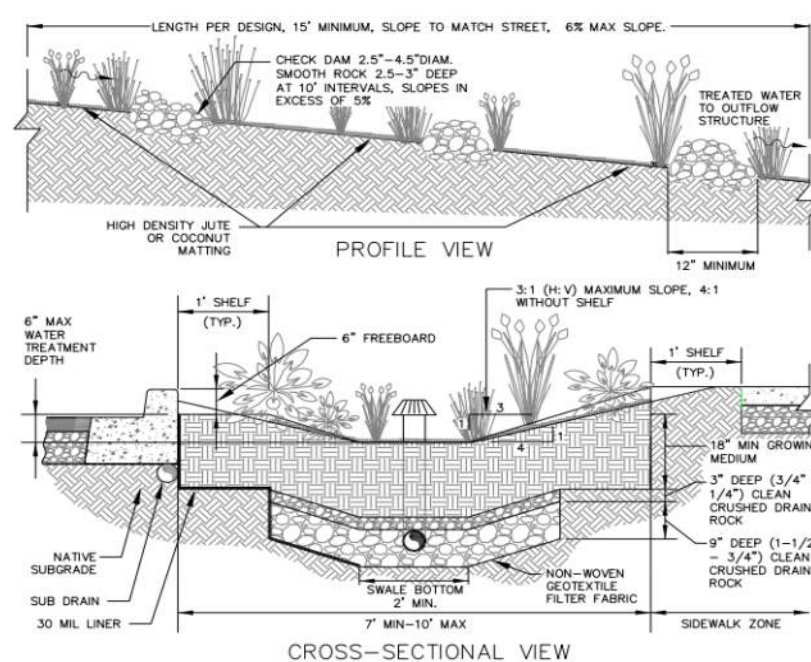
#### Flow-Through Planter

CWS LIDA Handbook Dwg No 794 (2016)



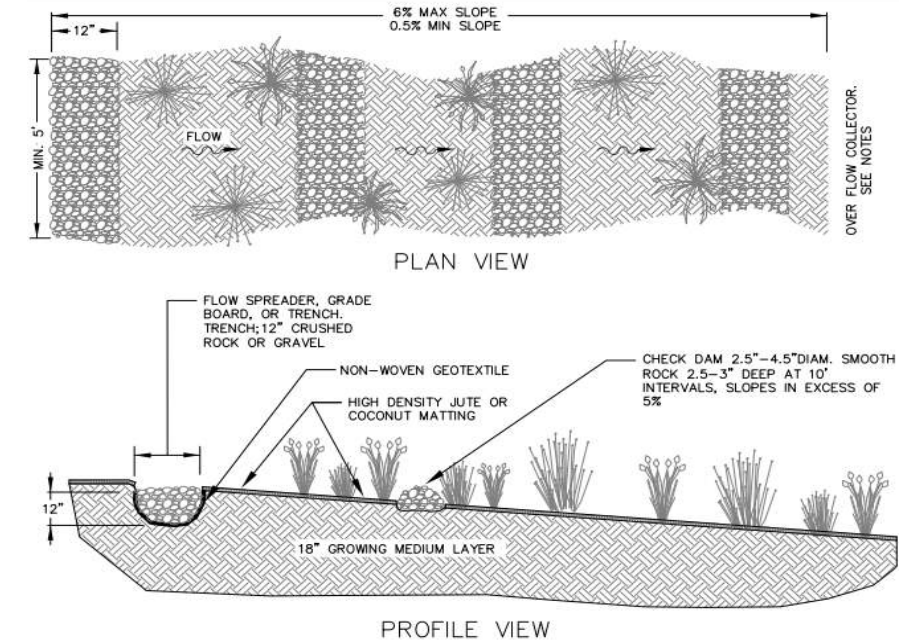
#### LIDA Swale

CWS LIDA Handbook Dwg No 795 (2016)



#### Vegetated Filter Strip

CWS LIDA Handbook Dwg No 796 (2016)





# Clean Water Services

Simplified LIDA Sizing

Per 2019 Clean Water Services Design & Construction Standards

Project Name:	Lam Research - Rain Garden C-4	By:	SJS	Checked:	BDN
Project Number:	2220087.00	Date:	8/15/2022	Date:	8/16/2022

<b>User Entry Variables</b>	
Impervious Area	14,116 ft <sup>2</sup>
Infiltration Rate	0.5 in/hr

<b>Notes/Design Criteria</b>	
Maximum Contributing Impervious Area	15,000 ft <sup>2</sup>
Sizing factors assume a maximum infiltration rate of	2 in/hr
If infiltration rate exceeds 2 in/hr, the simplified method may be oversizing your facility	
Sizing factor = 6%	CWS Design & Construction Standards - Section 4.08.4b
Sizing factor = 12%	CWS Design & Construction Standards - Section 4.08.4c

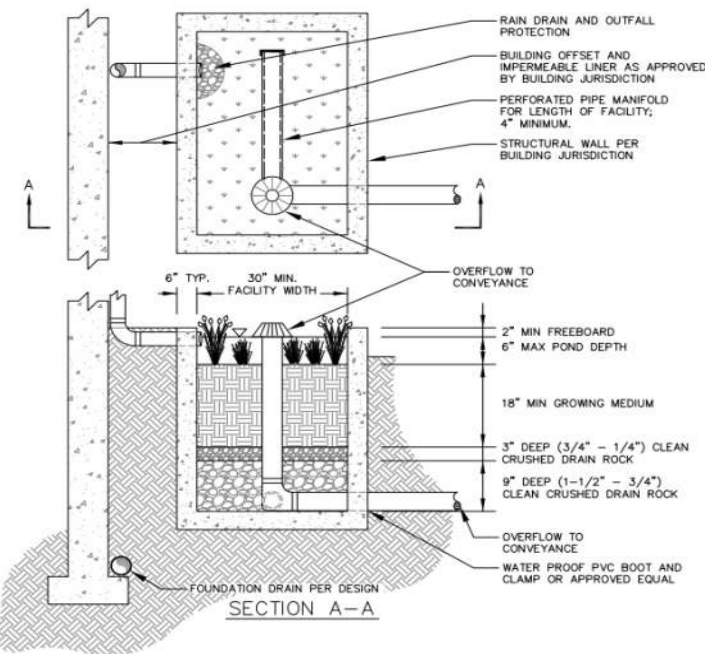
<b>From WQF and WQV Calculator</b>	
Required Treatment Area (A):	14,116 ft <sup>2</sup>

<b>Calculations</b>	
LIDA Facility Size (WQ ONLY)	847 ft <sup>2</sup>
LIDA Facility Size (WQ + Hydromodification)	1,694 ft <sup>2</sup>

## LIDA Facilities to be used with Simplified Sizing

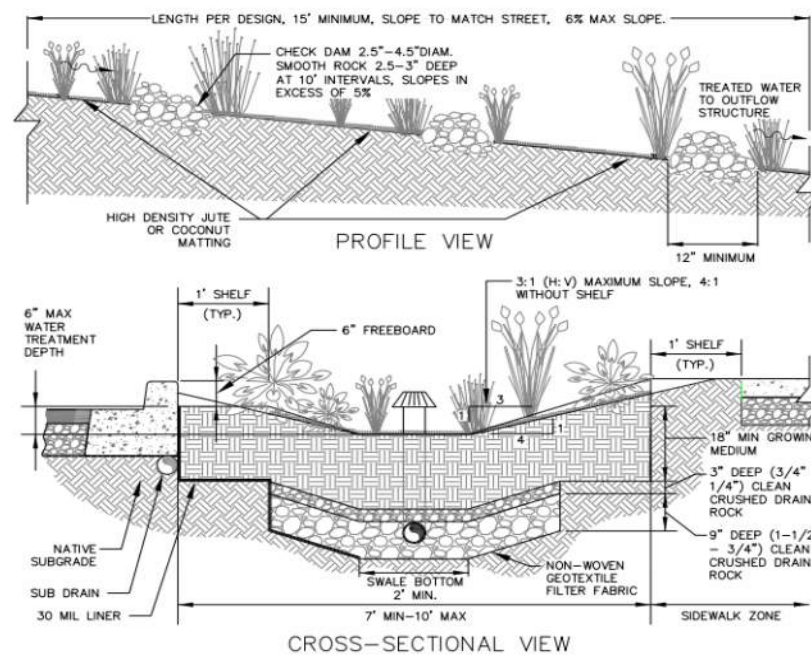
### Flow-Through Planter

CWS LIDA Handbook Dwg No 794 (2016)



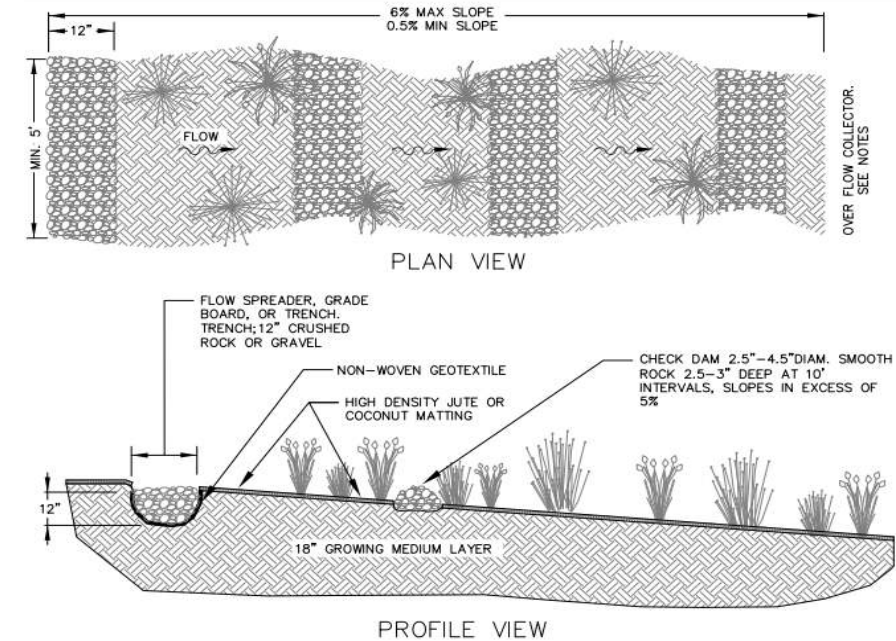
### LIDA Swale

CWS LIDA Handbook Dwg No 795 (2016)



### Vegetated Filter Strip

CWS LIDA Handbook Dwg No 796 (2016)



# Clean Water Services

## Vegetated Swale Calculator

Per 2019 Clean Water Services Design & Construction Standards (D&CS)

Project Name:	Lam Research - Swale D-1	By:	SJS	Checked:	BDN
Project Number:	2220087.00	Date:	8/15/2022	Date:	8/16/2022

### From WQF and WQV Calculator

Required Treatment Area (A):	A =	36,094 ft <sup>2</sup>
Water Quality Volume (WQV):	WQV =	1,083 ft <sup>3</sup>
Water Quality Flow (WQF):	WQF =	0.08 ft <sup>3</sup> /s

### User Entry Variables

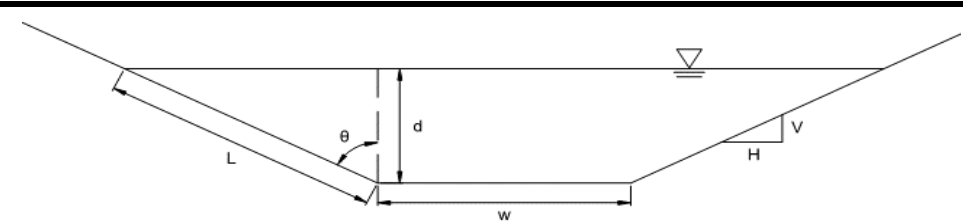
Slope	S =	0.045 ft/ft
Side Slopes	H =	4
	V =	1
Swale Length	L <sub>s</sub> =	100 ft
Swale Bottom Width	w =	8 ft
Manning's N-Value	n =	0.24

### Calculations

Swale Cross-Sectional Area	A =	0.42 ft <sup>2</sup>
	θ =	76 °
	L =	0.06 ft
Water Quality Depth	d =	0.052 ft
Velocity	v =	0.18 ft/s
Residence time	t =	9.27 min.
Manning's Equation	AR <sup>2/3</sup> =	0.057
Manning's Equation	AR <sup>2/3</sup> =	0.058

### Equations

$$AR^{2/3} = \frac{Q * n}{1.49\sqrt{S}} \quad A = (d * w) + d^2 \tan\theta \quad R = \frac{wd + Hd^2}{w + 2dH}$$



### Vegetated Swale Design Criteria

Minimum Slope =	0.005	<a href="#">D&amp;CS 4.09.4.c.4</a>
Maximum Side Slopes =	4 :1	<a href="#">D&amp;CS 4.09.4.c.8A</a>
Minimum Swale Length =	100 feet	<a href="#">D&amp;CS 4.09.4.c.3</a>
Minimum Flat Bottom Width =	2 feet	<a href="#">D&amp;CS 4.09.4.c.5</a>
Manning's n-value =	0.24	<a href="#">D&amp;CS 4.09.4.b.5</a>
Minimum Freeboard =	1 foot	<a href="#">D&amp;CS 4.09.4.b.4</a>
Maximum Depth =	6 inches	<a href="#">D&amp;CS 4.09.4.c.6</a>
Maximum Velocity =	2 ft/s	<a href="#">D&amp;CS 4.09.4.b.6</a>
Minimum Residence Time =	9 minutes	<a href="#">D&amp;CS 4.09.4.b.2</a>

$$AR^{2/3} = \frac{Q * n}{1.49\sqrt{S}}$$

$$AR^{2/3} = dw + d^2 \tan\theta \left[ \frac{dw + d^2 \tan\theta}{\left(w + 2 \frac{d}{\cos\theta}\right)^{2/3}} \right]$$

# Clean Water Services

## Vegetated Swale Calculator

Per 2019 Clean Water Services Design & Construction Standards (D&CS)

Project Name:	Lam Research - Swale D-2	By:	SJS	Checked:	BDN
Project Number:	2220087.00	Date:	8/15/2022	Date:	8/16/2022

### From WQF and WQV Calculator

Required Treatment Area (A):	A =	49,985 ft <sup>2</sup>
Water Quality Volume (WQV):	WQV =	1,500 ft <sup>3</sup>
Water Quality Flow (WQF):	WQF =	0.10 ft <sup>3</sup> /s

### User Entry Variables

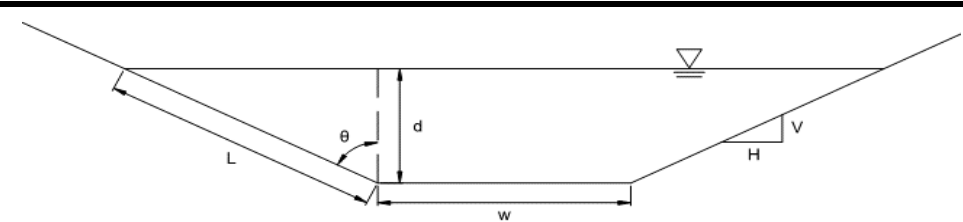
Slope	S =	0.04 ft/ft
Side Slopes	H =	4
	V =	1
Swale Length	L <sub>s</sub> =	100 ft
Swale Bottom Width	w =	10 ft
Manning's N-Value	n =	0.24

### Calculations

Swale Cross-Sectional Area	A =	0.57 ft <sup>2</sup>
	θ =	76 °
	L =	0.07 ft
Water Quality Depth	d =	0.057 ft
Velocity	v =	0.18 ft/s
Residence time	t =	9.16 min.
Manning's Equation	AR <sup>2/3</sup> =	0.084
Manning's Equation	AR <sup>2/3</sup> =	0.084

### Equations

$$AR^{2/3} = \frac{Q * n}{1.49\sqrt{S}} \quad A = (d * w) + d^2 \tan\theta \quad R = \frac{wd + Hd^2}{w + 2dH}$$



### Vegetated Swale Design Criteria

Minimum Slope =	0.005	<a href="#">D&amp;CS 4.09.4.c.4</a>
Maximum Side Slopes =	4 :1	<a href="#">D&amp;CS 4.09.4.c.8A</a>
Minimum Swale Length =	100 feet	<a href="#">D&amp;CS 4.09.4.c.3</a>
Minimum Flat Bottom Width =	2 feet	<a href="#">D&amp;CS 4.09.4.c.5</a>
Manning's n-value =	0.24	<a href="#">D&amp;CS 4.09.4.b.5</a>
Minimum Freeboard =	1 foot	<a href="#">D&amp;CS 4.09.4.b.4</a>
Maximum Depth =	6 inches	<a href="#">D&amp;CS 4.09.4.c.6</a>
Maximum Velocity =	2 ft/s	<a href="#">D&amp;CS 4.09.4.b.6</a>
Minimum Residence Time =	9 minutes	<a href="#">D&amp;CS 4.09.4.b.2</a>

$$AR^{2/3} = \frac{Q * n}{1.49\sqrt{S}}$$

$$AR^{2/3} = dw + d^2 \tan\theta \left[ \frac{dw + d^2 \tan\theta}{\left(w + 2 \frac{d}{\cos\theta}\right)^{2/3}} \right]$$



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APPENDIX C  
**DETENTION  
CALCULATIONS**

# Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	-----	3.584	-----	7.964	10.91	15.07	-----	-----	Pre-Dev Overall Site
2	SCS Runoff	-----	-----	0.400	-----	0.888	1.217	1.681	-----	-----	Pre-Dev New/Modified Site
3	SCS Runoff	-----	-----	3.184	-----	7.075	9.694	13.39	-----	-----	Pre-Dev Undisturbed Site
5	SCS Runoff	-----	-----	5.919	-----	8.215	9.576	11.34	-----	-----	Basin A - Dev
6	SCS Runoff	-----	-----	6.196	-----	8.359	9.629	11.26	-----	-----	Basin B - Dev
7	SCS Runoff	-----	-----	5.151	-----	7.719	9.296	11.38	-----	-----	Basin C - Dev
8	SCS Runoff	-----	-----	2.509	-----	3.533	4.144	4.937	-----	-----	Basin D - Dev
10	Combine	5, 6, 7, 8,	-----	19.76	-----	27.83	32.64	38.91	-----	-----	Full Site - Developed
12	Reservoir	5	-----	0.933	-----	1.803	2.756	4.153	-----	-----	Pond A Outflow
13	Reservoir	6	-----	1.019	-----	1.236	1.350	1.482	-----	-----	Pond B Outflow
14	Reservoir	7	-----	1.107	-----	1.418	1.579	1.909	-----	-----	Pond C Outflow
15	Reservoir	8	-----	0.315	-----	0.755	1.253	2.099	-----	-----	Pond D Outflow
17	Combine	12, 13, 14, 15,	-----	3.320	-----	5.148	6.736	9.040	-----	-----	Total site outflow

# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

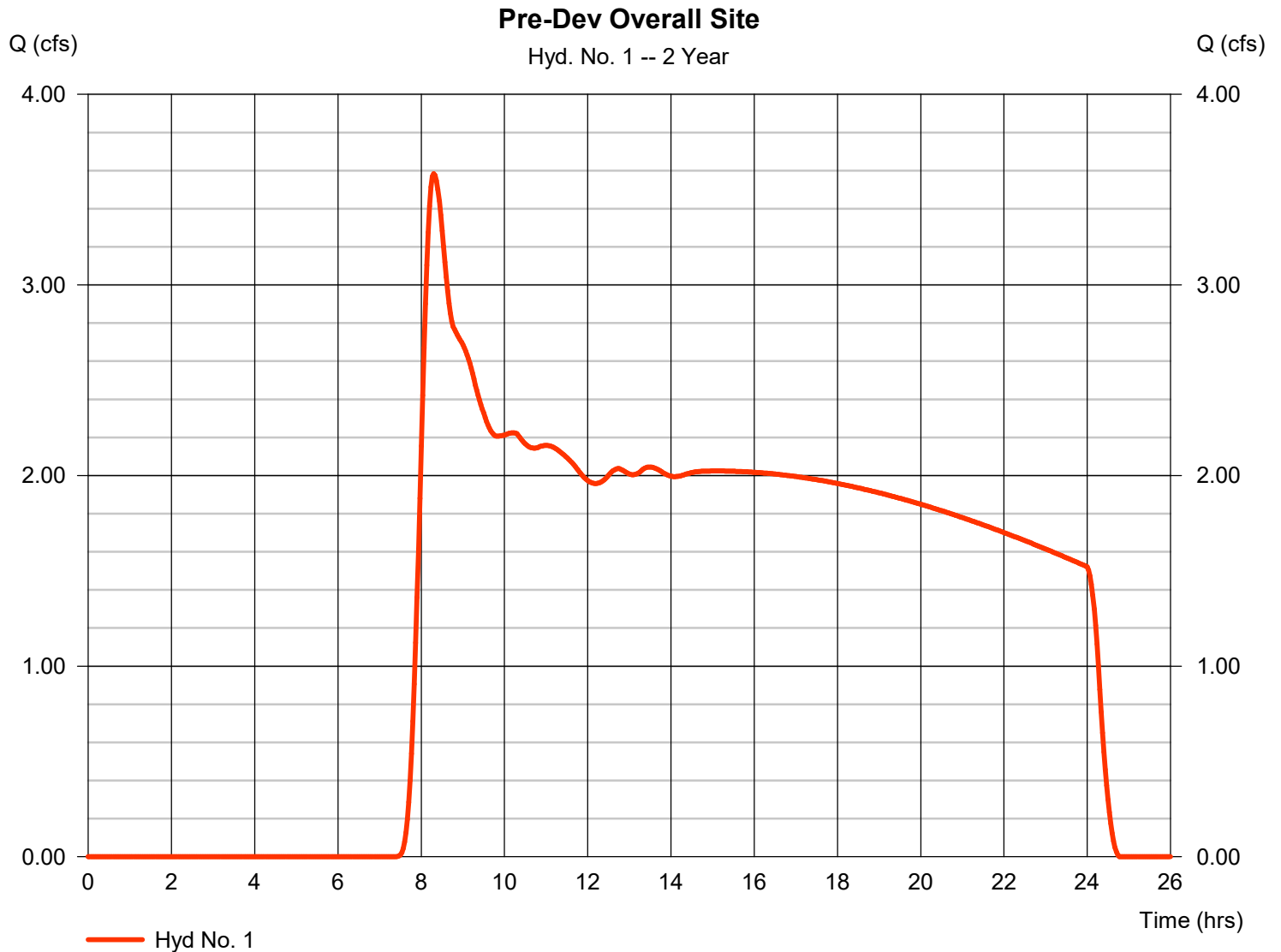
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.584	2	498	119,526	-----	-----	-----	Pre-Dev Overall Site
2	SCS Runoff	0.400	2	498	13,331	-----	-----	-----	Pre-Dev New/Modified Site
3	SCS Runoff	3.184	2	498	106,195	-----	-----	-----	Pre-Dev Undisturbed Site
5	SCS Runoff	5.919	2	480	86,804	-----	-----	-----	Basin A - Dev
6	SCS Runoff	6.196	2	480	88,568	-----	-----	-----	Basin B - Dev
7	SCS Runoff	5.151	2	482	83,209	-----	-----	-----	Basin C - Dev
8	SCS Runoff	2.509	2	480	37,379	-----	-----	-----	Basin D - Dev
10	Combine	19.76	2	480	295,959	5, 6, 7, 8,	-----	-----	Full Site - Developed
12	Reservoir	0.933	2	700	59,839	5	141.62	23,045	Pond A Outflow
13	Reservoir	1.019	2	674	62,077	6	138.65	23,468	Pond B Outflow
14	Reservoir	1.107	2	686	66,295	7	137.50	17,368	Pond C Outflow
15	Reservoir	0.315	2	816	14,110	8	137.04	15,366	Pond D Outflow
17	Combine	3.320	2	806	202,321	12, 13, 14, 15,	-----	-----	Total site outflow
Hydraflow storm calcs.gpw					Return Period: 2 Year			Tuesday, 08 / 16 / 2022	

# Hydrograph Report

## Hyd. No. 1

Pre-Dev Overall Site

Hydrograph type	= SCS Runoff	Peak discharge	= 3.584 cfs
Storm frequency	= 2 yrs	Time to peak	= 8.30 hrs
Time interval	= 2 min	Hyd. volume	= 119,526 cuft
Drainage area	= 58.010 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 30.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

## Hyd. No. 2

Pre-Dev New/Modified Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.400 cfs
Storm frequency	= 2 yrs	Time to peak	= 8.30 hrs
Time interval	= 2 min	Hyd. volume	= 13,331 cuft
Drainage area	= 6.470 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 30.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484





# Hydrograph Report

## Hyd. No. 3

Pre-Dev Undisturbed Site

Hydrograph type = SCS Runoff  
Storm frequency = 2 yrs  
Time interval = 2 min  
Drainage area = 51.540 ac  
Basin Slope = 0.0 %  
Tc method = User  
Total precip. = 2.50 in  
Storm duration = 24 hrs

Peak discharge = 3.184 cfs  
Time to peak = 8.30 hrs  
Hyd. volume = 106,195 cuft  
Curve number = 73  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 30.00 min  
Distribution = Type IA  
Shape factor = 484



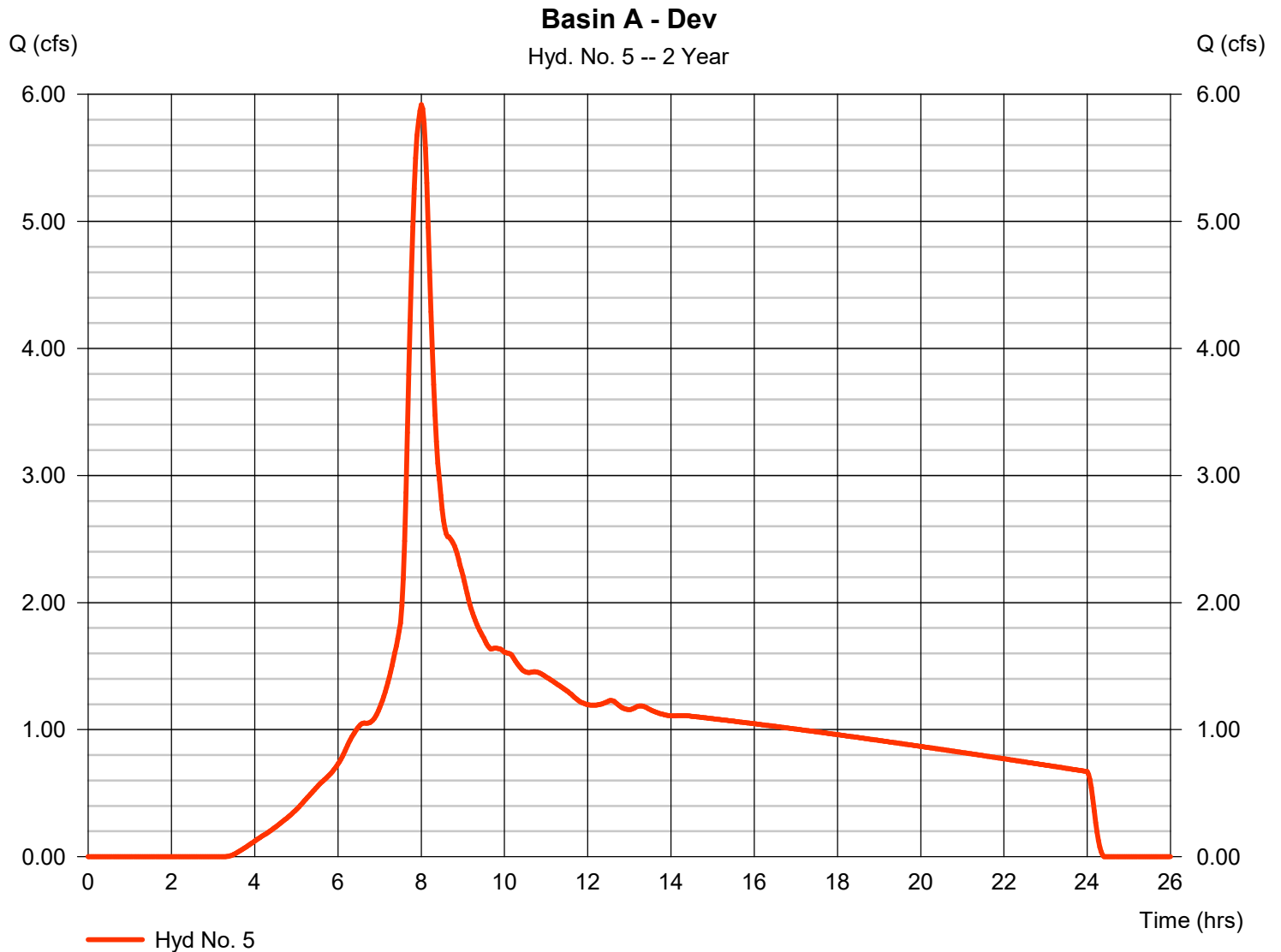
# Hydrograph Report

## Hyd. No. 5

Basin A - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 5.919 cfs
Storm frequency	= 2 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 86,804 cuft
Drainage area	= 16.020 ac	Curve number	= 90*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(1.250 x 98) + (8.150 x 98) + (5.890 x 76) + (0.730 x 98)] / 16.020



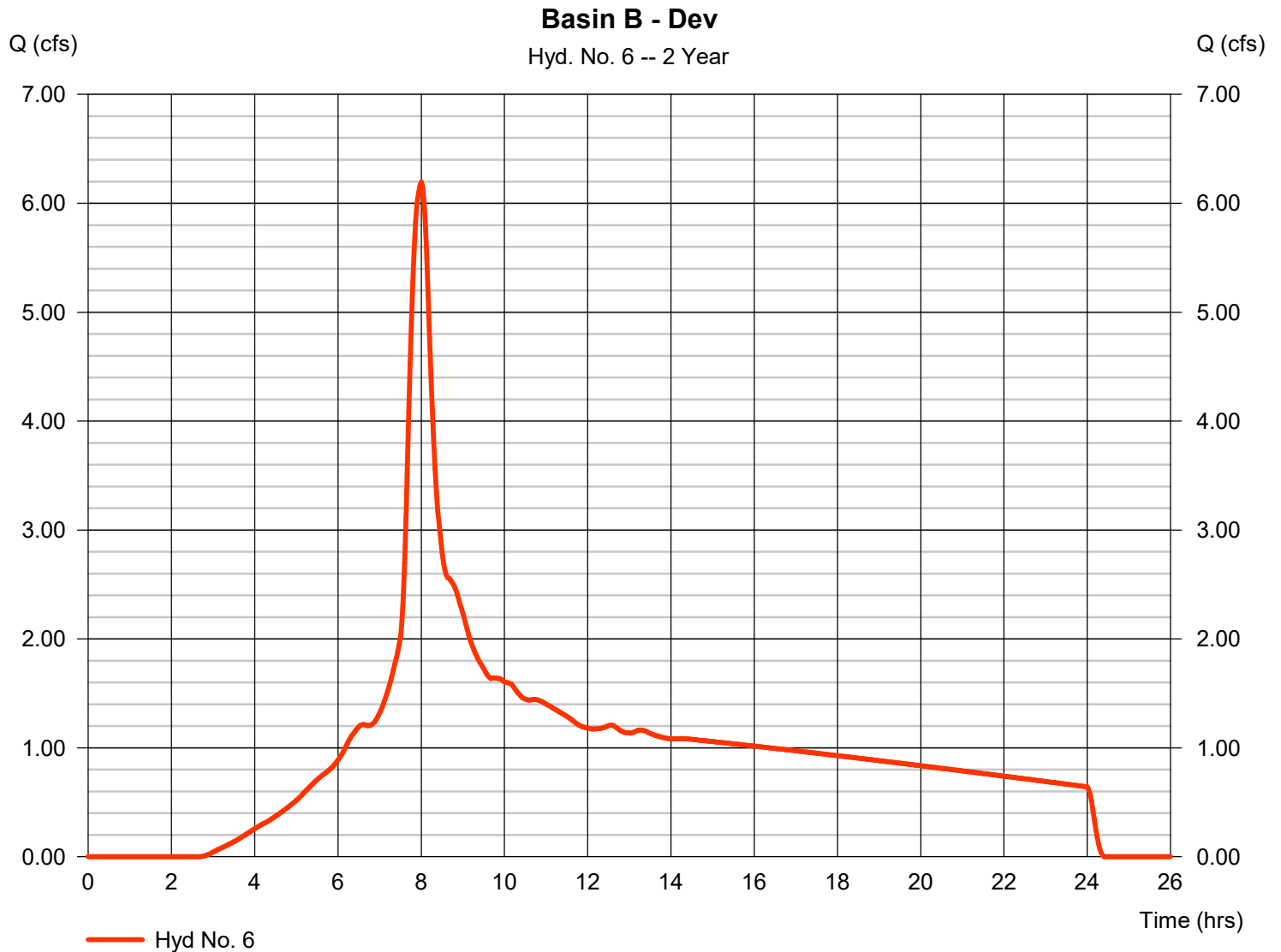
# Hydrograph Report

## Hyd. No. 6

Basin B - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 6.196 cfs
Storm frequency	= 2 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 88,568 cuft
Drainage area	= 14.780 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(3.350 x 98) + (7.020 x 98) + (4.190 x 76) + (0.220 x 98)] / 14.780



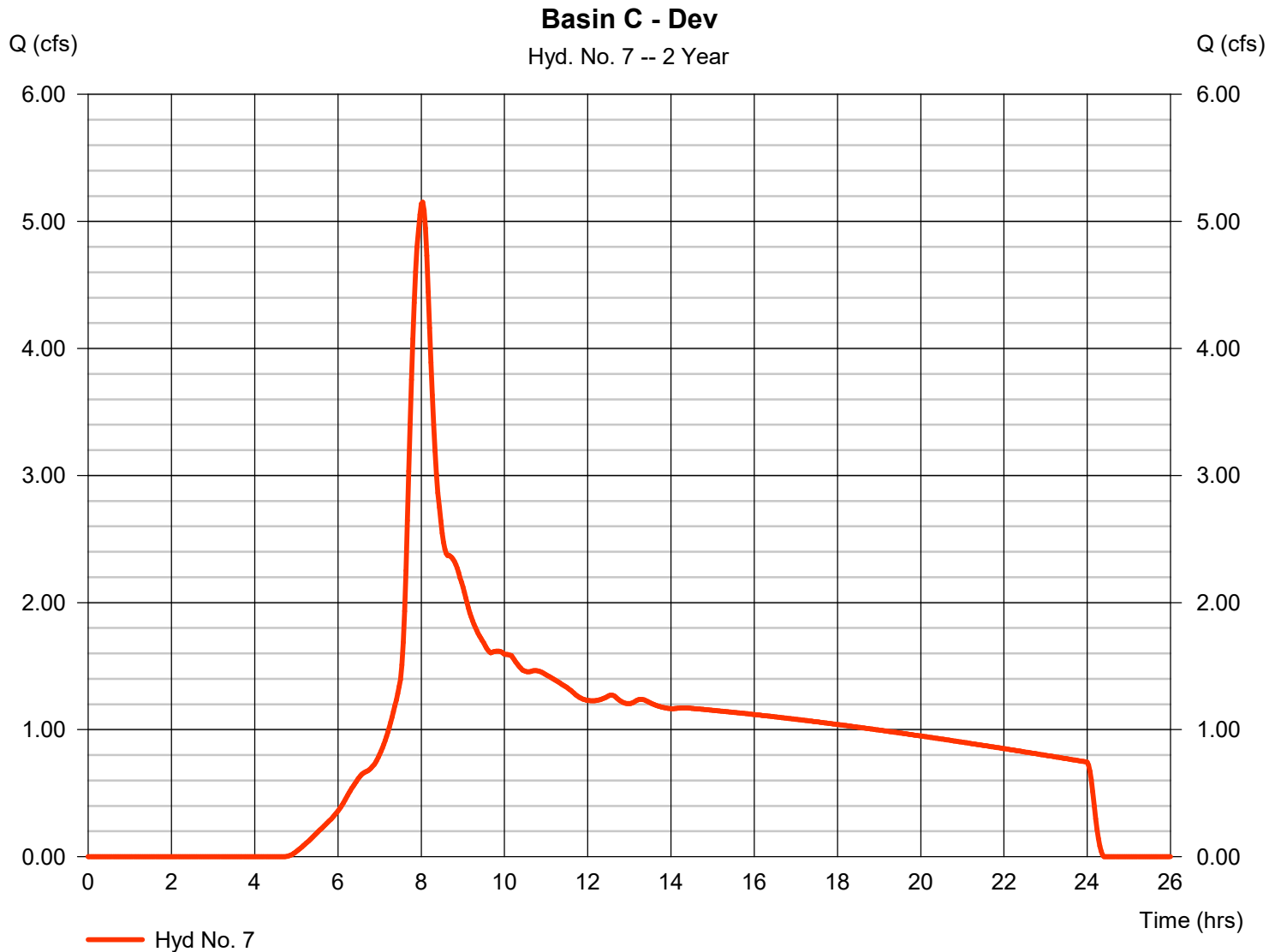
# Hydrograph Report

## Hyd. No. 7

Basin C - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 5.151 cfs
Storm frequency	= 2 yrs	Time to peak	= 8.03 hrs
Time interval	= 2 min	Hyd. volume	= 83,209 cuft
Drainage area	= 19.950 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(2.040 x 98) + (4.050 x 98) + (10.090 x 76) + (0.750 x 98) + (1.590 x 98) + (1.430 x 74)] / 19.950



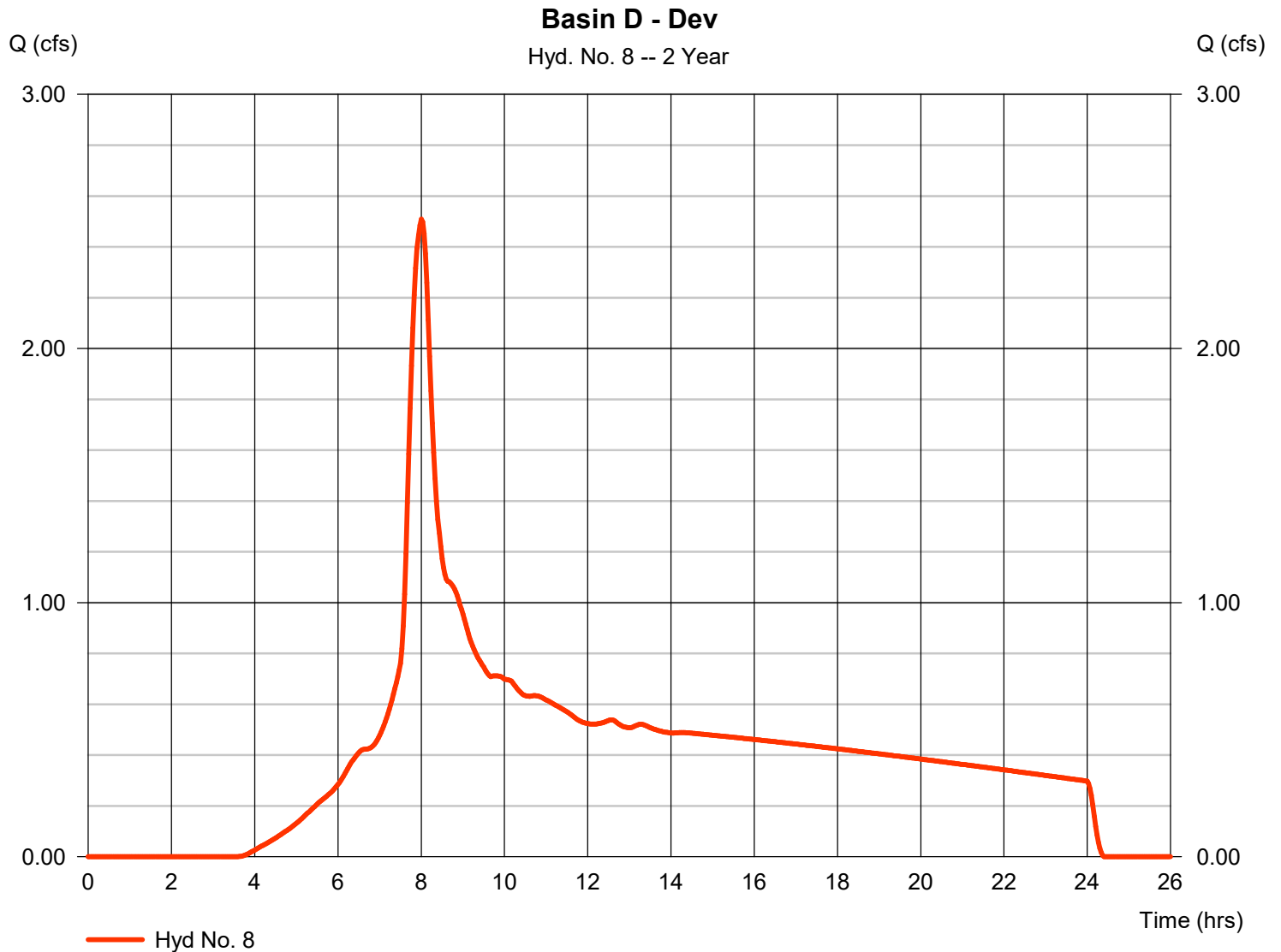
# Hydrograph Report

## Hyd. No. 8

Basin D - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 2.509 cfs
Storm frequency	= 2 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 37,379 cuft
Drainage area	= 7.260 ac	Curve number	= 89*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(1.240 x 98) + (1.040 x 76) + (3.180 x 98) + (1.800 x 74)] / 7.260





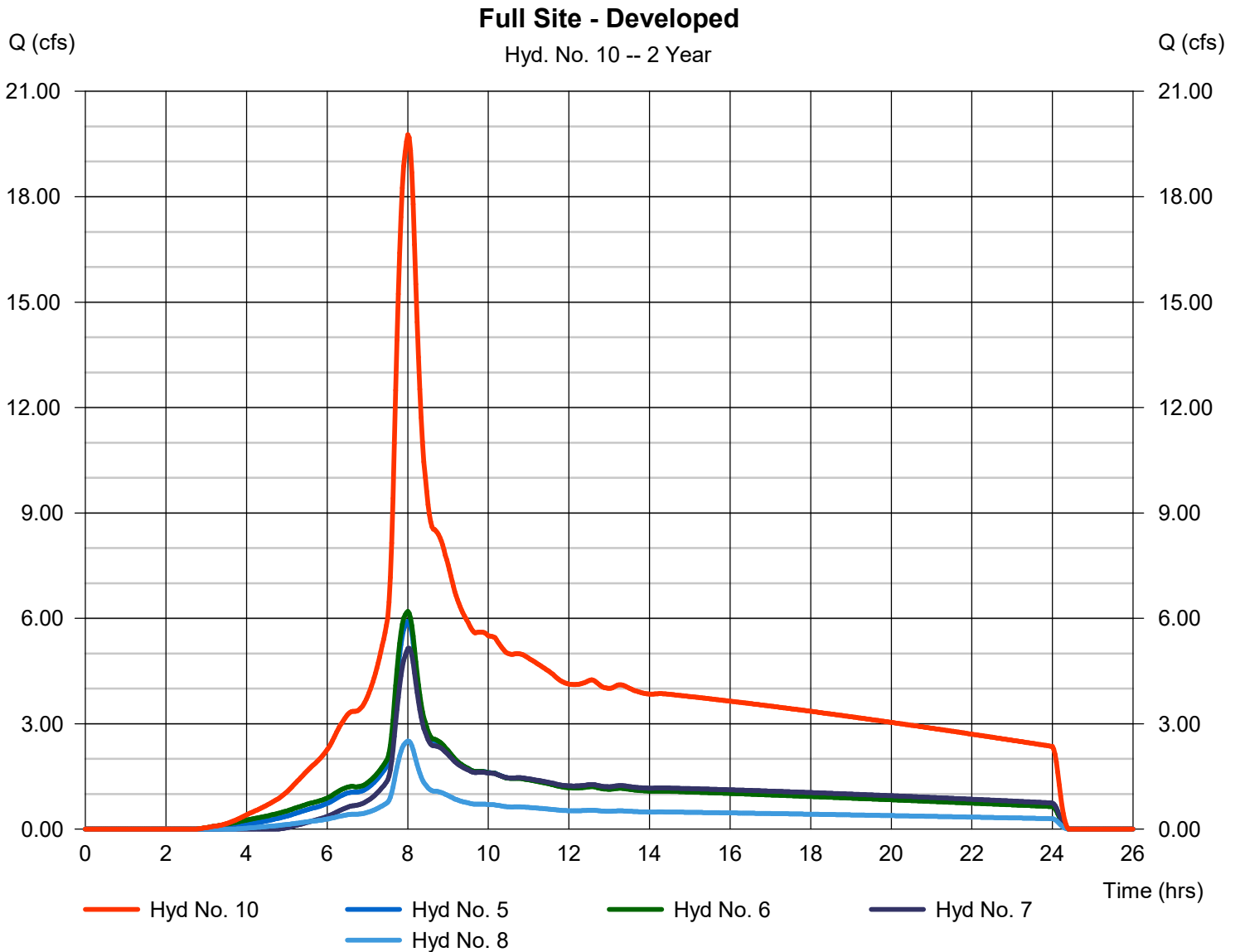
# Hydrograph Report

## Hyd. No. 10

Full Site - Developed

Hydrograph type = Combine  
Storm frequency = 2 yrs  
Time interval = 2 min  
Inflow hyds. = 5, 6, 7, 8

Peak discharge = 19.76 cfs  
Time to peak = 8.00 hrs  
Hyd. volume = 295,959 cuft  
Contrib. drain. area = 58.010 ac



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

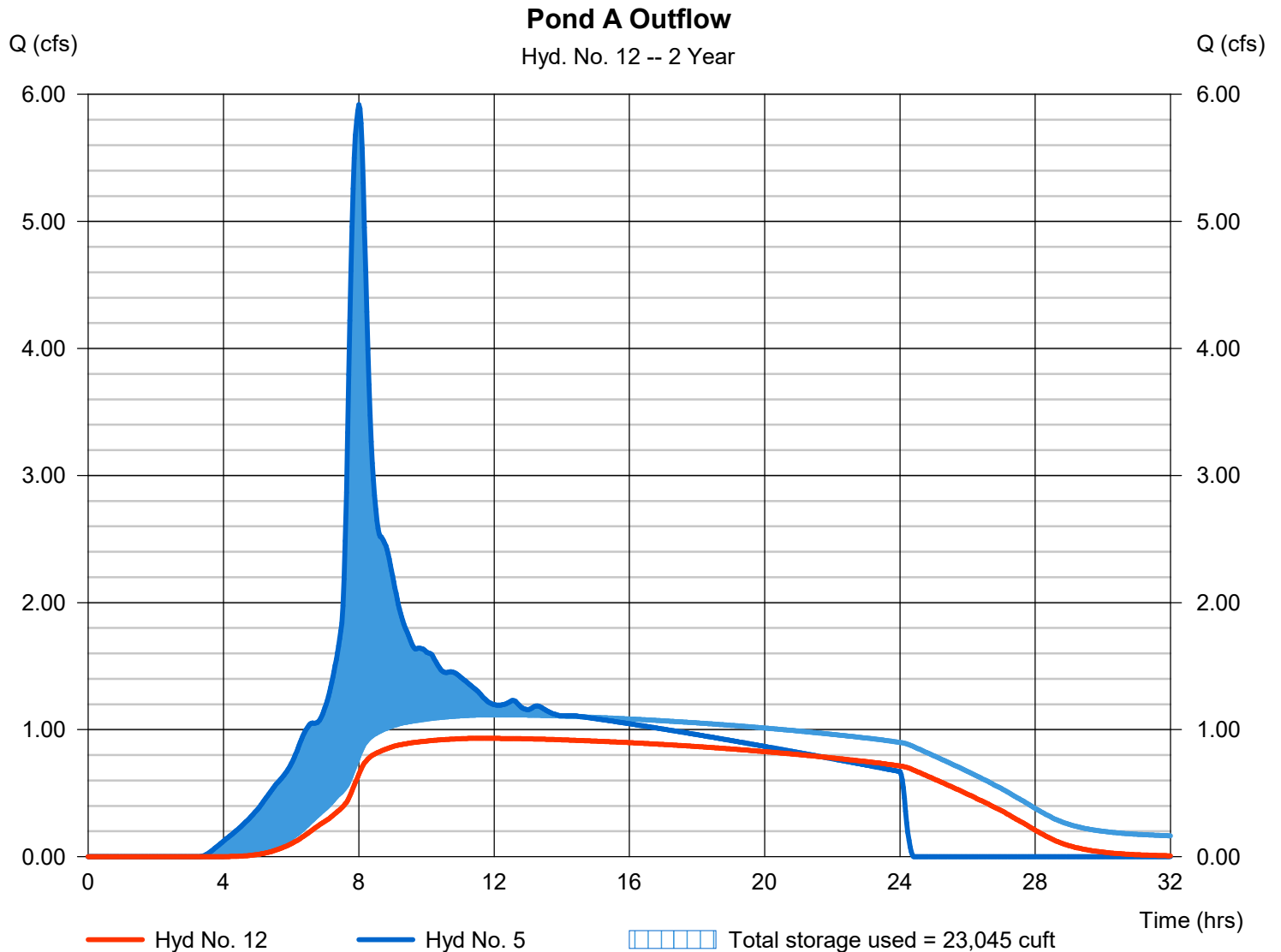
Tuesday, 08 / 16 / 2022

## Hyd. No. 12

### Pond A Outflow

Hydrograph type	= Reservoir	Peak discharge	= 0.933 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.67 hrs
Time interval	= 2 min	Hyd. volume	= 59,839 cuft
Inflow hyd. No.	= 5 - Basin A - Dev	Max. Elevation	= 141.62 ft
Reservoir name	= Existing Pond A	Max. Storage	= 23,045 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



# Pond Report

## Pond No. 1 - Existing Pond A

### Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 139.75 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	139.75	10,363	0	0
0.25	140.00	10,849	2,651	2,651
1.25	141.00	12,851	11,835	14,486
2.25	142.00	14,909	13,866	28,352
3.25	143.00	17,024	15,953	44,305

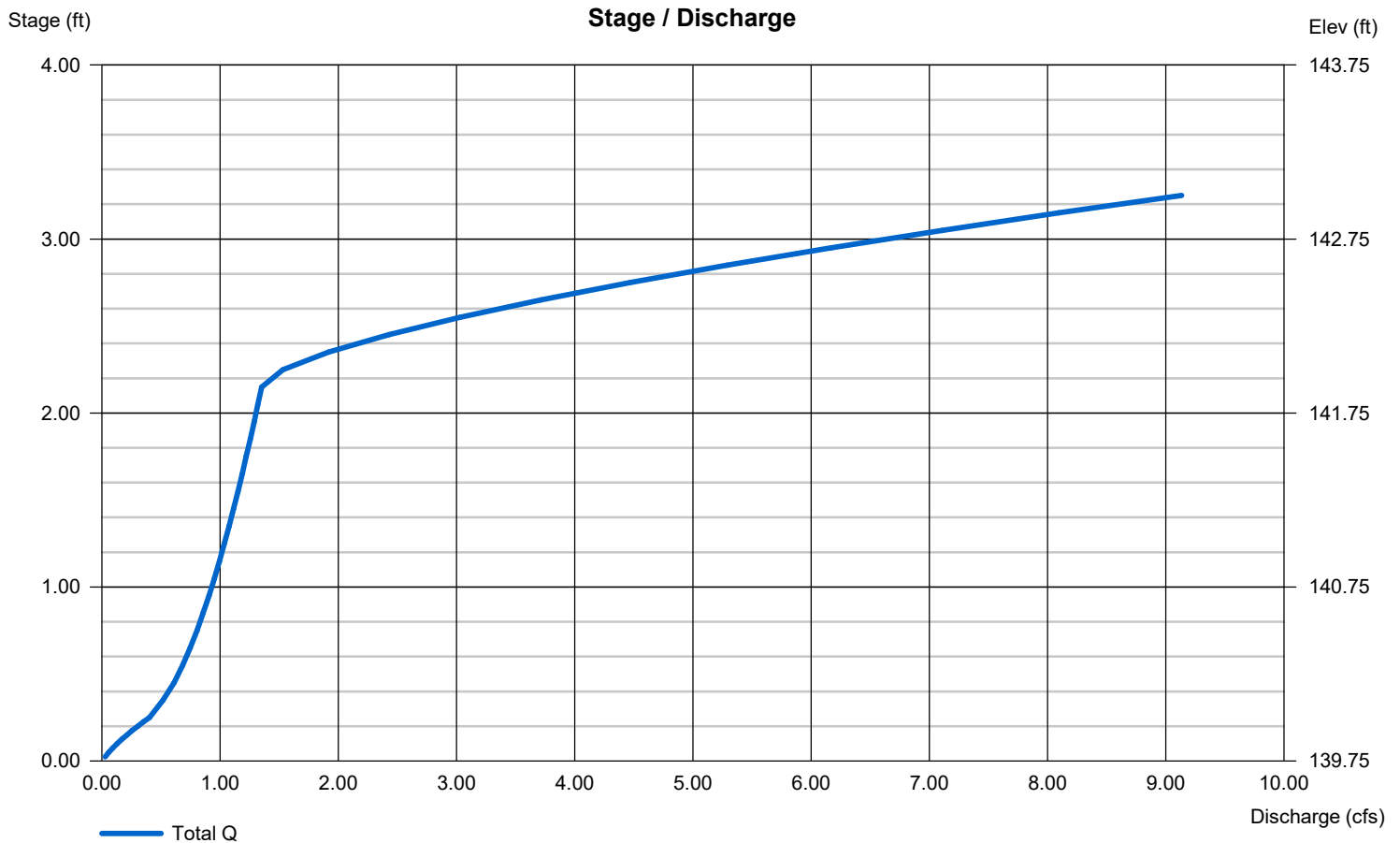
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 5.26	0.00	0.00	0.00
Span (in)	= 5.26	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 139.75	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	2.00	0.00	0.00
Crest El. (ft)	= 0.00	141.92	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	Rect	---	---
Multi-Stage	= No	No	No	No
Exfil. (in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

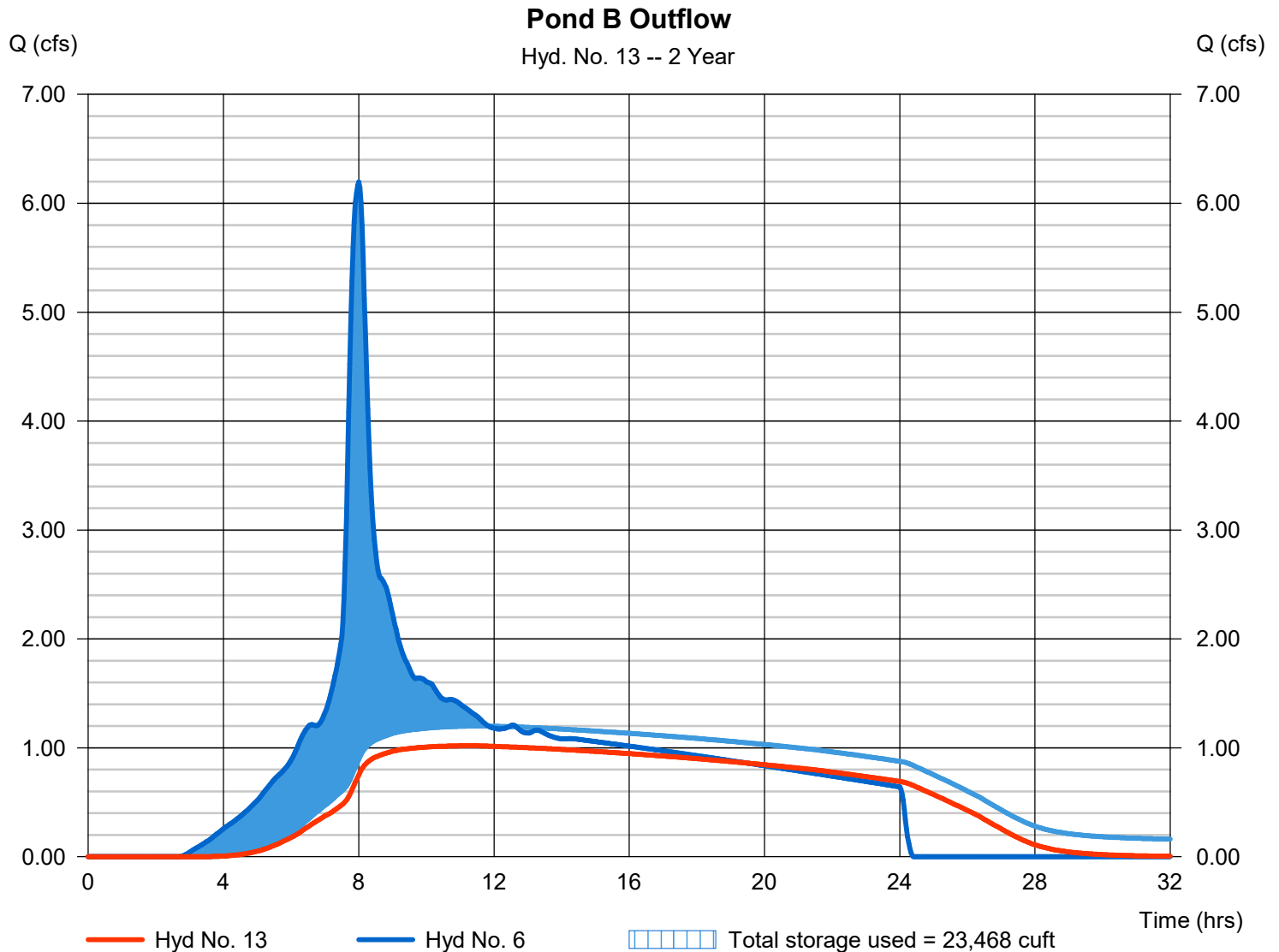
Tuesday, 08 / 16 / 2022

## Hyd. No. 13

### Pond B Outflow

Hydrograph type	= Reservoir	Peak discharge	= 1.019 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.23 hrs
Time interval	= 2 min	Hyd. volume	= 62,077 cuft
Inflow hyd. No.	= 6 - Basin B - Dev	Max. Elevation	= 138.65 ft
Reservoir name	= Existing Pond B	Max. Storage	= 23,468 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



# Pond Report

## Pond No. 2 - Existing Pond B

### Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 136.75 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	136.75	10,363	0	0
0.25	137.00	10,849	2,651	2,651
1.25	138.00	12,851	11,835	14,486
2.25	139.00	14,909	13,866	28,352
3.25	140.00	17,023	15,953	44,304
4.25	141.00	18,697	17,852	62,156

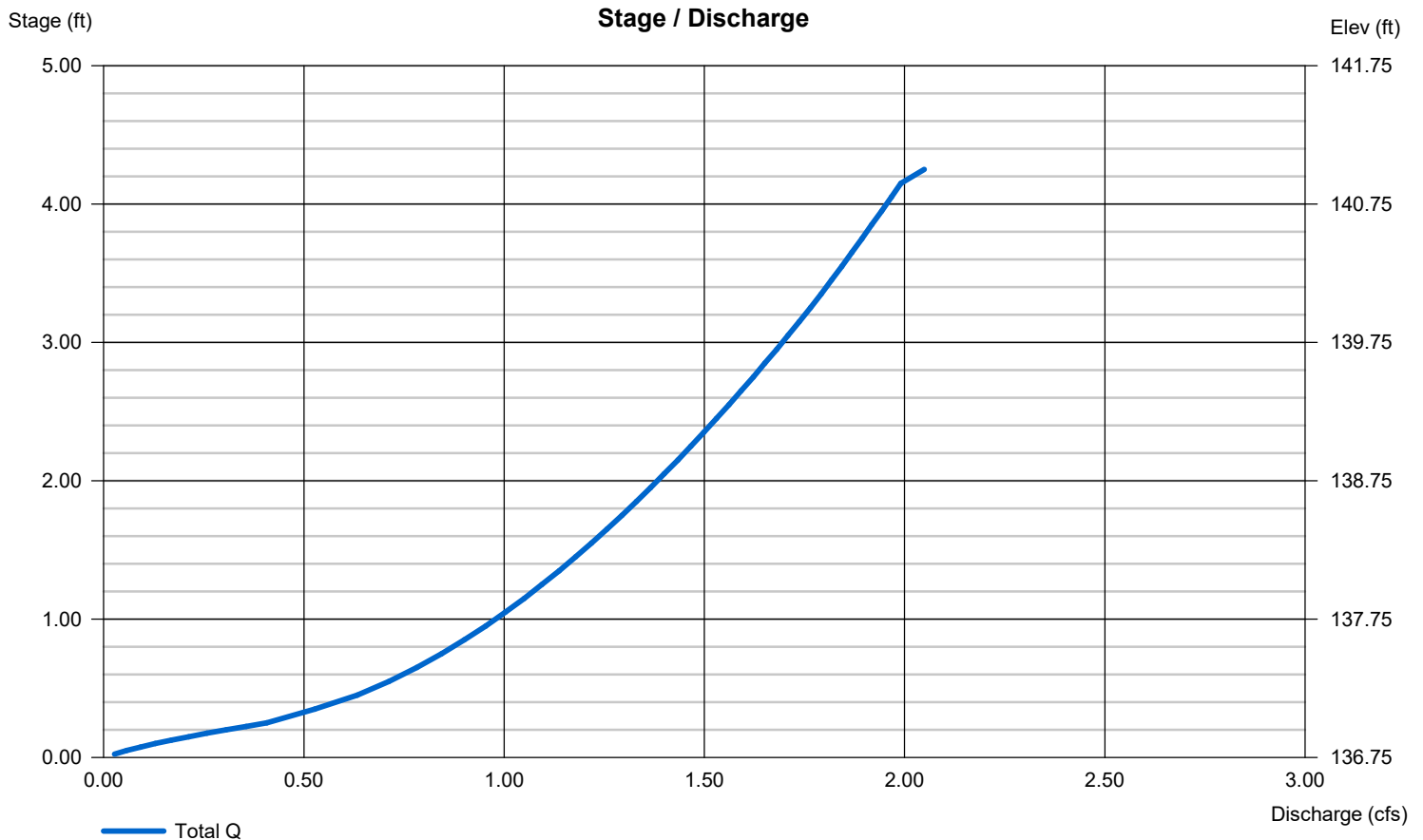
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 5.48	0.00	0.00	0.00
Span (in)	= 5.48	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 136.75	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	2.00	0.00	0.00
Crest El. (ft)	= 0.00	140.97	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	Rect	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).





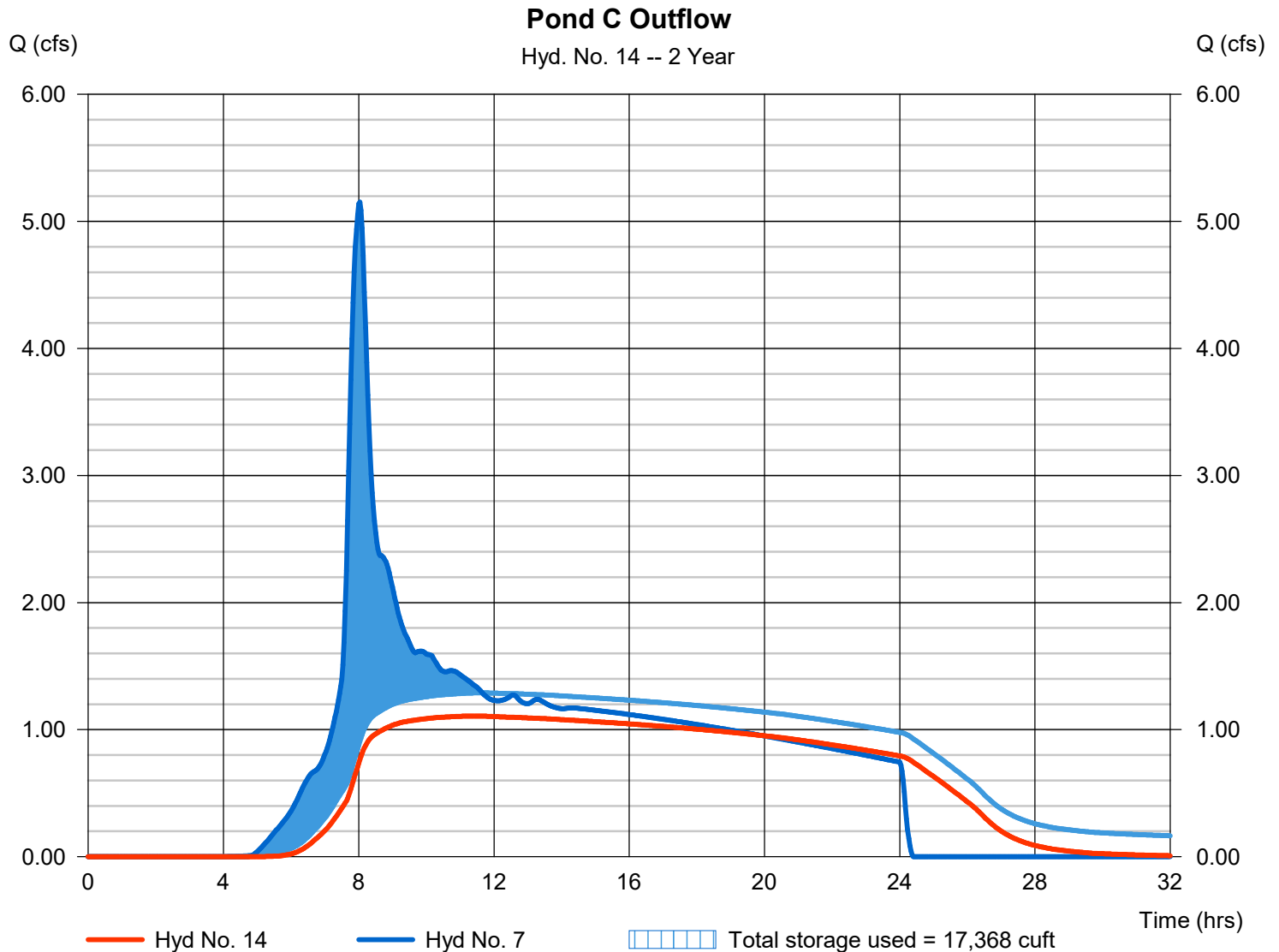
# Hydrograph Report

## Hyd. No. 14

### Pond C Outflow

Hydrograph type	= Reservoir	Peak discharge	= 1.107 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.43 hrs
Time interval	= 2 min	Hyd. volume	= 66,295 cuft
Inflow hyd. No.	= 7 - Basin C - Dev	Max. Elevation	= 137.50 ft
Reservoir name	= Existing Pond C	Max. Storage	= 17,368 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



# Pond Report

## Pond No. 3 - Existing Pond C

### Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 135.52 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	135.52	7,150	0	0
0.48	136.00	7,894	3,609	3,609
1.48	137.00	9,427	8,648	12,257
2.48	138.00	11,038	10,221	22,478
3.48	139.00	12,729	11,872	34,350
4.48	140.00	14,519	13,613	47,963
4.98	140.50	15,405	7,479	55,442

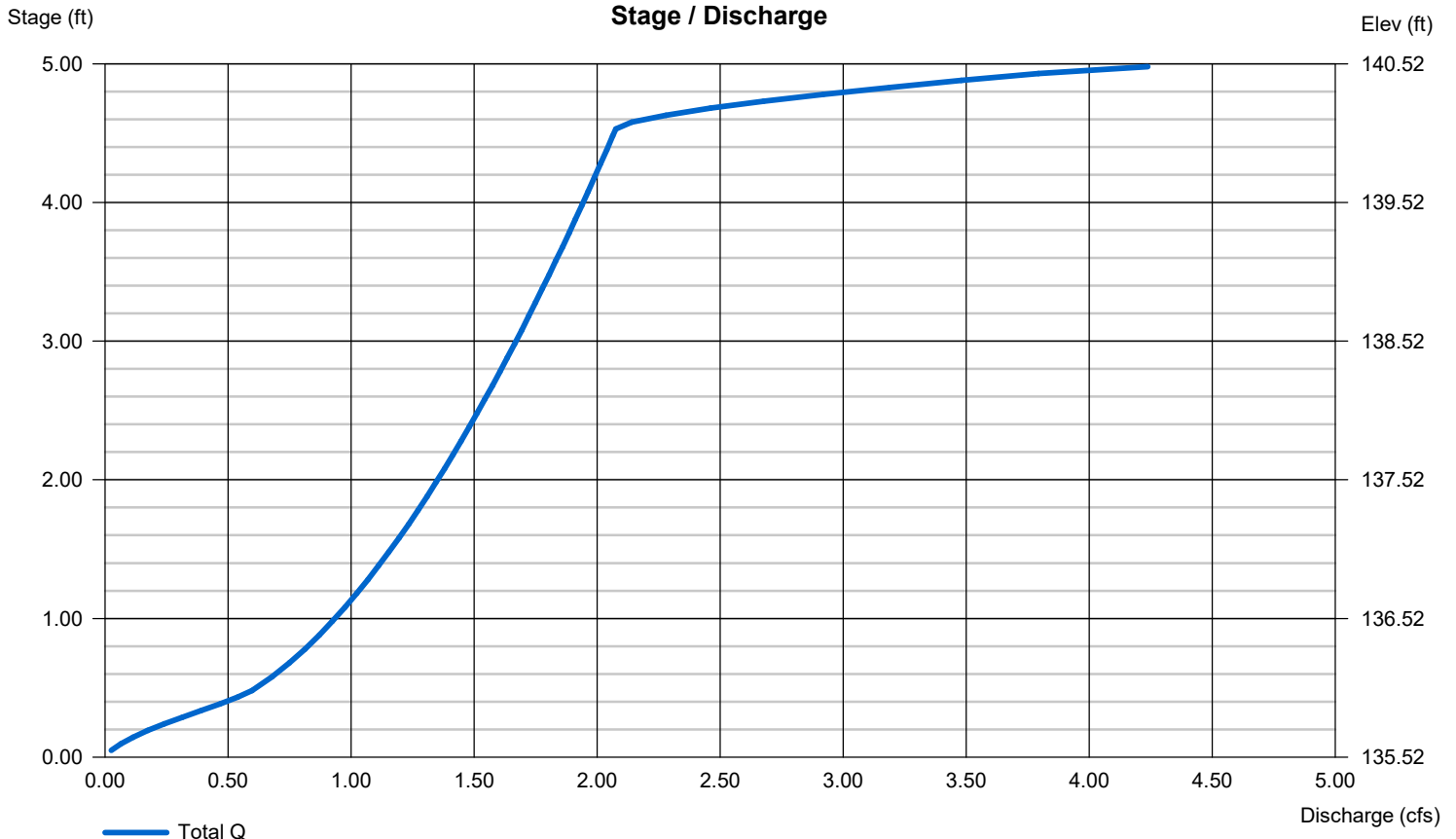
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 5.65	0.00	0.00	0.00
Span (in)	= 5.65	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 135.52	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	2.00	3.00	0.00
Crest El. (ft)	= 0.00	140.06	140.45	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	Rect	Rect	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



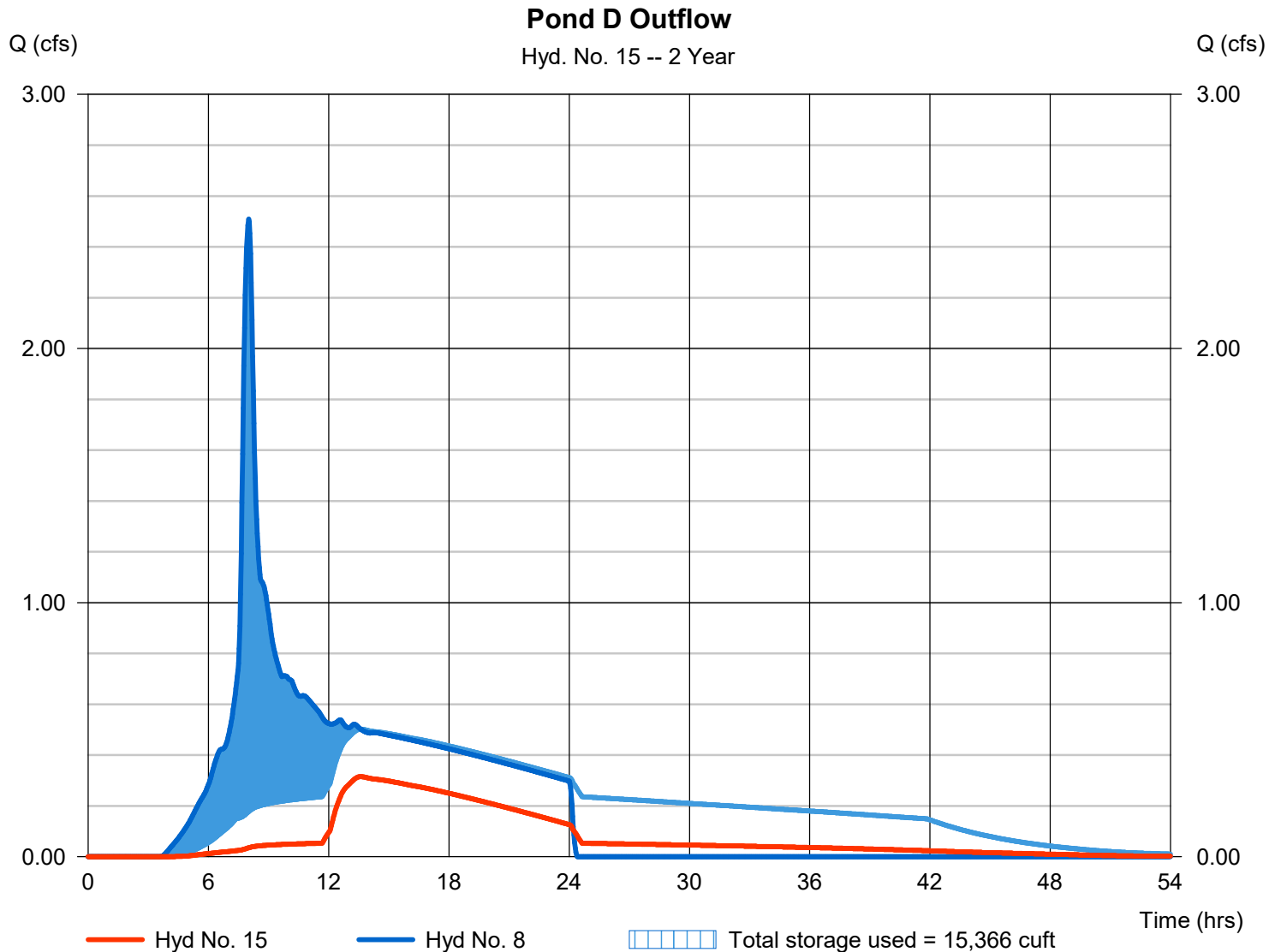
# Hydrograph Report

## Hyd. No. 15

### Pond D Outflow

Hydrograph type	= Reservoir	Peak discharge	= 0.315 cfs
Storm frequency	= 2 yrs	Time to peak	= 13.60 hrs
Time interval	= 2 min	Hyd. volume	= 14,110 cuft
Inflow hyd. No.	= 8 - Basin D - Dev	Max. Elevation	= 137.04 ft
Reservoir name	= Modified Pond D	Max. Storage	= 15,366 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



# Pond Report

## Pond No. 5 - Modified Pond D

### Pond Data

Trapezoid -Bottom L x W = 190.0 x 25.0 ft, Side slope = 3.00:1, Bottom elev. = 134.63 ft, Depth = 5.00 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	134.63	4,750	0	0
0.50	135.13	5,404	2,538	2,538
1.00	135.63	6,076	2,869	5,407
1.50	136.13	6,766	3,210	8,617
2.00	136.63	7,474	3,559	12,176
2.50	137.13	8,200	3,918	16,094
3.00	137.63	8,944	4,285	20,379
3.50	138.13	9,706	4,662	25,041
4.00	138.63	10,486	5,047	30,088
4.50	139.13	11,284	5,442	35,530
5.00	139.63	12,100	5,845	41,375

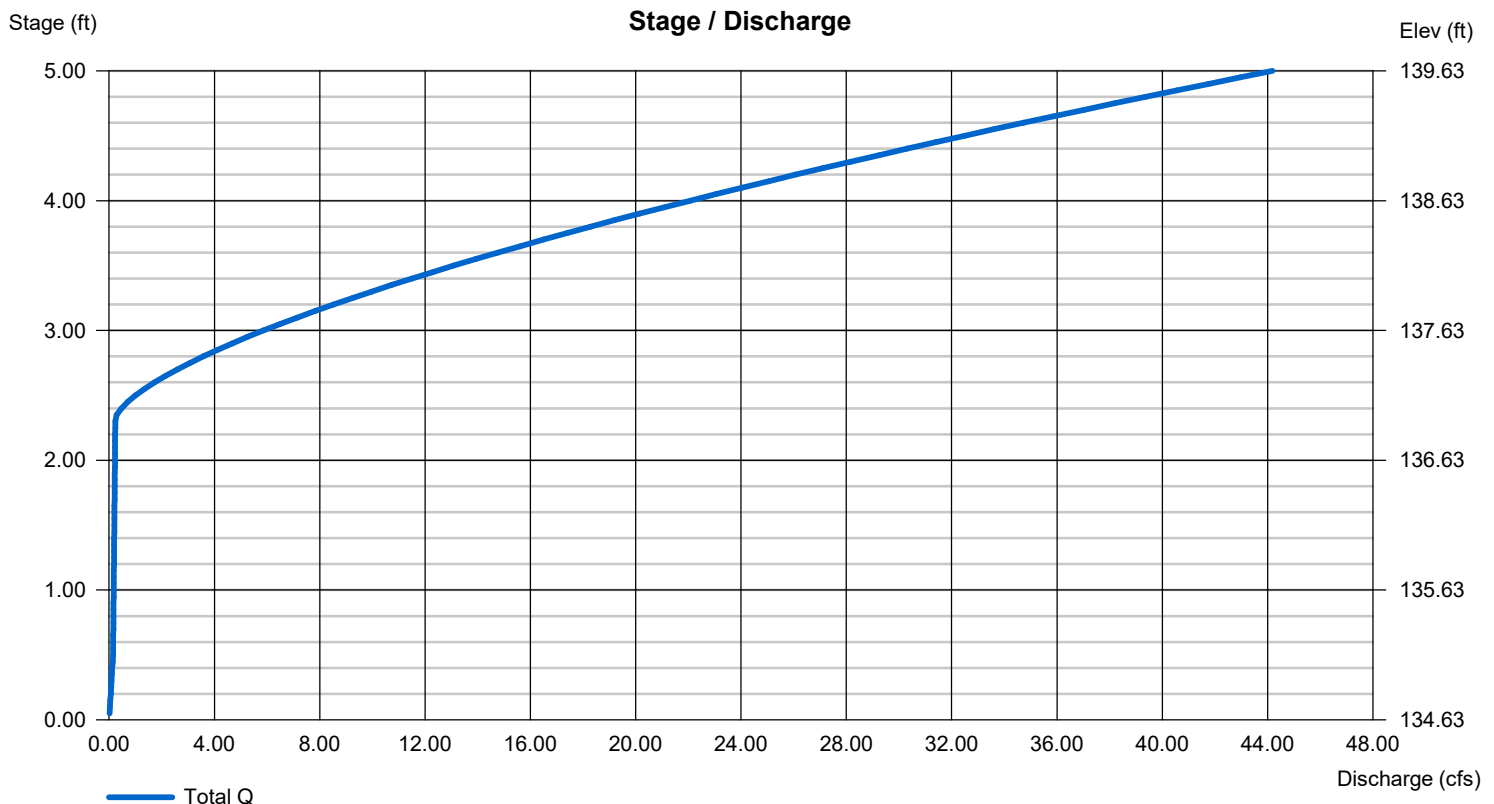
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 1.16	0.00	0.00	0.00
Span (in)	= 1.16	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 134.63	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	3.00	0.00	0.00
Crest El. (ft)	= 0.00	136.95	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	Rect	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



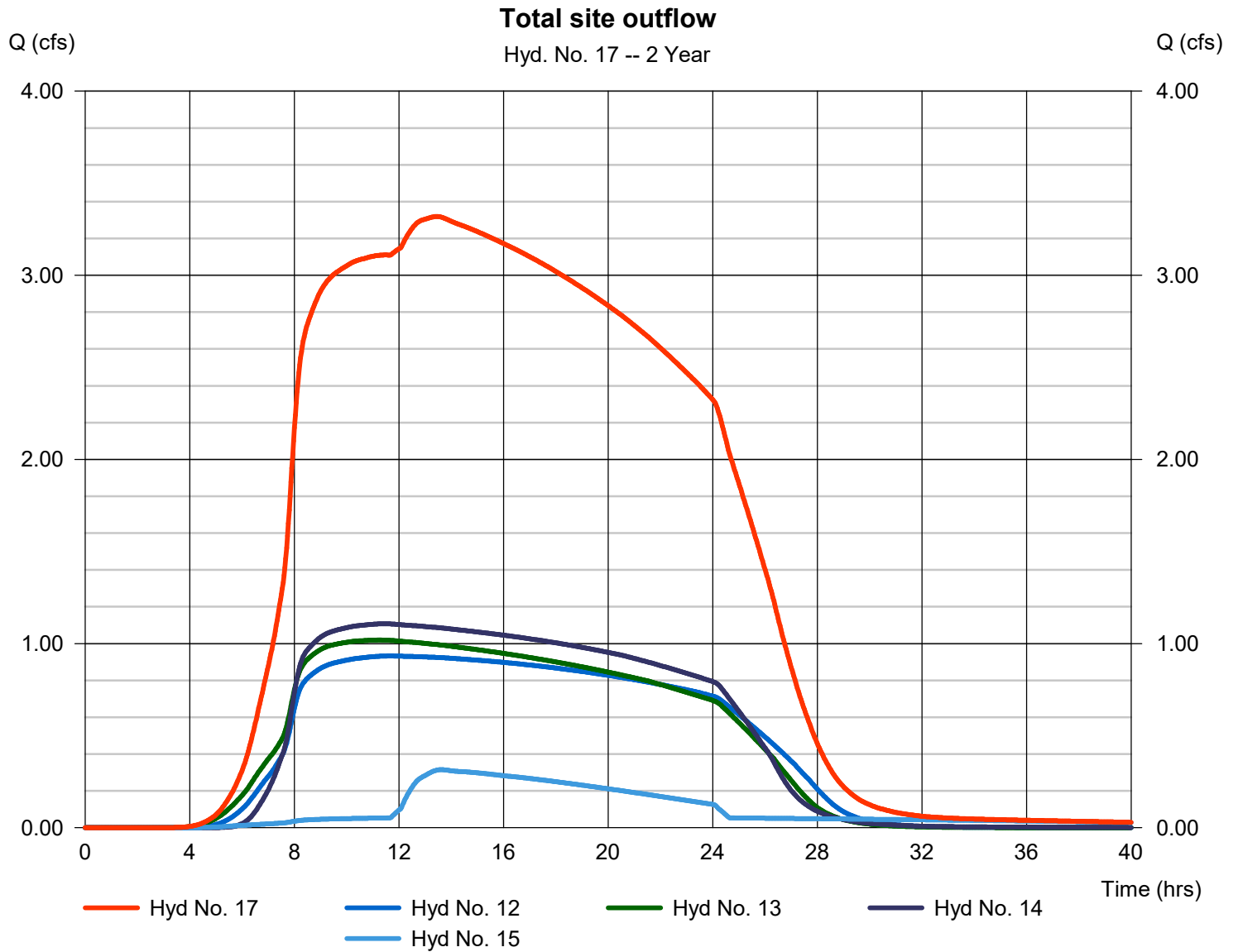
# Hydrograph Report

## Hyd. No. 17

Total site outflow

Hydrograph type = Combine  
Storm frequency = 2 yrs  
Time interval = 2 min  
Inflow hyds. = 12, 13, 14, 15

Peak discharge = 3.320 cfs  
Time to peak = 13.43 hrs  
Hyd. volume = 202,321 cuft  
Contrib. drain. area = 0.000 ac





# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	10.91	2	492	241,352	-----	-----	-----	Pre-Dev Overall Site	
2	SCS Runoff	1.217	2	492	26,919	-----	-----	-----	Pre-Dev New/Modified Site	
3	SCS Runoff	9.694	2	492	214,434	-----	-----	-----	Pre-Dev Undisturbed Site	
5	SCS Runoff	9.576	2	480	136,145	-----	-----	-----	Basin A - Dev	
6	SCS Runoff	9.629	2	480	135,426	-----	-----	-----	Basin B - Dev	
7	SCS Runoff	9.296	2	480	139,303	-----	-----	-----	Basin C - Dev	
8	SCS Runoff	4.144	2	480	59,381	-----	-----	-----	Basin D - Dev	
10	Combine	32.64	2	480	470,255	5, 6, 7, 8,	-----	-----	Full Site - Developed	
12	Reservoir	2.756	2	548	103,407	5	142.31	33,341	Pond A Outflow	
13	Reservoir	1.350	2	714	99,737	6	139.91	42,836	Pond B Outflow	
14	Reservoir	1.579	2	814	114,183	7	139.31	38,509	Pond C Outflow	
15	Reservoir	1.253	2	544	35,019	8	137.19	16,630	Pond D Outflow	
17	Combine	6.736	2	548	352,345	12, 13, 14, 15,	-----	-----	Total site outflow	
Hydraflow storm calcs.gpw					Return Period: 10 Year			Tuesday, 08 / 16 / 2022		

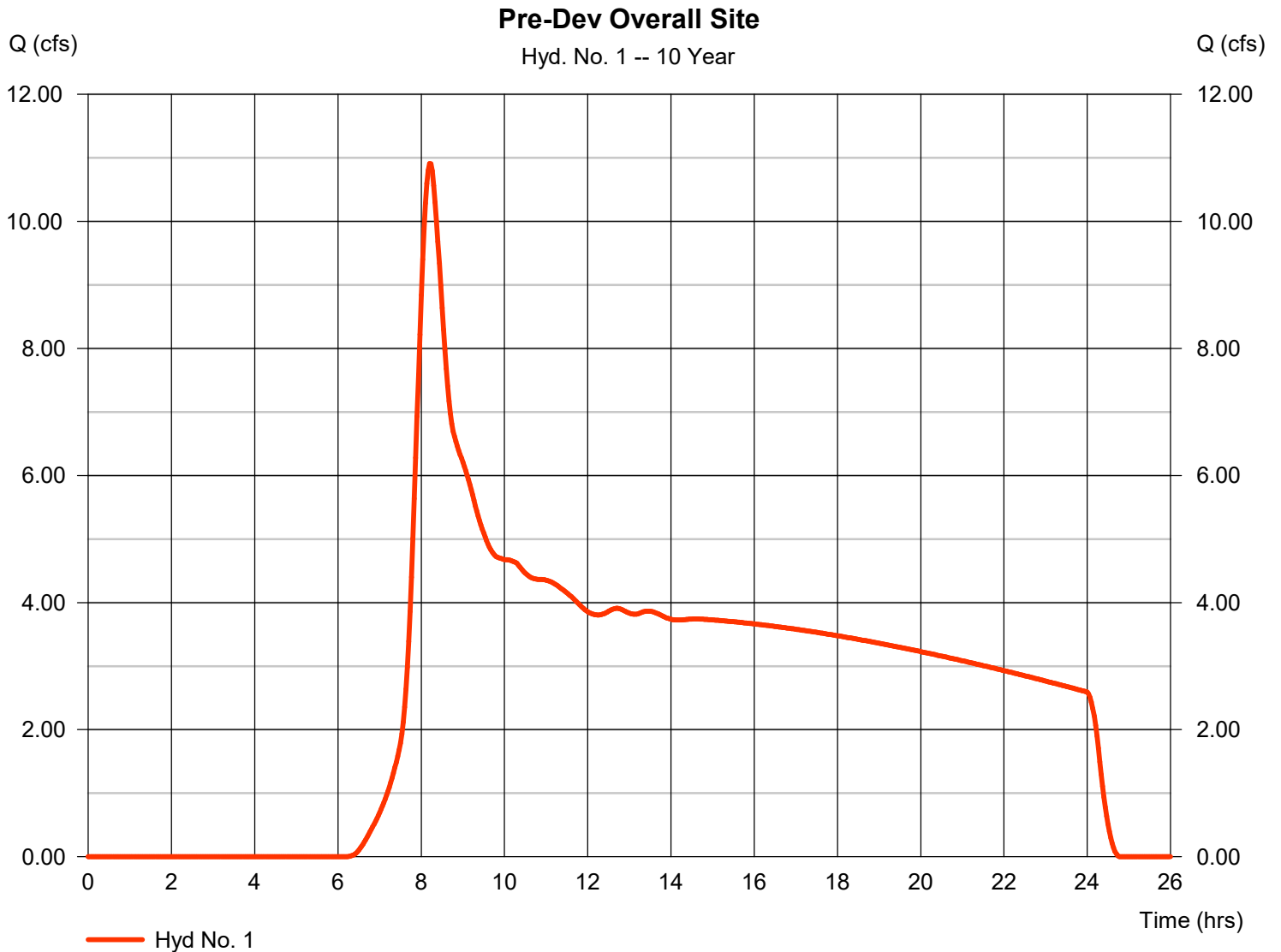
# Hydrograph Report

## Hyd. No. 1

Pre-Dev Overall Site

Hydrograph type = SCS Runoff  
Storm frequency = 10 yrs  
Time interval = 2 min  
Drainage area = 58.010 ac  
Basin Slope = 0.0 %  
Tc method = User  
Total precip. = 3.45 in  
Storm duration = 24 hrs

Peak discharge = 10.91 cfs  
Time to peak = 8.20 hrs  
Hyd. volume = 241,352 cuft  
Curve number = 73  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 30.00 min  
Distribution = Type IA  
Shape factor = 484

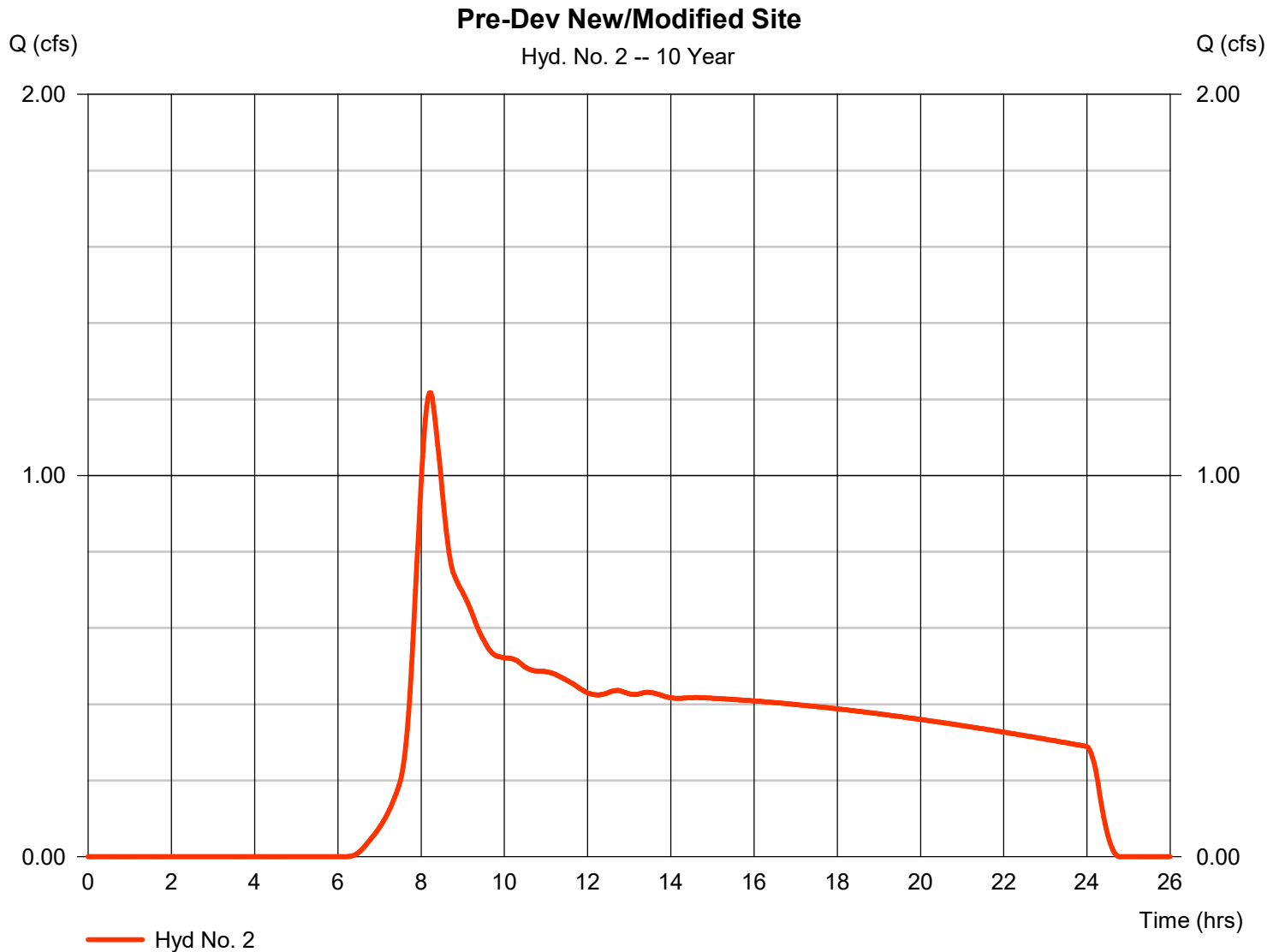


# Hydrograph Report

## Hyd. No. 2

Pre-Dev New/Modified Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.217 cfs
Storm frequency	= 10 yrs	Time to peak	= 8.20 hrs
Time interval	= 2 min	Hyd. volume	= 26,919 cuft
Drainage area	= 6.470 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 30.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

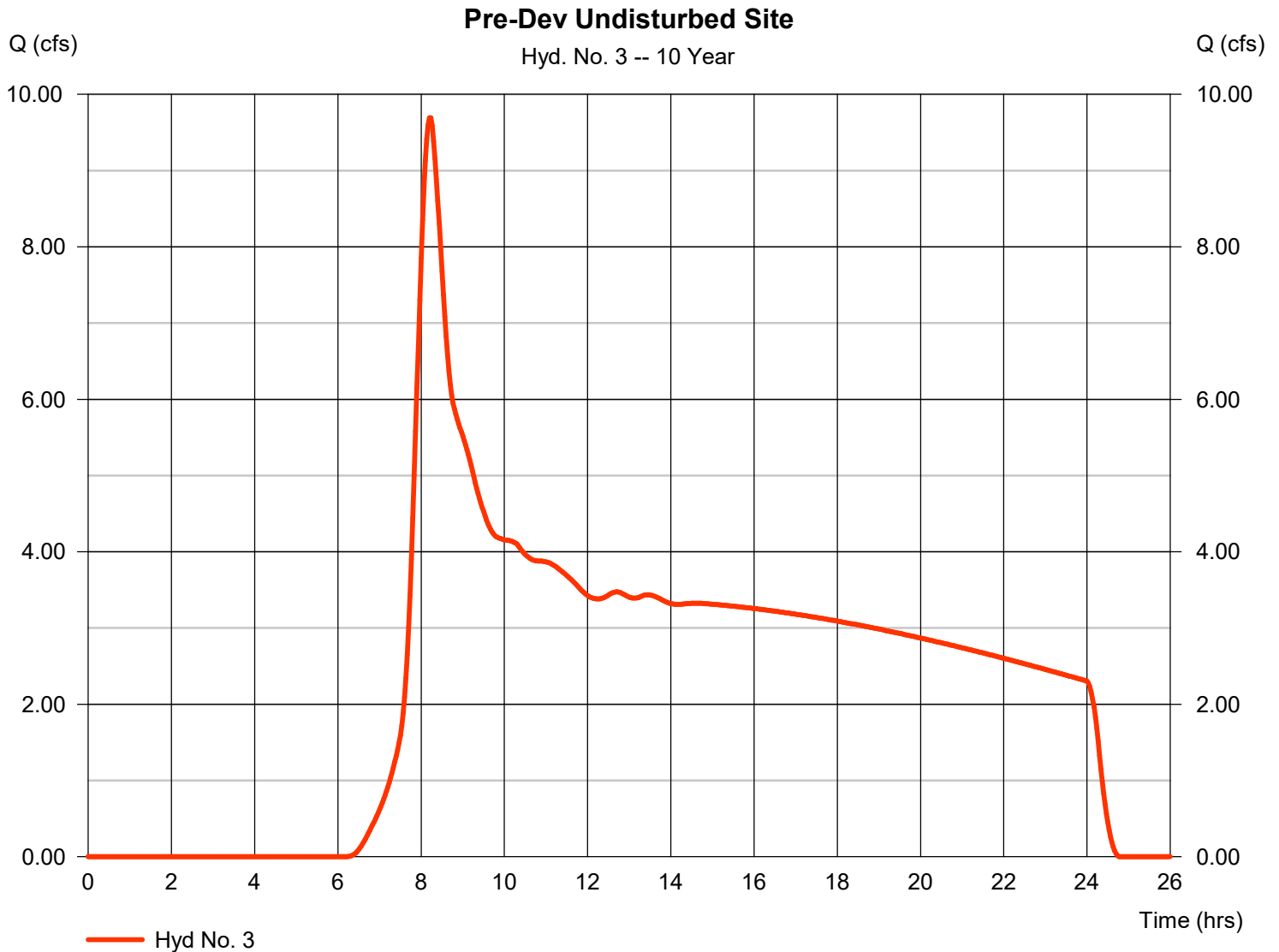


# Hydrograph Report

## Hyd. No. 3

Pre-Dev Undisturbed Site

Hydrograph type	= SCS Runoff	Peak discharge	= 9.694 cfs
Storm frequency	= 10 yrs	Time to peak	= 8.20 hrs
Time interval	= 2 min	Hyd. volume	= 214,434 cuft
Drainage area	= 51.540 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 30.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484



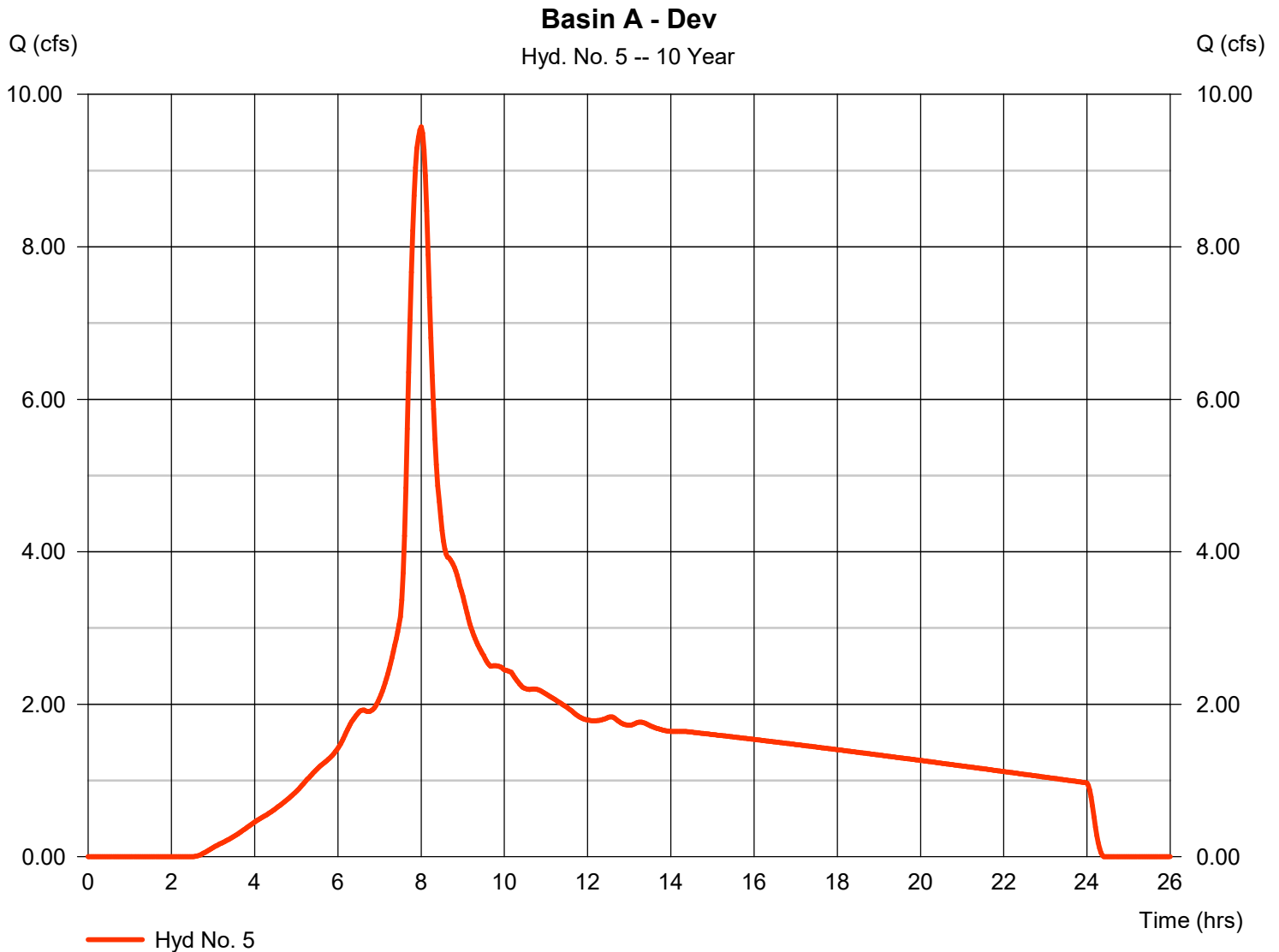
# Hydrograph Report

## Hyd. No. 5

Basin A - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 9.576 cfs
Storm frequency	= 10 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 136,145 cuft
Drainage area	= 16.020 ac	Curve number	= 90*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(1.250 x 98) + (8.150 x 98) + (5.890 x 76) + (0.730 x 98)] / 16.020





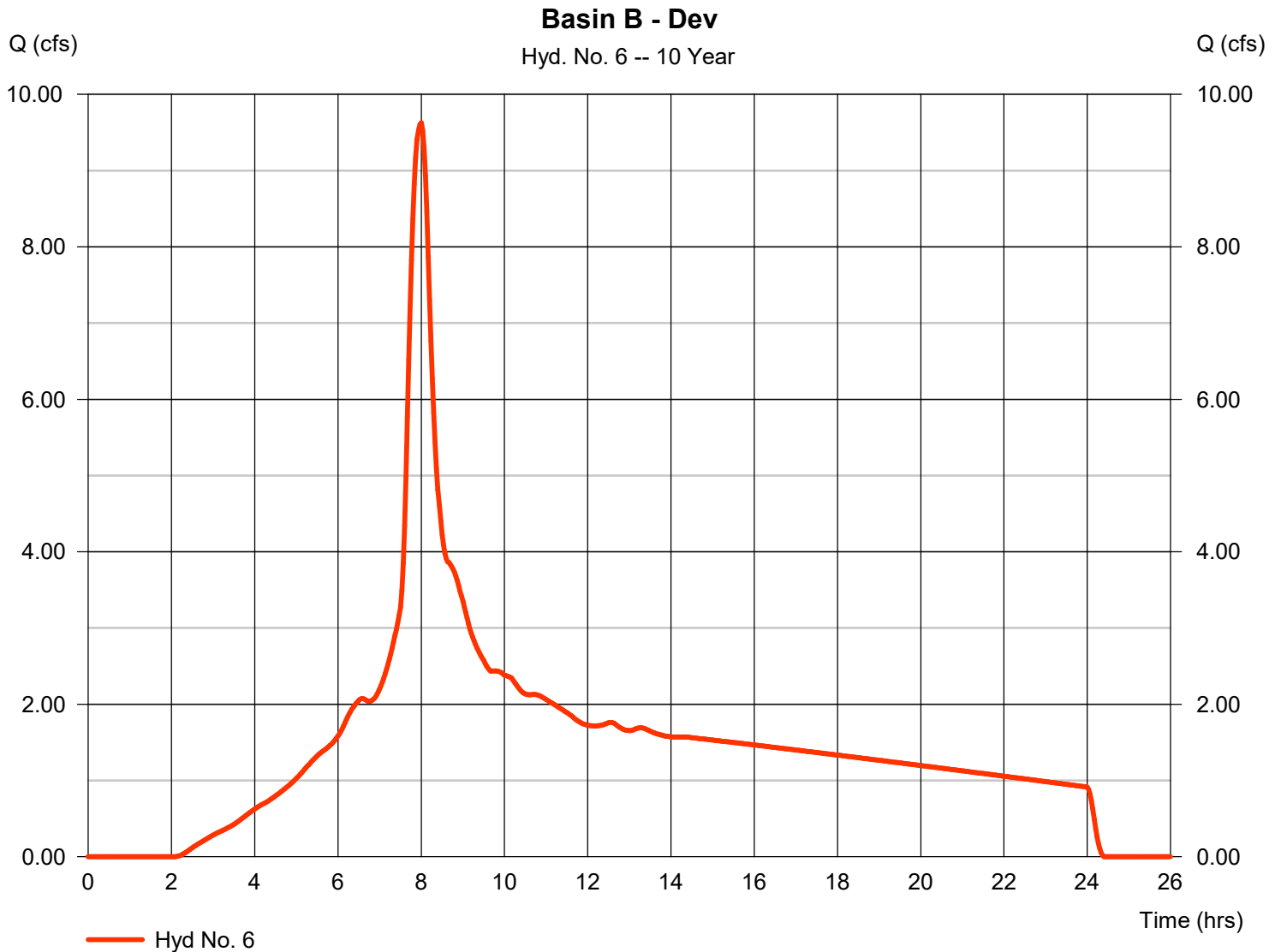
# Hydrograph Report

## Hyd. No. 6

Basin B - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 9.629 cfs
Storm frequency	= 10 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 135,426 cuft
Drainage area	= 14.780 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(3.350 x 98) + (7.020 x 98) + (4.190 x 76) + (0.220 x 98)] / 14.780



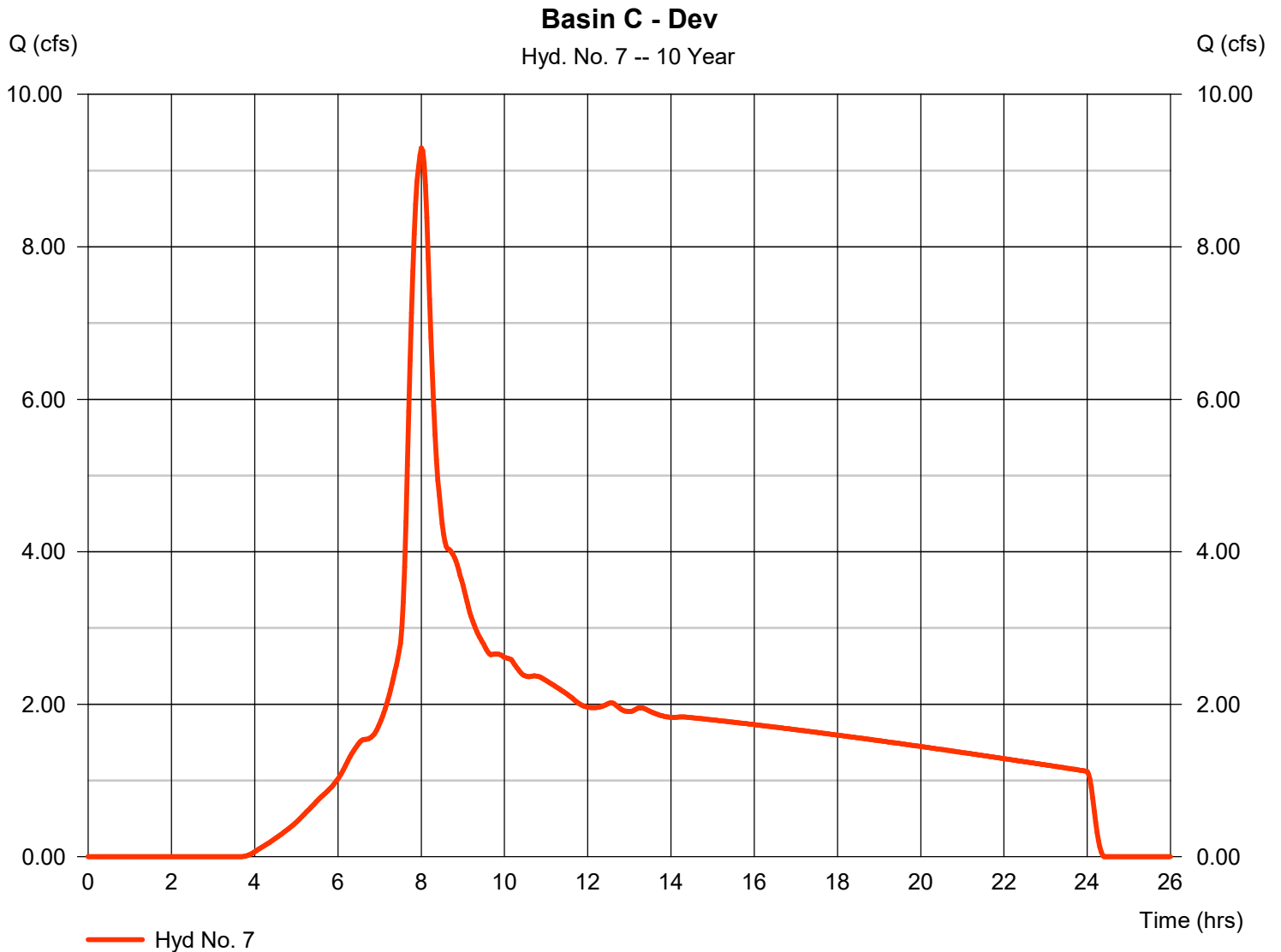
# Hydrograph Report

## Hyd. No. 7

Basin C - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 9.296 cfs
Storm frequency	= 10 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 139,303 cuft
Drainage area	= 19.950 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(2.040 x 98) + (4.050 x 98) + (10.090 x 76) + (0.750 x 98) + (1.590 x 98) + (1.430 x 74)] / 19.950



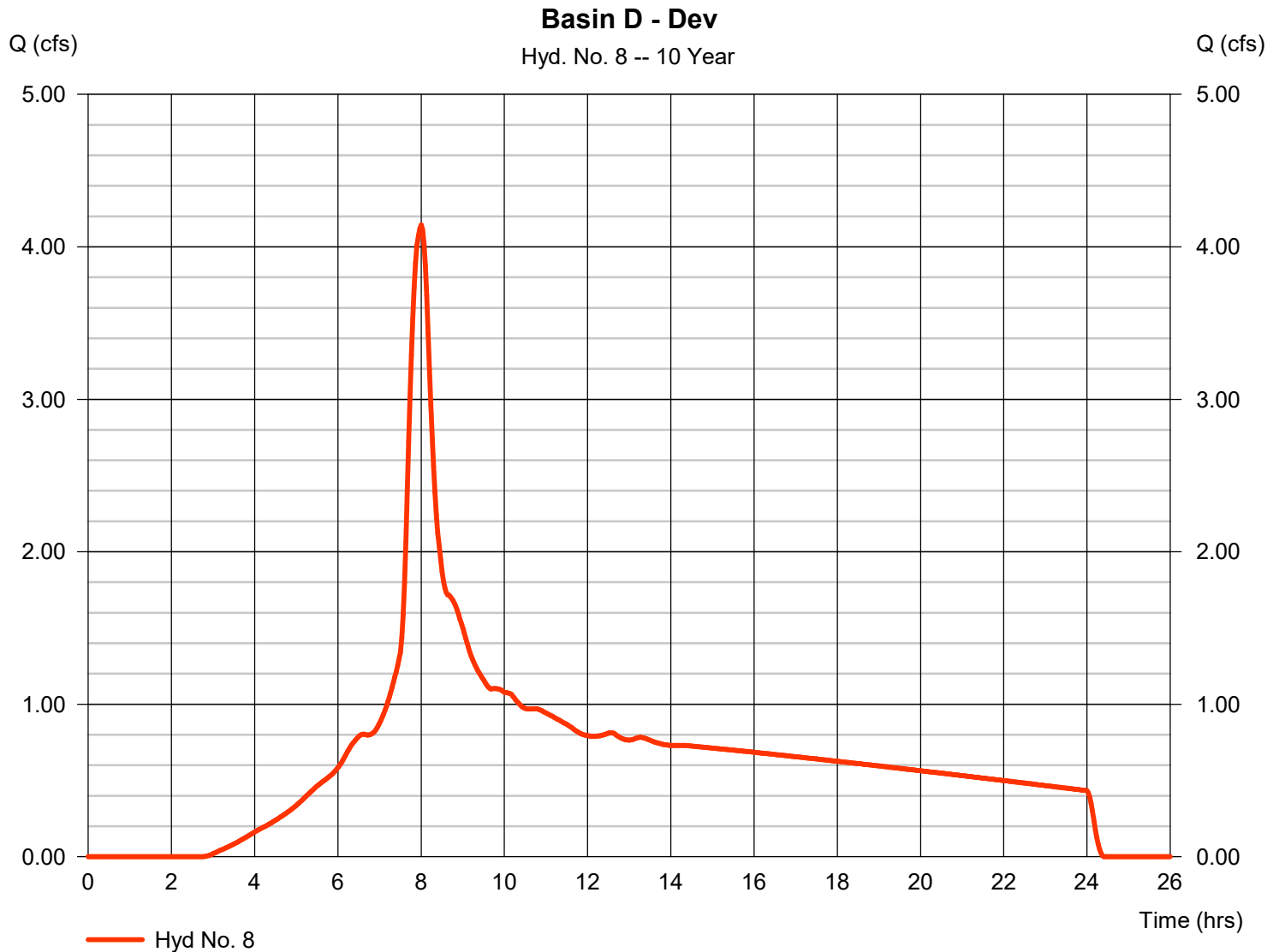
# Hydrograph Report

## Hyd. No. 8

Basin D - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 4.144 cfs
Storm frequency	= 10 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 59,381 cuft
Drainage area	= 7.260 ac	Curve number	= 89*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) =  $[(1.240 \times 98) + (1.040 \times 76) + (3.180 \times 98) + (1.800 \times 74)] / 7.260$



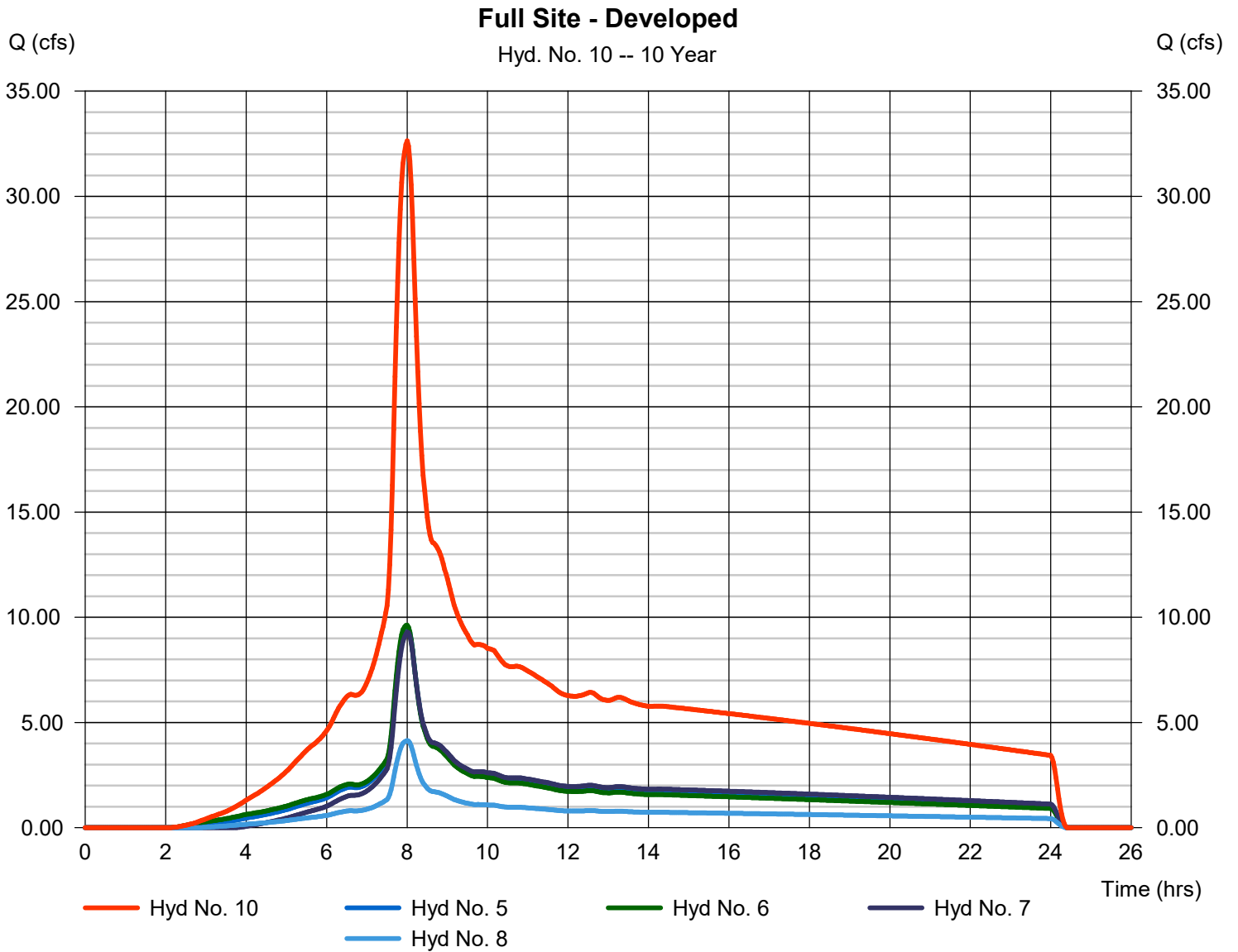
# Hydrograph Report

## Hyd. No. 10

Full Site - Developed

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 5, 6, 7, 8

Peak discharge = 32.64 cfs  
Time to peak = 8.00 hrs  
Hyd. volume = 470,255 cuft  
Contrib. drain. area = 58.010 ac



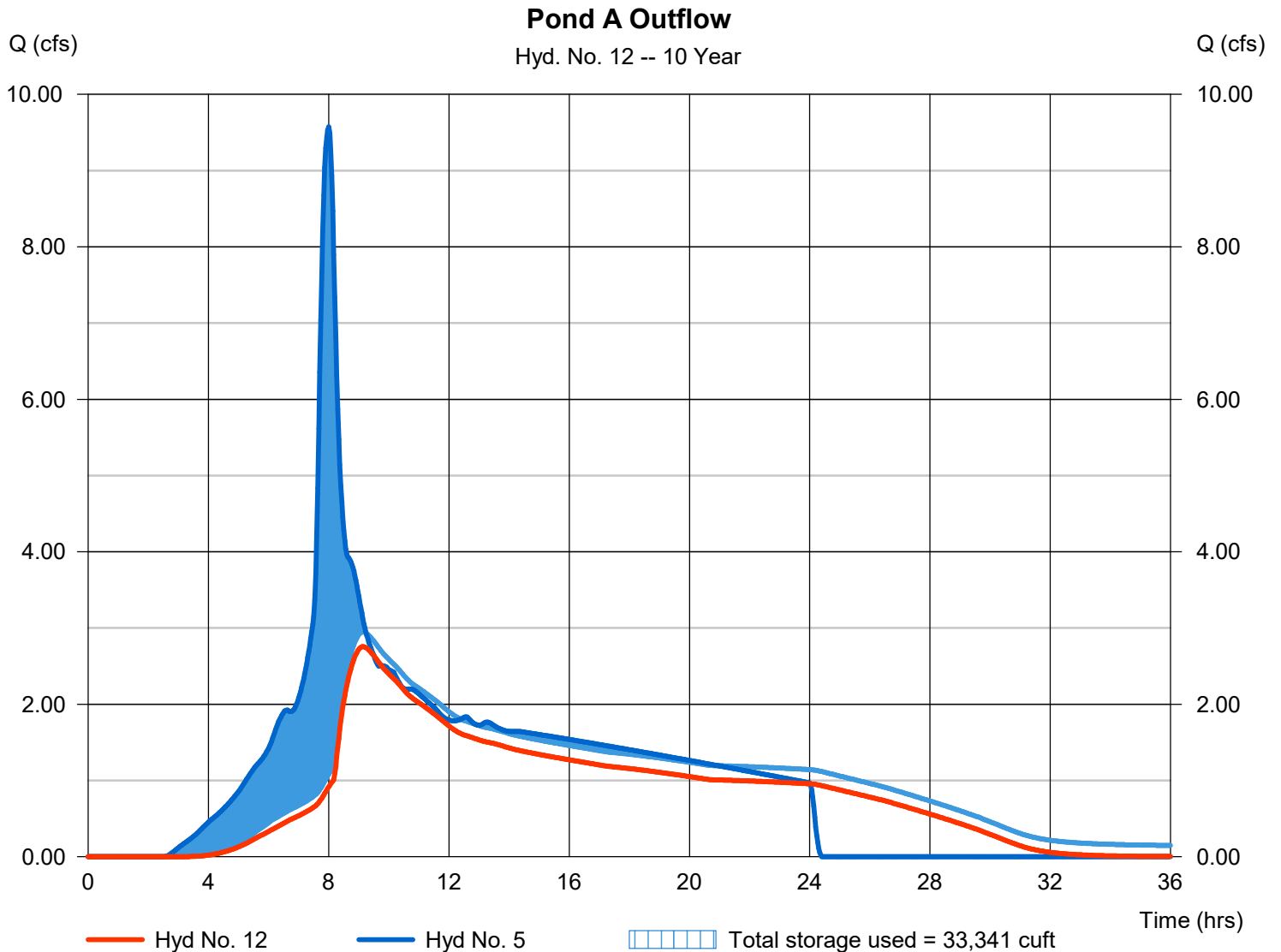
# Hydrograph Report

## Hyd. No. 12

### Pond A Outflow

Hydrograph type	= Reservoir	Peak discharge	= 2.756 cfs
Storm frequency	= 10 yrs	Time to peak	= 9.13 hrs
Time interval	= 2 min	Hyd. volume	= 103,407 cuft
Inflow hyd. No.	= 5 - Basin A - Dev	Max. Elevation	= 142.31 ft
Reservoir name	= Existing Pond A	Max. Storage	= 33,341 cuft

Storage Indication method used. Exfiltration extracted from Outflow.





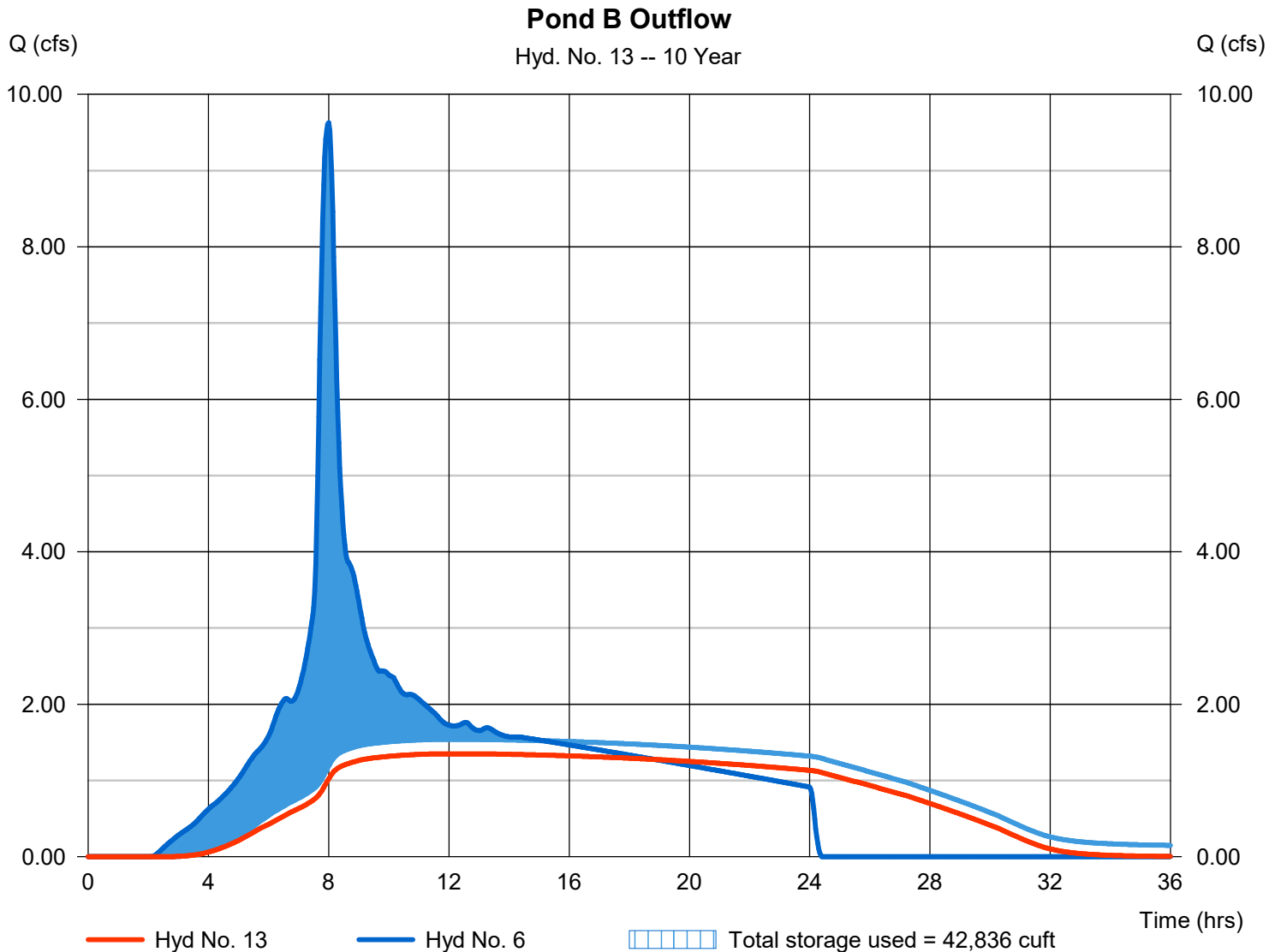
# Hydrograph Report

## Hyd. No. 13

### Pond B Outflow

Hydrograph type	= Reservoir	Peak discharge	= 1.350 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.90 hrs
Time interval	= 2 min	Hyd. volume	= 99,737 cuft
Inflow hyd. No.	= 6 - Basin B - Dev	Max. Elevation	= 139.91 ft
Reservoir name	= Existing Pond B	Max. Storage	= 42,836 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Report

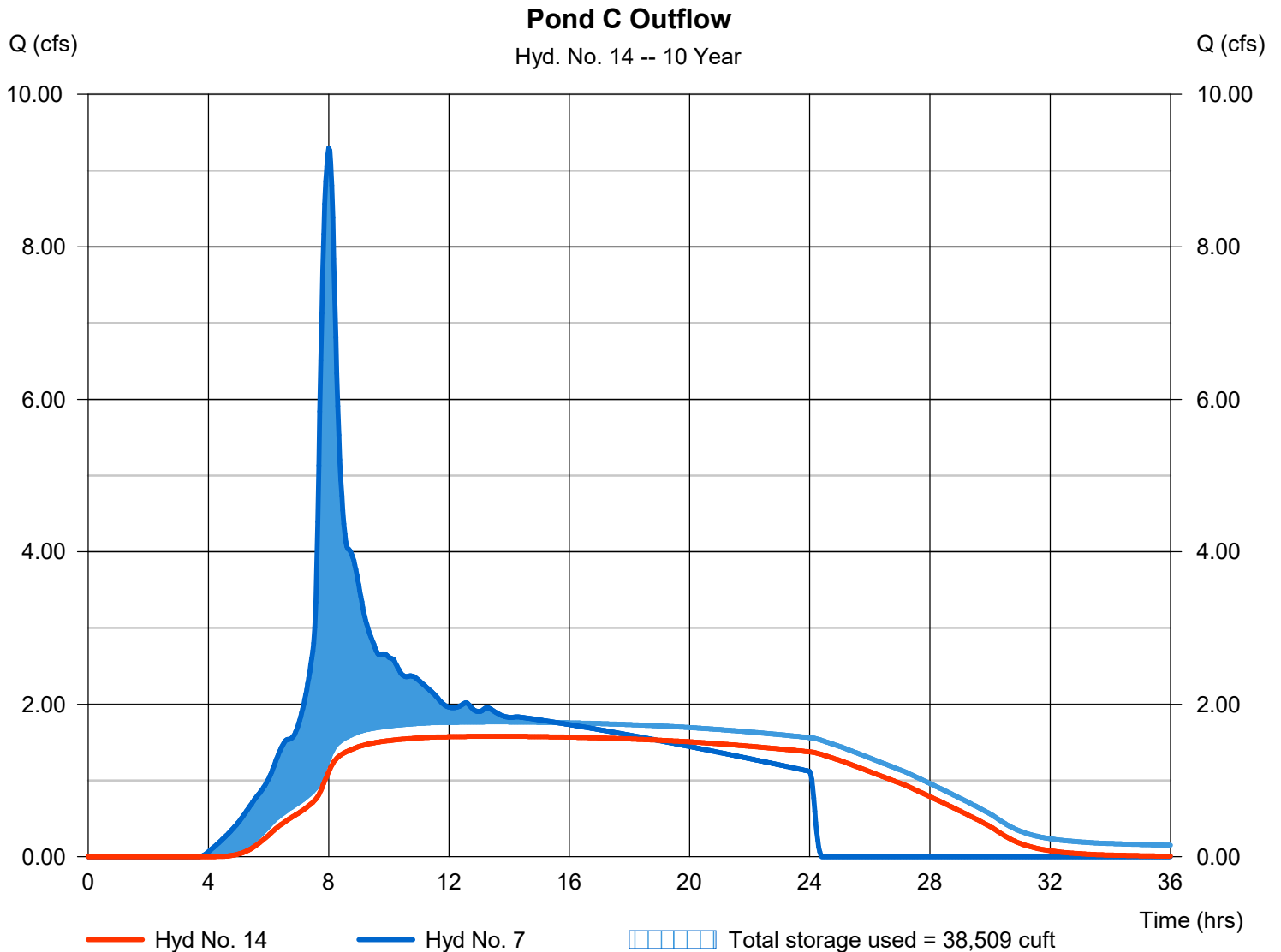
## Hyd. No. 14

### Pond C Outflow

Hydrograph type = Reservoir  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyd. No. = 7 - Basin C - Dev  
Reservoir name = Existing Pond C

Peak discharge = 1.579 cfs  
Time to peak = 13.57 hrs  
Hyd. volume = 114,183 cuft  
Max. Elevation = 139.31 ft  
Max. Storage = 38,509 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



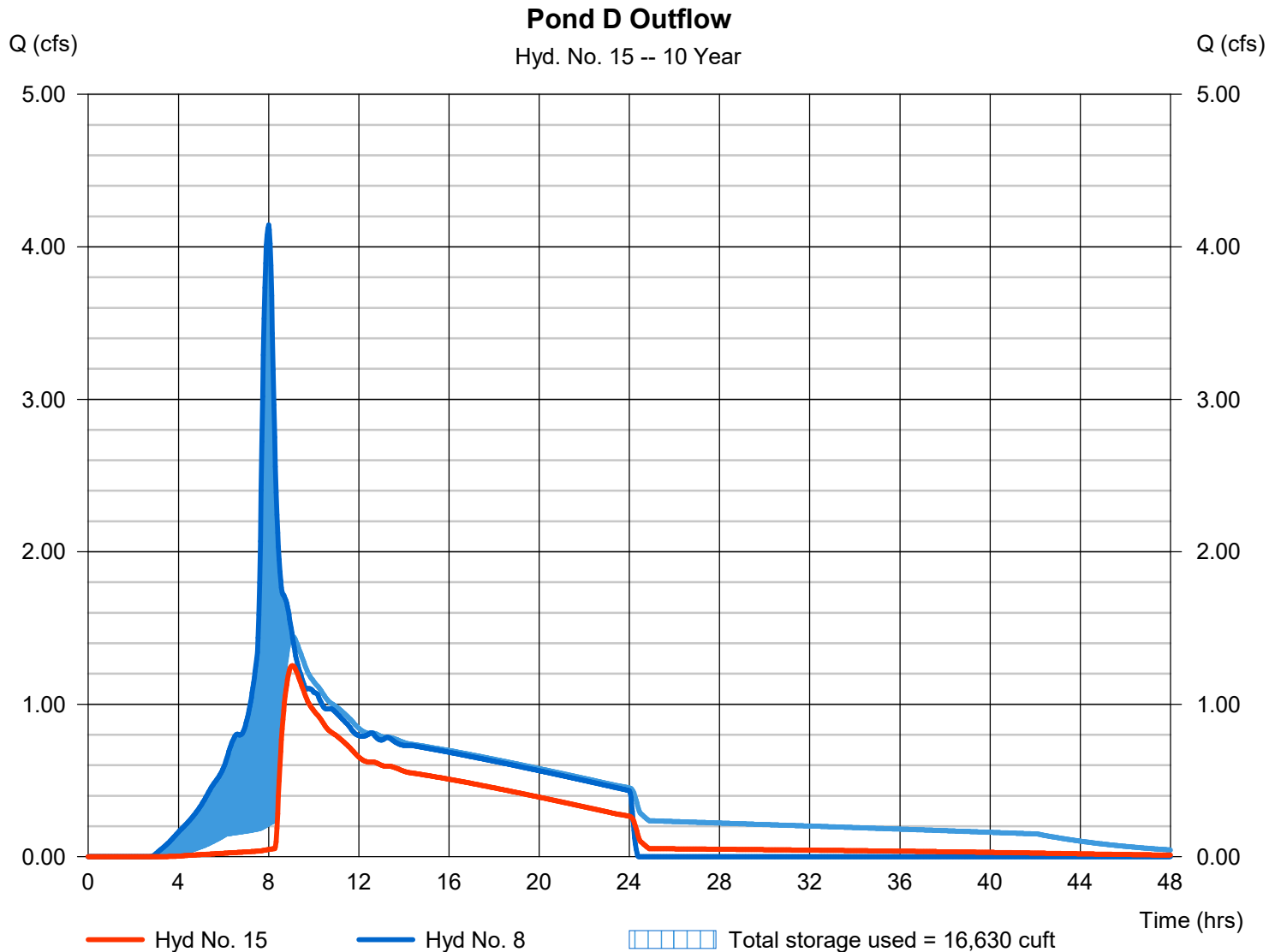
# Hydrograph Report

## Hyd. No. 15

### Pond D Outflow

Hydrograph type	= Reservoir	Peak discharge	= 1.253 cfs
Storm frequency	= 10 yrs	Time to peak	= 9.07 hrs
Time interval	= 2 min	Hyd. volume	= 35,019 cuft
Inflow hyd. No.	= 8 - Basin D - Dev	Max. Elevation	= 137.19 ft
Reservoir name	= Modified Pond D	Max. Storage	= 16,630 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



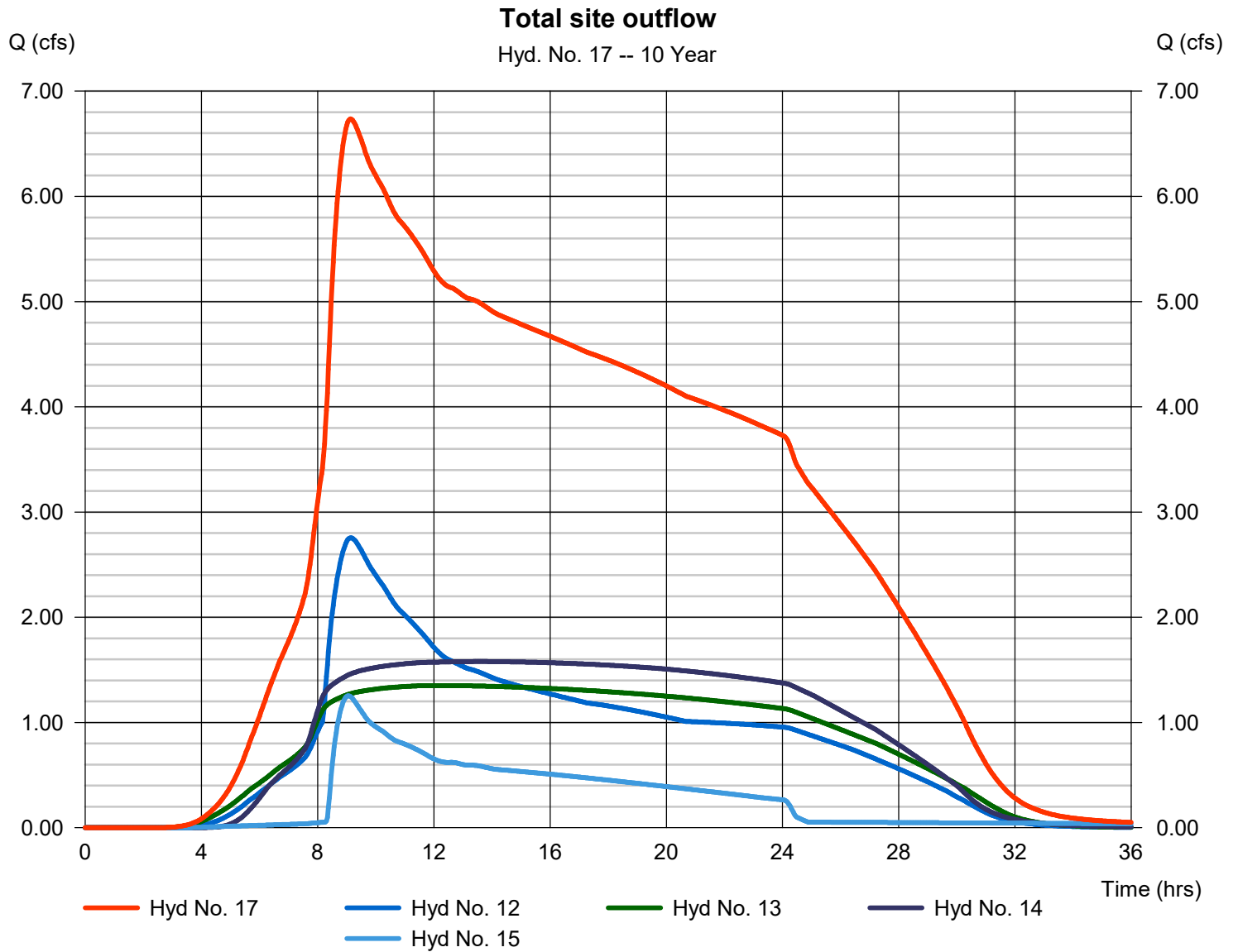
# Hydrograph Report

## Hyd. No. 17

Total site outflow

Hydrograph type = Combine  
Storm frequency = 10 yrs  
Time interval = 2 min  
Inflow hyds. = 12, 13, 14, 15

Peak discharge = 6.736 cfs  
Time to peak = 9.13 hrs  
Hyd. volume = 352,345 cuft  
Contrib. drain. area = 0.000 ac



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	15.07	2	492	306,623	-----	-----	-----	Pre-Dev Overall Site	
2	SCS Runoff	1.681	2	492	34,198	-----	-----	-----	Pre-Dev New/Modified Site	
3	SCS Runoff	13.39	2	492	272,424	-----	-----	-----	Pre-Dev Undisturbed Site	
5	SCS Runoff	11.34	2	480	160,144	-----	-----	-----	Basin A - Dev	
6	SCS Runoff	11.26	2	480	158,032	-----	-----	-----	Basin B - Dev	
7	SCS Runoff	11.38	2	480	167,245	-----	-----	-----	Basin C - Dev	
8	SCS Runoff	4.937	2	480	70,130	-----	-----	-----	Basin D - Dev	
10	Combine	38.91	2	480	555,550	5, 6, 7, 8,	-----	-----	Full Site - Developed	
12	Reservoir	4.153	2	524	126,143	5	142.51	36,436	Pond A Outflow	
13	Reservoir	1.482	2	808	117,852	6	140.51	53,417	Pond B Outflow	
14	Reservoir	1.909	2	808	137,895	7	140.14	50,056	Pond C Outflow	
15	Reservoir	2.099	2	508	45,410	8	137.30	17,521	Pond D Outflow	
17	Combine	9.040	2	514	427,299	12, 13, 14, 15,	-----	-----	Total site outflow	
Hydraflow storm calcs.gpw					Return Period: 25 Year			Tuesday, 08 / 16 / 2022		

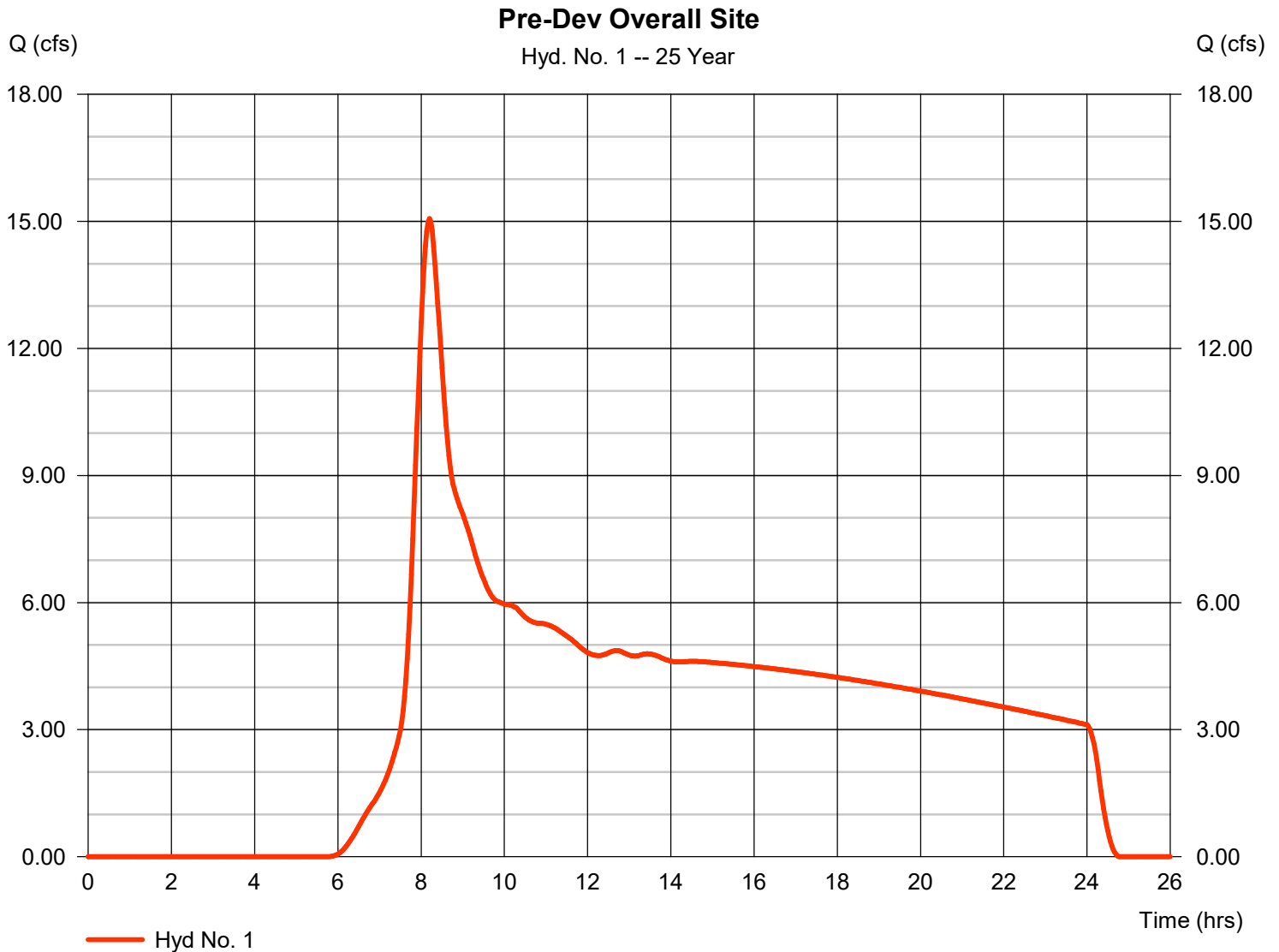


# Hydrograph Report

## Hyd. No. 1

Pre-Dev Overall Site

Hydrograph type	= SCS Runoff	Peak discharge	= 15.07 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.20 hrs
Time interval	= 2 min	Hyd. volume	= 306,623 cuft
Drainage area	= 58.010 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 30.00 min
Total precip.	= 3.90 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

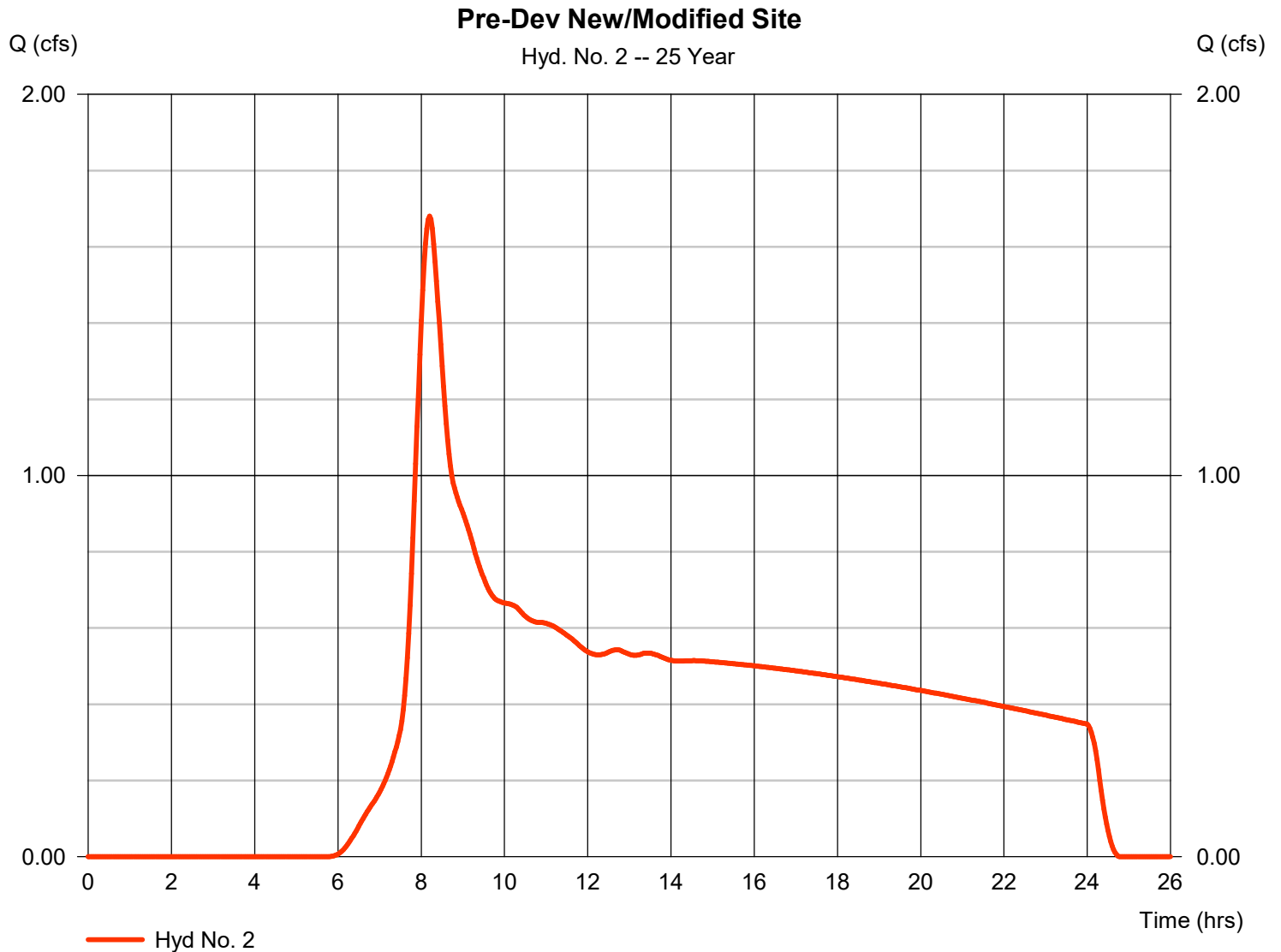


# Hydrograph Report

## Hyd. No. 2

Pre-Dev New/Modified Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.681 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.20 hrs
Time interval	= 2 min	Hyd. volume	= 34,198 cuft
Drainage area	= 6.470 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 30.00 min
Total precip.	= 3.90 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484



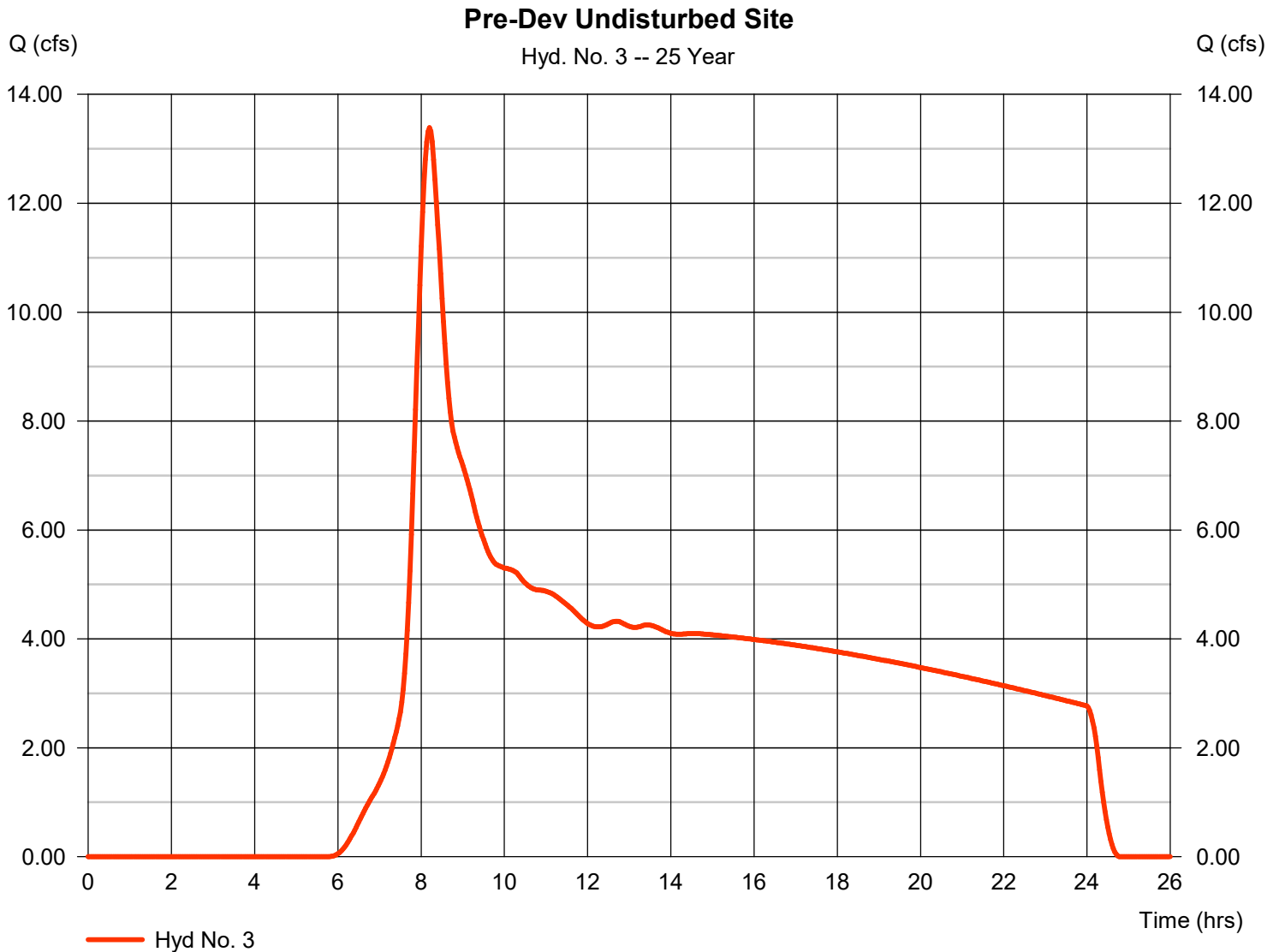
# Hydrograph Report

## Hyd. No. 3

Pre-Dev Undisturbed Site

Hydrograph type = SCS Runoff  
Storm frequency = 25 yrs  
Time interval = 2 min  
Drainage area = 51.540 ac  
Basin Slope = 0.0 %  
Tc method = User  
Total precip. = 3.90 in  
Storm duration = 24 hrs

Peak discharge = 13.39 cfs  
Time to peak = 8.20 hrs  
Hyd. volume = 272,424 cuft  
Curve number = 73  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 30.00 min  
Distribution = Type IA  
Shape factor = 484



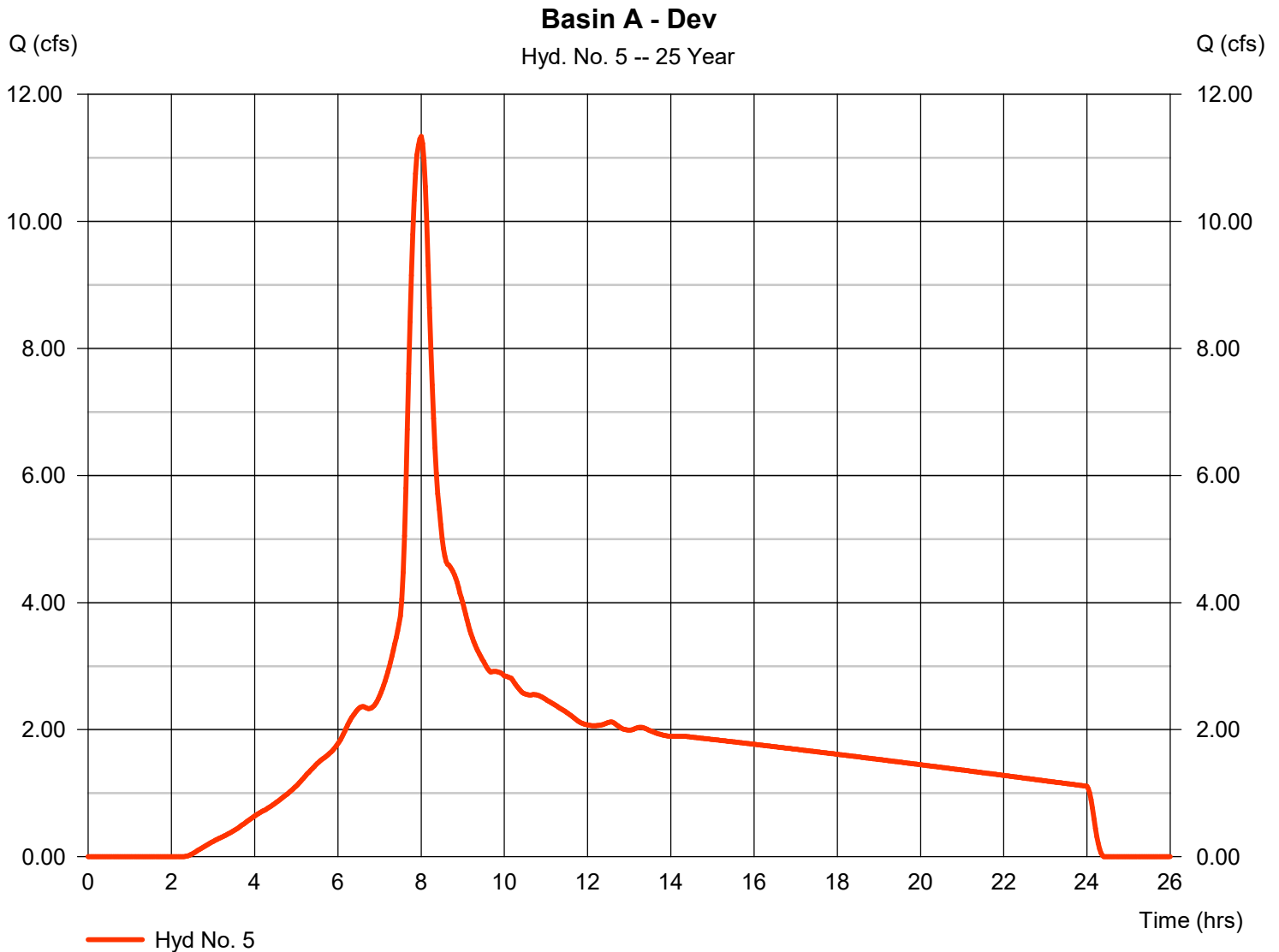
# Hydrograph Report

## Hyd. No. 5

Basin A - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 11.34 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 160,144 cuft
Drainage area	= 16.020 ac	Curve number	= 90*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.90 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(1.250 x 98) + (8.150 x 98) + (5.890 x 76) + (0.730 x 98)] / 16.020



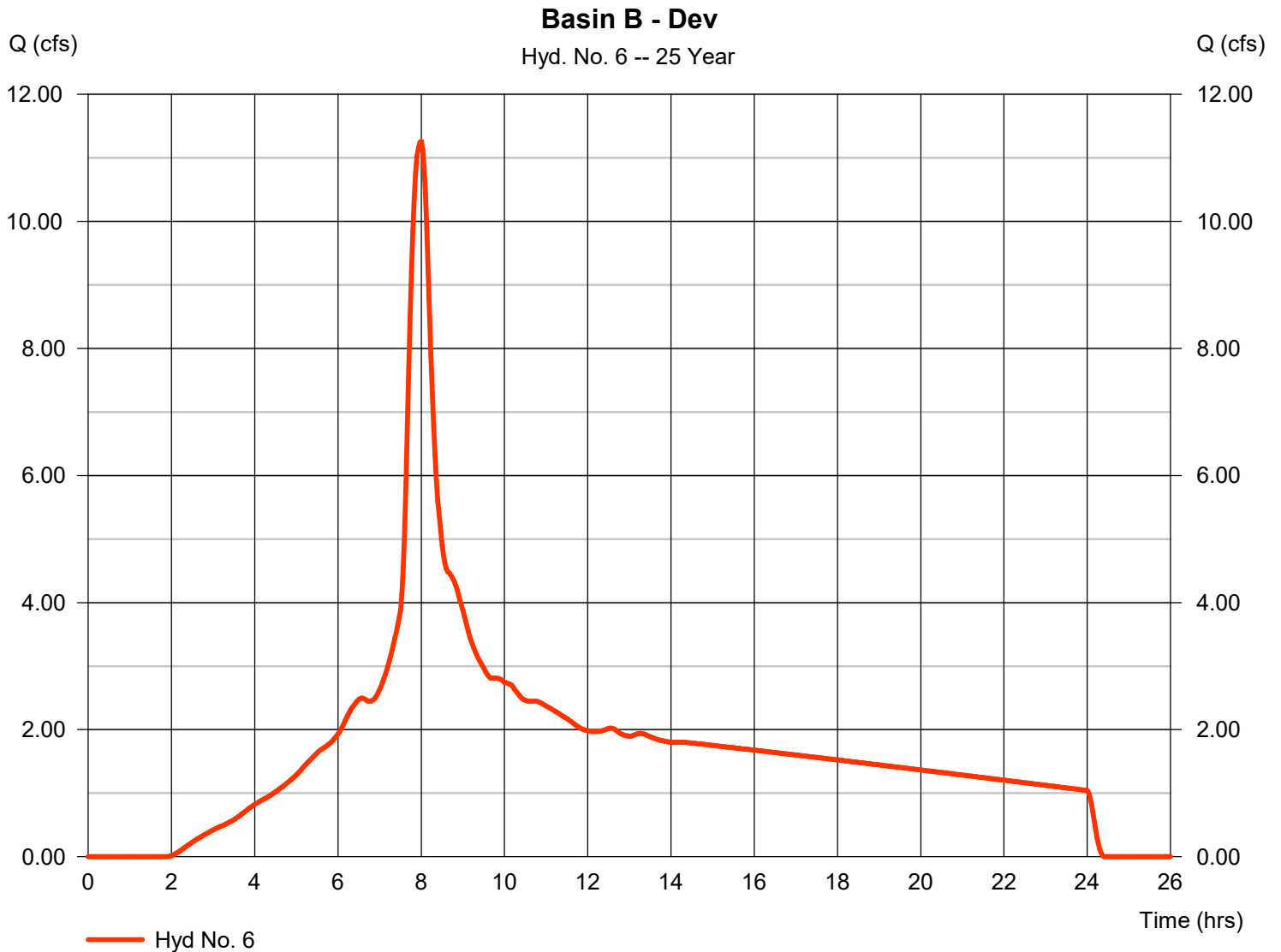
# Hydrograph Report

## Hyd. No. 6

Basin B - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 11.26 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 158,032 cuft
Drainage area	= 14.780 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.90 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(3.350 x 98) + (7.020 x 98) + (4.190 x 76) + (0.220 x 98)] / 14.780





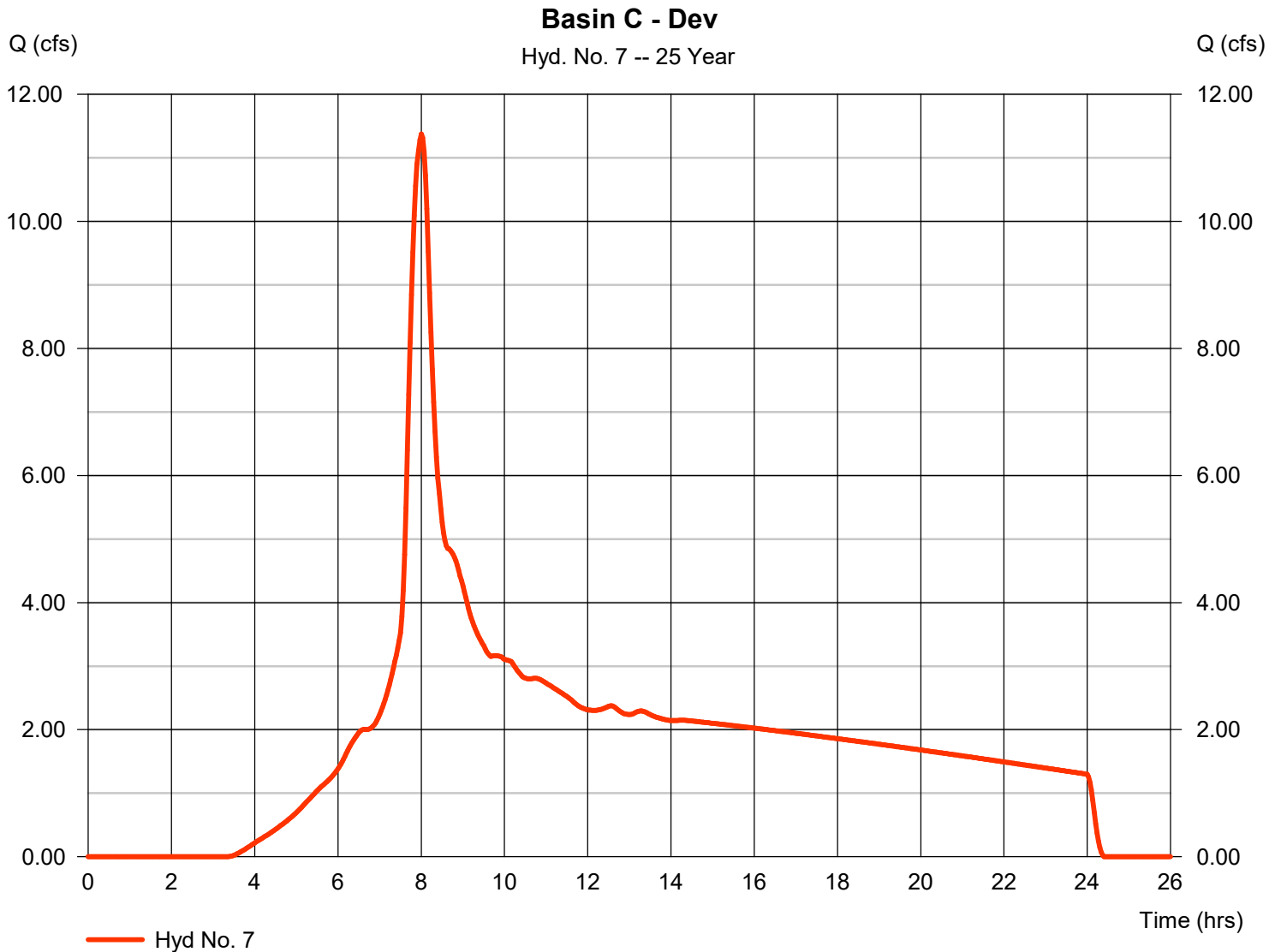
# Hydrograph Report

## Hyd. No. 7

Basin C - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 11.38 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 167,245 cuft
Drainage area	= 19.950 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.90 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(2.040 x 98) + (4.050 x 98) + (10.090 x 76) + (0.750 x 98) + (1.590 x 98) + (1.430 x 74)] / 19.950



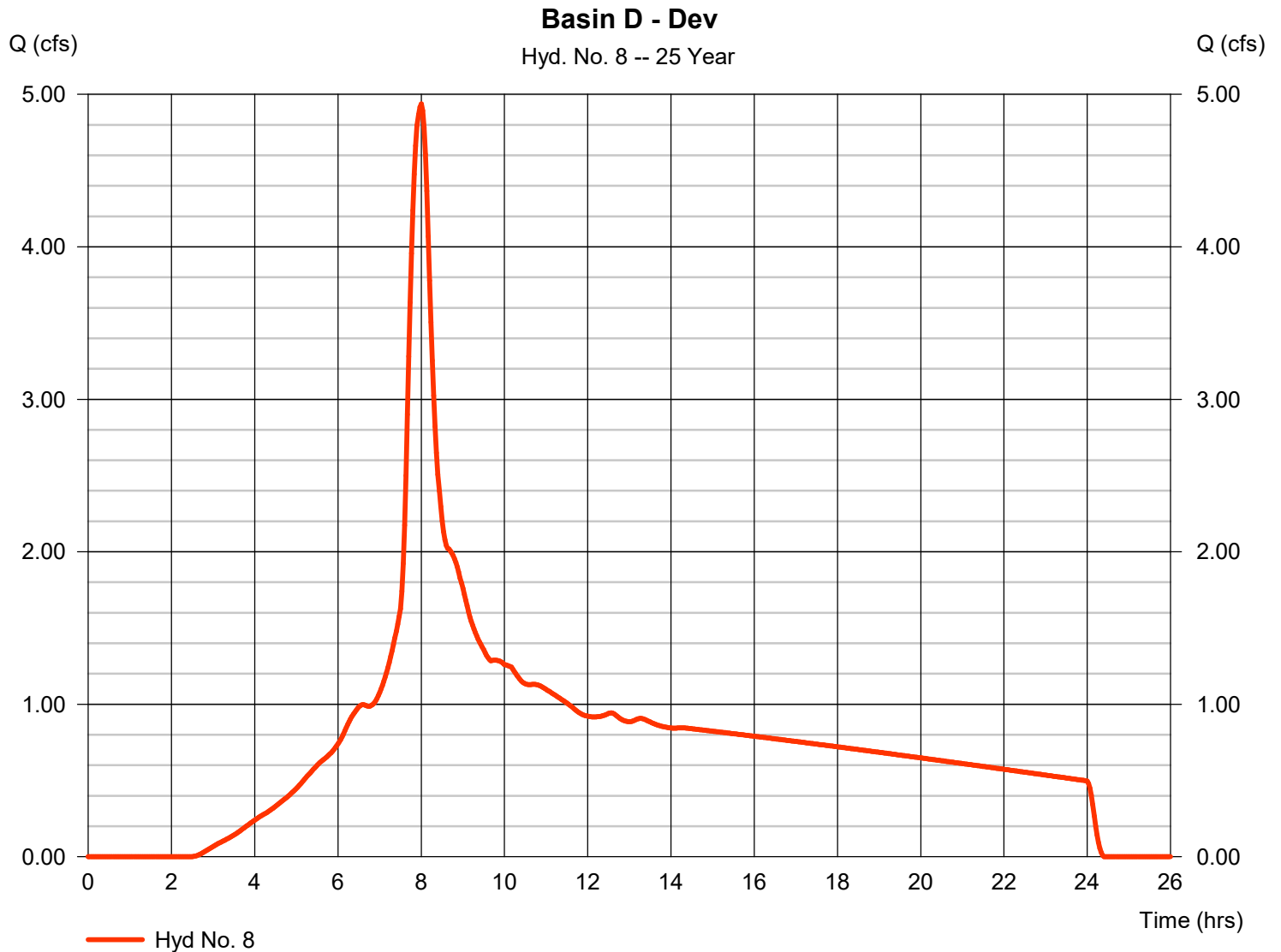
# Hydrograph Report

## Hyd. No. 8

Basin D - Dev

Hydrograph type	= SCS Runoff	Peak discharge	= 4.937 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 70,130 cuft
Drainage area	= 7.260 ac	Curve number	= 89*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.90 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(1.240 x 98) + (1.040 x 76) + (3.180 x 98) + (1.800 x 74)] / 7.260



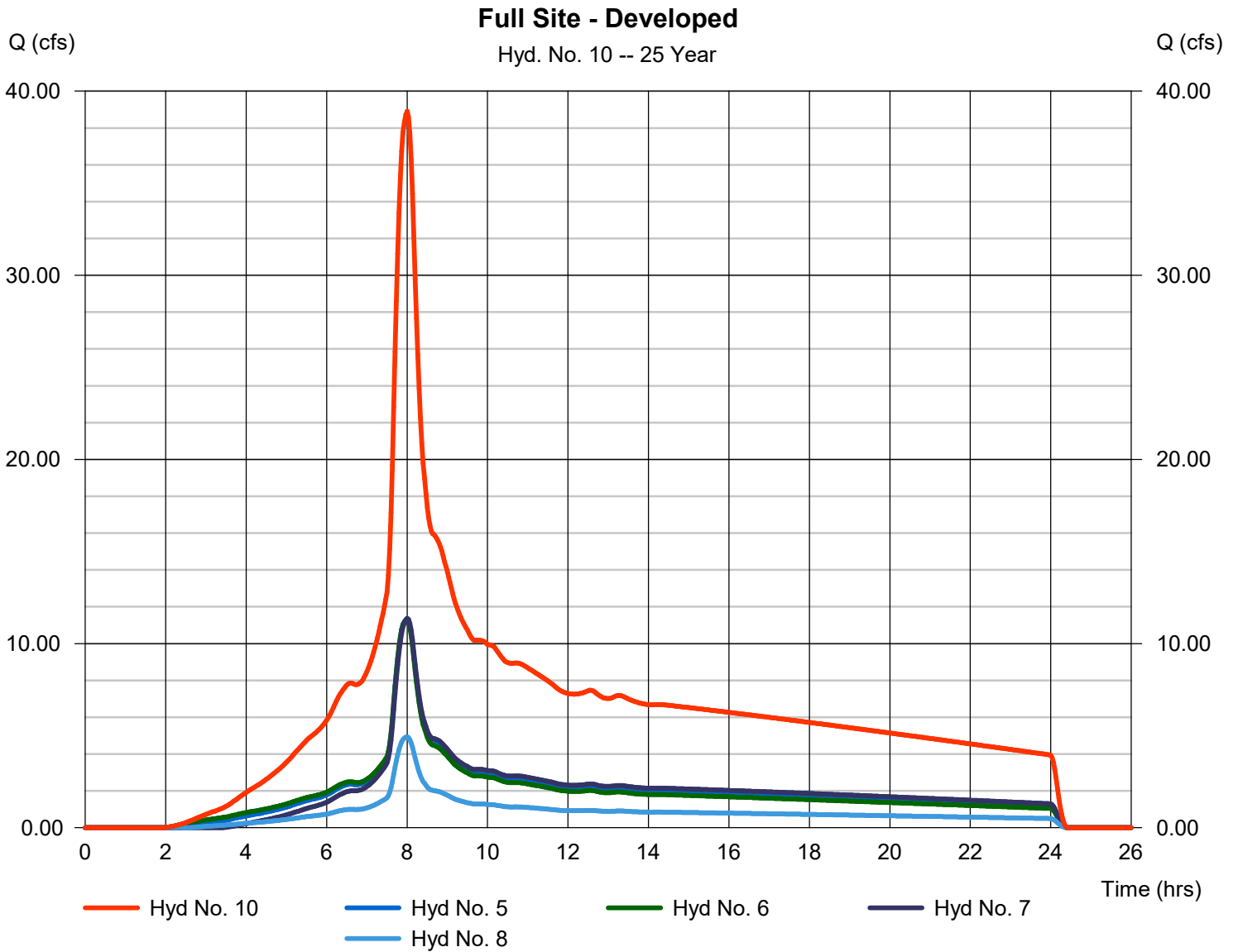
# Hydrograph Report

## Hyd. No. 10

Full Site - Developed

Hydrograph type = Combine  
Storm frequency = 25 yrs  
Time interval = 2 min  
Inflow hyds. = 5, 6, 7, 8

Peak discharge = 38.91 cfs  
Time to peak = 8.00 hrs  
Hyd. volume = 555,550 cuft  
Contrib. drain. area = 58.010 ac



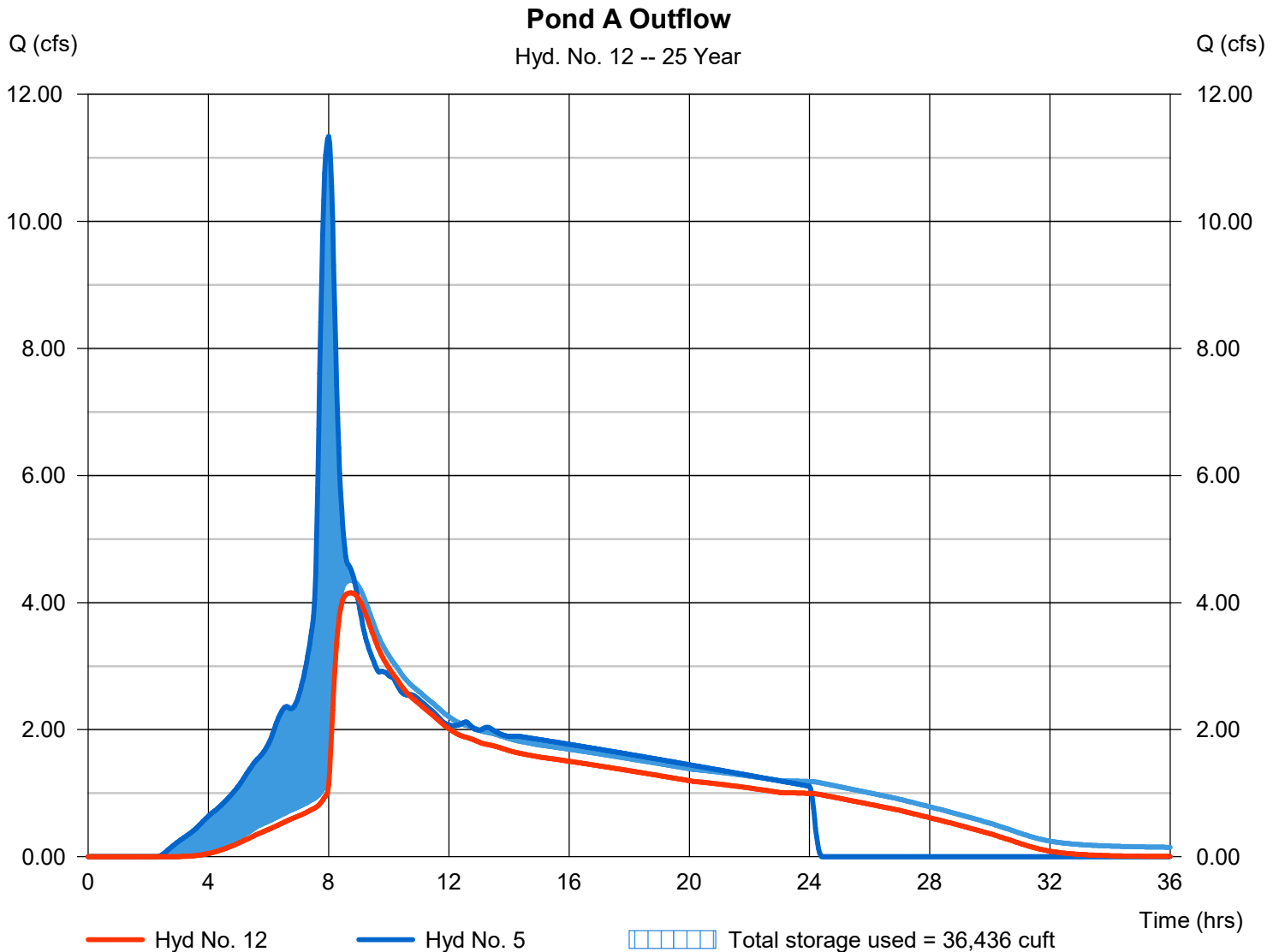
# Hydrograph Report

## Hyd. No. 12

### Pond A Outflow

Hydrograph type	= Reservoir	Peak discharge	= 4.153 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.73 hrs
Time interval	= 2 min	Hyd. volume	= 126,143 cuft
Inflow hyd. No.	= 5 - Basin A - Dev	Max. Elevation	= 142.51 ft
Reservoir name	= Existing Pond A	Max. Storage	= 36,436 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



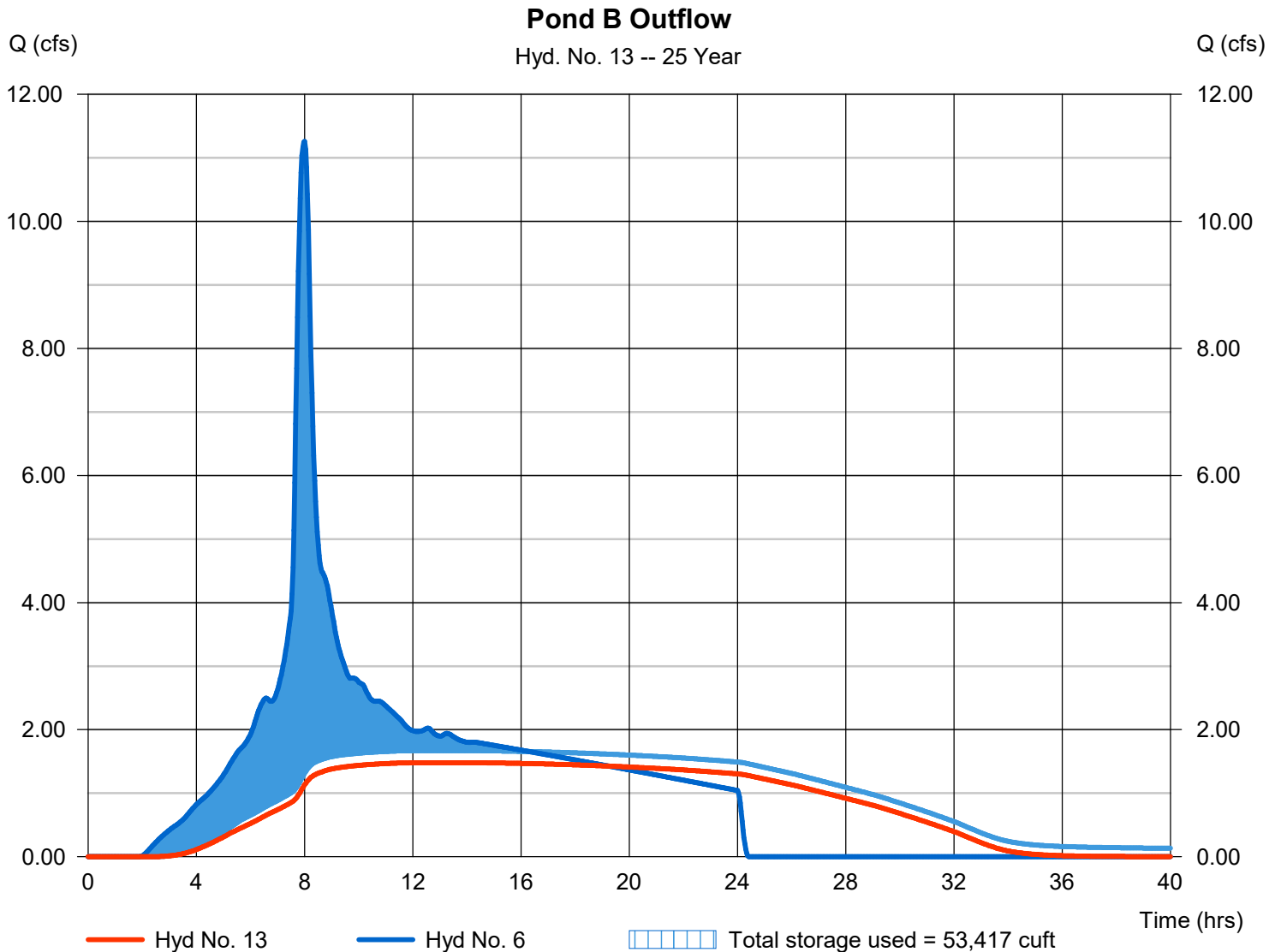
# Hydrograph Report

## Hyd. No. 13

### Pond B Outflow

Hydrograph type	= Reservoir	Peak discharge	= 1.482 cfs
Storm frequency	= 25 yrs	Time to peak	= 13.47 hrs
Time interval	= 2 min	Hyd. volume	= 117,852 cuft
Inflow hyd. No.	= 6 - Basin B - Dev	Max. Elevation	= 140.51 ft
Reservoir name	= Existing Pond B	Max. Storage	= 53,417 cuft

Storage Indication method used. Exfiltration extracted from Outflow.





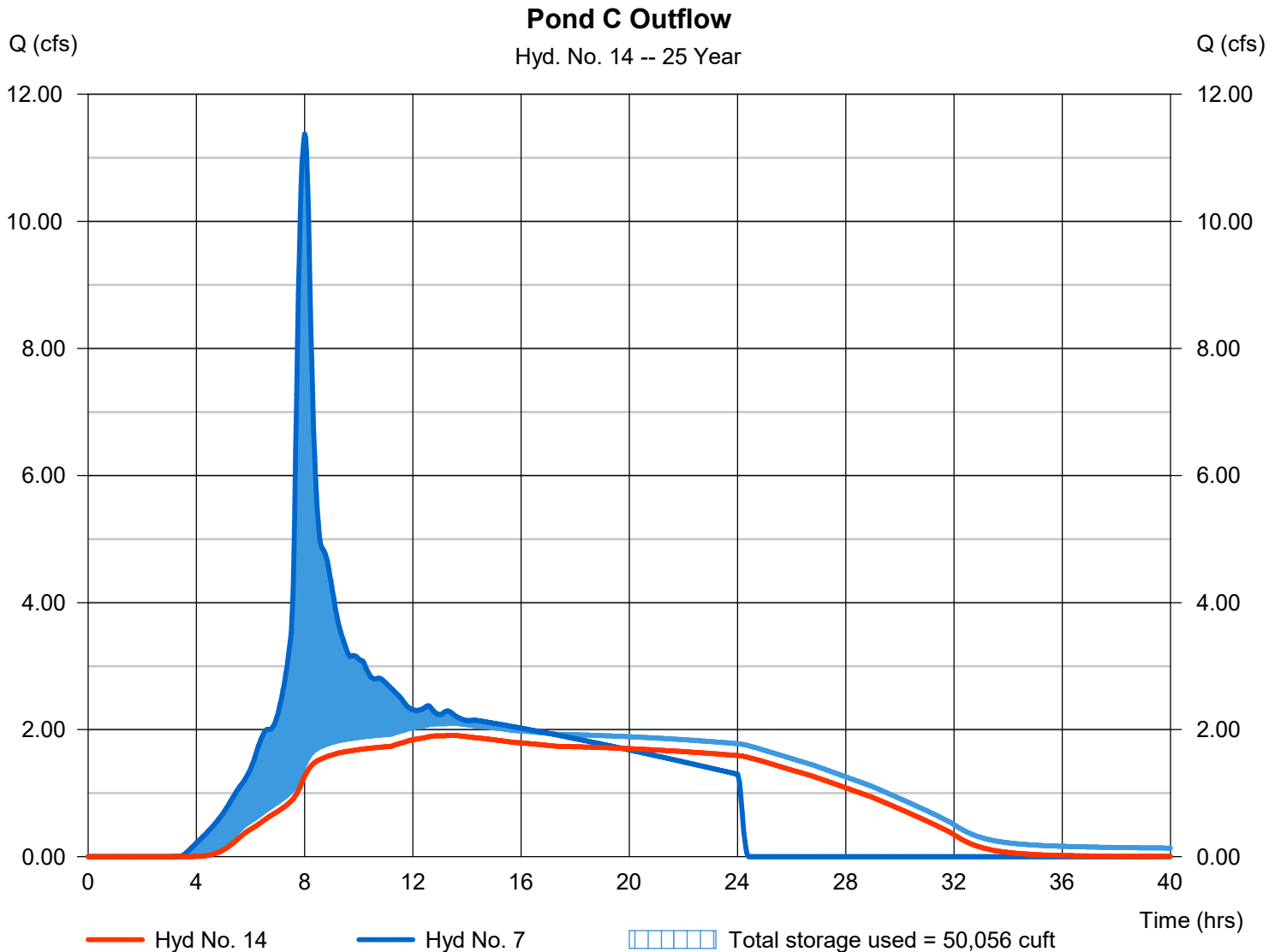
# Hydrograph Report

## Hyd. No. 14

### Pond C Outflow

Hydrograph type	= Reservoir	Peak discharge	= 1.909 cfs
Storm frequency	= 25 yrs	Time to peak	= 13.47 hrs
Time interval	= 2 min	Hyd. volume	= 137,895 cuft
Inflow hyd. No.	= 7 - Basin C - Dev	Max. Elevation	= 140.14 ft
Reservoir name	= Existing Pond C	Max. Storage	= 50,056 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



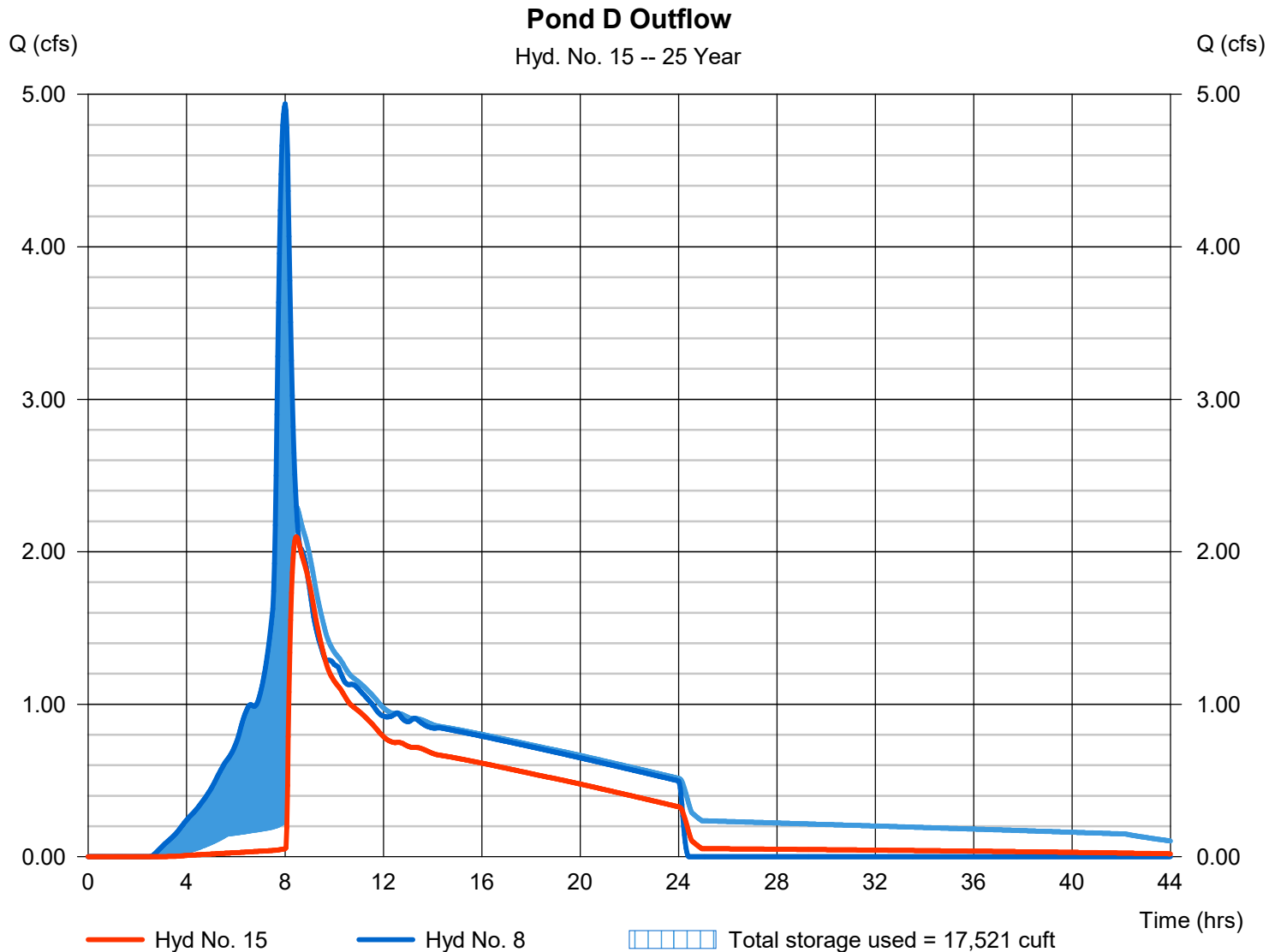
# Hydrograph Report

## Hyd. No. 15

### Pond D Outflow

Hydrograph type	= Reservoir	Peak discharge	= 2.099 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.47 hrs
Time interval	= 2 min	Hyd. volume	= 45,410 cuft
Inflow hyd. No.	= 8 - Basin D - Dev	Max. Elevation	= 137.30 ft
Reservoir name	= Modified Pond D	Max. Storage	= 17,521 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



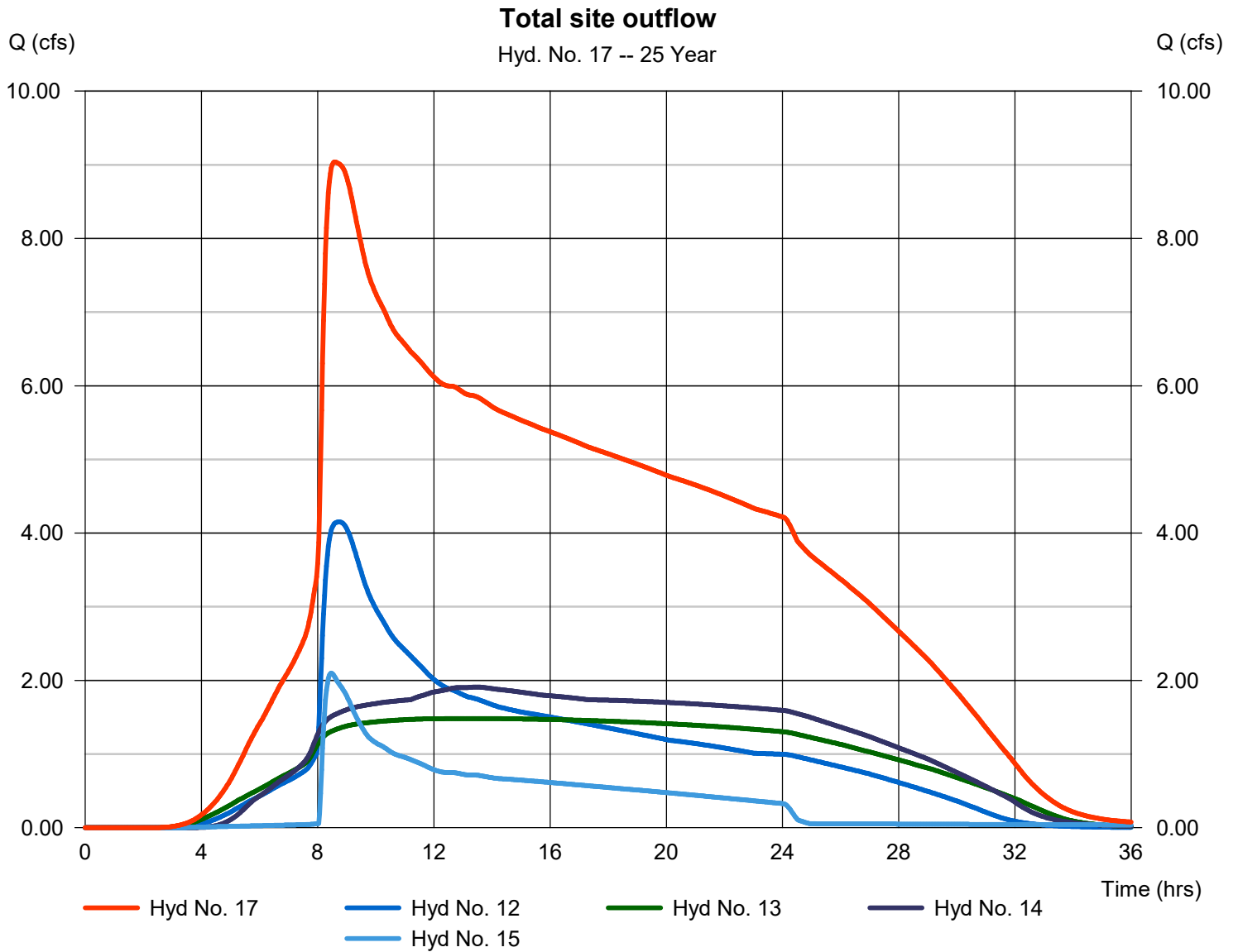
# Hydrograph Report

## Hyd. No. 17

Total site outflow

Hydrograph type = Combine  
Storm frequency = 25 yrs  
Time interval = 2 min  
Inflow hyds. = 12, 13, 14, 15

Peak discharge = 9.040 cfs  
Time to peak = 8.57 hrs  
Hyd. volume = 427,299 cuft  
Contrib. drain. area = 0.000 ac





---

APPENDIX D  
**PROPOSED SITE  
PLANS**





Architecture - Interiors  
Planning - Engineering

Portland, OR  
303.224.9292  
Vancouver, WA  
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REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**OVERALL SITE PLAN**

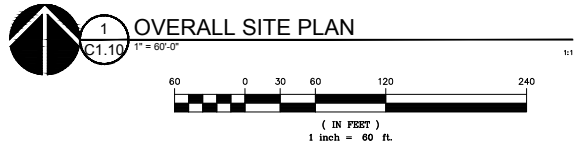
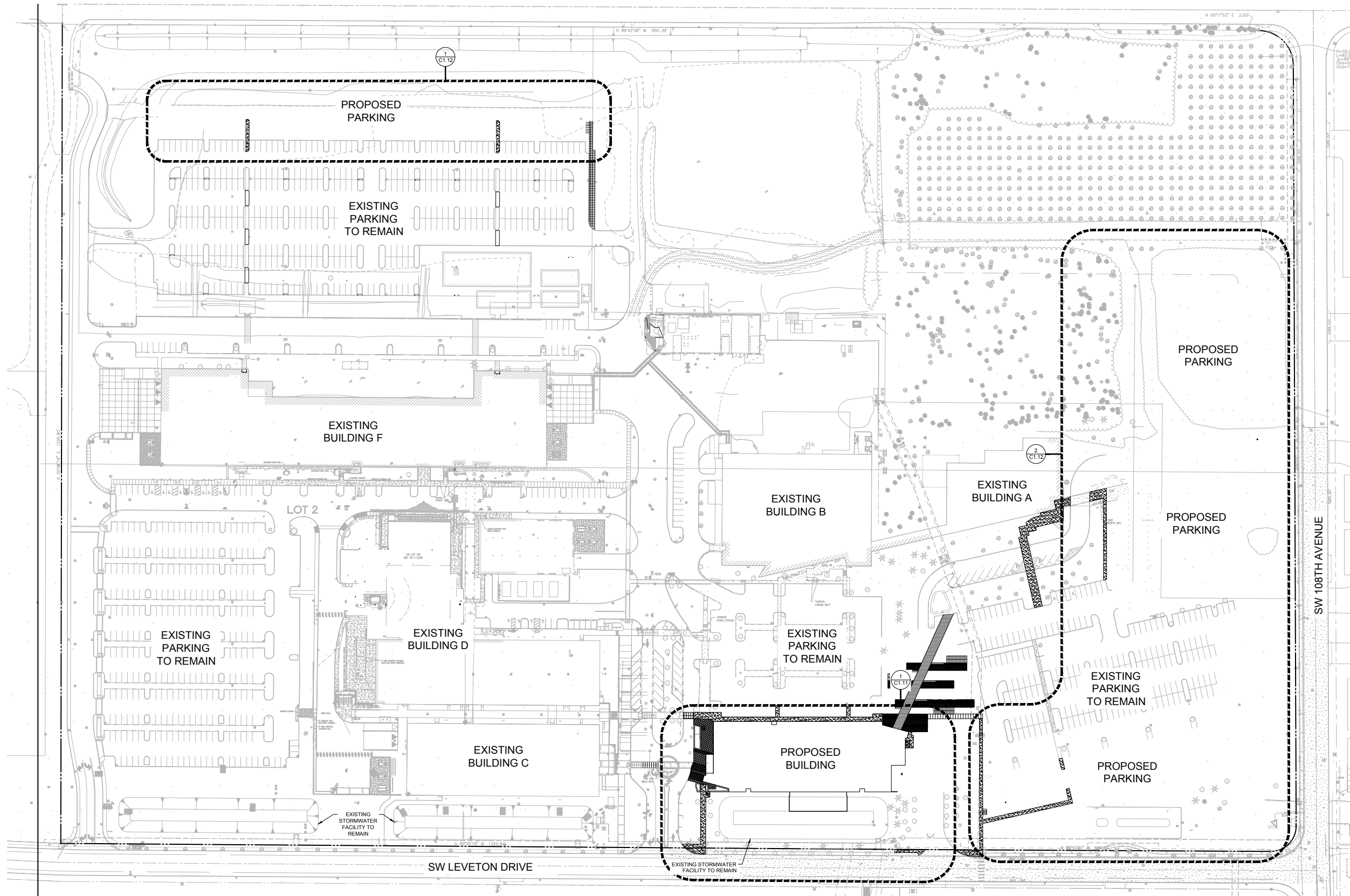
DRAWN BY: SJS

CHECKED BY: BDN

SHEET

**C1.10**

JOB NO. **2220087.00**

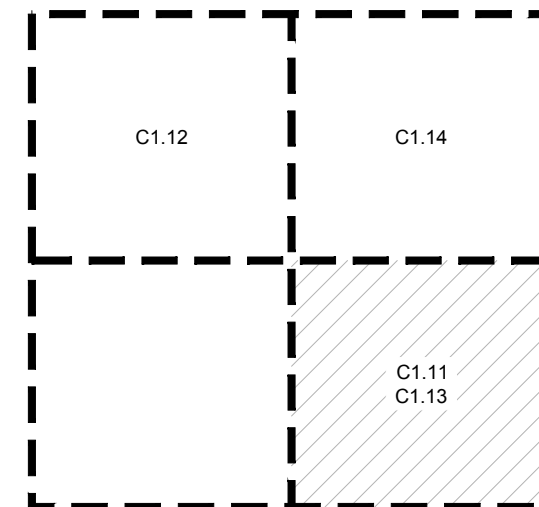
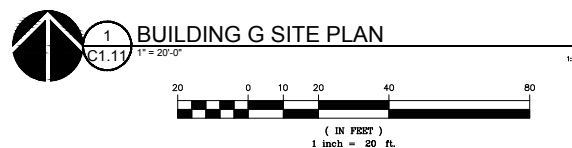
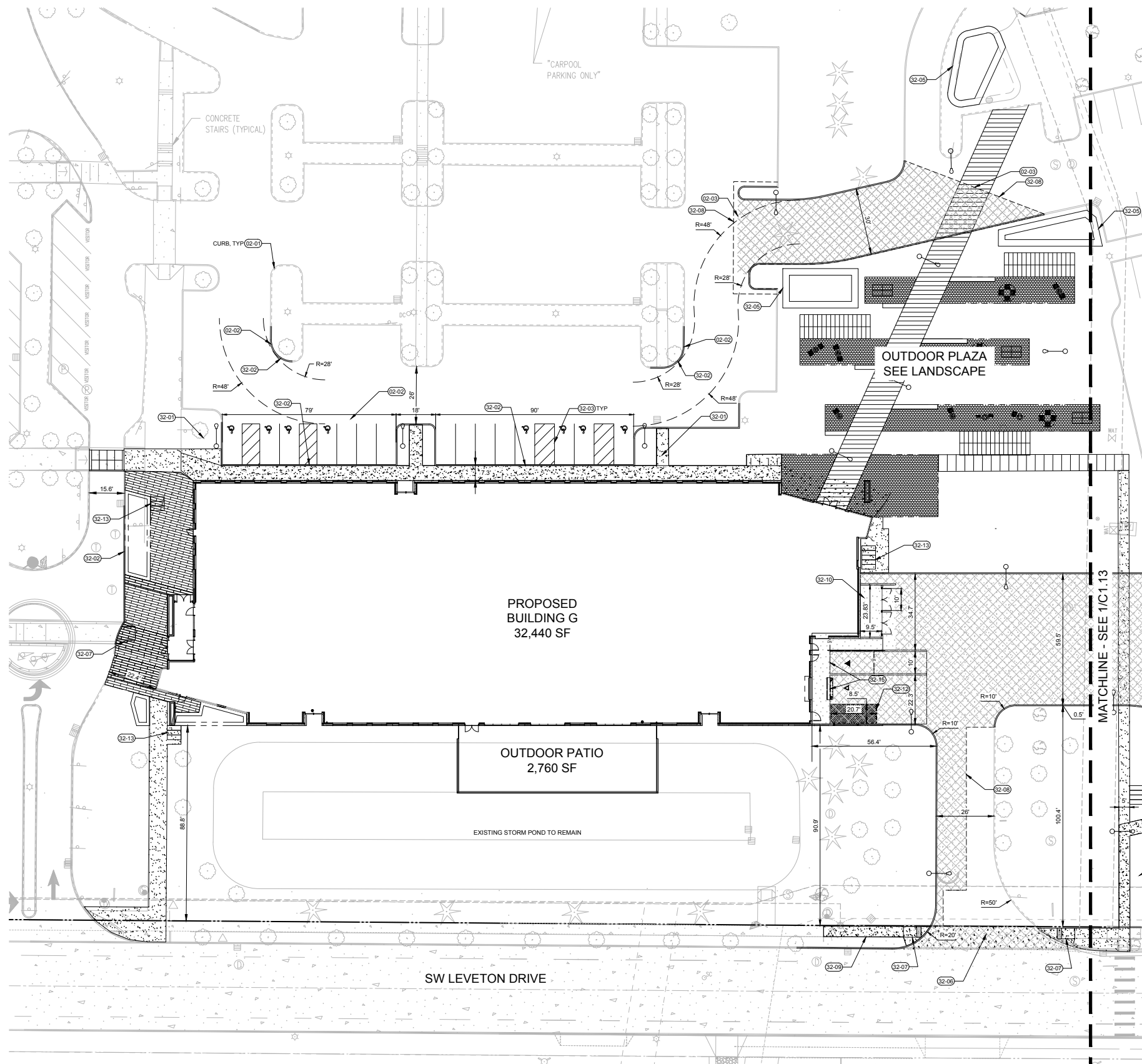


	SITE DATA	
	EXISTING COVERAGE (AC)	PROPOSED COVERAGE (AC)
TOTAL PROPERTY AREA	58.01	58.01
BUILDING AREA	6.31	7.06
PAVED IMPERVIOUS AREA	22.91	24.55
TOTAL IMPERVIOUS AREA	29.22	31.61
LANDSCAPE AREA	28.79	26.40

TYPE	PARKING DATA			
	EXISTING	PARKING REMOVED	ADDED PARKING	TOTAL SPACES
STANDARD PARKING	1336	33	578	1881
ACCESSIBLE PARKING	29	4	8	33
LOADING BERTHS	13	0	2	15
CARPOOL SPACES	12	2	2	12
COMPACT SPACES	0	0	0	0
TOTAL PARKING	1377	37	586	1926

**KEYNOTES**

- 02-01 PROTECT ITEM TO REMAIN (AS NOTED)
- 02-02 REMOVE ITEM (AS NOTED)
- 02-03 MATCH EXISTING PAVING
- 02-01 LANDSCAPE AREA PER LANDSCAPE PLANS
- 02-02 VERTICAL CURB
- 02-03 PARKING STALL STRIPING
- 02-04 NEW STORMWATER SWALE
- 02-05 NEW STORMWATER BASIN
- 02-06 NEW INDUSTRIAL DRIVEWAY
- 02-07 SIDEWALK CURB RAMP
- 02-08 SAWCUT AC PAVING
- 02-09 CONCRETE SIDEWALK
- 02-10 TRASH ENCLOSURE
- 02-11 WAYFINDING MONUMENT SIGN
- 02-12 TRASH COMPACTOR
- 02-13 LOCATION FOR BIKE PARKING
- 02-15 LOADING DOCK



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Delta	Issued As	Issue Date

SHEET TITLE:  
**BUILDING G  
 SITE PLAN**

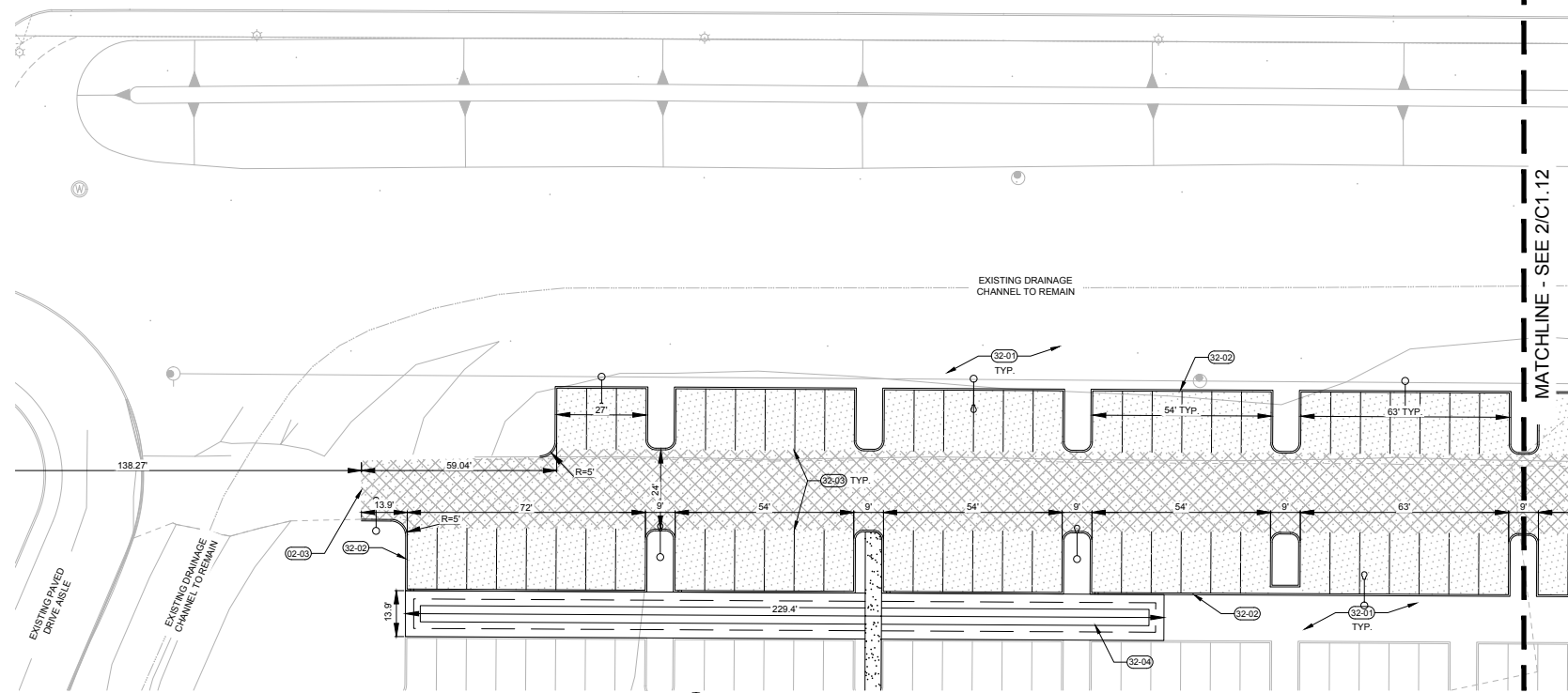
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 CHECKED BY: BDN  
 SHEET

**C1.11**

JOB NO. **2220087.00**

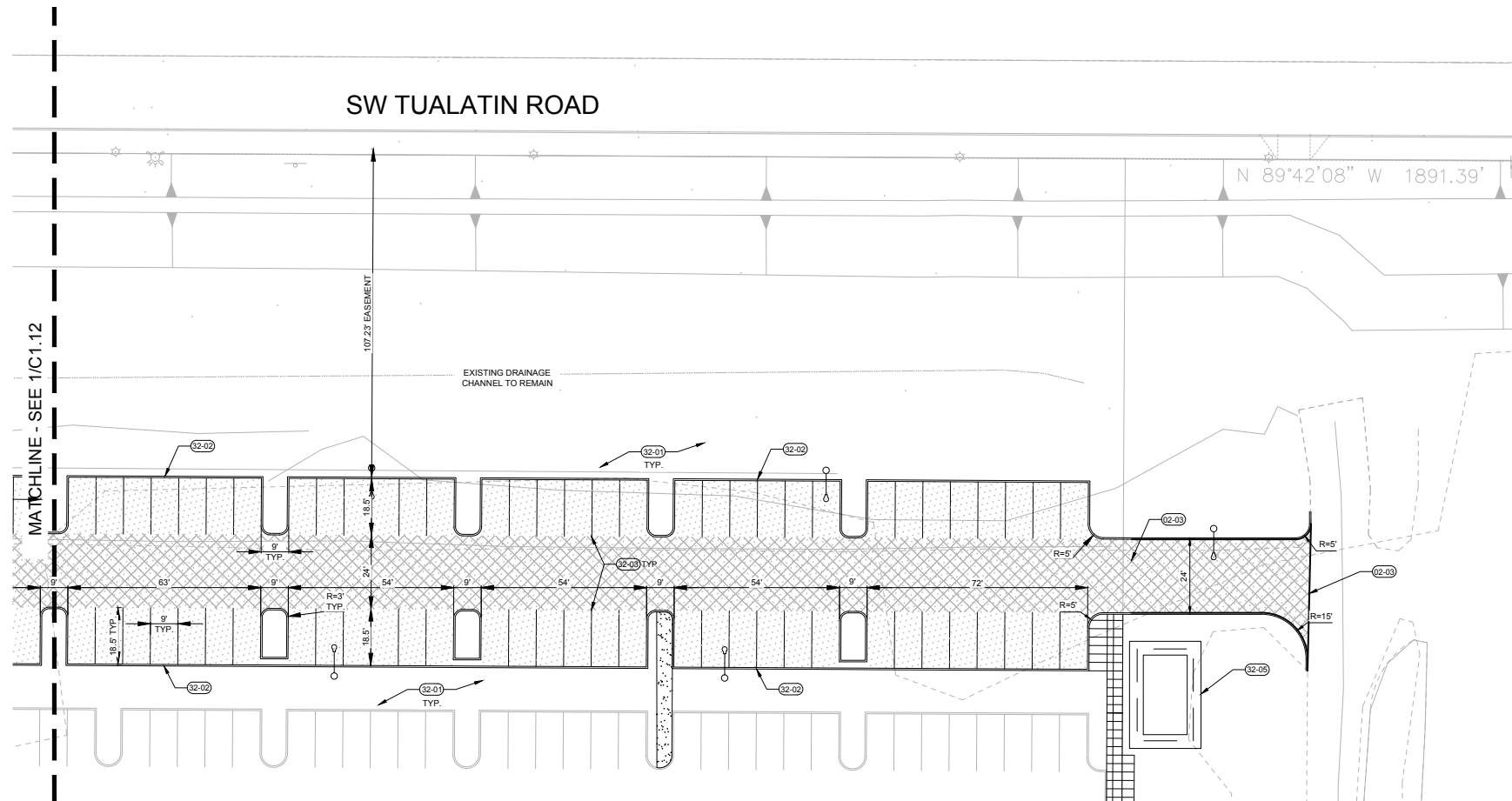


SW TUALATIN ROAD



1 NORTHWEST PARKING - WEST  
 C1.12 1" = 20'-0"  
 1 inch = 20 ft.

SW TUALATIN ROAD



2 NORTHWEST PARKING - EAST  
 C1.12 1" = 20'-0"  
 1 inch = 20 ft.

KEYNOTES

- 02-01 PROTECT ITEM TO REMAIN (AS NOTED)
- 02-02 REMOVE ITEM (AS NOTED)
- 02-03 MATCH EXISTING PAVING
- 32-01 LANDSCAPE AREA PER LANDSCAPE PLANS
- 32-02 VERTICAL CURB
- 32-03 PARKING STALL STRIPING
- 32-04 NEW STORMWATER SWALE
- 32-05 NEW STORMWATER BASIN
- 32-06 NEW INDUSTRIAL DRIVEWAY
- 32-07 SIDEWALK CURB RAMP
- 32-08 SAWCUT AC PAVING
- 32-09 CONCRETE SIDEWALK

NOTES

- 1. SEE 03.01 FOR GENERAL CIVIL NOTES AND LEGEND



Architecture - Interiors  
 Planning - Engineering

Project: 222008700  
 Location: Seattle, WA  
 Date: 8/2/2022

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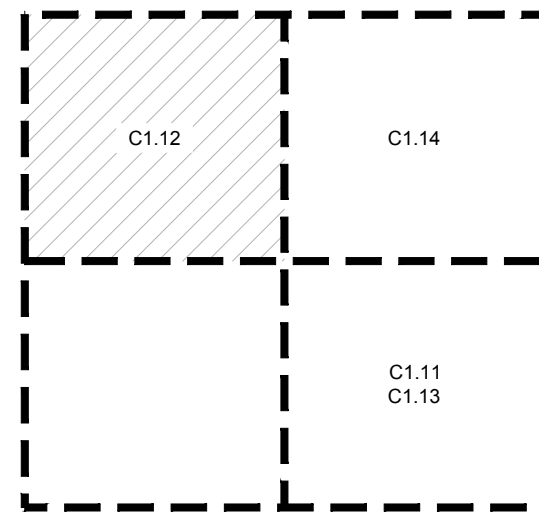
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**NORTHWEST PARKING EXPANSION SITE PLAN**

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 CHECKED BY: BDN  
 SHEET

**C1.12**

JOB NO. 2220087.00



REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**EAST PARKING  
EXPANSION  
SITE PLAN**

DRAWN BY: SJS  
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SHEET

**C1.13**

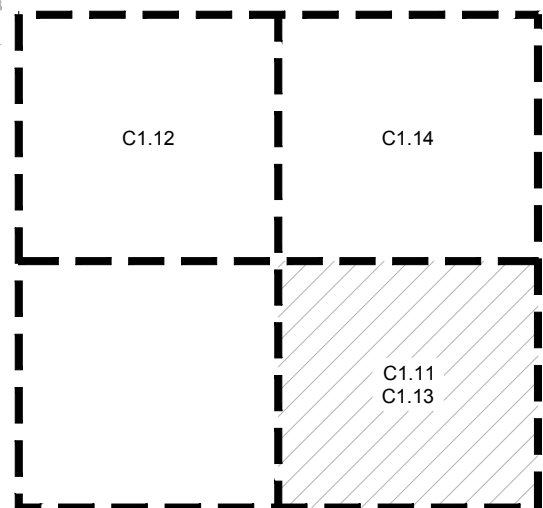
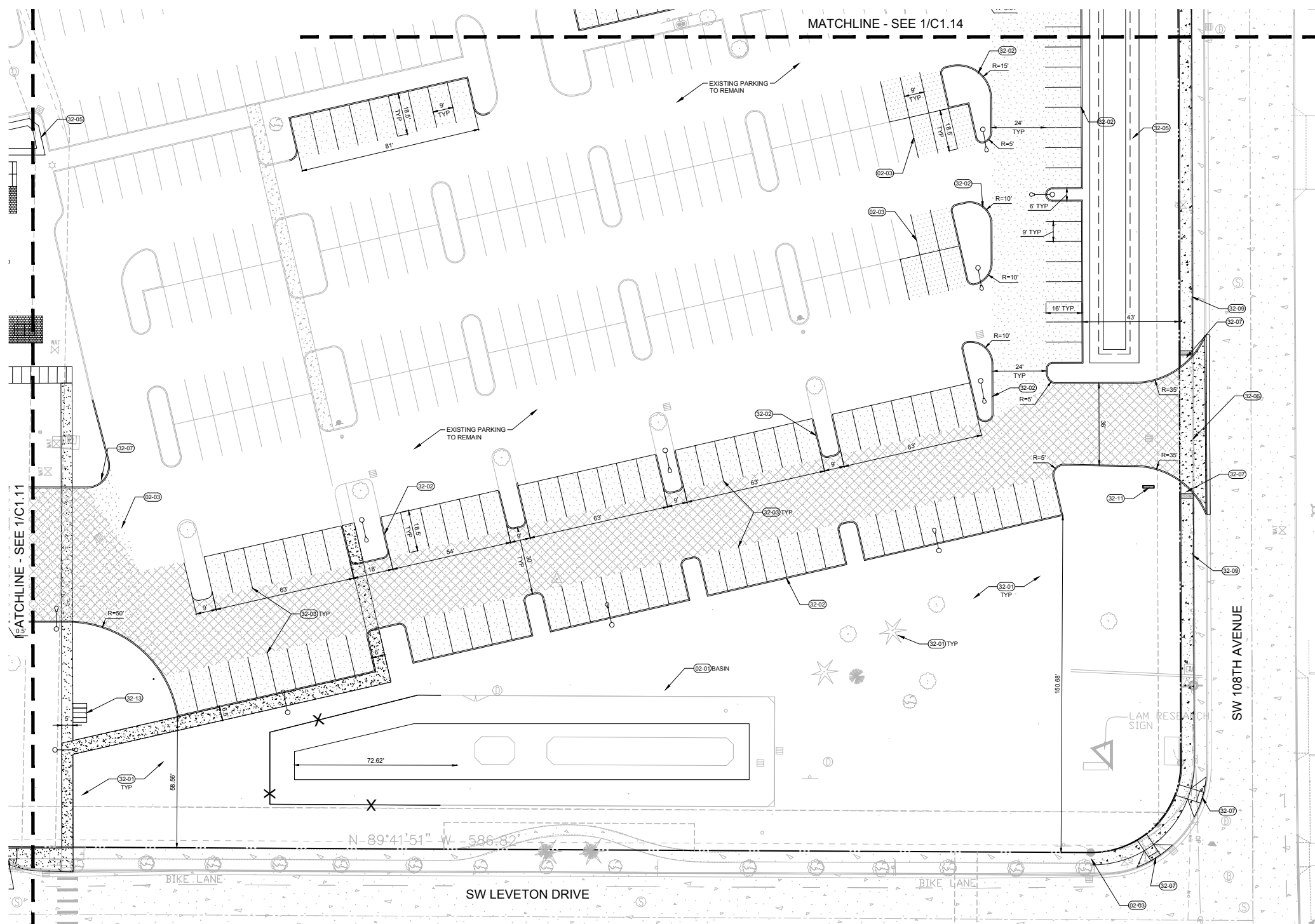
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- 02-02 REMOVE ITEM (AS NOTED)
- 02-03 MATCH EXISTING PAVING
- 32-01 LANDSCAPE AREA PER LANDSCAPE PLANS
- 32-02 VERTICAL CURB
- 32-03 PARKING STALL STRIPING
- 32-04 NEW STORMWATER SWALE
- 32-05 NEW STORMWATER BASIN
- 32-06 NEW INDUSTRIAL DRIVEWAY
- 32-07 SIDEWALK CURB RAMP
- 32-08 SAWCUT AD PAVING
- 32-09 CONCRETE SIDEWALK
- 32-11 WAYFINDING MONUMENT SIGN
- 32-13 LOCATION FOR BIKE PARKING

**NOTES**

1. SEE C0.01 FOR GENERAL CIVIL NOTES AND LEGEND

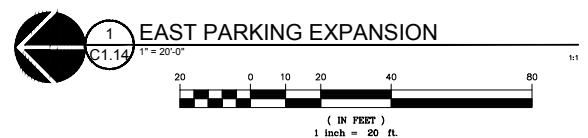
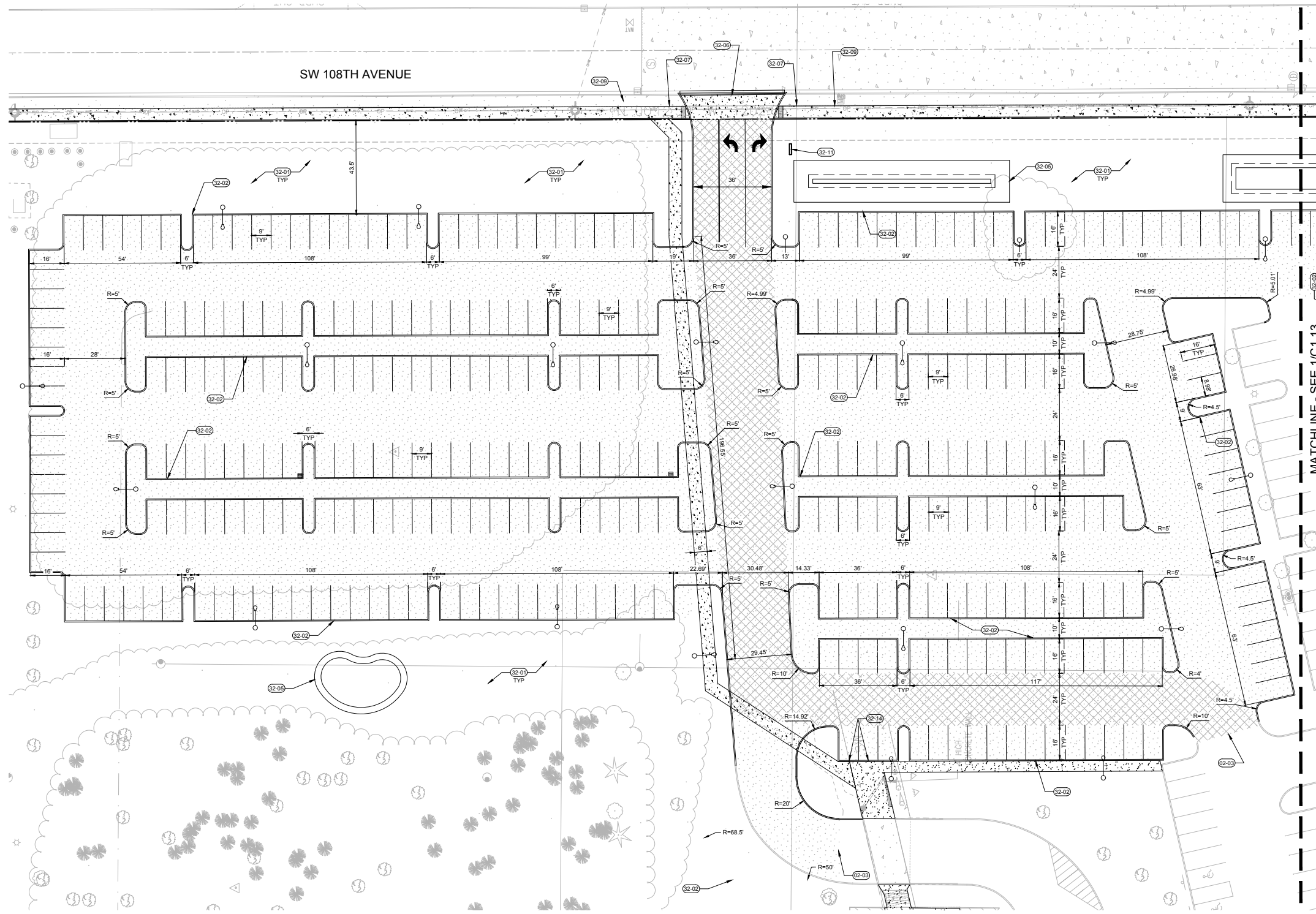


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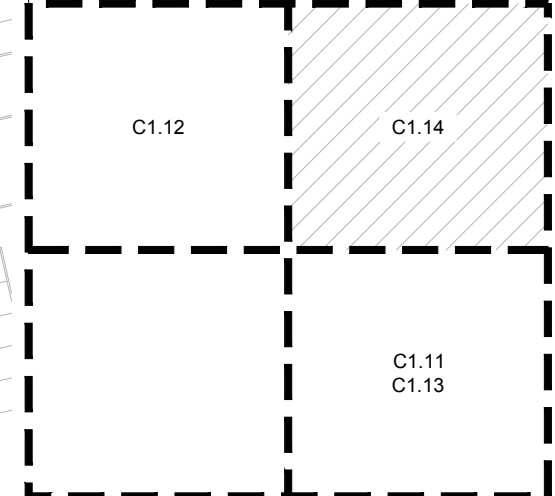
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- 02-02 REMOVE ITEM (AS NOTED)
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- 32-05 NEW STORMWATER BASIN
- 32-06 NEW INDUSTRIAL DRIVEWAY
- 32-07 SIDEWALK CURB RAMP
- 32-08 SAWCUT AC PAVING
- 32-09 CONCRETE SIDEWALK
- 32-11 WAYFINDING MONUMENT SIGN
- 32-14 CARPOOL PARKING

**NOTES**

1. SEE C0.01 FOR GENERAL CIVIL NOTES AND LEGEND



MATCHLINE - SEE 1/C1.13



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Delta	Issued As	Issue Date

SHEET TITLE:  
**EAST PARKING  
EXPANSION  
SITE PLAN**

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CHECKED BY: BDN  
SHEET

**C1.14**

JOB NO. **2220087.00**







REVISION SCHEDULE		
Delta	Issued As	Issue Date

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**BUILDING G  
UTILITY PLAN**

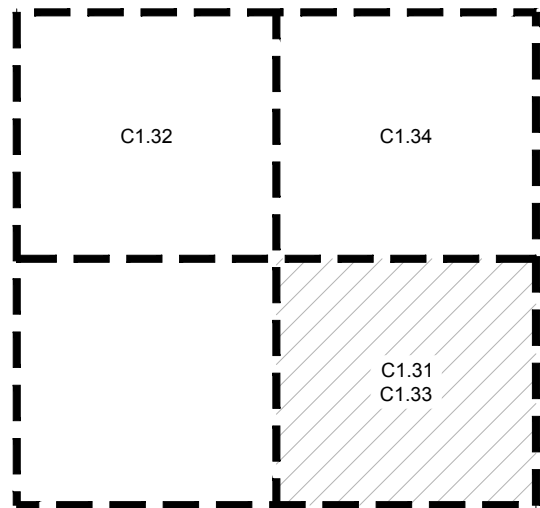
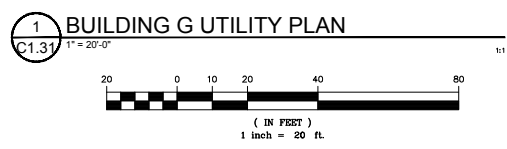
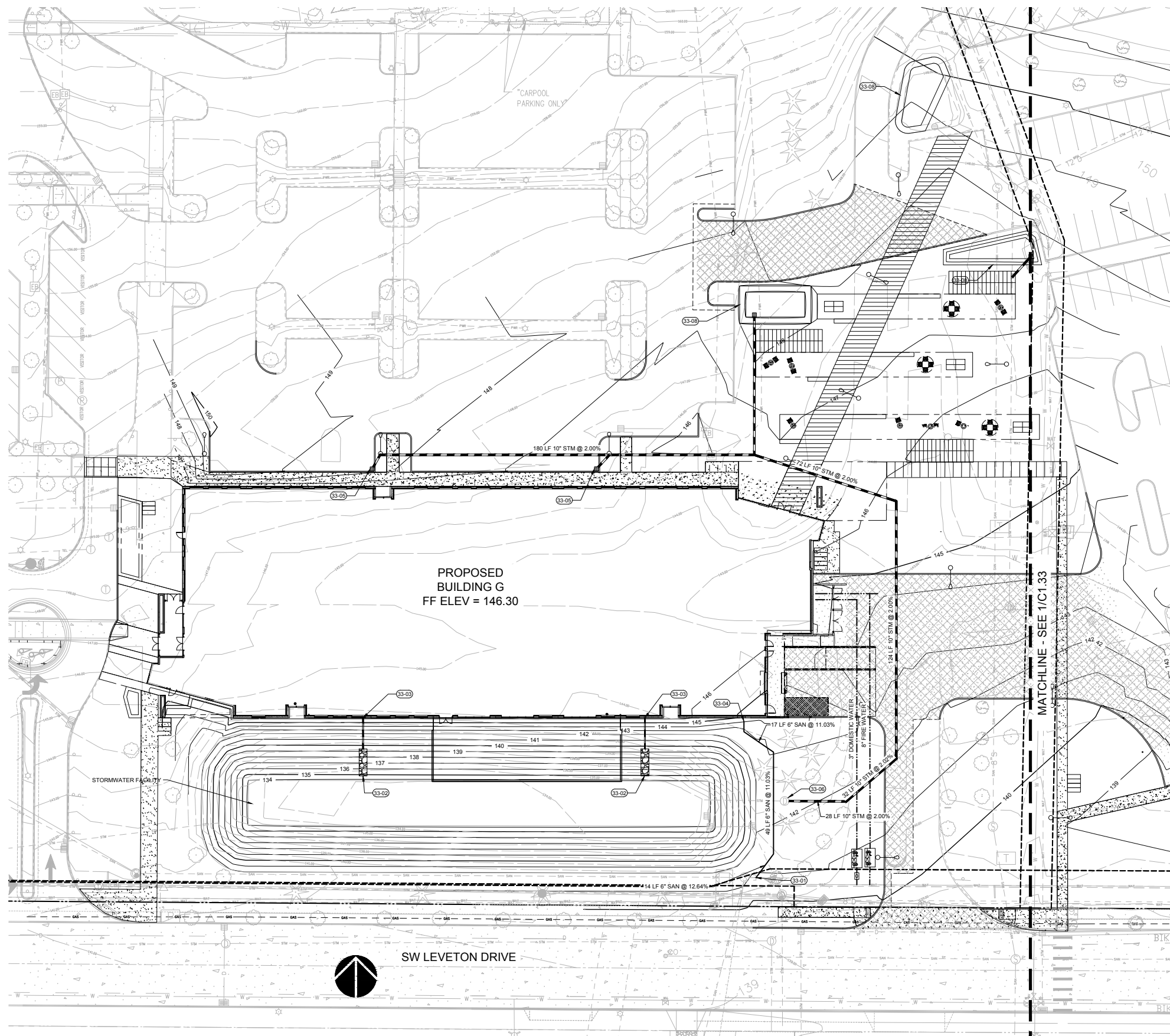
DRAWN BY: SJS  
CHECKED BY: BDN  
SHEET

# C1.31

JOB NO. **2220087.00**

### KEYNOTES

- 33-01 CONNECT SEWER TO EXISTING MANHOLE STUB
- 33-02 6" ROOF DRAIN OUTFALL WITH RIPRAP
- 33-03 ROOF DRAIN CONNECTION TO PLUMBING
- 33-04 CONNECT SEWER LATERAL TO PLUMBING
- 33-05 CATCH BASIN
- 33-06 CONNECT STORM TO EXISTING MANHOLE
- 33-08 STORMWATER BASIN
- 33-09 OVERFLOW OUTLET



REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**NORTHWEST  
 PARKING  
 EXPANSION  
 UTILITY PLANS**

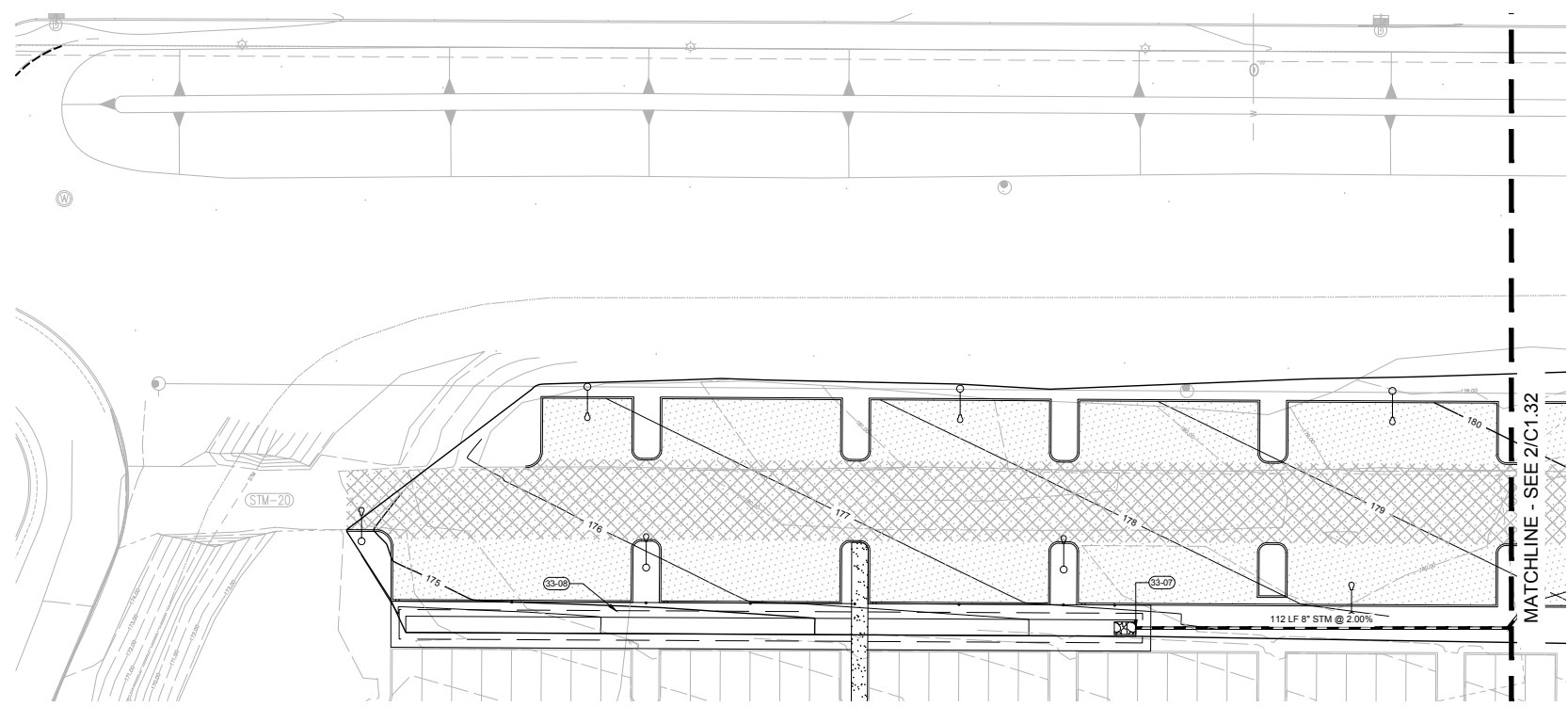
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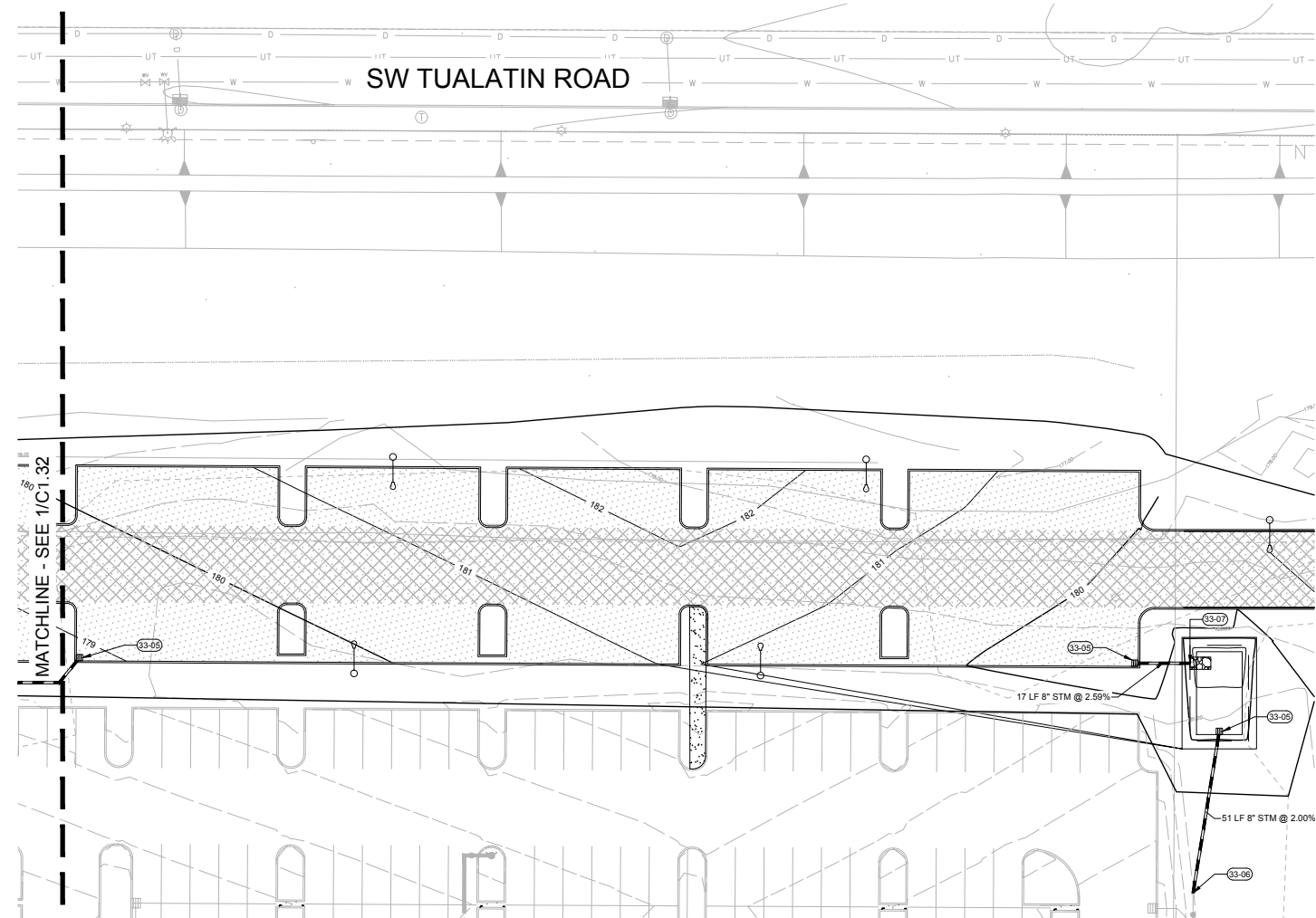
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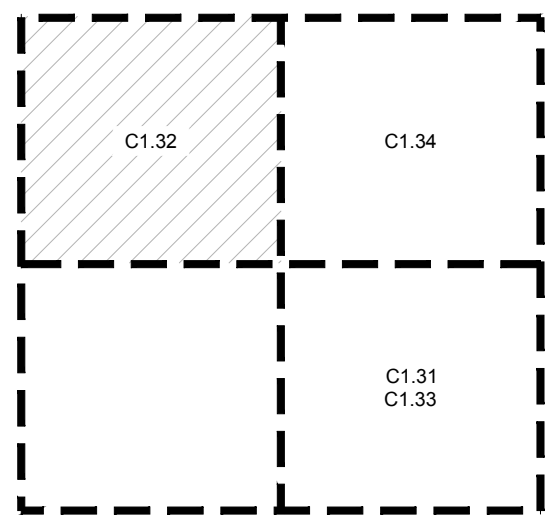
- 33-05 CATCH BASIN
- 33-06 CONNECT STORM TO EXISTING MANHOLE
- 33-07 PIPE OUTFALL WITH RIPRAP
- 33-08 STORMWATER BASIN
- 33-09 OVERFLOW OUTLET



**1 NW PARKING EXPANSION UTILITY PLAN - WEST**  
 C1.32 1" = 20'-0"  
 ( IN FEET )  
 1 inch = 20 ft.



**2 NW PARKING EXPANSION UTILITY PLAN - EAST**  
 C1.32 1" = 20'-0"  
 ( IN FEET )  
 1 inch = 20 ft.



**KEY MAP**  
 SCALE: NTS



Architecture - Interiors  
Planning - Engineering

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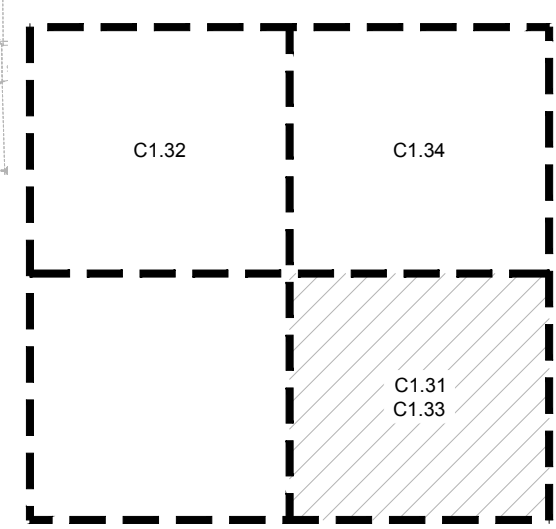
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EXPANSION  
UTILITY PLAN**

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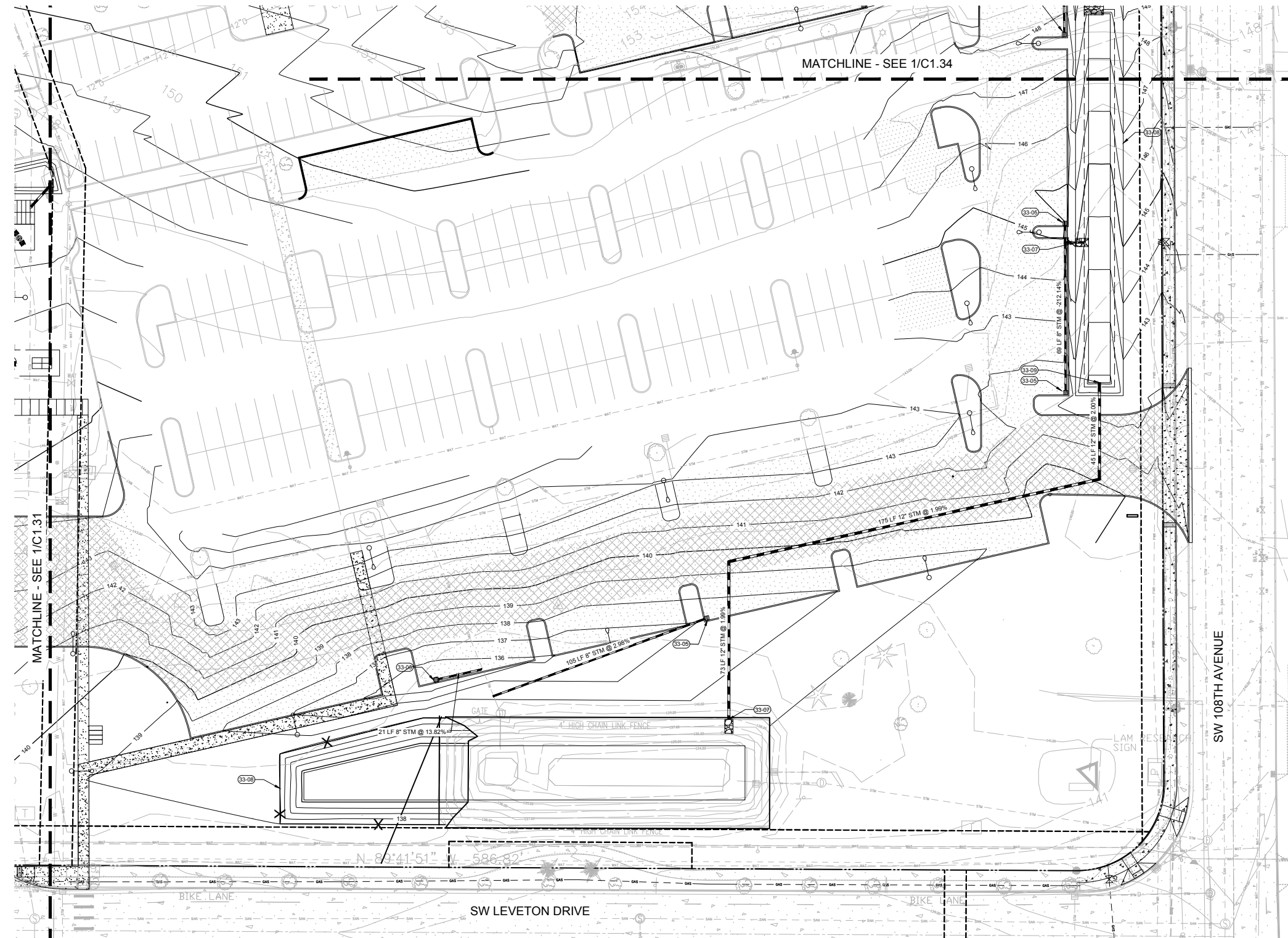
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JOB NO. **2220087.00**

- KEYNOTES**
- 33-05 CATCH BASIN
  - 33-07 PIPE OUTFALL WITH RIPRAP
  - 33-08 STORMWATER BASIN
  - 33-09 OVERFLOW OUTLET



**Schematic Design 8/2/2022**

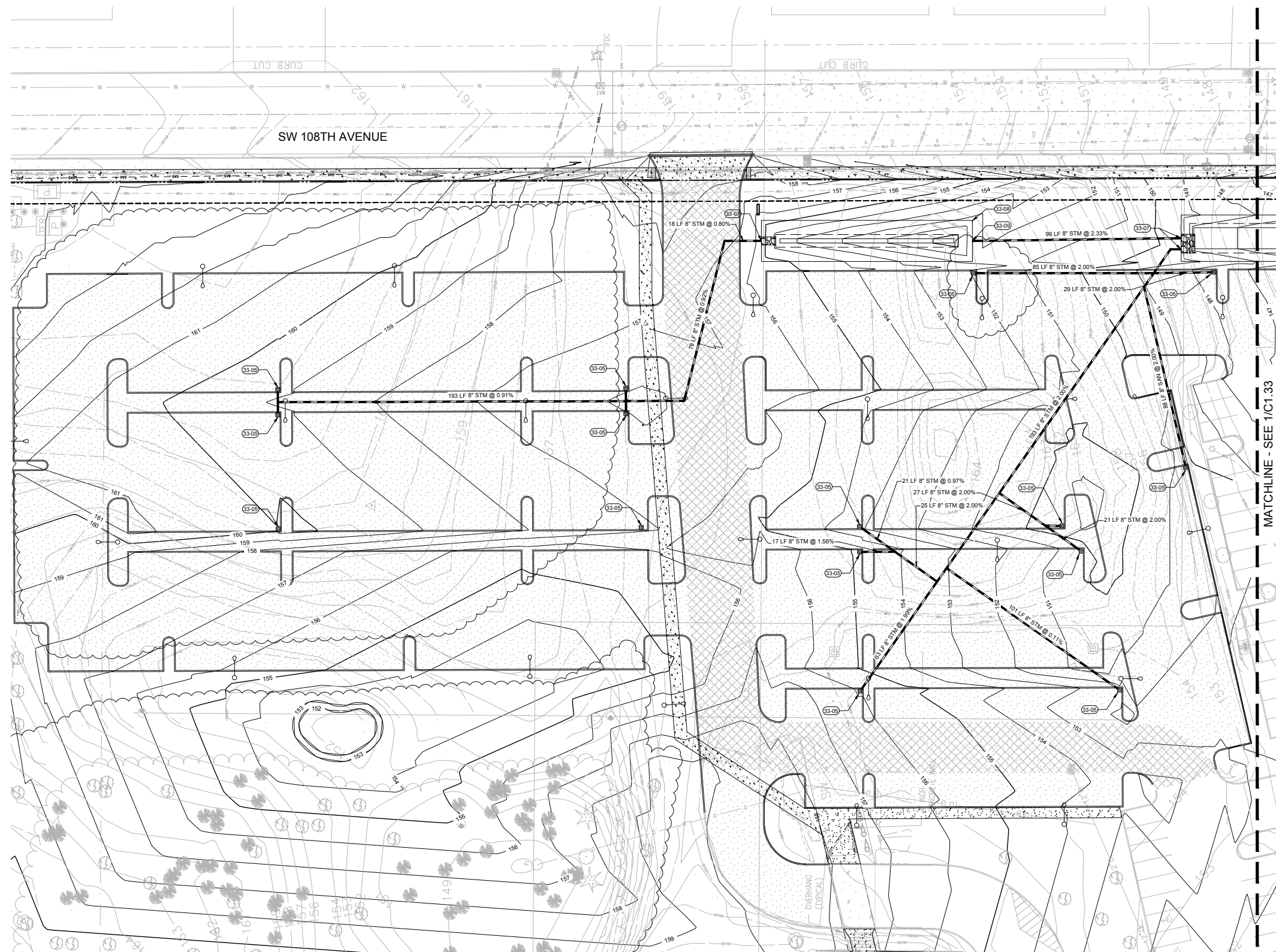


**1 EAST PARKING EXPANSION UTILITY PLAN**  
C1.33  
1" = 20'-0"  
0 10 20 40 80  
( IN FEET )  
1 inch = 20 ft



**KEYNOTES**

- 33-05 CATCH BASIN
- 33-07 PIPE OUTFALL WITH RIPRAP
- 33-08 STORMWATER BASIN
- 33-09 OVERFLOW OUTLET



MATCHLINE - SEE 1/C1.33

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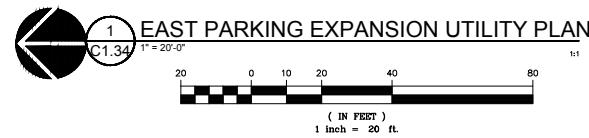
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Delta	Issued As	Issue Date

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**EAST PARKING  
EXPANSION  
UTILITY PLAN**

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SHEET

**C1.34**

JOB NO. **2220087.00**





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APPENDIX E  
**2001 NOVELLUS  
STORM REPORT**

# Storm Calculations

Novellus  
Tualatin, Oregon

3.5



EXPIRES: 12/31/01

Project Number: 000321

Dated: 2/14/01

REVISED: 3/6/01

**Description:**

Novellus is located on the northwest corner of SW Leveton Drive and SW 108th Avenue. The site is comprised of approximately 58 acres. The site currently has two buildings remaining from the previous Oki site. The two buildings were purchased by Novellus along with the property.

Water quality will be provided for all of the site including the existing impervious areas. Water quality will be provided to meet USA requirements which are to treat the "summer" storm or the first 0.36" of rainfall falling in a four hour period. Dry detention ponds with a permanent pool will be the method employed to accomplish treatment. The ponds are sized for full build out of the Novellus Master Plan as submitted in the Industrial Master Plan with the City of Tualatin.

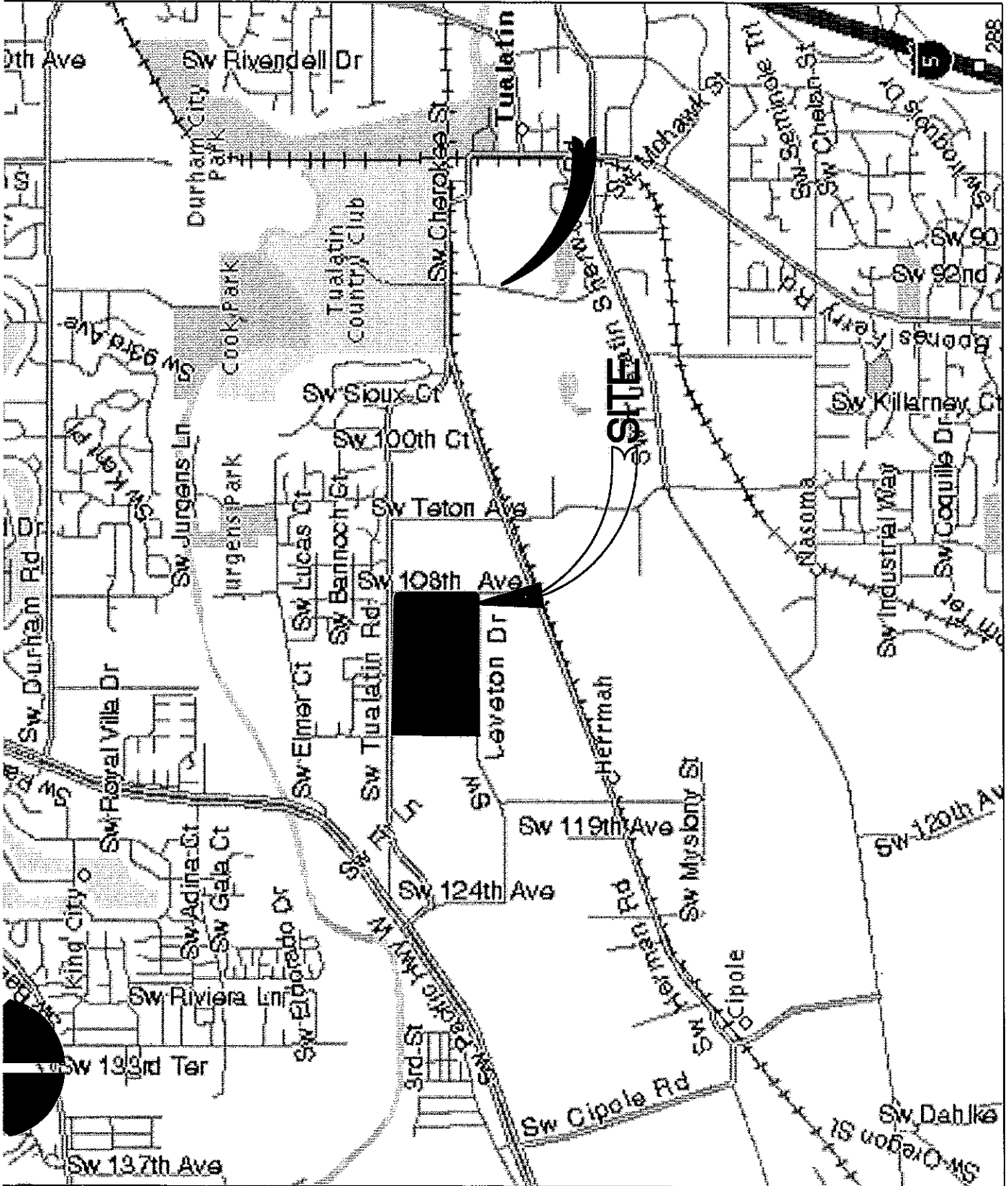
Detention will be provided to limit runoff from the site to match existing runoff for storms upto the 25yr event. Each pond will serve approximately 25% of the full built out site. The SCS based software program "WaterWorks" has been used to design the detention ponds.

All pipes have been designed to convey the 25yr storm using SCS methodology.

## Table of Contents

- A. Vicinity Map
- B. Site Map
- C. Areas with full 'build-out'
- D. Water Quality Volumes required
- E. Detention Summary
- F. SCS Soils Map
- G. SCS Soils Classification
- H. SCS Curve Number
- I. Pond 'A' Total Volume
- J. Pond 'A' Detention Volume
- K. Water Quality Orifice Sizing
- L. Pond 'A' Pond Outlet
- M. Pond 'A' computer detention calc's
- N. Pond 'B' Total Volume
- O. Pond 'B' Detention Volume
- P. Water Quality Orifice Sizing
- Q. Pond 'B' Pond Outlet
- R. Pond 'B' computer detention calc's
- S. Pond 'C' Total Volume
- T. Pond 'C' Detention Volume
- U. Water Quality Orifice Sizing
- V. Pond 'C' Pond Outlet
- W. Pond 'C' computer detention calc's
- X. Pipe sizing areas
- Y. Computer volumes for pipe sizing
- Z. Pipe sizing calc's

Attachment 'A'      Drainage Map



'A' VICINITY MAP





'C' AREAS W/ FULL 'BUILD-OUT'

POND 'A'

TOTAL AREA = 598,000  $\phi$  = 13.72 AC  
PERVIOUS AREA (15%) = 89,700  $\phi$  = 2.06 AC  
IMPERVIOUS AREA (85%) = 508,300  $\phi$  = 11.66 AC

POND 'B'

TOTAL AREA = 598,600  $\phi$  = 13.72 AC  
PERVIOUS AREA = 89,700  $\phi$  = 2.06 AC  
IMPERVIOUS = 508,300  $\phi$  = 11.66 AC

POND 'C'

TOTAL AREA = 643,500  $\phi$  = 14.77 AC  
PERVIOUS AREA = 96,525  $\phi$  = 2.22 AC  
IMPERVIOUS AREA = 546,975  $\phi$  = 12.55 AC

GROUP

**MACKENZIE**

0690 SW Bancroft St/PO Box 69039 Portland, OR 97201-0039  
Tel: 503.224.9560 Net: info@grpmack.com Fax: 503.228.1285

By \_\_\_\_\_

Date \_\_\_\_\_

Job # \_\_\_\_\_

Sht. \_\_\_\_\_ of \_\_\_\_\_

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# 'D' WQ VOLUMES REQUIRED

## POND 'A'

$$\text{VOL} = 508,300 \text{ ft}^2 \times 0.36 \text{ in} \times \frac{1\text{ft}}{12 \text{ in}} = \underline{\underline{15,250 \text{ ft}^3}}$$

## POND 'B'

$$\text{VOL} = 508,300 \text{ ft}^2 \times 0.36 \text{ in} \times \frac{1\text{ft}}{12 \text{ in}} = \underline{\underline{15,249 \text{ ft}^3}}$$

## POND 'C'

$$\text{VOL} = 546,975 \text{ ft}^2 \times 0.36 \text{ in} \times \frac{1\text{ft}}{12 \text{ in}} = \underline{\underline{16,409 \text{ ft}^3}}$$

GROUP

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By \_\_\_\_\_

Date \_\_\_\_\_

Job # \_\_\_\_\_

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# 'E' DETENTION SUMMARY

## POND 'A'

	EXIST. (cfs)	DEVELOP. (cfs)	RELEASE (cfs)	PEAK STAGE
2 YR	1.36	5.52	1.36	140.80
10 YR	2.90	7.93	1.58	141.99
25 YR	5.52	9.08	1.59	142.00

## POND 'B'

	EXIST. (cfs)	DEVEL. (cfs)	RELEASE (cfs)	PEAK STAGE
2 YR	1.36	5.73	1.36	138.97
10 YR	2.90	8.23	1.67	140.91
25 YR	3.71	9.42	1.78	140.97

## POND 'C'

	EXIST. (cfs)	DEVEL. (cfs)	RELEASE (cfs)	PEAK STAGE
2 YR	1.46	6.14	1.46	137.70
10 YR	3.12	8.82	1.76	138.98
25 YR	3.99	10.10	1.98	140.66

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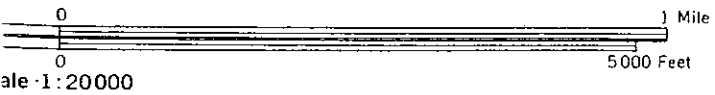
By \_\_\_\_\_

Date \_\_\_\_\_

Job # \_\_\_\_\_

Sht. \_\_\_\_\_ of \_\_\_\_\_

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F' SOILS MAP



TABLE 13.—Soil and

[Absence of an entry indicates the feature is not a concern. See Glossary for descriptions of such

Soil name and map symbol	Hydro- logic group	Flooding		
		Frequency	Duration	Months
Aloha: 1	C	None		
Amity: 2	C	None		
Astoria: 3E, 3F	B	None		
Briedwell: 4B, 5B, 5C, 5D	B	None		
Carlton: 6B, 6C	B	None		
Cascade: 7B, 7C, 7D, 7E, 7F	C	None		
Cehalem: 8C	C	None		
Cehalis: 9, 10	B	Common	Brief	Nov-Mar
Cornelius: <sup>1</sup> 11B, <sup>1</sup> 11C, <sup>1</sup> 11D, <sup>1</sup> 11E, <sup>1</sup> 11F; Cornelius part	C	None		
Kinton part	C	None		
Cornelius Variant: 12A, 12B, 12C	C	None		
Cove: 13, 14	D	Common	Brief	Dec-Apr
Dayton: 15	D	None		
Delena: 16C	D	None		
Goble: 17B, 17C, 17D, 17E, 18E, 18F	C	None		
Helvetia: 19B, 19C, 19D, 19E	C	None		
Hembre: 20E, 20F, 20G	B	None		
Hillsboro: 21A, 21B, 21C, 21D	B	None		
Huberly: 22	D	None		
Jory: 23B, 23C, 23D, 23E, 23F	C	None		
Kilchis: <sup>1</sup> 24G: Kilchis part	C	None		
Klickitat part	B	None		

STORMWATER MANAGEMENT MANUAL FOR THE PUGET SOUND BASIN

Table III-1.3 SCS Western Washington Runoff Curve Numbers  
 (Published by SCS in 1982) Runoff curve numbers for selected agricultural, suburban and urban land use for Type 1A rainfall distribution, 24-hour storm duration.

LAND USE DESCRIPTION	CURVE NUMBERS BY HYDROLOGIC SOIL GROUP			
	A	B	C	D
Cultivated land(1): winter condition	86	91	94	95
Mountain open areas: low growing brush & grasslands	74	82	89	92
Meadow or pasture:	65	78	85	89
Wood or forest land: undisturbed	42	64	76	81
Wood or forest land: young second growth or brush	55	72	81	86
Orchard: with cover crop	81	88	92	94
Open spaces, lawns, parks, golf courses, cemeteries, landscaping.				
Good condition: grass cover on ≥75% of the area	68	80	86	90
Fair condition: grass cover on 50-75% of the area	77	85	90	92
Gravel roads & parking lots:	76	85	89	91
Dirt roads & parking lots:	72	82	87	89
Impervious surfaces, pavement, roofs etc.	98	98	98	98
Open water bodies: lakes, wetlands, ponds etc.	100	100	100	100
Single family residential(2):				
Dwelling Unit/Gross Acre      %Impervious(3)				
1.0 DU/GA                              15				
1.5 DU/GA                              20				
2.0 DU/GA                              25				
2.5 DU/GA                              30				
3.0 DU/GA                              34				
3.5 DU/GA                              38				
4.0 DU/GA                              42				
4.5 DU/GA                              46				
5.0 DU/GA                              48				
5.5 DU/GA                              50				
6.0 DU/GA                              52				
6.5 DU/GA                              54				
7.0 DU/GA                              56				
PUD's, condos, apartments, commercial businesses & industrial areas				
		%impervious must be computed		
		Separate curve number shall be selected for pervious & impervious portions of the site or basin		

- (1) For a more detailed description of agricultural land use curve numbers refer to National Engineering Handbook, Sec. 4, Hydrology, Chapter 9, August 1972.
- (2) Assumes roof and driveway runoff is directed into street/storm system.
- (3) The remaining pervious areas (lawn) are considered to be in good condition for these curve numbers.

'I' - POND 'A' TOTAL VOLUME

ELEV. (FT)	AREA (SF)	VOL (CF)	CUMM. VOL (CF)
138	7015		
139	8904	7960	7960
140	10,849	9876	17,836 ← WQ VOL @ 139.75
141	12,851	11,850	29,686
142	14,909	13,880	43,566
143	17,024	15,967	59,532

WQ RELEASE RATE

$$\frac{15,250 \text{ ft}^3}{48 \text{ HRS}} \times \frac{1 \text{ hr}}{3600 \text{ s}} = 0.088 \text{ CS/s}$$

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Date \_\_\_\_\_  
Job # \_\_\_\_\_  
Sht. \_\_\_\_\_ of \_\_\_\_\_

J - POND 'A' DETENTION VOLUME

ELEV (FT)	AREA (SF)	VOL (CCF)	CUMM VOL (CCF)
139.75	10,363		
.140	10,849	2652	2652
.141	12,851	11,850	14,501
.142	14,909	13,880	28,382
.143	17,024	15,967	44,348

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 Date \_\_\_\_\_  
 Job # \_\_\_\_\_  
 Sht. \_\_\_\_\_ of \_\_\_\_\_

'K' - WQ ORIFICE 'A'

$$Q = CA(2gh)^{1/2}$$

$$A = \frac{Q}{C(2gh)^{1/2}}$$

$$A = \frac{0.088}{0.62(2 \times 32.2 \times 2.10)^{1/2}}$$

$$A = 0.0122 \text{ ft}^2$$

$$d = \sqrt{\frac{4A}{\pi}} = 0.125' = \underline{\underline{1.50'' \text{ } \phi}}$$

$$Q = 0.088$$

$$C = 0.62$$

$$g = 32.2$$

$$h = 139.75 - 137.65 = 2.10'$$

$$A = \frac{\pi d^2}{4}$$

$$d = \sqrt{\frac{4A}{\pi}}$$

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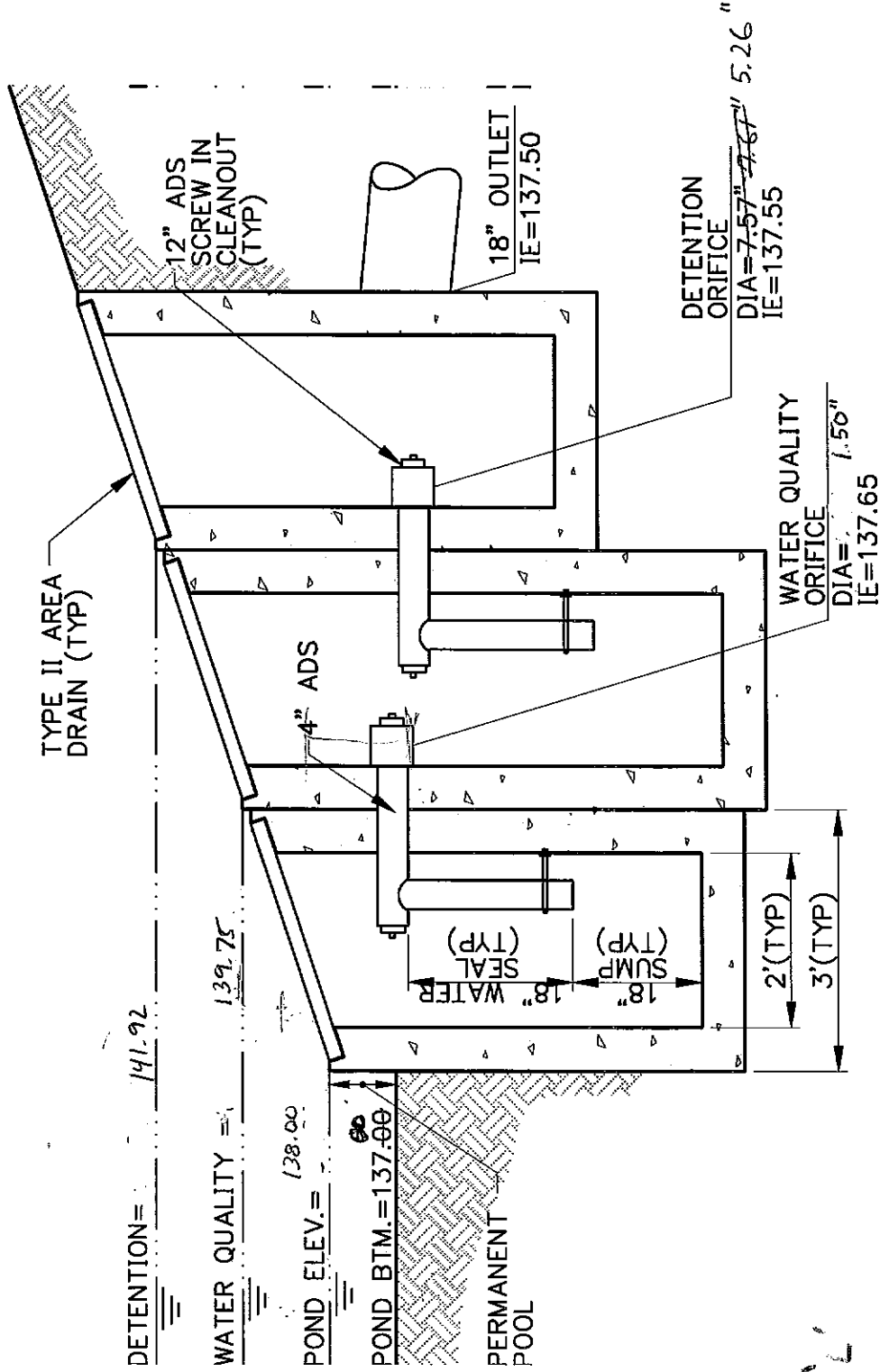
Date \_\_\_\_\_

Job # \_\_\_\_\_

Sht. \_\_\_\_\_ of \_\_\_\_\_

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# 1 POND "A" OUTLET DETAIL

C8.1 N.T.S. OUTFLOW DEVICE

SD150  
DETINSET= 1:1



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=====
  
BASIN SUMMARY
  
=====

BASIN ID: E10                   NAME: EXISTING 10YR STORM  
 SBUH METHODOLOGY  
 TOTAL AREA.....: 13.72 Acres           BASEFLOWS: 0.00 cfs  
 RAINFALL TYPE.....: TYPE1A           PERVIOUS AREA  
 PRECIPITATION.....: 3.45 inches           AREA..: 13.72 Acres  
 TIME INTERVAL.....: 10.00 min           CN....: 80.00  
 TIME OF CONC.....: 38.83 min           IMPERVIOUS AREA  
 ABSTRACTION COEFF: 0.20           AREA..: 0.00 Acres  
   CN....: 98.00  
 TcReach - Sheet   L: 300.00 ns:0.2400 p2yr: 2.50 s:0.0400  
 TcReach - Shallow L: 300.00 ks:10.00 s:0.0400  
 TcReach - Channel L:1400.00 kc:17.00 s:0.0400  
 PEAK RATE:    2.90 cfs   VOL:    1.83 Ac-ft   TIME:    490 min

BASIN ID: E2                    NAME: EXISTING 2YR STORM  
 SBUH METHODOLOGY  
 TOTAL AREA.....: 13.72 Acres           BASEFLOWS: 0.00 cfs  
 RAINFALL TYPE.....: TYPE1A           PERVIOUS AREA  
 PRECIPITATION.....: 2.50 inches           AREA..: 13.72 Acres  
 TIME INTERVAL.....: 10.00 min           CN....: 80.00  
 TIME OF CONC.....: 38.83 min           IMPERVIOUS AREA  
 ABSTRACTION COEFF: 0.20           AREA..: 0.00 Acres  
   CN....: 98.00  
 TcReach - Sheet   L: 300.00 ns:0.2400 p2yr: 2.50 s:0.0400  
 TcReach - Shallow L: 300.00 ks:10.00 s:0.0400  
 TcReach - Channel L:1400.00 kc:17.00 s:0.0400  
 PEAK RATE:    1.36 cfs   VOL:    1.02 Ac-ft   TIME:    490 min

BASIN ID: E25                  NAME: EXISTING 25YR STORM  
 SBUH METHODOLOGY  
 TOTAL AREA.....: 13.72 Acres           BASEFLOWS: 0.00 cfs  
 RAINFALL TYPE.....: TYPE1A           PERVIOUS AREA  
 PRECIPITATION.....: 3.90 inches           AREA..: 13.72 Acres  
 TIME INTERVAL.....: 10.00 min           CN....: 80.00  
 TIME OF CONC.....: 38.83 min           IMPERVIOUS AREA  
 ABSTRACTION COEFF: 0.20           AREA..: 0.00 Acres  
   CN....: 98.00  
 TcReach - Sheet   L: 300.00 ns:0.2400 p2yr: 2.50 s:0.0400  
 TcReach - Shallow L: 300.00 ks:10.00 s:0.0400  
 TcReach - Channel L:1400.00 kc:17.00 s:0.0400  
 PEAK RATE:    3.71 cfs   VOL:    2.24 Ac-ft   TIME:    490 min

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HYDROGRAPH SUMMARY

HYD NUM	PEAK RUNOFF RATE cfs	TIME OF PEAK min.	VOLUME OF HYDRO cf\AcFt	Contrib Area Acres
1	1.356	490	44270 cf	13.72
2	2.902	490	79526 cf	13.72
3	3.714	490	97581 cf	13.72
5	5.522	480	102758 cf	13.72
6	7.929	480	148087 cf	13.72
7	9.079	480	169790 cf	13.72
10	1.355	700	102983 cf	13.72
11	1.584	630	35096 cf	13.72
12	1.570	530	27536 cf	13.72

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ROUTING REPORT

STORAGE LIST            ID No.    A  
Description:

MULTIPLE ORIFICE        ID No.    A  
Description:  
Outlet Elev:    137.55  
Elev:    137.55 ft        Orifice Diameter:    5.2617 in.

ROUTING CURVE

STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min
137.55	0.0000	0.0000	0.0000	139.10	3837	0.9354	13.725	140.70	24218	1.3334	82.059
137.60	0.0000	0.1680	0.1680	139.20	5022	0.9651	17.704	140.80	25606	1.3544	86.707
137.70	0.0000	0.2910	0.2910	139.30	6207	0.9939	21.683	140.90	26994	1.3751	91.355
137.80	0.0000	0.3757	0.3757	139.40	7392	1.0219	25.661	141.00	28382	1.3955	96.002
137.90	0.0000	0.4445	0.4445	139.50	8577	1.0491	29.637	141.10	29979	1.4156	101.34
138.00	0.0000	0.5040	0.5040	139.60	9761	1.0757	33.614	141.20	31575	1.4354	106.69
138.10	0.0000	0.5572	0.5572	139.70	10946	1.1016	37.589	141.30	33172	1.4549	112.03
138.20	0.0000	0.6057	0.6057	139.80	12131	1.1270	41.564	141.40	34768	1.4742	117.37
138.30	0.0000	0.6507	0.6507	139.90	13316	1.1517	45.539	141.50	36365	1.4932	122.71
138.40	0.0000	0.6927	0.6927	140.00	14501	1.1760	49.513	141.60	37962	1.5120	128.05
138.50	0.0000	0.7323	0.7323	140.10	15889	1.1997	54.163	141.70	39558	1.5305	133.39
138.60	0.0000	0.7699	0.7699	140.20	17277	1.2230	58.814	141.80	41155	1.5489	138.73
138.70	0.0000	0.8057	0.8057	140.30	18665	1.2459	63.464	141.90	42751	1.5670	144.07
138.80	530.40	0.8400	2.6080	140.40	20053	1.2684	68.113				
138.90	1591	0.8729	6.1769	140.50	21442	1.2904	72.762				
139.00	2652	0.9047	9.7447	140.60	22830	1.3121	77.411				



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LEVEL POOL ROUTING TABLE

MATCH Q (cfs) : 1.36 INFLOW Q (cfs): 5.52  
 PEAK STAGE (ft): 140.80 PEAK OUTFLOW : 1.36  
 PEAK TIME: 700.00 min.  
 INFLOW HYD No. : 5 OUTFLOW HYD No.: 10

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	137.55	50.00
0.0001	0.0062	0.0000	0.0063	0.0001	0.0062	137.55	60.00
0.0062	0.0358	0.0000	0.0420	0.0062	0.0358	137.55	70.00
0.0358	0.0902	0.0000	0.1259	0.0358	0.0902	137.55	80.00
0.0902	0.1532	0.0000	0.2434	0.0902	0.1532	137.55	90.00
0.1532	0.2163	0.0000	0.3695	0.1532	0.2163	137.55	100.00
0.2163	0.2756	0.0000	0.4919	0.2163	0.2756	137.55	110.00
0.2756	0.3295	0.0000	0.6051	0.2756	0.3295	137.55	120.00
0.3295	0.3947	0.0000	0.7242	0.3295	0.3947	137.55	130.00
0.3947	0.4686	0.0000	0.8633	0.3947	0.4686	137.55	140.00
0.4686	0.5284	0.0000	0.9970	0.4686	0.5284	137.55	150.00
0.5284	0.5757	0.0000	1.1042	0.5284	0.5757	137.55	160.00
0.5757	0.6188	0.0000	1.1946	0.5757	0.6188	137.55	170.00
0.6188	0.6554	0.0000	1.2742	0.6188	0.6554	137.55	180.00
0.6554	0.6842	0.0000	1.3396	0.6554	0.6842	137.55	190.00
0.6842	0.7129	0.0000	1.3971	0.6842	0.7129	137.55	200.00
0.7129	0.7378	0.0000	1.4507	0.7129	0.7378	137.55	210.00
0.7378	0.7566	0.0000	1.4944	0.7378	0.7566	137.55	220.00
0.7566	0.7773	0.0000	1.5339	0.7566	0.7773	137.55	230.00
0.7773	0.7952	0.0000	1.5725	0.7773	0.7952	137.55	240.00
0.7952	0.8366	0.0000	1.6319	0.7952	0.8366	137.55	250.00
0.8366	0.8912	0.0304	1.7583	0.8063	0.9520	138.70	260.00
0.8912	0.9280	0.1435	1.9627	0.8085	1.1543	138.71	270.00
0.9280	0.9574	0.3419	2.2273	0.8123	1.4150	138.72	280.00
0.9574	0.9756	0.5977	2.5306	0.8173	1.7133	138.73	290.00
0.9756	0.9904	0.8904	2.8563	0.8230	2.0334	138.75	300.00
0.9904	1.1189	1.2043	3.3136	0.8291	2.4846	138.77	310.00
1.1189	1.3095	1.6469	4.0754	0.8376	3.2377	138.79	320.00
1.3095	1.4235	2.3919	5.1249	0.8458	4.2791	138.82	330.00
1.4235	1.4938	3.4237	6.3410	0.8554	5.4856	138.85	340.00
1.4938	1.5398	4.6191	7.6527	0.8666	6.7861	138.88	350.00
1.5398	1.5727	5.9077	9.0202	0.8784	8.1418	138.92	360.00
1.5727	1.5694	7.2514	10.393	0.8904	9.5031	138.96	370.00
1.5694	1.5448	8.6005	11.715	0.9025	10.812	138.99	380.00
1.5448	1.5328	9.8993	12.977	0.9129	12.064	139.03	390.00
1.5328	1.5311	11.141	14.205	0.9226	13.283	139.06	400.00
1.5311	1.5386	12.351	15.421	0.9320	14.489	139.09	410.00
1.5386	1.5435	13.548	16.630	0.9411	15.689	139.12	420.00
1.5435	1.9599	14.739	18.242	0.9500	17.292	139.15	430.00
1.9599	2.6167	16.330	20.907	0.9620	19.945	139.19	440.00
2.6167	3.0001	18.963	24.580	0.9813	23.599	139.26	450.00

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 =====  
 LEVEL POOL ROUTING TABLE
 =====

## LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs			min	----->			(ft)	(min)
3.0001	3.8181	22.591	29.410	1.0074	28.402	139.35	460.00	
3.8181	4.8896	27.362	36.069	1.0407	35.029	139.47	470.00	
4.8896	5.5224	33.944	44.356	1.0849	43.271	139.64	480.00	
5.5224	5.0947	42.133	52.750	1.1376	51.613	139.84	490.00	
5.0947	4.0608	50.426	59.582	1.1867	58.395	140.05	500.00	
4.0608	3.4876	57.174	64.722	1.2209	63.501	140.19	510.00	
3.4876	3.1022	62.255	68.845	1.2461	67.599	140.30	520.00	
3.1022	2.8252	66.333	72.261	1.2659	70.995	140.39	530.00	
2.8252	2.6735	69.713	75.211	1.2820	73.929	140.46	540.00	
2.6735	2.4188	72.633	77.726	1.2959	76.430	140.53	550.00	
2.4188	2.1056	75.122	79.647	1.3075	78.339	140.58	560.00	
2.1056	1.9318	77.023	81.060	1.3164	79.744	140.62	570.00	
1.9318	1.8402	78.421	82.193	1.3228	80.870	140.65	580.00	
1.8402	1.7861	79.542	83.169	1.3280	81.841	140.67	590.00	
1.7861	1.7572	80.508	84.052	1.3324	82.719	140.70	600.00	
1.7572	1.7089	81.383	84.849	1.3364	83.512	140.71	610.00	
1.7089	1.6498	82.172	85.531	1.3400	84.191	140.73	620.00	
1.6498	1.6177	82.848	86.115	1.3431	84.772	140.75	630.00	
1.6177	1.5965	83.427	86.641	1.3457	85.295	140.76	640.00	
1.5965	1.5897	83.947	87.133	1.3481	85.785	140.77	650.00	
1.5897	1.5869	84.435	87.612	1.3503	86.261	140.78	660.00	
1.5869	1.5149	84.909	88.011	1.3524	86.658	140.79	670.00	
1.5149	1.4041	85.304	88.223	1.3542	86.869	140.80	680.00	
1.4041	1.3427	85.514	88.260	1.3552	86.905	140.80	690.00	
1.3427	1.3131	85.550	88.206	1.3553	86.850	140.80	700.00	
1.3131	1.2929	85.495	88.101	1.3551	86.746	140.80	710.00	
1.2929	1.2822	85.392	87.967	1.3546	86.612	140.80	720.00	
1.2822	1.2808	85.258	87.821	1.3540	86.467	140.80	730.00	
1.2808	1.2764	85.114	87.671	1.3534	86.318	140.79	740.00	
1.2764	1.2744	84.965	87.516	1.3527	86.163	140.79	750.00	
1.2744	1.2780	84.811	87.364	1.3520	86.012	140.79	760.00	
1.2780	1.2762	84.660	87.214	1.3513	85.863	140.79	770.00	
1.2762	1.2757	84.513	87.065	1.3506	85.714	140.78	780.00	
1.2757	1.2081	84.364	86.848	1.3499	85.498	140.78	790.00	
1.2081	1.0987	84.149	86.456	1.3490	85.107	140.77	800.00	
1.0987	1.0378	83.759	85.896	1.3472	84.549	140.77	810.00	
1.0378	1.0040	83.204	85.246	1.3447	83.901	140.75	820.00	
1.0040	0.9854	82.559	84.549	1.3418	83.207	140.74	830.00	
0.9854	0.9752	81.868	83.829	1.3386	82.490	140.72	840.00	
0.9752	1.0037	81.155	83.134	1.3354	81.798	140.71	850.00	
1.0037	1.0582	80.466	82.528	1.3322	81.196	140.69	860.00	
1.0582	1.0890	79.866	82.014	1.3295	80.684	140.68	870.00	
1.0890	1.1022	79.357	81.548	1.3271	80.221	140.67	880.00	
1.1022	1.1142	78.896	81.112	1.3250	79.787	140.66	890.00	
1.1142	1.1212	78.464	80.700	1.3230	79.377	140.65	900.00	
1.1212	1.1211	78.056	80.298	1.3211	78.977	140.64	910.00	
1.1211	1.1257	77.658	79.904	1.3193	78.585	140.63	920.00	

NOVELLUS

 =====  
 LEVEL POOL ROUTING TABLE
 =====

## LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs			min	----->			(ft)	(min)
1.1257	1.1285	77.268	79.522	1.3175	78.204	140.63	930.00	
1.1285	1.1261	76.889	79.143	1.3157	77.828	140.62	940.00	
1.1261	1.1293	76.513	78.769	1.3140	77.455	140.61	950.00	
1.1293	1.1314	76.143	78.403	1.3123	77.091	140.60	960.00	
1.1314	1.0216	75.780	77.933	1.3106	76.623	140.59	970.00	
1.0216	0.8577	75.314	77.194	1.3084	75.885	140.58	980.00	
0.8577	0.7661	74.580	76.204	1.3050	74.899	140.57	990.00	
0.7661	0.7108	73.599	75.076	1.3004	73.775	140.55	1000.00	
0.7108	0.6842	72.480	73.875	1.2951	72.580	140.52	1010.00	
0.6842	0.6695	71.290	72.644	1.2895	71.355	140.50	1020.00	
0.6695	0.7299	70.071	71.470	1.2837	70.187	140.47	1030.00	
0.7299	0.8367	68.908	70.475	1.2782	69.197	140.44	1040.00	
0.8367	0.8966	67.923	69.657	1.2735	68.383	140.42	1050.00	
0.8966	0.9303	67.113	68.940	1.2696	67.671	140.41	1060.00	
0.9303	0.9493	66.404	68.284	1.2662	67.018	140.39	1070.00	
0.9493	0.9601	65.755	67.664	1.2631	66.401	140.38	1080.00	
0.9601	0.9319	65.141	67.033	1.2601	65.773	140.36	1090.00	
0.9319	0.8776	64.516	66.325	1.2571	65.068	140.35	1100.00	
0.8776	0.8474	63.815	65.540	1.2536	64.286	140.33	1110.00	
0.8474	0.9641	63.036	64.848	1.2499	63.598	140.32	1120.00	
0.9641	0.8960	62.351	64.211	1.2465	62.965	140.30	1130.00	
0.8960	0.7289	61.721	63.346	1.2434	62.103	140.29	1140.00	
0.7289	0.7691	60.863	62.361	1.2392	61.122	140.27	1150.00	
0.7691	0.7874	59.888	61.444	1.2344	60.210	140.25	1160.00	
0.7874	0.7977	58.980	60.565	1.2299	59.335	140.23	1170.00	
0.7977	0.8079	58.110	59.715	1.2256	58.490	140.21	1180.00	
0.8079	0.8094	57.268	58.885	1.2214	57.664	140.19	1190.00	
0.8094	0.8104	56.447	58.067	1.2173	56.849	140.18	1200.00	
0.8104	0.8153	55.636	57.262	1.2132	56.049	140.16	1210.00	
0.8153	0.8139	54.839	56.469	1.2092	55.259	140.14	1220.00	
0.8139	0.8132	54.054	55.681	1.2052	54.476	140.12	1230.00	
0.8132	0.8173	53.275	54.905	1.2013	53.704	140.11	1240.00	
0.8173	0.8153	52.507	54.139	1.1974	52.942	140.09	1250.00	
0.8153	0.8143	51.748	53.378	1.1935	52.184	140.07	1260.00	
0.8143	0.8182	50.995	52.627	1.1896	51.438	140.06	1270.00	
0.8182	0.8162	50.252	51.886	1.1858	50.701	140.04	1280.00	
0.8162	0.8152	49.519	51.150	1.1820	49.968	140.03	1290.00	
0.8152	0.8190	48.790	50.424	1.1783	49.245	140.01	1300.00	
0.8190	0.8169	48.071	49.707	1.1744	48.533	139.99	1310.00	
0.8169	0.8159	47.363	48.995	1.1700	47.825	139.98	1320.00	
0.8159	0.7808	46.660	48.256	1.1657	47.091	139.96	1330.00	
0.7808	0.7266	45.930	47.437	1.1612	46.276	139.94	1340.00	
0.7266	0.6963	45.119	46.542	1.1562	45.386	139.92	1350.00	
0.6963	0.6752	44.235	45.607	1.1508	44.456	139.90	1360.00	
0.6752	0.6677	43.311	44.654	1.1450	43.509	139.87	1370.00	
0.6677	0.6637	42.370	43.701	1.1391	42.562	139.85	1380.00	
0.6637	0.6571	41.429	42.750	1.1332	41.617	139.83	1390.00	

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
0.6571	0.6578	40.489	41.804	1.1273	40.677	139.80	1400.00
0.6578	0.6583	39.556	40.872	1.1213	39.751	139.78	1410.00
0.6583	0.6543	38.635	39.948	1.1154	38.832	139.75	1420.00
0.6543	0.6565	37.723	39.034	1.1096	37.924	139.73	1430.00
0.6565	0.6577	36.820	38.135	1.1038	37.031	139.71	1440.00
0.6577	0.5109	35.933	37.101	1.0980	36.003	139.69	1450.00
0.5109	0.2855	34.912	35.709	1.0913	34.617	139.66	1460.00
0.2855	0.1596	33.535	33.980	1.0823	32.898	139.63	1470.00
0.1596	0.0892	31.827	32.076	1.0709	31.005	139.58	1480.00
0.0892	0.0499	29.947	30.086	1.0583	29.027	139.53	1490.00
0.0499	0.0279	27.982	28.060	1.0450	27.015	139.48	1500.00
0.0279	0.0156	25.984	26.027	1.0312	24.996	139.43	1510.00
0.0156	0.0087	23.979	24.003	1.0172	22.986	139.38	1520.00
0.0087	0.0049	21.983	21.997	1.0031	20.993	139.33	1530.00
0.0049	0.0027	20.005	20.012	0.9889	19.023	139.28	1540.00
0.0027	0.0015	18.049	18.053	0.9746	17.078	139.23	1550.00
0.0015	0.0008	16.118	16.120	0.9604	15.160	139.18	1560.00
0.0008	0.0005	14.214	14.215	0.9461	13.269	139.14	1570.00
0.0005	0.0003	12.337	12.338	0.9319	11.406	139.09	1580.00
0.0003	0.0001	10.489	10.489	0.9175	9.5714	139.04	1590.00
0.0001	0.0001	8.6683	8.6685	0.9032	7.7654	139.00	1600.00
0.0001	0.0000	6.8783	6.8784	0.8871	5.9913	138.94	1610.00
0.0000	0.0000	5.1201	5.1202	0.8712	4.2490	138.89	1620.00
0.0000	0.0000	3.3938	3.3939	0.8551	2.5387	138.85	1630.00
0.0000	0.0000	1.7001	1.7001	0.8387	0.8614	138.80	1640.00
0.0000	0.0000	0.0547	0.0547	0.8067	-0.7521	138.70	1650.00

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ROUTING REPORT

STORAGE LIST            ID No.    A  
Description:

MULTIPLE ORIFICE        ID No.    A  
Description:  
Outlet Elev:    137.55  
Elev:    137.55 ft        Orifice Diameter:    5.2617 in.

ROUTING CURVE

STAGE	STORAGE	OUTFLOW	O+2S	STAGE	STORAGE	OUTFLOW	O+2S	STAGE	STORAGE	OUTFLOW	O+2S
(ft)	(cf)	(cfs)	cfs-min	(ft)	(cf)	(cfs)	cfs-min	(ft)	(cf)	(cfs)	cfs-min
137.55	0.0000	0.0000	0.0000	139.10	3837	0.9354	13.725	140.70	24218	1.3334	82.059
137.60	0.0000	0.1680	0.1680	139.20	5022	0.9651	17.704	140.80	25606	1.3544	86.707
137.70	0.0000	0.2910	0.2910	139.30	6207	0.9939	21.683	140.90	26994	1.3751	91.355
137.80	0.0000	0.3757	0.3757	139.40	7392	1.0219	25.661	141.00	28382	1.3955	96.002
137.90	0.0000	0.4445	0.4445	139.50	8577	1.0491	29.637	141.10	29979	1.4156	101.34
138.00	0.0000	0.5040	0.5040	139.60	9761	1.0757	33.614	141.20	31575	1.4354	106.69
138.10	0.0000	0.5572	0.5572	139.70	10946	1.1016	37.589	141.30	33172	1.4549	112.03
138.20	0.0000	0.6057	0.6057	139.80	12131	1.1270	41.564	141.40	34768	1.4742	117.37
138.30	0.0000	0.6507	0.6507	139.90	13316	1.1517	45.539	141.50	36365	1.4932	122.71
138.40	0.0000	0.6927	0.6927	140.00	14501	1.1760	49.513	141.60	37962	1.5120	128.05
138.50	0.0000	0.7323	0.7323	140.10	15889	1.1997	54.163	141.70	39558	1.5305	133.39
138.60	0.0000	0.7699	0.7699	140.20	17277	1.2230	58.814	141.80	41155	1.5489	138.73
138.70	0.0000	0.8057	0.8057	140.30	18665	1.2459	63.464	141.90	42751	1.5670	144.07
138.80	530.40	0.8400	2.6080	140.40	20053	1.2684	68.113				
138.90	1591	0.8729	6.1769	140.50	21442	1.2904	72.762				
139.00	2652	0.9047	9.7447	140.60	22830	1.3121	77.411				



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LEVEL POOL ROUTING TABLE

MATCH Q (cfs) : 2.90 INFLOW Q (cfs): 7.93  
 PEAK STAGE (ft): 141.99 PEAK OUTFLOW : 1.58  
 PEAK TIME: 630.00 min.  
 INFLOW HYD No. : 6 OUTFLOW HYD No.: 11

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE (ft)	TIME (min)
----- cfs min ----->							
0.0000	0.0019	0.0000	0.0019	0.0000	0.0019	137.55	40.00
0.0019	0.0209	0.0000	0.0229	0.0019	0.0209	137.55	50.00
0.0209	0.0630	0.0000	0.0839	0.0209	0.0630	137.55	60.00
0.0630	0.1440	0.0000	0.2070	0.0630	0.1440	137.55	70.00
0.1440	0.2565	0.0000	0.4005	0.1440	0.2565	137.55	80.00
0.2565	0.3646	0.0000	0.6211	0.2565	0.3646	137.55	90.00
0.3646	0.4624	0.0000	0.8270	0.3646	0.4624	137.55	100.00
0.4624	0.5481	0.0000	1.0104	0.4624	0.5481	137.55	110.00
0.5481	0.6221	0.0000	1.1701	0.5481	0.6221	137.55	120.00
0.6221	0.7143	0.0000	1.3364	0.6221	0.7143	137.55	130.00
0.7143	0.8201	0.0000	1.5344	0.7143	0.8201	137.55	140.00
0.8201	0.9008	0.0142	1.7351	0.8060	0.9291	138.70	150.00
0.9008	0.9604	0.1211	1.9823	0.8080	1.1743	138.71	160.00
0.9604	1.0135	0.3615	2.3355	0.8127	1.5228	138.72	170.00
1.0135	1.0568	0.7035	2.7738	0.8193	1.9544	138.74	180.00
1.0568	1.0886	1.1269	3.2723	0.8275	2.4447	138.76	190.00
1.0886	1.1211	1.6078	3.8176	0.8369	2.9807	138.79	200.00
1.1211	1.1484	2.1373	4.4068	0.8434	3.5634	138.81	210.00
1.1484	1.1673	2.7146	5.0303	0.8488	4.1814	138.83	220.00
1.1673	1.1896	3.3269	5.6838	0.8545	4.8293	138.84	230.00
1.1896	1.2085	3.9688	6.3669	0.8605	5.5064	138.86	240.00
1.2085	1.2628	4.6396	7.1110	0.8667	6.2442	138.88	250.00
1.2628	1.3370	5.3707	7.9705	0.8735	7.0970	138.90	260.00
1.3370	1.3845	6.2159	8.9374	0.8811	8.0563	138.93	270.00
1.3845	1.4213	7.1667	9.9725	0.8897	9.0828	138.95	280.00
1.4213	1.4427	8.1840	11.048	0.8988	10.149	138.98	290.00
1.4427	1.4610	9.2414	12.145	0.9078	11.237	139.01	300.00
1.4610	1.6480	10.321	13.430	0.9162	12.514	139.04	310.00
1.6480	1.9273	11.588	15.163	0.9260	14.237	139.07	320.00
1.9273	2.0950	13.298	17.320	0.9392	16.381	139.11	330.00
2.0950	2.1991	15.426	19.720	0.9552	18.765	139.17	340.00
2.1991	2.2669	17.792	22.258	0.9728	21.285	139.23	350.00
2.2669	2.3136	20.294	24.875	0.9910	23.884	139.29	360.00
2.3136	2.3054	22.874	27.493	1.0094	26.484	139.36	370.00
2.3054	2.2653	25.456	30.027	1.0275	29.000	139.42	380.00
2.2653	2.2436	27.955	32.464	1.0448	31.419	139.48	390.00
2.2436	2.2370	30.358	34.838	1.0610	33.777	139.54	400.00
2.2370	2.2440	32.701	37.182	1.0768	36.105	139.60	410.00
2.2440	2.2474	35.013	39.504	1.0920	38.412	139.66	420.00
2.2474	2.8471	37.305	42.400	1.1069	41.293	139.72	430.00
2.8471	3.7928	40.168	46.808	1.1252	45.683	139.79	440.00

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE								
I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs			min	----->			(ft)	(min)
=====								
3.7928	4.3398	44.530	52.663	1.1526	51.510	139.90	450.00	
4.3398	5.5086	50.324	60.172	1.1862	58.986	140.04	460.00	
5.5086	7.0369	57.762	70.308	1.2239	69.084	140.20	470.00	
7.0369	7.9294	67.811	82.777	1.2730	81.504	140.42	480.00	
7.9294	7.3040	80.173	95.407	1.3309	94.076	140.69	490.00	
7.3040	5.8151	92.689	105.81	1.3870	104.42	140.96	500.00	
5.8151	4.9882	102.99	113.80	1.4270	112.37	141.16	510.00	
4.9882	4.4319	110.91	120.33	1.4561	118.88	141.31	520.00	
4.4319	4.0321	117.40	125.86	1.4795	124.38	141.43	530.00	
4.0321	3.8122	122.88	130.73	1.4991	129.23	141.53	540.00	
3.8122	3.4466	127.71	134.97	1.5161	133.46	141.62	550.00	
3.4466	2.9985	131.92	138.37	1.5307	136.84	141.70	560.00	
2.9985	2.7496	135.30	141.04	1.5424	139.50	141.76	570.00	
2.7496	2.6178	137.95	143.32	1.5515	141.77	141.81	580.00	
2.6178	2.5397	140.21	145.37	1.5592	143.81	141.86	590.00	
2.5397	2.4974	142.24	147.28	1.5661	145.71	141.90	600.00	
2.4974	2.4279	144.14	149.06	1.5725	147.49	141.93	610.00	
2.4279	2.3430	145.91	150.68	1.5784	149.11	141.96	620.00	
2.3430	2.2966	147.52	152.16	1.5839	150.58	141.99	630.00	
2.2966	2.2658	150.58	155.14	0.0000	155.14	0.00	640.00	
2.2658	2.2555	155.14	159.66	0.0000	159.66	0.00	650.00	
2.2555	2.2507	159.66	164.17	0.0000	164.17	0.00	660.00	
2.2507	2.1480	164.17	168.57	0.0000	168.57	0.00	670.00	
2.1480	1.9905	168.57	172.70	0.0000	172.70	0.00	680.00	
1.9905	1.9030	172.70	176.60	0.0000	176.60	0.00	690.00	
1.9030	1.8606	176.60	180.36	0.0000	180.36	0.00	700.00	
1.8606	1.8315	180.36	184.05	0.0000	184.05	0.00	710.00	
1.8315	1.8159	184.05	187.70	0.0000	187.70	0.00	720.00	
1.8159	1.8136	187.70	191.33	0.0000	191.33	0.00	730.00	
1.8136	1.8069	191.33	194.95	0.0000	194.95	0.00	740.00	
1.8069	1.8037	194.95	198.56	0.0000	198.56	0.00	750.00	
1.8037	1.8084	198.56	202.17	0.0000	202.17	0.00	760.00	
1.8084	1.8056	202.17	205.79	0.0000	205.79	0.00	770.00	
1.8056	1.8045	205.79	209.40	0.0000	209.40	0.00	780.00	
1.8045	1.7086	209.40	212.91	0.0000	212.91	0.00	790.00	
1.7086	1.5536	212.91	216.17	0.0000	216.17	0.00	800.00	
1.5536	1.4672	216.17	219.19	0.0000	219.19	0.00	810.00	
1.4672	1.4192	219.19	222.08	0.0000	222.08	0.00	820.00	
1.4192	1.3927	222.08	224.89	0.0000	224.89	0.00	830.00	
1.3927	1.3781	224.89	227.66	0.0000	227.66	0.00	840.00	
1.3781	1.4182	227.66	230.46	0.0000	230.46	0.00	850.00	
1.4182	1.4949	230.46	233.37	0.0000	233.37	0.00	860.00	
1.4949	1.5382	233.37	236.40	0.0000	236.40	0.00	870.00	
1.5382	1.5567	236.40	239.50	0.0000	239.50	0.00	880.00	
1.5567	1.5733	239.50	242.63	0.0000	242.63	0.00	890.00	
1.5733	1.5830	242.63	245.79	0.0000	245.79	0.00	900.00	
1.5830	1.5827	245.79	248.95	0.0000	248.95	0.00	910.00	

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
1.5827	1.5888	248.95	252.12	0.0000	252.12	0.00	920.00
1.5888	1.5926	252.12	255.30	0.0000	255.30	0.00	930.00
1.5926	1.5890	255.30	258.49	0.0000	258.49	0.00	940.00
1.5890	1.5933	258.49	261.67	0.0000	261.67	0.00	950.00
1.5933	1.5960	261.67	264.86	0.0000	264.86	0.00	960.00
1.5960	1.4409	264.86	267.89	0.0000	267.89	0.00	970.00
1.4409	1.2096	267.89	270.55	0.0000	270.55	0.00	980.00
1.2096	1.0804	270.55	272.84	0.0000	272.84	0.00	990.00
1.0804	1.0023	272.84	274.92	0.0000	274.92	0.00	1000.00
1.0023	0.9647	274.92	276.88	0.0000	276.88	0.00	1010.00
0.9647	0.9438	276.88	278.79	0.0000	278.79	0.00	1020.00
0.9438	1.0289	278.79	280.77	0.0000	280.77	0.00	1030.00
1.0289	1.1794	280.77	282.97	0.0000	282.97	0.00	1040.00
1.1794	1.2636	282.97	285.42	0.0000	285.42	0.00	1050.00
1.2636	1.3110	285.42	287.99	0.0000	287.99	0.00	1060.00
1.3110	1.3376	287.99	290.64	0.0000	290.64	0.00	1070.00
1.3376	1.3527	290.64	293.33	0.0000	293.33	0.00	1080.00
1.3527	1.3129	293.33	296.00	0.0000	296.00	0.00	1090.00
1.3129	1.2363	296.00	298.55	0.0000	298.55	0.00	1100.00
1.2363	1.1936	298.55	300.98	0.0000	300.98	0.00	1110.00
1.1936	1.3577	300.98	303.53	0.0000	303.53	0.00	1120.00
1.3577	1.2617	303.53	306.15	0.0000	306.15	0.00	1130.00
1.2617	1.0264	306.15	308.43	0.0000	308.43	0.00	1140.00
1.0264	1.0829	308.43	310.54	0.0000	310.54	0.00	1150.00
1.0829	1.1085	310.54	312.74	0.0000	312.74	0.00	1160.00
1.1085	1.1230	312.74	314.97	0.0000	314.97	0.00	1170.00
1.1230	1.1372	314.97	317.23	0.0000	317.23	0.00	1180.00
1.1372	1.1392	317.23	319.50	0.0000	319.50	0.00	1190.00
1.1392	1.1405	319.50	321.78	0.0000	321.78	0.00	1200.00
1.1405	1.1474	321.78	324.07	0.0000	324.07	0.00	1210.00
1.1474	1.1453	324.07	326.36	0.0000	326.36	0.00	1220.00
1.1453	1.1442	326.36	328.65	0.0000	328.65	0.00	1230.00
1.1442	1.1498	328.65	330.95	0.0000	330.95	0.00	1240.00
1.1498	1.1470	330.95	333.24	0.0000	333.24	0.00	1250.00
1.1470	1.1455	333.24	335.54	0.0000	335.54	0.00	1260.00
1.1455	1.1509	335.54	337.83	0.0000	337.83	0.00	1270.00
1.1509	1.1479	337.83	340.13	0.0000	340.13	0.00	1280.00
1.1479	1.1464	340.13	342.43	0.0000	342.43	0.00	1290.00
1.1464	1.1517	342.43	344.72	0.0000	344.72	0.00	1300.00
1.1517	1.1487	344.72	347.02	0.0000	347.02	0.00	1310.00
1.1487	1.1472	347.02	349.32	0.0000	349.32	0.00	1320.00
1.1472	1.0977	349.32	351.57	0.0000	351.57	0.00	1330.00
1.0977	1.0214	351.57	353.68	0.0000	353.68	0.00	1340.00
1.0214	0.9789	353.68	355.69	0.0000	355.69	0.00	1350.00
0.9789	0.9491	355.69	357.61	0.0000	357.61	0.00	1360.00
0.9491	0.9386	357.61	359.50	0.0000	359.50	0.00	1370.00
0.9386	0.9327	359.50	361.37	0.0000	361.37	0.00	1380.00

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
=====							
0.9327	0.9235	361.37	363.23	0.0000	363.23	0.00	1390.00
0.9235	0.9245	363.23	365.08	0.0000	365.08	0.00	1400.00
0.9245	0.9251	365.08	366.93	0.0000	366.93	0.00	1410.00
0.9251	0.9194	366.93	368.77	0.0000	368.77	0.00	1420.00
0.9194	0.9224	368.77	370.61	0.0000	370.61	0.00	1430.00
0.9224	0.9241	370.61	372.46	0.0000	372.46	0.00	1440.00
0.9241	0.7177	372.46	374.10	0.0000	374.10	0.00	1450.00
0.7177	0.4011	374.10	375.22	0.0000	375.22	0.00	1460.00
0.4011	0.2242	375.22	375.84	0.0000	375.84	0.00	1470.00
0.2242	0.1253	375.84	376.19	0.0000	376.19	0.00	1480.00
0.1253	0.0700	376.19	376.39	0.0000	376.39	0.00	1490.00
0.0700	0.0391	376.39	376.50	0.0000	376.50	0.00	1500.00

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ROUTING REPORT

STORAGE LIST            ID No.    A  
Description:

MULTIPLE ORIFICE        ID No.    A  
Description:  
Outlet Elev:    137.55  
Elev:    137.55 ft        Orifice Diameter:    5.2617 in.

ROUTING CURVE

STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min
137.55	0.0000	0.0000	0.0000	139.10	3837	0.9354	13.725	140.70	24218	1.3334	82.059
137.60	0.0000	0.1680	0.1680	139.20	5022	0.9651	17.704	140.80	25606	1.3544	86.707
137.70	0.0000	0.2910	0.2910	139.30	6207	0.9939	21.683	140.90	26994	1.3751	91.355
137.80	0.0000	0.3757	0.3757	139.40	7392	1.0219	25.661	141.00	28382	1.3955	96.002
137.90	0.0000	0.4445	0.4445	139.50	8577	1.0491	29.637	141.10	29979	1.4156	101.34
138.00	0.0000	0.5040	0.5040	139.60	9761	1.0757	33.614	141.20	31575	1.4354	106.69
138.10	0.0000	0.5572	0.5572	139.70	10946	1.1016	37.589	141.30	33172	1.4549	112.03
138.20	0.0000	0.6057	0.6057	139.80	12131	1.1270	41.564	141.40	34768	1.4742	117.37
138.30	0.0000	0.6507	0.6507	139.90	13316	1.1517	45.539	141.50	36365	1.4932	122.71
138.40	0.0000	0.6927	0.6927	140.00	14501	1.1760	49.513	141.60	37962	1.5120	128.05
138.50	0.0000	0.7323	0.7323	140.10	15889	1.1997	54.163	141.70	39558	1.5305	133.39
138.60	0.0000	0.7699	0.7699	140.20	17277	1.2230	58.814	141.80	41155	1.5489	138.73
138.70	0.0000	0.8057	0.8057	140.30	18665	1.2459	63.464	141.90	42751	1.5670	144.07
138.80	530.40	0.8400	2.6080	140.40	20053	1.2684	68.113				
138.90	1591	0.8729	6.1769	140.50	21442	1.2904	72.762				
139.00	2652	0.9047	9.7447	140.60	22830	1.3121	77.411				



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LEVEL POOL ROUTING TABLE

MATCH Q (cfs) : 3.71 INFLOW Q (cfs): 9.08  
 PEAK STAGE (ft): 141.92 PEAK OUTFLOW : 1.57  
 PEAK TIME: 530.00 min.  
 INFLOW HYD No. : 7 OUTFLOW HYD No.: 12

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE (ft)	TIME (min)
<----- cfs min ----->							
=====							
0.0000	0.0088	0.0000	0.0088	0.0000	0.0088	137.55	40.00
0.0088	0.0452	0.0000	0.0540	0.0088	0.0452	137.55	50.00
0.0452	0.1056	0.0000	0.1508	0.0452	0.1056	137.55	60.00
0.1056	0.2104	-0.0000	0.3160	0.1056	0.2104	137.55	70.00
0.2104	0.3506	0.0000	0.5611	0.2104	0.3506	137.55	80.00
0.3506	0.4795	0.0000	0.8301	0.3506	0.4795	137.55	90.00
0.4795	0.5923	0.0000	1.0718	0.4795	0.5923	137.55	100.00
0.5923	0.6890	0.0000	1.2813	0.5923	0.6890	137.55	110.00
0.6890	0.7709	0.0000	1.4598	0.6890	0.7709	137.55	120.00
0.7709	0.8746	0.0000	1.6455	0.7709	0.8746	137.55	130.00
0.8746	0.9944	0.0676	1.9367	0.8070	1.1297	138.70	140.00
0.9944	1.0837	0.3178	2.3959	0.8119	1.5841	138.72	150.00
1.0837	1.1479	0.7636	2.9952	0.8205	2.1747	138.74	160.00
1.1479	1.2047	1.3430	3.6956	0.8317	2.8638	138.78	170.00
1.2047	1.2502	2.0215	4.4763	0.8423	3.6340	138.81	180.00
1.2502	1.2826	2.7845	5.3172	0.8495	4.4678	138.83	190.00
1.2826	1.3162	3.6106	6.2093	0.8572	5.3522	138.85	200.00
1.3162	1.3440	4.4868	7.1470	0.8653	6.2817	138.88	210.00
1.3440	1.3624	5.4078	8.1142	0.8739	7.2404	138.90	220.00
1.3624	1.3851	6.3580	9.1054	0.8824	8.2230	138.93	230.00
1.3851	1.4041	7.3319	10.121	0.8912	9.2299	138.96	240.00
1.4041	1.4642	8.3298	11.198	0.9001	10.298	138.99	250.00
1.4642	1.5479	9.3890	12.401	0.9090	11.492	139.01	260.00
1.5479	1.6023	10.574	13.724	0.9182	12.806	139.04	270.00
1.6023	1.6463	11.878	15.126	0.9283	14.198	139.08	280.00
1.6463	1.6727	13.259	16.578	0.9389	15.639	139.11	290.00
1.6727	1.6944	14.690	18.057	0.9497	17.107	139.15	300.00
1.6944	1.9105	16.147	19.751	0.9606	18.791	139.18	310.00
1.9105	2.2325	17.818	21.961	0.9729	20.988	139.23	320.00
2.2325	2.4245	19.999	24.656	0.9889	23.667	139.28	330.00
2.4245	2.5427	22.659	27.626	1.0079	26.619	139.35	340.00
2.5427	2.6187	25.590	30.751	1.0285	29.723	139.42	350.00
2.6187	2.6704	28.673	33.962	1.0497	32.913	139.50	360.00
2.6704	2.6589	31.842	37.171	1.0710	36.100	139.58	370.00
2.6589	2.6109	35.008	40.278	1.0919	39.186	139.66	380.00
2.6109	2.5841	38.074	43.269	1.1118	42.157	139.74	390.00
2.5841	2.5751	41.027	46.186	1.1307	45.055	139.81	400.00
2.5751	2.5817	43.907	49.063	1.1487	47.915	139.89	410.00
2.5817	2.5844	46.748	51.914	1.1662	50.748	139.96	420.00
2.5844	3.2716	49.566	55.422	1.1823	54.240	140.03	430.00
3.2716	4.3554	53.039	60.667	1.2001	59.466	140.10	440.00

NOVELLUS

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
			cfs min				(ft)	(min)
----->								
4.3554	4.9805	58.240	67.576	1.2262	66.350	140.21	450.00	
4.9805	6.3168	65.090	76.387	1.2598	75.128	140.36	460.00	
6.3168	8.0629	73.826	88.206	1.3014	86.904	140.55	470.00	
8.0629	9.0790	85.549	102.69	1.3553	101.34	140.80	480.00	
9.0790	8.3587	99.920	117.36	1.4155	115.94	141.10	490.00	
8.3587	6.6523	114.47	129.48	1.4690	128.02	141.37	500.00	
6.6523	5.7040	126.50	138.86	1.5119	137.35	141.60	510.00	
5.7040	5.0661	135.80	146.57	1.5441	145.03	141.77	520.00	
5.0661	4.6075	143.46	153.13	1.5702	151.56	141.92	530.00	
4.6075	4.3549	151.56	160.53	0.0000	160.53	0.00	540.00	
4.3549	3.9363	160.53	168.82	0.0000	168.82	0.00	550.00	
3.9363	3.4238	168.82	176.18	0.0000	176.18	0.00	560.00	
3.4238	3.1390	176.18	182.74	0.0000	182.74	0.00	570.00	
3.1390	2.9880	182.74	188.87	0.0000	188.87	0.00	580.00	
2.9880	2.8984	188.87	194.75	0.0000	194.75	0.00	590.00	
2.8984	2.8497	194.75	200.50	0.0000	200.50	0.00	600.00	
2.8497	2.7700	200.50	206.12	0.0000	206.12	0.00	610.00	
2.7700	2.6728	206.12	211.56	0.0000	211.56	0.00	620.00	
2.6728	2.6196	211.56	216.86	0.0000	216.86	0.00	630.00	
2.6196	2.5842	216.86	222.06	0.0000	222.06	0.00	640.00	
2.5842	2.5722	222.06	227.22	0.0000	227.22	0.00	650.00	
2.5722	2.5664	227.22	232.35	0.0000	232.35	0.00	660.00	
2.5664	2.4491	232.35	237.37	0.0000	237.37	0.00	670.00	
2.4491	2.2693	237.37	242.09	0.0000	242.09	0.00	680.00	
2.2693	2.1693	242.09	246.53	0.0000	246.53	0.00	690.00	
2.1693	2.1209	246.53	250.82	0.0000	250.82	0.00	700.00	
2.1209	2.0876	250.82	255.03	0.0000	255.03	0.00	710.00	
2.0876	2.0695	255.03	259.18	0.0000	259.18	0.00	720.00	
2.0695	2.0668	259.18	263.32	0.0000	263.32	0.00	730.00	
2.0668	2.0590	263.32	267.45	0.0000	267.45	0.00	740.00	
2.0590	2.0552	267.45	271.56	0.0000	271.56	0.00	750.00	
2.0552	2.0604	271.56	275.68	0.0000	275.68	0.00	760.00	
2.0604	2.0571	275.68	279.79	0.0000	279.79	0.00	770.00	
2.0571	2.0557	279.79	283.91	0.0000	283.91	0.00	780.00	
2.0557	1.9463	283.91	287.91	0.0000	287.91	0.00	790.00	
1.9463	1.7696	287.91	291.62	0.0000	291.62	0.00	800.00	
1.7696	1.6712	291.62	295.06	0.0000	295.06	0.00	810.00	
1.6712	1.6164	295.06	298.35	0.0000	298.35	0.00	820.00	
1.6164	1.5861	298.35	301.55	0.0000	301.55	0.00	830.00	
1.5861	1.5694	301.55	304.71	0.0000	304.71	0.00	840.00	
1.5694	1.6150	304.71	307.89	0.0000	307.89	0.00	850.00	
1.6150	1.7023	307.89	311.21	0.0000	311.21	0.00	860.00	
1.7023	1.7514	311.21	314.66	0.0000	314.66	0.00	870.00	
1.7514	1.7724	314.66	318.19	0.0000	318.19	0.00	880.00	
1.7724	1.7913	318.19	321.75	0.0000	321.75	0.00	890.00	
1.7913	1.8022	321.75	325.35	0.0000	325.35	0.00	900.00	
1.8022	1.8018	325.35	328.95	0.0000	328.95	0.00	910.00	

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE								
I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs			min	----->			(ft)	(min)
1.8018	1.8087	328.95	332.56	0.0000	332.56	0.00	920.00	
1.8087	1.8129	332.56	336.18	0.0000	336.18	0.00	930.00	
1.8129	1.8087	336.18	339.80	0.0000	339.80	0.00	940.00	
1.8087	1.8135	339.80	343.43	0.0000	343.43	0.00	950.00	
1.8135	1.8165	343.43	347.06	0.0000	347.06	0.00	960.00	
1.8165	1.6399	347.06	350.51	0.0000	350.51	0.00	970.00	
1.6399	1.3766	350.51	353.53	0.0000	353.53	0.00	980.00	
1.3766	1.2295	353.53	356.13	0.0000	356.13	0.00	990.00	
1.2295	1.1406	356.13	358.50	0.0000	358.50	0.00	1000.00	
1.1406	1.0978	358.50	360.74	0.0000	360.74	0.00	1010.00	
1.0978	1.0740	360.74	362.91	0.0000	362.91	0.00	1020.00	
1.0740	1.1708	362.91	365.16	0.0000	365.16	0.00	1030.00	
1.1708	1.3419	365.16	367.67	0.0000	367.67	0.00	1040.00	
1.3419	1.4378	367.67	370.45	0.0000	370.45	0.00	1050.00	
1.4378	1.4915	370.45	373.38	0.0000	373.38	0.00	1060.00	
1.4915	1.5218	373.38	376.39	0.0000	376.39	0.00	1070.00	
1.5218	1.5389	376.39	379.46	0.0000	379.46	0.00	1080.00	
1.5389	1.4935	379.46	382.49	0.0000	382.49	0.00	1090.00	
1.4935	1.4064	382.49	385.39	0.0000	385.39	0.00	1100.00	
1.4064	1.3578	385.39	388.15	0.0000	388.15	0.00	1110.00	
1.3578	1.5444	388.15	391.05	0.0000	391.05	0.00	1120.00	
1.5444	1.4352	391.05	394.03	0.0000	394.03	0.00	1130.00	
1.4352	1.1675	394.03	396.64	0.0000	396.64	0.00	1140.00	
1.1675	1.2317	396.64	399.04	0.0000	399.04	0.00	1150.00	
1.2317	1.2608	399.04	401.53	0.0000	401.53	0.00	1160.00	
1.2608	1.2772	401.53	404.07	0.0000	404.07	0.00	1170.00	
1.2772	1.2934	404.07	406.64	0.0000	406.64	0.00	1180.00	
1.2934	1.2956	406.64	409.23	0.0000	409.23	0.00	1190.00	
1.2956	1.2970	409.23	411.82	0.0000	411.82	0.00	1200.00	
1.2970	1.3048	411.82	414.42	0.0000	414.42	0.00	1210.00	
1.3048	1.3024	414.42	417.03	0.0000	417.03	0.00	1220.00	
1.3024	1.3012	417.03	419.63	0.0000	419.63	0.00	1230.00	
1.3012	1.3075	419.63	422.24	0.0000	422.24	0.00	1240.00	
1.3075	1.3042	422.24	424.85	0.0000	424.85	0.00	1250.00	
1.3042	1.3025	424.85	427.46	0.0000	427.46	0.00	1260.00	
1.3025	1.3086	427.46	430.07	0.0000	430.07	0.00	1270.00	
1.3086	1.3052	430.07	432.68	0.0000	432.68	0.00	1280.00	
1.3052	1.3034	432.68	435.29	0.0000	435.29	0.00	1290.00	
1.3034	1.3094	435.29	437.90	0.0000	437.90	0.00	1300.00	
1.3094	1.3060	437.90	440.52	0.0000	440.52	0.00	1310.00	
1.3060	1.3042	440.52	443.13	0.0000	443.13	0.00	1320.00	
1.3042	1.2479	443.13	445.68	0.0000	445.68	0.00	1330.00	
1.2479	1.1612	445.68	448.09	0.0000	448.09	0.00	1340.00	
1.1612	1.1128	448.09	450.37	0.0000	450.37	0.00	1350.00	
1.1128	1.0789	450.37	452.56	0.0000	452.56	0.00	1360.00	
1.0789	1.0669	452.56	454.70	0.0000	454.70	0.00	1370.00	
1.0669	1.0603	454.70	456.83	0.0000	456.83	0.00	1380.00	

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LEVEL POOL ROUTING TABLE

## LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
1.0603	1.0497	456.83	458.94	0.0000	458.94	0.00	1390.00
1.0497	1.0508	458.94	461.04	0.0000	461.04	0.00	1400.00
1.0508	1.0515	461.04	463.14	0.0000	463.14	0.00	1410.00
1.0515	1.0450	463.14	465.24	0.0000	465.24	0.00	1420.00
1.0450	1.0484	465.24	467.33	0.0000	467.33	0.00	1430.00
1.0484	1.0503	467.33	469.43	0.0000	469.43	0.00	1440.00
1.0503	0.8158	469.43	471.30	0.0000	471.30	0.00	1450.00
0.8158	0.4559	471.30	472.57	0.0000	472.57	0.00	1460.00
0.4559	0.2548	472.57	473.28	0.0000	473.28	0.00	1470.00
0.2548	0.1424	473.28	473.68	0.0000	473.68	0.00	1480.00
0.1424	0.0796	473.68	473.90	0.0000	473.90	0.00	1490.00
0.0796	0.0445	473.90	474.02	0.0000	474.02	0.00	1500.00

N' - POND 'B' TOTAL VOLUME

ELEV (FT)	AREA (SF)	VOL (CF)	CUMM VOL (CCF)
135	7015		
136	8904	7960	7960
137	10,849	9877	17,836 ← WQ VOL @ 136.75'
138	12,851	11,550	29,686
139	14,909	15,966	45,652
140	17,023	15,966	61,618

WQ RELEASE RATE

$$\frac{15,249 \text{ ft}^3}{48 \text{ HRS}} \times \frac{1 \text{ HR}}{3600 \text{ s}} = 0.088 \text{ cfs}$$

GROUP  
**MACKENZIE**

0690 SW Bancroft St / PO Box 69039 Portland, OR 97201-0039  
Tel: 503.224.9560 Net: info@grpmack.com Fax: 503.228.1285

By \_\_\_\_\_  
Date \_\_\_\_\_  
Job # \_\_\_\_\_  
Sht. \_\_\_\_\_ of \_\_\_\_\_



0' - POND 'B' DETENTION VOLUME

ELEV (FT)	AREA (SF)	VOL (CF)	CUMM. VOL. (CF)
136.75	10,363		
137	10,849	2652	2652
138	12,851	11,850	14,502
139	14,909	13,880	28,382
140	17,023	15,452	43,834

GROUP

**MACKENZIE**

0690 SW Bancroft St / PO Box 69039 Portland, OR 97201-0039  
 Tel: 503.224.9560 Net: info@grpmack.com Fax: 503.228.1285

By \_\_\_\_\_

Date \_\_\_\_\_

Job # \_\_\_\_\_

Sht. \_\_\_\_\_ of \_\_\_\_\_

'P' WQ ORIFICE 'B'

---

$$Q = CA (2gh)^{1/2}$$

$$A = \frac{Q}{C (2gh)^{1/2}}$$

$$A = \frac{0.088 \text{ cfs}}{0.62 (2 \times 32.2 \times 0.5)^{1/2}}$$

$$A = 0.025 \text{ } \phi$$

$$d = \sqrt{\frac{4A}{\pi}} = 0.178' = \underline{\underline{2.14'' \phi}}$$

$$Q = 0.088 \text{ cfs}$$

$$C = 0.6$$

$$h = 136.75 - 136.25 = 0.5'$$

$$g = 32.2$$

$$A = \frac{\pi d^2}{4}$$

$$d = \sqrt{\frac{4A}{\pi}}$$

---

GROUP

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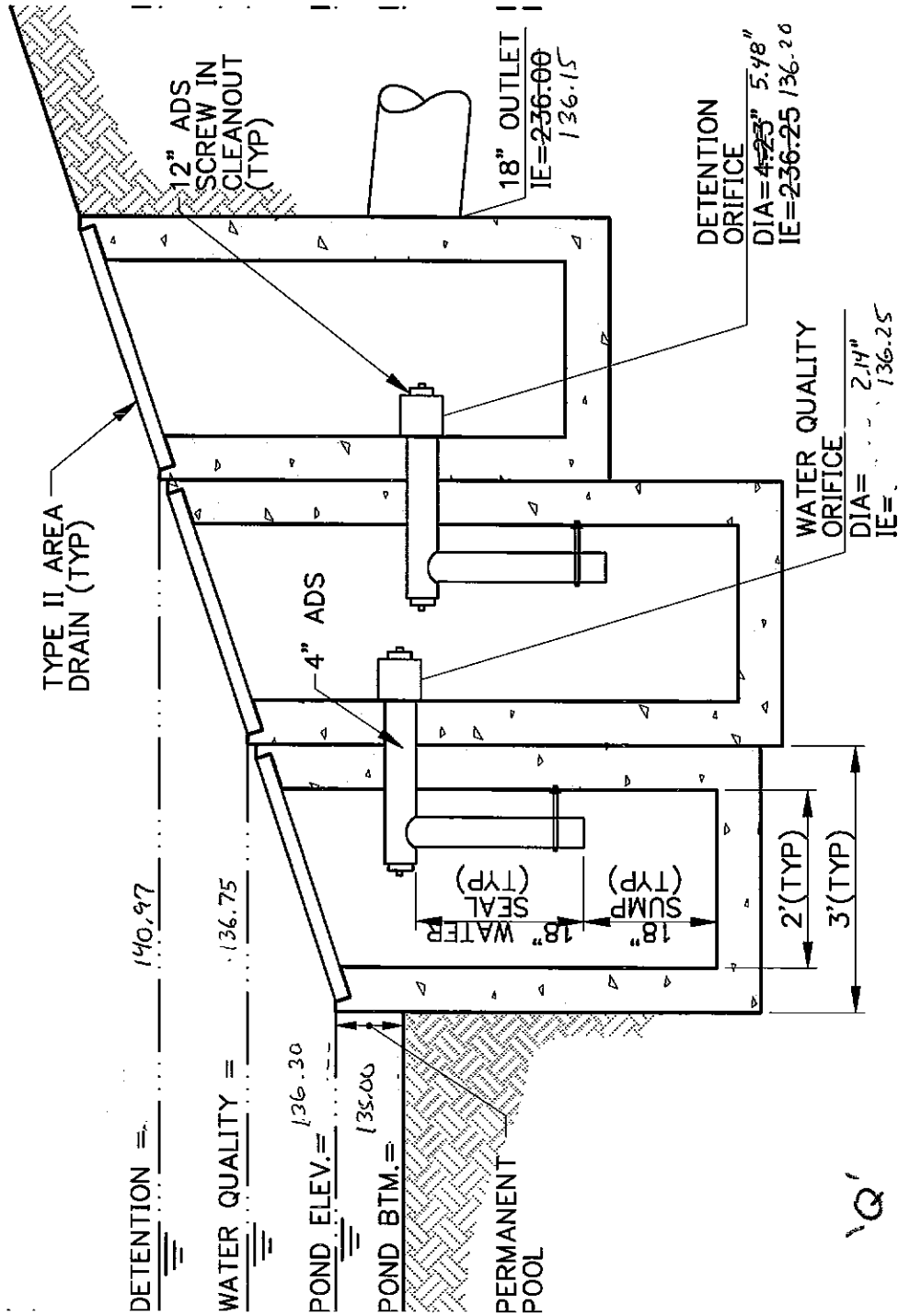
By \_\_\_\_\_

Date \_\_\_\_\_

Job # \_\_\_\_\_

Sht. \_\_\_\_\_ of \_\_\_\_\_

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# 2 POND "B" OUTLET DETAIL

C8.1  
 N.T.S.  
 OUTFLOW DEVICE

SD150  
 DETINSET= 1:1



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=====
  
BASIN SUMMARY

BASIN ID: E10                   NAME: EXISTING 10YR STORM  
 SBUH METHODOLOGY  
 TOTAL AREA.....: 13.72 Acres           BASEFLOWS: 0.00 cfs  
 RAINFALL TYPE....: TYPE1A           PERVIOUS AREA  
 PRECIPITATION....: 3.45 inches           AREA..: 13.72 Acres  
 TIME INTERVAL....: 10.00 min           CN....: 80.00  
 TIME OF CONC.....: 38.83 min           IMPERVIOUS AREA  
 ABSTRACTION COEFF: 0.20           AREA..: 0.00 Acres  
   CN....: 98.00  
 TcReach - Sheet   L: 300.00 ns:0.2400 p2yr: 2.50 s:0.0400  
 TcReach - Shallow L: 300.00 ks:10.00 s:0.0400  
 TcReach - Channel L:1400.00 kc:17.00 s:0.0400  
 PEAK RATE: 2.90 cfs VOL: 1.83 Ac-ft TIME: 490 min

BASIN ID: E2                   NAME: EXISTING 2YR STORM  
 SBUH METHODOLOGY  
 TOTAL AREA.....: 13.72 Acres           BASEFLOWS: 0.00 cfs  
 RAINFALL TYPE....: TYPE1A           PERVIOUS AREA  
 PRECIPITATION....: 2.50 inches           AREA..: 13.72 Acres  
 TIME INTERVAL....: 10.00 min           CN....: 80.00  
 TIME OF CONC.....: 38.83 min           IMPERVIOUS AREA  
 ABSTRACTION COEFF: 0.20           AREA..: 0.00 Acres  
   CN....: 98.00  
 TcReach - Sheet   L: 300.00 ns:0.2400 p2yr: 2.50 s:0.0400  
 TcReach - Shallow L: 300.00 ks:10.00 s:0.0400  
 TcReach - Channel L:1400.00 kc:17.00 s:0.0400  
 PEAK RATE: 1.36 cfs VOL: 1.02 Ac-ft TIME: 490 min

BASIN ID: E25                  NAME: EXISTING 25YR STORM  
 SBUH METHODOLOGY  
 TOTAL AREA.....: 13.72 Acres           BASEFLOWS: 0.00 cfs  
 RAINFALL TYPE....: TYPE1A           PERVIOUS AREA  
 PRECIPITATION....: 3.90 inches           AREA..: 13.72 Acres  
 TIME INTERVAL....: 10.00 min           CN....: 80.00  
 TIME OF CONC.....: 38.83 min           IMPERVIOUS AREA  
 ABSTRACTION COEFF: 0.20           AREA..: 0.00 Acres  
   CN....: 98.00  
 TcReach - Sheet   L: 300.00 ns:0.2400 p2yr: 2.50 s:0.0400  
 TcReach - Shallow L: 300.00 ks:10.00 s:0.0400  
 TcReach - Channel L:1400.00 kc:17.00 s:0.0400  
 PEAK RATE: 3.71 cfs VOL: 2.24 Ac-ft TIME: 490 min



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## =====

## HYDROGRAPH SUMMARY

HYD NUM	PEAK RUNOFF RATE cfs	TIME OF PEAK min.	VOLUME OF HYDRO cf\AcFt	Contrib Area Acres
1	1.356	490	44270 cf	13.72
2	2.902	490	79526 cf	13.72
3	3.714	490	97581 cf	13.72
5	5.734	480	102758 cf	13.72
6	8.230	480	148087 cf	13.72
7	9.422	480	169790 cf	13.72
10	1.356	690	102847 cf	13.72
11	1.670	800	148142 cf	13.72
12	1.779	660	39111 cf	13.72

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ROUTING REPORT

STORAGE LIST            ID No.    A  
Description:

MULTIPLE ORIFICE        ID No.    A  
Description:  
Outlet Elev:    136.20  
Elev:    136.20 ft        Orifice Diameter:    5.4785 in.

ROUTING CURVE

STAGE	STORAGE	OUTFLOW	O+2S	STAGE	STORAGE	OUTFLOW	O+2S	STAGE	STORAGE	OUTFLOW	O+2S
(ft)	(cf)	(cfs)	cfs-min	(ft)	(cf)	(cfs)	cfs-min	(ft)	(cf)	(cfs)	cfs-min
136.20	0.0000	0.0000	0.0000	137.90	13317	1.0620	45.452	139.60	37653	1.5019	127.01
136.30	0.0000	0.2576	0.2576	138.00	14502	1.0928	49.433	139.70	39198	1.5238	132.19
136.40	0.0000	0.3643	0.3643	138.10	15890	1.1227	54.089	139.80	40744	1.5454	137.36
136.50	0.0000	0.4461	0.4461	138.20	17278	1.1519	58.745	139.90	42289	1.5667	142.53
136.60	0.0000	0.5151	0.5151	138.30	18666	1.1803	63.400	140.00	43834	1.5877	147.70
136.70	0.0000	0.5759	0.5759	138.40	20054	1.2081	68.055	140.10	45251	1.6085	152.44
136.80	530.40	0.6309	2.3989	138.50	21442	1.2352	72.709	140.20	46667	1.6290	157.19
136.90	1591	0.6815	5.9855	138.60	22830	1.2618	77.362	140.30	48084	1.6492	161.93
137.00	2652	0.7285	9.5685	138.70	24218	1.2878	82.014	140.40	49500	1.6692	166.67
137.10	3837	0.7727	13.563	138.80	25606	1.3133	86.667	140.50	50917	1.6890	171.41
137.20	5022	0.8145	17.554	138.90	26994	1.3384	91.318	140.60	52334	1.7085	176.15
137.30	6207	0.8542	21.544	139.00	28382	1.3629	95.970	140.70	53750	1.7278	180.90
137.40	7392	0.8922	25.532	139.10	29927	1.3870	101.14	140.80	55167	1.7469	185.64
137.50	8577	0.9287	29.519	139.20	31472	1.4107	106.32	140.90	56583	1.7658	190.38
137.60	9762	0.9637	33.504	139.30	33018	1.4341	111.49				
137.70	10947	0.9975	37.488	139.40	34563	1.4570	116.67				
137.80	12132	1.0303	41.470	139.50	36108	1.4796	121.84				

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LEVEL POOL ROUTING TABLE

MATCH Q (cfs) : 1.36 INFLOW Q (cfs): 5.73  
 PEAK STAGE (ft): 138.97 PEAK OUTFLOW : 1.36  
 PEAK TIME: 690.00 min.  
 INFLOW HYD No. : 5 OUTFLOW HYD No.: 10

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE (ft)	TIME (min)
<----- cfs min ----->							
0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	136.20	50.00
0.0001	0.0071	0.0000	0.0072	0.0001	0.0071	136.20	60.00
0.0071	0.0405	0.0000	0.0476	0.0071	0.0405	136.20	70.00
0.0405	0.1004	0.0000	0.1409	0.0405	0.1004	136.20	80.00
0.1004	0.1674	0.0000	0.2677	0.1004	0.1674	136.20	90.00
0.1674	0.2325	0.0000	0.3999	0.1674	0.2325	136.20	100.00
0.2325	0.2922	0.0000	0.5246	0.2325	0.2922	136.20	110.00
0.2922	0.3455	0.0000	0.6377	0.2922	0.3455	136.20	120.00
0.3455	0.4121	0.0000	0.7576	0.3455	0.4121	136.20	130.00
0.4121	0.4879	0.0000	0.8999	0.4121	0.4879	136.20	140.00
0.4879	0.5466	0.0000	1.0345	0.4879	0.5466	136.20	150.00
0.5466	0.5916	0.0000	1.1382	0.5466	0.5916	136.20	160.00
0.5916	0.6329	0.0152	1.2397	0.5764	0.6633	136.70	170.00
0.6329	0.6676	0.0847	1.3853	0.5786	0.8067	136.70	180.00
0.6676	0.6944	0.2238	1.5859	0.5829	1.0030	136.71	190.00
0.6944	0.7222	0.4142	1.8308	0.5888	1.2420	136.72	200.00
0.7222	0.7459	0.6460	2.1141	0.5960	1.5181	136.74	210.00
0.7459	0.7634	0.9137	2.4231	0.6043	1.8187	136.75	220.00
0.7634	0.7836	1.2053	2.7523	0.6134	2.1389	136.77	230.00
0.7836	0.8010	1.5159	3.1005	0.6231	2.4774	136.79	240.00
0.8010	0.8455	1.8454	3.4918	0.6320	2.8598	136.80	250.00
0.8455	0.9035	2.2224	3.9714	0.6374	3.3340	136.81	260.00
0.9035	0.9394	2.6899	4.5328	0.6441	3.8888	136.83	270.00
0.9394	0.9673	3.2369	5.1435	0.6519	4.4916	136.84	280.00
0.9673	0.9831	3.8312	5.7815	0.6604	5.1211	136.86	290.00
0.9831	0.9963	4.4519	6.4312	0.6693	5.7620	136.88	300.00
0.9963	1.1404	5.0837	7.2204	0.6783	6.5421	136.89	310.00
1.1404	1.3477	5.8533	8.3415	0.6888	7.6527	136.92	320.00
1.3477	1.4589	6.9494	9.7560	0.7033	9.0527	136.95	330.00
1.4589	1.5216	8.3309	11.311	0.7217	10.590	136.99	340.00
1.5216	1.5601	9.8499	12.932	0.7398	12.192	137.03	350.00
1.5601	1.5875	11.434	14.582	0.7575	13.824	137.07	360.00
1.5875	1.5763	13.049	16.213	0.7754	15.437	137.11	370.00
1.5763	1.5447	14.645	17.766	0.7923	16.974	137.15	380.00
1.5447	1.5310	16.165	19.241	0.8084	18.433	137.19	390.00
1.5310	1.5300	17.609	20.670	0.8232	19.847	137.22	400.00
1.5300	1.5391	19.010	22.079	0.8373	21.241	137.26	410.00
1.5391	1.5444	20.390	23.474	0.8512	22.623	137.29	420.00
1.5444	2.0207	21.758	25.323	0.8645	24.459	137.33	430.00
2.0207	2.7418	23.577	28.339	0.8820	27.457	137.37	440.00
2.7418	3.1175	26.547	32.407	0.9098	31.497	137.45	450.00

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
			cfs min				(ft)	(min)
3.1175	3.9947	30.551	37.663	0.9461	36.717	137.55	460.00	
3.9947	5.1321	35.726	44.853	0.9910	43.862	137.68	470.00	
5.1321	5.7341	42.812	53.679	1.0493	52.629	137.86	480.00	
5.7341	5.1376	51.516	62.388	1.1133	61.274	138.07	490.00	
5.1376	3.9324	60.107	69.177	1.1673	68.010	138.25	500.00	
3.9324	3.3411	66.802	74.075	1.2078	72.867	138.40	510.00	
3.3411	2.9739	71.631	77.946	1.2361	76.710	138.50	520.00	
2.9739	2.7215	75.452	81.147	1.2581	79.889	138.59	530.00	
2.7215	2.6003	78.613	83.935	1.2759	82.659	138.65	540.00	
2.6003	2.3457	81.368	86.314	1.2914	85.022	138.71	550.00	
2.3457	2.0240	83.718	88.088	1.3043	86.783	138.76	560.00	
2.0240	1.8663	85.469	89.360	1.3140	88.046	138.80	570.00	
1.8663	1.7945	86.725	90.386	1.3207	89.065	138.83	580.00	
1.7945	1.7557	87.739	91.289	1.3262	89.963	138.85	590.00	
1.7557	1.7379	88.632	92.125	1.3311	90.794	138.87	600.00	
1.7379	1.6924	89.459	92.889	1.3355	91.554	138.89	610.00	
1.6924	1.6330	90.214	93.539	1.3396	92.200	138.91	620.00	
1.6330	1.6047	90.857	94.095	1.3430	92.752	138.92	630.00	
1.6047	1.5870	91.406	94.597	1.3459	93.251	138.93	640.00	
1.5870	1.5841	91.903	95.074	1.3486	93.725	138.94	650.00	
1.5841	1.5836	92.374	95.542	1.3511	94.191	138.95	660.00	
1.5836	1.5029	92.838	95.924	1.3535	94.571	138.96	670.00	
1.5029	1.3821	93.215	96.100	1.3555	94.744	138.97	680.00	
1.3821	1.3230	93.388	96.093	1.3564	94.737	138.97	690.00	
1.3230	1.2991	93.380	96.002	1.3564	94.646	138.97	700.00	
1.2991	1.2830	93.290	95.872	1.3559	94.516	138.97	710.00	
1.2830	1.2757	93.161	95.720	1.3552	94.364	138.97	720.00	
1.2757	1.2775	93.010	95.563	1.3544	94.209	138.97	730.00	
1.2775	1.2741	92.855	95.407	1.3536	94.053	138.96	740.00	
1.2741	1.2730	92.700	95.247	1.3528	93.894	138.96	750.00	
1.2730	1.2778	92.543	95.093	1.3520	93.741	138.96	760.00	
1.2778	1.2759	92.390	94.944	1.3511	93.593	138.95	770.00	
1.2759	1.2755	92.242	94.794	1.3504	93.443	138.95	780.00	
1.2755	1.1982	92.094	94.567	1.3496	93.218	138.95	790.00	
1.1982	1.0780	91.869	94.146	1.3484	92.797	138.94	800.00	
1.0780	1.0187	91.451	93.548	1.3462	92.202	138.93	810.00	
1.0187	0.9897	90.859	92.867	1.3430	91.524	138.92	820.00	
0.9897	0.9756	90.185	92.150	1.3394	90.810	138.90	830.00	
0.9756	0.9689	89.475	91.419	1.3356	90.083	138.89	840.00	
0.9689	1.0047	88.752	90.725	1.3317	89.394	138.87	850.00	
1.0047	1.0666	88.066	90.137	1.3280	88.809	138.86	860.00	
1.0666	1.0976	87.484	89.648	1.3249	88.323	138.85	870.00	
1.0976	1.1084	87.001	89.207	1.3222	87.885	138.84	880.00	
1.1084	1.1190	86.565	88.792	1.3199	87.473	138.83	890.00	
1.1190	1.1246	86.155	88.398	1.3177	87.081	138.82	900.00	
1.1246	1.1228	85.765	88.013	1.3156	86.697	138.81	910.00	
1.1228	1.1272	85.384	87.634	1.3135	86.320	138.80	920.00	

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## LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs			min	----->		(ft)	(min)
1.1272	1.1296	85.009	87.265	1.3114	85.954	138.79	930.00
1.1296	1.1263	84.645	86.901	1.3094	85.591	138.78	940.00
1.1263	1.1299	84.284	86.540	1.3074	85.232	138.78	950.00
1.1299	1.1320	83.927	86.189	1.3055	84.883	138.77	960.00
1.1320	1.0060	83.580	85.718	1.3036	84.414	138.76	970.00
1.0060	0.8262	83.113	84.945	1.3010	83.644	138.75	980.00
0.8262	0.7373	82.348	83.911	1.2968	82.614	138.74	990.00
0.7373	0.6885	81.323	82.749	1.2911	81.458	138.71	1000.00
0.6885	0.6694	80.173	81.531	1.2847	80.247	138.69	1010.00
0.6694	0.6600	78.969	80.298	1.2779	79.020	138.66	1020.00
0.6600	0.7340	77.749	79.143	1.2711	77.872	138.64	1030.00
0.7340	0.8542	76.607	78.195	1.2647	76.931	138.61	1040.00
0.8542	0.9139	75.671	77.439	1.2593	76.180	138.59	1050.00
0.9139	0.9437	74.925	76.783	1.2551	75.527	138.57	1060.00
0.9437	0.9587	74.276	76.179	1.2513	74.927	138.56	1070.00
0.9587	0.9663	73.679	75.604	1.2479	74.356	138.55	1080.00
0.9663	0.9309	73.112	75.009	1.2446	73.764	138.54	1090.00
0.9309	0.8693	72.523	74.323	1.2413	73.082	138.52	1100.00
0.8693	0.8389	71.844	73.553	1.2374	72.315	138.51	1110.00
0.8389	0.9767	71.082	72.898	1.2329	71.665	138.49	1120.00
0.9767	0.8924	70.436	72.305	1.2292	71.076	138.48	1130.00
0.8924	0.7030	69.850	71.446	1.2257	70.220	138.46	1140.00
0.7030	0.7621	68.999	70.464	1.2207	69.243	138.45	1150.00
0.7621	0.7865	68.028	69.577	1.2150	68.362	138.43	1160.00
0.7865	0.7988	67.152	68.737	1.2099	67.528	138.41	1170.00
0.7988	0.8099	66.323	67.931	1.2049	66.726	138.39	1180.00
0.8099	0.8106	65.526	67.147	1.2002	65.947	138.37	1190.00
0.8106	0.8111	64.751	66.373	1.1955	65.177	138.35	1200.00
0.8111	0.8164	63.986	65.614	1.1909	64.423	138.34	1210.00
0.8164	0.8142	63.236	64.867	1.1864	63.681	138.32	1220.00
0.8142	0.8133	62.499	64.126	1.1820	62.944	138.31	1230.00
0.8133	0.8179	61.767	63.398	1.1775	62.220	138.29	1240.00
0.8179	0.8153	61.047	62.681	1.1731	61.507	138.27	1250.00
0.8153	0.8142	60.339	61.968	1.1687	60.799	138.26	1260.00
0.8142	0.8187	59.635	61.268	1.1644	60.104	138.24	1270.00
0.8187	0.8161	58.943	60.578	1.1602	59.418	138.23	1280.00
0.8161	0.8150	58.262	59.893	1.1560	58.737	138.21	1290.00
0.8150	0.8195	57.585	59.220	1.1518	58.068	138.20	1300.00
0.8195	0.8169	56.921	58.557	1.1476	57.409	138.19	1310.00
0.8169	0.8157	56.266	57.898	1.1435	56.755	138.17	1320.00
0.8157	0.7756	55.615	57.207	1.1394	56.067	138.16	1330.00
0.7756	0.7162	54.932	56.424	1.1351	55.289	138.14	1340.00
0.7162	0.6868	54.159	55.562	1.1302	54.431	138.13	1350.00
0.6868	0.6674	53.307	54.661	1.1248	53.536	138.11	1360.00
0.6674	0.6628	52.417	53.747	1.1191	52.628	138.09	1370.00
0.6628	0.6606	51.515	52.838	1.1133	51.725	138.07	1380.00
0.6606	0.6547	50.617	51.932	1.1075	50.825	138.05	1390.00



NOVELLUS

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
			cfs min				(ft)	(min)
----->								
=====								
0.6547	0.6567	49.723	51.035	1.1017	49.933	138.03	1400.00	
0.6567	0.6578	48.837	50.152	1.0960	49.056	138.01	1410.00	
0.6578	0.6535	47.966	49.277	1.0898	48.187	137.99	1420.00	
0.6535	0.6564	47.104	48.414	1.0831	47.331	137.97	1430.00	
0.6564	0.6579	46.254	47.569	1.0765	46.492	137.95	1440.00	
0.6579	0.4897	45.422	46.570	1.0700	45.500	137.93	1450.00	
0.4897	0.2424	44.437	45.169	1.0623	44.107	137.90	1460.00	
0.2424	0.1200	43.056	43.418	1.0513	42.367	137.87	1470.00	
0.1200	0.0594	41.330	41.509	1.0374	40.472	137.82	1480.00	
0.0594	0.0294	39.450	39.538	1.0221	38.516	137.77	1490.00	
0.0294	0.0146	37.510	37.554	1.0060	36.548	137.73	1500.00	
0.0146	0.0072	35.559	35.581	0.9896	34.591	137.68	1510.00	
0.0072	0.0036	33.618	33.629	0.9730	32.656	137.63	1520.00	
0.0036	0.0018	31.700	31.705	0.9563	30.749	137.58	1530.00	
0.0018	0.0009	29.809	29.812	0.9395	28.872	137.53	1540.00	
0.0009	0.0004	27.950	27.951	0.9228	27.028	137.48	1550.00	
0.0004	0.0002	26.122	26.123	0.9059	25.217	137.44	1560.00	
0.0002	0.0001	24.328	24.328	0.8892	23.439	137.39	1570.00	
0.0001	0.0001	22.566	22.567	0.8723	21.694	137.35	1580.00	
0.0001	0.0000	20.839	20.839	0.8557	19.983	137.30	1590.00	
0.0000	0.0000	19.144	19.144	0.8387	18.306	137.26	1600.00	
0.0000	0.0000	17.484	17.484	0.8220	16.662	137.22	1610.00	
0.0000	0.0000	15.857	15.857	0.8051	15.051	137.18	1620.00	
0.0000	0.0000	14.263	14.263	0.7883	13.475	137.14	1630.00	
0.0000	0.0000	12.703	12.703	0.7717	11.931	137.10	1640.00	
0.0000	0.0000	11.177	11.177	0.7546	10.422	137.06	1650.00	
0.0000	0.0000	9.6842	9.6842	0.7380	8.9463	137.02	1660.00	
0.0000	0.0000	8.2259	8.2259	0.7203	7.5056	136.98	1670.00	
0.0000	0.0000	6.8042	6.8042	0.7014	6.1028	136.94	1680.00	
0.0000	0.0000	5.4198	5.4198	0.6830	4.7368	136.90	1690.00	
0.0000	0.0000	4.0729	4.0729	0.6639	3.4091	136.87	1700.00	
0.0000	0.0000	2.7639	2.7639	0.6451	2.1188	136.83	1710.00	
0.0000	0.0000	1.4963	1.4963	0.6225	0.8739	136.78	1720.00	
0.0000	0.0000	0.2890	0.2890	0.5849	-0.2960	136.72	1730.00	

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ROUTING REPORT

STORAGE LIST            ID No.    A  
Description:

MULTIPLE ORIFICE        ID No.    A  
Description:  
Outlet Elev:    136.20  
Elev:    136.20 ft        Orifice Diameter:    5.4785 in.

ROUTING CURVE

STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min
136.20	0.0000	0.0000	0.0000	137.90	13317	1.0620	45.452	139.60	37653	1.5019	127.01
136.30	0.0000	0.2576	0.2576	138.00	14502	1.0928	49.433	139.70	39198	1.5238	132.19
136.40	0.0000	0.3643	0.3643	138.10	15890	1.1227	54.089	139.80	40744	1.5454	137.36
136.50	0.0000	0.4461	0.4461	138.20	17278	1.1519	58.745	139.90	42289	1.5667	142.53
136.60	0.0000	0.5151	0.5151	138.30	18666	1.1803	63.400	140.00	43834	1.5877	147.70
136.70	0.0000	0.5759	0.5759	138.40	20054	1.2081	68.055	140.10	45251	1.6085	152.44
136.80	530.40	0.6309	2.3989	138.50	21442	1.2352	72.709	140.20	46667	1.6290	157.19
136.90	1591	0.6815	5.9855	138.60	22830	1.2618	77.362	140.30	48084	1.6492	161.93
137.00	2652	0.7285	9.5685	138.70	24218	1.2878	82.014	140.40	49500	1.6692	166.67
137.10	3837	0.7727	13.563	138.80	25606	1.3133	86.667	140.50	50917	1.6890	171.41
137.20	5022	0.8145	17.554	138.90	26994	1.3384	91.318	140.60	52334	1.7085	176.15
137.30	6207	0.8542	21.544	139.00	28382	1.3629	95.970	140.70	53750	1.7278	180.90
137.40	7392	0.8922	25.532	139.10	29927	1.3870	101.14	140.80	55167	1.7469	185.64
137.50	8577	0.9287	29.519	139.20	31472	1.4107	106.32	140.90	56583	1.7658	190.38
137.60	9762	0.9637	33.504	139.30	33018	1.4341	111.49				
137.70	10947	0.9975	37.488	139.40	34563	1.4570	116.67				
137.80	12132	1.0303	41.470	139.50	36108	1.4796	121.84				

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LEVEL POOL ROUTING TABLE

MATCH Q (cfs) : 2.90 INFLOW Q (cfs): 8.23  
 PEAK STAGE (ft): 140.41 PEAK OUTFLOW : 1.67  
 PEAK TIME: 800.00 min.  
 INFLOW HYD No. : 6 OUTFLOW HYD No.: 11

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE (ft)	TIME (min)
<----- cfs min ----->							
0.0000	0.0022	0.0000	0.0022	0.0000	0.0022	136.20	40.00
0.0022	0.0238	0.0000	0.0260	0.0022	0.0238	136.20	50.00
0.0238	0.0705	0.0000	0.0944	0.0238	0.0705	136.20	60.00
0.0705	0.1595	0.0000	0.2300	0.0705	0.1595	136.20	70.00
0.1595	0.2804	0.0000	0.4399	0.1595	0.2804	136.20	80.00
0.2804	0.3921	0.0000	0.6725	0.2804	0.3921	136.20	90.00
0.3921	0.4901	0.0000	0.8823	0.3921	0.4901	136.20	100.00
0.4901	0.5742	0.0000	1.0643	0.4901	0.5742	136.20	110.00
0.5742	0.6457	0.0000	1.2199	0.5742	0.6457	136.20	120.00
0.6457	0.7394	0.0677	1.4528	0.5780	0.8747	136.70	130.00
0.7394	0.8479	0.2898	1.8770	0.5849	1.2921	136.72	140.00
0.8479	0.9262	0.6945	2.4686	0.5975	1.8711	136.74	150.00
0.9262	0.9816	1.2561	3.1639	0.6150	2.5489	136.77	160.00
0.9816	1.0317	1.9159	3.9292	0.6330	3.2962	136.80	170.00
1.0317	1.0721	2.6526	4.7564	0.6436	4.1128	136.83	180.00
1.0721	1.1008	3.4578	5.6306	0.6551	4.9755	136.85	190.00
1.1008	1.1318	4.3083	6.5409	0.6672	5.8737	136.87	200.00
1.1318	1.1577	5.1938	7.4834	0.6799	6.8035	136.90	210.00
1.1577	1.1746	6.1113	8.4436	0.6922	7.7514	136.92	220.00
1.1746	1.1964	7.0467	9.4178	0.7046	8.7131	136.95	230.00
1.1964	1.2146	7.9958	10.407	0.7173	9.6896	136.98	240.00
1.2146	1.2737	8.9598	11.448	0.7298	10.718	137.00	250.00
1.2737	1.3532	9.9771	12.604	0.7412	11.863	137.03	260.00
1.3532	1.3994	11.109	13.861	0.7539	13.108	137.06	270.00
1.3994	1.4340	12.340	15.173	0.7677	14.406	137.09	280.00
1.4340	1.4521	13.624	16.510	0.7815	15.729	137.12	290.00
1.4521	1.4683	14.933	17.854	0.7954	17.058	137.15	300.00
1.4683	1.6787	16.249	19.396	0.8093	18.587	137.19	310.00
1.6787	1.9830	17.762	21.423	0.8248	20.599	137.23	320.00
1.9830	2.1467	19.754	23.884	0.8448	23.039	137.28	330.00
2.1467	2.2398	22.170	26.557	0.8685	25.688	137.34	340.00
2.2398	2.2969	24.795	29.331	0.8937	28.438	137.40	350.00
2.2969	2.3352	27.519	32.151	0.9188	31.232	137.47	360.00
2.3352	2.3149	30.288	34.939	0.9437	33.995	137.54	370.00
2.3149	2.2642	33.027	37.606	0.9679	36.638	137.61	380.00
2.2642	2.2399	35.648	40.152	0.9903	39.162	137.68	390.00
2.2399	2.2342	38.150	42.624	1.0113	41.613	137.74	400.00
2.2342	2.2436	40.582	45.059	1.0314	44.028	137.80	410.00
2.2436	2.2477	42.977	47.469	1.0506	46.418	137.86	420.00
2.2477	2.9341	45.349	50.531	1.0694	49.461	137.92	430.00
2.9341	3.9727	48.368	55.275	1.0929	54.182	138.00	440.00

NOVELLUS

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LEVEL POOL ROUTING TABLE
  
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## LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
=====							
3.9727	4.5081	53.059	61.540	1.1233	60.416	138.10	450.00
4.5081	5.7611	59.254	69.523	1.1621	68.361	138.24	460.00
5.7611	7.3831	67.151	80.296	1.2099	79.086	138.41	470.00
7.3831	8.2300	77.814	93.427	1.2714	92.156	138.64	480.00
8.2300	7.3623	90.813	106.41	1.3428	105.06	138.92	490.00
7.3623	5.6284	103.66	116.65	1.4050	115.24	139.18	500.00
5.6284	4.7761	113.79	124.20	1.4507	122.75	139.37	510.00
4.7761	4.2464	121.26	130.29	1.4835	128.80	139.52	520.00
4.2464	3.8824	127.29	135.42	1.5094	133.91	139.63	530.00
3.8824	3.7062	132.38	139.97	1.5310	138.44	139.73	540.00
3.7062	3.3412	136.89	143.94	1.5498	142.39	139.82	550.00
3.3412	2.8814	140.82	147.04	1.5661	145.48	139.90	560.00
2.8814	2.6556	143.90	149.44	1.5787	147.86	139.96	570.00
2.6556	2.5522	146.27	151.48	1.5884	149.89	140.00	580.00
2.5522	2.4959	148.29	153.34	1.5973	151.74	140.05	590.00
2.4959	2.4696	150.14	155.10	1.6054	153.50	140.09	600.00
2.4696	2.4040	151.88	156.76	1.6130	155.14	140.12	610.00
2.4040	2.3189	153.52	158.25	1.6202	156.63	140.16	620.00
2.3189	2.2779	155.00	159.60	1.6266	157.97	140.19	630.00
2.2779	2.2521	156.34	160.87	1.6323	159.23	140.22	640.00
2.2521	2.2472	157.60	162.10	1.6377	160.46	140.24	650.00
2.2472	2.2459	158.82	163.31	1.6430	161.67	140.27	660.00
2.2459	2.1308	160.02	164.39	1.6481	162.75	140.29	670.00
2.1308	1.9591	161.09	165.18	1.6527	163.53	140.32	680.00
1.9591	1.8748	161.87	165.71	1.6560	164.05	140.33	690.00
1.8748	1.8405	162.39	166.11	1.6582	164.45	140.34	700.00
1.8405	1.8174	162.79	166.45	1.6599	164.79	140.35	710.00
1.8174	1.8066	163.13	166.75	1.6613	165.09	140.36	720.00
1.8066	1.8087	163.43	167.04	1.6626	165.38	140.37	730.00
1.8087	1.8035	163.72	167.33	1.6638	165.67	140.37	740.00
1.8035	1.8016	164.00	167.61	1.6650	165.94	140.38	750.00
1.8016	1.8080	164.28	167.88	1.6661	166.22	140.38	760.00
1.8080	1.8050	164.55	168.16	1.6673	166.50	140.39	770.00
1.8050	1.8040	164.83	168.44	1.6685	166.77	140.40	780.00
1.8040	1.6945	165.10	168.60	1.6696	166.93	140.40	790.00
1.6945	1.5242	165.26	168.48	1.6703	166.81	140.41	800.00
1.5242	1.4402	165.14	168.10	1.6698	166.43	140.40	810.00
1.4402	1.3989	164.76	167.60	1.6682	165.93	140.39	820.00
1.3989	1.3787	164.27	167.04	1.6661	165.38	140.38	830.00
1.3787	1.3691	163.72	166.46	1.6638	164.80	140.37	840.00
1.3691	1.4195	163.14	165.93	1.6613	164.27	140.36	850.00
1.4195	1.5067	162.61	165.53	1.6591	163.87	140.35	860.00
1.5067	1.5503	162.22	165.27	1.6574	163.62	140.34	870.00
1.5503	1.5653	161.96	165.07	1.6563	163.42	140.34	880.00
1.5653	1.5800	161.76	164.91	1.6555	163.25	140.33	890.00
1.5800	1.5877	161.60	164.77	1.6548	163.11	140.33	900.00
1.5877	1.5850	161.46	164.63	1.6542	162.97	140.32	910.00

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->					STAGE		TIME
					(ft)		(min)
=====							
1.5850	1.5909	161.32	164.50	1.6536	162.84	140.32	920.00
1.5909	1.5941	161.19	164.38	1.6531	162.72	140.32	930.00
1.5941	1.5892	161.07	164.25	1.6526	162.60	140.32	940.00
1.5892	1.5940	160.95	164.13	1.6521	162.48	140.31	950.00
1.5940	1.5968	160.83	164.02	1.6515	162.37	140.31	960.00
1.5968	1.4188	160.72	163.73	1.6511	162.08	140.31	970.00
1.4188	1.1652	160.43	163.01	1.6499	161.37	140.30	980.00
1.1652	1.0397	159.72	161.92	1.6468	160.28	140.29	990.00
1.0397	0.9708	158.63	160.64	1.6422	159.00	140.27	1000.00
0.9708	0.9437	157.37	159.28	1.6367	157.64	140.24	1010.00
0.9437	0.9304	156.01	157.89	1.6309	156.26	140.21	1020.00
0.9304	1.0346	154.63	156.60	1.6250	154.97	140.18	1030.00
1.0346	1.2040	153.35	155.59	1.6194	153.97	140.15	1040.00
1.2040	1.2880	152.36	154.85	1.6151	153.23	140.13	1050.00
1.2880	1.3299	151.62	154.24	1.6119	152.63	140.12	1060.00
1.3299	1.3508	151.02	153.70	1.6093	152.09	140.10	1070.00
1.3508	1.3614	150.48	153.19	1.6069	151.59	140.09	1080.00
1.3614	1.3114	149.98	152.66	1.6047	151.05	140.08	1090.00
1.3114	1.2245	149.45	151.98	1.6024	150.38	140.07	1100.00
1.2245	1.1816	148.78	151.19	1.5995	149.59	140.06	1110.00
1.1816	1.3755	147.99	150.55	1.5960	148.95	140.04	1120.00
1.3755	1.2567	147.36	149.99	1.5932	148.40	140.03	1130.00
1.2567	0.9899	146.81	149.06	1.5908	147.46	140.01	1140.00
0.9899	1.0730	145.88	147.94	1.5868	146.35	140.00	1150.00
1.0730	1.1073	144.77	146.95	1.5823	145.37	139.97	1160.00
1.1073	1.1245	143.79	146.02	1.5783	144.44	139.95	1170.00
1.1245	1.1400	142.87	145.13	1.5745	143.56	139.94	1180.00
1.1400	1.1409	141.99	144.27	1.5709	142.70	139.92	1190.00
1.1409	1.1415	141.13	143.41	1.5674	141.85	139.90	1200.00
1.1415	1.1489	140.28	142.57	1.5639	141.01	139.89	1210.00
1.1489	1.1457	139.45	141.74	1.5604	140.18	139.87	1220.00
1.1457	1.1443	138.63	140.92	1.5570	139.36	139.85	1230.00
1.1443	1.1507	137.81	140.10	1.5536	138.55	139.84	1240.00
1.1507	1.1470	137.00	139.29	1.5503	137.74	139.82	1250.00
1.1470	1.1453	136.20	138.49	1.5470	136.94	139.81	1260.00
1.1453	1.1516	135.40	137.70	1.5437	136.15	139.79	1270.00
1.1516	1.1479	134.61	136.91	1.5404	135.37	139.78	1280.00
1.1479	1.1461	133.83	136.13	1.5371	134.59	139.76	1290.00
1.1461	1.1524	133.06	135.36	1.5338	133.82	139.75	1300.00
1.1524	1.1486	132.29	134.59	1.5306	133.06	139.73	1310.00
1.1486	1.1469	131.53	133.83	1.5274	132.30	139.72	1320.00
1.1469	1.0904	130.78	133.01	1.5243	131.49	139.70	1330.00
1.0904	1.0068	129.97	132.07	1.5208	130.55	139.69	1340.00
1.0068	0.9654	129.03	131.00	1.5168	129.48	139.67	1350.00
0.9654	0.9381	127.97	129.88	1.5123	128.36	139.65	1360.00
0.9381	0.9316	126.86	128.73	1.5076	127.22	139.63	1370.00
0.9316	0.9285	125.72	127.58	1.5027	126.07	139.60	1380.00



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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE
I1 I2 2S1 SUM O1 O2+2S2 STAGE TIME
<----- cfs min -----> (ft) (min)
=====
0.9285 0.9200 124.57 126.42 1.4978 124.93 139.58 1390.00
0.9200 0.9229 123.43 125.28 1.4929 123.78 139.56 1400.00
0.9229 0.9244 122.29 124.14 1.4880 122.65 139.54 1410.00
0.9244 0.9182 121.17 123.01 1.4831 121.53 139.52 1420.00
0.9182 0.9222 120.05 121.89 1.4783 120.41 139.49 1430.00
0.9222 0.9243 118.94 120.79 1.4734 119.31 139.47 1440.00
0.9243 0.6880 117.85 119.46 1.4686 117.99 139.45 1450.00
0.6880 0.3406 116.53 117.55 1.4628 116.09 139.43 1460.00
0.3406 0.1686 114.64 115.15 1.4545 113.69 139.39 1470.00
0.1686 0.0835 112.25 112.50 1.4438 111.06 139.34 1480.00
0.0835 0.0413 109.62 109.75 1.4321 108.32 139.29 1490.00
0.0413 0.0205 106.90 106.96 1.4198 105.54 139.24 1500.00
0.0205 0.0101 104.13 104.16 1.4072 102.76 139.18 1510.00
0.0101 0.0050 101.36 101.38 1.3944 99.982 139.13 1520.00
0.0050 0.0025 98.601 98.608 1.3816 97.226 139.08 1530.00
0.0025 0.0012 95.858 95.861 1.3688 94.493 139.02 1540.00
0.0012 0.0006 93.137 93.139 1.3551 91.784 138.97 1550.00
0.0006 0.0003 90.443 90.444 1.3408 89.104 138.91 1560.00
0.0003 0.0001 87.777 87.778 1.3264 86.451 138.85 1570.00
0.0001 0.0001 85.139 85.139 1.3122 83.827 138.80 1580.00
0.0001 0.0000 82.529 82.529 1.2978 81.232 138.74 1590.00
0.0000 0.0000 79.948 79.948 1.2834 78.665 138.68 1600.00
0.0000 0.0000 77.396 77.396 1.2691 76.127 138.63 1610.00
0.0000 0.0000 74.872 74.872 1.2548 73.617 138.57 1620.00
0.0000 0.0000 72.377 72.377 1.2404 71.136 138.52 1630.00
0.0000 0.0000 69.910 69.910 1.2261 68.684 138.47 1640.00
0.0000 0.0000 67.472 67.472 1.2118 66.261 138.41 1650.00
0.0000 0.0000 65.063 65.063 1.1974 63.866 138.36 1660.00
0.0000 0.0000 62.683 62.683 1.1831 61.500 138.31 1670.00
0.0000 0.0000 60.331 60.331 1.1687 59.162 138.26 1680.00
0.0000 0.0000 58.008 58.008 1.1544 56.853 138.21 1690.00
0.0000 0.0000 55.713 55.713 1.1400 54.573 138.16 1700.00
0.0000 0.0000 53.448 53.448 1.1257 52.322 138.11 1710.00
0.0000 0.0000 51.211 51.211 1.1113 50.099 138.06 1720.00
0.0000 0.0000 49.002 49.002 1.0970 47.905 138.01 1730.00
0.0000 0.0000 46.824 46.824 1.0809 45.743 137.96 1740.00
0.0000 0.0000 44.679 44.679 1.0642 43.615 137.91 1750.00
0.0000 0.0000 42.567 42.567 1.0473 41.520 137.85 1760.00
0.0000 0.0000 40.489 40.489 1.0307 39.459 137.80 1770.00
0.0000 0.0000 38.445 38.445 1.0137 37.431 137.75 1780.00
0.0000 0.0000 36.434 36.434 0.9971 35.437 137.70 1790.00
0.0000 0.0000 34.457 34.457 0.9801 33.477 137.65 1800.00
0.0000 0.0000 32.513 32.513 0.9635 31.550 137.60 1810.00
0.0000 0.0000 30.603 30.603 0.9465 29.657 137.55 1820.00
0.0000 0.0000 28.727 28.727 0.9299 27.797 137.50 1830.00
0.0000 0.0000 26.884 26.884 0.9129 25.971 137.46 1840.00
0.0000 0.0000 25.075 25.075 0.8962 24.179 137.41 1850.00

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs			min	----->			(ft)	(min)
0.0000	0.0000	23.299	23.299	0.8793	22.420	137.37	1860.00	
0.0000	0.0000	21.557	21.557	0.8626	20.695	137.32	1870.00	
0.0000	0.0000	19.849	19.849	0.8458	19.003	137.28	1880.00	
0.0000	0.0000	18.174	18.174	0.8289	17.345	137.24	1890.00	
0.0000	0.0000	16.533	16.533	0.8123	15.721	137.19	1900.00	
0.0000	0.0000	14.926	14.926	0.7953	14.130	137.15	1910.00	
0.0000	0.0000	13.352	13.352	0.7786	12.573	137.11	1920.00	
0.0000	0.0000	11.811	11.811	0.7617	11.049	137.08	1930.00	
0.0000	0.0000	10.305	10.305	0.7449	9.5597	137.04	1940.00	
0.0000	0.0000	8.8313	8.8313	0.7284	8.1029	137.00	1950.00	
0.0000	0.0000	7.3937	7.3937	0.7093	6.6844	136.96	1960.00	
0.0000	0.0000	5.9938	5.9938	0.6906	5.3031	136.92	1970.00	
0.0000	0.0000	4.6313	4.6313	0.6718	3.9595	136.88	1980.00	
0.0000	0.0000	3.3066	3.3066	0.6529	2.6537	136.84	1990.00	
0.0000	0.0000	2.0192	2.0192	0.6345	1.3847	136.81	2000.00	
0.0000	0.0000	0.7843	0.7843	0.6003	0.1840	136.74	2010.00	
0.0000	0.0000	0.0000	0.0000	0.1840	-0.1840	136.70	2020.00	

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ROUTING REPORT

STORAGE LIST            ID No.    A  
Description:

MULTIPLE ORIFICE        ID No.    A  
Description:  
Outlet Elev:    136.20  
Elev:    136.20 ft        Orifice Diameter:    5.4785 in.

ROUTING CURVE

STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min
136.20	0.0000	0.0000	0.0000	137.90	13317	1.0620	45.452	139.60	37653	1.5019	127.01
136.30	0.0000	0.2576	0.2576	138.00	14502	1.0928	49.433	139.70	39198	1.5238	132.19
136.40	0.0000	0.3643	0.3643	138.10	15890	1.1227	54.089	139.80	40744	1.5454	137.36
136.50	0.0000	0.4461	0.4461	138.20	17278	1.1519	58.745	139.90	42289	1.5667	142.53
136.60	0.0000	0.5151	0.5151	138.30	18666	1.1803	63.400	140.00	43834	1.5877	147.70
136.70	0.0000	0.5759	0.5759	138.40	20054	1.2081	68.055	140.10	45251	1.6085	152.44
136.80	530.40	0.6309	2.3989	138.50	21442	1.2352	72.709	140.20	46667	1.6290	157.19
136.90	1591	0.6815	5.9855	138.60	22830	1.2618	77.362	140.30	48084	1.6492	161.93
137.00	2652	0.7285	9.5685	138.70	24218	1.2878	82.014	140.40	49500	1.6692	166.67
137.10	3837	0.7727	13.563	138.80	25606	1.3133	86.667	140.50	50917	1.6890	171.41
137.20	5022	0.8145	17.554	138.90	26994	1.3384	91.318	140.60	52334	1.7085	176.15
137.30	6207	0.8542	21.544	139.00	28382	1.3629	95.970	140.70	53750	1.7278	180.90
137.40	7392	0.8922	25.532	139.10	29927	1.3870	101.14	140.80	55167	1.7469	185.64
137.50	8577	0.9287	29.519	139.20	31472	1.4107	106.32	140.90	56583	1.7658	190.38
137.60	9762	0.9637	33.504	139.30	33018	1.4341	111.49				
137.70	10947	0.9975	37.488	139.40	34563	1.4570	116.67				
137.80	12132	1.0303	41.470	139.50	36108	1.4796	121.84				

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LEVEL POOL ROUTING TABLE

MATCH Q (cfs) : 3.71 INFLOW Q (cfs): 9.42  
 PEAK STAGE (ft): 140.97 PEAK OUTFLOW : 1.78  
 PEAK TIME: 660.00 min.  
 INFLOW HYD No. : 7 OUTFLOW HYD No.: 12

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
0.0000	0.0101	0.0000	0.0101	0.0000	0.0101	136.20	40.00
0.0101	0.0511	0.0000	0.0612	0.0101	0.0511	136.20	50.00
0.0511	0.1172	0.0000	0.1684	0.0511	0.1172	136.20	60.00
0.1172	0.2314	0.0000	0.3486	0.1172	0.2314	136.20	70.00
0.2314	0.3813	0.0000	0.6127	0.2314	0.3813	136.20	80.00
0.3813	0.5133	0.0000	0.8946	0.3813	0.5133	136.20	90.00
0.5133	0.6254	0.0000	1.1387	0.5133	0.6254	136.20	100.00
0.6254	0.7193	0.0480	1.3927	0.5774	0.8152	136.70	110.00
0.7193	0.7978	0.2321	1.7492	0.5832	1.1660	136.71	120.00
0.7978	0.9030	0.5723	2.2730	0.5937	1.6793	136.73	130.00
0.9030	1.0258	1.0701	2.9989	0.6092	2.3897	136.76	140.00
1.0258	1.1121	1.7590	3.8970	0.6306	3.2663	136.80	150.00
1.1121	1.1713	2.6232	4.9067	0.6431	4.2635	136.82	160.00
1.1713	1.2245	3.6063	6.0021	0.6572	5.3449	136.85	170.00
1.2245	1.2665	4.6725	7.1635	0.6724	6.4911	136.88	180.00
1.2665	1.2954	5.8030	8.3649	0.6881	7.6768	136.91	190.00
1.2954	1.3274	6.9731	9.5958	0.7037	8.8922	136.95	200.00
1.3274	1.3536	8.1725	10.854	0.7196	10.134	136.98	210.00
1.3536	1.3698	9.3991	12.123	0.7348	11.388	137.01	220.00
1.3698	1.3920	10.639	13.401	0.7486	12.652	137.05	230.00
1.3920	1.4103	11.890	14.692	0.7626	13.929	137.08	240.00
1.4103	1.4760	13.153	16.039	0.7765	15.263	137.11	250.00
1.4760	1.5658	14.472	17.514	0.7905	16.723	137.14	260.00
1.5658	1.6191	15.918	19.102	0.8058	18.297	137.18	270.00
1.6191	1.6610	17.475	20.755	0.8219	19.933	137.22	280.00
1.6610	1.6838	19.095	22.440	0.8382	21.601	137.26	290.00
1.6838	1.7030	20.747	24.133	0.8548	23.279	137.30	300.00
1.7030	1.9460	22.408	26.057	0.8708	25.186	137.34	310.00
1.9460	2.2967	24.297	28.540	0.8889	27.651	137.39	320.00
2.2967	2.4840	26.739	31.520	0.9116	30.609	137.45	330.00
2.4840	2.5893	29.670	34.744	0.9383	33.805	137.53	340.00
2.5893	2.6528	32.839	38.081	0.9663	37.115	137.61	350.00
2.6528	2.6948	36.120	41.468	0.9944	40.474	137.69	360.00
2.6948	2.6693	39.452	44.816	1.0221	43.794	137.77	370.00
2.6693	2.6091	42.745	48.023	1.0488	46.974	137.86	380.00
2.6091	2.5794	45.901	51.089	1.0737	50.015	137.94	390.00
2.5794	2.5714	48.919	54.070	1.0965	52.973	138.01	400.00
2.5714	2.5808	51.858	57.010	1.1155	55.894	138.08	410.00
2.5808	2.5843	54.760	59.925	1.1340	58.791	138.14	420.00
2.5843	3.3711	57.639	63.595	1.1522	62.443	138.20	430.00
3.3711	4.5616	61.268	69.201	1.1745	68.026	138.28	440.00

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs			min	----->			(ft)	(min)
4.5616	5.1730	66.818	76.553	1.2079	75.345	138.40	450.00	
5.1730	6.6055	74.095	85.873	1.2503	84.623	138.56	460.00	
6.6055	8.4586	83.321	98.385	1.3021	97.083	138.76	470.00	
8.4586	9.4219	95.715	113.60	1.3681	112.23	139.02	480.00	
9.4219	8.4243	110.79	128.64	1.4373	127.20	139.31	490.00	
8.4243	6.4378	125.70	140.56	1.5026	139.06	139.60	500.00	
6.4378	5.4605	137.50	149.40	1.5524	147.85	139.83	510.00	
5.4605	4.8532	146.26	156.57	1.5884	154.99	140.00	520.00	
4.8532	4.4357	153.37	162.66	1.6195	161.04	140.15	530.00	
4.4357	4.2333	159.39	168.06	1.6454	166.41	140.28	540.00	
4.2333	3.8155	164.75	172.79	1.6681	171.13	140.39	550.00	
3.8155	3.2899	169.44	176.54	1.6878	174.86	140.49	560.00	
3.2899	3.0315	173.15	179.47	1.7032	177.77	140.57	570.00	
3.0315	2.9129	176.06	182.00	1.7151	180.29	140.63	580.00	
2.9129	2.8482	178.56	184.32	1.7253	182.60	140.69	590.00	
2.8482	2.8179	180.86	186.53	1.7347	184.79	140.74	600.00	
2.8179	2.7427	183.05	188.61	1.7435	186.87	140.78	610.00	
2.7427	2.6453	185.11	190.50	1.7518	188.75	140.83	620.00	
2.6453	2.5983	186.99	192.23	1.7593	190.48	140.87	630.00	
2.5983	2.5685	188.71	193.88	1.7662	192.11	140.90	640.00	
2.5685	2.5626	190.34	195.47	1.7726	193.70	140.94	650.00	
2.5626	2.5609	191.92	197.04	1.7789	195.26	140.97	660.00	
2.5609	2.4294	195.26	200.25	0.0000	200.25	0.00	670.00	
2.4294	2.2335	200.25	204.91	0.0000	204.91	0.00	680.00	
2.2335	2.1372	204.91	209.29	0.0000	209.29	0.00	690.00	
2.1372	2.0979	209.29	213.52	0.0000	213.52	0.00	700.00	
2.0979	2.0714	213.52	217.69	0.0000	217.69	0.00	710.00	
2.0714	2.0589	217.69	221.82	0.0000	221.82	0.00	720.00	
2.0589	2.0611	221.82	225.94	0.0000	225.94	0.00	730.00	
2.0611	2.0551	225.94	230.06	0.0000	230.06	0.00	740.00	
2.0551	2.0527	230.06	234.16	0.0000	234.16	0.00	750.00	
2.0527	2.0599	234.16	238.28	0.0000	238.28	0.00	760.00	
2.0599	2.0563	238.28	242.39	0.0000	242.39	0.00	770.00	
2.0563	2.0551	242.39	246.50	0.0000	246.50	0.00	780.00	
2.0551	1.9302	246.50	250.49	0.0000	250.49	0.00	790.00	
1.9302	1.7361	250.49	254.16	0.0000	254.16	0.00	800.00	
1.7361	1.6403	254.16	257.53	0.0000	257.53	0.00	810.00	
1.6403	1.5932	257.53	260.77	0.0000	260.77	0.00	820.00	
1.5932	1.5702	260.77	263.93	0.0000	263.93	0.00	830.00	
1.5702	1.5591	263.93	267.06	0.0000	267.06	0.00	840.00	
1.5591	1.6165	267.06	270.23	0.0000	270.23	0.00	850.00	
1.6165	1.7157	270.23	273.57	0.0000	273.57	0.00	860.00	
1.7157	1.7652	273.57	277.05	0.0000	277.05	0.00	870.00	
1.7652	1.7822	277.05	280.60	0.0000	280.60	0.00	880.00	
1.7822	1.7989	280.60	284.18	0.0000	284.18	0.00	890.00	
1.7989	1.8075	284.18	287.78	0.0000	287.78	0.00	900.00	
1.8075	1.8043	287.78	291.39	0.0000	291.39	0.00	910.00	



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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE								
I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs			min	----->			(ft)	(min)
=====								
1.8043	1.8110	291.39	295.01	0.0000	295.01	0.00	920.00	
1.8110	1.8146	295.01	298.64	0.0000	298.64	0.00	930.00	
1.8146	1.8089	298.64	302.26	0.0000	302.26	0.00	940.00	
1.8089	1.8143	302.26	305.88	0.0000	305.88	0.00	950.00	
1.8143	1.8173	305.88	309.51	0.0000	309.51	0.00	960.00	
1.8173	1.6148	309.51	312.95	0.0000	312.95	0.00	970.00	
1.6148	1.3260	312.95	315.89	0.0000	315.89	0.00	980.00	
1.3260	1.1832	315.89	318.40	0.0000	318.40	0.00	990.00	
1.1832	1.1048	318.40	320.68	0.0000	320.68	0.00	1000.00	
1.1048	1.0739	320.68	322.86	0.0000	322.86	0.00	1010.00	
1.0739	1.0587	322.86	325.00	0.0000	325.00	0.00	1020.00	
1.0587	1.1772	325.00	327.23	0.0000	327.23	0.00	1030.00	
1.1772	1.3699	327.23	329.78	0.0000	329.78	0.00	1040.00	
1.3699	1.4655	329.78	332.61	0.0000	332.61	0.00	1050.00	
1.4655	1.5130	332.61	335.59	0.0000	335.59	0.00	1060.00	
1.5130	1.5368	335.59	338.64	0.0000	338.64	0.00	1070.00	
1.5368	1.5488	338.64	341.73	0.0000	341.73	0.00	1080.00	
1.5488	1.4919	341.73	344.77	0.0000	344.77	0.00	1090.00	
1.4919	1.3929	344.77	347.65	0.0000	347.65	0.00	1100.00	
1.3929	1.3441	347.65	350.39	0.0000	350.39	0.00	1110.00	
1.3441	1.5647	350.39	353.30	0.0000	353.30	0.00	1120.00	
1.5647	1.4294	353.30	356.29	0.0000	356.29	0.00	1130.00	
1.4294	1.1259	356.29	358.85	0.0000	358.85	0.00	1140.00	
1.1259	1.2204	358.85	361.19	0.0000	361.19	0.00	1150.00	
1.2204	1.2594	361.19	363.67	0.0000	363.67	0.00	1160.00	
1.2594	1.2789	363.67	366.21	0.0000	366.21	0.00	1170.00	
1.2789	1.2965	366.21	368.79	0.0000	368.79	0.00	1180.00	
1.2965	1.2975	368.79	371.38	0.0000	371.38	0.00	1190.00	
1.2975	1.2982	371.38	373.98	0.0000	373.98	0.00	1200.00	
1.2982	1.3065	373.98	376.58	0.0000	376.58	0.00	1210.00	
1.3065	1.3029	376.58	379.19	0.0000	379.19	0.00	1220.00	
1.3029	1.3012	379.19	381.80	0.0000	381.80	0.00	1230.00	
1.3012	1.3084	381.80	384.41	0.0000	384.41	0.00	1240.00	
1.3084	1.3042	384.41	387.02	0.0000	387.02	0.00	1250.00	
1.3042	1.3023	387.02	389.62	0.0000	389.62	0.00	1260.00	
1.3023	1.3094	389.62	392.24	0.0000	392.24	0.00	1270.00	
1.3094	1.3051	392.24	394.85	0.0000	394.85	0.00	1280.00	
1.3051	1.3031	394.85	397.46	0.0000	397.46	0.00	1290.00	
1.3031	1.3102	397.46	400.07	0.0000	400.07	0.00	1300.00	
1.3102	1.3059	400.07	402.69	0.0000	402.69	0.00	1310.00	
1.3059	1.3038	402.69	405.30	0.0000	405.30	0.00	1320.00	
1.3038	1.2396	405.30	407.84	0.0000	407.84	0.00	1330.00	
1.2396	1.1445	407.84	410.23	0.0000	410.23	0.00	1340.00	
1.1445	1.0975	410.23	412.47	0.0000	412.47	0.00	1350.00	
1.0975	1.0664	412.47	414.63	0.0000	414.63	0.00	1360.00	
1.0664	1.0590	414.63	416.76	0.0000	416.76	0.00	1370.00	
1.0590	1.0554	416.76	418.87	0.0000	418.87	0.00	1380.00	

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## =====

## LEVEL POOL ROUTING TABLE

## LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
1.0554	1.0458	418.87	420.97	0.0000	420.97	0.00	1390.00
1.0458	1.0490	420.97	423.07	0.0000	423.07	0.00	1400.00
1.0490	1.0507	423.07	425.17	0.0000	425.17	0.00	1410.00
1.0507	1.0437	425.17	427.26	0.0000	427.26	0.00	1420.00
1.0437	1.0482	427.26	429.35	0.0000	429.35	0.00	1430.00
1.0482	1.0505	429.35	431.45	0.0000	431.45	0.00	1440.00
1.0505	0.7819	431.45	433.28	0.0000	433.28	0.00	1450.00
0.7819	0.3871	433.28	434.45	0.0000	434.45	0.00	1460.00
0.3871	0.1916	434.45	435.03	0.0000	435.03	0.00	1470.00
0.1916	0.0949	435.03	435.32	0.0000	435.32	0.00	1480.00
0.0949	0.0470	435.32	435.46	0.0000	435.46	0.00	1490.00
0.0470	0.0233	435.46	435.53	0.0000	435.53	0.00	1500.00

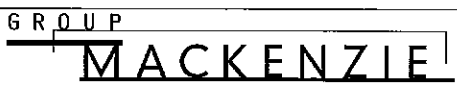
'S' - POND 'C' TOTAL VOLUME

ELEV (FT)	AREA (SF)	VOL (CF)	CUMM VOL (CCF)
133.5	6500		
134	7015	3379	3379
135	8904	7960	11,339
136	10,849	9697	21,036
137	14,909	12,879	33,915
138	17,023	15966	49881
139	21,230	19,127	69,007

← WQ VOL @ 135.52

WQ RELEASE RATE

$$\frac{16,409 \text{ ft}^3}{48 \text{ HRS}} \times \frac{1 \text{ HR}}{3600 \text{ S}} = 0.095 \text{ cfs}$$



By \_\_\_\_\_  
 Date \_\_\_\_\_  
 Job # \_\_\_\_\_  
 Sht. \_\_\_\_\_ of \_\_\_\_\_

'T' - POND 'C' DETENTION VOLUME

ELEV (FT)	AREA (SF)	VOL (CF)	CUMM. VOL (CF)
135.52	9,915		
136	10,819	4983	4983
137	14,909	12,879	17,862
138	17,023	15,966	33,828
139	21,230	19,127	52,955

GROUP  
**MACKENZIE**

0690 SW Bancroft St / PO Box 69039 Portland, OR 97201-0039  
 Tel: 503.224.9560 Net: info@grpmack.com Fax: 503.228.1285

By \_\_\_\_\_

Date \_\_\_\_\_

Job # \_\_\_\_\_

Sht. \_\_\_\_\_ of \_\_\_\_\_

'U' - WQ ORIFICE 'C'

$$Q = CA(2gh)^{1/2}$$

$$A = \frac{Q}{C(2gh)^{1/2}}$$

$$A = \frac{0.095}{0.62(2 \times 32.2 \times 0.62)^{1/2}}$$

$$A = 0.024 \text{ ft}^2$$

$$Q = 0.095 \text{ cfs}$$

$$C = 0.62$$

$$g = 32.2$$

$$h = 135.52' - 134.90' = 0.62'$$

$$A = \frac{\pi d^2}{4}$$

$$d = \sqrt{\frac{4A}{\pi}}$$

$$d = \sqrt{\frac{4A}{\pi}} = 0.178' = \underline{\underline{2.10'' \phi}}$$

GROUP

**MACKENZIE**

0690 SW Bancroft St / PO Box 69039 Portland, OR 97201-0039  
Tel: 503.224.9560 Net: info@grpmack.com Fax: 503.228.1285

By \_\_\_\_\_

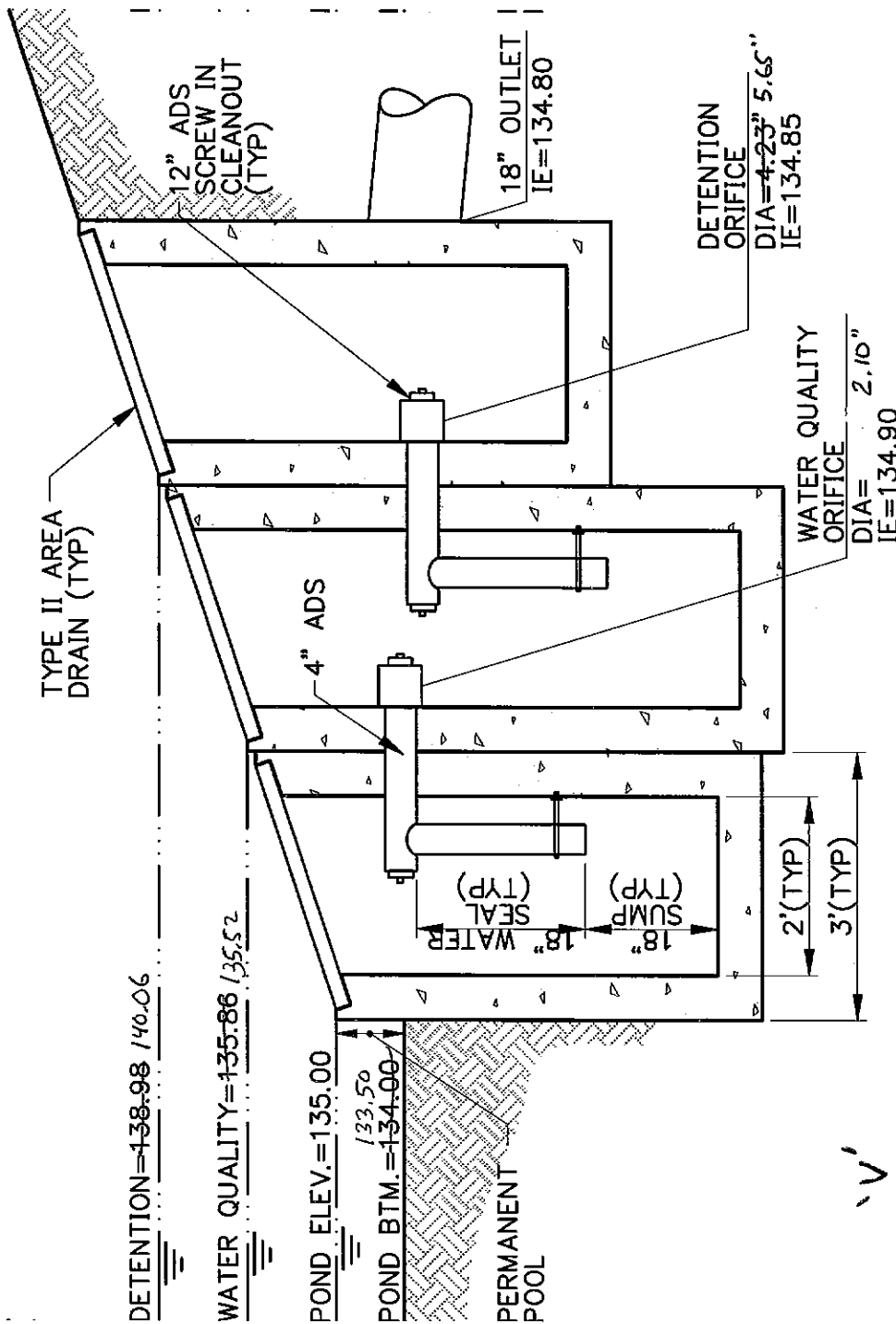
Date \_\_\_\_\_

Job # \_\_\_\_\_

Sht. \_\_\_\_\_ of \_\_\_\_\_

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**3 POND "C" OUTLET DETAIL**

**C8.1**  
N.T.S.  
OUTFLOW DEVICE

SD150  
DETINSET = 1:1





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## =====

## HYDROGRAPH SUMMARY

HYD NUM	PEAK RUNOFF RATE cfs	TIME OF PEAK min.	VOLUME OF HYDRO cf\AcFt	Contrib Area Acres
1	1.460	490	47658 cf	14.77
2	3.124	490	85612 cf	14.77
3	3.999	490	105049 cf	14.77
5	6.139	480	110109 cf	14.77
6	8.822	480	158818 cf	14.77
7	10.104	480	182151 cf	14.77
10	1.460	690	110176 cf	14.77
11	1.760	800	158945 cf	14.77
12	1.976	800	182266 cf	14.77

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ROUTING REPORT

STORAGE LIST            ID No.    A  
Description:

MULTIPLE ORIFICE        ID No.    A  
Description:  
Outlet Elev:    134.85  
Elev:    134.85 ft        Orifice Diameter:    5.6484 in.

ROUTING CURVE

STAGE	STORAGE	OUTFLOW	O+2S	STAGE	STORAGE	OUTFLOW	O+2S	STAGE	STORAGE	OUTFLOW	O+2S
(ft)	(cf)	(cfs)	cfs-min	(ft)	(cf)	(cfs)	cfs-min	(ft)	(cf)	(cfs)	cfs-min
134.85	0.0000	0.0000	0.0000	136.90	16574	1.2396	56.487	139.00	52955	1.7638	178.28
134.90	0.0000	0.1936	0.1936	137.00	17862	1.2695	60.810	139.10	53960	1.7849	181.65
135.00	0.0000	0.3353	0.3353	137.10	19459	1.2987	66.161	139.20	54964	1.8058	185.02
135.10	0.0000	0.4329	0.4329	137.20	21055	1.3272	71.511	139.30	55969	1.8264	188.39
135.20	0.0000	0.5122	0.5122	137.30	22652	1.3552	76.861	139.40	56973	1.8468	191.76
135.30	0.0000	0.5808	0.5808	137.40	24248	1.3826	82.211	139.50	57978	1.8670	195.13
135.40	0.0000	0.6421	0.6421	137.50	25845	1.4094	87.559	139.60	58982	1.8870	198.49
135.50	0.0000	0.6980	0.6980	137.60	27442	1.4358	92.908	139.70	59987	1.9067	201.86
135.60	830.50	0.7498	3.5181	137.70	29038	1.4616	98.256	139.80	60991	1.9263	205.23
135.70	1869	0.7982	7.0270	137.80	30635	1.4871	103.60	139.90	61996	1.9456	208.60
135.80	2907	0.8439	10.533	137.90	32231	1.5121	108.95	140.00	63000	1.9648	211.96
135.90	3945	0.8872	14.037	138.00	33828	1.5366	114.30	140.10	64500	1.9838	216.98
136.00	4983	0.9285	17.538	138.10	35741	1.5608	120.70	140.20	66000	2.0026	222.00
136.10	6271	0.9680	21.871	138.20	37653	1.5847	127.10	140.30	67500	2.0212	227.02
136.20	7559	1.0060	26.202	138.30	39566	1.6082	133.50	140.40	69000	2.0397	232.04
136.30	8847	1.0426	30.532	138.40	41479	1.6313	139.89	140.50	70500	2.0580	237.06
136.40	10135	1.0779	34.860	138.50	43392	1.6541	146.29	140.60	72000	2.0761	242.08
136.50	11423	1.1121	39.187	138.60	45304	1.6766	152.69	140.70	73500	2.0941	247.09
136.60	12710	1.1453	43.513	138.70	47217	1.6988	159.09	140.80	75000	2.1119	252.11
136.70	13998	1.1776	47.839	138.80	49130	1.7207	165.49	140.90	76500	2.1296	257.13
136.80	15286	1.2090	52.163	138.90	51042	1.7424	171.88				



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LEVEL POOL ROUTING TABLE

MATCH Q (cfs) : 1.46 INFLOW Q (cfs): 6.14  
 PEAK STAGE (ft): 137.70 PEAK OUTFLOW : 1.46  
 PEAK TIME: 690.00 min.  
 INFLOW HYD No. : 5 OUTFLOW HYD No.: 10

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE (ft)	TIME (min)
----- cfs min ----->							
0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	134.85	50.00
0.0001	0.0076	0.0000	0.0076	0.0001	0.0076	134.85	60.00
0.0076	0.0433	0.0000	0.0508	0.0076	0.0433	134.85	70.00
0.0433	0.1072	0.0000	0.1504	0.0433	0.1072	134.85	80.00
0.1072	0.1787	0.0000	0.2859	0.1072	0.1787	134.85	90.00
0.1787	0.2482	0.0000	0.4269	0.1787	0.2482	134.85	100.00
0.2482	0.3120	0.0000	0.5602	0.2482	0.3120	134.85	110.00
0.3120	0.3689	0.0000	0.6809	0.3120	0.3689	134.85	120.00
0.3689	0.4400	0.0000	0.8089	0.3689	0.4400	134.85	130.00
0.4400	0.5209	0.0000	0.9609	0.4400	0.5209	134.85	140.00
0.5209	0.5837	0.0000	1.1046	0.5209	0.5837	134.85	150.00
0.5837	0.6317	0.0000	1.2153	0.5837	0.6317	134.85	160.00
0.6317	0.6758	0.0000	1.3075	0.6317	0.6758	134.85	170.00
0.6758	0.7129	0.0000	1.3887	0.6758	0.7129	134.85	180.00
0.7129	0.7415	0.0146	1.4689	0.6983	0.7706	135.50	190.00
0.7415	0.7711	0.0713	1.5839	0.6994	0.8845	135.50	200.00
0.7711	0.7965	0.1830	1.7506	0.7015	1.0492	135.51	210.00
0.7965	0.8151	0.3447	1.9563	0.7045	1.2518	135.51	220.00
0.8151	0.8367	0.5436	2.1954	0.7082	1.4872	135.52	230.00
0.8367	0.8552	0.7747	2.4667	0.7125	1.7542	135.53	240.00
0.8552	0.9028	1.0367	2.7947	0.7174	2.0773	135.54	250.00
0.9028	0.9647	1.3540	3.2215	0.7234	2.4981	135.55	260.00
0.9647	1.0030	1.7670	3.7348	0.7311	3.0037	135.56	270.00
1.0030	1.0328	2.2633	4.2992	0.7404	3.5588	135.58	280.00
1.0328	1.0497	2.8084	4.8909	0.7504	4.1406	135.60	290.00
1.0497	1.0638	3.3822	5.4956	0.7584	4.7372	135.62	300.00
1.0638	1.2177	3.9706	6.2521	0.7666	5.4855	135.63	310.00
1.2177	1.4390	4.7085	7.3653	0.7770	6.5883	135.66	320.00
1.4390	1.5578	5.7961	8.7929	0.7922	8.0007	135.69	330.00
1.5578	1.6247	7.1898	10.372	0.8109	9.5614	135.73	340.00
1.6247	1.6659	8.7301	12.021	0.8312	11.189	135.77	350.00
1.6659	1.6953	10.337	13.699	0.8520	12.847	135.82	360.00
1.6953	1.6835	11.974	15.353	0.8725	14.481	135.87	370.00
1.6835	1.6500	13.588	16.922	0.8924	16.029	135.91	380.00
1.6500	1.6357	15.119	18.404	0.9107	17.494	135.96	390.00
1.6357	1.6349	16.566	19.836	0.9279	18.908	136.00	400.00
1.6349	1.6449	17.967	21.247	0.9410	20.306	136.03	410.00
1.6449	1.6508	19.352	22.648	0.9537	21.694	136.06	420.00
1.6508	2.1604	20.728	24.539	0.9664	23.573	136.10	430.00
2.1604	2.9320	22.590	27.682	0.9829	26.699	136.14	440.00
2.9320	3.3346	25.689	31.956	1.0102	30.946	136.21	450.00

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
			cfs min				(ft)	(min)
----->								
3.3346	4.2741	29.900	37.508	1.0459	36.462	136.31	460.00	
4.2741	5.4928	35.372	45.139	1.0906	44.048	136.44	470.00	
5.4928	6.1390	42.899	54.530	1.1493	53.381	136.61	480.00	
6.1390	5.5016	52.163	63.804	1.2177	62.586	136.83	490.00	
5.5016	4.2117	61.307	71.021	1.2792	69.741	137.03	500.00	
4.2117	3.5791	68.424	76.214	1.3178	74.897	137.17	510.00	
3.5791	3.1862	73.552	80.317	1.3449	78.972	137.26	520.00	
3.1862	2.9163	77.606	83.709	1.3660	82.343	137.34	530.00	
2.9163	2.7867	80.959	86.662	1.3832	85.279	137.40	540.00	
2.7867	2.5141	83.881	89.182	1.3980	87.784	137.46	550.00	
2.5141	2.1695	86.373	91.057	1.4105	89.647	137.50	560.00	
2.1695	2.0007	88.227	92.397	1.4197	90.977	137.54	570.00	
2.0007	1.9238	89.551	93.476	1.4263	92.049	137.56	580.00	
1.9238	1.8824	90.618	94.424	1.4315	92.993	137.58	590.00	
1.8824	1.8634	91.556	95.302	1.4362	93.866	137.60	600.00	
1.8634	1.8147	92.426	96.104	1.4404	94.663	137.62	610.00	
1.8147	1.7511	93.219	96.785	1.4443	95.341	137.63	620.00	
1.7511	1.7209	93.893	97.365	1.4475	95.918	137.65	630.00	
1.7209	1.7020	94.467	97.890	1.4503	96.440	137.66	640.00	
1.7020	1.6989	94.987	98.388	1.4529	96.935	137.67	650.00	
1.6989	1.6985	95.480	98.877	1.4553	97.422	137.68	660.00	
1.6985	1.6120	95.964	99.275	1.4576	97.817	137.68	670.00	
1.6120	1.4825	96.358	99.452	1.4595	97.993	137.69	680.00	
1.4825	1.4191	96.532	99.434	1.4604	97.974	137.70	690.00	
1.4191	1.3936	96.513	99.326	1.4603	97.866	137.69	700.00	
1.3936	1.3764	96.406	99.176	1.4598	97.716	137.69	710.00	
1.3764	1.3686	96.257	99.002	1.4590	97.543	137.69	720.00	
1.3686	1.3705	96.085	98.824	1.4582	97.366	137.69	730.00	
1.3705	1.3669	95.908	98.646	1.4573	97.189	137.68	740.00	
1.3669	1.3658	95.732	98.465	1.4565	97.008	137.68	750.00	
1.3658	1.3710	95.553	98.289	1.4556	96.834	137.68	760.00	
1.3710	1.3690	95.379	98.119	1.4548	96.664	137.67	770.00	
1.3690	1.3686	95.210	97.948	1.4539	96.494	137.67	780.00	
1.3686	1.2857	95.041	97.695	1.4531	96.242	137.67	790.00	
1.2857	1.1567	94.790	97.233	1.4519	95.781	137.66	800.00	
1.1567	1.0932	94.331	96.581	1.4497	95.131	137.65	810.00	
1.0932	1.0620	93.685	95.840	1.4465	94.393	137.64	820.00	
1.0620	1.0469	92.950	95.059	1.4430	93.616	137.63	830.00	
1.0469	1.0398	92.177	94.264	1.4392	92.825	137.61	840.00	
1.0398	1.0783	91.389	93.507	1.4354	92.072	137.60	850.00	
1.0783	1.1447	90.640	92.863	1.4317	91.432	137.58	860.00	
1.1447	1.1780	90.003	92.326	1.4285	90.897	137.57	870.00	
1.1780	1.1896	89.472	91.839	1.4259	90.413	137.56	880.00	
1.1896	1.2010	88.990	91.380	1.4235	89.957	137.55	890.00	
1.2010	1.2070	88.536	90.944	1.4212	89.523	137.54	900.00	
1.2070	1.2052	88.103	90.516	1.4191	89.097	137.54	910.00	
1.2052	1.2099	87.680	90.095	1.4170	88.678	137.53	920.00	

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs			min	----->			(ft)	(min)
1.2099	1.2126	87.263	89.685	1.4149	88.270	137.52	930.00	
1.2126	1.2090	86.857	89.279	1.4129	87.866	137.51	940.00	
1.2090	1.2129	86.455	88.877	1.4109	87.466	137.51	950.00	
1.2129	1.2152	86.057	88.485	1.4090	87.076	137.50	960.00	
1.2152	1.0799	85.669	87.964	1.4070	86.557	137.49	970.00	
1.0799	0.8869	85.153	87.120	1.4044	85.715	137.48	980.00	
0.8869	0.7915	84.315	85.994	1.4002	84.593	137.47	990.00	
0.7915	0.7392	83.199	84.730	1.3945	83.335	137.44	1000.00	
0.7392	0.7186	81.947	83.405	1.3882	82.016	137.42	1010.00	
0.7186	0.7085	80.635	82.062	1.3816	80.680	137.40	1020.00	
0.7085	0.7880	79.306	80.802	1.3747	79.427	137.37	1030.00	
0.7880	0.9171	78.059	79.764	1.3683	78.396	137.35	1040.00	
0.9171	0.9812	77.033	78.931	1.3630	77.568	137.33	1050.00	
0.9812	1.0132	76.209	78.203	1.3588	76.845	137.31	1060.00	
1.0132	1.0293	75.489	77.532	1.3551	76.177	137.30	1070.00	
1.0293	1.0375	74.825	76.892	1.3516	75.540	137.29	1080.00	
1.0375	0.9995	74.192	76.229	1.3483	74.881	137.28	1090.00	
0.9995	0.9333	73.536	75.469	1.3449	74.124	137.26	1100.00	
0.9333	0.9008	72.783	74.617	1.3409	73.276	137.25	1110.00	
0.9008	1.0488	71.940	73.889	1.3365	72.553	137.23	1120.00	
1.0488	0.9582	71.220	73.227	1.3327	71.894	137.22	1130.00	
0.9582	0.7548	70.565	72.278	1.3293	70.949	137.21	1140.00	
0.7548	0.8183	69.625	71.198	1.3242	69.874	137.19	1150.00	
0.8183	0.8446	68.555	70.218	1.3185	68.899	137.17	1160.00	
0.8446	0.8577	67.586	69.288	1.3133	67.975	137.15	1170.00	
0.8577	0.8697	66.667	68.394	1.3084	67.086	137.13	1180.00	
0.8697	0.8705	65.782	67.522	1.3036	66.219	137.12	1190.00	
0.8705	0.8710	64.920	66.661	1.2990	65.362	137.10	1200.00	
0.8710	0.8767	64.068	65.816	1.2943	64.521	137.09	1210.00	
0.8767	0.8744	63.231	64.983	1.2898	63.693	137.07	1220.00	
0.8744	0.8734	62.408	64.155	1.2852	62.870	137.05	1230.00	
0.8734	0.8783	61.589	63.341	1.2808	62.060	137.04	1240.00	
0.8783	0.8756	60.784	62.538	1.2763	61.262	137.02	1250.00	
0.8756	0.8744	59.990	61.740	1.2720	60.468	137.01	1260.00	
0.8744	0.8793	59.200	60.954	1.2672	59.687	136.99	1270.00	
0.8793	0.8765	58.425	60.181	1.2618	58.919	136.97	1280.00	
0.8765	0.8753	57.663	59.415	1.2565	58.158	136.96	1290.00	
0.8753	0.8801	56.907	58.662	1.2512	57.411	136.94	1300.00	
0.8801	0.8773	56.165	57.923	1.2460	56.677	136.92	1310.00	
0.8773	0.8761	55.436	57.189	1.2410	55.948	136.90	1320.00	
0.8761	0.8330	54.712	56.421	1.2358	55.185	136.89	1330.00	
0.8330	0.7692	53.955	55.557	1.2304	54.327	136.87	1340.00	
0.7692	0.7377	53.102	54.609	1.2243	53.385	136.85	1350.00	
0.7377	0.7168	52.167	53.622	1.2177	52.404	136.83	1360.00	
0.7168	0.7119	51.193	52.622	1.2107	51.411	136.81	1370.00	
0.7119	0.7096	50.208	51.629	1.2036	50.426	136.78	1380.00	
0.7096	0.7032	49.229	50.642	1.1964	49.446	136.76	1390.00	

NOVELLUS

 =====  
 LEVEL POOL ROUTING TABLE  
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## LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
0.7032	0.7054	48.256	49.665	1.1893	48.476	136.74	1400.00
0.7054	0.7066	47.293	48.705	1.1822	47.523	136.71	1410.00
0.7066	0.7019	46.348	47.756	1.1753	46.581	136.69	1420.00
0.7019	0.7050	45.413	46.820	1.1682	45.651	136.67	1430.00
0.7050	0.7066	44.490	45.902	1.1613	44.741	136.65	1440.00
0.7066	0.5260	43.586	44.819	1.1545	43.664	136.63	1450.00
0.5260	0.2604	42.518	43.304	1.1465	42.158	136.60	1460.00
0.2604	0.1289	41.023	41.412	1.1349	40.277	136.57	1470.00
0.1289	0.0638	39.157	39.349	1.1205	38.229	136.53	1480.00
0.0638	0.0316	37.124	37.220	1.1046	36.115	136.48	1490.00
0.0316	0.0156	35.027	35.074	1.0878	33.987	136.43	1500.00
0.0156	0.0077	32.916	32.939	1.0708	31.868	136.38	1510.00
0.0077	0.0038	30.815	30.826	1.0535	29.773	136.33	1520.00
0.0038	0.0019	28.737	28.743	1.0362	27.706	136.28	1530.00
0.0019	0.0009	26.688	26.691	1.0187	25.672	136.23	1540.00
0.0009	0.0005	24.671	24.672	1.0013	23.671	136.19	1550.00
0.0005	0.0002	22.687	22.688	0.9838	21.704	136.14	1560.00
0.0002	0.0001	20.737	20.738	0.9665	19.771	136.10	1570.00
0.0001	0.0001	18.822	18.823	0.9488	17.874	136.05	1580.00
0.0001	0.0000	16.942	16.942	0.9315	16.011	136.01	1590.00
0.0000	0.0000	15.100	15.100	0.9105	14.190	135.96	1600.00
0.0000	0.0000	13.301	13.301	0.8890	12.412	135.90	1610.00
0.0000	0.0000	11.545	11.545	0.8671	10.678	135.85	1620.00
0.0000	0.0000	9.8320	9.8320	0.8457	8.9864	135.80	1630.00
0.0000	0.0000	8.1626	8.1626	0.8237	7.3389	135.76	1640.00
0.0000	0.0000	6.5366	6.5366	0.8023	5.7343	135.71	1650.00
0.0000	0.0000	4.9539	4.9539	0.7804	4.1735	135.66	1660.00
0.0000	0.0000	3.4147	3.4147	0.7589	2.6558	135.62	1670.00
0.0000	0.0000	1.9219	1.9219	0.7340	1.1879	135.57	1680.00
0.0000	0.0000	0.4809	0.4809	0.7070	-0.2262	135.52	1690.00

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ROUTING REPORT

STORAGE LIST            ID No.    A  
Description:

MULTIPLE ORIFICE        ID No.    A  
Description:  
Outlet Elev:    134.85  
Elev:    134.85 ft        Orifice Diameter:    5.6484 in.

ROUTING CURVE

STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min
134.85	0.0000	0.0000	0.0000	136.90	16574	1.2396	56.487	139.00	52955	1.7638	178.28
134.90	0.0000	0.1936	0.1936	137.00	17862	1.2695	60.810	139.10	53960	1.7849	181.65
135.00	0.0000	0.3353	0.3353	137.10	19459	1.2987	66.161	139.20	54964	1.8058	185.02
135.10	0.0000	0.4329	0.4329	137.20	21055	1.3272	71.511	139.30	55969	1.8264	188.39
135.20	0.0000	0.5122	0.5122	137.30	22652	1.3552	76.861	139.40	56973	1.8468	191.76
135.30	0.0000	0.5808	0.5808	137.40	24248	1.3826	82.211	139.50	57978	1.8670	195.13
135.40	0.0000	0.6421	0.6421	137.50	25845	1.4094	87.559	139.60	58982	1.8870	198.49
135.50	0.0000	0.6980	0.6980	137.60	27442	1.4358	92.908	139.70	59987	1.9067	201.86
135.60	830.50	0.7498	3.5181	137.70	29038	1.4616	98.256	139.80	60991	1.9263	205.23
135.70	1869	0.7982	7.0270	137.80	30635	1.4871	103.60	139.90	61996	1.9456	208.60
135.80	2907	0.8439	10.533	137.90	32231	1.5121	108.95	140.00	63000	1.9648	211.96
135.90	3945	0.8872	14.037	138.00	33828	1.5366	114.30	140.10	64500	1.9838	216.98
136.00	4983	0.9285	17.538	138.10	35741	1.5608	120.70	140.20	66000	2.0026	222.00
136.10	6271	0.9680	21.871	138.20	37653	1.5847	127.10	140.30	67500	2.0212	227.02
136.20	7559	1.0060	26.202	138.30	39566	1.6082	133.50	140.40	69000	2.0397	232.04
136.30	8847	1.0426	30.532	138.40	41479	1.6313	139.89	140.50	70500	2.0580	237.06
136.40	10135	1.0779	34.860	138.50	43392	1.6541	146.29	140.60	72000	2.0761	242.08
136.50	11423	1.1121	39.187	138.60	45304	1.6766	152.69	140.70	73500	2.0941	247.09
136.60	12710	1.1453	43.513	138.70	47217	1.6988	159.09	140.80	75000	2.1119	252.11
136.70	13998	1.1776	47.839	138.80	49130	1.7207	165.49	140.90	76500	2.1296	257.13
136.80	15286	1.2090	52.163	138.90	51042	1.7424	171.88				



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LEVEL POOL ROUTING TABLE

MATCH Q (cfs) : 3.12 INFLOW Q (cfs): 8.82  
 PEAK STAGE (ft): 138.98 PEAK OUTFLOW : 1.76  
 PEAK TIME: 800.00 min.  
 INFLOW HYD No. : 6 OUTFLOW HYD No.: 11

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
0.0000	0.0023	0.0000	0.0023	0.0000	0.0023	134.85	40.00
0.0023	0.0255	0.0000	0.0278	0.0023	0.0255	134.85	50.00
0.0255	0.0753	0.0000	0.1008	0.0255	0.0753	134.85	60.00
0.0753	0.1703	0.0000	0.2456	0.0753	0.1703	134.85	70.00
0.1703	0.2994	0.0000	0.4697	0.1703	0.2994	135.50	80.00
0.2994	0.4187	0.0000	0.7181	0.2994	0.4187	135.50	90.00
0.4187	0.5234	0.0000	0.9421	0.4187	0.5234	135.50	100.00
0.5234	0.6131	0.0000	1.1365	0.5234	0.6131	135.50	110.00
0.6131	0.6895	0.0000	1.3026	0.6131	0.6895	135.50	120.00
0.6895	0.7895	0.0000	1.4789	0.6895	0.7895	135.50	130.00
0.7895	0.9053	0.0898	1.7845	0.6997	1.0848	135.50	140.00
0.9053	0.9889	0.3797	2.2739	0.7051	1.5688	135.51	150.00
0.9889	1.0481	0.8548	2.8918	0.7140	2.1778	135.53	160.00
1.0481	1.1016	1.4526	3.6024	0.7252	2.8772	135.55	170.00
1.1016	1.1447	2.1391	4.3854	0.7380	3.6474	135.58	180.00
1.1447	1.1754	2.8958	5.2158	0.7516	4.4642	135.60	190.00
1.1754	1.2085	3.7014	6.0852	0.7629	5.3224	135.63	200.00
1.2085	1.2361	4.5477	6.9923	0.7747	6.2176	135.65	210.00
1.2361	1.2542	5.4306	7.9208	0.7871	7.1338	135.68	220.00
1.2542	1.2775	6.3342	8.8659	0.7996	8.0662	135.70	230.00
1.2775	1.2969	7.2545	9.8289	0.8118	9.0171	135.73	240.00
1.2969	1.3600	8.1930	10.850	0.8241	10.026	135.76	250.00
1.3600	1.4449	9.1885	11.993	0.8373	11.156	135.79	260.00
1.4449	1.4942	10.305	13.244	0.8516	12.392	135.82	270.00
1.4942	1.5311	11.525	14.551	0.8669	13.684	135.85	280.00
1.5311	1.5505	12.801	15.882	0.8828	15.000	135.89	290.00
1.5505	1.5680	14.101	17.220	0.8985	16.321	135.93	300.00
1.5680	1.7930	15.407	18.768	0.9141	17.854	135.97	310.00
1.7930	2.1184	16.922	20.834	0.9313	19.903	136.01	320.00
2.1184	2.2939	18.953	23.365	0.9500	22.415	136.05	330.00
2.2939	2.3939	21.442	26.130	0.9728	25.157	136.11	340.00
2.3939	2.4554	24.160	29.009	0.9968	28.013	136.18	350.00
2.4554	2.4969	26.991	31.944	1.0213	30.922	136.24	360.00
2.4969	2.4756	29.877	34.849	1.0458	33.803	136.31	370.00
2.4756	2.4218	32.734	37.631	1.0693	36.562	136.38	380.00
2.4218	2.3962	35.471	40.289	1.0914	39.197	136.44	390.00
2.3962	2.3906	38.085	42.872	1.1122	41.760	136.50	400.00
2.3906	2.4010	40.628	45.419	1.1319	44.288	136.56	410.00
2.4010	2.4058	43.136	47.943	1.1511	46.792	136.62	420.00
2.4058	3.1411	45.622	51.169	1.1698	49.999	136.68	430.00
3.1411	4.2539	48.806	56.201	1.1933	55.008	136.75	440.00

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs min ----->			----->				(ft)	(min)
=====								
4.2539	4.8282	53.779	62.861	1.2292	61.631	136.87	450.00	
4.8282	6.1720	60.357	71.358	1.2740	70.084	137.02	460.00	
6.1720	7.9120	68.764	82.848	1.3196	81.528	137.17	470.00	
7.9120	8.8222	80.149	96.884	1.3791	95.504	137.39	480.00	
8.8222	7.8936	94.056	110.77	1.4483	109.32	137.65	490.00	
7.8936	6.0356	107.81	121.74	1.5138	120.23	137.91	500.00	
6.0356	5.1224	118.67	129.82	1.5591	128.27	138.09	510.00	
5.1224	4.5550	126.68	136.35	1.5890	134.76	138.22	520.00	
4.5550	4.1650	133.15	141.87	1.6127	140.26	138.32	530.00	
4.1650	3.9765	138.63	146.77	1.6326	145.14	138.41	540.00	
3.9765	3.5852	143.49	151.05	1.6500	149.40	138.48	550.00	
3.5852	3.0921	147.73	154.41	1.6650	152.74	138.55	560.00	
3.0921	2.8499	151.07	157.01	1.6768	155.33	138.60	570.00	
2.8499	2.7391	153.65	159.24	1.6858	157.55	138.64	580.00	
2.7391	2.6789	155.86	161.27	1.6935	159.58	138.68	590.00	
2.6789	2.6508	157.88	163.21	1.7005	161.51	138.71	600.00	
2.6508	2.5806	159.80	165.03	1.7071	163.33	138.74	610.00	
2.5806	2.4893	161.61	166.68	1.7133	164.97	138.77	620.00	
2.4893	2.4454	163.25	168.19	1.7190	166.47	138.79	630.00	
2.4454	2.4178	164.74	169.61	1.7241	167.88	138.82	640.00	
2.4178	2.4127	166.15	170.98	1.7289	169.25	138.84	650.00	
2.4127	2.4114	167.52	172.35	1.7335	170.61	138.86	660.00	
2.4114	2.2879	168.87	173.57	1.7381	171.83	138.88	670.00	
2.2879	2.1036	170.09	174.48	1.7422	172.74	138.90	680.00	
2.1036	2.0131	171.00	175.11	1.7453	173.37	138.91	690.00	
2.0131	1.9763	171.62	175.61	1.7474	173.86	138.92	700.00	
1.9763	1.9516	172.11	176.04	1.7490	174.29	138.93	710.00	
1.9516	1.9400	172.54	176.43	1.7504	174.68	138.94	720.00	
1.9400	1.9423	172.93	176.81	1.7518	175.06	138.94	730.00	
1.9423	1.9368	173.31	177.19	1.7530	175.44	138.95	740.00	
1.9368	1.9348	173.68	177.55	1.7543	175.80	138.96	750.00	
1.9348	1.9418	174.04	177.92	1.7555	176.16	138.96	760.00	
1.9418	1.9386	174.41	178.29	1.7567	176.53	138.97	770.00	
1.9386	1.9376	174.77	178.65	1.7579	176.89	138.97	780.00	
1.9376	1.8200	175.13	178.89	1.7591	177.13	138.98	790.00	
1.8200	1.6371	175.37	178.83	1.7599	177.07	138.98	800.00	
1.6371	1.5469	175.31	178.49	1.7597	176.73	138.98	810.00	
1.5469	1.5026	174.97	178.02	1.7586	176.26	138.98	820.00	
1.5026	1.4810	174.51	177.49	1.7570	175.73	138.97	830.00	
1.4810	1.4706	173.98	176.93	1.7553	175.17	138.96	840.00	
1.4706	1.5249	173.42	176.42	1.7534	174.66	138.95	850.00	
1.5249	1.6185	172.91	176.06	1.7517	174.30	138.94	860.00	
1.6185	1.6653	172.55	175.84	1.7505	174.09	138.94	870.00	
1.6653	1.6815	172.34	175.68	1.7498	173.93	138.93	880.00	
1.6815	1.6974	172.18	175.56	1.7492	173.81	138.93	890.00	
1.6974	1.7056	172.07	175.47	1.7488	173.72	138.93	900.00	
1.7056	1.7027	171.97	175.38	1.7485	173.63	138.93	910.00	

NOVELLUS

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LEVEL POOL ROUTING TABLE

## LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs			min	----->			(ft)	(min)
1.7027	1.7091	171.88	175.29	1.7482	173.55	138.93	920.00	
1.7091	1.7127	171.80	175.22	1.7480	173.47	138.93	930.00	
1.7127	1.7074	171.72	175.14	1.7477	173.40	138.92	940.00	
1.7074	1.7126	171.65	175.07	1.7475	173.32	138.92	950.00	
1.7126	1.7156	171.57	175.00	1.7472	173.26	138.92	960.00	
1.7156	1.5244	171.51	174.75	1.7470	173.00	138.92	970.00	
1.5244	1.2519	171.26	174.03	1.7461	172.29	138.92	980.00	
1.2519	1.1171	170.54	172.91	1.7437	171.17	138.91	990.00	
1.1171	1.0431	169.43	171.59	1.7400	169.85	138.89	1000.00	
1.0431	1.0140	168.11	170.17	1.7355	168.43	138.87	1010.00	
1.0140	0.9997	166.70	168.72	1.7307	166.99	138.85	1020.00	
0.9997	1.1117	165.26	167.37	1.7258	165.65	138.82	1030.00	
1.1117	1.2937	163.92	166.33	1.7213	164.61	138.80	1040.00	
1.2937	1.3840	162.89	165.57	1.7177	163.85	138.79	1050.00	
1.3840	1.4290	162.14	164.95	1.7151	163.23	138.77	1060.00	
1.4290	1.4515	161.52	164.40	1.7130	162.69	138.76	1070.00	
1.4515	1.4629	160.98	163.89	1.7112	162.18	138.76	1080.00	
1.4629	1.4092	160.47	163.34	1.7094	161.63	138.75	1090.00	
1.4092	1.3158	159.93	162.65	1.7075	160.94	138.74	1100.00	
1.3158	1.2697	159.24	161.82	1.7052	160.12	138.73	1110.00	
1.2697	1.4782	158.42	161.16	1.7024	159.46	138.72	1120.00	
1.4782	1.3504	157.76	160.59	1.7001	158.89	138.71	1130.00	
1.3504	1.0637	157.19	159.61	1.6981	157.91	138.70	1140.00	
1.0637	1.1531	156.21	158.43	1.6947	156.74	138.68	1150.00	
1.1531	1.1900	155.04	157.39	1.6907	155.70	138.66	1160.00	
1.1900	1.2084	154.01	156.41	1.6871	154.72	138.65	1170.00	
1.2084	1.2252	153.04	155.47	1.6837	153.79	138.63	1180.00	
1.2252	1.2261	152.11	154.56	1.6804	152.88	138.62	1190.00	
1.2261	1.2268	151.20	153.65	1.6773	151.98	138.60	1200.00	
1.2268	1.2347	150.30	152.76	1.6741	151.09	138.59	1210.00	
1.2347	1.2313	149.42	151.88	1.6710	150.21	138.57	1220.00	
1.2313	1.2298	148.55	151.01	1.6679	149.34	138.56	1230.00	
1.2298	1.2367	147.67	150.14	1.6648	148.48	138.55	1240.00	
1.2367	1.2328	146.81	149.28	1.6618	147.62	138.53	1250.00	
1.2328	1.2310	145.96	148.43	1.6588	146.77	138.52	1260.00	
1.2310	1.2377	145.11	147.58	1.6558	145.93	138.51	1270.00	
1.2377	1.2337	144.27	146.74	1.6528	145.09	138.49	1280.00	
1.2337	1.2319	143.44	145.91	1.6498	144.26	138.48	1290.00	
1.2319	1.2386	142.61	145.08	1.6469	143.43	138.47	1300.00	
1.2386	1.2346	141.79	144.26	1.6439	142.62	138.46	1310.00	
1.2346	1.2327	140.98	143.45	1.6410	141.80	138.44	1320.00	
1.2327	1.1720	140.17	142.57	1.6381	140.93	138.43	1330.00	
1.1720	1.0821	139.30	141.55	1.6350	139.92	138.42	1340.00	
1.0821	1.0377	138.29	140.41	1.6314	138.77	138.40	1350.00	
1.0377	1.0083	137.15	139.19	1.6272	137.57	138.38	1360.00	
1.0083	1.0014	135.94	137.95	1.6229	136.33	138.36	1370.00	
1.0014	0.9980	134.71	136.71	1.6184	135.09	138.34	1380.00	

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LEVEL POOL ROUTING TABLE
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LEVEL POOL ROUTING TABLE

Table with 8 columns: I1, I2, 2S1, SUM, O1, O2+2S2, STAGE, TIME. The table contains 40 rows of numerical data representing routing parameters and results.

NOVELLUS

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs min ----->			min	>-----<			(ft)	(min)
0.0000	0.0000	22.411	22.411	0.9813	21.430	136.14	1860.00	
0.0000	0.0000	20.466	20.466	0.9640	19.502	136.09	1870.00	
0.0000	0.0000	18.555	18.555	0.9464	17.609	136.05	1880.00	
0.0000	0.0000	16.680	16.680	0.9291	15.751	136.00	1890.00	
0.0000	0.0000	14.843	14.843	0.9074	13.936	135.95	1900.00	
0.0000	0.0000	13.050	13.050	0.8859	12.164	135.90	1910.00	
0.0000	0.0000	11.300	11.300	0.8640	10.436	135.85	1920.00	
0.0000	0.0000	9.5935	9.5935	0.8426	8.7509	135.80	1930.00	
0.0000	0.0000	7.9302	7.9302	0.8207	7.1095	135.75	1940.00	
0.0000	0.0000	6.3102	6.3102	0.7993	5.5109	135.70	1950.00	
0.0000	0.0000	4.7336	4.7336	0.7773	3.9563	135.66	1960.00	
0.0000	0.0000	3.2004	3.2004	0.7559	2.4446	135.61	1970.00	
0.0000	0.0000	1.7145	1.7145	0.7301	0.9844	135.56	1980.00	
0.0000	0.0000	0.2811	0.2811	0.7033	-0.4222	135.51	1990.00	



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ROUTING REPORT

STORAGE LIST            ID No.    A  
Description:

MULTIPLE ORIFICE        ID No.    A  
Description:  
Outlet Elev:    134.85  
Elev:    134.85 ft            Orifice Diameter:    5.6484 in.

ROUTING CURVE

STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min	STAGE (ft)	STORAGE (cf)	OUTFLOW (cfs)	O+2S cfs-min
134.85	0.0000	0.0000	0.0000	136.90	16574	1.2396	56.487	139.00	52955	1.7638	178.28
134.90	0.0000	0.1936	0.1936	137.00	17862	1.2695	60.810	139.10	53960	1.7849	181.65
135.00	0.0000	0.3353	0.3353	137.10	19459	1.2987	66.161	139.20	54964	1.8058	185.02
135.10	0.0000	0.4329	0.4329	137.20	21055	1.3272	71.511	139.30	55969	1.8264	188.39
135.20	0.0000	0.5122	0.5122	137.30	22652	1.3552	76.861	139.40	56973	1.8468	191.76
135.30	0.0000	0.5808	0.5808	137.40	24248	1.3826	82.211	139.50	57978	1.8670	195.13
135.40	0.0000	0.6421	0.6421	137.50	25845	1.4094	87.559	139.60	58982	1.8870	198.49
135.50	0.0000	0.6980	0.6980	137.60	27442	1.4358	92.908	139.70	59987	1.9067	201.86
135.60	830.50	0.7498	3.5181	137.70	29038	1.4616	98.256	139.80	60991	1.9263	205.23
135.70	1869	0.7982	7.0270	137.80	30635	1.4871	103.60	139.90	61996	1.9456	208.60
135.80	2907	0.8439	10.533	137.90	32231	1.5121	108.95	140.00	63000	1.9648	211.96
135.90	3945	0.8872	14.037	138.00	33828	1.5366	114.30	140.10	64500	1.9838	216.98
136.00	4983	0.9285	17.538	138.10	35741	1.5608	120.70	140.20	66000	2.0026	222.00
136.10	6271	0.9680	21.871	138.20	37653	1.5847	127.10	140.30	67500	2.0212	227.02
136.20	7559	1.0060	26.202	138.30	39566	1.6082	133.50	140.40	69000	2.0397	232.04
136.30	8847	1.0426	30.532	138.40	41479	1.6313	139.89	140.50	70500	2.0580	237.06
136.40	10135	1.0779	34.860	138.50	43392	1.6541	146.29	140.60	72000	2.0761	242.08
136.50	11423	1.1121	39.187	138.60	45304	1.6766	152.69	140.70	73500	2.0941	247.09
136.60	12710	1.1453	43.513	138.70	47217	1.6988	159.09	140.80	75000	2.1119	252.11
136.70	13998	1.1776	47.839	138.80	49130	1.7207	165.49	140.90	76500	2.1296	257.13
136.80	15286	1.2090	52.163	138.90	51042	1.7424	171.88				

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LEVEL POOL ROUTING TABLE

MATCH Q (cfs) : 4.00    INFLOW Q (cfs): 10.10  
 PEAK STAGE (ft): 140.06    PEAK OUTFLOW : 1.98  
 PEAK TIME: 800.00 min.  
 INFLOW HYD No. : 7    OUTFLOW HYD No.: 12

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
0.0000	0.0108	0.0000	0.0108	0.0000	0.0108	134.85	40.00
0.0108	0.0546	0.0000	0.0654	0.0108	0.0546	135.50	50.00
0.0546	0.1252	0.0000	0.1798	0.0546	0.1252	135.50	60.00
0.1252	0.2471	0.0000	0.3723	0.1252	0.2471	135.50	70.00
0.2471	0.4071	0.0000	0.6542	0.2471	0.4071	135.50	80.00
0.4071	0.5481	0.0000	0.9552	0.4071	0.5481	135.50	90.00
0.5481	0.6678	0.0000	1.2158	0.5481	0.6678	135.50	100.00
0.6678	0.7681	0.0000	1.4358	0.6678	0.7681	135.50	110.00
0.7681	0.8518	0.0687	1.6886	0.6993	0.9893	135.50	120.00
0.8518	0.9641	0.2859	2.1019	0.7034	1.3985	135.51	130.00
0.9641	1.0953	0.6876	2.7470	0.7109	2.0362	135.52	140.00
1.0953	1.1875	1.3136	3.5963	0.7226	2.8737	135.55	150.00
1.1875	1.2507	2.1358	4.5739	0.7380	3.8359	135.58	160.00
1.2507	1.3074	3.0818	5.6399	0.7542	4.8857	135.61	170.00
1.3074	1.3523	4.1170	6.7767	0.7687	6.0081	135.64	180.00
1.3523	1.3831	5.2239	7.9594	0.7842	7.1752	135.67	190.00
1.3831	1.4173	6.3750	9.1755	0.8002	8.3753	135.70	200.00
1.4173	1.4453	7.5595	10.422	0.8158	9.6063	135.74	210.00
1.4453	1.4626	8.7745	11.682	0.8318	10.851	135.77	220.00
1.4626	1.4863	10.003	12.952	0.8478	12.104	135.81	230.00
1.4863	1.5058	11.241	14.233	0.8633	13.370	135.84	240.00
1.5058	1.5760	12.491	15.572	0.8789	14.693	135.88	250.00
1.5760	1.6719	13.799	17.046	0.8949	16.152	135.92	260.00
1.6719	1.7289	15.239	18.640	0.9121	17.728	135.96	270.00
1.7289	1.7740	16.798	20.301	0.9302	19.371	136.00	280.00
1.7740	1.7986	18.425	21.998	0.9452	21.053	136.04	290.00
1.7986	1.8195	20.092	23.710	0.9605	22.750	136.08	300.00
1.8195	2.0796	21.774	25.673	0.9757	24.698	136.12	310.00
2.0796	2.4549	23.705	28.239	0.9928	27.246	136.17	320.00
2.4549	2.6557	26.232	31.342	1.0148	30.327	136.22	330.00
2.6557	2.7687	29.286	34.711	1.0408	33.670	136.30	340.00
2.7687	2.8373	32.602	38.208	1.0682	37.140	136.37	350.00
2.8373	2.8828	36.044	41.764	1.0959	40.668	136.45	360.00
2.8828	2.8561	39.544	45.283	1.1235	44.160	136.53	370.00
2.8561	2.7921	43.009	48.658	1.1502	47.507	136.61	380.00
2.7921	2.7608	46.332	51.885	1.1751	50.710	136.69	390.00
2.7608	2.7527	49.512	55.025	1.1985	53.827	136.77	400.00
2.7527	2.7632	52.606	58.122	1.2208	56.901	136.84	410.00
2.7632	2.7674	55.658	61.189	1.2425	59.947	136.91	420.00
2.7674	3.6107	58.683	65.061	1.2636	63.798	136.98	430.00
3.6107	4.8868	62.512	71.009	1.2858	69.723	137.06	440.00

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 =====  
 LEVEL POOL ROUTING TABLE
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## LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME	
<----- cfs			min	----->			(ft)	(min)
4.8868	5.5430	68.406	78.835	1.3177	77.518	137.17	450.00	
5.5430	7.0799	76.159	88.782	1.3586	87.424	137.31	460.00	
7.0799	9.0687	86.015	102.16	1.4087	100.75	137.50	470.00	
9.0687	10.104	99.281	118.45	1.4735	116.98	137.75	480.00	
10.104	9.0361	115.43	134.57	1.5468	133.03	138.04	490.00	
9.0361	6.9063	131.42	147.36	1.6064	145.76	138.29	500.00	
6.9063	5.8589	144.10	156.87	1.6522	155.22	138.49	510.00	
5.8589	5.2080	153.53	164.60	1.6854	162.91	138.64	520.00	
5.2080	4.7606	161.20	171.17	1.7119	169.46	138.76	530.00	
4.7606	4.5438	167.72	177.03	1.7342	175.29	138.86	540.00	
4.5438	4.0957	173.54	182.18	1.7538	180.43	138.95	550.00	
4.0957	3.5317	178.65	186.28	1.7772	184.50	139.06	560.00	
3.5317	3.2545	182.70	189.48	1.8026	187.68	139.18	570.00	
3.2545	3.1274	185.86	192.24	1.8221	190.42	139.28	580.00	
3.1274	3.0582	188.58	194.77	1.8387	192.93	139.36	590.00	
3.0582	3.0257	191.07	197.16	1.8538	195.30	139.43	600.00	
3.0257	2.9452	193.43	199.41	1.8681	197.54	139.51	610.00	
2.9452	2.8406	195.66	201.44	1.8813	199.56	139.57	620.00	
2.8406	2.7903	197.67	203.30	1.8932	201.41	139.63	630.00	
2.7903	2.7584	199.50	205.05	1.9041	203.15	139.69	640.00	
2.7584	2.7522	201.23	206.74	1.9142	204.83	139.74	650.00	
2.7522	2.7505	202.90	208.41	1.9240	206.48	139.79	660.00	
2.7505	2.6094	204.55	209.91	1.9335	207.98	139.84	670.00	
2.6094	2.3990	206.03	211.04	1.9421	209.10	139.88	680.00	
2.3990	2.2956	207.15	211.85	1.9485	209.90	139.91	690.00	
2.2956	2.2535	207.94	212.49	1.9530	210.54	139.94	700.00	
2.2535	2.2251	208.58	213.06	1.9567	211.11	139.96	710.00	
2.2251	2.2117	209.15	213.58	1.9599	211.62	139.97	720.00	
2.2117	2.2142	209.66	214.09	1.9629	212.12	139.99	730.00	
2.2142	2.2077	210.16	214.58	1.9654	212.61	140.00	740.00	
2.2077	2.2052	210.65	215.06	1.9673	213.09	140.01	750.00	
2.2052	2.2130	211.12	215.54	1.9691	213.57	140.02	760.00	
2.2130	2.2092	211.60	216.02	1.9709	214.05	140.03	770.00	
2.2092	2.2080	212.08	216.50	1.9727	214.52	140.04	780.00	
2.2080	2.0738	212.55	216.83	1.9745	214.86	140.05	790.00	
2.0738	1.8653	212.88	216.82	1.9758	214.84	140.06	800.00	
1.8653	1.7624	212.87	216.50	1.9757	214.52	140.06	810.00	
1.7624	1.7118	212.55	216.02	1.9745	214.05	140.05	820.00	
1.7118	1.6871	212.07	215.47	1.9727	213.50	140.04	830.00	
1.6871	1.6753	211.53	214.89	1.9706	212.92	140.03	840.00	
1.6753	1.7370	210.95	214.36	1.9684	212.40	140.02	850.00	
1.7370	1.8436	210.43	214.01	1.9664	212.04	140.01	860.00	
1.8436	1.8968	210.08	213.82	1.9651	211.85	140.00	870.00	
1.8968	1.9151	209.89	213.70	1.9642	211.74	140.00	880.00	
1.9151	1.9331	209.77	213.62	1.9635	211.66	139.99	890.00	
1.9331	1.9424	209.70	213.57	1.9631	211.61	139.99	900.00	
1.9424	1.9390	209.65	213.53	1.9628	211.56	139.99	910.00	

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

Table with 8 columns: I1, I2, 2S1, SUM, O1, O2+2S2, STAGE (ft), TIME (min). The table contains 40 rows of numerical data representing routing parameters and results.

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LEVEL POOL ROUTING TABLE

LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
1.1347	1.1243	171.59	173.85	1.7473	172.10	138.92	1390.00
1.1243	1.1278	170.36	172.61	1.7431	170.87	138.90	1400.00
1.1278	1.1296	169.13	171.39	1.7390	169.65	138.88	1410.00
1.1296	1.1221	167.91	170.16	1.7348	168.43	138.87	1420.00
1.1221	1.1270	166.70	168.95	1.7307	167.22	138.85	1430.00
1.1270	1.1295	165.49	167.75	1.7266	166.02	138.83	1440.00
1.1295	0.8407	164.30	166.27	1.7226	164.54	138.81	1450.00
0.8407	0.4162	162.83	164.08	1.7175	162.37	138.79	1460.00
0.4162	0.2060	160.66	161.28	1.7101	159.57	138.75	1470.00
0.2060	0.1020	157.87	158.18	1.7005	156.48	138.71	1480.00
0.1020	0.0505	154.79	154.94	1.6898	153.25	138.66	1490.00
0.0505	0.0250	151.57	151.65	1.6786	149.97	138.61	1500.00
0.0250	0.0124	148.30	148.34	1.6670	146.67	138.56	1510.00
0.0124	0.0061	145.01	145.03	1.6554	143.38	138.51	1520.00
0.0061	0.0030	141.73	141.74	1.6437	140.10	138.45	1530.00
0.0030	0.0015	138.47	138.47	1.6320	136.84	138.40	1540.00
0.0015	0.0007	135.22	135.22	1.6203	133.60	138.35	1550.00
0.0007	0.0004	131.99	131.99	1.6085	130.39	138.30	1560.00
0.0004	0.0002	128.79	128.79	1.5967	127.19	138.25	1570.00
0.0002	0.0001	125.61	125.61	1.5850	124.02	138.20	1580.00
0.0001	0.0000	122.45	122.45	1.5732	120.88	138.15	1590.00
0.0000	0.0000	119.32	119.32	1.5615	117.75	138.10	1600.00
0.0000	0.0000	116.20	116.20	1.5497	114.65	138.05	1610.00
0.0000	0.0000	113.12	113.12	1.5380	111.58	138.01	1620.00
0.0000	0.0000	110.05	110.05	1.5241	108.53	137.95	1630.00
0.0000	0.0000	107.02	107.02	1.5101	105.51	137.89	1640.00
0.0000	0.0000	104.01	104.01	1.4960	102.52	137.84	1650.00
0.0000	0.0000	101.04	101.04	1.4819	99.554	137.78	1660.00
0.0000	0.0000	98.086	98.086	1.4678	96.619	137.72	1670.00
0.0000	0.0000	95.165	95.165	1.4537	93.711	137.67	1680.00
0.0000	0.0000	92.271	92.271	1.4397	90.832	137.62	1690.00
0.0000	0.0000	89.406	89.406	1.4255	87.981	137.56	1700.00
0.0000	0.0000	86.569	86.569	1.4115	85.158	137.51	1710.00
0.0000	0.0000	83.760	83.760	1.3974	82.363	137.46	1720.00
0.0000	0.0000	80.980	80.980	1.3833	79.596	137.40	1730.00
0.0000	0.0000	78.227	78.227	1.3692	76.858	137.35	1740.00
0.0000	0.0000	75.503	75.503	1.3552	74.148	137.30	1750.00
0.0000	0.0000	72.807	72.807	1.3410	71.466	137.25	1760.00
0.0000	0.0000	70.138	70.138	1.3270	68.811	137.20	1770.00
0.0000	0.0000	67.499	67.499	1.3128	66.186	137.15	1780.00
0.0000	0.0000	64.887	64.887	1.2988	63.588	137.10	1790.00
0.0000	0.0000	62.303	62.303	1.2847	61.019	137.05	1800.00
0.0000	0.0000	59.748	59.748	1.2707	58.477	137.00	1810.00
0.0000	0.0000	57.224	57.224	1.2534	55.971	136.95	1820.00
0.0000	0.0000	54.735	54.735	1.2360	53.499	136.89	1830.00
0.0000	0.0000	52.280	52.280	1.2185	51.062	136.83	1840.00
0.0000	0.0000	49.861	49.861	1.2010	48.660	136.77	1850.00



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LEVEL POOL ROUTING TABLE

## LEVEL POOL ROUTING TABLE

I1	I2	2S1	SUM	O1	O2+2S2	STAGE	TIME
<----- cfs min ----->						(ft)	(min)
0.0000	0.0000	47.476	47.476	1.1836	46.293	136.72	1860.00
0.0000	0.0000	45.126	45.126	1.1661	43.960	136.66	1870.00
0.0000	0.0000	42.812	42.812	1.1487	41.663	136.61	1880.00
0.0000	0.0000	40.532	40.532	1.1311	39.401	136.56	1890.00
0.0000	0.0000	38.287	38.287	1.1138	37.173	136.50	1900.00
0.0000	0.0000	36.077	36.077	1.0962	34.981	136.45	1910.00
0.0000	0.0000	33.902	33.902	1.0789	32.823	136.40	1920.00
0.0000	0.0000	31.762	31.762	1.0613	30.700	136.35	1930.00
0.0000	0.0000	29.656	29.656	1.0439	28.613	136.30	1940.00
0.0000	0.0000	27.586	27.586	1.0263	26.560	136.26	1950.00
0.0000	0.0000	25.551	25.551	1.0090	24.542	136.21	1960.00
0.0000	0.0000	23.550	23.550	0.9914	22.559	136.16	1970.00
0.0000	0.0000	21.585	21.585	0.9740	20.611	136.12	1980.00
0.0000	0.0000	19.654	19.654	0.9565	18.698	136.07	1990.00
0.0000	0.0000	17.759	17.759	0.9390	16.820	136.03	2000.00
0.0000	0.0000	15.900	15.900	0.9200	14.980	135.98	2010.00
0.0000	0.0000	14.082	14.082	0.8983	13.183	135.93	2020.00
0.0000	0.0000	12.307	12.307	0.8766	11.430	135.88	2030.00
0.0000	0.0000	10.575	10.575	0.8550	9.7201	135.83	2040.00
0.0000	0.0000	8.8868	8.8868	0.8333	8.0535	135.78	2050.00
0.0000	0.0000	7.2419	7.2419	0.8116	6.4303	135.73	2060.00
0.0000	0.0000	5.6403	5.6403	0.7900	4.8503	135.68	2070.00
0.0000	0.0000	4.0821	4.0821	0.7682	3.3139	135.64	2080.00
0.0000	0.0000	2.5678	2.5678	0.7461	1.8218	135.59	2090.00
0.0000	0.0000	1.1031	1.1031	0.7187	0.3845	135.54	2100.00
0.0000	0.0000	0.0000	0.0000	0.3845	-0.3845	135.50	2110.00

PIPES HAVE BEEN DESIGNED TO CONVEY  
THE 25 YR STORM FOR EXISTING AND FUTURE  
EXPANSION. FLOWS WERE GENERATED USING THE  
SCS BASED SOFTWARE PROGRAM "WATERWORKS"

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GROUP

**MACKENZIE**

0690 SW Bancroft St / PO Box 69039 Portland, OR 97201-0039  
Tel: 503.224.9560 Net: info@grpmack.com Fax: 503.228.1285

By \_\_\_\_\_

Date \_\_\_\_\_

Job # \_\_\_\_\_

Sht. \_\_\_\_\_ of \_\_\_\_\_

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# AREAS FOR PIPE SIZING - 'X'

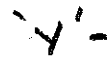
ID	AREA (AC)	ID	AREA (AC)	ID	AREA (AC)
CB					
#1	0.26	#21	0.26	#42	0.21
#2	0.07	#22	0.10	#43	0.36
#3	0.05	#23	0.25	#44	0.07
#4	0.05	#24	0.25	#45	0.20
#5	0.24	#25	0.15	#46	0.25
#6	0.09	#26	0.19	#47	0.29
#7	0.08	#27	0.14	#48	0.26
#8	0.08	#28	0.10	#49	0.13
#9	0.10	#29	0.16	#50	0.18
#10	0.12	#30	0.17	#51	0.11
#11	0.11	#31	0.13	#52	0.18
#12	0.11	#32	0.03	#53	0.21
#13	0.11	#33	0.03	#54	0.12
#14	0.20	#34	0.06	#55	0.15
#15	0.21	#35	0.21	#56	0.03
#16	0.21	#36	0.12	#57	0.04
#17	0.11	#37	0.17	DITCH	
#18	0.11	#38	0.19	INLET	
#19	0.06	#38A	0.12	#1	0.46
#20	0.06	#39	0.15	#2	1.0
#21		#40	0.36	#3	0.28
		#41	0.15		

# AREAS FOR PIPE SIZING

ID	AREA (Ac)	ID	AREA (Ac)
RD			
#1	0.06	#22	0.15
#2	0.06	#23	0.15
#3	0.06	#24	0.15
#4	0.06	#25	0.15
#5	0.06	#26	0.15
#6	0.06	#27	0.15
#7	0.06		
#8	0.06	FUTURE	
#9	0.06	#1	3.40
#10	0.23	#2	3.50
#11	0.22	#3	0.35
#12	0.08		
#13	0.08		
#14	0.08		
#15	0.20		
#16	0.20		
#17	0.15		
#18	0.15		
#19	0.28		
#20	0.28		
#21	0.28		

By \_\_\_\_\_  
 Date \_\_\_\_\_  
 Job # \_\_\_\_\_  
 Sht. \_\_\_\_\_ of \_\_\_\_\_

GROUP  
**MACKENZIE**



PIPE SIZING

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BASIN RESULT SUMMARY

BASIN ID	-----VOLUME-----		-RATE-	----TIME-----		Hydrograph Methodology	Area Acres
	---cf--	Ac-ft	--cfs-	-min-	hours		
CB1	3459	0.08	0.21	480	8.00	SBUH Method	0.26
CB10	1597	0.04	0.10	480	8.00	SBUH Method	0.12
CB11	1464	0.03	0.09	480	8.00	SBUH Method	0.11
CB12	1464	0.03	0.09	480	8.00	SBUH Method	0.11
CB13	1464	0.03	0.09	480	8.00	SBUH Method	0.11
CB14	2661	0.06	0.16	480	8.00	SBUH Method	0.20
CB15	2794	0.06	0.17	480	8.00	SBUH Method	0.21
CB16	2794	0.06	0.17	480	8.00	SBUH Method	0.21
CB17	1464	0.03	0.09	480	8.00	SBUH Method	0.11
CB18	1464	0.03	0.09	480	8.00	SBUH Method	0.11
CB19	798	0.02	0.05	480	8.00	SBUH Method	0.06
CB2	931	0.02	0.06	480	8.00	SBUH Method	0.07
CB20	798	0.02	0.05	480	8.00	SBUH Method	0.06
CB21	3459	0.08	0.21	480	8.00	SBUH Method	0.26
CB22	1331	0.03	0.08	480	8.00	SBUH Method	0.10
CB23	3326	0.08	0.20	480	8.00	SBUH Method	0.25
CB24	3326	0.08	0.20	480	8.00	SBUH Method	0.25
CB25	1996	0.05	0.12	480	8.00	SBUH Method	0.15
CB26	2528	0.06	0.15	480	8.00	SBUH Method	0.19
CB27	1863	0.04	0.11	480	8.00	SBUH Method	0.14
CB28	1331	0.03	0.08	480	8.00	SBUH Method	0.10
CB29	2129	0.05	0.13	480	8.00	SBUH Method	0.16
CB3	665	0.02	0.04	480	8.00	SBUH Method	0.05
CB30	2262	0.05	0.14	480	8.00	SBUH Method	0.17
CB31	1730	0.04	0.11	480	8.00	SBUH Method	0.13
CB32	399	0.01	0.02	480	8.00	SBUH Method	0.03
CB33	399	0.01	0.02	480	8.00	SBUH Method	0.03
CB34	798	0.02	0.05	480	8.00	SBUH Method	0.06
CB35	2794	0.06	0.17	480	8.00	SBUH Method	0.21
CB36	1597	0.04	0.10	480	8.00	SBUH Method	0.12
CB37	2262	0.05	0.14	480	8.00	SBUH Method	0.17
CB38	2528	0.06	0.15	480	8.00	SBUH Method	0.19
CB38A	1597	0.04	0.10	480	8.00	SBUH Method	0.12
CB39	1996	0.05	0.12	480	8.00	SBUH Method	0.15
CB4	665	0.02	0.04	480	8.00	SBUH Method	0.05
CB40	4790	0.11	0.29	480	8.00	SBUH Method	0.36
CB41	1996	0.05	0.12	480	8.00	SBUH Method	0.15
CB42	2794	0.06	0.17	480	8.00	SBUH Method	0.21
CB43	4790	0.11	0.29	480	8.00	SBUH Method	0.36
CB44	931	0.02	0.06	480	8.00	SBUH Method	0.07
CB45	2661	0.06	0.16	480	8.00	SBUH Method	0.20
CB46	3326	0.08	0.20	480	8.00	SBUH Method	0.25
CB47	3859	0.09	0.24	480	8.00	SBUH Method	0.29
CB48	3459	0.08	0.21	480	8.00	SBUH Method	0.26
CB49	1730	0.04	0.11	480	8.00	SBUH Method	0.13
CB5	3193	0.07	0.20	480	8.00	SBUH Method	0.24
CB50	2395	0.05	0.15	480	8.00	SBUH Method	0.18



## PIPE SIZING

=====
  
BASIN RESULT SUMMARY
  
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BASIN	-----VOLUME-----		-RATE-	----TIME-----		Hydrograph	Area
ID	---cf--	Ac-ft	--cfs-	-min-	hours	Methodology	Acres
CB51	1464	0.03	0.09	480	8.00	SBUH Method	0.11
CB52	2395	0.05	0.15	480	8.00	SBUH Method	0.18
CB53	2794	0.06	0.17	480	8.00	SBUH Method	0.21
CB54	1597	0.04	0.10	480	8.00	SBUH Method	0.12
CB55	1996	0.05	0.12	480	8.00	SBUH Method	0.15
CB56	399	0.01	0.02	480	8.00	SBUH Method	0.03
CB57	532	0.01	0.03	480	8.00	SBUH Method	0.04
CB6	1197	0.03	0.07	480	8.00	SBUH Method	0.09
CB7	1064	0.02	0.07	480	8.00	SBUH Method	0.08
CB8	1064	0.02	0.07	480	8.00	SBUH Method	0.08
CB9	1331	0.03	0.08	480	8.00	SBUH Method	0.10
DI1	6120	0.14	0.37	480	8.00	SBUH Method	0.46
DI3	3725	0.09	0.23	480	8.00	SBUH Method	0.28
FUT1	45238	1.04	2.77	480	8.00	SBUH Method	3.40
FUT2	46568	1.07	2.85	480	8.00	SBUH Method	3.50
FUT3	4657	0.11	0.29	480	8.00	SBUH Method	0.35
RD1	798	0.02	0.05	480	8.00	SBUH Method	0.06
RD10	3060	0.07	0.19	480	8.00	SBUH Method	0.23
RD11	2927	0.07	0.18	480	8.00	SBUH Method	0.22
RD12	1064	0.02	0.07	480	8.00	SBUH Method	0.08
RD13	1064	0.02	0.07	480	8.00	SBUH Method	0.08
RD14	1064	0.02	0.07	480	8.00	SBUH Method	0.08
RD15	2661	0.06	0.16	480	8.00	SBUH Method	0.20
RD16	2661	0.06	0.16	480	8.00	SBUH Method	0.20
RD17	1996	0.05	0.12	480	8.00	SBUH Method	0.15
RD18	1996	0.05	0.12	480	8.00	SBUH Method	0.15
RD19	3725	0.09	0.23	480	8.00	SBUH Method	0.28
RD2	798	0.02	0.05	480	8.00	SBUH Method	0.06
RD20	3725	0.09	0.23	480	8.00	SBUH Method	0.28
RD21	3725	0.09	0.23	480	8.00	SBUH Method	0.28
RD22	1996	0.05	0.12	480	8.00	SBUH Method	0.15
RD23	1996	0.05	0.12	480	8.00	SBUH Method	0.15
RD24	1996	0.05	0.12	480	8.00	SBUH Method	0.15
RD25	1996	0.05	0.12	480	8.00	SBUH Method	0.15
RD26	1996	0.05	0.12	480	8.00	SBUH Method	0.15
RD27	1996	0.05	0.12	480	8.00	SBUH Method	0.15
RD3	798	0.02	0.05	480	8.00	SBUH Method	0.06
RD4	798	0.02	0.05	480	8.00	SBUH Method	0.06
RD5	798	0.02	0.05	480	8.00	SBUH Method	0.06
RD6	798	0.02	0.05	480	8.00	SBUH Method	0.06
RD7	798	0.02	0.05	480	8.00	SBUH Method	0.06
RD8	798	0.02	0.05	480	8.00	SBUH Method	0.06
RD9	798	0.02	0.05	480	8.00	SBUH Method	0.06





STORM SEWERS

SEWER LOCATION	TIME (Min)		INCR. AREA	COEFF OF RUNOFF (C)	INCR. EQUIV. (A-F)	TOTAL EQUIV. AREA (INCEN. AREA + C/F)	RUNOFF (CMS)	SEWER DESIGN				PROFILE				
	INCR. TIME	TOTAL TIME (To Upper End)						INTENSITY (I)	INCR. AREA	COEFF OF RUNOFF (C)	INCR. EQUIV. (A-F)	INVERT ELEV.	GROUND ELEV.	SLOPE (%)	DIAMETER (IN)	CAPACITY (CMS)
By: _____ Date: _____ Ck'd _____ Date: _____																
STREET																
1	2	3	7	8	9	10	11	12	13	14	15	16	17	18		
CS #16, 17, 18 (29)						0.35	5.85	7.05	18"	30						
CS #19, 20 (30)						0.10	0.10	1.0	6"	0.12						
CS #21 (31)						0.21	0.21	2.0	6"	0.86						
CS #22 (32)						0.08	0.29	3.16	8"	2.44						
CS #23 (33)						0.20	0.49	3.16	8"	2.44						
CS #24 (34)						6.70	0.69	4.63	16"	5.10						
CS #25 (35)						6.12	0.81	4.63	16"	5.10						
CS #26 (36)						6.10	0.91	2.5	12"	6.10						
CS #27 (37)						0.11	1.02	2.5	12"	6.10						
CS #28, 29 (38)						6.22	1.24	2.5	12"	6.10						
CS #30 (39)						0.11	0.14	6.13%	6"	1.51						
CS #31 (40)						0.11	0.25	11.6%	8"	4.46						
CS #32, 33 (41)						0.04	0.29	11.6%	8"	4.46						
CS #34 (42)						0.05	0.34	11.6%	8"	4.46						

# STORM SEWERS

SEWER LOCATION				TIME (Min.)		In. Hr.	AREA (Acres)				SEWER DESIGN				PROFILE					
							INCR. AREA	COEFF. OF RUNOFF (c)	INCR. EQUIV. (c-ft)	TOTAL EQUIV. AREA (Acres)	RUNOFF (CFS)	SLOPE (%)	DIAMETER (IN.)	CAPACITY (CFS)			VELOCITY (FPS)	LENGTH (FT)	GROUND ELEV.	INVERT ELEV.
By: _____	Date: _____	CK'd _____	Date: _____																	
STREET																				
1	2	3	TO R.H. #	INCR. TIME	TOTAL TIME (To Upper End)	INTENSITY (I)	INCR. AREA	COEFF. OF RUNOFF (c)	INCR. EQUIV. (c-ft)	TOTAL EQUIV. AREA (Acres)	RUNOFF (CFS)	SLOPE (%)	DIAMETER (IN.)	CAPACITY (CFS)	VELOCITY (FPS)	LENGTH (FT)	GROUND ELEV.	INVERT ELEV.		
CS #35 RD #22 (42)																				
RD #23 (43)																				
RD #24 (44)																				
(41) + (42) = (45)																				
CS # 36, 37 (46)																				
OT #3 (47)																				
Future #2 (48)																				
CS #38 (49)																				
CS #38A (50)																				
CS #39 (51)																				
CS #40, 41 (52)																				



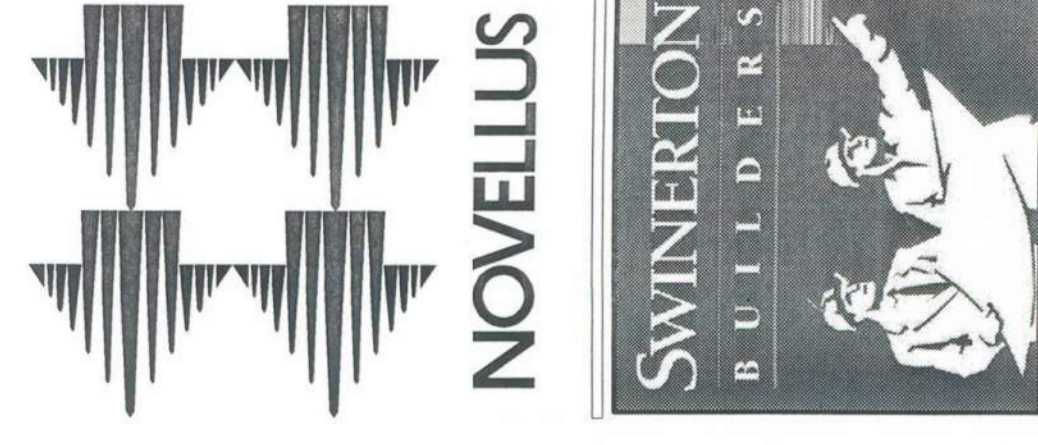
STORM SEWERS

SEWER LOCATION		TIME (Min)		In. / Hr.	AREA (Acres)			SEWER DESIGN				PROFILE								
														SEWER #	TO K.H. #	INCR. TIME	TOTAL TIME (To Upper End)	INTENSITY (I)	INCR. AREA	COEFF OF RUNOFF (c)
By: _____ Date: _____ CK'd _____ Date: _____  STREET																				
1																				
RO #12																				
RO #13																				
RO #14																				
RO # 15, 16																				
(52) + (56) = (97)																				
CS #12																				
CS #15 Foot #3																				
CS # 41, RO # 17																				
CS # 15, RO # 18																				
(58) + (61) = (62)																				
CS # 14																				
CS # 47																				

# STORM SEWERS

SEWER LOCATION		TIME (Min.)		IN. Hc.	AREA (Acres)				SEWER DESIGN				PROFILE									
															GROUND ELEV.	INVERT ELEV.						
By:	Date:	CK'd:	Date:	STREET:	M.F. #	TO R.H. #	INCR. TIME	TOTAL TIME (To Upper End)	INTENSITY (1)	INCR. AREA	COEF OF RUNOFF (C)	INCR. EQUIV. (A-D)	TOTAL EQUIV. AREA (ACRES)	RUNOFF (CFS)	(%) SLOPE	DIAMETER (IN.)	CAPACITY (CFS)	VELOCITY (FPS)	LENGTH (FT)	17	18	
					1																	
CS #48	RD #19	65																				
	RD #20	66																				
CS #49		67																				
	RD #21	68																				
CS #50		69																				
(63) + (64) + (65)		70																				
CS #51		71																				
CS #52		72																				
CS #53		73																				
CS #54		74																				
CS #55		75																				
CS #56, 57		76																				





**NOVELLUS**  
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Fax: (503)231-3587  
Electrical Consultant  
Glumac International  
Phone: (503)227-5280  
Fax: (503)274-7674

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DATE  
BY  
CLOSING DATE

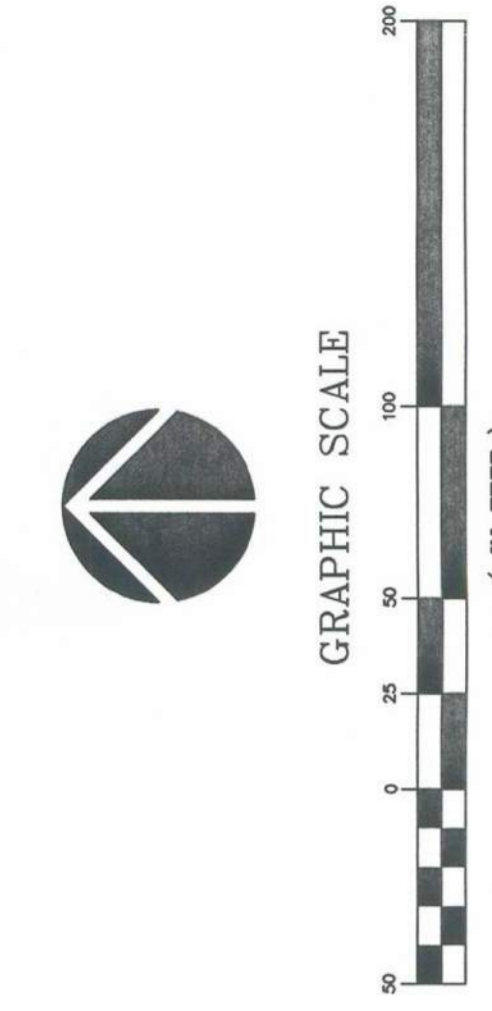
SHEET TITLE  
**SITE  
STORM  
SEWER  
PLAN  
PHASE I**

FIRST ISSUED:  
LAST ISSUE:  
DRAWN BY:  
CHECKED BY:

C5.0

000366

UTILITY PERMIT REVIEW SUBMITTAL 2/14/01



**UTILITY NOTES**

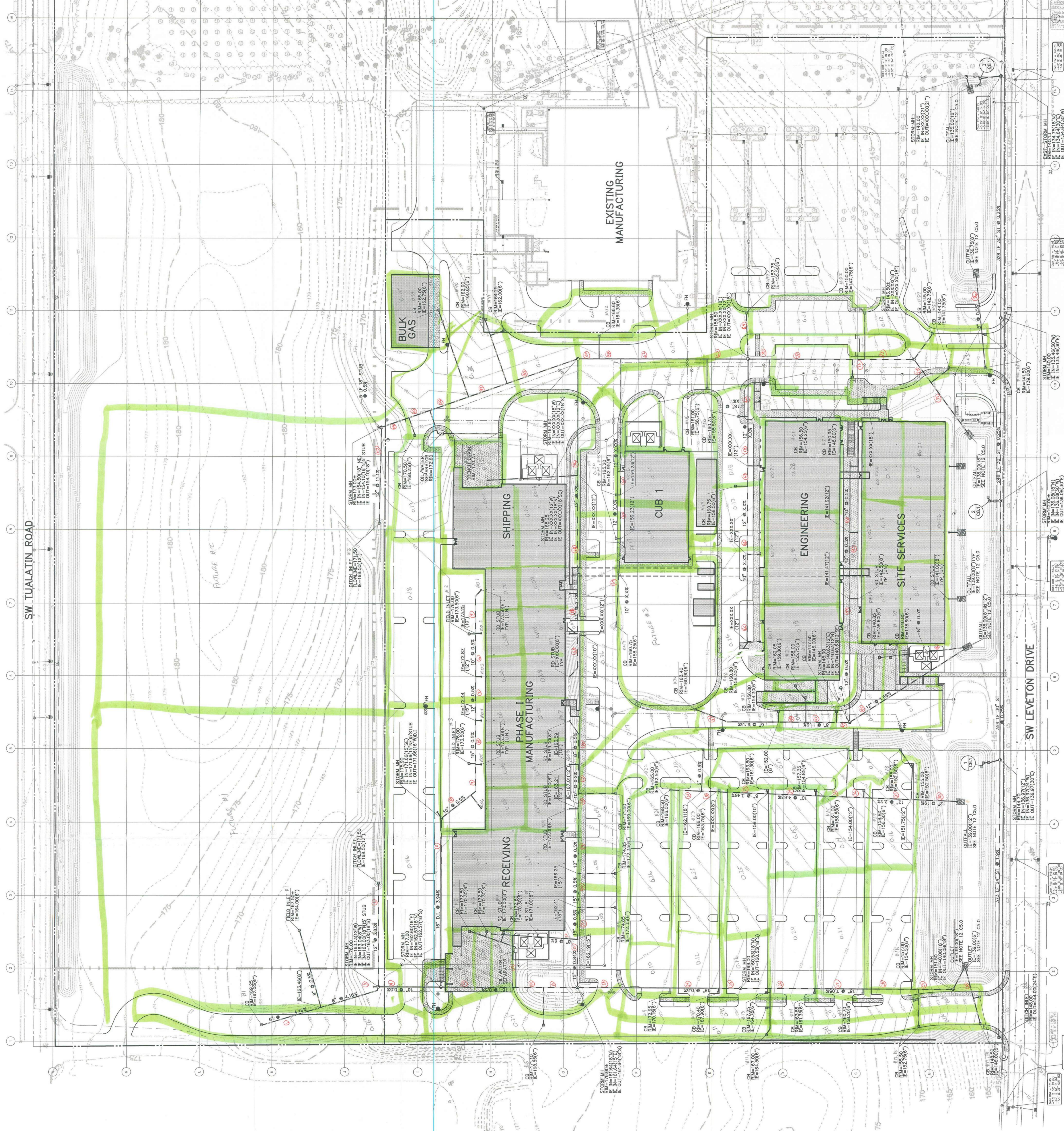
1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF TUALATIN, THE UNITED SEWAGE AGENCY, AND THE CURRENT EDITION OF THE UNIFORM CODE BOOK. ALL WORK WITHIN THE PUBLIC R.O.W. REQUIRES A PUBLIC WORKS PERMIT.
2. THE WORKING DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND OR ELBOW REQUIRED FOR INSTALLATION IN THE SPACE PROVIDED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL LOCATIONS FOR WORK SHALL BE CHECKED AND COORDINATED WITH ALL EXISTING UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXISTING UNDERGROUND UTILITIES AND SHALL BE RESPONSIBLE FOR EXCAVATION SHALL BE VERIFIED AS TO CONDITION, SIZE AND LOCATION BY UNCOVERING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE BEGINNING CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES.
3. PROVIDE CLEANOUTS AS REQUIRED IN THE CURRENT UNIFORM PLUMBING CODE CHAPTER 7, SECTIONS 707 AND 719, AND CHAPTER 11, SECTION 1103.4. CLEANOUTS SHALL BE PROVIDED FOR ALL SEWER LINES. CLEANOUTS SHALL BE 4" DIA. UNLESS NOTED OTHERWISE. NOT ALL REQUIRED CLEANOUTS ARE SHOWN ON THE PLANS.
4. ALL STORM PIPING IS SIZED FOR A MANNING'S "N" VALUE = 0.013. CLEANOUTS SHALL BE 4" DIA. UNLESS NOTED OTHERWISE. NOT ALL REQUIRED CLEANOUTS ARE SHOWN ON THE PLANS.
5. SEE MECHANICAL DRAWINGS FOR UTILITIES LOCATED WITHIN THE BUILDING AND TO 5' OUTSIDE THE BUILDING.
6. ALL ROOF DRAIN LEADERS TO BE 8" AT 2.0% MIN. UNLESS NOTED OTHERWISE.
7. VERIFY LOCATION, SIZE AND DEPTH OF EXISTING UTILITIES BY PORTHOLE PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF DISCREPANCIES.
8. PROVIDE 4" DIA. DRAIN LINE FROM ROOF DRAIN LEADER TO WATER METER AND BACKFLOW PREVENTER VALVE TO THE DOUBLE CHECK VALVE (DCV) VALVE. PROVIDE 1/2" HP SUMP PUMP AT BASE OF FIRE VALVE AND INSTALL 2" PVC DRAIN LINE TO SUMP PUMP ELECTRICAL SERVICE. FURNISH 3/4" RICH DIAMETER CONDUIT FROM BUILDING ELECTRICAL ROOM TO FIRE VALVE FOR SUMP PUMP ELECTRICAL SERVICE. PROVIDE 1/2" DIA. CONDUIT FOR FLOW SENSOR INSTALLATION AND CONDUIT REQUIREMENTS.
9. THE SURVEY INFORMATION SHOWN AS A BACKGROUND SCREEN ON THIS SHEET IS BASED ON A SURVEY PREPARED BY HICKMAN AND ASSOCIATES.
10. CONTRACTOR TO PROVIDE POWER TO IRRIGATION CONTROLLER. SEE SPECIFICATIONS.
11. SEE BUILDING PLUMBING DRAWINGS FOR PIPING WITHIN THE BUILDING AND UP TO 5' OUTSIDE THE BUILDING, INCLUDING ANY FOUNDATION DRAINAGE PIPING.
12. PROVIDE MINIMUM 12" DIA. THICK TYPE II RIP-RAP AT 12" AND LARGER STORM OUTFALLS. PROVIDE MINIMUM 8" DIA. THICK TYPE II RIP-RAP AT 10" AND SMALLER OUTFALLS.

**PROPOSED UTILITY LEGEND**

- STORM SEWER LINE
- SANITARY SEWER LINE
- FIRE WATER LINE
- WATER METER
- MANHOLE
- CATCH BASIN/OTCH INLET
- FIELD INLET
- FIRE HYDRANT ASSEMBLY
- UNLESS NOTED

**EXISTING UTILITY LEGEND**

- SITE BOUNDARY
- ADJOINING OR INTERIOR PROPERTY LINE
- RIGHT-OF-WAY CENTERLINE
- WATER LINE
- GAS LINE
- SANITARY SEWER LINE
- UNDERGROUND TELEPHONE LINE (ITE)
- STORM DRAINAGE LINE
- UNDERGROUND POWER LINE
- OVERHEAD POWER LINE
- FIRE HYDRANT
- WATER VALVE
- GAS VALVE
- CATCH BASIN
- CURB LINE
- EDGE OF PAVEMENT
- STREET SIGN
- SANITARY SEWER MANHOLE
- EVERGREEN TREE WITH DIAMETER
- DECIDUOUS TREE WITH DIAMETER
- CHAIN LINK FENCE LINE
- LIGHT POLE
- 6" BOLLARD
- ROOF DRAIN (SHOOT ON ROOF)
- GAS METER
- POWER TRANSFORMER
- CAMERA TOWER
- POWER POLE
- GUY ANCHOR
- SIDE INLET CATCH BASIN
- MAIL BOX
- STORM SEWER MANHOLE



SW TUALATIN ROAD  
SW LEVETON DRIVE  
SWINERTON BUILDERS  
NOVELLUS  
TUALATIN FACILITY  
PHASE I  
STORM SEWER PLAN  
000366  
2/14/01





## Land Use Application

### Project Information

Project Title: <b>Lam New Building &amp; Parking</b>
Brief Description: <b>Proposed new 120,000 SF building and approximately 530 new parking spaces (part of build-out of Phase 1 of IMP 00-01).</b>

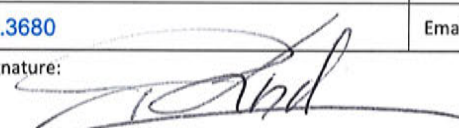
### Property Information

Address: <b>11155-11361 SW Leveton Drive</b>
Assessor's Map Number and Tax Lots: <b>2S122AA00 - 500, 800, 100</b>

### Applicant/Primary Contact

Name: <b>Suzannah Stanley</b>	Company Name: <b>Mackenzie</b>	
Address: <b>1515 SE Water Ave, Ste 100</b>		
City: <b>Portland</b>	State: <b>OR</b>	ZIP: <b>97214</b>
Phone: <b>971-346-3808</b>	Email: <b>SStanley@mcknze.com</b>	

### Property Owner

Name: <b>Lam Research Corporation</b>		
Address: <b>4650 Cushing Parkway</b>		
City: <b>Fremont</b>	State: <b>CA</b>	ZIP: <b>94538</b>
Phone: <b>1.510.572.3680</b>	Email: <b>Pat.lord@lamresearch.com</b>	
Property Owner's Signature: 		Date: <b>8/12/22</b>

*(Note: Letter of authorization is required if not signed by owner)*

**AS THE PERSON RESPONSIBLE FOR THIS APPLICATION, I HEREBY ACKNOWLEDGE THAT I HAVE READ THIS APPLICATION AND STATE THAT THE INFORMATION IN AND INCLUDED WITH THIS APPLICATION IN ITS ENTIRETY IS CORRECT. I AGREE TO COMPLY WITH ALL APPLICABLE CITY AND COUNTY ORDINANCES AND STATE LAWS REGARDING BUILDING CONSTRUCTION AND LAND USE.**

**Primary Contact**

Applicant's Signature: 	Date: <b>8/11/22</b>
--	----------------------

- Land Use Application Type:
- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Annexation (ANN)                          | <input type="checkbox"/> Historic Landmark (HIST)     | <input type="checkbox"/> Minor Architectural Review (MAR) |
| <input checked="" type="checkbox"/> Architectural Review (AR)      | <input type="checkbox"/> Industrial Master Plan (IMP) | <input type="checkbox"/> Minor Variance (MVAR)            |
| <input type="checkbox"/> Architectural Review—Single Family (ARSF) | <input type="checkbox"/> Plan Map Amendment (PMA)     | <input type="checkbox"/> Sign Variance (SVAR)             |
| <input type="checkbox"/> Architectural Review—ADU (ARADU)          | <input type="checkbox"/> Plan Text Amendment (PTA)    | <input type="checkbox"/> Variance (VAR)                   |
| <input type="checkbox"/> Conditional Use (CUP)                     | <input type="checkbox"/> Tree Removal/Review (TCP)    |   |

### Office Use

Case No:	Date Received:	Received by:
Fee:	Receipt No:	

# SENSITIVE AREA PRE-SCREENING SITE ASSESSMENT

Clean Water Services File Number

22-001940

1. **Jurisdiction:** City of Tualatin

2. **Property Information** (example: 1S234AB01400)

Tax lot ID(s): 2S122AA00500, 2S122AB00100, 2S122AA00800

**OR Site Address:** \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Nearest cross street: \_\_\_\_\_

4. **Development Activity** (check **all** that apply)

- Addition to single family residence (rooms, deck, garage)
- Lot line adjustment       Minor land partition
- Residential condominium     Commercial condominium
- Residential subdivision       Commercial subdivision
- Single lot commercial       Multi lot commercial
- Other New office building and parking lots

3. **Owner Information**

Name: Hugh Kingery

Company: Lam Research Corp.

Address: 11155 SW Levelton Drive

City, State, Zip: Tualatin, OR, 97062

Phone/fax: 971-762-8510

Email: hugh.kingery@lamresearch.com

4. **Applicant Information**

Name: Brent Nielsen

Company: Mackenzie

Address: 1515 SE Water Avenue, Suite 100

City, State, Zip: Portland, OR, 97214

Phone/fax: 503-224-9560

Email: bnielsen@mcknze.com

6. **Will the project involve any off-site work?**  Yes     No     Unknown

Location and description of off-site work: Driveway modifications and additions along site frontage.

7. **Additional comments or information that may be needed to understand your project:** \_\_\_\_\_

**This application does NOT replace Grading and Erosion Control Permits, Connection Permits, Building Permits, Site Development Permits, DEQ 1200-C Permit or other permits as issued by the Department of Environmental Quality, Department of State Lands and/or Department of the Army COE. All required permits and approvals must be obtained and completed under applicable local, state, and federal law.**

By signing this form, the Owner or Owner's authorized agent or representative, acknowledges and agrees that employees of Clean Water Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site. I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Print/type name Brent Nielsen

Print/type title Civil Engineer

Signature 

Date 7/12/22

## FOR DISTRICT USE ONLY

- Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO ISSUANCE OF A SERVICE PROVIDER LETTER.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.
- Based on review of the submitted materials and best available information sensitive areas do not appear to exist on site or within 200' of the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider Letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, State and federal law.
- Based on review of the submitted materials and best available information the above referenced project will not significantly impact the existing or potentially sensitive area(s) found near the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect additional water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider Letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, state and federal law.
- THIS SERVICE PROVIDER LETTER IS NOT VALID UNLESS \_\_\_\_\_ CWS APPROVED SITE PLAN(S) ARE ATTACHED.**
- The proposed activity does not meet the definition of development or the lot was platted after 9/9/95 ORS 92.040(2). **NO SITE ASSESSMENT OR SERVICE PROVIDER LETTER IS REQUIRED.**

Reviewed by 

Date 7/12/2022

Once complete, email to: [SPLReview@cleanwaterservices.org](mailto:SPLReview@cleanwaterservices.org) • Fax: (503) 681-4439

OR mail to: SPL Review, Clean Water Services, 2550 SW Hillsboro Highway, Hillsboro, Oregon 97123





Architecture • Interiors  
Planning • Engineering

Portland, OR  
503.224.9560  
Vancouver, WA  
360.695.7879  
Seattle, WA  
206.749.9993  
www.mcknze.com

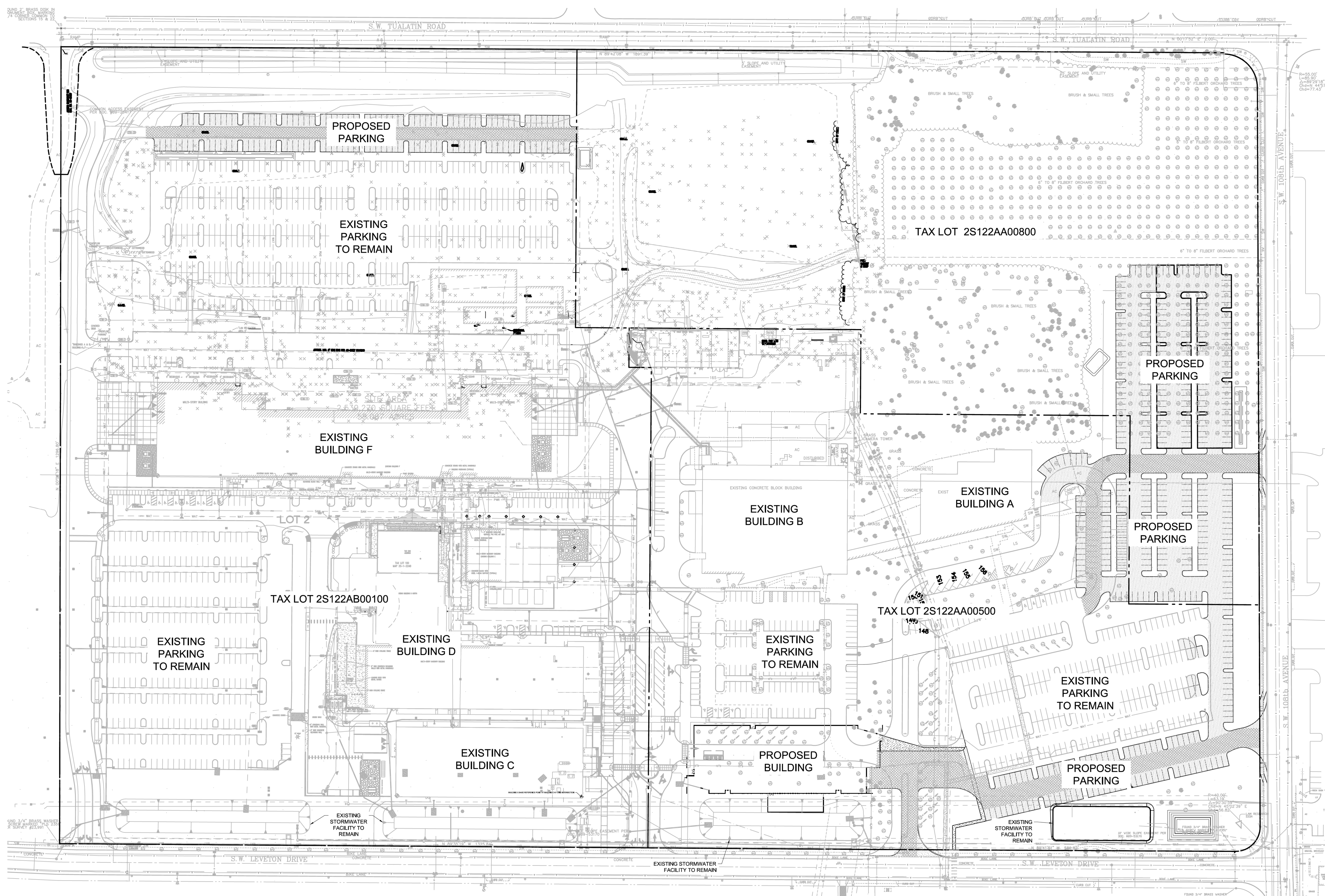
**MACKENZIE**  
DESIGN DRIVEN • CLIENT FOCUSED

Client  
**LAM RESEARCH**



Project  
**LAM RESEARCH  
TUALATIN**

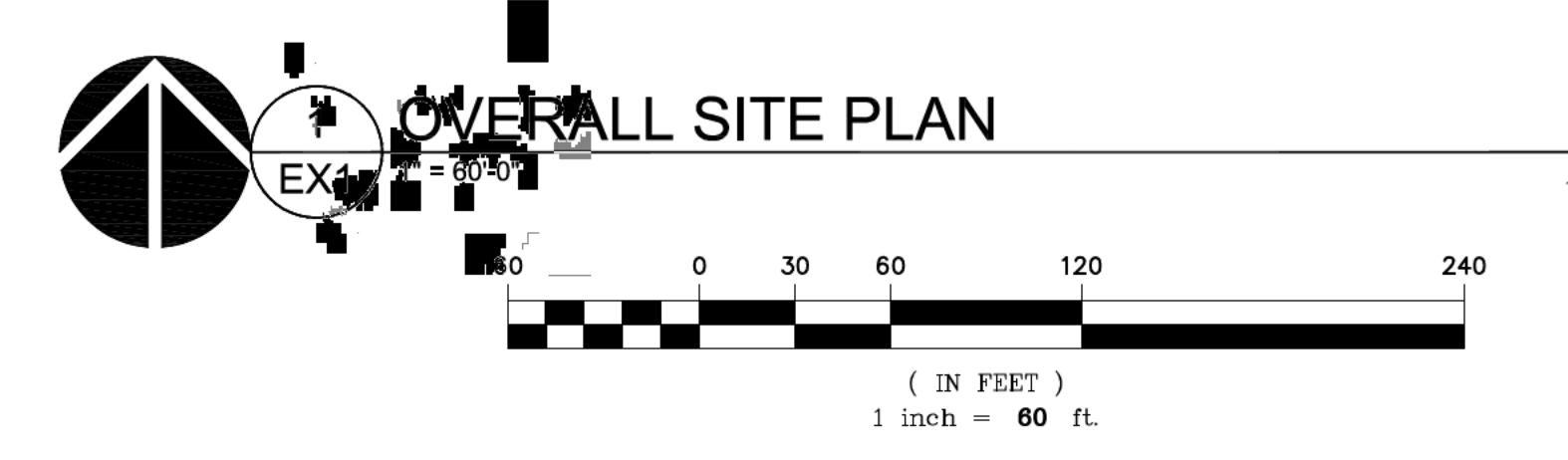
**NEW OFFICE BUILDING**



© MACKENZIE 2022  
ALL RIGHTS RESERVED  
THESE DRAWINGS ARE THE PROPERTY OF  
MACKENZIE AND ARE NOT TO BE USED  
OR REPRODUCED IN ANY MANNER  
WITHOUT PRIOR WRITTEN PERMISSION

REVISION SCHEDULE		
Delta	Issued As	Issue Date

SHEET TITLE:  
**PRE-SCREEN  
SITE PLAN  
EXHIBIT**



**SITE LOCATION INFORMATION**

LOCAL JURISDICTION: TUALATIN  
TAX LOTS: 2S122AA00500, 2S122AB00100, 2S122AA00800  
11155 SW LEVETON DRIVE TUALATIN, OREGON 97062

**OWNER**

LAM RESEARCH CORP.  
11155 SW LEVETON DRIVE  
TUALATIN, OREGON 97062  
CONTACT: HUGH KINGERY  
PHONE: 971-762-4510  
EMAIL: HUGH.KINGERY@LAMRESEARCH.COM

**CIVIL ENGINEER**

MACKENZIE  
1515 SE WATER AVENUE, SUITE 100  
PORTLAND, OREGON 97214  
CONTACT: BRENT NIELSEN  
PHONE: (503) 224-8560  
EMAIL: BNIELSEN@MCKENZE.COM

DRAWN BY: SJS  
CHECKED BY: BDN  
SHEET

**EX 1**

JOB NO. **2220087.00**

**PRELIMINARY ONLY**



**FIRE CODE / LAND USE / BUILDING REVIEW  
APPLICATION**



**North Operating Center**  
11945 SW 70<sup>th</sup> Avenue  
Tigard, OR 97223  
Phone: 503-649-8577

**South Operating Center**  
8445 SW Elligsen Rd  
Wilsonville, OR 97070  
Phone: 503-649-8577

REV 6-30-20

**Project Information**

Contact Person Name: Mackenzie – Suzannah Stanley  
Address: 1515 SE Water Ave #100, Portland, OR 97214  
Phone: 503-224-9560  
Email: sstanley@mcknze.com  
Site Address: 11155 SE Leveton Dr  
City: Tualatin  
Map & Tax Lot #: 2S122AB-100; 2S122AA-500 and -800  
Business Name: Lam Research  
Land Use/Building Jurisdiction: City of Tualatin  
Land Use/ Building Permit # AR22-0006

Choose from: Beaverton, Tigard, Newberg, **Tualatin**, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

**Project Description**

New 4-story office building and parking

**Permit/Review Type (check one):**

- Land Use / Building Review - Service Provider Permit
- Emergency Radio Responder Coverage Install/Test
- LPG Tank (Greater than 2,000 gallons)
- Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)
  - \* Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.
- Explosives Blasting (Blasting plan is required)
- Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)
- Tents or Temporary Membrane Structures (in excess of 10,000 square feet)
- Temporary Haunted House or similar
- OLCC Cannabis Extraction License Review
- Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

**For Fire Marshal's Office Use Only**

TVFR Permit # 2022-0108  
Permit Type: SPP  
Submittal Date: \_\_\_\_\_  
Assigned To: DARBT  
Due Date: \_\_\_\_\_  
Fees Due: \_\_\_\_\_  
Fees Paid: \_\_\_\_\_

**Approval/Inspection Conditions**  
(For Fire Marshal's Office Use Only)

**This section is for application approval only**

[Signature] 0306 9/16/22  
Fire Marshal or Designee Date

Conditions:

See Attached Conditions:  Yes  No

Site Inspection Required:  Yes  No

**This section used when site inspection is required**

Inspection Comments:

\_\_\_\_\_  
Final TVFR Approval Signature & Emp ID Date



11255 SW Leveton Dr. Tualatin, Oregon, OR 97062  
4500 SW Leveton Dr. Tualatin, OR 97062

September 9, 2022

Sonya Nordstrom  
Mackenzie Architecture

Re: Lam Research  
11155 SW Leveton Dr.  
Tualatin, OR 97062

Dear Sonya,

Thank you, for sending us the preliminary site plans for this proposed development in Tualatin, OR.

My Company: Republic Services of Clackamas and Washington Counties has the franchise agreement to service this area with the City of Tualatin. We will provide complete commercial waste removal and recycling services as needed on a weekly basis for this location


The design plans for a Front Load trash and recycle enclosure with dimensions of 20' wide X 10'-2" deep with two gates that open to a minimum of 120 degrees, wind pins mounted to gates and capable of securing gates in the open and closed position, no center post, is adequate for housing our receptacles and is accessible for our trucks to service.

The design plans for a self-contained trash compactor chute located at the loading dock, with a footprint of 8'-5" wide X 20'-9" deep, with all service connections accessible from ground level on the north side, wheel guiderails that extend the length of the compactor with wheels stops to prevent collision with the loading dock, minimum of 4'Ft. clearance from the aesthetics wall that does not extend past the length of the compactor, is adequate for our trucks to service. Our operations team will require confirmation of the compactor compatibility with our trucks and ground set up at the time of installation.

The site access and truck traffic pattern design plan will allow our trucks to navigate the site and service both the Front Load and Compactor receptacles. The planned receptacles for this 123,460 square foot office building are adequate and allows for adjusted service levels as needed.

Thanks Sonya, for your help and concerns for our services prior to this project being developed.

Sincerely,

  
Kelly Herrod  
Operations Supervisor  
Republic Services Inc.



*First American*

**First American Title Insurance Company**

1 SW Columbia Street, Ste 1600  
Portland, OR 97204  
Phn - (503)222-3651 (800)929-3651  
Fax - (877)242-3513

**MULTNOMAH COUNTY TITLE UNIT**

FAX (877)242-3513

Title Officer: Blake Spencer  
(503)222-3651  
BISpencer@firstam.com

**LOT BOOK SERVICE**

Lam Research  
11155 SW Leveton Drive  
Tualatin, OR 97062

Order No.: 7019-3978352  
July 28, 2022

Attn: Hugh Kingery  
Phone No.: - Fax No.:  
Email: Hugh.Kingery@lamresearch.com

Re:

Fee: \$500.00

We have searched our Tract Indices as to the following described property:

The land referred to in this report is described in Exhibit A attached hereto.

and as of July 20, 2022 at 8:00 a.m.

We find that the last deed of record runs to

Lam Research Corporation, a Delaware Corporation

We find the following apparent encumbrances prior to the effective date hereof:

1. Statutory powers and assessments of Clean Water Services.
2. Private Stormwater Facilities Agreement, including terms and provisions thereof.

Recorded: August 19, 2021 as Fee No. 2021 088690

3. Unrecorded leases or periodic tenancies, if any.

**(The following Exceptions Affects Lot 1)**

4. Easement, including terms and provisions contained therein:  
Recording Information: June 09, 1989 as Fee No. 89026084  
In Favor of: The City of Tualatin  
For: Slope and utility  
Affects: The Southwesterly corner

Document re-recorded July 06, 1989 as Fee No. 89030633

5. Easement, including terms and provisions contained therein:  
Recording Information: November 01, 1989 as Fee No. 89053170  
In Favor of: The City of Tualatin  
For: Slope  
Affects: The Southerly portion
6. The terms and provisions contained in the document entitled "Declaration of Roadway, Utility, Cross-Access and Parking Easements and Restrictive Covenants" recorded March 22, 2002 as Fee No. 2002 033655.
7. Easement, including terms and provisions contained therein:  
Recording Information: April 15, 2002 as Fee No. 2002 044680  
In Favor of: The City of Tualatin  
For: Water line  
Affects: The Southerly portion
8. Revocable Permit (Right-of-Way), including terms and provisions thereof.  
  
Recorded: October 26, 2017 as Fee No. 2017 084661
9. Private Stormwater Facilities Agreement, including terms and provisions thereof.  
  
Recorded: November 02, 2020 as Fee No. 2020 110089

**(The following Exceptions Affects Lot 2)**

10. Easement, including terms and provisions contained therein:  
Recording Information: June 01, 1990 as Fee No. 90028257  
In Favor of: The City of Tualatin  
For: Pedestrian walkway and bikepath  
Affects: The Southerly portion
11. Easement, including terms and provisions contained therein:  
Recording Information: November 23, 1999 as Fee No. 99130427  
In Favor of: The City of Tualatin  
For: Slope, public utility and pedestrian walkway  
Affects: The Northerly portion



12. Easement, including terms and provisions contained therein:  
Recording Information: June 22, 2001 as Fee No. 2001 060136  
In Favor of: Portland General Electric Company, an Oregon corporation  
For: Underground electrical power lines and signal or communication lines  
Affects: The Easterly portion
  
13. The terms and provisions contained in the document entitled "Declaration of Roadway, Utility, Cross-Access and Parking Easements and Restrictive Covenants" recorded March 22, 2002 as Fee No. 2002 033655.
  
14. Easement, including terms and provisions contained therein:  
Recording Information: April 15, 2002 as Fee No. 2002 044680  
In Favor of: The City of Tualatin  
For: Water line
  
15. Revocable Permit (Right-of-Way), including terms and provisions thereof.  
  
Recorded: October 26, 2017 as Fee No. 2017 084661
  
16. Private Stormwater Facilities Agreement, including terms and provisions thereof.  
  
Recorded: November 02, 2020 as Fee No. 2020 110089

**(The following Exceptions Affects Lot 3)**

17. Easement, including terms and provisions contained therein:  
Recording Information: May 05, 1989 as Fee No. 89020417  
For: common access
  
18. Easement, including terms and provisions contained therein:  
Recording Information: November 23, 1999 as Fee No. 99130427  
In Favor of: The City of Tualatin  
For: Slope, public utility and sidewalk and pedestrian  
Affects: The Northerly portion
  
19. The terms and provisions contained in the document entitled "Declaration of Roadway, Utility, Cross-Access and Parking Easements and Restrictive Covenants" recorded March 22, 2002 as Fee No. 2002 033655.

We have also searched our General Index for Judgments and State and Federal Liens against the Grantee(s) named above and find:

NONE

We find the following unpaid taxes and city liens:

1. Taxes for the fiscal year 2022-2023 a lien due, but not yet payable

NOTE: Taxes for the year 2021-2022 PAID IN FULL

Tax Amount: \$533,346.88  
Map No.: 2S122AB00100  
Property ID: R2107971  
Tax Code No.: 023.76

NOTE: Taxes for the year 2021-2022 PAID IN FULL

Tax Amount: \$105,937.14  
Map No.: 2S122AA00500  
Property ID: R2107973  
Tax Code No.: 023.76

NOTE: Taxes for the year 2021-2022 PAID IN FULL

Tax Amount: \$67,392.15  
Map No.: 2S122AA00800  
Property ID: R2107974  
Tax Code No.: 023.76

NOTE: Taxes for the year 2021-2022 PAID IN FULL

Tax Amount: \$2,343,152.44  
Map No.: 2S122AB00100  
Property ID: R2180033  
Tax Code No.: 023.76

2. City liens, if any, of the City of Tualatin.

NOTE: We find no outstanding voluntary liens of record affecting subject property. An inquiry should be made concerning the existence of any unrecorded lien or other indebtedness which could give rise to any security interest in the subject property.

THIS IS NOT a title report since no examination has been made of the title to the above described property. Our search for apparent encumbrances was limited to our Tract Indices, and therefore above listings do not include additional matters which might have been disclosed by an examination of the record title. We assume no liability in connection with this Lot Book Service and will not be responsible for errors or omissions therein. The charge for this service will not include supplemental reports, rechecks or other services.



*First American*

First American Title Insurance Company  
1 SW Columbia Street, Ste 1600  
Portland, OR 97204

### **Illegal Restrictive Covenants**

Please be advised that any provision contained in this document, or in a document that is attached, linked, or referenced in this document, that under applicable law illegally discriminates against a class of individuals based upon personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or any other legally protected class, is illegal and unenforceable by law.



**Exhibit "A"**

Real property in the County of Washington, State of Oregon, described as follows:

**PARCEL 1:**

A TRACT OF LAND BEING A PORTION OF PARCELS 1 AND 3, PARTITION PLAT NO. 2001-058, LOCATED IN THE NORTHEAST ONE-QUARTER OF SECTION 22, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF TUALATIN, WASHINGTON COUNTY, OREGON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A BRASS SCREW AND WASHER LOCATED AT THE NORTHWEST CORNER OF SAID PARCEL 3, SAID POINT BEING ALSO ON THE SOUTHERLY RIGHT-OF-WAY LINE OF SW TUALATIN ROAD, 32.00 FEET SOUTHERLY OF THE CENTERLINE THEREOF, WHEN MEASURED AT RIGHT ANGLES; THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE, NORTH 89°42'41" EAST A DISTANCE OF 0.06 FEET TO AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE, SOUTH 89°42'08" EAST A DISTANCE OF 839.18 FEET TO A 5/8 INCH IRON ROD; THENCE DEPARTING SAID SOUTHERLY RIGHT-OF-WAY LINE, SOUTH 00°17'49" WEST A DISTANCE OF 450.67 FEET TO A 5/8 INCH IRON ROD; THENCE SOUTH 89°35'19" EAST A DISTANCE OF 87.37 FEET TO A 5/8 INCH IRON ROD; THENCE SOUTH 00°24'38" WEST A DISTANCE OF 66.15 FEET TO A 5/8 INCH IRON ROD; THENCE SOUTH 89°35'22" EAST A DISTANCE OF 36.44 FEET TO A 5/8 INCH IRON ROD; THENCE SOUTH 00°24'41" WEST A DISTANCE OF 779.79 FEET TO A COPPER DISK LOCATED ON THE NORTHERLY RIGHT-OF-WAY LINE OF SW LEVETON DRIVE, 30.00 FEET NORTHERLY OF THE CENTERLINE THEREOF, WHEN MEASURED AT RIGHT ANGLES; THENCE ALONG SAID NORTHERLY RIGHT-OF-WAY LINE, NORTH 89°34'51" WEST A DISTANCE OF 957.07 FEET TO A BRASS DISK LOCATED AT THE SOUTHWEST CORNER OF SAID PARCEL 1; THENCE ALONG THE WEST LINE OF SAID PARCEL 1 AND THE WEST LINE OF SAID PARCEL 3, NORTH 00°06'26" EAST A DISTANCE OF 1294.82 FEET TO THE POINT OF BEGINNING.

**PARCEL 2:**

A TRACT OF LAND BEING A PORTION OF PARCELS 2 AND 3, PARTITION PLAT NO. 2001-058, LOCATED IN THE NORTHEAST ONE-QUARTER OF SECTION 22, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF TUALATIN, WASHINGTON COUNTY, OREGON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A BRASS SCREW AND WASHER LOCATED AT THE NORTHWEST CORNER OF SAID PARCEL 3, SAID POINT BEING ALSO ON THE SOUTHERLY RIGHT-OF-WAY LINE OF SW TUALATIN ROAD, 32.00 FEET SOUTHERLY OF THE CENTERLINE THEREOF, WHEN MEASURED AT RIGHT ANGLES; THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE, NORTH 89°42'41" EAST A DISTANCE OF 0.06 FEET TO AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE, SOUTH 89°42'08" EAST A DISTANCE OF 839.18 FEET TO A 5/8 INCH IRON ROD AND THE POINT OF BEGINNING; THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE, SOUTH 89°42'08" EAST A DISTANCE OF 1052.10 FEET TO A POINT OF CURVATURE THEREON; THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE, 85.91 FEET THROUGH THE ARC OF A 55.00 FOOT RADIUS CIRCULAR CURVE TO THE RIGHT, SAID CURVE HAVING A CENTRAL ANGLE OF 89°29'34", A CHORD BEARING OF SOUTH 44°57'21" EAST AND A CHORD LENGTH OF 77.44 FEET TO A 5/8 INCH IRON ROD LOCATED AT A POINT OF TANGENCY ON THE WESTERLY RIGHT-OF-WAY LINE OF SW 108TH AVENUE, 32.00 FEET WESTERLY OF THE CENTERLINE THEREOF, WHEN MEASURED AT RIGHT ANGLES; THENCE ALONG SAID WESTERLY RIGHT-OF-WAY LINE, SOUTH 00°12'34" EAST A DISTANCE OF 843.64 FEET TO A 5/8 INCH IRON ROD; THENCE DEPARTING SAID WESTERLY RIGHT-OF-WAY LINE, NORTH 89°35'22" WEST A DISTANCE OF 212.34 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 00°24'38" EAST A DISTANCE OF 306.24 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 89°35'22" WEST A DISTANCE OF 438.80 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 00°24'38"



EAST A DISTANCE OF 139.01 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 89°35'19" WEST A DISTANCE OF 464.30 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 00°17'49" EAST A DISTANCE OF 450.67 FEET TO THE POINT OF BEGINNING.

PARCEL 3:

A TRACT OF LAND BEING A PORTION OF PARCELS 1 AND 2, PARTITION PLAT NO. 2001-058, LOCATED IN THE NORTHEAST ONE-QUARTER OF SECTION 22, TOWNSHIP 2 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF TUALATIN, WASHINGTON COUNTY, OREGON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A BRASS SCREW AND WASHER LOCATED AT THE NORTHWEST CORNER OF PARCEL 3 OF PARTITION PLAT NO. 2001-058, SAID POINT BEING ALSO ON THE SOUTHERLY RIGHT-OF-WAY LINE OF SW TUALATIN ROAD, 32.00 FEET SOUTHERLY OF THE CENTERLINE THEREOF, WHEN MEASURED AT RIGHT ANGLES; THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE, NORTH 89°42'41" EAST A DISTANCE OF 0.06 FEET TO AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE, SOUTH 89°42'08" EAST A DISTANCE OF 839.18 FEET TO A 5/8 INCH IRON ROD; THENCE DEPARTING SAID SOUTHERLY RIGHT-OF-WAY LINE, SOUTH 00°17'49" WEST A DISTANCE OF 450.67 FEET TO A 5/8 INCH IRON ROD; THENCE SOUTH 89°35'19" EAST A DISTANCE OF 87.37 FEET TO A 5/8 INCH IRON ROD AND THE POINT OF BEGINNING; THENCE SOUTH 00°24'38" WEST A DISTANCE OF 66.15 FEET TO A 5/8 INCH IRON ROD; THENCE SOUTH 89°35'22" EAST A DISTANCE OF 36.44 FEET TO A 5/8 INCH IRON ROD; THENCE SOUTH 00°24'41" WEST A DISTANCE OF 779.79 FEET TO A COPPER DISK LOCATED ON THE NORTHERLY RIGHT-OF-WAY LINE OF SW LEVETON DRIVE, 30.00 FEET NORTHERLY OF THE CENTERLINE THEREOF, WHEN MEASURED AT RIGHT ANGLES; THENCE ALONG SAID NORTHERLY RIGHT-OF-WAY LINE, SOUTH 89°34'51" EAST A DISTANCE OF 368.77 FEET TO AN ANGLE POINT THEREON; THENCE CONTINUING ALONG SAID NORTHERLY RIGHT-OF-WAY LINE, SOUTH 89°42'00" EAST A DISTANCE OF 586.84 FEET TO A BRASS SCREW AND WASHER LOCATED AT A POINT OF CURVATURE THEREON; THENCE CONTINUING ALONG SAID NORTHERLY RIGHT-OF-WAY LINE, 63.19 FEET THROUGH THE ARC OF A 40.00 FOOT RADIUS CIRCULAR CURVE TO THE LEFT, SAID CURVE HAVING A CENTRAL ANGLE OF 90°30'34", A CHORD BEARING OF NORTH 45°02'43" EAST AND A CHORD LENGTH OF 56.82 FEET TO A POINT OF TANGENCY ON THE WESTERLY RIGHT-OF-WAY LINE OF SW 108TH AVENUE, 32.00 FEET WESTERLY OF THE CENTERLINE THEREOF, WHEN MEASURED AT RIGHT ANGLES; THENCE ALONG SAID WESTERLY RIGHT-OF-WAY LINE, NORTH 00°12'34" WEST A DISTANCE OF 359.19 FEET TO A 5/8 INCH IRON ROD; THENCE DEPARTING SAID WESTERLY RIGHT-OF-WAY LINE, NORTH 89°35'22" WEST A DISTANCE OF 212.34 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 00°24'38" EAST A DISTANCE OF 306.24 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 89°35'22" WEST A DISTANCE OF 438.80 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 00°24'38" EAST A DISTANCE OF 139.01 FEET TO A 5/8 INCH IRON ROD; THENCE NORTH 89°35' 19" WEST A DISTANCE OF 376.93 TO THE POINT OF BEGINNING.



**From:** [Suzannah Stanley](#)  
**To:** [Erin Engman](#); [Steve Koper](#)  
**Cc:** [Mike Rueter](#); [Chelsey Reinoehl](#)  
**Subject:** RE: CIO contact: Lam Research New Office Building  
**Date:** Wednesday, September 7, 2022 4:54:31 PM  
**Attachments:** [image002.png](#)  
[image004.png](#)  
[08c298f4-6906-48a5-889d-7a1b37cd9903.png](#)

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Hello Erin,

Thanks. In response to TDC 32.140 (1)(h):

*A statement as to whether any City-recognized Citizen Involvement Organizations (CIOs) whose boundaries include, or are adjacent to, the subject property were contacted in advance of filing the application and, if so, a summary of the contact. The summary must include the date when contact was made, the form of the contact and who it was with (e.g. phone conversation with neighborhood association chairperson, meeting with land use committee, presentation at neighborhood association meeting), and the result;*

We did not contact any City-recognized CIOs.

Please use this statement in your completeness checklist.

Thanks,

**Suzannah Stanley** Land Use Planning  
D 971-346-3808 C 503-853-3652 Senior Associate  
[Professional Licenses & Certifications](#)

---

**From:** Erin Engman <[engman@tualatin.gov](mailto:engman@tualatin.gov)>  
**Sent:** Wednesday, September 7, 2022 4:29 PM  
**To:** Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Steve Koper <[skoper@tualatin.gov](mailto:skoper@tualatin.gov)>  
**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Chelsey Reinoehl <[CReinoehl@mcknze.com](mailto:CReinoehl@mcknze.com)>  
**Subject:** RE: CIO contact: Lam Research New Office Building

Here's the hyperlink: [TDC 32.140\(1\)\(h\)](#).

**Erin Engman**

Senior Planner  
City of Tualatin | Planning Division  
503.691.3024 | [www.tualatinoregon.gov](http://www.tualatinoregon.gov)

---

**From:** Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>  
**Sent:** Wednesday, September 7, 2022 4:17 PM  
**To:** Erin Engman <[engman@tualatin.gov](mailto:engman@tualatin.gov)>; Steve Koper <[skoper@tualatin.gov](mailto:skoper@tualatin.gov)>  
**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Chelsey Reinoehl <[CReinoehl@mcknze.com](mailto:CReinoehl@mcknze.com)>  
**Subject:** RE: CIO contact: Lam Research New Office Building

Thanks, Erin,

I'm not seeing it in the code at my fingertips; what should the "notice" entail? A site plan and FYI that we've submitted?

The arborist is working on the report and we hope to have that done very soon.

We'll probably want to wait until 9/16 for the incomplete letter.

Thanks,

**Suzannah Stanley**

D 971-346-3808 C 503-853-3652

Land Use Planning

Senior Associate

[Professional Licenses & Certifications](#)

---

**From:** Erin Engman <[eengman@tualatin.gov](mailto:eengman@tualatin.gov)>

**Sent:** Wednesday, September 7, 2022 12:25 PM

**To:** Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>; Steve Koper <[skoper@tualatin.gov](mailto:skoper@tualatin.gov)>

**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Chelsey Reinoehl <[CReinoehl@mcknze.com](mailto:CReinoehl@mcknze.com)>

**Subject:** RE: CIO contact: Lam Research New Office Building

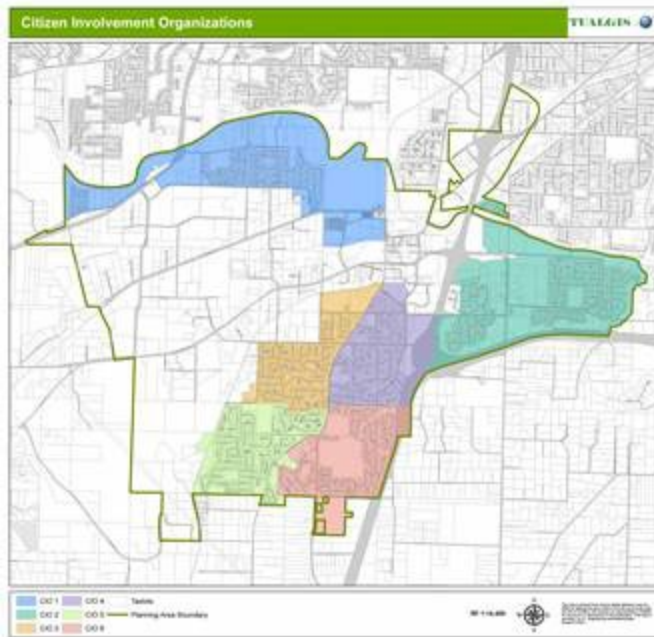
Hi Suzannah-

Hope you had a good Labor Day weekend. Steve brought me up to speed with the LAM check-in meeting, and I wanted to circle back with you on your questions.

For your question below, there is additional information on our CIOs shared in Chapter 11 of our Municipal Code, specifically [TMC 11-9-060](#) states:

*The Commercial and Manufacturing CIOs' boundaries are designated as the boundary of the entire Planning Area of the City of Tualatin (see Figure 11-9-1, below).*

Therefore the LAM site would fall within the Commercial CIO boundaries and reaching out to them would be encouraged to satisfy [TDC 32.140\(1\)\(h\)](#). The contact list for the Commercial CIO includes: [tualatincommercialcio@gmail.com](mailto:tualatincommercialcio@gmail.com), [scottm@capacitycommercial.com](mailto:scottm@capacitycommercial.com), [robertekellogg@yahoo.com](mailto:robertekellogg@yahoo.com), [famtunstall1@frontier.com](mailto:famtunstall1@frontier.com).



I also understand that you had questions on submittal items for tree removal. I wanted to confirm that a Tree Assessment Report is a required completeness item under [TDC 32.140\(1\)\(c\)](#) and [TDC 33.110\(4\)\(b\)](#); and is needed to satisfactorily demonstrate that our approval criteria for tree removal is met. Additionally, preserving the City's tree canopy is of interest to our Architectural Review Board and they will want to review the report as part of their decision.

Please let me know if you'd like me to wait until September 16 (last date granted by ORS) to make my completeness determination for your applications, or if you'd prefer that I share that in the next few days.

### Erin Engman

Senior Planner

City of Tualatin | Planning Division

503.691.3024 | [www.tualatinoregon.gov](http://www.tualatinoregon.gov)

---

**From:** Suzannah Stanley <[SStanley@mcknze.com](mailto:SStanley@mcknze.com)>

**Sent:** Thursday, September 1, 2022 3:30 PM

**To:** Steve Koper <[skoper@tualatin.gov](mailto:skoper@tualatin.gov)>; Erin Engman <[eengman@tualatin.gov](mailto:eengman@tualatin.gov)>

**Cc:** Mike Rueter <[MRueter@mcknze.com](mailto:MRueter@mcknze.com)>; Chelsey Reinoehl <[CReinoehl@mcknze.com](mailto:CReinoehl@mcknze.com)>

**Subject:** CIO contact: Lam Research New Office Building

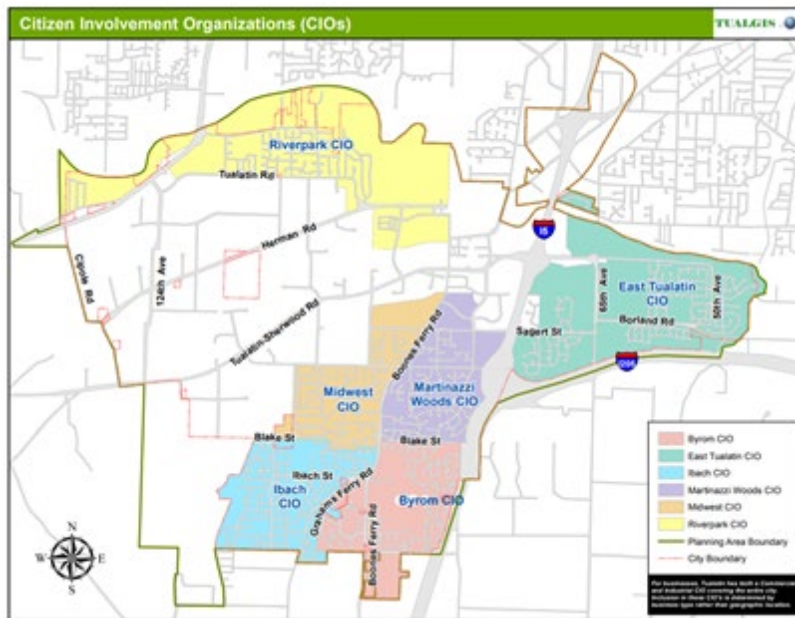
Hello Steve and Erin,

We took a look at the CIO notice requirements.

**“Notice Requirements.** The applicant must provide notice to neighboring property owners (within 1,000 feet), designated Citizen Involvement Organization (CIO) representatives, and the Tualatin Community Development Department. The City is able to provide the applicant with a complete

Mailing Area List for a fee. Requests for Mailing Area Lists can be made by contacting [planning@tualatin.gov](mailto:planning@tualatin.gov)

However, the Lam site is not inside of a CIO district.



We obtained the complete mailing area list from the Planning department but since there aren't any, no CIOs were listed. So it seems like that requirement doesn't apply. Let me know if you have any questions. Thanks,

**Suzannah Stanley**

D 971-346-3808 C 503-853-3652

Land Use Planning

Senior Associate

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To encourage healthy living and work-life balance during the summer months, our offices will close at 12 PM on Fridays.

**AFFIDAVIT OF MAILING NOTICE**

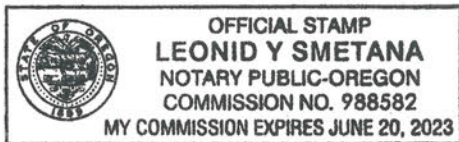
STATE OF OREGON            )  
  ) SS  
COUNTY OF WASHINGTON )

I, Chelsey Reinoehl being first duly sworn, depose and say:

That on the 2nd day of August, 20 22, I served upon the persons shown on Exhibit "A" (Mailing Area List), attached hereto and by this reference incorporated herein, a copy of the Notice of Neighborhood/Developer Meeting marked Exhibit "B," attached hereto and by this reference incorporated herein, by mailing to them a true and correct copy of the original hereof. I further certify that the addresses shown on said Exhibit "A" are their regular addresses as determined from the books and records of the Washington County and/or Clackamas County Departments of Assessment and Taxation Tax Rolls, and that said envelopes were placed in the United States Mail with postage fully prepared thereon.

*Chelsey Reinoehl*  
Signature

SUBSCRIBED AND SWORN to before me this 15<sup>th</sup> day of August, 20 22.



*L. Smetana*  
Notary Public for Oregon  
My commission expires: June 20, 2023

RE: \_\_\_\_\_



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[REDACTED]  
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TUALATIN, OR 97062

2S115DC07100

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TUALATIN, OR 97062

2S123B000600

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2S115DC10000

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TUALATIN, OR 97062

2S122AD00400

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SANTA CLARA, CA 95054

2S115DC03700

[REDACTED]  
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TUALATIN, OR 97062

2S115DD12200

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2S115DC09400

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2S115DD11900

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2S115DD15000

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2S122AD00900

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[REDACTED]

BEAVERTON, OR 97008

2S115DD13900

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2S115DC11800

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TUALATIN, OR 97062

2S114CB02800

[REDACTED]  
[REDACTED]

TIGARD, OR 97224

2S115DD19500

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TUALATIN, OR 97062

2S115DD11000

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2S114CC06100

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2S114CC06900

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2S115DC09200

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PORTLAND, OR 97208

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TUALATIN, OR 97062

2S115DC11300

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LA QUINTA, CA 92253

2S115DC00900

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TUALATIN, OR 97062

2S115DA03800

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2S115DD02100

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2S115DC12100

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2S123BB90002

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2S115C002802

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TIGARD, OR 97223

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TUALATIN, OR 97062

2S122AD01300

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SAUSALITO, CA 94965

2S123BB00501

[REDACTED]  
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LAKE OSWEGO, OR 97034

2S115DD19000

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TUALATIN, OR 97062

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TUALATIN, OR 97062

2S114CC07300

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PORTLAND, OR 97225

2S123BB00701

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[REDACTED]

PORTLAND, OR 97201

# MACKENZIE.

August 1, 2022

RE: LAM Research – New Office Building and Parking  
*Rescheduled Neighborhood Meeting*

Dear Property Owner:

You recently received an invitation to a virtual neighborhood meeting on August 8, 2022 at 8:00 PM. Unfortunately, due to a conflict, we have rescheduled the meeting to August 16 at 7:00 PM. The meeting will be held in person at:

Juanita Pohl Center  
8513 SW Tualatin Road  
Tualatin, OR 97062  
**Tuesday, August 16 at 7:00 PM**

This meeting is being held to discuss a proposed project located at 11155 SW Leveton Drive. The proposal is for a new 120,000 SF, 4-story building on the south end of the existing Lam campus, east and south of existing buildings. The proposed parking expansion will be east and northeast of the proposed building. The project will require a Type III Architectural Review due to the building size, as well as a modification to the previous Industrial Master Plan due to one component of the proposed parking lot design (also a Type III review).

This is an informational meeting to share the development proposal with interested neighbors. You will have the opportunity to review preliminary plans and identify topics of interest or consideration. Feel free to contact me with any questions or commentary.

Regards,

Suzannah Stanley, Land Use Planner  
Mackenzie  
[SStanley@mcknze.com](mailto:SStanley@mcknze.com)

cc: [planning@tualatin.gov](mailto:planning@tualatin.gov), Tualatin Community Development Department

Enclosure(s): Preliminary Overall Site Plan









**CERTIFICATION OF SIGN POSTING**

<p><b>NOTICE</b></p> <p><b>NEIGHBORHOOD / DEVELOPER MEETING</b></p> <p>__/__/2010 __:__.m.</p> <p>SW _____</p> <p>503-__-__</p>
---

In addition to the requirements of TDC 32.150, the 18" x 24" sign must display the meeting date, time, and address as well as a contact phone number. The block around the word "NOTICE" must remain **orange** composed of the **RGB color values Red 254, Green 127, and Blue 0**. A PowerPoint template of this sign is available at: <https://www.tualatinoregon.gov/planning/land-use-application-sign-templates>.

---

As the applicant for the \_\_\_\_\_ project, I hereby certify that on this day, \_\_\_\_\_ sign(s) was/were posted on the subject property in accordance with the requirements of the Tualatin Development Code and the Community Development Division.

Applicant's Name: \_\_\_\_\_  
*(Please Print)*

Applicant's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

# MACKENZIE.

## SIGN-IN SHEET

P 503.224.9560 • F 503.228.1285 • W MCKNZE.COM  
RiverEast Center, 1515 SE Water Avenue, #100, Portland, OR 97214

Portland, Oregon • Vancouver, Washington • Seattle, Washington

**PROJECT NUMBER:** 2220087.00

**MEETING DATE:** 8/16/22

**PROJECT NAME:** Lam Research New Office  
Building

**MEETING TIME:** 7:00 PM

**FACILITATOR:** Suzannah Stanley

*Jean Hamilton*

*J. Hami 828 @ aol.com*

*Dominic Tallent*

*dontallent79@gmail.com*

## MEETING MINUTES

---

PROJECT NUMBER: 2220087.00                      ISSUE DATE: August 17, 2022  
PROJECT NAME: Lam Research New Office Building

---

RECORDED BY: Suzannah Stanley – Land Use Planner  
TO: FILE  
PRESENT: Jennifer Otterness – Lam Research  
Joan Hamilton, Dominic Tallent – Neighbors  
Mike Rueter, Janet Jones, Suzannah Stanley – Mackenzie

**SUBJECT: Neighborhood Meeting Minutes (August 16, 2022)**

### INFORMATION ITEMS

1. The meeting began at 7:06 PM.
2. Suzannah Stanley (Mackenzie) described the project and that it will require a Type III AR application and Type III IMP.
3. Dominic Tallent (Neighbor) asked what the hours would be at the new building: staggered shifts or day schedule? Jennifer Otterness (Lam Research) said during the day.
4. Joan Hamilton (Neighbor) asked how many employees. Jennifer said up to 600; some from the existing buildings, probably 500-550 new. Joan said Tualatin Road is getting very busy and there are no adequate crosswalks. Janet Jones (Mackenzie) said recent and historical counts have found Lam trips travel mostly via Leveton Drive to 124th Avenue and OR 99W and via 108th to Herman Road and I-5.
5. Jennifer said Lam put a crosswalk in on Tualatin Road. Joan said the Tualatin Road/115th Avenue intersection is unsafe for kids.
6. Dominic asked about the accesses in and out on Tualatin. Janet said there is no access to Tualatin Road, currently only a fire access is provided on Tualatin Road. Jennifer said we looked at opening that but it's faster to go down Leveton Drive and up 124th Avenue. Joan said we should study 115th/Hazelbrook. Janet said the City didn't require that one. Mike Rueter (Mackenzie) said that under existing conditions that intersection may have issues but we have to focus on what's this project's impacts are.
7. Janet shared the results of the traffic study and where the traffic tends to go. We studied intersections where the project adds the City's trip threshold. Based on our available data, we do not believe new trips will route to OR 99W via Hazelbrook Road.
8. Mackenzie staff shared their business cards with the neighbors in case of their future questions. The meeting adjourned around 7:25 PM.

Every effort has been made to accurately record this meeting. If any errors or omissions are noted, please provide written response within five days of receipt.

**CERTIFICATION OF SIGN POSTING**



The applicant must provide and post a sign pursuant to Tualatin Development Code (TDC 32.150). The block around the word "NOTICE" must remain yellow composed of the RGB color values Red 255, Green 255, and Blue 0. A template is available at:

<https://www.tualatinoregon.gov/planning/land-use-application-sign-templates>

**NOTE:** For larger projects, the Community Development Department may require the posting of additional signs in conspicuous locations.

---

As the applicant for the \_\_\_\_\_ project,  
I hereby certify that on this day, \_\_\_\_\_ sign(s) was/were posted on the subject property in  
accordance with the requirements of the Tualatin Development Code and the Community Development Division.

Applicant's Name: \_\_\_\_\_  
*(Please Print)*

Applicant's Signature: \_\_\_\_\_

Date: \_\_\_\_\_





**NOTICE**  
ARCHITECTURAL  
REVIEW AR-22-0001  
For more information call  
503-691-3026 or visit  
[www.hualatinoregon.gov](http://www.hualatinoregon.gov)

**NOTICE**  
INDUSTRIAL MASTER  
PLAN IMP-22-0001  
For more information call  
503-691-3026 or visit  
[www.hualatinoregon.gov](http://www.hualatinoregon.gov)





## NOTICE

**ARCHITECTURAL  
REVIEW AR-22-0006**

For more information call  
503-691-3026 or visit  
[www.tualatinoregon.gov](http://www.tualatinoregon.gov)



## NOTICE

**INDUSTRIAL MASTER  
PLAN IMP-22-0001**

For more information call  
503-691-3026 or visit  
[www.tualatinoregon.gov](http://www.tualatinoregon.gov)



**Cash Register Receipt**  
City of Tualatin

**Receipt Number**  
**WEB6134**

DESCRIPTION	ACCOUNT	QTY	PAID
<b>ProjectTRAK</b>			<b>\$2,785.00</b>
AR22-0006	Address: 11155 SW LEVETON DR	Apn: 2S122AA00500	\$2,785.00
<b>ARCHITECTURAL REVIEW FEES</b>			<b>\$2,785.00</b>
ARCHITECTURAL REVIEW FEES	XR01	0	\$2,785.00
<b>TOTAL FEES PAID BY RECEIPT: WEB6134</b>			<b>\$2,785.00</b>

Date Paid: Thursday, August 18, 2022

Paid By: Lam Research

Cashier: ECON

Pay Method: eCredit Card 039289

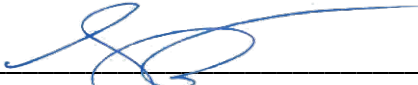


## AFFIDAVIT OF MAILING

I, Erin Engman, being first duly sworn, depose and say:

That on the 28 day of October, 2022, I served upon the persons shown on Exhibit A, attached hereto and by this reference incorporated herein, a copy of a Notice of Application marked Exhibit B, attached hereto and by this reference incorporated herein, by mailing to them a true and correct copy of the original hereof. I further certify that the addresses shown on said Exhibit A are their regular addresses as determined from the books and records of the Washington County and/or Clackamas County Departments of Assessment and Taxation Tax Rolls, and that said envelopes were placed in the United States Mail at Tualatin, Oregon, with postage fully prepared thereon.

Dated this 28 of October, 2022

  
\_\_\_\_\_  
Signature

RE: IMP22-0001

TLID	OWNER1	OWNERADDR	OWNERCITY	OWNERSTATE	OWNERZIP
2S123BB00501	18355 SW TETON AVENUE TUALATIN OR LLC	17455 SW RIDGEVIEW LN	LAKE OSWEGO	OR	97034
2S123BB90002	3 J'S PROPERTIES LLC	10400 SW TUALATIN RD	TUALATIN	OR	97062
2S123BB00701	AAA OREGON/IDAHO	600 MARKET ST	PORTLAND	OR	97201
2S122AD01300	ABBOTT TUALATIN LLC	3030 BRIDGEWAY	SAUSALITO	CA	94965
2S115DC12100	ABERNATHY TRAVIS E & ABERNATHY AMANDA M	17860 SW 114TH AVE	TUALATIN	OR	97062
2S114CC07300	ABRAMS HOWARD R REV LIV TRUST	7799 SW MONTCLAIR DR	PORTLAND	OR	97225
2S114CC05700	ACKLEY KRISTEN & ROTTMAN ERIK A	17961 SW 105TH CT	TUALATIN	OR	97062
2S114CB01900	ADAMS KAREN E & BARTHOLOMEW BRIAN J	17445 SW 104TH AVE	TUALATIN	OR	97062
2S115DD00700	ADAMS SHEILA D	10915 SW TUALATIN RD	TUALATIN	OR	97062
2S114CC07600	AHUNA KLAUS G & AHUNA JANET L	10332 SW PUEBLO ST	TUALATIN	OR	97062
2S115DD02100	AIELLO KAREN L	10650 SW PUEBLO CT	TUALATIN	OR	97062
2S115DC00800	ALBERTSON BRUCE & ALBERTSON JUDY	11415 SW ELMER CT	TUALATIN	OR	97062
2S115DD15100	ALBERT GARY J & ALBERT LISA J	17630 SW 108TH PL	TUALATIN	OR	97062
2S115DA03800	AMAN FAMILY TRUST	17435 SW 108TH PL	TUALATIN	OR	97062
2S115DD19000	ANDERSON DEBORAH M	11045 SW TUALATIN RD	TUALATIN	OR	97062
2S115C002802	APOSTOLIC LUTHERAN CHURCH OF PORTLAND	PO BOX 23312	TIGARD	OR	97223
2S115DC00900	ARBUCKLE JAMES F & ARBUCKLE MARY D	11400 SW ELMER CT	TUALATIN	OR	97062
2S115DC11300	ARNDT RONALD C 2015 TRUST	80395 WEISKOPF	LA QUINTA	CA	92253
2S115DA01700	ARROYO CHRIS & ARROYO JAQUELINE C	10515 SW STARR DR	TUALATIN	OR	97062
2S115DD07600	ASAI C&C JOINT TRUST	10555 SW KIOWA ST	TUALATIN	OR	97062
2S122AA00400	ASCENTEC ENGINEERING LLC	18500 SW 108TH AVE	TUALATIN	OR	97062
2S122AD00100	ASCENTEC ENGINEERING LLC	18500 SW 108TH AVE	TUALATIN	OR	97062
2S115DD06500	AUGUSTYNIAK EDWARD J & SUJCZYNSKA MONIKA J	10555 SW BANNOCH CT	TUALATIN	OR	97062
2S115DC06100	BAEDOR FAMILY TRUST	17775 SW 111TH AVE	TUALATIN	OR	97062
2S115DD02900	BAILEY TRUST	17971 SW 106TH AVE	TUALATIN	OR	97062
2S115DD15200	BAIRD LEAH J	17610 SW 108TH PL	TUALATIN	OR	97062
2S114CC07700	BANEY JOACHIM E	PO BOX 3474	PORTLAND	OR	97208
2S115DD12100	BANTA BRYCE & BANTA RENE	17880 SW 110TH AVE	TUALATIN	OR	97062
2S115DC00600	BARRACLOUGH RODNEY P JR & BARRACLOUGH SANDRA	11475 SW ELMER CT	TUALATIN	OR	97062
2S115DD12900	BARROW BRAD JAMES & BARROW SYDNEY ANTONETTE	10850 SW BANNOCH ST	TUALATIN	OR	97062
2S115DD17000	BARRON LIV TRUST	11065 SW LUCAS DR	TUALATIN	OR	97062
2S115DD07200	BARTHOLOMEW MARY C TRUST	10570 SW KIOWA ST	TUALATIN	OR	97062
2S115DC10300	BATEMAN BRENT A & BATEMAN KARLA S	17875 SW 114TH AVE	TUALATIN	OR	97062
2S115DD07400	BAUMANN THOMAS K & BAUMANN ROSEMARIE D	10500 SW KIOWA ST	TUALATIN	OR	97062
2S115DD07000	BAXTER CHRISTOPHER & BAXTER STEPHANIE	10606 SW BANNOCH CT	TUALATIN	OR	97062
2S115DD02000	BELL TAMERA J & JURCHEN STEVEN L	10644 SW PUEBLO ST	TUALATIN	OR	97062
2S114CB01600	BENEDICT ELIZABETH A	10460 SW KELLOGG DR	TUALATIN	OR	97062
2S115DA01900	BENKE FAMILY TRUST	17400 SW 106TH CT	TUALATIN	OR	97062
2S115DD10400	BENNETT JENNIFER ANN & FRICK BENJAMIN JOHN	11030 SW WINTU CT	TUALATIN	OR	97062
2S115DC08400	BERG TOR L & BERG CHERYL L	17880 SW 113TH AVE	TUALATIN	OR	97062
2S115DC04900	BERGGREN TERESA D	11115 SW GARRETT ST	TUALATIN	OR	97062
2S115DC09200	BERGGREN BRAD J & BERGGREN ROBERTA K	11425 SW KALISPELL ST	TUALATIN	OR	97062
2S115DC05800	BIEHLER ROBYN L	17750 SW 112TH AVE	TUALATIN	OR	97062
2S114CC06900	BILITZ MARTIN & BILITZ MICHAELA DANIELA	10479 SW PUEBLO ST	TUALATIN	OR	97062
2S114CB02600	BIXEL JENNIFER	10455 SW KELLOGG DR	TUALATIN	OR	97062
2S115DC10800	BLAKEY BLAKE & BLAKEY DOMENIQUE	11400 SW APALACHEE ST	TUALATIN	OR	97062
2S114CC06100	BLATT CHARLES M JR & BLATT NAOMI T	17897 SW 105TH CT	TUALATIN	OR	97062
2S115DD11000	BLUM MARY LOU	11020 SW WISHRAM CT	TUALATIN	OR	97062
2S114CC07000	BORTHWICK MELODY	10461 SW PUEBLO ST	TUALATIN	OR	97062
2S115DD19200	BOSWOOD KRISTINA G	11029 SW TUALATIN RD	TUALATIN	OR	97062
2S115DD19500	BOWER NESLER FAMILY TRUST	17967 SW 110TH PL	TUALATIN	OR	97062
2S115DC08500	BRISAN MARIUS M & BRISAN LIDIA M	17850 SW 113TH AVE	TUALATIN	OR	97062
2S115DD15700	BROCKWAY FAMILY TRUST	17455 SW 108TH PL	TUALATIN	OR	97062
2S114CB02800	BROOKS STEVEN K & DAVIS HEATHER M	15532 SW PACIFIC HWY #CIB111	TIGARD	OR	97224
2S115DC09400	BROPHY JEFFREY E & BROPHY DANETTE M	11465 SW KALISPELL ST	TUALATIN	OR	97062
2S115DD11600	BROWNE AARON J & BROWNE KELLIE G	11035 SW WISHRAM CT	TUALATIN	OR	97062
2S115DC01900	BRYANT SYDNAY & BRYANT JAKE	11420 SW ROBERTS CT	TUALATIN	OR	97062
2S115DD12200	BUCKNER ORVILLE KERN III	17890 SW 110TH AVE	TUALATIN	OR	97062
2S114CB02100	BURDICK EILEEN T & BURDICK CHRISTOPHER J	17430 SW 104TH AVE	TUALATIN	OR	97062
2S115DC11800	BURNS JACK S	17785 SW 113TH AVE	TUALATIN	OR	97062
2S115DC03700	BUSHNELL TODD MICHAEL	17960 SW 111TH AVE	TUALATIN	OR	97062
2S115DD05800	CAGLE STEVEN & CAROLYN LIV TRUST	10777 SW KIOWA CT	TUALATIN	OR	97062
2S115DD13900	CALDER KENNETH D & CALDER MARY C	10945 SW TUNICA ST	TUALATIN	OR	97062
2S122AD00400	CALMAX TECHNOLOGY INC	3491 LAFAYETTE ST	SANTA CLARA	CA	95054
2S115DC04000	CAVEN JEREMY LIONEL	17870 SW 111TH AVE	TUALATIN	OR	97062
2S122AD00900	CEDAR LANDSCAPE MAINTENANCE LLC	6107 SW MURRAY BLVD #175	BEAVERTON	OR	97008
2S115DC10000	CERO JEFFREY C & CERO CARISSA	11410 SW KALISPELL ST	TUALATIN	OR	97062
2S115DD01800	CHALFAN TRUST	4095 WESTBAY RD	LAKE OSWEGO	OR	97035
2S115DD15000	CHALISE PRAVEEN & CHALISE DEEPA	17625 SW 108TH PL	TUALATIN	OR	97062
2S115DD06400	CHAMBERS NICHOLAS RYAN & MURATA-CHAMBERS AKIMI SAKU	10595 SW BANNOCH CT	TUALATIN	OR	97062
2S123B000600	CHAMBERLAIN HUSSA PROPERTIES	18755 SW TETON AVE	TUALATIN	OR	97062
2S115DC11000	CHANG SARAH	11360 SW APALACHEE ST	TUALATIN	OR	97062
2S115DC07100	CHAUNCEY LOIS	17890 SW 112TH AVE	TUALATIN	OR	97062
2S115DD05100	CHRISTIAN LOU A & CHRISTIAN TINA L	10677 SW BANNOCH ST	TUALATIN	OR	97062
2S115DD02500	CLARK DAVID A & CLARK CATHERINE M	10639 SW PUEBLO CT	TUALATIN	OR	97062
2S115DD08400	CLARK MONICA J & CLARK LONNY T	10525 SW LUCAS CT	TUALATIN	OR	97062
2S115DD11900	CLARK CHARLES L TRUST	17875 SW 110TH AVE	TUALATIN	OR	97062
2S115DC02100	COCKRELL WILLIAM D & COCKRELL PAMELA K	11460 SW ROBERTS CT	TUALATIN	OR	97062
2S114CC06700	CODINO VAL H & CODINO LOIS D	17962 SW 105TH CT	TUALATIN	OR	97062
2S115DD16700	COMPTON JAY W	17595 SW 110TH AVE	TUALATIN	OR	97062
2S115DD05300	CONNER DANIEL J & CONNER SHARON W	10650 SW KIOWA CT	TUALATIN	OR	97062
2S115DD17200	CORR FAMILY REV TRUST	17585 SW 111TH AVE	TUALATIN	OR	97062
2S115DC90003	COSNER BERNADETTE	17890 SW 115TH AVE UNIT 3	TUALATIN	OR	97062
2S115DC10100	COX LEE H & COX CHRISTINA R	17825 SW 114TH AVE	TUALATIN	OR	97062
2S115C001600	CR RIVERCREST MEADOWS COMMUNITIES LLC	444 W BEECH ST #300	SAN DIEGO	CA	92101
2S115C001700	CR RIVERCREST MEADOWS COMMUNITIES LLC	444 W BEECH ST #300	SAN DIEGO	CA	92101
2S115DD01400	CRALL RICHARD F & CRALL BARBARA M	10055 SW WASCO WAY	TUALATIN	OR	97062



2S115DC10200	CROSS THOMAS A & CROSS DIANE RUTH	17845 SW 114TH AVE	TUALATIN	OR	97062
2S115C002803	CYPRESS PARISH LLC	16750 SE KENS CT	MILWAUKIE	OR	97267
2S114CC05500	DEAVILLE CASEY D	17970 SW 105TH CT	TUALATIN	OR	97062
2S115DD17500	DEBRAUWERE RICHARD L & DEBRAUWERE ELEANOR K	11100 SW LUCAS DR	TUALATIN	OR	97062
2S115DD14100	DEHEN PAUL V & DEHEN ROBERTA A	10995 SW TUNICA ST	TUALATIN	OR	97062
2S115DA03500	DEJONG STEVEN & DEJONG KAITLIN	17350 SW 108TH PL	TUALATIN	OR	97062
2S115DC06200	DOLAK TYLER JOHN & MCMUNN KRISTIANA NICHOLE	17795 SW 111TH AVE	TUALATIN	OR	97062
2S115DD02300	DONAUGH ANTHONY M & DONAUGH CHRISTI S	10651 SW PUEBLO CT	TUALATIN	OR	97062
2S115DC08600	DONOHUE NICHOLAS MICHAEL	17800 SW 113TH AVE	TUALATIN	OR	97062
2S115DC06500	DOWNING DARYL & DOWNING CHRISTINE	17865 SW 111TH AVE	TUALATIN	OR	97062
2S115DD06100	DRAPER JAMES A & JANICE F TRUST	17755 SW 106TH AVE	TUALATIN	OR	97062
2S115DA04000	DUPUIS KENNETH & DUPUIS ERIN	17550 SW 110TH AVE	TUALATIN	OR	97062
2S115DA04100	DUPUIS FAMILY TRUST	17460 SW 110TH AVE	TUALATIN	OR	97062
2S115DC08700	EASTMAN ROBYN T & EASTMAN SANDY M	17770 SW 113TH AVE	TUALATIN	OR	97062
2S115DC06700	EDEN CHRISTOPHER	11155 SW APALACHEE ST	TUALATIN	OR	97062
2S115DD20000	EDWARDS MARK	17986 SW 110TH PL	TUALATIN	OR	97062
2S115DA04800	ESTRADA ALFRED & ESTRADA SHARON	17460 SW 111TH AVE	TUALATIN	OR	97062
2S115DD14500	FB TRUST	10910 SW BANNOCH ST	TUALATIN	OR	97062
2S115DC02000	FENN DENNIS LESLIE & FENN ROBERTA JEAN	11440 SW ROBERTS CT	TUALATIN	OR	97062
2S115DC07000	FEUERBORN CHAD M & FEUERBORN CATHY	26385 SW PEAKS MT ROAD	WEST LINN	OR	97068
2S115DD15800	FISH TAMMY G & FISH WAYNE L	17475 SW 108TH PL	TUALATIN	OR	97062
2S115DC11400	FITCH JACQUELINE DARLENE & FITCH JOHN WALLACE	17915 SW 113TH AVE	TUALATIN	OR	97062
2S115DC10900	FLORES SAMANTHA & PENA JOSE ROBERTO	11380 SW APALACHEE ST	TUALATIN	OR	97062
2S115DD13600	FOILES LESLIE E & FOILES VICTORIA A	10960 SW TUNICA ST	TUALATIN	OR	97062
2S115DC00500	FORD KEVIN & LOCKE EMMA	11495 SW ELMER CT	TUALATIN	OR	97062
2S115DD19400	FORD JOHN E & AMES STEPHANIE	17953 SW 110TH PL	TUALATIN	OR	97062
2S115DC05100	FRAINEY BRIAN A & FRAINEY ABIGAIL J	11155 SW GARRETT ST	TUALATIN	OR	97062
2S115DA01600	FRANKLIN MELLISA & FRANKLIN IGNACIO	17425 SW 105TH AVE	TUALATIN	OR	97062
2S115DA01400	FRIEDMAN MARK E REV TRUST & FRIEDMAN JOHNNALEE L REV TRUST	17355 SW 105TH AVE	TUALATIN	OR	97062
2S115DC09800	FRONCZAK GREG JOHN	11450 SW KALISPELL ST	TUALATIN	OR	97062
2S1220000400	FUJIMI CORPORATION	11200 SW LEVETON DR	TUALATIN	OR	97062
2S115DD05400	GALLARDO MICHAEL & MIELE SARA	10680 SW KIOWA CT	TUALATIN	OR	97062
2S115DD13500	GALLAGHER RON MICHAEL & GALLAGHER KELLY MORIARTY	17975 SW 109TH AVE	TUALATIN	OR	97062
2S115DC06800	GALVIN JEREMY & GALVIN ANDREA	17950 SW 112TH AVE	TUALATIN	OR	97062
2S122AD01100	GARSKE TRAVIS W	PO BOX 729	COLBERT	WA	99005
2S115DC03000	GASTON LARRY R REV LIV TRUST	18189 SHADY HOLLOW WAY	WEST LINN	OR	97068
2S115DA04400	GILBERTSON CHRISTOPHER C & GILBERTSON HEIDI S	17435 SW 110TH AVE	TUALATIN	OR	97062
2S115DD09100	GILL BRANDON & GILL SARENA	10550 SW STARR DR	TUALATIN	OR	97062
2S115DC06000	GIMARELLI-BAST TERRA	11120 SW GARRETT ST	TUALATIN	OR	97062
2S115DD02700	GIRDNER DOUGLAS R & GIRDNER SANDRA L	10623 SW PUEBLO CT	TUALATIN	OR	97062
2S114CB02500	GITT SHARON M	10435 SW KELLOGG DR	TUALATIN	OR	97062
2S115DD16200	GITT SEAN C & GITT MELISSA A	17770 SW 110TH AVE	TUALATIN	OR	97062
2S115DD16900	GLASSER FAMILY REV TRUST	11035 SW LUCAS DR	TUALATIN	OR	97062
2S115DA04300	GODFREY DAVID E & GODFREY LISA J	17410 SW 110TH AVE	TUALATIN	OR	97062
2S115DD16600	GOESSENS JACQUES E & GOESSENS SUSAN	17580 SW 110TH AVE	TUALATIN	OR	97062
2S114CC05800	GONZALEZ JULIE A REV TRUST	17565 SW 110TH AVE	TUALATIN	OR	97062
2S115DA04600	GONZALEZ JULIE A REV TRUST	17565 SW 110TH AVE	TUALATIN	OR	97062
2S115DC11900	GONZALEZ RODOLFO GUERRERO & GUZMAN JOSE LUIS AMEZCUA	17780 SW 114TH AVE	TUALATIN	OR	97062
2S115DC00300	GOVINDAN ANUMARLA & GOVINDAN SODHARI	11460 SW HAZELBROOK RD	TUALATIN	OR	97062
2S115DA04700	GRAHAM CONNIE L REV TRUST	PO BOX 2238	TUALATIN	OR	97062
2S115DC10500	GREENE JOHN W & GREENE SUSAN	17915 SW 114TH AVE	TUALATIN	OR	97062
2S115DD06000	GREEN GARY L & GREEN JANIS A	10695 SW KIOWA CT	TUALATIN	OR	97062
2S115DD11800	GREEN CRAIG D	17885 SW 110TH AVE	TUALATIN	OR	97062
2S115DD01700	GROVE NICOLE & GROVE MATTHEW	17987 SW 106TH AVE	TUALATIN	OR	97062
2S115DD04900	GUILFOYLE CAROL L TRUST	10795 SW BANNOCH ST	TUALATIN	OR	97062
2S115DD10600	GUTOWSKI MARK A	11070 SW WINTU CT	TUALATIN	OR	97062
2S114CC05400	GUY CARRIE & GUY TIMOTHY M	10482 SW PUEBLO CT	TUALATIN	OR	97062
2S115DD07700	HACKBARTH JANICE V	10585 SW KIOWA ST	TUALATIN	OR	97062
2S115DD15400	HALL STEPHEN C & HALL WENDY S	10799 SW LUCAS DR	TUALATIN	OR	97062
2S115DC00400	HAMILTON PAUL CHARLES & HAMILTON JOAN E	PO BOX 3207	TUALATIN	OR	97062
2S115DC09900	HAMILTON BRETT T & HAMILTON KAMI R	11430 SW KALISPELL ST	TUALATIN	OR	97062
2S115DD19900	HANNEGAN MICHAEL L	17992 SW 110TH PL	TUALATIN	OR	97062
2S114CB01500	HANNON RACHELLE S & HANNON JEFFREY T	17440 SW 105TH AVE	TUALATIN	OR	97062
2S115DD16400	HANSON TIMOTHY J & HANSON SUSAN E	17690 SW 110TH AVE	TUALATIN	OR	97062
2S115DD19100	HARRIS DEGAY C & OBIDIGBO OBINNA KINGSLEY	11037 SW TUALATIN RD	TUALATIN	OR	97062
2S115DC03200	HARTFEIL DERICH & HARTFEIL ELEANOR	11170 SW APALACHEE ST	TUALATIN	OR	97062
2S114CB02400	HAUPERT REV TRUST	10415 SW KELLOGG DR	TUALATIN	OR	97062
2S115DD18300	HAYES RYAN D & ANCHARSKI NANCY	11025 SW WINYA CT	TUALATIN	OR	97062
2S115DC90000	HAZELBROOK CONDO UNIT OWNERS			OR	00000
2S115DD14000	HEIN CHRISTOPHER HAROLD & HEIN SUSANNE BIRGIT	10975 SW TUNICA ST	TUALATIN	OR	97062
2S122AA00100	HELSEER LP	PO BOX 1569	TUALATIN	OR	97062
2S115DD01900	HELTNESS ERIC TODD & HELTNESS CHERYL LYNN	10632 SW PUEBLO CT	TUALATIN	OR	97062
2S115DD02400	HEMANN MAURA A REV LIV TRUST	10645 SW PUEBLO CT	TUALATIN	OR	97062
2S114CB02300	HENRY DAVID & SHARI TRUST	10355 SW KELLOGG DR	TUALATIN	OR	97062
2S115DD13400	HENSLEY TRACY L & BARTELS AARON DAVID	17980 SW 109TH AVE	TUALATIN	OR	97062
2S115DD08100	HERINCKX JEFFREY & HERINCKX CHANDA S	10560 SW LUCAS CT	TUALATIN	OR	97062
2S115DC06300	HEWITT KRISTY K & HEWITT MARSHALL	17815 SW 111TH AVE	TUALATIN	OR	97062
2S115DD06700	HILDEBRAN REED & HILDEBRAN SALLY J	10500 SW BANNOCH CT	TUALATIN	OR	97062
2S114CC07500	HILLIARD DAVID M & DRAPER ELIZABETH L	10316 SW PUEBLO ST	TUALATIN	OR	97062
2S115DC90002	HINDS FAMILY TRUST	17900 SW 115TH AVE	TUALATIN	OR	97062
2S115DC01100	HIRTE EDWIN K & HIRTE TERESA J	11450 SW ELMER CT	TUALATIN	OR	97062
2S115DC01700	HISLOP BRENT & HISLOP CLAUDIA	11425 SW ROBERTS CT	TUALATIN	OR	97062
2S115DD10900	HOLMES TRUST	11025 SW WINTU CT	TUALATIN	OR	97062
2S115DC08800	HOOVER DEVIN & HOOVER KRISTEN	11315 SW KALISPELL ST	TUALATIN	OR	97062
2S115DC09600	HOURLANI JIHAD & SHIKHA HAYAT	11490 SW KALISPELL ST	TUALATIN	OR	97062
2S115DA05200	HOWELL ZACHARY P & HOWELL REBECCA J	17535 SW 111TH AVE	TUALATIN	OR	97062
2S122AA00600	HR LLC	18280 SW 108TH AVE	TUALATIN	OR	97062
2S115DC05000	HUGEBACK BENJAMIN L & HUGEBACK JULIET F	11135 SW GARRETT ST	TUALATIN	OR	97062

2S114CC07100	HURDLE FAMILY REV TRUST	15927 SE LARK AVE	MILWAUKIE	OR	97267
2S115DA04900	HUTCHISON BERNADETTE SEP PROP REV LIV TRUST	17430 SW 111TH AVE	TUALATIN	OR	97062
2S115DD05900	HYATT SEAN & HYATT LISA	10755 SW KIOWA CT	TUALATIN	OR	97062
2S115DA04500	IMBLER-YOUNG DIANE REV LIV TRUST	17485 SW 110TH AVE	TUALATIN	OR	97062
2S115DD12300	IMUS R GREGORY & IMUS DEBORAH R	17895 SW 109TH AVE	TUALATIN	OR	97062
2S122BA00100	JAE OREGON INC	11555 SW LEVETON DR	TUALATIN	OR	97062
2S122BA00200	JAE OREGON INC	11555 SW LEVETON DR	TUALATIN	OR	97062
2S115DA02100	JAFFEE CAROLINE JOHANNA & JAFFEE JAY	17350 SW 106TH CT	TUALATIN	OR	97062
2S115DD01100	JAGODNIK BRIAN & JAGODNIK LAUREN	10536 SW PUEBLO ST	TUALATIN	OR	97062
2S115DD05600	JASTER ALEXIS	10760 SW KIOWA CT	TUALATIN	OR	97062
2S115DD17300	JERNBERG STANFORD W & JERNBERG LINDA F	17655 SW 111TH AVE	TUALATIN	OR	97062
2S114CB02200	JEWELL THOMAS G & JEWELL DANA P	17400 SW 104TH AVE	TUALATIN	OR	97062
2S115DD07500	JIRICEK AARON G & KARINA B REV LIV TRUST	10525 SW KIOWA ST	TUALATIN	OR	97062
2S115DC07400	JODOIN MICHAEL A & JODOIN NANCY	17810 SW 112TH AVE	TUALATIN	OR	97062
2S115DA03700	JOHNSTON LAURA D	17385 SW 108TH PL	TUALATIN	OR	97062
2S115DA05000	JOHNSON PHILLIP TILO	17445 SW 111TH AVE	TUALATIN	OR	97062
2S115DD17100	JOHNSON KIT & JOHNSON AMY	17560 SW 111TH AVE	TUALATIN	OR	97062
2S115DD20100	JONES ROBERT ALAN & JONES SHELLEY DIANE	17964 SW 110TH PL	TUALATIN	OR	97062
2S115DD08800	KERR JACK & KERR SARWESHNI	17645 SW 106TH AVE	TUALATIN	OR	97062
2S115DD03000	KINDRED LYLE V & KINDRED ELAINE A	17968 SW 106TH AVE	TUALATIN	OR	97062
2S115DD16100	KING BRADLEY W & KING LAURA J	17800 SW 110TH AVE	TUALATIN	OR	97062
2S115DC05600	KIRKPATRICK GREG D & KIRKPATRICK DEBRA S	17765 SW 112TH AVE	TUALATIN	OR	97062
2S115DC04300	KLEIN GEORGE P & KLEIN LEANNE S	17800 SW 111TH AVE	TUALATIN	OR	97062
2S115DD15500	KLENZ MICHAEL & KLENZ LINDA	17480 SW 108TH AVE	TUALATIN	OR	97062
2S115DD00900	KNAPKE STEVEN J & KNAPKE LIEN K	17997 SW 105TH CT	TUALATIN	OR	97062
2S115DD08600	KNAPPENBERGER CLARK W & KNAPPENBERGER CAROLYN	10575 SW LUCAS CT	TUALATIN	OR	97062
2S115DC11100	KNOLES RYAN CHRISTOPHER & CATON LISA	11340 SW APALACHEE ST	TUALATIN	OR	97062
2S115DD17900	KRAJCAR TIMOTHY D & KRAJCAR KIERSTEN A	11070 SW WINYA CT	TUALATIN	OR	97062
2S115DC07900	KUMAR ZOYA & UFFORD JOHN C	17915 SW 112TH AVE	TUALATIN	OR	97062
2S115DD15900	KUMLER PHILIP A & JULIE I FAM TRUST	17515 SW 108TH PL	TUALATIN	OR	97062
2S122AA00500	LAM RESEARCH CORPORATION	2025 GATEWAY PL #228	SAN JOSE	CA	95110
2S122AA00800	LAM RESEARCH CORPORATION	2025 GATEWAY PL #228	SAN JOSE	CA	95110
2S122AB00100	LAM RESEARCH CORPORATION	2025 GATEWAY PL #228	SAN JOSE	CA	95110
2S115DC11700	LAMB ETHAN S & LAMB SARAH W	17825 SW 113TH AVE	TUALATIN	OR	97062
2S115DC12500	LANG JULIANNE LERAE	3402 36TH AVE APT 3A	ASTORIA	NY	11106
2S115DC10700	LAUREN NICHOLAS D & LAUREN CHRISTINA M	17935 SW 114TH AVE	TUALATIN	OR	97062
2S115DA05100	LEE MIKE	17475 SW 111TH AVE	TUALATIN	OR	97062
2S115DD04500	LEE ANGELA & LEE BRETT	10640 SW BANNOCH ST	TUALATIN	OR	97062
2S115DD14900	LEE JONATHAN K & LEE STEPHANIE IRVING	17605 SW 108TH PL	TUALATIN	OR	97062
2S115DC08300	LEGEND HOMES CORPORATION	735 SW 158TH AVE STE 130	BEAVERTON	OR	97006
2S114CC07900	LEONARD JOHN D & LEONARD SARA	10412 SW PUEBLO ST	TUALATIN	OR	97062
2S115DC09100	LIGHT HARVEY EUGENE & LIGHT CLAUDIA JO	11405 SW KALISPELL ST	TUALATIN	OR	97062
2S115DD13200	LIN DONGMEI & MAO DIAN	17950 SW 109TH AVE	TUALATIN	OR	97062
2S114CC05600	LOANZON EMMELINE	17994 SW 105TH CT	TUALATIN	OR	97062
2S114CC05900	LONGTIN DAVID E JR	17929 SW 105TH CT	TUALATIN	OR	97062
2S114CC06300	LOOMIS TRUDY E	17902 SW 105TH CT	TUALATIN	OR	97062
2S115DD15600	LORENTE JOAQUIN & LORENTE LOUISE	17460 SW 108TH PL	TUALATIN	OR	97062
2S115DC04700	LOSER CALLIE	17700 SW 111TH AVE	TUALATIN	OR	97062
2S115DD11200	LUIKART GLEN	11060 SW WISHRAM CT	TUALATIN	OR	97062
2S122AA00700	LUMBER FAMILY CO LLC	PO BOX 1427	TUALATIN	OR	97062
2S115DD06800	MACAULAY THOMAS & MACAULAY DEBRA	10520 SW BANNOCH CT	TUALATIN	OR	97062
2S115DD14800	MACIELINSKI DAMIEN & LAURIE LIV TRUST	17565 SW 108TH PL	TUALATIN	OR	97062
2S115DD04800	MACK ADAM S & MACK KATHRYN M	10770 SW BANNOCH ST	TUALATIN	OR	97062
2S115DD18100	MACK RYAN P & MACK PATRICIA L	17825 SW 110TH AVE	TUALATIN	OR	97062
2S115DD03200	MACMILLEN JAMES WILSON & MACMILLEN DONNA JEAN	10547 SW PUEBLO ST	TUALATIN	OR	97062
2S115DD01500	MAGILKE GILBERT & MAGILKE GAIL L	17990 SW 106TH AVE	TUALATIN	OR	97062
2S115DC07200	MAGUIRE BRIAN J & MAGUIRE LISA N	17860 SW 112TH AVE	TUALATIN	OR	97062
2S114CC06500	MALETA SANDRA L & MALETA GREGORY B	17932 SW 105TH CT	TUALATIN	OR	97062
2S115DC00100	MANABE STELLA K & NAKAMA DEAN S	11420 SW HAZELBROOK RD	TUALATIN	OR	97062
2S115DC02200	MANN ERIC A & LUPULESCU NICOLETA	11490 SW ROBERTS CT	TUALATIN	OR	97062
2S115DC03500	MANN SONIA & MANN JONATHAN	11100 SW APALACHEE ST	TUALATIN	OR	97062
2S115DC04500	MARKS CHRISTINA A REV LIV TRUST	17760 SW 111TH AVE	TUALATIN	OR	97062
2S115DC04600	MARONDE JOHN ALBERT & MARONDE JILL I	17730 SW 111TH AVE	TUALATIN	OR	97062
2S122AD01000	MARSHALL ASSOCIATED LLC	PO BOX 278	TUALATIN	OR	97062
2S115DA01500	MAYER ANDREW PETER & MAYER MARIT JANAE	17395 SW 105TH AVE	TUALATIN	OR	97062
2S115DC03400	MCCLATCHEY CAITLIN & MCCLATCHEY GARRETT	11130 SW APALACHEE ST	TUALATIN	OR	97062
2S115DD01200	MCCURTAIN LIV TRUST	10560 SW PUEBLO ST	TUALATIN	OR	97062
2S115DD06900	MCCURDY WAYNE & MCCURDY BETTE	10580 SW BANNOCH CT	TUALATIN	OR	97062
2S115DD19600	MCKINNON SPENCER E	17971 SW 110TH PL	TUALATIN	OR	97062
2S115DC11500	MCPHERSON SCOTT K & MCPHERSON SUSAN R	17895 SW 113TH AVE	TUALATIN	OR	97062
2S115DD08000	MEGARGEE IRWIN F & MEGARGEE AMY L	10580 SW LUCAS CT	TUALATIN	OR	97062
2S115DC03900	MELTON LAWRENCE E & MELTON TONYA M	17900 SW 111TH AVE	TUALATIN	OR	97062
2S115DA03600	MEYER PAUL R & MEYER MARY B	17365 SW 108TH PL	TUALATIN	OR	97062
2S115DC06900	MICHAELIDES JAMIE C & RADISH KEVIN A	17920 SW 112TH AVE	TUALATIN	OR	97062
2S115DD05200	MIDKIFF HOUSTON A & MIDKIFF NANCY	17845 SW 106TH AVE	TUALATIN	OR	97062
2S115DC90004	MILES RAYE K	17880 SW 115TH AVE	TUALATIN	OR	97062
2S115DC03100	MILLER LYNN B	11190 SW APALACHEE ST	TUALATIN	OR	97062
2S115DD14300	MILLER JOINT TRUST	10970 SW BANNOCH ST	TUALATIN	OR	97062
2S115DD12500	MILNE JAMES S & MILNE MARY F	17875 SW 109TH AVE	TUALATIN	OR	97062
2S115DC01600	MINATO KAZUKI & MINATO YUKO	11445 SW ROBERTS CT	TUALATIN	OR	97062
2S115DC01300	MITCHELL TIMOTHY	900 SW 5TH AVE FL 17	PORTLAND	OR	97204
2S115DC90001	MITCHELL GARRETT C & MITCHELL SHARON M	17910 SW 115TH AVE	TUALATIN	OR	97062
2S115DD06300	MOORE KERRI ANN & MOORE CHRISTOHER	10619 SW BANNOCH CT	TUALATIN	OR	97062
2S115DD12000	MORAN STEVEN TIMOTHY & MORAN ASHLEY SCHNAPP	17870 SW 110TH AVE	TUALATION	OR	97062
2S122AD00600	MORGAN WILLIAM RAY & JANICE ELLEN REV LIV TRUST	4500 SW ADVANCE RD	WILSONVILLE	OR	97070
2S122AD00700	MORGAN WILLIAM RAY & JANICE ELLEN REV LIV TRUST	4500 SW ADVANCE RD	WILSONVILLE	OR	97070
2S122AD00800	MORGAN WILLIAM RAY & JANICE ELLEN REV LIV TRUST	4500 SW ADVANCE RD	WILSONVILLE	OR	97070
2S115DD13800	MORRELL LIVING TRUST	10915 SW TUNICA ST	TUALATIN	OR	97062

2S114CC06400 MORRISSEY FAMILY TRUST	17924 SW 105TH CT	TUALATIN	OR	97062
2S114CC06600 MOWERY DANA KAY	17948 SW 105TH CT	TUALATIN	OR	97062
2S115DC07600 MUIR JOHN S & ACHILOVA LOLA	17795 SW 112TH AVE	TUALATIN	OR	97062
2S115DD06200 MUNSON JAMES L & PAMELA B REV LIV TRUST	10600 SW KIOWA ST	TUALATIN	OR	97062
2S115DC09500 MURMAN CORY D & MURMAN TAMIKO A	11485 SW KALISPELL ST	TUALATIN	OR	97062
2S115DD19300 MURO MONICA D	11011 SW TUALATIN RD	TUALATIN	OR	97062
2S115DD10800 MUSTEDANAGIC ADIS & MUSTEDANAGIC ALISA	11045 SW WINTU CT	TUALATIN	OR	97062
2S115DC11200 NAJERA KENE S & BUSTOS ESMERALDA RODRIGUEZ	12288 SW FUJI CT	TIGARD	OR	97224
2S115DD14400 NEWTON DAVID & E SUZANNE JOINT TRUST	10950 SW BANNOCH ST	TUALATIN	OR	97062
2S114CC08000 NGUYEN HONG T & TRI VINH V	10444 SW PUEBLO ST	TUALATIN	OR	97062
2S115DC01500 NGUYEN CATHY H	11485 SW ROBERTS CT	TUALATIN	OR	97062
2S115DA03200 NORDEN PAUL W & NORDEN JEANINE D	17440 SW 108TH PL	TUALATIN	OR	97062
2S115DC00700 OLSON LIVING TRUST	11435 SW ELMER CT	TUALATIN	OR	97062
2S115DD17700 OLSON DOUGLAS E & OLSON KIMBERLY R	11130 SW WINYA CT	TUALATIN	OR	97062
2S115DD07900 ORLANES JONATHAN	10620 SW LUCAS DR	TUALATIN	OR	97062
2S115DD12400 OWEN GREGORY L & OWEN DEBORAH L	17885 SW 109TH AVE	TUALATIN	OR	97062
2S115DD13100 PAIGE ROBERT & PAIGE KELLIE	17940 SW 109TH AVE	TUALATIN	OR	97062
2S115DD18200 PAPAS EDITH ELIZABETH	11055 SW WINYA CT	TUALATIN	OR	97062
2S115DD00800 PARK DANIEL K & PARK ANNA K	9333 SW NEZ PERCE CT	TUALATIN	OR	97062
2S114CC07400 PARKER DAVID SCOTT	10301 SW PUEBLO ST	TUALATIN	OR	97062
2S115DC01200 PARKER SARAH D & PARKER WILEY	11480 SW ELMER CT	TUALATIN	OR	97062
2S115DC12000 PARKER MARION M	17830 SW 114TH AVE	TUALATIN	OR	97062
2S114CB01700 PAYNE DANIEL J & PAYNE JANET M	10440 SW KELLOGG DR	TUALATIN	OR	97062
2S114CC06800 PENNIMAN STEVEN K & PHYLLIS D REV LIV TRUST	8374 VEREDA DEL PADRE	GOLETA	CA	93117
2S114CC07800 PENSADO ERNESTO & ALVARENGA NALLY M	10380 SW PUEBLO ST	TUALATIN	OR	97062
2S115DC06600 PETERSON JACOB CURTIS & PETERSON JULIE DAWN	17925 SW 111TH AVE	TUALATIN	OR	97062
2S115DA02000 PEUSER NILS ARNE & PEUSER NICOLE	17380 SW 106TH CT	TUALATIN	OR	97062
2S122000300 PHIGHT LLC	ONE BOWERMAN DR	BEAVERTON	OR	97005
2S115DD08900 PLAMBECK CAROL R	10600 SW STARR DR	TUALATIN	OR	97062
2S115DC01400 POINTS YU SUNL	11465 SW ROBERTS CT	TUALATIN	OR	97062
2S115DD19800 POUR ALI FROTAN & ESFANDIARPOUR SAMANEH	17995 SW 110TH PL	TUALATIN	OR	97062
2S115DD01600 PR 17995 SW 106TH LLC	8925 SW IOWA DR	TUALATIN	OR	97062
2S115DD11300 PRICE DAVID A & PRICE JENNIFER K	11080 SW WISHRAM CT	TUALATIN	OR	97062
2S114CC06200 PUPPO MIKK	17894 SW 105TH CT	TUALATIN	OR	97062
2S115DC08000 PURCELLA ALEXANDRA M & PURCELLA SCOTT E	11215 SW APALACHEE ST	TUALATIN	OR	97062
2S115DC05700 PUTNAM DAVID L JR & PUTNAM HEIDI F	17770 SW 112TH AVE	TUALATIN	OR	97062
2S115DA03400 RADECKI SHAUN MICHAEL & RADECKI JESSICA ELLEN	17370 SW 108TH PL	TUALATIN	OR	97062
2S115DC09300 RADER SAM A & RADER ANDREA S	11445 SW KALISPELL ST	TUALATIN	OR	97062
2S115DD09200 RAMSBY MILLS TRUST	10500 SW STARR DR	TUALATIN	OR	97062
2S115DC00200 RANDALL LAWRENCE L & SANDOVAL-RANDALL C SUSIE	11440 SW HAZELBROOK RD	TUALATIN	OR	97062
2S114CC05300 RAXTER NORA SUSAN	10476 SW PUEBLO ST	TUALATIN	OR	97062
2S115DC04800 REDFERN KAREN D	11105 SW GARRETT ST	TUALATIN	OR	97062
2S115DC04200 RICE DOUGLAS S	17820 SW 111TH AVE	TUALATIN	OR	97062
2S115DD07800 RICHARDS EMMETT L & RICHARDS MARY C & RICHARDS SHELLEY D	15247 WILBUR RD	LA CONNER	WA	98257
2S115DD17800 RICHARDSON DEVIN & RICHARDSON TAMI ANN	11100 SW WINYA CT	TUALATIN	OR	97062
2S114CC06000 RICHEY LELAND R & RICHEY VALERIE J FAMILY TRUST	17911 SW 105TH CT	TUALATIN	OR	97062
2S115DD16800 RIRIE LIVING TRUST	11015 SW LUCAS DR	TUALATIN	OR	97062
2S115DC11600 RIVERA AURELIO GOMEZ	17865 SW 113TH AVE	TUALATIN	OR	97062
2S115DA04200 ROBBINS FAMILY REVOCABLE TRUST	17420 SW 110TH AVE	TUALATIN	OR	97062
2S115DC03600 ROBERTS BLAINE N	17980 SW 111TH AVE	TUALATIN	OR	97062
2S115DC12200 ROBERTS JULIE A	17890 SW 114TH AVE	TUALATIN	OR	97062
2S115DD01300 ROBINSON RONALD L & ROBINSON MICHELLE	17976 SW 106TH AVE	TUALATIN	OR	97062
2S115DC05200 ROE FAMILY TRUST	620 SAND HILL RD #213F	PALO ALTO	CA	94304
2S115DD03300 RUVALCABA CHRIS & RUVALCABA ESTHER	10529 SW PUEBLO ST	TUALATIN	OR	97062
2S115DC09700 RYAN DAIN & RYAN LEE	11470 SW KALISPELL ST	TUALATIN	OR	97062
2S115DD11400 RYAN MICHAEL	11075 SW WILSHRAM CT	TUALATIN	OR	97062
2S115DC12300 RYMAL CHARLES & RYMAL JESSICA	17920 SW 114TH AVE	TUALATIN	OR	97062
2S115DC02500 SABRA HEALTH CARE HOLDINGS III LLC	10220 SW GREENBURG RD #201	PORTLAND	OR	97223
2S115DD02800 SATTLER BRIAN L & WALCZYK KERRY M	10615 SW PUEBLO CT	TUALATIN	OR	97062
2S115DC08900 SAVASTA THOMAS	11355 SW KALISPELL ST	TUALATIN	OR	97062
2S115DD04700 SCHAEFER SETH & SCHAEFER RENEE	10710 SW BANNOCH ST	TUALATIN	OR	97062
2S115DD08500 SCHENK JOANNE DANNA & SCHENK ROGER MYRON	10555 SW LUCAS CT	TUALATIN	OR	97062
2S115DD15300 SCHLACHTER KEVIN M & SCHLACHTER RENEE	17570 SW 108TH PL	TUALATIN	OR	97062
2S115DC06400 SCHLOETTER ERIN RENAE BATES	17845 SW 111TH AVE	TUALATIN	OR	97062
2S115DD12800 SCHOENHEIT JOHN & SCHOENHEIT KAITLIN J	17890 SW 109TH AVE	TUALATIN	OR	97062
2S114CB02000 SHEN PING LU	17460 SW 104TH AVE	TUALATIN	OR	97062
2S115DC05300 SHERFINSKI MICHAEL R	22915 SW 94TH TER	TUALATIN	OR	97062
2S115DD16300 SHERMAN JENNIFER A TRUST	17740 SW 110TH AVE	TUALATIN	OR	97062
2S115DC04100 SHERWOOD NICOLE D	17850 SW 111TH AVE	TUALATIN	OR	97062
2S115DD18600 SHETLER STACY A & SHETLER JOANNA L	11080 SW LUCAS DR	TUALATIN	OR	97062
2S115DD01000 SLAYTON LUANN LAURA	17989 SW 105TH CT	TUALATIN	OR	97062
2S115DD14200 SMITH LESTER MICHAEL & SMITH JOAN MARIE	10990 SW BANNOCH ST	TUALATIN	OR	97062
2S115DD19700 SMITH WILLIAM E & SHEARER-SMITH SARAH K	17989 SW 110TH PL	TUALATIN	OR	97062
2S115DD05500 SOVEY RACHEL & SOVEY BREEZ EUGENE	10720 SW KIOWA CT	TUALATIN	OR	97062
2S115DD13000 SPENCER FAMILY REV TRUST	17920 SW 109TH AVE	TUALATIN	OR	97062
2S115DC04400 STANTON ANDREW & STANTON ASHLEY	17780 SW 111TH AVE	TUALATIN	OR	97062
2S115DA03300 STEINER LARRY D SURVIVORS TRUST	17420 SW 108TH PL	TUALATIN	OR	97062
2S115DC05500 STEINMETZ JON & JEANETTE TRUST	17735 SW 112TH AVE	TUALATIN	OR	97062
2S115DC08100 STEWART-MOONEY MAUREEN	11225 SW APALACHEE ST	TUALATIN	OR	97062
2S115DD12600 STRENGTH GREG M & STRENGTH MARGO D	17870 SW 109TH AVE	TUALATIN	OR	97062
2S115DD13700 STRIBLING DAVID L & STRIBLING AMANDA L	10920 SW TUNICA ST	TUALATIN	OR	97062
2S115DD11700 STRICKLER LAUREL R & STRICKLER ADAM J	11025 SW WISHRAM CT	TUALATIN	OR	97062
2S115DC05900 STRINGFELLOW GAYLE	11140 SW GARRETT ST	TUALATIN	OR	97062
2S115DC03300 SULLIVAN SHANON LEE	11150 SW APALACHEE ST	TUALATIN	OR	97062
2S115DC05400 SULLIVAN WAIKEN L & SULLIVAN JENNIFER	17705 SW 112TH AVE	TUALATIN	OR	97062
2S115DD18400 SWAFFORD DOUGLAS G & SINCERE MIRIAM A	17715 SW 110TH AVE	TUALATIN	OR	97062
2S115DD17600 TALLENT DOMINIC JAMES & TALLENT HEINI	11115 SW WINYA CT	TUALATIN	OR	97062
2S115DD03100 TAYLOR-WEBER JAMIE & TAYLOR-WEBER ANTHONY	10573 SW PUEBLO ST	TUALATIN	OR	97062

2S115DD17400 TAYLOR MATTHEW R & TAYLOR SUZANNE L	17675 SW 111TH AVE	TUALATIN	OR	97062
2S115DC07300 TERJESON JOHN	17840 SW 112TH AVE	TUALATIN	OR	97062
2S123BB90000 TETON INDUSTRIAL CONDO OWNERS OF ALL UNITS			OR	00000
2S115DC07800 TIEDEMANN CHRISTINA ANNE	17885 SW 112TH AVE	TUALATIN	OR	97062
2S115D001400 TIGARD-TUALATIN SCHOOL DISTRICT #23J	6960 SW SANDBURG ST	TIGARD	OR	97223
2S114CC07200 TOWLE CORDES K & KRAEMER JILL J	15045 SW 141ST AVE	TIGARD	OR	97224
2S115DD11100 TREBELHORN DEAN B & TREBELHORN LINDA V	11040 SW WISHRAM CT	TUALATIN	OR	97062
2S115DD05000 TREMAIN JUNE E TRUST	10735 SW BANNOCH ST	TUALATIN	OR	97062
2S115DD05700 TROTMAN TRUST	10799 SW KIOWA CT	TUALATIN	OR	97062
2S115DA03900 TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S115DA05300 TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S115DA05400 TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
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2S115DD20300 TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S1220000800 TUALATIN CITY OF	18880 SW MARTINAZZI AVE	TUALATIN	OR	97062
2S122AD00200 TUALATIN CITY OF	PO BOX 723597	ATLANTA	GA	31139
2S123B000602 TUALATIN TETON LLC	621 SW ALDER ST STE 800	PORTLAND	OR	97205
2S115DD02600 VALDENEGRO GILLIAN F TRUST	12925 NW PARRETT MOUNTAIN RD	NEWBERG	OR	97132
2S115DD13300 VANHORN MARK G & DIANA L LIV TRUST	17960 SW 109TH AVE	TUALATIN	OR	97062
2S114CB01400 VANN KEN & VANN CHRISTINA M	17480 SW 105TH AVE	TUALATIN	OR	97062
2S115DC01000 WAGGONER LOREN M & WAGGONER CYNTHIA J	11430 SW ELMER CT	TUALATIN	OR	97062
2S115DD10300 WAGNER LINDA G PHD	17945 SW 110TH AVE	TUALATIN	OR	97062
2S115DC07700 WALK DAVID ALLAN & WALK WANDA VAI	17855 SW 112TH AVE	TUALATIN	OR	97062
2S1220000500 WASHINGTON COUNTY FACILITIES MGMT	169 N 1ST AVE #42	HILLSBORO	OR	97124
2S115DD12700 WATT REBECCA SUE	17880 SW 109TH AVE	TUALATIN	OR	97062
2S115DC01800 WATTS MARK A & WATTS APRYLE	11400 SW ROBERTS CT	TUALATIN	OR	97062
2S123BB90001 WAVE PROPERTY HOLDINGS LLC	18057 SW TETON AVE	TUALATIN	OR	97062
2S115DC09000 WEBSTER CHARLES N & WEBSTER KAREN A	11385 SW KALISPELL ST	TUALATIN	OR	97062
2S115DD08700 WEISS BENJAMIN M & WEISS KATRINA M	10595 SW LUCAS CT	TUALATIN	OR	97062
2S115DD04600 WEITMAN LIVING TRUST	10666 SW BANNOCH ST	TUALATIN	OR	97062
2S115DC10400 WEN-SHU LIU	17885 SW 114TH AVE	TUALATIN	OR	97062
2S115DC03800 WEST PHYLLIS ELAINE	17930 SW 111TH AVE	TUALATIN	OR	97062
2S115DC07500 WESTPHAL FAMILY TRUST	11405 SW HAZELBROOK RD	TUALATIN	OR	97062
2S115DA01800 WETHERN LINDA J	17470 SW 106TH CT	TUALATIN	OR	97062
2S115DD10700 WIGGINS JEAN E TRUST	11065 SW WINTU CT	TUALATIN	OR	97062
2S115DD02200 WILLIAMS MATTHEW STEVEN	10655 SW PUEBLO CT	TUALATIN	OR	97062
2S115DD07300 WILLIAMS VERONICA L	10540 SW KIOWA ST	TUALATIN	OR	97062
2S115DD10500 WILLIAMS DAVE A & WILLIAMS KIMBERLY R	11050 SW WINTU CT	TUALATIN	OR	97062
2S115DD16000 WILLON MARK & PAM TRUST	17850 SW 110TH AVE	TUALATIN	OR	97062
2S115DD08200 WILSON CONSTANCE J TRUST	10530 SW LUCAS CT	TUALATIN	OR	97062
2S115DD06600 WINKLER MISTY D & REGISTER JEAN	10515 SW BANNOCH CT	TUALATIN	OR	97062
2S115DD16500 WISNER RANDOLPH R & DEBBIE R LIV TRUST	17600 SW 110TH AVE	TUALATIN	OR	97062
2S114CB01800 WOLFE GEORGE A & WOLFE ANDREA H	10420 SW KELLOGG DR	TUALATIN	OR	97062
2S115DD11500 WOLLEY KEVIN & WOLLEY JANE	11055 SW WISHRAM CT	TUALATIN	OR	97062
2S114CB02700 WORLEY LAURA & SPIEGEL JOEL	10475 SW KELLOGG DR	TUALATIN	OR	97062
2S115DD09000 WRIGHT MICHAEL & WRIGHT LISA	17570 SW 106TH AVE	TUALATIN	OR	97062
2S115DD18000 WRIGHT RALPH RICHARD & LYNDA RAE LIV TRUST	11040 SW WINYA CT	TUALATIN	OR	97062
2S115DD18500 YAM ASA	11050 SW LUCAS DR	TUALATIN	OR	97062
2S115DC10600 YANG HAOWEI	17925 SW 114TH AVE	TUALATIN	OR	97062
2S115DD08300 ZIENKIEWICZ MIKE & ZIENKIEWICZ STEPHANIE	10510 SW LUCAS CT	TUALATIN	OR	97062
2S115DC02900 ZOUMPOULIDIS ZACHARIAS & ZOUMPOULIDIS AUDREY C	11220 SW APALACHEE ST	TUALATIN	OR	97062
Suzannah Stanley, Mackenzie	1515 SE Water Avenue, Suite 100	Portland	OR	97214
Pat Lord, LAM Research Corporation	4650 Cushing Parkway	Fremont	CA	94538



**NOTICE OF HEARING AND OPPORTUNITY TO COMMENT**  
**CASE FILES: IMP 22-0001 and AR 22-0006— LAM RESEARCH OFFICE BUILDING**

**NOTICE IS HEREBY GIVEN** that public hearings will be held:

**Location:** Tualatin Service Center  
 10699 SW Herman Road, Tualatin, OR 97062

**Zoom Teleconference:** Link with log-in instructions available  
[www.tualatinoregon.gov/meetings](http://www.tualatinoregon.gov/meetings)

**INDUSTRIAL MASTER PLAN (IMP) 22-0001**  
**November 17, 2022 at 6:30 pm**

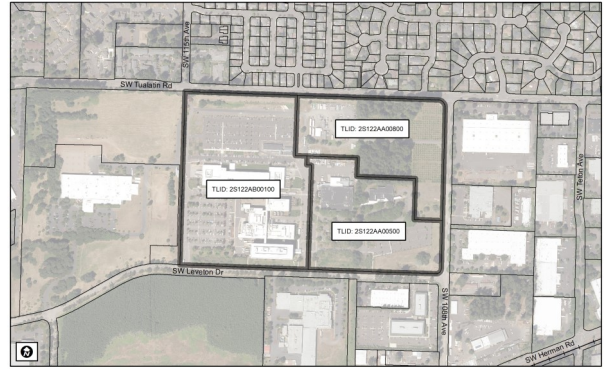
*Mackenzie, on behalf of LAM Research Corporation, is requesting an amendment to setback standards memorialized under IMP 00-01, for a campus development on a 58 acre site zoned Manufacturing Park (MP).*

**ARCHITECTURAL REVIEW (AR) 22-0006**  
**November 30, 2022 at 6:30 pm**

*Mackenzie, on behalf of LAM Research Corporation, is requesting approval to construct a four-story, 120,000 square foot office building at 11155 SW Leveton Drive.*

**Comments and questions may be submitted to Erin Engman, Senior Planner at:**  
[eengman@tualatin.gov](mailto:eengman@tualatin.gov)

**Located at:** 11155 SW Leveton Dr **Tax Lots:** 2S122AA 500, 800 & 2S122AB 100



- **Industrial Master Plan Criteria:** TDC Chapters: 32, 33, 62
- **Architectural Review Criteria:** TDC Chapters: 32, 33, 62, 63, 73A-D, 74, 75
- **Staff report** will be available at least seven days before the hearing for inspection at no cost, and copies will be provided at a reasonable cost.
- **Print copies** of the application are available at a reasonable cost.
- **Individuals wishing to comment on the application** must do so in writing to the Planning Division prior to the hearing, or in writing and/or orally at the hearing. Materials must be received by **November 3** to be included in the hearing packet.



**NOTICE OF HEARING AND OPPORTUNITY TO COMMENT**  
**CASE FILES: IMP 22-0001 and AR 22-0006— LAM RESEARCH OFFICE BUILDING**

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**INDUSTRIAL MASTER PLAN (IMP) 22-0001**  
**November 17, 2022 at 6:30 pm**

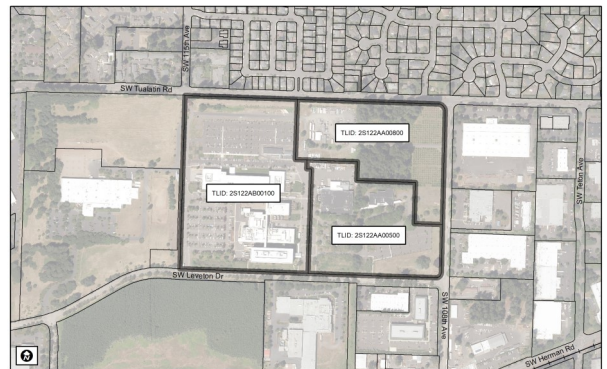
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- **Industrial Master Plan Criteria:** TDC Chapters: 32, 33, 62
- **Architectural Review Criteria:** TDC Chapters: 32, 33, 62, 63, 73A-D, 74, 75
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- **The public hearing will begin** with a staff presentation, followed by testimony by proponents, testimony by opponents, and rebuttal. The time of individual testimony may be limited. If a participant requests, before the hearing is closed, the record shall remain open for at least 7 days after the hearing.
- **All citizens are invited to attend and be heard:** Failure of an issue to be raised in the hearing, in person, or by letter, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond to the issue precludes appeal to the State Land Use Board of Appeals (LUBA) based on that issue. The failure of the applicant to raise constitutional or other issues relating to the proposed conditions of approval with sufficient specificity to the decision maker to respond to the issue precludes an action for damages in circuit court.
- **Notice of the Decision** will only be provided to those who submit written comments regarding that application or testify at the hearing.

*You received this mailing because you own property within 1,000 feet (ft) of the site or within a residential subdivision which is partly within 1,000 ft.*

For additional information contact:

Erin Engman, Senior Planner, [eengman@tualatin.gov](mailto:eengman@tualatin.gov) and 503-691-3024

«OWNER1»  
«OWNERADDR»  
«OWNERCITY», «OWNERSTATE»  
«OWNERZIP»

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**From:** [Erin Engman](#)  
**To:** [Erin Engman](#); [Suzannah Stanley](#); [pat.lord@lamresearch.com](mailto:pat.lord@lamresearch.com)  
**Cc:** [mweston@ci.king-city.or.us](mailto:mweston@ci.king-city.or.us); [planning@sherwoodoregon.gov](mailto:planning@sherwoodoregon.gov); [naomi\\_vogel@co.washington.or.us](mailto:naomi_vogel@co.washington.or.us); [theresa\\_cherniak@co.washington.or.us](mailto:theresa_cherniak@co.washington.or.us); [deqinfo@deg.state.or.us](mailto:deqinfo@deg.state.or.us); [landusenotifications@oregonmetro.gov](mailto:landusenotifications@oregonmetro.gov); [ODOT\\_R1\\_DevRev@odot.oregon.gov](mailto:ODOT_R1_DevRev@odot.oregon.gov); [baldwinb@trimet.org](mailto:baldwinb@trimet.org); [LUComments@cleanwaterservices.org](mailto:LUComments@cleanwaterservices.org); [Ty.Darby@tvfr.com](mailto:Ty.Darby@tvfr.com); [KHerrod@republicservices.com](mailto:KHerrod@republicservices.com); [info@theintertwine.org](mailto:info@theintertwine.org); [Anneleah@tualatinchamber.com](mailto:Anneleah@tualatinchamber.com); [OR.METRO.ENGINEERING@ZIPLY.COM](mailto:OR.METRO.ENGINEERING@ZIPLY.COM); [tod.shattuck@pgn.com](mailto:tod.shattuck@pgn.com); [brandon.fleming@pgn.com](mailto:brandon.fleming@pgn.com); [kenneth.spencer@pgn.com](mailto:kenneth.spencer@pgn.com); [richard.girard@nwnatural.com](mailto:richard.girard@nwnatural.com); [icrawford@wccca.com](mailto:icrawford@wccca.com); [Jackie Humphreys](#)  
**Subject:** Notice of Hearing: IMP22-0001 and AR 22-0006 Lam Research, 11155 SW Leveton Dr  
**Date:** Monday, October 31, 2022 9:07:00 AM

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## NOTICE OF HEARING AND OPPORTUNITY TO COMMENT

**NOTICE IS HEREBY GIVEN** that public hearings will be held at the Tualatin Service Center located at: 10699 SW Herman Road, Tualatin, OR 97062. A Zoom meeting link will also be published with the meeting agenda and packet materials seven days prior to the public hearing: [www.tualatinoregon.gov/meetings](http://www.tualatinoregon.gov/meetings).

### **INDUSTRIAL MASTER PLAN (IMP) 22-0001**

**November 17, 2022 at 6:30 pm**

*Mackenzie, on behalf of Lam Research Corporation, is requesting an amendment to setback standards memorialized under IMP 00-01, for a campus development on a 58 acre site zoned Manufacturing Park (MP).*

*Comments due: November 7*

### **ARCHITECTURAL REVIEW (AR) 22-0006**

**November 30, 2022 at 6:30 pm**

*Mackenzie, on behalf of Lam Research Corporation, is requesting approval to construct a four-story, 120,000 square foot office building at 11155 SW Leveton Drive.*

*Comments due: November 16*

You may view the application materials on our Projects web page: <https://www.tualatinoregon.gov/planning/imp-22-0001-lam-office-campus>.

**Individuals wishing to comment may do so in writing** to the Planning Division prior to the hearing and/or present written and/or verbal testimony at the hearing. Hearings begin with a staff presentation, followed by testimony by proponents, testimony by opponents, and rebuttal. The time of individual testimony may be limited. If a participant requests before the hearing is closed, the

record shall remain open for at least 7 days after the hearing.

All citizens are invited to attend and be heard upon the applications. Failure of an issue to be raised in the hearing, in person, or by letter, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond to the issue precludes appeal to the State Land Use Board of Appeals (LUBA) based on that issue. The failure of the applicant to raise constitutional or other issues relating to the proposed conditions of approval with sufficient specificity to the decision maker to respond to the issue precludes an action for damages in circuit court.

**Type III Industrial Master Plan Criteria:** TDC Chapters: 32, 33, 62

**Type III Architectural Review Criteria:** TDC Chapters: 32, 33, 62, 63, 73A-D, 74, 75

A staff report will be available seven days prior to the public hearing, published at [www.tualatinoregon.gov/meetings](http://www.tualatinoregon.gov/meetings). This meeting and any materials being considered can be made accessible upon request.

Written comments and questions can be submitted to: [eengman@tualatin.gov](mailto:eengman@tualatin.gov).

**Erin Engman**

Senior Planner

City of Tualatin | Planning Division

503.691.3024 | [www.tualatinoregon.gov](http://www.tualatinoregon.gov)

**From:** [Erin Engman](#)  
**To:** [Erin Engman](#)  
**Cc:** [Ext - Planning](#); [Don Hudson](#); [Mike McCarthy](#); [Jonathan Taylor](#); [Kim McMillan](#); [Sherilyn Lombos](#); [Martin Loring](#); [Tom Scott](#); [Tony Doran](#); [Terrance Leahy](#); [Tom Steiger](#); [Ross Hoover](#); [Megan George](#); [Betsy Ruef](#); [riverparkcio@gmail.com](#); [jasuwiz@gmail.com](#); [famtuninstall1@frontier.com](#); [dan@danhardyproperties.com](#); [katepinamonti@hotmail.com](#); [cynmartz12@gmail.com](#); [daniel@bachhuber.co](#); [cio.east.west@gmail.com](#); [doug\\_ulmer@comcast.net](#); [keenanwoods7@gmail.com](#); [dana476@gmail.com](#); [mcrowell248@comcast.net](#); [tualatinmidwestcio@gmail.com](#); [dikkusan@live.com](#); [cniew@yahoo.com](#); [tmpgarden@comcast.net](#); [snoelluwcwle@yahoo.com](#); [MartinazziWoodsCIO@gmail.com](#); [solson.1827@gmail.com](#); [delmoore@frontier.com](#); [jamison.l.shields@gmail.com](#); [ClaudiaSterling68@gmail.com](#); [abuschert@gmail.com](#); [roydloop@gmail.com](#); [Tualatinibachcio@gmail.com](#); [edkcnw@comcast.net](#); [patricia.parsons@ctt.com](#); [rwcleanrooms@gmail.com](#); [byromcio@gmail.com](#); [mwestenhaver@hotmail.com](#); [tualatincommercialcio@gmail.com](#); [scottm@capacitycommercial.com](#); [robertekellogg@yahoo.com](#); [famtuninstall1@frontier.com](#)  
**Subject:** Notice of Hearing: IMP22-0001 and AR 22-0006 Lam Research, 11155 SW Leveton Dr  
**Date:** Monday, October 31, 2022 9:13:00 AM

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## **NOTICE OF HEARING AND OPPORTUNITY TO COMMENT**

**NOTICE IS HEREBY GIVEN** that public hearings will be held at the Tualatin Service Center located at: 10699 SW Herman Road, Tualatin, OR 97062. A Zoom meeting link will also be published with the meeting agenda and packet materials seven days prior to the public hearing: [www.tualatinoregon.gov/meetings](http://www.tualatinoregon.gov/meetings).

### **INDUSTRIAL MASTER PLAN (IMP) 22-0001**

**November 17, 2022 at 6:30 pm**

*Mackenzie, on behalf of Lam Research Corporation, is requesting an amendment to setback standards memorialized under IMP 00-01, for a campus development on a 58 acre site zoned Manufacturing Park (MP).*

*Comments due: November 7*

### **ARCHITECTURAL REVIEW (AR) 22-0006**

**November 30, 2022 at 6:30 pm**

*Mackenzie, on behalf of Lam Research Corporation, is requesting approval to construct a four-story, 120,000 square foot office building at 11155 SW Leveton Drive.*

*Comments due: November 16*

You may view the application materials on our Projects web page: <https://www.tualatinoregon.gov/planning/imp-22-0001-lam-office-campus>.

**Individuals wishing to comment may do so in writing** to the Planning Division prior to the hearing

and/or present written and/or verbal testimony at the hearing. Hearings begin with a staff presentation, followed by testimony by proponents, testimony by opponents, and rebuttal. The time of individual testimony may be limited. If a participant requests before the hearing is closed, the record shall remain open for at least 7 days after the hearing.

All citizens are invited to attend and be heard upon the applications. Failure of an issue to be raised in the hearing, in person, or by letter, or failure to provide sufficient specificity to afford the decision maker an opportunity to respond to the issue precludes appeal to the State Land Use Board of Appeals (LUBA) based on that issue. The failure of the applicant to raise constitutional or other issues relating to the proposed conditions of approval with sufficient specificity to the decision maker to respond to the issue precludes an action for damages in circuit court.

**Type III Industrial Master Plan Criteria:** TDC Chapters: 32, 33, 62

**Type III Architectural Review Criteria:** TDC Chapters: 32, 33, 62, 63, 73A-D, 74, 75

A staff report will available seven days prior to the public hearing, published at [www.tualatinoregon.gov/meetings](http://www.tualatinoregon.gov/meetings). This meeting and any materials being considered can be made accessible upon request.

Written comments and questions can be submitted to: [eengman@tualatin.gov](mailto:eengman@tualatin.gov).

**Erin Engman**

Senior Planner

City of Tualatin | Planning Division

503.691.3024 | [www.tualatinoregon.gov](http://www.tualatinoregon.gov)



## MEMORANDUM

**Date:** November 8, 2022

**To:** Erin Engman, Senior Planner, City of Tualatin

**From:** Jackie Sue Humphreys, Clean Water Services (CWS)

**Subject:** Lam Research Master Plan Amendment and Building G, IMP 22-0001, AR 22-0006, 2S122AA00500, 00800, 2S122AB00100

Please include the following comments when writing your conditions of approval:

### **PRIOR TO ANY WORK ON THE SITE**

A Clean Water Services (CWS) Storm Water Connection Permit Authorization must be obtained. Application for CWS Permit Authorization must be in accordance with the requirements of the Design and Construction Standards, Resolution and Order No. 19-5 as amended by R&O 19-22, or prior standards as meeting the implementation policy of R&O 18-28, and is to include:

- a. Detailed plans prepared in accordance with Chapter 2, Section 2.04.
- b. Detailed grading and erosion control plan. An Erosion Control Permit will be required. Area of Disturbance must be clearly identified on submitted construction plans. If site area and any offsite improvements required for this development exceed one-acre of disturbance, project will require a 1200-CN Erosion Control Permit. If site area and any offsite improvements required for this development exceed five-acres of disturbance, project will require a 1200-C Erosion Control Permit.
- c. Detailed plans showing each lot within the development having direct access by gravity to public storm and sanitary sewer.
- d. Provisions for water quality in accordance with the requirements of the above named design standards. Water Quality is required for all new development and redevelopment areas per R&O 19-5, Section 4.04. Access shall be provided for maintenance of facility per R&O 19-5, Section 4.07.6.

- e. If use of an existing offsite or regional Water Quality Facility is proposed, it must be clearly identified on plans, showing its location, condition, capacity to treat this site and, any additional improvements and/or upgrades that may be needed to utilize that facility.
- f. If private lot LIDA systems proposed, must comply with the current CWS Design and Construction Standards. A private maintenance agreement, for the proposed private lot LIDA systems, needs to be provided to the City for review and acceptance.
- g. Show all existing and proposed easements on plans. Any required storm sewer, sanitary sewer, and water quality related easements must be granted to the City.
- h. Application may require additional permitting and plan review from CWS Source Control Program. For any questions or additional information, please contact Source Control at (503) 681-5175.
- i. Any proposed offsite construction activities will require an update or amendment to the current Service Provider Letter for this project.

## CONCLUSION

This Land Use Review does not constitute CWS approval of storm or sanitary sewer compliance to the NPDES permit held by CWS. CWS, prior to issuance of any connection permits, must approve final construction plans and drainage calculations.



## PLANNING COMMISSION DECISION

Republished on November 16, 2022

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Case #:	IMP 22-0001
Project:	Lam Research Corporation Campus
Location:	11155-11361 SW Leveton Drive; Tax Lots: 2S122AA 500 and 800; 2S122AB 100
Representative:	Suzannah Stanley, Mackenzie
Owner:	Lam Research Corporation

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### I. FINDINGS

- A. An application for an Industrial Master Plan (IMP 22-0001) was filed by Mackenzie, on behalf of Lam Research Corporation requesting approval to amend Conditions of Approval 1.a. and 1.b. from IMP 00-01, in order to modify setback standards for the campus development.
- B. The Tualatin Planning Commission conducted a noticed quasi-judicial public hearing on November 17, 2022 in conformance with the laws of the State of Oregon and the City of Tualatin.
- C. The Tualatin Planning Commission concludes that the findings and analysis, testimony at the public hearing, and materials in the record address the approval criteria of TDC 33.050 for Industrial Master Plans the approval of the IMP 22-0001 with Conditions of Approval.

### II. ACTION

The Tualatin Planning Commission approves IMP 22-0001 and adopted the staff analysis and findings, dated November 17, 2022, with the following Conditions of Approval:

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#### GENERAL:

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1. If future modifications to this Industrial Master Plan are necessary, a new Industrial Master Plan application must be submitted to the City for review.

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#### PUBLIC FACILITIES:

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2. Through the Architectural Review process:
  - a. Easement declarations must be recorded and/or maintained for cross-access, parking, and utilities (including but not limited to: water, sanitary sewer, storm drainage) that extend across parcels shared under common ownership within the campus, when deemed necessary.
  - b. Utilities must serve individual parcels within the campus, in accordance with the Public Works Construction Code and TDC 74.610, 74.620, and 74.630.

**LOCATION, DESIGN, COLOR AND MATERIALS**

3. Development proposed through the Architectural Review process must:
- a. Include building material elements consisting of, or complimentary to: masonry, sandstone, architectural metal siding, and window glazing. Color palettes must remain complimentary to earth toned shades.
  - b. Meet the modified development standards listed in the table below:

STANDARD	MODIFIED DEVELOPMENT STANDARDS UNDER IMP 22-0001
<b>LOT SIZE</b>	
Minimum Lot Size	15 acres
<b>MINIMUM SETBACKS</b>	
Minimum Building Setback for Yards Adjacent to SW Leveton Drive	68 feet
Minimum Building Setback for Yards Adjacent to SW 108th Drive	98 feet
Minimum Building Setback for Yards Adjacent to SW Tualatin Road	Subject to Table 62-2 Development Standards in the MP Zone
Minimum Setback for Side and Rear Yards not Adjacent to Streets or Alleys	0 feet from side and rear yards under common ownership From Lot 2S122BA00100 (currently owned by JAE Oregon Inc.): Subject to Table 62-2 Development Standards in the MP Zone
Parking and Circulation Areas Adjacent to SW Leveton Drive	50 feet
Parking and Circulation Areas Adjacent to SW 108 <sup>th</sup> Avenue	43 feet
Parking and Circulation Areas Adjacent to SW Tualatin Road	35 feet
Parking and Circulation Areas Adjacent to Private Property Line	0 feet from property lines under common ownership 9.5 feet from Lot 2S122BA00100 (currently owned by JAE Oregon Inc.)
Fences	Subject to Table 62-2 Development Standards in the MP Zone

STANDARD	MODIFIED DEVELOPMENT STANDARDS UNDER IMP 22-0001
<b>STRUCTURE HEIGHT</b>	
Maximum Height	Subject to Table 62-2 Development Standards in the MP Zone
Maximum Height Adjacent to Residential District	Subject to Table 62-2 Development Standards in the MP Zone

- c. Maintain the existing earthen berm and landscaping consisting of deciduous street trees, evergreen trees, and shrubs along the northeast frontage of SW Tualatin Road to the driveway adjacent to 115<sup>th</sup> Avenue.
- d. Retain the existing stand of trees behind Building A, or integrate into the parking lot design as deemed appropriate.
- e. Parking lot landscaping for the north-half of the site must follow the standard requirements of TDC Chapter 73C. To accommodate grade changes, an alternative method of parking lot landscaping is acceptable for terraced parking lots proposed for the south-half of the site. These lots must provide a minimum landscape island area of 25 square feet per parking stall and comply with the following:
  - i. Landscape separation that is a minimum of five feet in width is required for every twelve continuous spaces in a row;
  - ii. Landscaping strip that is a minimum of ten feet in width must be placed in between rows of facing vehicles;
  - iii. Must be planted with one deciduous shade trees for every four parking spaces, with required trees evenly dispersed throughout the parking lot;
  - iv. Must be planted with groundcover or shrubs; and
  - v. Native plant materials are encouraged.



### III. APPEAL

The applicant or any person who submitted written comments or testified orally or in writing at the Tualatin Planning Commission hearing and who may be adversely affected by the Commission's decision may file a request for review of the final decision of the Tualatin Planning Commission to the City Council.

The Tualatin Planning Commission's decision will be final after 14 calendar days from the mailing of this order, unless a written appeal is received by the **Tualatin Planning Division at 10699 SW Herman Road, Tualatin, Oregon, before 5:00 p.m., December 1, 2022. The appeal must be submitted on the City appeal form with all the information requested provided thereon, signed by the appellant, and include the applicable appeal fee.** The plans and appeal forms are available at the Planning Division offices. The appeal forms must include reasons, current appeal fee, and meet the requirements of Section 32.310 of the Tualatin Development Code. The City Council will review and make a decision. The parties will be notified of the Council meeting date.

ADOPTED THIS 17 DAY OF NOVEMBER 2022.

PLANNING COMMISSION

CITY OF TUALATIN

BY:

  
\_\_\_\_\_  
Janelle Thompson, Vice Chair  
Tualatin Planning Commission

## Technical Memorandum

**Date:** October 10, 2022  
**Project:** 20-2737  
**To:** Mr. Tony Doran, Engineering Associate  
Ms. Kim McMillan, PE, City Engineer  
City of Tualatin  
**From:** Brian Ginter, PE  
**Re:** Water System Capacity Analysis – LAM Research Property Office Building G

---

### Introduction

As requested, this memorandum has been prepared to present the findings of our analysis of the water service to the proposed expansion at the Lam Research property located at 11155 SE Leveton Drive. This memorandum presents the findings of this analysis for the City's use in determining the water system improvements necessary to meet fire flow and pressure requirements.

### Background

The City's water system hydraulic model was used to perform a hydraulic analysis of pressure and fire flow performance in the City's water system under maximum day demand conditions with fire flow events evaluated at the site. The pressure and flow conditions were tested at the proposed location for the new domestic and fire service vaults located southeast of the proposed "Building G", connecting to the existing high pressure main in SW Leveton Drive.

The proposed development is a new 120,000 square foot office building. The proposed development is located within the City's existing Pressure Zone A but is served by a high pressure main fed by the Tualatin Supply Main connection directly from the PWB wholesale supply system at a static hydraulic grade of approximately 530 feet. Figure 1 illustrates the development site, adjacent water system infrastructure, and the location of the modeled fire flow test.

### Analysis and Findings

The hydraulic model was updated as described above and fire flow performance tested at the proposed fire service location (shown in Figure 1).

A summary of specific model conditions for this analysis is presented below:

**Demand Conditions:** 2030 Maximum Day Demand

**Fire Flow:** 3,000 gpm

**Physical Condition:** Existing facilities plus proposed connection

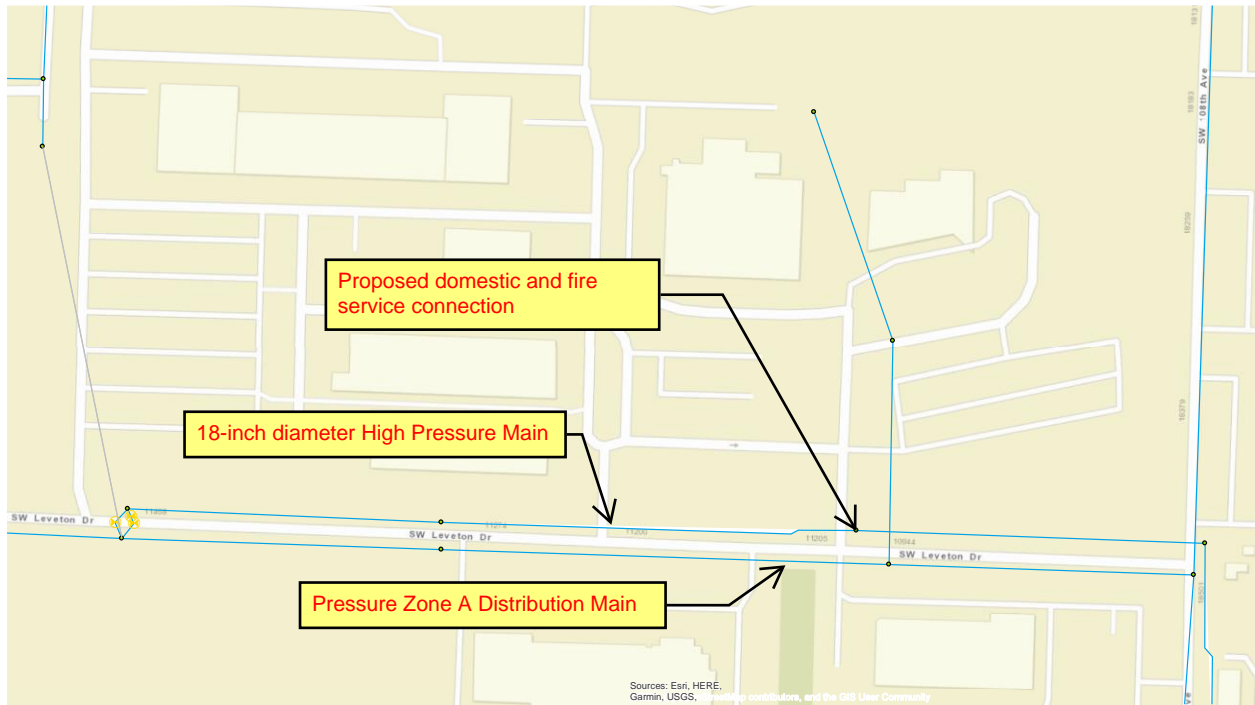
Since the proposed domestic and fire suppression services are proposed to be connected to the high pressure main, there is adequate flow and pressure available without impact to the residual pressure in the adjacent Pressure Zone A area. Static pressures in the transmission main exceed 150 psi and a 20 psi drop is estimated under fire flow conditions.

Based on the findings of this analysis and a review of overall system improvement needs presented in the Water System Master Plan, there are no required water distribution system improvements necessary to serve domestic and fire suppression flows to the proposed development.

It is the developer's responsibility to size internal (private) fire and domestic mains for adequate service pressure, private hydrants and fire suppression sprinkler systems as these facilities are outside the scope of this analysis.

Please do not hesitate to contact us if you have any questions or comments in this regard. We would be happy to meet with you personally to discuss the findings presented in this memorandum.

Figure 1 | Proposed Development Site and Water System Infrastructure



**From:** [Erin Engman](#)  
**To:** [Margo Strength](#)  
**Cc:** [Suzannah Stanley](#); [Mike Rueter](#)  
**Subject:** RE: LAM Research setback standards  
**Date:** Tuesday, November 8, 2022 8:47:00 AM

---

Hi Margo-

Thanks for reaching out with your question regarding the Lam application. I've copied the applicants to this email in case they wish to comment on your question, but I can provide some clarity.

Their application is not looking to amend setbacks along SW Tualatin Road or impact the trees along its frontage. And as part of the hearing, I will recommend that our Planning Commission include a condition on their approval that requires the earthen berm and landscape coverage to be retained along their frontage on SW Tualatin Road.

Rather the applicant is looking to amend the setbacks listed below:

- [Building Setbacks](#):
  - Interior side and rear yard setback: Reduced from 20 feet to 0 feet.
  - Side yard setback to JAE (property to west): Reduced from 100 feet to 50 feet.
- [Parking and Circulation Setbacks](#):
  - Adjacent to Leveton Drive: Reduced from 108 feet to 50 feet.
  - Interior to site: Plan sheet reference to 0 feet
  - Side yard setback to JAE (property to west): Plan sheet reference to 9.5 feet

More information is contained in their document:

[https://www.tualatinoregon.gov/sites/default/files/fileattachments/planning/project/55418/exhibit\\_a1\\_-\\_narrative.pdf](https://www.tualatinoregon.gov/sites/default/files/fileattachments/planning/project/55418/exhibit_a1_-_narrative.pdf)

Please let me know if you have any other questions and have a good day,

**Erin Engman**

Senior Planner

City of Tualatin | Planning Division

503.691.3024 | [www.tualatinoregon.gov](http://www.tualatinoregon.gov)

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**From:** Margo Strength <dgrahms@comcast.net>

**Sent:** Sunday, November 6, 2022 10:04 PM

**To:** Erin Engman <engman@tualatin.gov>

**Subject:** LAM Research setback standards

Erin,

I live in a development of homes across the street from the LAM Research building in Tualatin. I am concerned about LAM Research requesting an amendment to setback standards. Does this mean that the beautiful trees along Tualatin Rd will be cut down? They provide a nice camouflage of LAM's office buildings and many people enjoying walking the meandering sidewalks next to the trees. It would be a shame to see them cut down. Hopefully they won't be, so I thought I would ask.

Thank you,  
Margo Strength



**From:** [Erin Engman](#)  
**To:** [Chris Hein](#)  
**Cc:** [Suzannah Stanley](#); [Mike Rueter](#)  
**Subject:** RE: Lam Research Office Building  
**Date:** Monday, November 14, 2022 10:24:00 AM  
**Attachments:** [image003.png](#)  
[image004.png](#)

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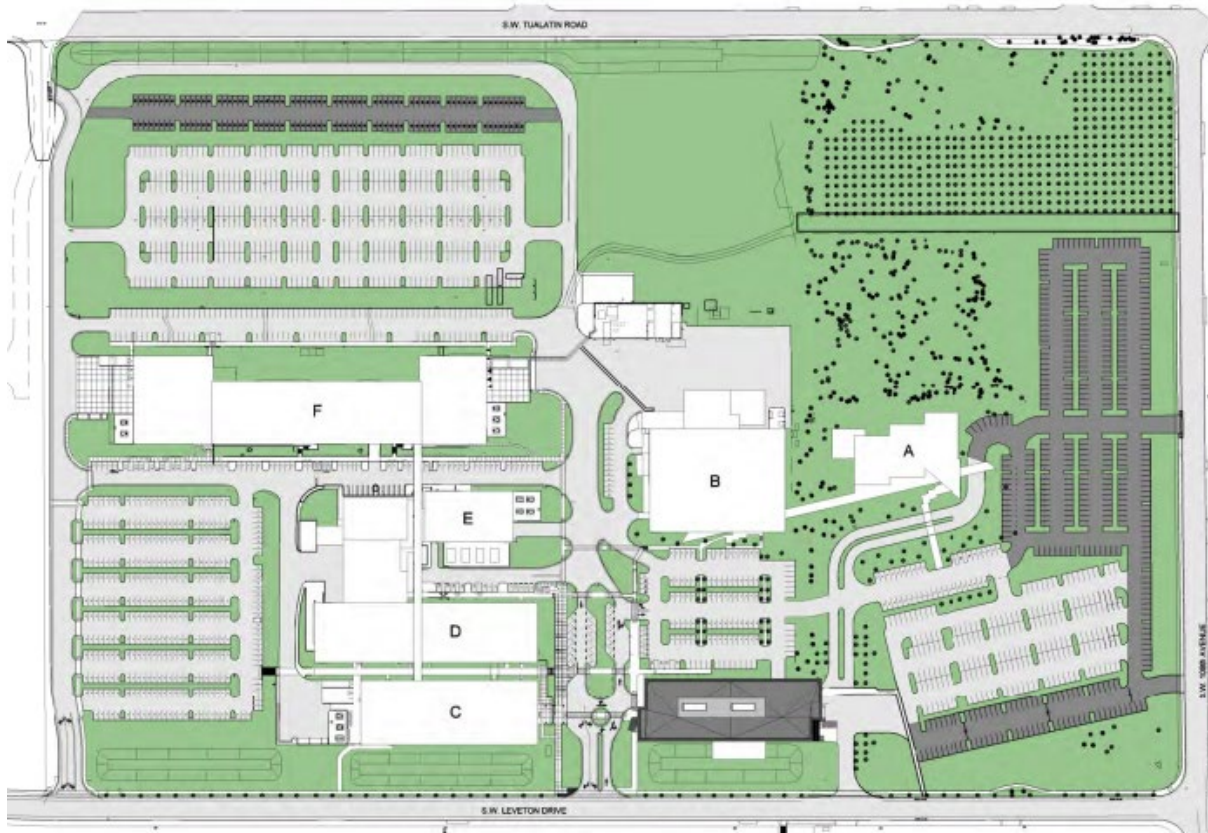
Hi Chris-

Thanks for reaching out with your question regarding the Lam application. I've copied the applicants to this email in case they wish to comment on your question, but I can provide some clarity.

The new office building is proposed on the south end of the site, toward SW Leveton Drive as shown in the site plan below. The proposed improvements are shown in dark grey.

And to provide additional clarification, their application is not looking to amend setbacks along SW Tualatin Road or impact the trees along its frontage. Rather the applicant is looking to amend the setbacks listed below:

- Building Setbacks:
  - Interior side and rear yard setback: Reduced from 20 feet to 0 feet.
  - Side yard setback to JAE (property to west): Reduced from 100 feet to 50 feet.
- Parking and Circulation Setbacks:
  - Adjacent to Leveton Drive: Reduced from 108 feet to 50 feet.
  - Interior to site: Plan sheet reference to 0 feet
  - Side yard setback to JAE (property to west): Plan sheet reference to 9.5 feet



Please let me know if you have any other questions and have a good day,

**Erin Engman**

Senior Planner  
City of Tualatin | Planning Division  
503.691.3024 | [www.tualatinoregon.gov](http://www.tualatinoregon.gov)

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**From:** Chris Hein <ChrisH@osf.com>  
**Sent:** Friday, November 11, 2022 11:11 AM  
**To:** Erin Engman <eengman@tualatin.gov>  
**Subject:** Lam Research Office Building

Hi Erin,

I live off 109<sup>th</sup> and Tualatin Rd. across from the Lam Campus  
I received a hearing/ notice card about Lam wanting to change the setbacks to build a four story 120,000 office building.  
My question is where on the campus are they wanting to locate this?

As you know now there currently is a nice buffer between Lam and Tualatin Road.

Thanks for the information.

Chris

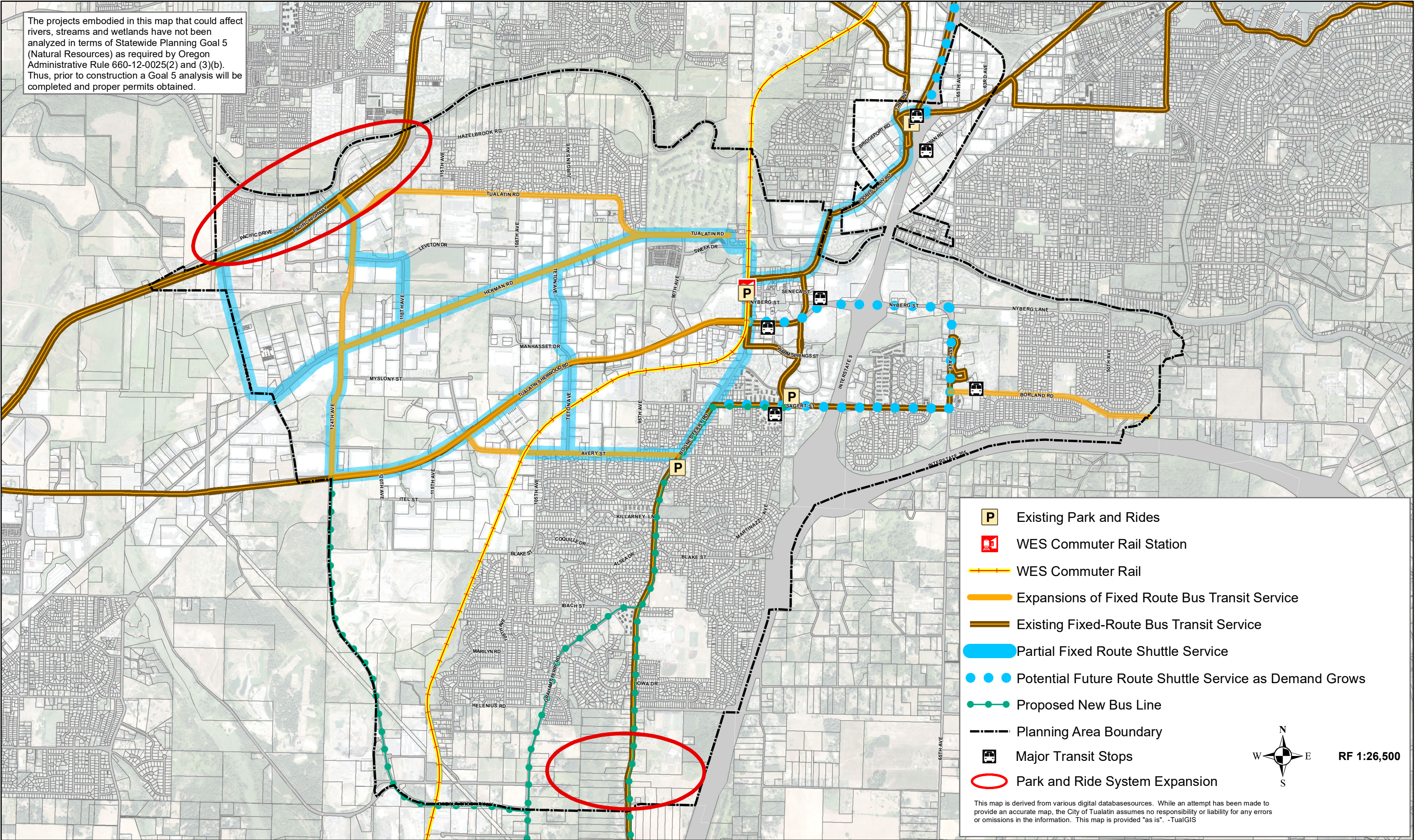


**Chris Hein**  
VP Food & Beverage  
OSF International, Inc.  
715 S Bancroft Street | Portland, OR 97239  
T: 503.225.0433 Ext. 310 | F: 503.226.6214  
[chrish@osf.com](mailto:chrish@osf.com) | [www.osf.com](http://www.osf.com)



# Map 8-5: Tualatin Transit Plan

The projects embodied in this map that could affect rivers, streams and wetlands have not been analyzed in terms of Statewide Planning Goal 5 (Natural Resources) as required by Oregon Administrative Rule 660-12-0025(2) and (3)(b). Thus, prior to construction a Goal 5 analysis will be completed and proper permits obtained.



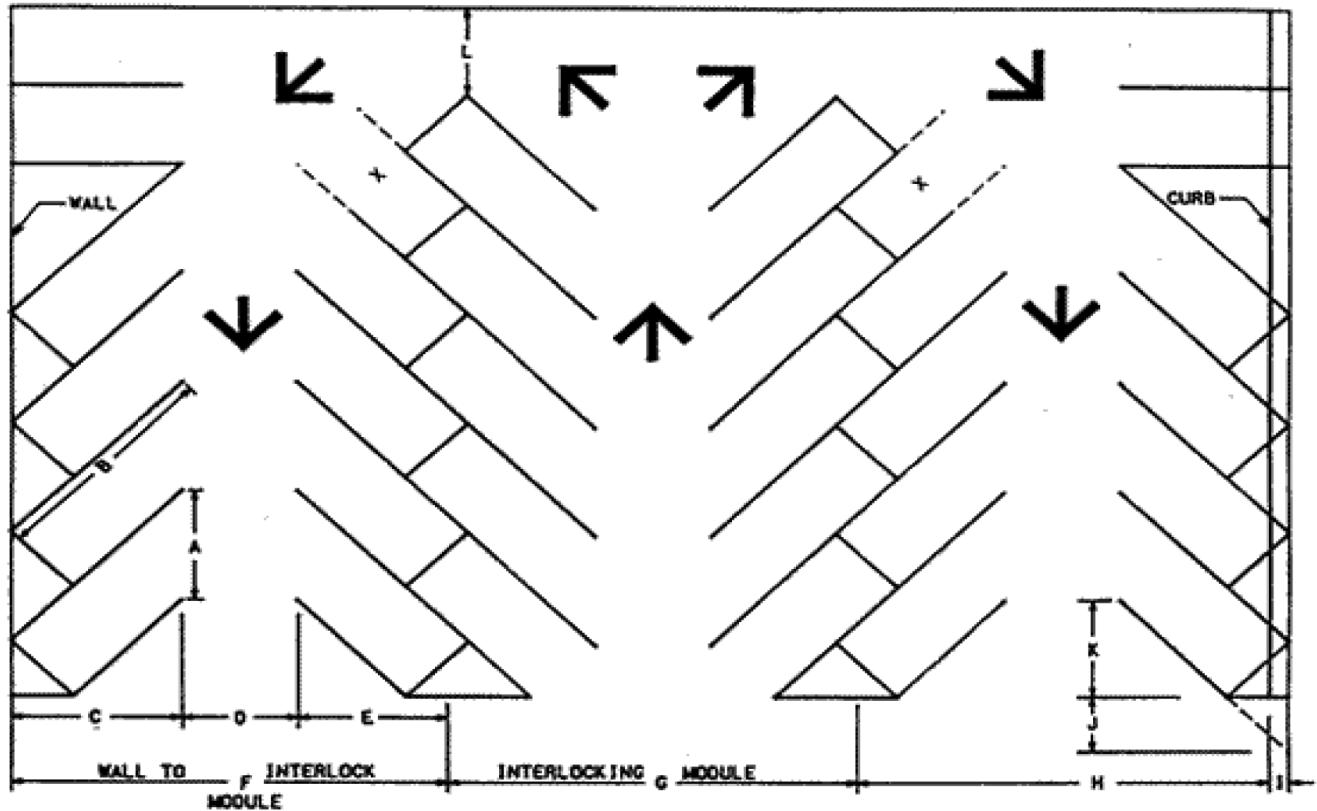
- Existing Park and Rides
- WES Commuter Rail Station
- WES Commuter Rail
- Expansions of Fixed Route Bus Transit Service
- Existing Fixed-Route Bus Transit Service
- Partial Fixed Route Shuttle Service
- Potential Future Route Shuttle Service as Demand Grows
- Proposed New Bus Line
- Planning Area Boundary
- Major Transit Stops
- Park and Ride System Expansion



This map is derived from various digital databasesources. While an attempt has been made to provide an accurate map, the City of Tualatin assumes no responsibility or liability for any errors or omissions in the information. This map is provided "as is". -TualGIS



**Tualatin Development Code - Figure 73-1  
Parking Space Design Standards for 9-Foot Stalls**



<u>Dimension</u>	<u>On Diagram</u>	<u>45°</u>	<u>60°</u>	<u>75°</u>	<u>90°</u>
Stall width parallel to aisle	A	12.7	10.4	9.3	9.0
Stall Length of line	B	25.0	22.0	20.0	18.5
Stall depth to wall	C	17.5	19.0	19.5	18.5
Aisle width between stall lines	D	12.0	16.0	21.0	24.0
Stall depth, interlock	E	15.3	17.5	18.8	18.5
Module, wall to interlock	F	44.8	52.5	61.3	63.0
Module, interlocking	G	42.6	51.0	61.0	63.0
Module, interlocking to curb face	H	42.8	50.2	58.8	60.5
Bumper overhang (typical)	I	2.0	2.3	2.5	2.5
Offset	J	6.3	2.7	0.5	0.0
Setback	K	11.0	8.3	5.0	0.0
Cross aisle, one-way	L	12.0	12.0	12.0	12.0
Cross aisle, two way	-	22.0	22.0	22.0	22.0

X = Stall not accessible in some cases.

**Parking Dimensions for Subcompact Parking**

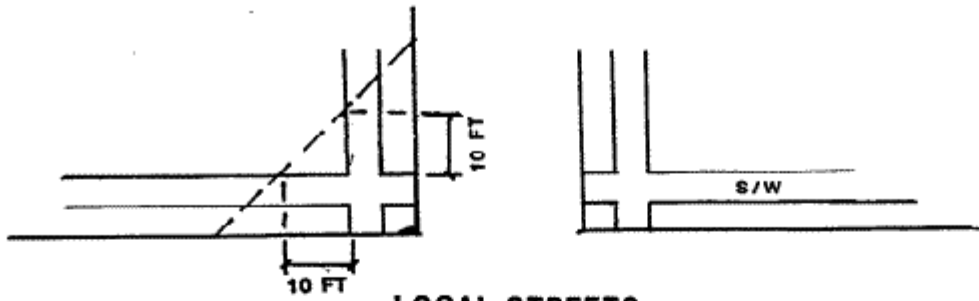
	<u>45°</u>	<u>60°</u>	<u>75°</u>	<u>90°</u>
Stall Width	7.5	7.5	7.5	7.7
Aisle Width per Stall	10.5	8.7	7.8	7.5
Depth of Stalls at right angle to aisle	16.0	16.7	16.3	15.0
Aisle Width	11.0	14.0	17.4	20.0
Wall-to-Wall module	43.0	47.4	50.0	50.0

**Note:** These measurements are inadequate for average compacts. Each stall depth should be increased about 1 foot (2 feet total for the module) to accommodate for the usual range of compact sizes.

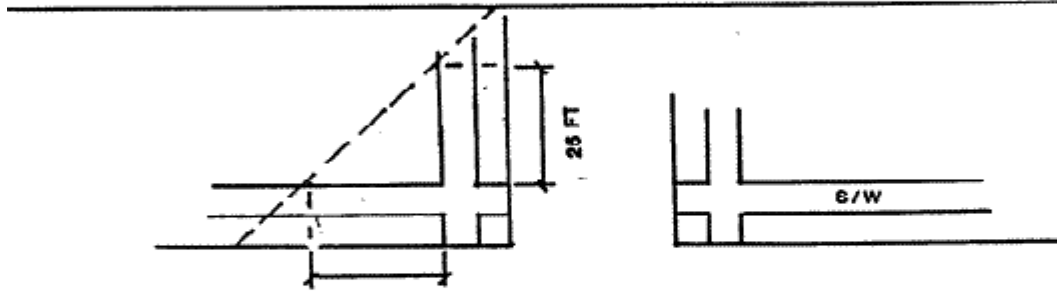
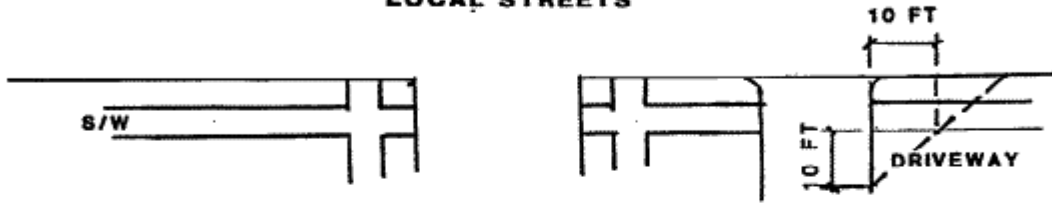




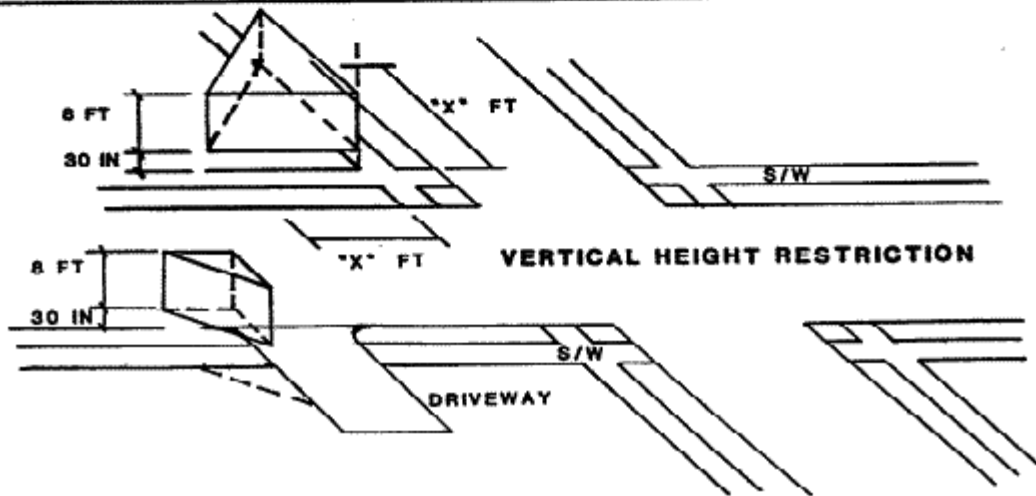
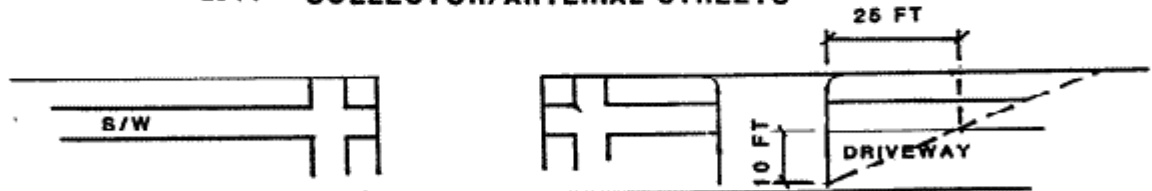
# VISION CLEARANCE AREA



**LOCAL STREETS**



**25 FT COLLECTOR/ARTERIAL STREETS**

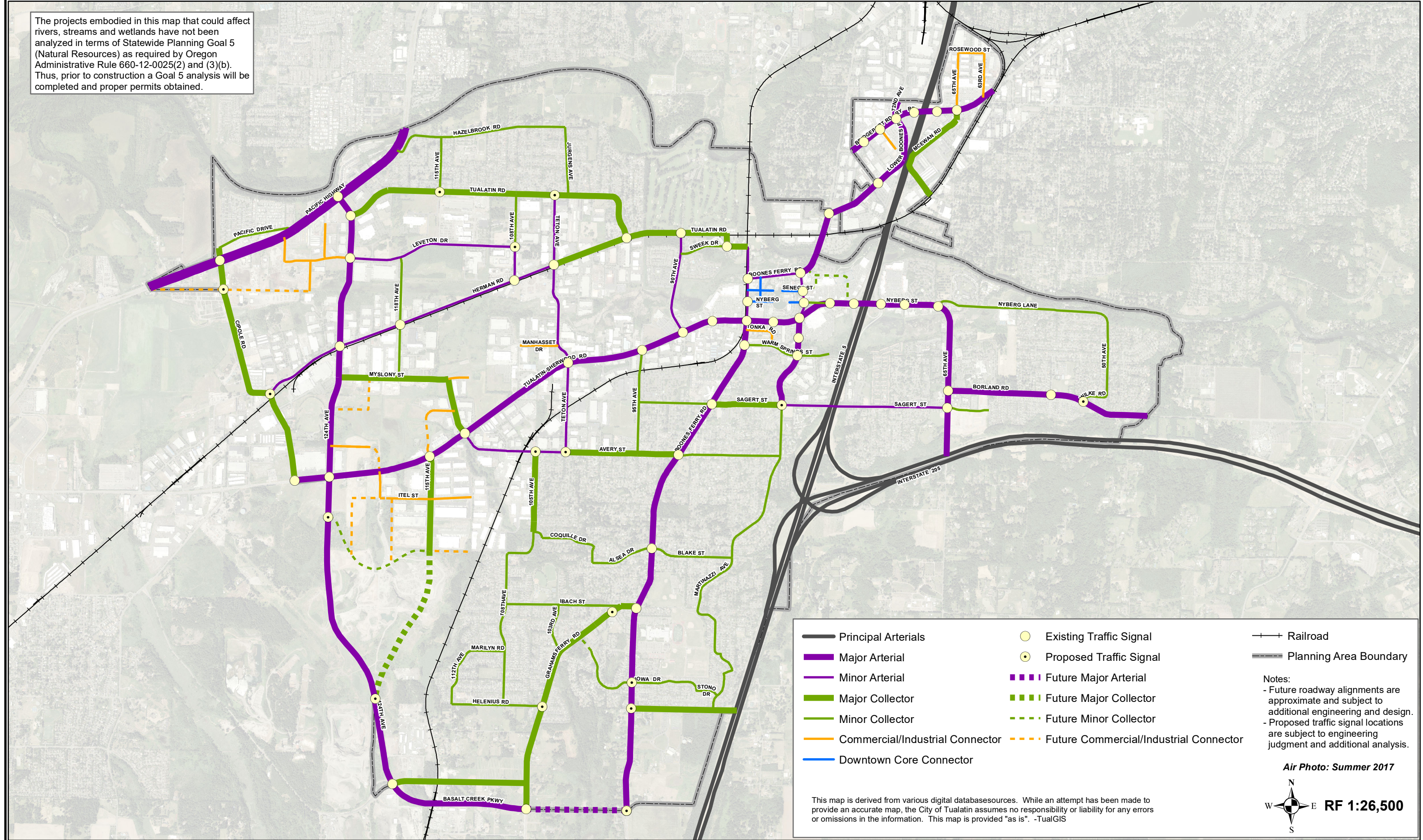


**VERTICAL HEIGHT RESTRICTION**



# Map 8-1: Functional Classification and Traffic Signal Plan

The projects embodied in this map that could affect rivers, streams and wetlands have not been analyzed in terms of Statewide Planning Goal 5 (Natural Resources) as required by Oregon Administrative Rule 660-12-0025(2) and (3)(b). Thus, prior to construction a Goal 5 analysis will be completed and proper permits obtained.



Principal Arterials	Existing Traffic Signal	Railroad
Major Arterial	Proposed Traffic Signal	Planning Area Boundary
Minor Arterial	Future Major Arterial	
Major Collector	Future Major Collector	
Minor Collector	Future Minor Collector	
Commercial/Industrial Connector	Future Commercial/Industrial Connector	
Downtown Core Connector		

Notes:  
 - Future roadway alignments are approximate and subject to additional engineering and design.  
 - Proposed traffic signal locations are subject to engineering judgment and additional analysis.

**Air Photo: Summer 2017**

**RF 1:26,500**

This map is derived from various digital databasesources. While an attempt has been made to provide an accurate map, the City of Tualatin assumes no responsibility or liability for any errors or omissions in the information. This map is provided "as is". -TualGIS





## ARCHITECTURAL REVIEW BOARD DECISION

Republished on November 30, 2022

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Case #:	AR 22-0006
Project:	Lam Research Corporation Campus
Location:	11155-11361 SW Leveton Drive; Tax Lots: 2S122AA 500 and 800; 2S122AB 100
Representative:	Suzannah Stanley, Mackenzie
Owner:	Lam Research Corporation

---

### I. FINDINGS

- A. An application for an Architectural Review application (AR 22-0006) was filed by Mackenzie, on behalf of Lam Research Corporation requesting approval to construct a four-story, 120,000 square foot office building, two new access drives off of SW 108th, and parking lot expansions by approximately 549 stalls. The applicant has also submitted a tree removal permit for 80 trees to construct the improvements.
- B. The Architectural Review Board conducted a noticed quasi-judicial public hearing on November 30, 2022 in conformance with the laws of the State of Oregon and the City of Tualatin.
- C. The Architectural Review Board concludes that the findings and analysis, testimony at the public hearing, and materials in the record address the criteria of TDC 33.020(5) for the approval of the AR 22-0006 with Conditions of Approval.

### II. ACTION

The Architectural Review Board approves AR 22-0006 and adopted the staff analysis and findings, dated November 30, 2022, with the following Conditions of Approval:

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#### GENERAL:

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- A1. This Architectural Review approval shall expire after two years unless a building, or grading permit submitted in conjunction with a building permit application, has been issued and substantial construction pursuant thereto has taken place and an inspection performed by a member of the Building Division, or an extension is granted under TDC 33.020(10).

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#### PRIOR TO EROSION CONTROL, PUBLIC WORKS, AND WATER QUALITY PERMIT ISSUANCE:

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*Submit to [eTrakit](#) for review and approval:*

- A2. The applicant must apply for applicable Engineering Erosion Control, Water Quality, and Public Works permits:
  - a. Apply using [eTrakit](#). With the initial Engineering permit(s) application(s) include:

- i. One combined set of 24"x36" plans including all applicable Engineering permits attached to one Engineering permit. Include a note on other Engineering permits stating which application includes the set.
    - ii. Payment for an Erosion Control permit fee per the fee schedule.
    - iii. Engineering estimate and deposit for each Water Quality or Public Works permit per the fee schedule.
  - b. Deliver two 24"x36" hard copies of the combined Engineering permit plan sets to:  
City of Tualatin  
Attn: Engineering Division c/o Hayden Ausland, Principal Engineer, PE  
10699 SW Herman Road  
Tualatin, OR 97062
- A3. The applicant must submit Final Street Improvement Plans for SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road in accordance with applicable sections of Tualatin Development Code (TDC) 74 and 75 and Public Works Construction Code (PWCC) that show:
  - a. Dedication of half-street right-of-ways to total 37 feet from centerline for SW Leveton Drive and SW Tualatin Road.
  - b. For SW 108th Avenue from SW Leveton Drive to SW Tualatin Road:
    - i. Dedication of adequate right-of-way to construct required public improvements with a minimum of a half-street total of 38 feet from centerline for SW 108th Avenue;
    - ii. A minimum 6-foot-wide planter strip on the west side including:
      1. Curb;
      2. Replace existing street lights with the LED, Option A standard;
      3. Street trees; and
      4. Public LIDA stormwater street swales within an adequately wide planter strip or:
        - a. Proof that the existing public drywell at the intersection of SW 108th Avenue and SW Leveton Drive has capacity to accommodate stormwater requirement due to addition and modification of public impervious area; and,
        - b. Meet any and all requirements from DEQ for continued use of said public drywell.
    - iii. A 6-foot-wide sidewalk;
    - iv. Undergrounding overhead utilities as approved by the City Engineer; and
    - v. Ramp replacement on the west side of the intersection of SW 108th Avenue and SW Leveton Drive for both north (sending) and south (receiving).
  - c. An 8-foot-wide public utility easement, or existing equivalent approved by the City Engineer, and any required slope easements adjacent to SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road including five feet of public utility easement surrounding water meter, backflow protection, and fire vault;
  - d. All adjacent public sidewalks for all lots involved with this development within compliance of ADA standards or replacement of necessary driveways, ramps, and panels to bring into compliance;
  - e. All proposed driveways:
    - i. A minimum distance of 300 feet from intersections of SW 108th Avenue & SW Leveton Drive and SW 108th Avenue & SW Tualatin Road; and
    - ii. Opposing existing driveways or offset a minimum of 150 feet.

- f. Turning movement diagrams showing all existing and proposed driveways operate without adverse impact to public rights-of-way as determined by the City Engineer:
    - i. Identify any driveways privately restricted for specific passenger vehicles or truck use, proposed private signage necessary to control movement, and a circulation plan;
    - ii. Onsite signage and maintenance plan for onsite signage as approved by the City Engineer; and
    - iii. Show existing and proposed curb radii are able to accommodate associated allowed vehicular movements.
  - g. Replacement of concrete doweled panels impacted by construction as determined by the City Engineer.
- A4. The applicant must submit Final Water System Plans in accordance with Tualatin Development Code (TDC) 74.610, Tualatin Municipal Code (TMC) 3-3, and Public Works Construction Code (PWCC) that show:
- a. A gate valve at the main for both domestic and fire service laterals; and
  - b. Adjacent to SW Leveton Drive right-of-way:
    - i. A reduced pressure backflow prevention and water meter for the domestic lateral;
    - ii. The water meter behind the curb within the planter strip;
    - iii. If within final plans, irrigation after a domestic meter and reduced pressure backflow device; and
    - iv. The fire vault surrounded by a five foot public utility easement.
- A5. The applicant must submit Final Sanitary Sewer System Plans in accordance with Tualatin Development Code (TDC) 74.620, Tualatin Municipal Code (TMC) 3-2, and Public Works Construction Code (PWCC) that show location of the lines, grade, materials, and other details.
- A6. The applicant must submit:
- a. A DEQ Rule Authorization letter with associated plans indicating approval and any and all required modifications to accommodate stormwater from new and modified public impervious areas within the existing public drywell at the intersection of SW 108th Avenue and SW Leveton Drive.
  - b. Final Stormwater System Calculations and Plans in accordance with Tualatin Development Code (TDC) 74.630 and 74.650, Tualatin Municipal Code (TMC) 3-5-200 through 3-5-430, Public Works Construction Code (PWCC), and Clean Water Services' (CWS) Design & Construction Standards (D&CS) Chapter 4 stamped by an Oregon registered, professional engineer in accordance with TMC 3-5-390(1) that:
    - i. Provide a downstream analysis, including but not limited to erosion, and include solutions within final plans for ¼ mile downstream from the release from the private development through the public stormwater system, in accordance with TMC 3-5-210(4);
    - ii. Accommodate up to a 25-year storm event within the public stormwater system with a maximum capacity of 82% in accordance with TDC 74.640 and CWS D&CS 5.05.2.d and the City Engineer;
    - iii. Address runoff from all new and modified private and public impervious areas; and,
    - iv. Prove gravity flow five feet from the outside of the established line of the building to the public stormwater system or as otherwise approved by the City Engineer, in accordance with CWS D&CS 1.03.39 and 5.09.3(a) (1) and (4);



- v. Discharge to an approved public system;
  - vi. Treat new and modified impervious areas in accordance with CWS D&CS 4.08.1.d meeting phosphorous removal in accordance with TMC 3-5-350 per the design storm in accordance with TMC 3-5-360 and CWS D&CS 4.08.2;
  - vii. Detain up to the 25-year storm event in accordance with TMC 3-5-220, TMC 3-5-230, and CWS D&CS 4.08;
  - viii. Accommodate hydromodification including post-development runoff rates not exceeding pre-development runoff rates for ½ the 2-year storm event and the 5-year and 10-year storm events for proposed new and modified impervious areas in accordance with CWS D&CS 4.03.5; and
  - ix. In accordance with TDC 74.650(2) and CWS D&CS 3.01.2(d), comply with:
    - 1. The submitted Clean Water Services' Service Provider Letter CWS File Number dated July 12, 2022 conditions to obtain a Stormwater Connection Permit Authorization Letter; and
    - 2. Requirements stated within the Clean Water Services' Memorandum dated November 8, 2022.
  - c. Financial assurance for construction performance in accordance with TMC 3-390(3), PWCC 102.14.00, and amount per CWS D&CS 2.07 Table 2-1; and
  - d. A copy of the recorded private stormwater maintenance agreement in accordance with TMD 3-5-390(4). The agreement must assure the owner as responsible for maintenance of the constructed portions of private stormwater systems within their lot. The identified system must include all conveyance, detention, hydromodification, and treatment.
- A7. The applicant must submit Final Erosion Control Plans in accordance with Tualatin Development Code (TDC) 74.640, Tualatin Municipal Code (TMC) 3-5-050 and 3-5-060, Public Works Construction Code (PWCC), and Clean Water Services' (CWS) Design & Construction Standards (D&CS) Chapters 2 and 6 that:
- a. Minimize the impact of stormwater from the development to adjacent properties; and
  - b. Plans sufficient to either:
    - i. Obtain a National Pollution Discharge Elimination System (NPDES) 1200-CN Stormwater Discharge Permit from Clean Water Services as an agent of Oregon Department of Environmental Quality if disturbance is between 1 and 5 acres; or,
    - ii. Obtain a National Pollution Discharge Elimination System (NPDES) 1200-C Construction Erosion Control permit from Oregon DEQ.

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**PRIOR TO BUILDING PERMIT ISSUANCE:**

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***Submit to [eTrakit](#) for review and approval:***

- A8. The applicant must submit a copy of recorded public utility and slope easements, as approved by the City Engineer, and deeds of right-of-way dedication in accordance with Tualatin Development Code (TDC) 74.210 and 74.330 which show:
- a. An 8-foot-wide public utility and any necessary slope easement, adjacent to SW 108th Avenue, SW Leveton Drive, and SW Tualatin Road including five feet of public utility easement surrounding proposed water meter, backflow protection, and fire vault; and
  - b. Half-street right-of-way dedication from centerline for a total of 38 feet for SW 108th Avenue and 37 feet for both SW Leveton Drive and SW Tualatin Road and any additional dedication for SW 108th Avenue to accommodate and any final public stormwater LIDA facilities.

- A9. The applicant must obtain:
- a. A National Pollution Discharge Elimination System (NPDES) 1200-C Construction Erosion Control permit from Oregon DEQ; and
  - b. Erosion Control, Public Works, and Water Quality Permits from the City of Tualatin.
- A10. The applicant must pay a fee-in-lieu of construction, as determined by the City Engineer, for any new PGE Option A street lights associated with reconstruction of the west side of SW 108<sup>th</sup> Avenue, and any other street lights (associated with the development) that will be in public right-of-way and/or city responsibility.
- A11. The applicant must submit a Final Site Plan Set (in PDF format) to the Planning Division that is in substantial conformance to the submitted site plans and includes:
- a. Trees identified in Tree Assessment Report (Exhibit A3) must be identified on the landscaping and grading plan, consistent with TDC 73B.080(3). Tree protection fencing and other preservation measures recommended by the Arborist should also be specified on the grading plan.
  - b. Walkways that are a minimum of 6 feet in width; constructed of asphalt, concrete, pervious concrete, pavers, or grasscrete; and meet ADA standards at time of construction, consistent with TDC 73A.300(1).
  - c. As a substitute for building perimeter landscaping, plazas that are developed with pavers, bricks, or other surfaces and contain pedestrian amenities, such as: benches, tables with umbrellas, shade trees, and canopies must be provided along building perimeters viewable by the general public from parking lots or the public right-of-way, in conformance with TDC 73B.040(1). This requirement does not apply to loading areas, bicycle parking areas, and pedestrian entrances.
  - d. A minimum of 192 parking spaces at an applied rate of 1.6 spaces per 1,000 square feet of gross floor area, consistent with TDC 73C.010(2)(a)(iv).
  - e. Details to demonstrate that proposed bicycle parking meets the standards of TDC 73C.050(2)(a)-(c), and that a minimum of 12 short-term and 5 long-term bicycle parking spaces are provided, in conformance with TDC 73C.100(1).
  - f. A minimum of 8 vanpool or carpool parking spaces, consistent with TDC 73C.100(2).
  - g. A minimum of 3 loading facilities that are a no less than 12 feet wide x 35 feet long with an unobstructed height of 14 feet, or evidence that adequate loading facilities exist on the same lot as the proposed office building, consistent with TDC 73C.120.
  - h. In accordance with IMP 22-0001, parking lot landscaping for the north-half of the site must follow the standard requirements of TDC Chapter 73C. To accommodate grade changes, an alternative method of parking lot landscaping is acceptable for terraced parking lots proposed for the south-half of the site. These lots must provide a minimum landscape island area of 25 square feet per parking stall and comply with the following:
    - i. Landscape separation that is a minimum of five feet in width is required for every twelve continuous spaces in a row;
    - ii. Landscaping strip that is a minimum of ten feet in width must be placed in between rows of facing vehicles;
    - iii. Must be planted with one deciduous shade trees for every four parking spaces, with required trees evenly dispersed throughout the parking lot;
    - iv. Must be planted with groundcover or shrubs; and
    - v. Native plant materials are encouraged.

- i. Demonstrate that an adequate waste and recyclables management solution is provided in compliance with TDC 73D. If the minimum standards method is chosen, a minimum of 490 square feet of trash enclosure area must be shown on the plans. These facilities must comply with the location, design, and access standards in TDC 73D.070.
- j. In accordance with IMP 22-0001, building materials must consist of, or be complimentary to: masonry, sandstone, architectural metal siding, and window glazing. Color palettes must remain complimentary to earth toned shades.

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**DURING CONSTRUCTION ACTIVITY:**

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- A12. The applicant must install tree protection fencing consistent with the Tree Assessment Report submitted as Exhibit A3 and Section 73B.080(3). Please contact the Planning Division to schedule an inspection with a minimum of 48 hours' notice. Where site conditions make grading or other similar encroachment upon a preserved tree's drip-line area, such grading or similar encroachment must only be permitted under the direction of a qualified arborist.

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**PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY:**

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- A13. Provide an identification system which clearly locates buildings and their entries for patrons and emergency services, pursuant to TDC 73A.300(4)(d). Building identification approved by TVF&R must be placed in a position that is plainly legible and visible from the street fronting the property. Numbers must contrast with their background, be a minimum of 4 inches high, and have a minimum stroke width of 1/2 inch.
- A14. Areas impacted by grading and all areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas, or undisturbed natural areas must be landscaped, pursuant to TDC 73B.040(1)(a).
- A15. The applicant must install required vanpool and carpool signage, pursuant to TDC 73C.010(2)(a)(xi) and bicycle parking signage per MUTCD standards, pursuant to TDC 73C.050(2)(d).
- A16. The applicant must construct proposed buildings and all site improvements as illustrated on the approved Final Site Plan and Final Color Architectural Elevations. The applicant must contact the Planning Division for a site inspection at least 72 hours prior to requesting a certificate of occupancy. This inspection is separate from inspection(s) done by the Building Division.
- A17. The applicant must complete all the private stormwater and public improvements as shown on the approved permit plans. All improvements must also be accepted by the City in accordance with Tualatin Development Code (TDC) 74.120.
- A18. The applicant must submit paper and electronic as-builts of the Engineering permits along with maintenance bonds and any final fees for public and water quality improvements.

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**THE FOLLOWING ITEMS APPLY TO THE SITE IN AN ON-GOING MANNER:**

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- A19. All uses must be conducted within a completely enclosed building, except off-street parking and loading, and basic utilities, pursuant to TDC 62.210(5).
- A20. The proposed development must comply with the Environmental Regulations of TDC 63.

- A21. All mechanical equipment must be screened in accordance with TDC 73A.300(5). Prior to approval of a mechanical permit, the applicant or property owner must submit scaled elevations illustrating that above-grade or on-grade equipment will be screened by parapet, sight-obscuring fence, landscaping, or other method.
- A22. All sign permits require separate sign permit approval per TDC Chapter 38. This approval does not constitute sign permit approval.
- A23. All site, building exterior, and landscaping improvements approved through the AR process must be continually maintained, so as to remain substantially similar to original approval through the AR process, except as permitted under TDC 33.020(7) (Modifications to Previously Approved Final Architectural Review Decisions).
- A24. All parking spaces shall be continuously maintained in compliance with the dimensional standards specified in TDC Figure 73-1 (Exhibit H).
- A25. No vehicular parking, hedge, planting, fence, wall structure, or temporary/permanent physical obstruction is permitted between 30 inches and eight feet above the established height of the curb in the vision clearance area specified in TDC Figure 73-2 (Exhibit I).

### III. APPEAL

The applicant or any person who submitted written comments or testified orally or in writing at the Architectural Review Board hearing and who may be adversely affected by the Board's decision may file a request for review of the final decision of the Architectural Review Board to the City Council.

The Architectural Review Board's decision will be final after 14 calendar days from the mailing of this order, unless a written appeal is received by the **Tualatin Planning Division at 10699 SW Herman Road, Tualatin, Oregon, before 5:00 p.m., December \_\_, 2022. The appeal must be submitted on the City appeal form with all the information requested provided thereon, signed by the appellant, and include the applicable appeal fee.** The plans and appeal forms are available at the Planning Division offices. The appeal forms must include reasons, current appeal fee, and meet the requirements of Section 32.310 of the Tualatin Development Code. The City Council will review and make a decision. The parties will be notified of the Council meeting date.

ADOPTED THIS \_\_\_\_ DAY OF NOVEMBER 2022.

ARCHITECTURAL REVIEW BOARD  
CITY OF TUALATIN

BY: \_\_\_\_\_  
Sitting Member,  
Architectural Review Board