Hearings Examiner Meeting Agenda
Thursday, November 14, 2024, 4:30 PM
Council Chambers, 616 NE 4th AVE

NOTE: The City welcomes public meeting citizen participation. TTY Relay Service: 711. In compliance with the ADA, if you need special assistance to participate in a meeting, contact the City Clerk's office at (360) 834-6864, 72 hours prior to the meeting so reasonable accommodations can be made (28 CFR 35.102-35.104 ADA Title 1)

To Participate Remotely:

OPTION 1 -

1. Go to www.zoom.us and download the app or click "Join A Meeting" and use Meeting ID – 850 4673 8141
2. Or, from any device click https://us06web.zoom.us/j/85046738141

OPTION 2 - Join by phone (audio only):
Dial 877-853-5257 and enter meeting ID# 850 4673 8141

For Public Comment:
Click the raise hand icon in the app or by phone, hit *9 to "raise your hand", or email to communitydevelopment@cityofcamas.us

These will be entered into the meeting record. Emails received up until one hour before the start of the meeting will be emailed to the Meeting Body prior to the meeting start time.

CALL TO ORDER

INTRODUCTIONS AND INSTRUCTIONS

HEARING ITEM

1. 13th Street Gas Station (APPEAL24-1001)

CLOSE OF MEETING

LAND USE DECISION

APPEAL24-1001 STAFF REPORT

13th Street Gas Station

CONSOLIDATED PLANNING FILES: ARCH23-07, CA23-08, DR23-09, SEPA23-12, SPRV23-06
Decision Date: September 16, 2024
Appeal Date: September 30, 2024

PROPOSAL	The proposal includes the construction of an 8-pump gas station, a 4,100 square-foot convenience store, and a drive-thru car wash, located at 20101 NE 13th Street, in the BP - Business Park Zone.
LOCATION	The property is located on the southwesterly corner of the intersection at NE 13th Street and NW Friberg-Strunk Street. The parcel number is 176148000, situated in the NW 1/4 of Section 29, Township 2 North, Range 3 East of the Willamette Meridian, Clark County.

APPLICANT	PLS Engineering, Travis Johnson 604 W. Evergreen Blvd. Vancouver, WA 98660 (360) 944-6519	**OWNER**	Pak USA Camas, LLC 3993 NW Currawong Court Camas, WA 98607 (512) 779-4999

APPLICABLE LAW: The application was submitted on November 9, 2023, and the applicable codes are those codes that were in effect at the date of application. Camas Municipal Code (CMC) Title 17 Land Development and Title 18, specifically (but not limited to): Chapter 18.11 - Parking, Chapter 18.13 - Landscaping, Chapter 18.18 - Site Plan Review, Chapter 18.19 Design Review, Chapter 18.37 Business Park, and Chapter 18.55 Administrative Procedures.

SUMMARY

The proposed project includes the construction of an 8-pump gas station, a 4,100 square-foot convenience, and a drive-thru car wash on an approximately 0.97-acre parcel currently developed with a single-family residence, situated in the BP – Business Park Zone. According to CMC 18.07.030 – Table 1, the proposed uses are allowed within the BP Zone, subject to the necessary approvals.

A SEPA Determination of Non-Significance was issued on February 22, 2024, with the comment period closing on March 7, 2024. Prior to the closing of the comment period, several comments were received from the public with concerns related to noise, traffic, air and water pollution. The applicant voluntarily placed the project on pause so that they could addressed concerns received during the initial SEPA comment period. Revised technical reports were submitted to staff on July 11, 2024, and the SEPA Determination of Non-Significance was re-distributed on August 15, 2024, with the comment period ending on August 29, 2024. Public comments were again received during the second SEPA comment period with comments similar to what was submitted during the initial SEPA review period. No new topics of concern were included.

A Notice of Decision for the project's approval was distributed on September 16, 2024, and the decision was appealed September 30, 2024.

The appeal narrative noted concerns related to potential water pollution, noise and light pollution, as well as an increase in traffic congestion. Also noted was the concern to allow a vehicle car was within the BP – Business Park Zone. With regards to the items noted in the Appeal Narrative, staff has the following comments:

- Water Pollution
  The appeal narrative notes the belief that the project has the potential to pollute open waters, increasing concerns about the management of Lacamas Lake, endangering safe drinking water supply of neighboring wells.

  As noted in the staff report dated September 16, 2024, a Preliminary Stormwater Technical Information Report (PTIR) dated November 2023, was prepared by PLS Engineering, Inc. The PTIR was prepared in accordance with Ecology's *Stormwater Management Manual for Western Washington* (2019 SWMMWW). Ecology issued the 2024 *Stormwater Management Manual for Western Washington* which was effective as of August 1, 2024. Both the 2019 and the 2024 manuals state that minimum requirements (MRs) #1-#9 will apply for a new development project that results in 5,000 sf or greater of new plus replaced hard surface area. Minimum requirements #1 - #9 applies to the proposed development.

  The minimum requirement discussed in the PTIR relate to construction stormwater pollution prevention; source control of pollution; preservation of natural drainage systems, including infiltration, which is not proposed for this project; on-site stormwater management; stormwater runoff treatment; stormwater flow control; wetlands protection; and operation and maintenance of stormwater treatment and detention facilities.

  With the conditions of approval contained in the staff report, the proposed project meets the requirements of CMC 14.02 Stormwater Control and CMC 17.19.040.C.3 Storm Drainage. ***Staff's position in support of the project stands.***

- Noise & Light Pollution
  The appeal narrative states that the proposed project could have the potential to create noise and light pollution that would interfere with the quiet enjoyment of residences in the nearby neighborhoods.

  [Noise Pollution]: As noted in the Revised SEPA Checklist dated July 9, 2024, typical noise in the area consists of traffic noise from surrounding areas/roads along with typical home and business use noises. Short term noise would include construction noise which would occur during approved hours as mandated by the City of Camas and Washington State. Long term noises could include slight increase in traffic noise and vehicle noise once construction is completed. The project is required to comply with CMC 9.32.050 – Public disturbance noises which prohibits the use of equipment and activities producing intermittent or repetitive noise commonly associated with site improvements before 7am or after 7pm - Monday through Friday, before 7am or after 5pm – Saturday, and anytime on Sundays or anytime on New Years Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, or Christmas Day. The project has been conditioned in accordance with Camas Municipal Code requirements***. Staff's position in support of the project stands.***

  [Light Pollution]: With regards to light pollution, the applicant's narrative indicates that the lighting plan meets the minimum safety standards and outdoor lighting will be shielded to prevent off-site light spillage to the greatest extent possible. In accordance with CMC 18.19.050, the proposed project has been conditioned to require all landscape, parking lot, and/or building lighting to be directed, hooded, or shielded away from surrounding properties. ***Staff's position in support of the project stands.***

- Permitting a Car Wash in the BP – Business Park Zone

The appeal narrative notes that permitting the construction of a car wash in the BP Zone potentially violates zoning requirements.
As per CMC 18.07.030 – Table 1, Gas/Fuel stations with mini markets are a permitted use within the BP – Business Park Zone, as are most auto oriented uses. Although the Camas Municipal Code does not specifically call out a car wash in the Use Authorization Table as a permitted use in the BP Zone, it is an auto oriented use and is considered an ancillary use to the proposed gas station/mini market. The project has been reviewed under the current development standards of Camas Municipal Code and no variances have been requested. Adequate parking has been provided for the proposed gas station, mini market, and car wash as per CMC 18.11.130. With the conditions of approval in place, the project meets the requirements of the Camas Municipal Code. ***Staff stands in support of the project.***

- Dangerous Intersection/Access Standards
  The appeal narrative indicates the proposed project would create a dangerous intersection, expose the City to liability for granting an exception to the Access Standards – permitting a left turn access shorter than 660-feet, and the disruption of recreational use of the designated bicycle route.

  [Dangerous Intersection]: The proposed project is located on the southeast corner of the existing signalized intersection of NE 13th Street, NW Goodwin Road, and NW Friberg-Strunk. The signalized intersection consists of dedicated east and west bound travel lanes, a dedicated bike lane, a dedicated right turn lane from NE 13th Street onto NW Friberg-Strunk, and pedestrian crosswalks.

  [Access Standards]: Per CDSM, Section III Design Standards, *Table 3 Access Spacing Standards*, the access spacing standards on a roadway classified as an arterial are a minimum of 660-feet and a maximum of 1,000-feet. Due to the length of the parcel frontage along NE 13th Street, which is approximately 328-feet, it is not possible for the applicant to meet the minimum access spacing standards and still access the proposed development from NE 13th Street. Therefore, a deviation request to the city engineer was required for the location of the drive access as shown. A deviation request was submitted by the applicant.

  The access spacing standards apply to the distance between access drives. These standards do not refer to the length of a dedicated left-turn pocket. A dedicated left turn pocket was a requirement for support of the deviation request from the city engineer.

  A revised site plan was submitted with the Traffic Engineer's *Left Turn Lane Memo*, dated April 9, 2024, that included a dedicated left-turn lane. The staff report addresses the traffic and transportation as well as the request for a deviation from the access spacing standards and the left turn requirements. As conditioned, the project can and will meet the requirements of the Camas Design Standards Manual (CDSM) for Traffic and Transportation. ***Staff's support of the proposed project stands.***

- Updated Traffic Study
  The appeal narrative indicates the proposed project should conduct an updated traffic study that accounts for the new warehouse, the new residential traffic east (Goodwin/Green Mountain), Union Hight School traffic, the new Oak Tree Station, the new Business Park mall buildings on NW Friberg-Struck St., and to include the traffic impact of Harmony Sports Complex.

  The Traffic Analysis Report (TIR), dated September 2023, included all the developments noted above, except for the Harmony Sports Complex, which is in the City of Vancouver and owned by

Clark County. It should be noted that staff is not aware of any vested new trips for the Harmony Sports Complex.

Not noted above nor included in the September 2023 TIR is the 34 Lot Monte Verde subdivision east of Green Mountain on the south side of NE 28th Street. The in-process information for Monte Verde has been provided to the applicant. The Monte Verde development will add no more than 1 extra trip for every two minutes to the overall PM peak traffic count on NE 13th Street. The city engineer finds that the impact of these additional trips to be de minimis in relation to the findings of the Charbonneau traffic study. ***Staff's support of the proposed project stands.***

- Separate Ingress and Egress
  The appeal narrative indicates a requirement for separate ingress and egress for better traffic flow, including a primary exit to NW Friberg-Strunk Street.

  Highlights of the Charbonneau Engineering Memo, dated June 12, 2024, and the city's responses are as follows:

  > *"Only one access (NE 13th Street) is permitted to serve the property as no connection is allowed to NE Friberg-Strunk Street."*

  The pre-application notes stated no access onto NE Friberg-Strunk Street would be permitted; however, during the application review process, staff stated that access onto NW Friberg-Strunk would be supported as a right-in/right-out only. ***Staff's support of the proposed project stands.***

- Operating Hours
  The appeal narrative indicates operating hours of the gas station shall be incompliance with BP zoning, including all gasoline tanker trucks filling gasoline and all deliveries.

  Highlights of the Charbonneau Engineering Memo, dated June 12, 2024, and the city's responses are as follows:

  > *"To minimize the impacts associated with fueling trucks, deliveries will avoid the peak traffic periods by restricting arrivals and departures to the hours between 7:00 PM to 7:00 AM. Additionally, the fueling truck operators will be directed to make right turns from/to NE 13th Street when entering and exiting the site."* A condition of approval is warranted.

  The staff report addresses the traffic and transportation, the request for a deviation from the access spacing standards, the left turn requirements, ingress and egress, and hours of operation. As conditioned, the project can and will meet the requirements of the Camas Design Standards Manual (CDSM) for Traffic and Transportation. ***Staff's support of the proposed project stands.***

CONCLUSION

Based on the findings and discussion provided in the staff report dated September 16, 2024, staff concludes that the appeal should be denied, and the 13th Street Gas Station (SPRV23-06) should be upheld because the project complies with the applicable standards if all conditions of approval are met.

Community Development Department | Planning Division
616 NE Fourth Ave, Camas, WA 98607
360-817-1568 | permits@cityofcamas.us

General Application Form 13th Street Gas Station **Case Number:** SPRV23-06

Applicant Information

Applicant/Contact:: Khan (*Last*) Taz (*First*) *Phone:* 512-779-4999

Address: 3993 NW Currawong Court Camas, WA 98607
Street Address *Apartment/Unit #*

Vancouver (*City*) WA (*State*) 98660 (*ZIP Code*)

Email Address: tkhanusa@gmail.com

Property Information

Property Address: 20101 NE 13th Street (*Street Address*) 176148000 (*County Assessor # / Parcel #*)

Camas (*City*) WA (*State*) 98607 (*ZIP Code*)

Zoning District BP Site Size 0.97 AC

Description of Project

Convenience store with drive-thru car wash and gas pumps

Are you requesting a consolidated review per CMC 18.55.020(B)? YES ☐ NO ☐

Permits Requested: ☐ Type I ☑ Type II ☐ Type III ☐ Type IV, BOA, Other

Property Owner or Contract Purchaser

Owner's Name: Pak USA Camas LLC (*Last*) (*First*) *Phone:* 512-779-4999

20101 NE 13th Street
Street Address *Apartment/Unit #*

Vancouver (*City*) WA (*State*) 98607 (*Zip Code*)

Email Address: tkhanusa@gmail.com

Signature

I authorize the applicant to make this application. Further, I grant permission for city staff to conduct site inspections of the property.

Signature: DocuSigned by: FF97DED7E6DD4FF... **Date:** 10/19/2023

Note: If multiple property owners are party to the application, an additional application form must be signed by each owner. If it is impractical to obtain a property owner signature, then a letter of authorization from the owner is required.

Date Submitted: 11/9/23 Pre-Application Date:	$7,906.80 Receipt #788411 11/9/23 by AB
Staff: Related Cases # PA22-32 ARCH23-07 CA23-08 DR23-09 SEPA23-12 ☐ **Electronic Copy Submitted**	**Validation of Fees**

Application Checklist and Fees [updated on January 1, 2023]

◊ Annexation	$944 - 10% petition; $4,013 - 60% petition	001-00-345-890-00		$
◊ Appeal Fee		001-00-345-810-00	$436.00	$
◊ Archaeological Review		001-00-345-810-00	$150.00	$ 150.00
◊ Binding Site Plan	$2,055 + $24 per unit	001-00-345-810-00		$
◊ Boundary Line Adjustment		001-00-345-810-00	$113.00	$
◊ Comprehensive Plan Amendment		001-00-345-810-00	$6,373.00	$
◊ Conditional Use Permit				
Residential	$3,738 + $105 per unit	001-00-345-810-00		$
Non-Residential		001-00-345-810-00	$4,734.00	$
◊ Continuance of Public Hearing		001-00-345-810-00	$573.00	$
◊ Critical or Sensitive Areas (fee per type)		001-00-345-810-00	$848.00	$ 848.00
(wetlands, steep slopes or potentially unstable soils, streams and watercourses, vegetation removal, wildlife habitat)				
◊ Design Review				
Minor		001-00-345-810-00	$474.00	$
Committee		001-00-345-810-00	$2,598.00	$ 2,598.00
◊ Development Agreement	$959 first hearing; $590 ea. add'l hearing/continuance	001-00-345-810-00		$
◊ Director's Intrepretation			$350.00	$
◊ Engineering Department Review - *Fees Collected at Time of Engineering Plan Approval*				
Construction Plan Review & nspection		*(3% of approved estimated construction costs)*		
Modification to Approved Construction Plan Review		*(Fee shown for information only)*	$459.00	
Single Family Residence (SFR) - Stormwater Plan Review		*(Fee shown for information only)*	$228.00	
Gates/Barrier on Private Street Plan Review		*(Fee shown for information only)*	$1,139.00	
◊ Fire Department Review				
Short Plat or other Development Construction Plan Review & Insp.		115-09-345-830-10	$308.00	$
Subdivision or PRD Construction Plan Review & Inspection		115-09-345-830-10	$384.00	$
Commercial Construction Plan Review & Inspection		115-09-345-830-10	$460.00	$
◊ Franchise Agreement Administrative Fee			$5,696.00	$
◊ Home Occupation				
Minor - Notification (No fee)			$0.00	0.00
Major		001-00-321-900-00	$75.00	$
◊ LI/BP Development	$4,734 + $41.00 per 1000 sf of GFA	001-00-345-810-00		$
◊ Minor Modifications to approved development		001-00-345-810-00	$378.00	$
◊ Planned Residential Development	$38 per unit + subdivision fees	001-00-345-810-00		$
◊ Plat, Preliminary				
Short Plat	4 lots or less: $2,118 per lot	001-00-345-810-00		$
Short Plat	5 lots or more: $7,848 + $250 per lot	001-00-345-810-00		$
Subdivision	$7,848 + $250 per lot	001-00-345-810-00		$
◊ Plat, Final:				
Short Plat		001-00-345-810-00	$219.00	$
Subdivision		001-00-345-810-00	$2,598.00	$
◊ Plat Modification/Alteration		001-00-345-810-00	$1,308.00	$
◊ Pre-Application (Type III or IV Permits)				
No fee for Type I or II				
General		001-00-345-810-00	$387.00	$
Subdivision (Type III or IV)		001-00-345-810-00	$996.00	$
◊ SEPA		001-00-345-890-00	$886.00	$ 886.00
◊ Shoreline Permit		001-00-345-890-00	$1,308.00	$
◊ Sign Permit				
General Sign Permit	(Exempt if building permit is required)	001.00.322.400.00	$45.00	$
Master Sign Permit		001.00.322.400.00	$138.00	$
◊ Site Plan Review				
Residential	$1,259 + $34 per unit	001-00-345-810-00		$
Non-Residential	$3,146 + $68 per 1000 sf of GFA	001-00-345-810-00		$ 3,424.80
Mixed Residential/Non Residential	(see below)	001-00-345-810-00		$
	$4,435 + $34 per res unit + $68 per 1000 sf of GFA			
◊ Temporary Use Permit		001-00-321-990-00	$88.00	$
◊ Variance (Minor)		001-00-345-810-00	$760.00	$
◊ Variance (Major)		001-00-345-810-00	$1,417.00	$
◊ Zone Change (single tract)		001-00-345-810-00	$3,659.00	$

Fees reviewed & approved by Planner: _____ 11/9/23

Initial ***Date***

Total Fees Due: $ 7,906.80

City of Camas
616 NE 4th Avenue
Camas, WA 98607
360-834-2462

Finance Office Hours:
Monday-Friday 9:00 - 5:00 p.m.

Date/Time 11/09/2023 03:53 PM
Receipt No. 00788411
Receipt Date 11/09/2023

CR plan	7,906.80
arc/rev archaeoligal rev iew	150.00
crit/sens critical/sensitv e areas	848.00
sepa sepa fees	886.00
designrev design review	2,598.00
plan rev plan review	3,424.80

Cash: 0.00
Other: 0.00
7,906.80
Check: 7,906.80

Total: 7,906.80
Change: 0.00

Check No: 13th St Gas Station ch
k #111

PAK USA Camas, LLC
Customer #: 000000

Cashier: abaldwin
Station: IS02593

Engineering - Surveying - Planning * 604 W Evergreen Blvd, Vancouver, WA 98660 * P 360-944-6519 * F 360-944-6539

13th Street Site Plan

Complete list of the permit approvals sought by the applicant:

1. Type II Site Plan Review
2. Design Review
3. SEPA
4. Critical Areas Review
5. Archaeological Review
6. Fire Department Review
7. Building permit and Plan Review
8. Engineering Review

Pre-Application Meeting Notes
13th Street Gas Station w/ Convenience Store, Drive-thru Car Wash & Retail Building
File PA22-32

Meeting held via Zoom: Thursday, July 28th, 2022
Notes issued via email: Tuesday, August 8, 2022

Applicant:
Taz Khan
701 Columbia Street, #109
Vancouver, WA 98660

Representing City of Camas: Yvette Sennewald, Senior Planner
Randy Miller, Fire Marshal
Anita Ashton, Engineering
Ahmed Yanka, Engineering

Location: 20101 NE 13th Street, Camas, WA 98607
NW ¼ of Section 29, Township 2 North, Range 3 East, of the Willamette Meridian

Tax Accounts: 176148000

Zoning: Business Park (BP)

Description: Applicant is proposing to construct a gas station with convenience store, drive through car wash, and retail building on the subject 0.95-acre site, currently developed with a single-family residential dwelling unit.

NOTICE: Notwithstanding any representation by City staff at a pre-application conference, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite to an applicant all relevant applicable code requirements shall not constitute a waiver by the City of any standard or requirement [CMC 18.55.060 (C)]. This pre-application conference shall be valid for a period of 180 days from the date it is held. If no application is filed within 180 days of the conference or meeting, the applicant must schedule and attend another conference before the city will accept a permit application [CMC 18.55.060 (D)]. Any changes to the code or other applicable laws, which take effect between the pre-application conference and submittal of an application, shall be applicable [CMC 18.55.060 (D)]. **A link to the Camas Municipal Code (CMC) can be found on the City of Camas website, http://www.cityofcamas.us/ on the main page under "Business and Development".**

STAFF NOTES

PLANNING DIVISION Yvette Sennewald |817-7269

Applicable codes for this development include Title 17 - Land Development, and Title 18 - Zoning of the Camas Municipal Code ("CMC"). The applicant is responsible for reviewing the code and addressing the applicable provisions. The following pre-application notes are based on application materials and site plan submitted on June 24, 2022.

Development of a gas station with drive-thru car wash, convenience store, and retail space in the Business Park (BP) Zone is a permitted use and requires Design Review (Major) and Site Plan Review. Design Review is a Type II approval, and the city will schedule a public meeting with the Design Review Committee (DRC) to seek recommendations for the proposed project.

Type II Design Review and Site Plan Review	Fees (as of July 28th, 2022)
Archeological Review	$137
Critical Area Review	$775
Design Review Committee	$2,375
SEPA	$810
Site Plan Review (Non-Residential)	$2,876 + $68 per 1000 sf of GA

The following items are required to be submitted for consideration of the proposed project:

1. **APPLICATION.** Required materials are listed in CMC18.55.110 (A through G). Include a site plan with applicable setbacks, building footprint and elevations. As per CMC 18.09.030, commercial development setbacks must meet the following:

    - Front: 15-feet
    - Side: 15-feet
    - Rear: 50-feet
    - Maximum building coverage: 50%

2. **DESIGN REVIEW**. Design Review is required for new developments in commercial zones pursuant to CMC Chapter18.19.020. The standards applicable to this property for Design Review are found in the Design Review Manual to include the Standard Principles & Guidelines and the Specific Principles & Guidelines Commercial and Mixed Uses including, but not limited to:

    - Building shall be used to define the streetscape. Building walls or fences visible from roadways should be articulated to avoid a blank look. The wall can be broken up by including a combination of window/display space, plantings, and offsetting walls with two tone colors.
    - On-site parking areas shall be placed to the interior of the development unless the development proves prohibitive.
    - All parking shall be screened with landscaping. The drive-thru along street frontages shall be heavily landscaped.
    - The development adjacent to residential areas should be built with a size, scale, and materials compatible with neighboring buildings.

    An application for design review must include (at a minimum) building elevations, materials, exterior colors, and landscaping plans.

    Development sign. The applicant must install a 4'x8' sign on the property that provides details about the project, site plan, contact information, and includes space for public hearing information to be filled in when a date is scheduled. Staff can provide a handout if requested.

Landscaping Regulations

- A Tree Survey per CMC 18.13.045, which requires an inventory and assessment of existing trees prepared by a certified arborist or professional forester, is required if trees are proposed for removal.
- A Landscape, Tree, and Vegetation plan must be submitted pursuant to CMC 18.13.050. A minimum 20 tree unit density per net acre (exclusive of critical area tracts) is required for new development per CMC 18.13.051 and shall be incorporated into the overall landscape plan.
- Landscape screening buffers shall be provided per CMC 18.13.055 Table 1. A 10-foot L3 landscape buffer is required long the property line abutting the residentially zoned property to the west and a 5-ft L2 landscape buffer is required along the property line abutting residentially zoned property separated by a street to the north. A minimum 10-ft. L3 High screen landscape buffer will be required to screen the drive-thru from NW 13th Street and NW Friberg-Strunk Street.

Abutting Zone ➡	Residential	
Uses on Site ⬇	Not Separated by a Street	Separated by a Street
Commercial	10' L 3	5' L 2

- Landscaping for the parking lot shall comply the requirements in CMC 18.13.060 (A-H).

Parking Regulations

The proposed project is required to meet the automobile parking requirements pursuant to CMC Chapter 18.11. The number of off-street parking spaces is calculated based on the table at CMC 18.11.130 Standards as follows:

USE	NUMBER OF PARKING SPACES
Gas station with mini market	1 per nozzle plus 1 per 250 square feet of gross floor area
Car wash	2 per stall, and 1 space per 2 employees
Retail stores less than 5,000 sq. ft.	1 per 300 square feet

3. **ARCHEOLOGICAL REVIEW.** The site is in an area of high probability for the presence of archaeological objects as identified on Clark Co. GIS. If the site is within ¼ mile of an archaeological site, an archaeological predetermination will be required per CMC Section 16.31.070.A. Submit to the City proof of emailing or mailing the tribes per CMC 16.31.160.

4. **CRITICAL AREAS REVIEW.** Per Clark County GIS mapping, habitat conservation areas (i.e. wetlands) have been identified on the subject property. As such, per CMC Section 16.51.130, a critical areas report prepared by a qualified professional is required if a proposed development is within or adjacent to a critical area. The general requirements for a critical areas report are found in CMC Section 16.51.140.

5. **SEPA.** The subject site contains critical areas, and the proposed project is not categorically exempt from the State Environmental Policy Act (SEPA) requirements. Per CMC Section 16.07.020.A, a SEPA checklist is required.

6. **SITE PLAN REVIEW.** All new non-residential uses for the location of any buildings are required to obtain Site Plan Review and approval as per CMC 18.18.020.A. The city shall consider approval of the site plan with specific consideration to the following and as stated in CMC 18.18.060.A-F:
   - Compatibility with the city's comprehensive plan;
   - Compliance with all applicable design and development standards;
   - Availability and accessibility of adequate public services;
   - Adequate provisions are made for other public and private services and utilities, parks, and trails;
   - Adequate provisions are made for maintenance of public utilities; and
   - All relevant statutory codes, regulations, ordinances, and compliance with the same. The review and decision of the city shall be in accordance with the provisions of CMC Chapter 18.55 Administration and Procedures.

BUILDING DIVISION — Brian Smith | 817-1568

No comments at this time.

ENGINEERING DIVISION — Anita Ashton | 817-7231

<u>General Engineering Requirements:</u>

1. Civil site construction plans shall be prepared by a licensed Washington State Engineer in accordance with the *Camas Design Standards Manual (CDSM)* and CMC 17.19.040.
2. Per CMC 17.19.040.C.1 all utilities designed to serve the development shall be placed underground. This includes the dry utilities, such as power, fiber optics, cable, etc.
3. *<u>Engineering civil site improvements plans are not to be submitted until after land-use decision is issued.</u>*
4. Engineering civil site improvement plans are to be submitted to Community Development (CDev) Engineering Dept. for review and approval.
5. The CDev Engineering Dept. is responsible for plan review (PR) and construction inspection (CI). A 3% PR&CI fee is collected by engineering for all infrastructure improvements.
   a. The 3% fee is based on a stamped engineer's estimate.
   b. The engineer's estimate is to include all improvements outside of the proposed building footprints.
   c. *<u>Payment of the 1% plan review (PR) fee is required prior to 1st review of the civil plans</u>*.
      i. *<u>The 1st review will not begin until the 1% PR fee is paid.</u>*
   d. *<u>Payment of the 2% construction inspection (CI) fee is to be paid prior to release of approved construction drawings by the CDev Engineering Dept.</u>*
6. *<u>Building permit applications are not to be submitted until after final engineering plan approval</u>*, *<u>unless otherwise approved by the Building Official.</u>*
7. The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, and traffic control markings for the proposed development.

8. Work within the city right-of-way (ROW) will require an encroachment permit and approval of a traffic control plan (TCP), prior to start of any work.
    a. The encroachment permit and TCP is to be submitted to CDev engineering.
9. If applicable, existing wells, septic tanks, and septic drain fields shall be decommissioned in accordance with state and county guidelines per CMC 17.19.020 (A3).
10. Regulations for installation of public improvements, improvement agreements, bonding, final acceptance, etc. can be found at CMC 17.21.
11. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, and associated appurtenances are installed.

Traffic/Transportation:

1. A transportation impact analysis (TIA) is required and shall be prepared in accordance with the City's adopted *Traffic Impact Study Guidelines* as outlined in the *CDSM*.
2. The Applicant will be required to have a traffic engineer analyze the following:
    a. Site distance at the applicant's access point onto NE 13th Street.
    b. Vision clearance area is to be addressed, per CMC 18.17.030.
    c. An onsite traffic circulation plan showing ingress and egress, per CMC 17.19.040 (B.10.a).
    d. Address movement conflicts with nearby intersections and existing driveways.
    e. Provide AM and PM Peak Hour trip distribution to and from the site down to less than 20 trips thru any given impacted intersection.
    f. Intersections to be analyzed include, but are not limited:
        i. NE Goodwin Road / NW Friberg-Strunk Street
        ii. NE 192nd Avenue / NE 13th Street
        iii. SE 1st Street / NW Friberg-Strunk Street
        iv. Additional intersections will be based on the trip distribution information and the COV Concurrency requirements in the attached memo noted below.
3. Comments from Eric Hahn, City of Vancouver's Senior Engineer for Streets & Transportation are attached. The applicant's traffic engineer is to include and address the requirements noted in the July 14, 2022, Concurrency Review memo.
4. At time of application, the additional comments will be provided from Clark County's Concurrency Engineer regarding the proposed development.

Streets:

The proposed development is bordered by NE 13th Street on the north side and on the east side by NW Friberg-Strunk Street.

NE 13th Street:

1. Half-width street improvements along NE 13th Street is not TIF creditable at this time.
2. NE 13th Street is federally functionally classified as a minor arterial within Camas City Limits.
    a. There were minimal frontage improvements installed on the corner of NE 13th Street and NW Friberg-Strunk Street as part of the intersection improvements for the signal and road improvements to the south.

3. Per CMC 17.19.040.B.1, the applicant will be required to construct full-depth half-width street improvements along the frontage of the proposed development along the NE 13th Street frontage.
    a. The required frontage improvements, which will begin at the west curb return and continue west along the proposed development.
    b. Some of the existing curb along the right-turn lane, to the west, will need to be removed for the frontage improvements and to still allow for the right-turn lane to the east. Staff will work with the applicant's consultant to during the preliminary design phase.
4. Per CMC 17.19.040.B.5, the applicant will be required to dedicate sufficient right-of-way (ROW) for full half-width street improvements.
    a. The existing right-of-way width varies from approximately 60-feet to 63-feet along the frontage of the proposed development.
    b. The existing right-of-way width from the centerline to the existing north property boundary varies from 25-feet to 27-feet.
    c. The applicant will be required to dedicate approximately 10-feet to 14-feet of ROW to allow for construction of curb & gutter, 6-foot sidewalk, 6-foot planter strip, maintain the existing right-turn lane, 5-foot bike lane, and a center left-turn median.
5. Per *CDSM, Table 1 – Guideline for Geometry of Private Roadways - Off-Street Parking*:
    a. Note 2.c: Aisle dimensions: one-way aisles are a minimum of 15-feet wide; two-way aisles are a minimum of 24-feet wide.
    b. Note 2.d: Parking spaces are to be setback a minimum of 50-feet from back of sidewalk on an arterial.
        i. The existing depth of the parcel is 131-feet. The requirement for right-of-way dedication will reduce the depth the depth of the parcel. Meeting the required offset from the back of sidewalk would further reduce the developable area.
        ii. A deviation request from the minimum 50-foot setback requirement should be submitted. A deviation request from this standard would be supported by the city engineer.
6. Per *CDSM Table 3, Access Spacing Standards* on a roadway classified as an arterial are 660-feet minimum and 1000-feet max.
    a. The westernmost property boundary is approximately 367-feet west of the intersection on NE 13th Street and NW Friberg-Strunk Street.
    b. The existing driveway to the current single-family residence is approximately 244-feet west of the intersection of NE 13th Street and NW Friberg-Strunk Street.
    c. A deviation request from meeting the minimum access spacing required should be submitted. A deviation request from this standard would be supported by the city engineer. However, The access to the proposed development is to be located as close to the western property boundary as feasible.
6. The proposed drive access is to be a minimum 24-foot-wide full ingress / egress access, with 35-foot curb radii and ADA accessible curb ramps on each side.
    a. A wider drive access may be required to accommodate fueling tankers and large delivery vehicles. The onsite circulation plan is to be based on the fueling tankers and large delivery vehicles.

On-site Parking Lot Requirements:

7. Per CDSM, Table 1 – Guideline for Geometry of Private Roadway:
    a. Note 2.c: Aisle dimensions: one-way aisles are a minimum of 15-feet wide; two-way aisles are a minimum of 24-feet wide.
8. Additional drive aisle widths may be required based on usage, truck sizes, on-site circulation plan, and input from Fire Marshall's Office.

NW Friberg-Strunk Street:

9. NW Friberg-Strunk Street is a fully improved 3-lane arterial with two travel lanes and a center-turn pocket with sidewalk and planter strips on both sides.
10. No frontage improvements or right-of-way dedication will be required since the road is fully improved.
11. No access is proposed to the site; nor will one be allowed on NW Friberg-Strunk Street due to the site's proximity to the intersection with NW 13th Street.

<u>Stormwater:</u>

1. The size of the proposed development is approximately 41,382 sf (0.95 acres).
2. A preliminary stormwater report (TIR), in accordance with the latest edition of Ecology's *Stormwater Management Manual for Western Washington (current edition 2019 SWMMWW*), is required at time of application.
3. Per CMC 14.02 Stormwater Control, stormwater treatment and detention shall be designed in accordance with the latest edition of Ecology's *SWMMWW*.
4. Refer to Ecology's *Figure I-3.1 Flow Chart for Determining Requirements for Re-Development (Vol. I, Chapter 3)*.
    a. All development projects shall comply with Minimum Requirement (MR) #2 – Submittal of a Stormwater Pollution Prevent Plan (SWPPP).
    b. As the project results in 5,000 sf, or greater, of new plus replaced hard surface area; than Minimum Requirements (MR) #1- #9 will apply.
5. Catch basins that will collect surface water runoff from the fueling station area are to discharge to the sanitary sewer system.
6. Ownership and maintenance of onsite stormwater facilities will be the responsibility of the property Owner, per CMC 17.19.040 (C3).
7. The City shall have right-of-entry for inspection purposes.
8. Onsite private storm easements, if required, are to be shown on the construction drawings.
9. Provisions are to be made for roof downspout controls. Stormwater from downspouts is not to be directed onto adjoining parcels. Reference Ecology's latest edition of the SWMMWW for roof downspout controls.
10. A designated concrete washout area (BMP C154, Vol. II, Chap. 3, pgs. 320-326) is to be shown on the site plans.
    a. The concrete washout area is to be removed prior to issuance of final occupancy.

<u>Erosion Control</u>

1. The size of the proposed development is approximately 41,382 sf (0.95 acres).

2. The land-disturbing activities are not greater than one acre, therefore, the applicant is not required to obtain an *NPDES Construction Stormwater General Permit* from Ecology.
    a. However, a Stormwater Pollution Prevention Plan (SWPPP) is required and is to be submitted prior to any land-disturbing activities. A copy is to be on site at all times during construction.
3. The applicant will be responsible for all erosion and sediment control measures to ensure that sediment laden water does not leave the site or impact adjacent parcels.
4. Mud tracking onto the road surface is discouraged and any mud tracking is to be cleaned up immediately.

<u>Water:</u>

1. There is an existing 12-inch water main located in NE Friberg-Strunk Street.
    a. An 8-inch water service and an existing 1-inch water service were stubbed to this parcel from NW Friberg-Strunk Street. The 8-inch water service is located at the southernmost property boundary of the proposed development, with the 1-inch water service approximately 5-feet to the north.
2. The applicant will be required to design and extend the existing 8-inch ductile iron waterline for the proposed development.
3. The onsite water system shall be privately owned and maintained beyond the water meter by the property owner.
    a. <u>An above-ground reduced pressure valve assembly (RPBA) is to be installed behind the water meter and is to be accessible for testing and inspections.</u>
    b. The onsite fire line will require a Double Detector Check Valve (DDCV) which is to be located at the right-of-way.
4. Applicant shall demonstrate that there are adequate fire flows available for the development.
5. Onsite fire hydrants are to be private and shall be ordered and painted red from the factory.
6. Irrigation systems will require a separate irrigation meter with Back Flow Prevention Device (BFPD), which will be owned and maintained by the property owners.
7. A 10-foot separation is required, within the right-of-way, between the waterline and sanitary sewer main.

<u>Sanitary Sewer:</u>

1. NW Friberg-Strunk Street: There is an existing 4-inch pressure sewer main located in the west side of NW Friberg-Strunk Street.
    a. A 4-inch pressure sewer lateral was stubbed to this parcel from NE Friberg-Strunk Street. The existing 4-inch lateral is located approximately 15-feet north of the 8-inch water service.
2. The applicant will be responsible for the design, installation, and maintenance of the private STEP sewer system, including the STEP tank, that will serve the proposed development, per CMC 17.19.040 (C, 2, d.).
3. A 10-foot separation is required, within the right-of-way, between water service and sewer lateral.

Parks/Trails:

1. Not applicable.

Garbage & Recycling:

1. Location of onsite garbage and recycling receptacles is to be approved by the garbage and recycling providers.

Impact Fees & System Development Charges (SDCs):

1. The proposed development is located in the South District.
2. Impact Fees and SDCs are collected at time of building permit submittal.
3. The impact fees and SDCs noted below are for informational purposes only.
4. Impact fees and SDCs are adjusted on January 1st of each year.

Impact Fees for 2022:

Commercial use:

1. Traffic Impact Fees (TIF) – $3,657.00 / PM Peak Hour Trip
   a. Contact Engineering for estimated fees which will be based on usage and number of PM Peak Hour trips.
2. School Impact Fees (SIF) – Not applicable
3. Park/Open Space (PIF) – Not applicable
4. Fire (FIF) - $0.40 psf

System Development Charges (SDCs) for 2022:

1. Water
   a. 1" meter - $13,451.00 + $445.00 connection fee
   b. 1.5" meter - $26,901.00 + $851.00 connection fee
   c. 2" meter - $43,002.00 + $2,075.00 connection fee

2. Sewer – Commercial (Sewer SDCs are based on the size of water meters.)
   a. 1" meter - $6,234.00 + $177.00 STEP/STEF Inspection
   b. 1.5" meter - $12,467.00 + $177.00 STEP/STEF Inspection
   c. 2" meter - $19,948.00 + $177.00 STEP/STEF Inspection

FIRE MARSHAL Randy Miller | 834-6191

No building or structure regulated by the building and/or fire code shall be erected, constructed, enlarged, altered, repaired, moved, converted, or demolished unless a separate permit for each building or structure has first been obtained from the CWFMO Camas Municipal Code 15.04.030.D.12.a

Any inadvertent omission or failure to site or include any applicable codes or code language by the Fire Marshal's office or the City shall not be considered a waiver by the applicant.

1) Multiple permits or potential permits with the Fire Marshal's Office will/may be required as this property develops.
    a. Site Plan
    b. New Construction permit with the FMO. Provide 2 sets of drawings and any explanatory needed to complete the review.
    c. Depending on building use, NFPA 24 Fire Main Underground permit required with the FMO. Minimum level "U" license required. Strictly enforced.
    d. Depending on building use classification, NFPA 13 Fire Sprinkler System required with the FMO. WA State licensed fire sprinkler contractor. Federal programs for tax benefits may be available for fire sprinkler installations.
    e. Depending on building use, NFPA 72 Fire Alarm System permit required with the FMO, minimum NICET III for design and NICET II for acceptance testing.
    f. NFPA 17A Commercial Hood Suppression System permit required with the FMO. (commercial-hood or stand-alone fryer systems) Mechanical permit with the building department required.
    g. IFC CO2 Permit required with the FMO for any Dewar Tank use.
    h. Permit required with the FMO for any retail propane tank exchange-cabinet.
    i. IFC Fuel Dispensing. Combustible/flammable liquids underground tanks-dispensing and use Permit required with the FMO.
    j. Bulk Propane tank Sales/Dispensing Permit required with the FMO when applicable.
    k. UST Permit required with the FMO for any underground storage tanks discovered during site preparations/excavation.
    l. Approved address and or monument required with the FMO, to be clearly visible and readable from both directions on 13th.

2) Please don't hesitate to contact the FMO if you have any questions. 360-834-6191 or FMO@cityofcamas.us

20101 NE 13th Street Gas Station **County Pre-app (PA22-32)**
20101 NE 12th Street Case Mgr (Yvette Sennewald)

CONCURRENCY (VMC 11.70)

- Based on submitted information and the City of Vancouver's initial review the proposed development may send trips to the following Transportation Management Zones (TMZ) and Transportation Analysis Zones (TAZ).

TAZ #481

TMZ/Corridor	**Limits of Corridor**
192nd Avenue	SR 14 to 18th Street

- After an initial review of the submitted information it appears the proposed project may send trips into the city's street systems and concurrency corridors. The City of Vancouver requests the following submittal requirements be placed on the proposed project:

Trip Generation and Distribution

- Use the most current edition of the Institute of Transportation Engineers (ITE) Tip Generation, and follow the guidelines specified in the most current ITE Trip Generation Handbook. Trip generation and distribution shall be justified by the applicant and approved by the City Traffic Engineer prior to completion of the TIA.
- Approved pass-by trips shall be included at driveways.

A. General TIA Requirements.

- For any development sending 5 or more net new PM peak hour trips through the city's concurrency corridors, trip generation and distribution is required for project-generated AM & PM peak hour trips at or adjacent to all site accesses.
- When sending fewer than 5 PM peak trips through the city's concurrency corridors only trip generation is required. In this case, the trip generation calculation does not have to be completed by a licensed engineer.
- Additionally, for developments sending 20 or more PM peak hour trips through the city's concurrency corridors, the analysis shall encompass all intersections specified by the traffic engineer for LOS analysis that fall within the limits identified in 11.70.090. The analysis may also include intersections beyond the thresholds listed in 11.70.090 where significant traffic hazards would be caused or materially aggravated by the proposed development.
- Trip distribution shall use the Regional Transportation Council select link assignment for the project TAZ. However, if the project sends fewer than 20 net new PM peak hour trips through the city's concurrency corridors, trip distribution may be based on existing traffic patterns and guidelines in the current ITE Trip Generation Handbook.

B. Transportation Concurrency Requirements.

- For developments sending 5 or more net new PM peak hour trips through the city's concurrency corridors, the applicant is required to submit trip generation and distribution for the proposed development and to list the number of PM peak trips entering each of the concurrency corridors in table format. See Table 1 below for the list of corridors.
- For developments sending fewer than 5 PM peak trips through the city's concurrency corridors, trip distribution is not required. However, for concurrency purposes, all trips shall be assumed to impact the closest concurrency corridor.
- Transportation Concurrency is evaluated according to the Corridor Classification. The Director may require additional information or modeling if an impacted corridor is operating close to the adopted level of service. Generally, where a proposed development sends trips to a Category 1 or Category 2 corridor, the Director shall track those trips and presume concurrency between LOS measurements pursuant to VMC 11.70.090.

Table 1: Concurrency Corridors and Current Classification

Arterial Concurrency Corridor	Extent	LOS Standard Avg. PM Peak Speed (MPH)	2012 Corridor Classification
Mill Plain Blvd.	Fourth Plain to I-5	10	Category 1
	I-5 to Andresen	12	Category 1
	Andresen to I-205	12	Category 1
	I-205 to 136th Ave.	10	Category 1
	136th Ave. to 164th Ave.	10	Category 1
	164th Ave. to 192nd Ave.	10	Category 1
St. Johns / Ft. Van Way	Mill Plain to 63rd St.	12	Category 1
Fourth Plain Blvd.	Mill Plain to I-5	12	Category 1
	I-5 to Andresen	10	Category 1
	Andresen to I-205	10	Category 1
	I-205 to 162nd Ave.	10	Category 1
Andresen Road	Mill Plain to SR500	11	Category 1
	SR500 to 78th St.	15	Category 1
112th Avenue	Mill Plain to 28th St.	11	Category 1
	28th St. to 51st St.	15	Category 1
164th/162nd Avenue	SR14 to SE 1st St.	10	Category 1
	SE 1st St. to Fourth Plain	10	Category 1
Burton Road / 28th Street	18th St. to 112th Ave.	12	Category 1
	112th Ave. to 138th Ave.	10	Category 1
	138th Ave. to 162nd Ave.	12	Category 1
18th Street	112th Ave. to 138th Ave.	12	Category 1
	138th Ave. to 164th	12	Category 1

	Ave.		
136th/137th Avenue	Mill Plain to 28th St.	12	Category 1
	28th St. to Fourth Plain	12	Category 1
192nd Avenue	SR14 to NE 18th St.	10	Category 1

Identify in table format the number of site generated PM peak hour trips entering all City corridors, if any. If there are no trips to a corridor, enter as zero.

- Prior to final site plan approval, the applicant shall pay per-trip monitoring fees for trips sent to every corridor, up to a maximum monitoring fee of $1,500 for any single development (VMC 20.180.070).

- **Below are a few items that shall be included in the traffic impact analysis. All other requirements can be found on the City of Vancouver website at** http://www.cityofvancouver.us/publicworks/page/concurrency

  - Safety – Crash history and mitigations - Provide a five year crash history, crash rate per mev, and proposed mitigations for intersections with crash rate exceeding 1.0 per mev. Copies of the crash reports shall be included in the TIA. (VMC 11.80.130 and 11.70)
    Please contact Eric Hahn, Senior Civil Engineer, at Eric.Hahn@cityofvancouver.us for a list of intersections to study.

  - Safety and operations – Queue analysis - Provide peak hour queue analysis. (VMC 11.80.130, 11.80.080, 11.70)
    Please contact Eric Hahn, Senior Civil Engineer, at Eric.Hahn@cityofvancouver.us for a list of intersections to study.

  - Warrant analysis – Signals and Turn lanes - Provide traffic signal / turn lane warrants as defined by the Manual on Uniform Traffic Control Devices. (VMC 11.80.080)
    Please contact Eric Hahn, Senior Civil Engineer, at Eric.Hahn@cityofvancouver.us for a list of intersections to study.

- **The city is collecting proportionate share fees for the following project(s):**

Project Location	Unit Cost per Trip
137th Ave – 49th St to Fourth Plain Blvd	**$3,000** per PM peak hour trip
192nd Ave & SR-14 ramps	**$2,000** per PM peak hour trip
Fourth Plain Blvd & 152nd Ave Signal	**$333** per PM peak hour trip
Lieser/St. Helens/MacArthur	**$2,000** per PM peak hour trip
192nd Avenue & NE 13th Street	**$400** per PM Peak hour trip
192nd Ave & SE 34th St	**$150** per PM peak hour trip
176th Ave & SE 20th St	**$400** per PM peak hour trip
Grove St/Columbia House Blvd/SR-14 WB off-ramp	**$600** per **AM** peak hour trip
MacArthur & Devine Roundabout	**$2,226** per **PM** peak hour trip
MacArthur & Andresen Roundabout	**$2,285** per **PM** peak hour trip

- **The applicant will be required to contribute proportionate share fees to mitigate trips that the development project will generate and send through any of the current proportionate share projects. The TIA must determine and identify the number of peak hour trips that will be generated by the project and sent through the proportionate share intersections and/or street segments as listed above.**

- **The applicant shall submit to the City of Vancouver a trip generation and distribution and assignment to 5 pm peak hour trips and the traffic study review fee of $398.00. This shall be submitted electronically in ePlans.**

- If there any questions on the City of Vancouver transportation or traffic scoping requirements, please contact Eric Hahn or Jen Patrick at the City of Vancouver - Transportation Services at the contact numbers listed below.

  Eric Hahn
  Eric.Hahn@cityofvancouer.us
  (360) 487-7702

  Jen Patrick
  Jennifer.Patrick@cityofvancouver.us
  (360) 487-7720

PROJECT NARRATIVE
For

13TH SITE PLAN

A PRELIMINARY TYPE II APPLICATION

Submitted to
CITY OF CAMAS

FOR
TAZ KHAN
3993 NW Currawong Court
Camas, WA 98607

October 2023

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General Information

Applicant/Owner:

Taz Khan
3993 NW Currawong Court
Camas, WA 98607
512-779-4999
tkhanusa@gmail.com

Owner:

Pak USA Camas LLC
20101 NE 13th Street
Camas, WA 98607

Project Contacts:

PLS Engineering
Travis Johnson, PE
604 W Evergreen Boulevard
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

Location:	NW ¼ of Section 29, T2N, R3E, WM
Address:	20101 NE 13th Street, Camas, WA 98607
Project Size:	0.97 acres/42,257 SF
Zoning:	BP – Business Park
Overlay:	None
Comprehensive Plan:	IND
Current Use:	Vacant
Parcel Number:	176148000
School District:	Evergreen
Water District:	Camas
Sewer District:	Camas
Fire District:	Camas
Park District:	N/A
Clark County Reference:	PA22-32
Transportation Impact Fee:	Camas

Project Description

The 13th Street Site Plan project proposes to construct a 4,100 sf convenience store with drive-thru car wash and gas pumps on parcel 176148000. The convenience store will have small general retail sales including food items, cold beverages and potentially some on-site prepared foods.

The site is located on the southwest corner of the intersection at NE 13th Street and NW Friberg-Strunk Street. A single-family home is currently on site that will be removed. Parcels to the north across NE 13th Street, as well as directly to the west, are single-family residential uses under Clark County jurisdiction. South of the site is a developing business park approved as Lacamas Tech Business Park. East of the site across NW Friberg-Strunk Street is Camas Meadows Golf Club.

The site is relatively flat with vegetation consisting primarily of grass with scattered trees.

Transportation and Utilities:
NE 13th Street is an existing Minor Arterial that abuts the site to the north and provides access to the site. Frontage improvements are proposed to bring the street up to half-width standards including a 37' half-width ROW and 23' half-width paved section with 6' planter strip and 6' detached sidewalks.

NW Friberg-Strunk Street is a fully improved 3 lane arterial that does not require frontage improvements per the Pre-Application Conference Report.

There are no transit routes or stops within 1/4 mile of the development site.

A traffic study has been provided that shows the projected trip generations for the development. No offsite mitigation is required based on the study.

Stormwater will be collected and treated onsite before being routed to an onsite underground stormwater detention facility. From there it will be discharged to an existing conveyance system. A stormwater report has been provided to show compliance with the City stormwater regulations.

The site will be served by public water and sewer services.

Critical Areas:
Ecological Land Services (ELS) assessed the site for critical areas and has provided a Critical Areas Report. ELS concludes that there is one Oregon white oak on the south portion of the property, but no wetlands, oak woodlands or cave as mapped by WDFW.

The parcel is within a high and moderate - high archaeological predictive area, therefore an Archaeological Predetermination has been prepared for the site and submitted with this application.

Proposal & Code Compliance Discussion

Title 16 – Environment

16.01 - SEPA

The State Environmental Policy Act (SEPA) procedures require documentation of critical areas as well as discussion on earth, air, water, plants and animals, energy and natural resources, environmental health, noise, land and shoreline uses, aesthetics, recreation, historic and cultural preservation, transportation, and public services and utilities. A SEPA application is required and has been included with this application.

16.31 – Archaeological Resource Preservation

The site is located in an area of high probability for the presence of archaeological artifacts. An Archaeological Predetermination Survey Report is required for this project. Archaeological Services, LLC (ASCC) performed an onsite field investigation on August 17, 2023. Several artifacts were found including pink glass fragments suspected to be Depression Glass, a coin bank dated to 1926-1930, and a metal bolt. Based on these items, along with the former structures that appear on site in historic photos, ASCC is recording the debris scatter as a historic-area archaeological site and recommends a Cultural Resource Survey Report prior to any ground disturbing activity.

16.51 – Critical Areas - 16.53 Wetlands - 16.61 Fish and Wildlife Habitat

WDFW has mapped the site as having oak woodland and being within a cave rich area. No wetlands are mapped onsite however potential wetlands are mapped by Clark County GIS on the property to the south. A Critical Areas Report has been prepared by Ecological Land Services (ELS) for the the site and concludes that there is one Oregon white oak on the south portion of the property, but no oak woodlands or caves as mapped by WDFW. The potential wetland to the south is located within the footprint of a proposed building and that application has received permits to fill the wetland.

A Mitigation Plan prepared by ELS is included with this application that proposes mitigation within the Terrace Oak Bank for the removal of the single Oregon white oak on site.

Title 17 – Land Development

17.19.040 – Infrastructure Standards

NE 13th Street is an existing minor arterial that abuts the site to the north. Access to the site will be via a new entrance/exit from NE 13th Street. Half width improvements are proposed as part of this project. Some improvements at the intersection of NW Friberg-Strunk Street were previously completed. Frontage improvements for this development will begin at the west curb return and continue west along the site frontage. Additional right-of-way will be dedicated to provide a 37' half-width right-of-way with a 52' full-width right-of-way. The 23'paved

roadway half width that tapers out to 28.5'at the intersection with NW Friberg-Strunk Street. It includes a 6' detached sidewalk and an 8' planter strip.

NW Friberg-Strunk is an existing 3-lane arterial that is fully improved. No frontage improvements are required or proposed. No access is proposed via NW Friberg-Strunk Street.

Circulation:

No circulation to adjacent parcels is proposed. The site fronts on NE 13th Street and NW Friberg-Strunk Street, therefore no further circulation to the north or east is required. The parcel to the west is zoned residential and falls under Clark County jurisdiction. Any circulation to the west would not be compatible with this proposed use. The parcels to the south are currently developing as a business park and do not require circulation to and through the subject parcel.

Turnarounds:

The proposed drive aisles that will serve the site vary in width from 24' to 32' wide and can be utilized as a loop road for fire turnaround.

Pedestrian/Bicycle Circulation:

All sidewalks, driveway aprons, and pedestrian crossings will comply with the American with Disabilities Act.

Access Spacing:

Required access spacing along an arterial is 660' minimum and 1,000' maximum. The westernmost property line is approximately 367' west of the intersection with NW Friberg-Strunk Street, therefore it is not possible to meet minimum access spacing based on the existing conditions of the site. A deviation request has been submitted with this application to grant relief from this standard. The access to the site has been located as far west as possible, while allowing for a street taper on NE 13th Street and providing space on site for gas tanker trucks to maneuver to exit the site.

Traffic Study:

A Traffic Study has been prepared for this project by Charbonneau Engineering and is included with this application. The following is a summary of the study:

- Intersection sight distance at the access point exceeds the minimum standard (390 feet) as over 500 feet of sightline is available in both directions on NE 13th Street. For safety reasons the sightlines must be maintained and potential obstructions due to street grade, buildings, parking, signing, fencing, landscaping, above ground utilities, or other objects shall not be permitted.
- The capacity analysis has determined that only one intersection will fail. The signalized intersection at NE 13th Street and NE 192nd Avenue will operate at LOS `F` during the PM peak hour in the year 2026 background and total traffic scenarios. The failing condition is attributed to the growth and in-process traffic. The City has recognized and documented in the TSP that long range future improvements will be necessary on NE 13th Street (Goodwin Road) to accommodate heavier traffic. A year 2035 improvement is listed in Table 6 within the TSP that proposes street widening which should mitigate the issue.

Specifically, the current study finds that adding a separate left turn lane on the westbound approach will mitigate the failing condition to acceptable LOS `D`. However, no mitigation is proposed in conjunction with the gas station & market development as the failure is due to the background traffic conditions.

- A left turn lane warrant was assessed for the westbound to southbound movement from NE 13th Street for traffic entering the site. The AM & PM peak hours were evaluated for the year 2026 total traffic scenario. The turn lane is not warranted in the PM peak hour. The warrant curve (Exhibit 1310-7a in the appendix) indicates that a left turn is marginally met based on a 40 MPH travel speed. However, the travel speed on NE 13th Street is 35 MPH which if plotted indicates the warrant would not be met. It is also noted that the queuing analysis for the westbound left turn movement has confirmed that up to one vehicle may queue to make a left turn resulting in a LOS `A` condition. Considering these factors adding a westbound left turn lane on NE 13th Street is not proposed in conjunction with the development.
- Based on the findings of the traffic analysis no off-site improvements to the transportation system are recommended.
- The City of Vancouver's intersections that are identified for future improvements are detailed in the traffic study in Table 4. The table includes the number of peak hour site trips that will impact the locations, cost per trip, and the proportionate share fee equating to $153,050.
- The development at full build out will create an additional 2,281 new trips, with 60 net AM peak hour trips and 81 net PM peak hour trips.

Sewer and Water

The site will be served by the City of Camas for public sewer service. There is an existing 4" pressure sewer main located in the west half of NE Friberg-Strunk Street. A 4" pressure sewer lateral was stubbed to the site from NE Friberg-Strunk Street. A private STEP sewer system is required for this site.

City of Camas will provide public water service. There in an existing 12" water main located in NE Friberg-Strunk Street with an existing 8" water main to the site at the SE corner of the site. The development will extend the existing 8" water main to serve the site.

Stormwater and Erosion Control

Stormwater runoff from pollution generating surfaces is proposed to be treated using filter cartridges and then routed to an underground detention facility. Infiltration was deemed infeasible by the geotechnical engineer, so discharge from the site will be routed to an existing drainage ditch on the north side of the site.

A preliminary stormwater plan has been submitted with this application. The preliminary technical information report (TIR) has also been submitted with this application which better explains the stormwater system and how it meets the applicable code.

Garbage and Recycling:
The location of onsite garbage and recycling receptacles is shown on the preliminary site plan.

Impact Fees:
This development will pay impact fees for traffic and fire.

System Development Charges:
Water and sewer system development charges will be paid by this development.

Fire:
Fire apparatus access is provided onsite with the proposed drive aisles. Permits for underground storage tanks, fuel dispensing, sprinkler system and fire alarm system will be required. One new fire hydrant is proposed onsite.

Title 18 - Zoning

18.05 – Zoning Districts

The site is designated as being within the BP (Business Park) zoning district, a commercial district.

18.07 – Use Authorization

The applicant proposes a gas/fuel station with mini market, which is a permitted uses in the BP zone. Development in this zone is noted as needing to comply with Design Review under CMC 18.19.

18.09 – Density and Dimensions

Density standards are not applicable for this zone/use. The following standards apply to this development:

Table 1 – Density and Dimensions for Commercial and Industrial Zones

	BP	Proposed
Maximum density (dwelling units/net acre)	n/a	n/a
Minimum lot area (square feet)	½ acre	0.97 acres
Minimum lot width (feet)	100	131’
Minimum lot depth (feet)	100	328’
Maximum building lot coverage	50%	20%
Maximum building height (feet)	None	28’
Minimum front yard	15’	15’
Minimum side yard	15’	15’
Minimum rear yard	50’	50’

The development will comply with the above standards.

18.11 – Parking

CMC 18.11.130 requires that gas stations with mini markets provide 1 parking space per nozzle plus 1 space per 250 sf of gross floor area. Car wash uses require 2 spaces per stall and 1 space per 2 employees. The following parking calculations demonstrate what is required for this site:

4,100 sf mini market @ 1/250 sf	= 17 spaces
8 nozzle gas station @ 1/nozzle	= 8 spaces
1 stall carwash w/2 employees @ 2/stall + ½ employees	= 3 spaces
Total	= 28 spaces
Excluding gas fill-up stalls	= 20 spaces

This development proposes a total of 20 parking spaces, all standard size, plus 8 gas fill-up stalls. Of the 20 standard spaces 1 will be ADA compliant, 2 will have electric vehicle charging infrastructure at the time of development and 2 are designated as future electric vehicle charging spaces.

The design of the site limits any vehicle from having to back out into public right-of-way.

18.13 – Landscaping

A Tree Survey has been submitted with this application providing an inventory of existing trees. A Landscape, Tree and Vegetation Plan has been submitted with this application showing proposed landscaping, and all onsite trees proposed to be retained or removed.

A 20-unit/acre tree density per net acre has been incorporated into the site plan. The tree density is met by providing street trees, and plantings withing the proposed tract areas. The proposed and adjacent uses are residential or open space, so specific landscape buffers are not required.

Landscape buffers have been provided as follows:

North: 5' - L2
West: 10' – L3
South: 5' – L2
East: 10' – L3

The pre-application conference report states that the drive-thru car wash should be screened to a 10'- L3 buffer standard. This would require a 10' – L3 buffer along the east as well as a portion of the north property line. This is not a code requirement, rather a design review recommendation from previous projects. It is not possible to provide the 10' buffer due to the constraints of the parcel. The lot is narrow; after right-of-way dedication the remaining lot width is approximately 124'. A 10' – L3 buffer is provided along NW Friberg-Strunk Street, as the lot is quite deep and there is room for the additional buffer. Along NE 13th Street a 5' – L2 buffer has been shown. It should be noted that the drive-thru for the car wash will generate significantly less traffic than a drive-thru for fast food. In addition, the car wash will generate fewer trips than the traffic utilizing the site for the gas station or the mini mart. From a trip

generation/screening standpoint it does not seem that additional screening is necessary for this type of a drive-thru. A deviation request is not submitted for this item because the project does meet written code. The applicant hopes that the City will work with us to find a compromise.

Street trees will be provided along NE 13th Street. NW Friberg-Strunk Street is already built to the required standards with street trees; no street trees along NW Friberg-Strunk Street are proposed.

18.15 – Signs

No signs are proposed with this project at this time.

18.17 – Supplemental Development Standards

This lot is a corner lot, therefore a vision clearance area of 15' x 15' is required.

18.19 – Design Review

Per CMC 18.19.020 Design Review is required for new developments in commercial zones. The applicant has designed the site to provide:

- Parking areas placed towards the interior of the site and screened with landscaping.
- The drive-thru is screened heavily with landscape.
- The design of the site has kept development away from the existing home to the west.
- The proposed building is designed to be built right on the setback line in order to define the streetscape. Blank walls have been avoided.
- Outdoor lighting will be directed so as not to impact adjacent properties and streets.

18.18 – Site Plan Review

This proposal is subject to a Type II Site Plan Review. All applicable content has been submitted for a complete application. The following criteria must be addressed in order for the site plan to be approved:

- *Compatibility with the City's comprehensive plan*

Response: This project encourages economic development in an area designated as Business Park, which is considered Employment Land.

- *Compliance with all applicable design and development standards*

Response: As evidenced in this narrative, and associated plans, the proposed development complies with all applicable codes and development standards.

- *Availability and accessibility of adequate public services*

Response: Public water and sewer are available adjacent to the site in public right-of-way. Garbage and recycling services are available in the area. Emergency services such as fire, medical and police also are available in the area. This development will not impact schools or parks.

- *Adequate provisions are made for other public and private services and utilities, parks, and trails*

Response: This development will pay impact fees for traffic and fire, as well as system development charges for water and sewer. This development will not impact schools or parks as it is commercial in nature. There are no trails in the vicinity of the site to connect to. Garbage and recycling service will be paid for by the owner of the site.

- *Adequate provisions are made for maintenance of public utilities*

Response: Provisions have been made to provide for the maintenance of public utilities by paying impact fees and system development charges.

- *All relevant statutory codes, regulations, ordinance, and compliance with the same*

Response: This narrative and the associated plans and reports address all relevant statutory codes, regulations, ordinance and demonstrate compliance with the applicable codes.

18.55 – Administration and Procedures

This project is subject to a Type II process for Site Plan Review. The application will be subject to the development approval and application timelines of this chapter.

A preapplication meeting is required per CMC 18.55.060. A preapplication conference was held on July 28th, 2022 and a land use application was not submitted within 180 days. The applicant met City staff to review changes made to the layout. Emails with Yvette Sennewold confirm that this meeting acted as a 2nd pre-application conference and no further conference or waiver would be required.

The applicant has submitted the required documents and information as required CMC 18.55.110.

CLARK COUNTY WASHINGTON
PUBLIC HEALTH
www.clark.wa.gov
1601 E Fourth Plain Blvd, Bldg 17
PO Box 9825
Vancouver, WA 98666-8825
564.397.8000

August 23rd, 2023

Travis Johnson
PLS Engineering
604 W. Evergreen Blvd.
Vancouver, WA 98660

RE: Conditional Development Review Evaluation Approval for the "13th Street Site Plan" Development located at 20101 NE 13th St. in Camas, WA 98607 (SR0063672; APN 176148000; PA22-32)

*****Final Approval Required by Clark County Public Health*****

The Development Review Evaluation for which you applied has been completed by Clark County Public Health (CCPH). This evaluation is limited to the area of the proposed development.

On-Site Sewage Treatment Systems (CCC 24.17, WAC 246-272A, CCC 40.370, RCW 58.17):

Public sewer service is proposed and required for this development. The presence of an on-site sewage system (OSS) is indicated within County records and was confirmed by the current resident of the parcel during a 8/23/23 field evaluation:

- 20101 NE 13th St., APN 176148000 – Operational OSS (ON0018388), tank located east of existing residence consistent with as-built drawing within County records

Additional OSS components may exist at the site. This OSS and any OSS tanks or drywells discovered during development must be properly abandoned per CCC 24.17.210, with written notice provided to CCPH and Online RME Pumper Reports or receipts attached. Abandoned OSS locations must be marked on the final development site plan. The proposed development must be served by public sewer.

Water Systems (WAC 173-160, WAC 246-290, CCC 40.370, RCW 58.17):

Public water service is proposed and required for this project. The presence of an existing drinking water well is indicated within County records and was observed in the field by CCPH staff during a 8/23/23 field evaluation:

- 20101 NE 13th St., APN 176148000 – Operational water well (WP0002883) located west of existing residence as shown on OSS as-built drawing within County records

Additional water wells may exist at the site. This water well and any water wells discovered during development must be legally decommissioned by a licensed well driller per WAC 173-160-381, with written notice provided to CCPH and decommissioning well logs attached. Decommissioned well locations must be marked on the final development site plan. The proposed development must be served by public water.

If you have any questions concerning this letter, please contact me at (564) 397-7373.

Sincerely,

Salvador Robb-Chavez
Digitally signed by Salvador Robb-Chavez
Date: 2023.08.23 14:30:05 -07'00'

Salvador Robb-Chavez
Environmental Health Specialist II

Cc: Taz Khan, PAK USA Camas LLC; Yvette Sennewald, City of Camas Community Development Department

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]

13th Street Site Plan

2. Name of applicant: [help]

Taz Khan

3. Address and phone number of applicant and contact person: [help]

3993 NW Currawong Court
Camas, WA 98607

4. Date checklist prepared: [help]

August 23, 2023

5. Agency requesting checklist: [help]

City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]

Development is expected to start at the time of final construction drawing approval, likely in early 2024. No phasing is proposed.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

No, not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

SEPA Checklist, Archaeological Predetermination, Geotechnical Report, Critical Areas Report

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

No, there are no known government approvals pending related to this property.

10. List any government approvals or permits that will be needed for your proposal, if known.

- *Preliminary Type II Site Plan*
- *Public notification and staff report publications*
- *Final engineering plan review and approval*
- *Final Site Plan Approval*
- *SEPA*
- *SWWPPP*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The applicant proposes to construct a 4,100 sf convenience store with gas pumps and a drive through car wash. The site is zoned BP, Business Park, and is 0.97 acres in size.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

The site is located at 20101 NE 13th Street, Camas, WA 98607, in the NW ¼ of Section 29, Township 2 North, Range 3 East of the Willamette Meridian. The site is comprised of tax lot 176148000. See the proposed development plans for a preliminary site plan, grading plan, vicinity map and topographical data.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

5% per Clark County GIS data

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

This site has the following soils onsite per Clark County GIS data:

WrB – Wind River Gravelly Loam, 0-8% slopes
CvA – Cove Silty Loam, 0-3% slopes

It is unknown if these soils are classified as agricultural or if the site contains prime farmland.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate area.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

There will be grading for the construction of drive aisles, the installation of utilities, and the preparation of the site for the future convenience store, car wash and gas pumps. Surplus material may be required to be hauled from the site to an approved dump site or offsite fill may be required. Quantities and source are unknown at this time.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Standard erosion control measures will be followed during grading construction on the site. A final erosion control plan will be reviewed and approved by City of Camas.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 80%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Proposed measures to reduce and control erosion include providing an erosion control plan for review and approval prior to starting construction on the site and following the conditions of the approved grading and erosion control plan during all phases of construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal commercial/retail uses as well as possible vapor from the gas tanks.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are no known off-site sources of emissions or odor that may affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Dust from construction can be mitigated by sprinkling the site with water during construction as needed. Stage 2 vapor recovery systems will be included in the gas storage tanks and delivery systems.

3. Water [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

There is a wetland to the south of the site that has permits to be filled for the proposed

Lacamas Tech Business Park. There are no other surface water bodies or wetlands within the immediate vicinity of the site.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

No, there is no work that will take place within 200' of any water bodies.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

Not applicable – there are no wetlands onsite.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

The proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, the site does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No, there will be no discharge of waste material to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No ground water will be withdrawn with this proposal. Stormwater from pollution generating surfaces will be treated prior to being routed to an existing roadside ditch.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

No waste material is proposed to be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

The main source of runoff is from stormwater. There will be runoff from impervious roof area, drive aisles, parking areas, and landscaped areas. Onsite catch basins will connect

to a pipe network that leads to an underground detention facility that will discharge to an existing roadside ditch.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

Not anticipated.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

Use of approved erosion control measures during all phases of development.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

x deciduous tree: alder, **maple**, aspen, **other: Oregon white oak, ash, cottonwood, cherry**
x evergreen tree: **fir**, cedar, pine, other
x shrubs
x grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
x other types of vegetation: **blackberry**

b. What kind and amount of vegetation will be removed or altered? [help]

Site vegetation will be stripped for site preparation. Trees beyond the property line are proposed to be retained.

c. List threatened and endangered species known to be on or near the site. [help]

There is 1 priority habitat Oregon white oak onsite.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Landscaping will be provided onsite in accordance with City of Camas requirements. One Oregon white oak will be removed and mitigated at a 6:1 ratio.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

None known.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:
birds: hawk, heron, eagle, **songbirds, other:** mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Small mammals, such as mice, voles, and rabbits are located on and near the site. This site is also in an area where larger mammals, such as raccoons, opossum, and mammals indigenous to the Clark County area are sometimes located.

b. List any threatened and endangered species known to be on or near the site. [help]

There are no known threatened or endangered species on or near the site.

c. Is the site part of a migration route? If so, explain. help]

This site is part of the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

The site will provide landscaped buffers and street trees.

e. List any invasive animal species known to be on or near the site. [help]

None known

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

The site will be served primarily by electricity.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

The convenience store and car wash will have energy efficient windows and will comply with state building codes which includes conservation measures.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk

of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

The gas station will store and dispense gasoline and diesel, which are flammable and could spill.

1) Describe any known or possible contamination at the site from present or past uses. [help]

Utilizing the "What's in My Neighborhood" section of DOE's database shows that there are no cleanup sites or known hazards within 0.5 miles of the site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

There are no known existing hazardous chemicals/conditions that may affect the development.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

The site proposes a gas station; gas and diesel will be stored and used on the site after development.

4) Describe special emergency services that might be required. [help]

No special emergency services outside those normally expected in a commercial/business area are anticipated to be required in association with this proposal.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

Emergency shut-off switches will be located inside of the convenience store and outside at the gas pumps. Underground storage and pipes will be double-containment construction with rupture protection. Underground tanks also include monitoring of the inner walls for leaks. Overfill protection, gravity return of undispensed product, breakaway valves and stage 2 vapor recovery systems are also included in the storage tanks and delivery systems.

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)? [help]

Light traffic noise from surrounding areas/roads along with typical home and business use noises. None of these will affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site. [help]

Short term noises would include construction noises which would occur during approved hours as mandated by City of Camas and Washington State. Long term noises could include slight increase in traffic noise and vehicle noise at the site.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Construction on the site will take place during normal working hours as allowed by the City.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed site has an existing single-family residence and two outbuildings. To the south is a developing business park. West of the site is a single family residence. To the east of the site across NW Friberg-Strunk Street is land owned by Camas Meadows Golf Club. To the north across NE 13th Street are single family homes.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

It is unknown whether the site has been used as working farmlands or forest lands. There are not currently any agricultural or forest uses associated with the site.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No, the proposal will not be affected by, nor will it affect, any surrounding working farm or forest land business.

c. Describe any structures on the site. [help]

Single family residences and two outbuildings.

d. Will any structures be demolished? If so, what? [help]

All structures will be demolished.

e. What is the current zoning classification of the site? [help]

BP – Business Park

f. What is the current comprehensive plan designation of the site? [help]

IND - Industrial

g. If applicable, what is the current shoreline master program designation of the site? [help]

The site does not lie within the shoreline master program.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

There is an Oregon white oak on site.

i. Approximately how many people would reside or work in the completed project? [help]

It is currently planned that approximately 2 people will work at this site at the time of full buildout.

j. Approximately how many people would the completed project displace? [help]

The removal of one single-family residence has the potential to displace up to 3 people.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

There are no measures proposed to avoid or reduce displacement impacts.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

By complying with the zoning designation, the comprehensive plan, and the City of Camas Development Code, the proposal will be compatible with the existing and projected land uses.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

No impacts are expected to agricultural or forest lands, therefore no measures are proposed.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

Not applicable, no homes are proposed.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

One existing residence will be eliminated. The income level housing type is unknown.

c. Proposed measures to reduce or control housing impacts, if any: [help]

The applicant will pay all impact fees associated with the development at the time of building permit.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

All new construction will meet City of Camas building codes for commercial/business development. Exterior building materials will include composite wood siding, fiber cement panels, CMU, metal roofing and accents, and veneer stone. The tallest structure will not exceed 28'.

b. What views in the immediate vicinity would be altered or obstructed? [help]

The site will change from a large-lot single family residence to a commercial/retail development with a convenience store, gas station and drive-through car wash.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The site will be landscaped as required by the City of Camas. The main roadway frontages will be landscaped with trees per the City of Camas roadway standards.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

When the site is built out external illumination will be provided for the canopy/fueling area and for perimeter lot lighting and parking areas.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No, light or glare from the finished project will not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are existing off-site sources of light from adjacent homes and roads, but they will not affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Shielding of lights and streetlights will reduce light and glare impacts offsite.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Camas Meadows Golf Club is adjacent to the east. The Harmony Sports Complex is approximately ½ mile to the west.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

There will be no recreational uses displaced with this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

No impacts are proposed, therefore no measures to reduce or control impacts on recreation are proposed.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

There are no structures recommended for listing in national, state or local preservation registers per the Archaeological Predetermination.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

Archaeological Services, LLC (ASCC) performed an onsite field investigation on August 17, 2023. No mention of landmarks, features or other evidence of Indian use or occupation are mentioned. Several artifacts were found including pink glass fragments suspected to be Depression Glass, a coin bank dated to 1926-1930, and a metal bolt. Based on these items, along with the former structures that appear on site in historic photos, ASCC is recording the debris scatter as a historic-area archaeological site and recommends a Cultural Resource Survey Report prior to any ground disturbing activity.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The report utilized surface surveys and excavation of test pits, as well as reviewing historical maps and records on file at the Washington State Department of Archaeology and Historic Preservation.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

Based on the findings of the Archaeological Predetermination, a Cultural Resources Study is recommended prior to ground disturbing activity. If during the course of construction any artifacts are discovered, all work will cease, and proper notification shall be given to City of Camas and DAHP.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

NE 13th Street and NW Friberg-Strunk Street abut the site to the north and west. A new driveway off of NE 13th Street will provide access to the site.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

C-tran does not operate in close proximity to the site. The nearest stop is 1.6 miles SE of the site along SE 192nd Avenue at Mill Plain Blvd.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

20 parking spaces, plus 8 gas fill-up spaces, will be provided with this development. The project will eliminate approximately 2-4 parking spaces with the removal of the existing home.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Frontage improvements are proposed to bring NE 13th Street up to half-width roadway standards. NW Friberg-Strunk Street is currently built out to standard.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help].

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

It is anticipated that 2,281 new trips per day would be generated by the project. It is expected that 60 trips will occur in the AM peak hour (7:00 – 9:00 AM) and 81 trips will occur in the PM peak hour (4:00 – 6:00).

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

Not anticipated

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The applicant will pay transportation impact fees.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes. The completion of this development will increase the need for public services in the area.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

This project will pay impact fees for traffic at the time of building permit.

16. Utilities [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

- *Electricity: Clark Public Utilities*
- *Water: City of Camas*
- *Telephone: Century Link, Comcast*
- *Sanitary Sewer: City of Camas*
- *Natural Gas: NW Natural*

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

DocuSigned by:

Signature: _____
FF97DED7F6DB4EF...

Name of signee Faz Khan

Position and Agency/Organization Managing Member Pak USA Camas, LLC

Date Submitted: 10/9/2023

GEOTECHNICAL ENGINEERING STUDY

13th Street Gas Station
NE 13th Street & NW Friberg-Strunk Street
Camas, Clark County, Washington
Tax Lot No. (176148000)

Prepared for:
Taz Khan
701 Columbia Street #109
Vancouver, WA 98660

Prepared By:

Donald J. Bruno, CEG
Engineering Geologist

9/31/23

State of Washington
Engineering Geologist
2177
Licensed Geologist

DONALD J. BRUNO

Project No. G26-0723

{August 2023}

Earth Engineering Inc.
PO Box 1512, Ridgefield, Washington 98642
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Earth Engineering, Inc.
Geotechnical & Environmental Consultants

Taz Khan
701 Columbia Street #109
Vancouver, Washington 98660

August 31st 2023
G26-0723

Subject: **Geotechnical Engineering Study**
13th Street Gas Station, C-Store & Car Wash
NE 13th Street & NW Friberg-Strunk Street
Camas, Clark County, Washington
(Tax Lot No. 176148000)

Hello Taz,

We are pleased to submit our engineering report for the subject property located in Camas, Washington. This report presents the results of our field exploration, selective laboratory tests, field testing and engineering analyses.

Based on the results of this study, it is our opinion that construction of the proposed commercial structures is feasible from a geotechnical standpoint, provided recommendations presented in this report are included in the project design.

We appreciate the opportunity to have been of service to you and look forward to working with you in the future. Should you have any questions about the content of this report, or if we can be of further assistance, please call.

Respectfully Submitted,
Earth Engineering Inc.,

Donald J. Bruno, CEG
Engineering Geologist

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{G26-0723}

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INTRODUCTION

General

This report presents the results of the geotechnical engineering study completed by Earth Engineering, Inc. for the proposed gas station, convenience store and drive thru car wash located in Camas, Washington. The general location of the site is shown on the *Vicinity Map, Figure 1.* At the time our study was performed, the site and our exploratory locations are approximately as shown on the *Site Plan, Figure 2.*

The purpose of this study was to explore subsurface conditions at the site and based on the conditions encountered provide geotechnical recommendations for the proposed construction. In addition this report includes infiltration testing for stormwater design and a seismic hazard evaluation.

Project Description

Based on the information that was provided to us by the project civil engineer (PLS), it is our understanding the site will be developed with a one story convenience store building that will provide four thousand one-hundred (4100) square feet of floor space, a one thousand one-hundred and eighty nine (1189) square foot drive thru car wash, a fuel pumping island, trash enclosure and an asphalt paved access driveway with vehicle parking spaces. Construction will also include the installation of a stormwater system and subsurface utilities.

Due to the relatively flat topography, it is anticipated that earthwork cuts and fills will be less than two feet to achieve the desired design grade. The convenience store and car wash structures will be constructed with a metal or wood frame and slab on grade floors.

Structural design loads were not available at the time this report was written. However, based on our experience with similar projects, we anticipate that wall and column loads will be approximately seven hundred and fifty (750) to one thousand five hundred (1500) pounds per lineal foot (maximum dead plus live loads). Slab on grade loads will most likely range from one hundred (100) to one hundred and fifty (150) pounds per square foot (psf).

If any of the above information is incorrect or changes, we should be consulted to review the recommendations contained in this report. In any case, it is recommended that Earth Engineering, Inc. perform a general review of the final design for the proposed construction.

SITE CONDITIONS

Surface

The rectangular shaped property encompasses approximately one acre. An existing single family residence was located at the central west area of the property. The adjacent properties to the south and west are moderately to heavily vegetated with single family homes on acreage.
NE 13th Street borders the north side and NW Friberg-Strunk Street.

The property is relatively level and slopes gently downward from the north to the south and southeast with an overall elevation change of approximately five feet and a gradient that is less than two percent (2%). The property has been landscaped with a manicured lawn as well as a variety of trees and flowering bushes.

Subsurface & Soil Classification

For this study, the site was explored by excavating two test pits at the approximate locations shown on the *Site Plan, Figure 2.* Infiltration testing was performed in both test pits. All soil was classified following the Unified Soil Classification System (USCS). A USCS Legend is included as Plate A1. A description of the field exploration methods is included in Appendix A.

In general, in our test pits we encountered very stiff to hard soil consisting of Silt (ML) and lean Clay (CL) to the maximum exploration depth of ten and one half (10.5) feet below the existing ground surface. Please refer to the test pit logs, Plates A-2 thru A-3, for a more detailed description of the conditions encountered.

Groundwater

During the time of our field exploration (August 2023) groundwater was not encountered in any of our test pits. It is important to note that groundwater conditions are not static; fluctuations may be expected in the level and seepage flow depending on the season, amount of, surface water runoff, and other factors. Generally, groundwater levels are higher and the seepage rate is greater in the wetter winter months (typically October through May).

General Regional Geology

General information about geologic conditions and soil in the vicinity of the site was obtained by reviewing the Geologic Map of Washington-Southwest Quadrant, Washington Division of Geology and Earth Resources, (Geologic Map GM-34, 1987). This map provides general information about geologic units in the Camas, Clark County, Washington area.

Our review of existing geological information indicates that soils in the vicinity of the subject site were formed from alluvial deposits during the Quaternary Period. Outburst flood deposits from glacial Lake Missoula deposited these sedimentary soils. The native material encountered in our test pits consists predominantly of Silt.

LABORATORY TESTING

Laboratory tests were conducted on representative soil samples to verify or modify the field soil classification of the units encountered, and to evaluate the general physical properties as well as the engineering characteristics of the soils encountered. The following provides information about the testing procedures performed on representative soil samples and the general condition of subsurface soil conditions encountered:

- *Moisture Content (ASTM-D2216-92)* tests were performed on representative samples. The native Silt has a moisture content that ranges from thirteen to forty three percent (13-43 %). The native lean clay has a moisture content of thirty eight percent (38%)

- In-Situ Soil Density (ASTM-D4564-93) utilizing the sleeve method was performed on representative samples to determine the wet and dry density of native soil. The in-situ density provides a relative indication of soil support characteristics. The average wet density of the native silt is one hundred and ten (110) pounds per cubic foot (pcf). The average dry density of this soil is ninety six (96) pcf.

Laboratory testing confirms that subsurface soil consists predominantly of Silt and lean Clay. These types of soil are sensitive to changes in moisture content. Moisture sensitive soils are discussed in more detail in the *Site Preparation and Grading* section of this report.

The results of laboratory tests performed on specific samples are provided at the appropriate sample depth on the individual test pit logs. However, it is important to note that some variation of subsurface conditions may exist. Our geotechnical recommendations are based on our interpretation of these test results.

SEISMIC HAZARD EVALUATION

The following provides a seismic hazard evaluation for the proposed commercial building and fuel island. Our evaluation is based on subsurface conditions encountered at the site during the time of our geotechnical study and a review of applicable geologic maps (Washington State Department of Natural Resources, Geologic Map of Washington-Southwest Quadrant, 1987) and the International Building Code (IBC-2018) guidelines.

In general, supportive soil at the subject site consists of very stiff to hard Silt. The geologic map indicates that no known active faults are located within one-mile of the subject site. Soils encountered at the site are classified as a type "D" soil in accordance with "Seismic Design Categories" (IBC 2018, Section 1803.5.12).

Liquefaction:

Structures are subject to damage from earthquakes due to direct and indirect action. Shaking represents direct action. Indirect action is represented by foundation failures and is typified by liquefaction. Liquefaction occurs when soil loses all shear strength for short periods of time during an earthquake. Ground shaking of sufficient duration results in the loss of grain to grain contact as well as a rapid increase in pore water pressure. This causes the soil to assume physical properties of a fluid.

To have potential for liquefaction a soil must be loose, cohesion-less (generally sands and silts), below the groundwater table, and must be subjected to sufficient magnitude and duration of ground shaking. The effects of liquefaction may be large total settlement and/or large differential settlement for structures with foundations in or above the liquefied soil. Based on the very stiff to hard soil conditions encountered and the absence of a near surface groundwater table, it is not likely that soil liquefaction would occur at the subject site during a seismic event.

DISCUSSION AND RECOMMENDATIONS

General

Based on the results of our study, it is our opinion the commercial project can be developed as planned provided the geotechnical recommendations contained in this report are incorporated into the final design. The proposed buildings (convenience store & car wash) as well as the fuel island canopy can be supported on conventional shallow spread footings bearing either entirely on competent native soil or compacted structural fill. Supporting the proposed buildings on homogeneous material will significantly decrease the potential for differential settlement across the foundation area.

This report has been prepared for specific application to this project only and in a manner consistent with that level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area for the exclusive use of Taz Khan and their representatives. This report, in its entirety, should be included in the project documents for information to the contractor. No warranty, expressed or implied, is made.

Site Preparation and Grading

The site shall be stripped and cleared of all vegetation, organic matter and any other deleterious material. Stripped material should not be mixed with any soils to be used as fill. Stripped soil could potentially be used for topsoil at landscape areas after removing vegetation and screening out organic matter.

Building and Driveway Areas:

After clearing and grading, the exposed sub-grade at building and pavement areas should be compacted to a dense non-yielding condition with suitable compaction equipment. This phase of earthwork compaction shall be performed prior to the placement of structural fill, at the bottom of all foundation excavations, interior and exterior concrete slabs, as well as the driveway-parking areas, before the placement of base rock.

Structural Fill:

Structural fill is defined as any soil placed under buildings or any other load bearing-areas. Structural fill placed under footings and slab on grade should be placed in thin horizontal lifts not exceeding eight inches and compacted to a minimum ninety-five percent (95%) of its maximum dry density (Modified Proctor ASTM D1557). The fill material should be placed within two to three percent of the optimum moisture content.

Fill under pavements should also be placed in lifts approximately eight inches in thickness, and compacted to a minimum of ninety percent (92%) of its maximum dry density (Modified Proctor ASTM D1598), except for the top twelve (12) inches which should be compacted to ninety-five percent (95%) of the maximum dry density.

We recommend that structural fill consist of a well graded granular material having a maximum size of two inches and no more than five percent (5%) fines passing the #200 sieve, based on the ¾ inch fraction. It is recommended that any structural fill planned for onsite use, be submitted for approval prior to import.

The placement and compaction of structural fill should be observed by a representative from our office to verify that fill has been placed and compacted in accordance with the approved project plans and specifications.

It should be noted that the depth of excavation to competent soil at foundation footings and floor slab areas could be greater or less than anticipated depending on conditions encountered. Our test pits provide general information about subsurface soil and groundwater conditions.

Wet Weather Construction & Moisture Sensitive Soils:

Field observations and laboratory testing indicates that soil encountered at the site consists of moisture sensitive Silt and lean Clay. As such in an exposed condition moisture sensitive soil can become disturbed during normal construction activity, especially when in a wet or saturated condition. Once disturbed, in a wet condition, these soils will be unsuitable for support of foundations, floor slabs and pavements.

Therefore, where soil is exposed and will support new construction, care must be taken not to disturb their condition. If disturbed soil conditions develop, the affected soil must be removed and replaced with structural fill. The depth of removal will be dependent on the depth of disturbance developed during construction. Covering the excavated area with plastic and refraining from excavation activities during rainfall will minimize the disturbance and decrease the potential degradation of supportive soils.

Earthwork grading and foundation construction will be difficult during the wet winter and spring seasons. Based on this condition we suggest that grading and foundation construction be completed during the drier summer and fall seasons.

Foundations

Based on the encountered subsurface soil conditions, preliminary building design criteria, and assuming compliance with the preceding *Site Preparation and Grading* section, the proposed building may be supported on conventional shallow spread footings bearing entirely on six inches of compacted granular structural fill.

Individual spread footings or continuous wall footings providing support for the proposed commercial building and pump island canopy may be designed for a maximum allowable bearing value of two -thousand (2000) pounds per square foot (psf).

Footings for a one level structure should be at least twelve (12) inches in width. Footings for a two-level structure should be a minimum of fifteen (15) inches in width. In either case, all footings should extend to a depth of at least eighteen (18) inches below the lowest adjacent finished sub grade for lateral support and frost heave considerations.

These basic allowable bearing values are for dead plus live loads and may be increased one-third for combined dead, live, wind, and seismic forces. It is estimated that total and differential footing settlements for the relatively light building will be approximately one-half and one-quarter inches, respectively.

Lateral loads can be resisted by friction between the foundation and the supporting sub grade or by passive earth pressure acting on the buried portions of the foundation. For the latter, the foundations must be poured "neat" against the existing soil or back filled with a compacted fill meeting the requirements of structural fill.

- Passive Pressure = 300 pcf equivalent fluid weight
- Coefficient of Friction = 0.40

We recommend that all footing excavations be observed by a representative of Earth Engineering, Inc. prior to placing forms or rebar, to verify that sub grade support conditions are as anticipated in this report, and/or provide modifications in the design as required.

Slab on Grade

The sub-grade for all concrete floor slab areas should be compacted to a dense non-yielding condition prior to the placement of base rock. It is important to note that the existing sub-grade soil may become too wet to re-compact due to weather conditions. If supportive soils become saturated it may be necessary to remove the unsuitable material and replace it with imported granular structural fill.

Interior floor slabs should be provided with a minimum of six inches of compacted granular structural fill after compacting the sub-grade. In areas where moisture is undesirable, a vapor barrier such as a 8-mil plastic membrane should be placed beneath the slab.

Temporary Excavations

The following information is provided solely as a service to our client. Under no circumstances should this information be interpreted to mean that Earth Engineering Inc. is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

In no case should excavation slopes be greater than the limits specified in local, state and federal safety regulations. Based on the information obtained from our field exploration and laboratory testing, the site soils expected to be encountered in excavations, very stiff to hard Silt would be classified as a Type "A" soil by OSHA guidelines.

Therefore, temporary excavations and cuts greater than four feet in height, should be sloped at an inclination no steeper than 3/4H:1V (horizontal:vertical) for type "A" soils. If slopes of this inclination, or flatter, cannot be constructed or if excavations greater than ten feet in depth are required, temporary shoring will be necessary.

Infiltration Testing

During August of 2023, infiltration testing was performed at two locations at four and one half and six feet below the existing ground surface. The approximate location of the infiltration tests are shown on the *Site Plan, Figure 2.*

Infiltration testing was conducted in general accordance with standard engineering practices The Encased Falling Head Test consists of driving a fifteen (15) inch long, six-inch diameter pipe six inches into the exposed ground surface at the bottom of the test pit. The pipe is filled with water as the soil around the bottom and below the pipe is saturated for several hours. The pipe is filled again, and the amount of time required for the water to fall, per inch, for six inches, is recorded. This step is performed a minimum of three times. The test results are averaged and calculated in inches per hour.

Testing yielded infiltration rates that ranged from 0.1 to 0.25 inches per hour. Based on these infiltration rates and the very stiff to hard soil conditions encountered, it is our opinion on-site soil is not conducive to infiltration. Alternative methods will need to be employed for stormwater control.

Site Drainage

The site should be graded so that surface water is directed off the site. Water should not be allowed to stand in any area where buildings or slabs are to be constructed. Loose surfaces should be sealed at the end of each workday by compacting the surface to reduce the potential for moisture infiltration into the soils. Final site grades should allow for drainage away from the building foundation. The ground should be sloped at a gradient of three percent for a distance of at least ten feet away from the buildings.

We recommend that a footing drain be installed around the perimeter of the building just below the invert of the footing with a gradient sufficient to initiate flow. Under no circumstances should the roof down spouts be connected to the footing drain system. We suggest that clean outs be installed at several accessible locations to allow for the periodic maintenance of the footing drain system. Details for the footing drain have been included on *Figure 3, Typical Footing Drain Detail.*

Utility Support and Back Fill

Based on the conditions encountered, the soil to be exposed by utility trenches should provide adequate support for utilities. Utility trench backfill is a concern in reducing the potential for settlement along utility alignments, particularly in pavement areas. It is also important that each section of utility line be adequately supported in the bedding material. The back fill material should be hand tamped to ensure support is provided around the pipe haunches.

Fill should be carefully placed and hand tamped to about twelve inches above the crown of the pipe before any compaction equipment is used. The remainder of the trench back fill should be placed in lifts having a loose thickness of ten inches.

Exhibit 8 APPEAL24-1001

A typical trench backfill section and compaction requirements for load supporting and non-load supporting areas is presented on *Figure 4, Utility Trench Backfill Detail.* Trench back fill may consist of imported granular fill provided the material is approved, placed and compacted near the optimum moisture content.

Imported granular material or on-site soil to be used as backfill should be submitted to our laboratory at least one week prior to construction so that we can provide a laboratory proctor for field density testing. If native soil is planned for use as backfill, additional testing may be required to determine the suitability of the material.

Pavements

The durability of pavements is related in part to the condition of the underlying sub grade. To provide a properly prepared sub grade for pavements, we recommend the sub grade be treated and prepared as described in the *Site Preparation and Grading* section of this report.

It is possible that some localized areas of soft, wet or unstable sub grade may still exist after this process. Before placement of any base rock, the sub grade should be compacted with suitable compaction equipment. Yielding areas that are identified should be excavated to firm material and replaced with compacted one and one quarter inch-minus clean-crushed rock. The following pavement sections are recommended for the proposed pavement areas:

- Entrance Driveway & Truck Turnaround - Four inches of Asphalt Concrete (AC) over ten inches of compacted Crushed Rock Base (CRB), over a geo-grid consisting of Tensar BX 1200 or equivalent.

- Parking Stalls for Automobiles - Three inches of Asphalt Concrete (AC) over eight inches of compacted Crushed Rock Base (CRB) material.

The geo-grid should be placed directly on the sub grade surface of the driveway prior to placement of base rock. Appropriate geo-textiles have been designed to increase the strength of the sub grade and extend pavement life.

Asphaltic Cement (AC) and Crushed Rock Base (CRB) materials should conform to WSDOT specifications. All base rock should be compacted to at least ninety-five percent (95 %) of the ASTM D1557-91 laboratory test standard.

We recommend that a minimum of eight inches of compacted CRB be placed below all exterior slabs. Exterior concrete slabs that are subject to vehicle traffic loads should be at five inches in thickness. It is also suggested that nominal reinforcement such as "6x6-10/10" welded wire mesh be installed, near midpoint, in new exterior concrete slabs and paving.

Additional Services & Earthwork Monitoring

Earth Engineering, Inc. will be available to provide consultation services related to review of the final design to verify that the recommendations within our purview have been properly interpreted and implemented in the approved construction plans and specifications. A representative from our office will be available to attend a pre-construction meeting to discuss and/or clarify all geotechnical issues related to the proposed project.

In addition, it is suggested that our office be retained to provide geotechnical services during construction to observe compliance with the design concepts and project specifications and to allow design changes in the event subsurface conditions differ from those anticipated. Our construction services would include monitoring and documenting the following:

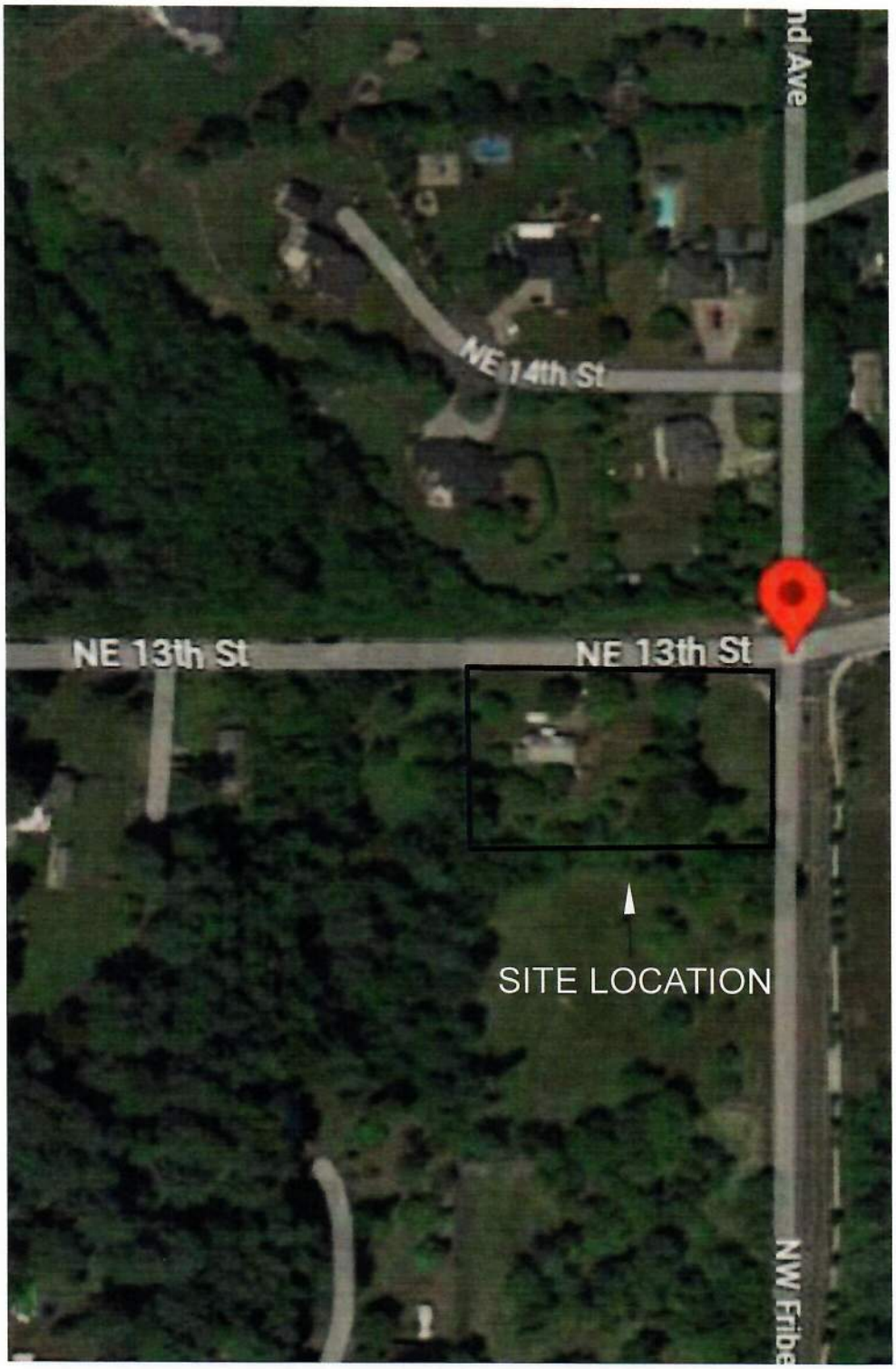
- Verify that site has been adequately stripped of organic materials.
- Observe the condition of exposed bearing soils at the building areas.
- Laboratory proctor tests for structural fill materials.
- Observe compaction and provide density testing of structural fill.
- Observe compaction and provide density testing of utility trench backfill.
- Provide footing inspection at the building & canopy footings to verify soil bearing capacity.
- Verify the installation of all building and site drainage elements.
- Provide density testing of the asphalt driveway and parking areas.

LIMITATIONS

Our recommendations and conclusions are based on the site materials observed, selective laboratory testing, engineering analyses, the design information provided to Earth Engineering, Inc. and our experience as well as engineering judgment. The conclusions and recommendations are professional opinions derived in a manner consistent with that level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area. No warranty is expressed or implied.

The recommendations submitted in this report are based upon the data obtained from the test pits. Soil and groundwater conditions may vary from those encountered. The nature and extent of variations may not become evident until construction. If variations do appear, Earth Engineering, Inc. should be requested to reevaluate the recommendations contained in this report and to modify or verify them in writing prior to proceeding with the proposed construction.

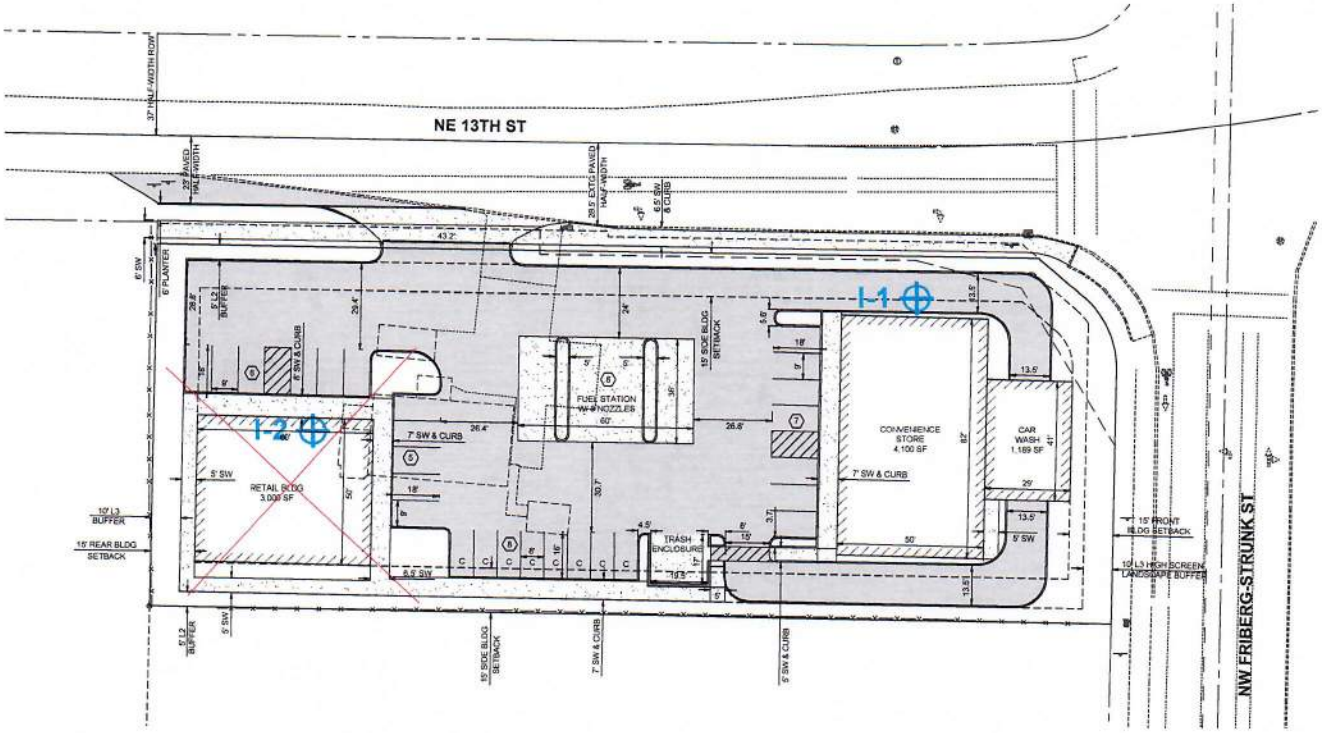
VICINITY MAP



Earth Engineering
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	TAZ KHAN	DRAWN:	EG
PROJECT: 13TH STREET GAS STATION NE 13TH ST & NW FRIBERG-STRUNK ST CAMAS, WA		DATE:	09/2023
		FIGURE:	1
		PRO. #:	G26-0723

SITE PLAN

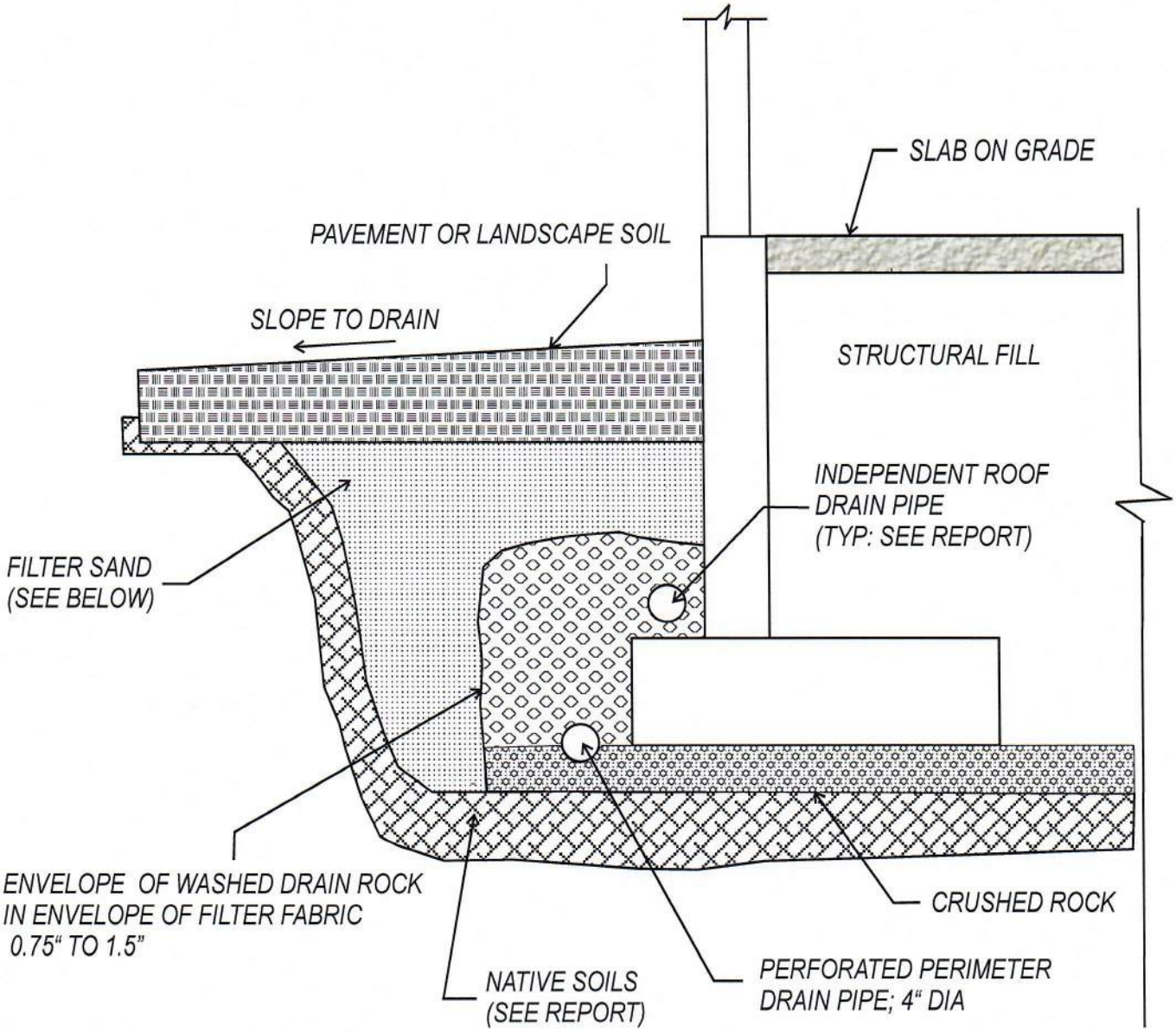


LEGEND

I-1 ⊕ Approximate Infiltration Test Location

NTS

Earth Engineering GEOTECHNICAL & ENVIRONMENTAL SERVICES	CLIENT: TAZ KHAN	DRAWN:	EG
	PROJECT: 13TH STREET GAS STATION NE 13TH ST & NW FRIBERG -STRUNK ST CAMAS, WA	DATE:	09/2023
		FIGURE:	2
		PRO. #:	G26-0723



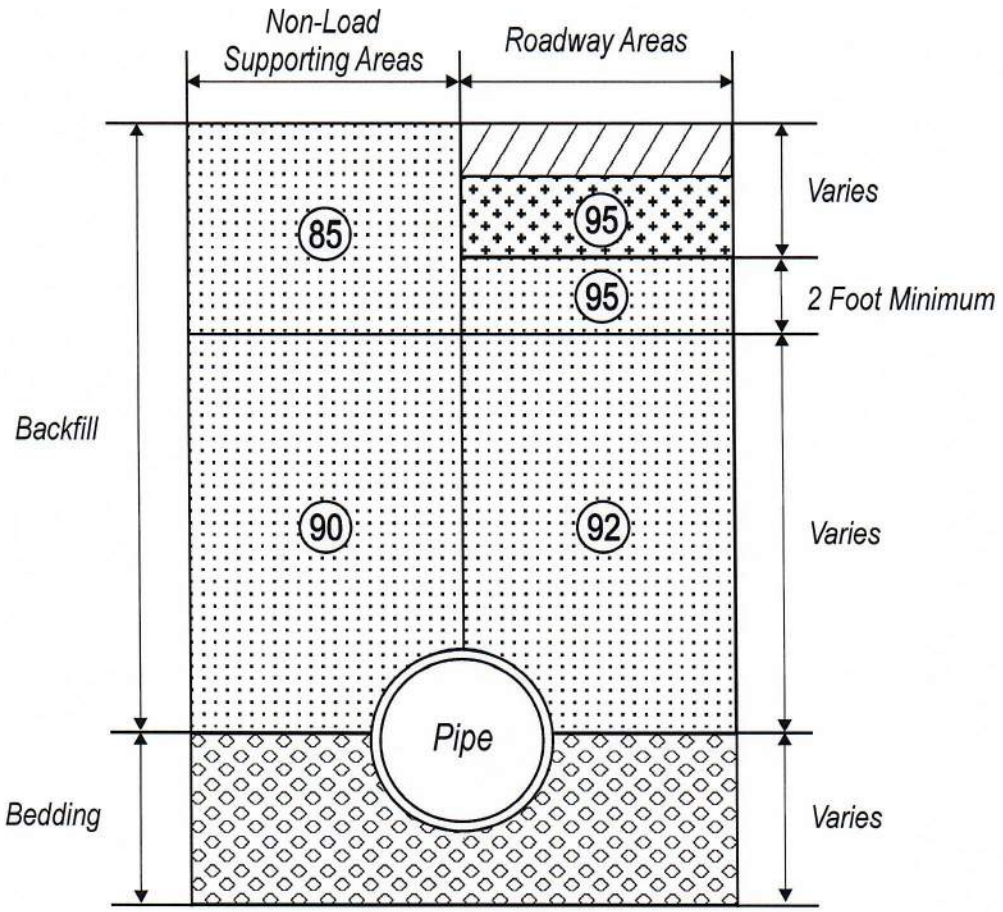
NOTES:

1. FILTER SAND - FINE AGGREGATE FOR PORTLAND CEMENT; SECTION 9=03.1(2)
2. PERFORATED OR SLOTTED RIGID PVC PIPE WITH A POSITIVE DRAINAGE GRADIENT
3. FILTER FABRIC OPTIONAL IF FILTER SAND USED

TYPICAL FOOTING DRAIN DETAIL

Not to Scale

Earth Engineering, Inc. GEOTECHNICAL & ENVIRONMENTAL SERVICES	CLIENT: 13TH STREET GAS STATION	DRAWN:	DB
	PROJECT: COMMERCIAL BUILDING NE 13TH ST. & NW FRIBERG-STRUCK ST. VANCOUVER, WA	DATE:	07/2023
		FIGURE:	3
		PRO. #:	G26-0723



LEGEND

Asphalt or Concrete Pavement

Roadway Base Material or Base Rock

Backfill: Compacted on-site soil or imported select fill material as described in the site preparation of the general Earthwork Section of the attached report text.

92 — Minimum percentage of maximum Laboratory Dry Density as determined by ASTM Test method D1557 (Modified Proctor),unless otherwise specified in the attached report text.

Bedding Material: Material type depends on type of pipe and laying conditions. Bedding should conform to the manufacturer's recommendations for the type of pipe selected.

UTILITY TRENCH BACKFILL DETAIL

Not to Scale

Earth Engineering, Inc. GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS	CLIENT: 13TH ST. GAS STATION	DRAWN:	DB
	PROJECT: COMMERCIAL BUILDING NE 13TH ST. & NW FRIBERG-STRUNK CAMAS, WA	DATE:	07/2023
		FIGURE:	4
		PRO. #:	G26-0723

APPENDIX A

(FIELD EXPLORATION)

FIELD EXPLORATION

Our field exploration was performed on August 4th 2023. Subsurface conditions at the site were explored by excavating two test pits. The test pits were excavated to a maximum depth of ten and one half (10.5) feet below the existing ground surface. The test pits were excavated using a track-hoe.

The test pits were located by pacing from property features. The locations are shown on the Site Plan, Figure 2. Field exploration was monitored by an Earth Engineering, Inc. representative, who classified the soils that we encountered and maintained a log of each test pit, obtained representative samples, and observed pertinent site features. Representative soil samples were placed in closed containers and returned to the laboratory for further examination and testing.

All samples were identified using the Standard Classification of Soils for Engineering Purposes (ASTM D2487-93) in accordance with the Unified Soil Classification System (USCS), which is presented on Plate A-1. The test pit log and boring logs are presented in Appendix A. The final log represents our interpretations of the field logs and the results of the laboratory tests on field samples.

UNIFIED SOIL CLASSIFICATION SYSTEM
LEGEND

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTION
Coarse Grained Soils	Gravel and Gravelly Soils More Than 50% Coarse Fraction Retained on No 4 Sieve	Clean Gravels (little or no fines)		GW / gw	Well-Graded Gravels, Gravel-Sand Mixtures Little or no Fines
				GP / gp	Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
		Gravels with Fines (appreciable amount of fines)		GM / gm	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC / gc	Clayey Gravels, Gravel-Sand-Clay Mixtures
More Than 50% Material Larger Than No 200 Sieve Size	Sand and Sandy Soils More Than 50% Coarse Fraction Passing No 4 Sieve	Clean Sand (little or no fines)		SW / sw	Well-graded Sands, Gravelly Sands Little or no Fines
				SP / sp	Poorly-Graded Sands, Gravelly Sands Little or no Fines
		Sands with Fines (appreciable amount of fines)		SM / sm	Silty Sands, Sand-Silt Mixtures
				SC / sc	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils	Silts and Clays	Liquid Limit Less than 50		ML / ml	Inorganic Silts and Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands; Clayey Silts w/ slight Plasticity
				CL / cl	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean
				OL / ol	Organic Silts and Organic Silty Clays of Low Plasticity
More Than 50% Material Smaller Than No 200 Sieve Size	Silts and Clays	Liquid Limit Greater than 50		MH / mh	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soils
				CH / ch	Inorganic Clays of High Plasticity, Fat Clays
				OH / oh	Organic Clays of Medium to High Plasticity, Organic Silts
Highly Organic Soils				PT / pt	Peat, Humus, Swamp Soils with High Organic Contents

Topsoil		Humus and Duff Layer
Fill		Highly Variable Constituents

Earth Engineering Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	13TH STREET GAS STATION	DRAWN:	DB
PROJECT:	COMMERCIAL BUILDING NE13TH ST. & NW FRIBERG-STRUNK ST. CAMAS, WA	DATE:	07/2023
		PLATE:	A1
		PRO. #:	G26-0723

LOG OF TEST PIT I-1

(Northeast)

ELEVATION: **+/- 239 feet**
EXPLORATORY EQUIPMENT: **TRACK HOE**
DATE: **08/04/2023**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1		6" Topsoil						
	●			Light Brown			14	-
2								
3								
4								
	●	▤ - Field infiltration rate of 0.25 inches per hour					18	-
5		**Silt (ML)**			Damp to Wet	Very Stiff to Hard		
6		**trace sand**						
7								
8								
9				Grey Brown				
10	●	(Native)					26	-

Bottom of test pit at 10.5 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	TAZ KHAN	DRAWN:	DB
PROJECT:	13TH ST GAS STATION NE 13TH ST & NW FRIBERG-STRUNK ST CAMAS, WA	DATE:	09/2023
		PLATE:	A-2
		PRO. #:	G26-0723

LOG OF TEST PIT I-2

(Central West)

ELEVATION: **+/- 240 feet**
EXPLORATORY EQUIPMENT: **TRACK HOE**
DATE: **08/04/2023**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1		8" Topsoil						
2	●			Light Brown to Dark Brown	Damp to Sat	Very Stiff to Hard	13	-
3		**Silt (ML)**						
4								
5								
6	●	- Field infiltration rate of 0.1 inches per hour					43	
7		(Native)						
8								
9		**lean Clay (CL)**		Light Brown Grey	Sat	Very Stiff to Hard		
10	●						38	-

Bottom of test pit at 10.0 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	TAZ KHAN	DRAWN:	DB
PROJECT:	13TH ST GAS STATION NE 13TH ST & NW FRIBERG-STRUNK ST CAMAS, WA	DATE:	09/2023
		PLATE:	A-3
		PRO. #:	G26-0723

PRELIMINARY TECHNICAL INFORMATION REPORT

NE 13th Street Site Plan

City of Camas, Washington

Prepared by:
PLS Engineering
Consulting Engineers and Planners
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

Prepared for:
Taz Khan
3993 NW Currawong Court
Camas, WA 98607

Prepared: November of 2023

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Appendix A: Maps

- **Vicinity Map**
- **Soils Map**
- **Critical Areas Map**
- **Basin Maps**

Appendix B: Design Calculations & Modeling

Appendix C: Geotechnical Report

Appendix D: Operations and Maintenance Manual

Appendix E: Construction Stormwater Pollution Prevention Plan (SWPPP)

Appendix F: Environmental Documentation

CERTIFICATE OF ENGINEER

NE 13th Street Gas Station Site Plan

Technical Information Report

The technical information and data contained in this report was prepared under the direction and supervision of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

This document was prepared by:

Scott W. Gilliland, PE

Section A – Project Overview

Section A.1 – Site Information

This project will comply with current City of Camas Standards for Stormwater and Erosion Control per CMC Title 14. The Final Grading / Erosion Control / Drainage Plans have been prepared by the project civil engineer, PLS Engineering, Inc. The site will be served by public sewer and water provided by the City of Camas. This project phase proposes construction of 35 single-family residential lots with associated structures, access, paved storage areas, sewer, water, and storm drain connections. Access to the site is from NE 13th Street.

The physical address of the site is currently 20101 NE 13th Street, but the postal office may change that prior to the completion of this project. The parcel serial number is 176148000. The property is located in the Northwest quarter of Section 29, T2N, R3E of the Willamette Meridian. The property is bordered by NE 13th Street on the north side, 1 acre single family lots to the West, NW Friburg-Strunk Street to the East, and Business Park to the South. The cumulative property area contains a total of 42,257 square feet (0.97 acres), with 1,832 square feet (.04 acres) of right of way dedication, resulting in 40,425 square feet (0.93 acres) of developed area. This technical information report will address the stormwater runoff associated with the construction which will take place.

The topography of the site is set below the bordering roadways by approximately 2' and slightly sloped from the high point at the NW corner of the site towards the SW and SE corners of the site. Elevations range from approximately 249' to 244'. Slopes are generally between 1% and 7%, while the slopes at the edge of the Northern and Eastern boundary roads are around 33%. The site contains a 1,600 square-foot house and a 150 square-foot shop. These structures are planned to be removed. The remainder of the site is filled with grass, landscaping, and a variety of trees. There are potential wetlands mapped on Clark County Maps South of the site. There is a White Oak located on the South edge of the site. Otherwise, there are no known water courses, areas prone to flooding, floodplains, shoreline areas, water bodies, unstable slopes, landslide hazard areas, habitat, critical areas, or historic sites located on the site. Site drainage follows the slope of the land going from the NW corner to the SE/SW corners. There are also some isolated low points on site. The site runoff currently flows to the South, but that is clearly not the historical flow from the site. It appears that when NE 13th Street, and NW Friburg-Strunk Street were created, they were raised above the property and effectively dammed off the site. Historically, the flow from this site traveled to the NE towards Lacamas Creek.

Site runoff from PGIS surfaces will be routed to a to a cartridge vault for treatment. The treated runoff and any other runoff not routed to the vault will flow to an underground detention system. The detention system was modeled using WWHM software to discharge flows in compliance with the SWMMWW. The detention system discharges to an existing MH in NE 13th Street where it will be routed to a roadside ditch located on the North side of NE Goodwin road where it will eventually reach Lacamas creek, returning the site flows to their historical flow path.

Existing frontage on NE 13th Street is currently flowing in two different directions. The North side of the street is routed to the East where it eventually flows into Lacamas Creek. The South side of the street is routed to the South where it is treated and discharged as part of a City road project. The discharge appears to flow to a Wetland located East of NW Friberg-Strunk Street. The site discharge

historically followed the flow path of the North side of the road and is being discharged to that storm system. Consequently, this project has two TDA's. Runoff from the South side of 13th is identified as TDA 1, and will only include the existing and proposed frontage improvements along 13th. TDA 2 will include the roadway improvements on the North side of 13th, as well as the site improvements.

Section B – Minimum Requirements

Section B.2 – Determination of Applicable Minimum Requirements

After site development, disturbed impervious surfaces will cover approximately 49,280 square feet, resulting in more than 5,000 square foot of hard surface area. Consequently, this site must meet all nine Minimum Requirements of the stormwater manual. The site area and the North side of 13th will discharge to TDA 2, and the frontage improvements on the South side of 13th will discharge to TDA 1. The minimum requirements for the TDA's will be different. The areas for each TDA are summarized below. The stormwater system is designed to comply with all City requirements for stormwater treatment and quantity control. The treatment regulations require treatment of 91% of the total runoff volume from pollution generating impervious surfaces while the quantity control regulations require that post-development discharges shall match pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

Total Site Area:

Existing hard surface	12,106 ft^2
New hard surface	35,442 ft^2
Replaced hard	7,566 ft^2
Native vegetation converted to lawn or landscaping	9,829 ft^2
Native vegetation converted to pasture	0 ft^2
Total land-disturbing activity	1.21 acre
Pollution-generating hard surface	30,977 ft^2
Pollution-generating pervious surface	0 ft^2
New Pollution-generating hard surface	23,634 f t^2
Total pollution-generating surfaces	31,200 ft^2
Total non-pollution-generating surfaces	20,078 ft^2

TDA 1:

Existing hard surface	7,566 ft^2
New hard surface	3,091 ft^2
Replaced hard	7,566 ft^2
Native vegetation converted to lawn or landscaping	895 ft^2
Native vegetation converted to pasture	0 ft^2
Total land-disturbing activity	0.26 acre
Pollution-generating hard surface	8,875 ft^2
Pollution-generating pervious surface	0 ft^2
New Pollution-generating hard surface	1,532 f t^2
Total pollution-generating surfaces	9,098 ft^2
Total non-pollution-generating surfaces	895 ft^2

TDA 2:

Existing hard surface	4,540 ft^2
New hard surface	32,351 ft^2
Replaced hard	0 ft^2
Native vegetation converted to lawn or landscaping	8,934 ft^2
Native vegetation converted to pasture	0 ft^2
Total land-disturbing activity	0.95 acre
Pollution-generating hard surface	22,102 ft^2
Pollution-generating pervious surface	0 ft^2
New Pollution-generating hard surface	22,102 ft^2
Total pollution-generating surfaces	22,102 ft^2
Total non-pollution-generating surfaces	19,183 ft^2

MR #1) Preparation of Stormwater Site Plans
All Stormwater System designs meet City of Camas Requirements for conveyance, quality control and quantity. See final construction documents for more details.

MR #2) Construction Stormwater Pollution Prevention
A Stormwater Pollution Prevention Plan is being included with this report and will be onsite for the duration of the project's construction.

MR #3) Source Control of Pollution
See Section D

MR #4) Preservation of Natural Drainage Systems and Outfalls
The historic flow path from the site was to the NE. The South side of 13th was artificially routed to away from the historic flow path and to the South. This flow path will remain unchanged. The North side of 13th is currently following the historic flow path to the NE and will remain unchanged. The site runoff was dammed off by the roadways located North and East of the site, and its historic flow path was changed to the South. This project will restore the site to its historic flow path. This will maintain and preserve the natural drainage systems.

MR #5) Onsite Stormwater Management
See Section E

MR #6) Runoff Treatment
See Section F

MR #7) Flow Control
See Section G

MR #8) Wetland Protection

Clark County maps show the potential for a Wetland located South of the site. See Appendix F for documentation showing that there are not any wetlands on the site.

MR #9) Operations and Maintenance
See Appendix D

Section C – Soils Evaluation

The soils are mapped by the NRCS as Wind River gravelly loam (WrB) for the majority of the site, and Cove silty clay loam (CwA) at the SW corner and Eastern edge of the site.

Earth Engineering Inc. investigated the site on August 4, 2023, and provided a Geotechnical report for the site on August 31, 2023. The geotechnical investigation identified the subsurface soils on site as hard silty clay soils. Consequently, the site was modeled assuming soil type SG4. The geotechnical report has been included in Appendix C and a soil map is included in Appendix A.

Section D – Source Control

The pollution risks involved with this project mainly include the sediment accumulation involved with construction. The Stormwater Pollution Prevention Plan is a document that notes our certain Best Management Practice's (BMP's) that will help prevent sediment laden water from leaving the site during construction. The Erosion Control Plan located in the final construction drawings will provide protection measures involved with minimizing the chance that sediment from the site could enter downstream waterways. The SWPPP is provided in Appendix E.

After construction is complete, this site will be a Gas Station, with special source control measures required. The following Source Control BMPs should be implemented after construction to meet the MR# 3 requirements:

- **BMP S409: BMP's for Fueling at Dedicated Stations**.
- **BMP S412: BMP's for Loading and Unloading Areas of Liquid or Solid Materials**.
- **BMP S426: BMP's for Spills of Oil and Hazardous Substances**.
- **BMP S455: BMP's for Spill Prevention and Cleanup**.

Section E – On-site Stormwater Management BMPs

Minimum Requirement 5 requires the applicant to employ On-site Stormwater Management BMPs in accordance with the following project thresholds, standards, and lists to infiltrate, disperse, and retain stormwater runoff on-site to the maximum extent feasible without causing flooding or erosion impacts. Based on section I-2.5.1 of the Western Washington Stormwater Manual the development is within the UGA on a parcel that is less than 5 acres therefore Low Impact Development Performance Standards and BMP T5.13; or List #2 will apply (applicant option). Due to negligible infiltration rates, this project will apply List #2. If certain BMP's are infeasible; infeasibility criteria per the 2019 Stormwater Management Manual for Western Washington are also noted.

List #2:
Lawn and Landscape areas:
BMP T5.13 Post-Construction Soil Quality and Depth:
This requirement will be met during final design and shown on final construction drawings.

Roofs:
BMPT5.30A or T5.30B Full Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

BMPT5.14A or BMPT5.14B Rain Gardens and Bioretention:
The soil permeability factor above groundwater is less than 0.3 inches per. Because the site soils don't accommodate infiltration, this is not a feasible infiltration BMP as part of Minimum requirement #5.

BMPT5.10C Downspout Dispersion Systems:
There is insufficient space to meet the required dispersion lengths and setbacks from the structures and the property lines.

BMP T5.10D Perforated Stub-out Connections
There is insufficient space to meet the required setback of 10' away from the structures and property lines, and infiltration rates are less than 0.3 inches per hour.

Other Hard Surfaces:
BMPT5.30A or T5.30B Full Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

BMPT5.15 Permeable Pavement:
Permeable pavement is insufficient due to soil infiltration above the groundwater table being less than 0.3 in/hr.

BMPT5.14A or BMPT5.14B Rain Gardens and Bioretention:
The soil permeability factor above groundwater is less than 0.3 inches per hour. Because the site soils don't accommodate infiltration, this is not a feasible infiltration BMP as part of Minimum requirement #5.

BMPT5.12 Sheet Flow Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

None of the List 2 requirements can be met by this project. Consequently, site stormwater runoff from this project will be treated and detained prior to discharge as described in Sections F and G of this report.

The following BMPs will be implemented to meet the MR# 5 requirements:

- **BMP T5.13: Post-Construction Soil Quality and Depth** for lawn and landscaped areas.
- **BMP D.2: Detention Tanks** for runoff from the site.
- **BMP V10.0: Manufactured Treatment Devices** for runoff from the site.
- **BMP T11.11: Coalescing Plate (CP) Separator** for treatment of fuel station spills, mini-mart grease, and car wash oils.

Section F – Runoff Treatment Analysis and Design

Treatment for the site will be accomplished with Contech treatment cartridges. Preliminary stormwater analysis with a WWHM model (see appendix B) identifies the water quality storm event for the site as 0.1213. This volume includes roof, landscape, and frontage runoff, which will not all be treated as part of the final design. The Contech sizing table below identifies treatment flow rates for different cartridges. For example, the 18" ZPG cartridges will each treat 0.028 cfs. Based on this preliminary analysis, there will be 5 or less 18" cartridges needed to treat the stormwater runoff from the site. Due to elevation issues it might be necessary to use low drop cartridges which would result in 7 or less ZPG cartridges. This site is very tight vertically, so the preliminary rim elevations and pipe IE's were sent to Contech who verified that their treatment cartridges will operate properly under the proposed backwater conditions.

Table 1-Contech Sizing Chart

	$2\ GPM/ft^2$			$1\ GPM/ft^2$			$1.67\ GPM/ft^2$		
StormFilter	Flow (GPM)	Flow (CFS)	Color	Flow (GPM)	Flow (CFS)	Color	Flow (GPM)	Flow (CFS)	Color
LowDrop	10	0.022	Gray (GRY)	5.00	0.011	Blue (BLU)	8.35	0.019	Yellow (YLW)
18"	15	0.033	Black (BLK)	7.50	0.017	Blue (BLU)	12.53	0.028	Red (RED)
27"	22.5	0.05	Gold (GLD)	11.50	0.025	Pink (PNK)	18.79	0.042	White (WHT)

Section G - Flow Control Analysis and Design

The stormwater quantity control system for this site has been designed based on the current stormwater quantity control requirements of the City of Camas. The quantity control standards require that stormwater discharges shall match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

The runoff from this site will be detained in an underground detention facility. The preliminary design assumes 6 x 136' 24" CMP pipes placed in gravel. The gravel has a porosity of 0.40. Underground storage was modelled in WWHM using a trench. In order to properly model the 24" CMP in the underground storage, the porosity for the rock was calculated and averaged out to be 0.7326. The WWHM model shows that it passed and meets the discharge requirements of the SWMMWW.

See Appendix B for calculations.

Section H – Wetland Protection

There are not any wetlands on the site. See appendix F.

Section I – Other Permits

The project will be required to obtain preliminary site plan approval, final site plan approval, construction drawing approval, an NPDES construction stormwater permit, and building permit approval prior to construction.

Section J – Conveyance Systems Analysis and Design

Conveyance will be provided with the Final TIR.

Section K – Special Reports and Studies

A Geotechnical Report for the site is included in Appendix C. A Critical Areas report and a Mitigation plan are included in Appendix F. No other special studies are anticipated to be needed.

Section L –Operations and Maintenance Manual

The stormwater facility located on-site will be maintained by the site owner. An Operations and Maintenance Manual is included as Appendix D of this report.

APPENDIX A

Maps

Vicinity Map

Legend

- Taxlots
- All Roads
  - Interstate
  - State Route
  - Arterial
  - Forest Arterial
  - Minor Collector
  - Forest Collector
  - Private or Other

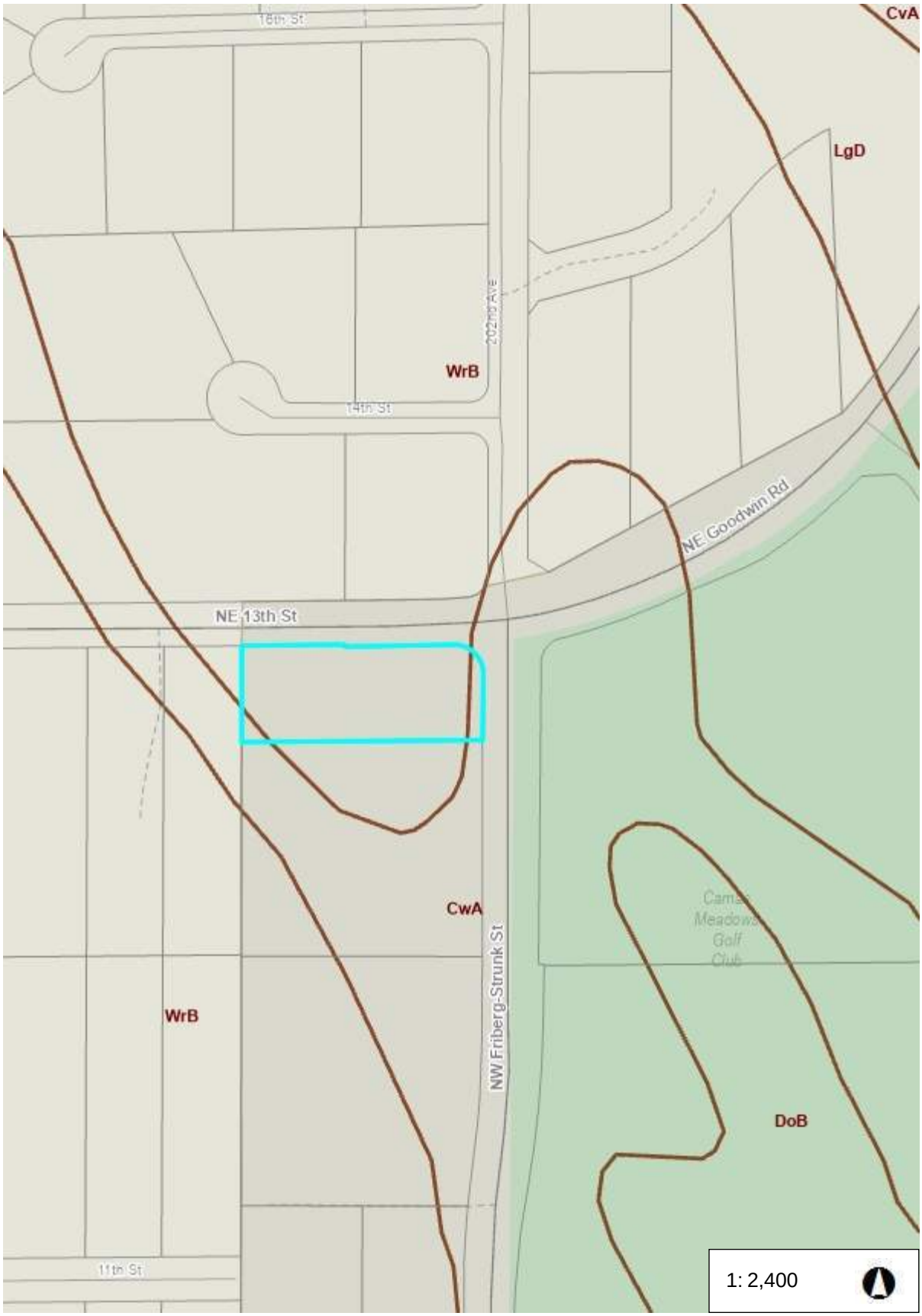
Notes:

1,000.0 0 500.00 1,000.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. Taxlot (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.

Soils Map



Legend

- Taxlots
- Soil Type

Notes:

400.0 0 200.00 400.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

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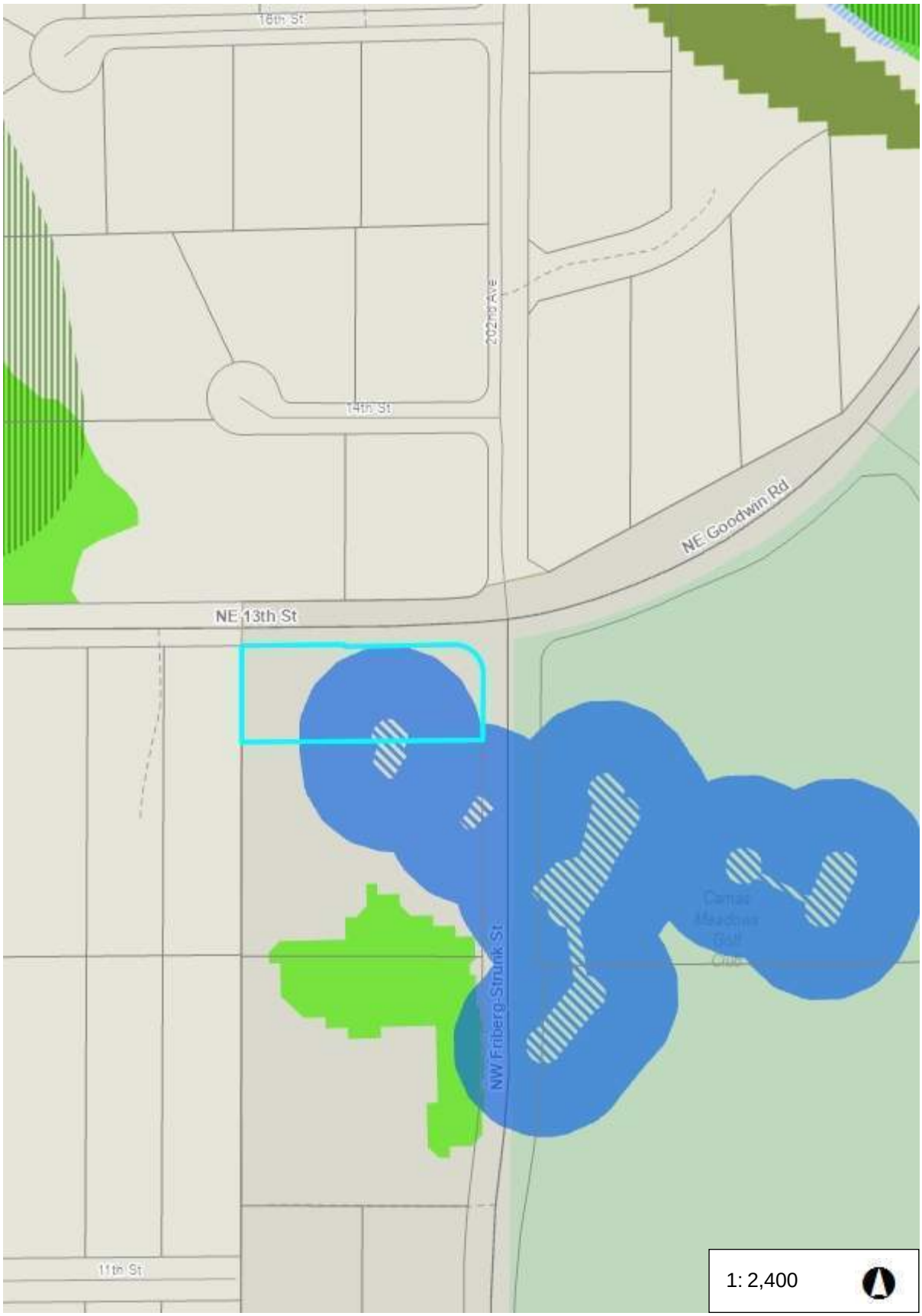
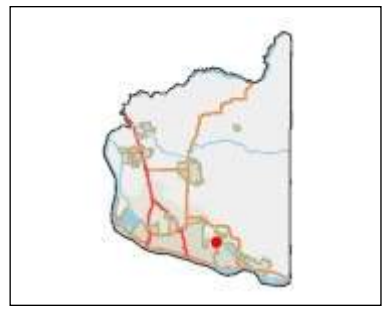
Critical Areas Map





Legend

- Taxlots
- Species
  - Species Area
  - Adjacent to Species Area
- Habitat
  - Habitat Area
  - Adjacent to Habitat Area
- Riparian Habitat
- Severe Erosion Hazard Areas
- Steep Slopes and Landslide H
  - Areas of Historic or Active Landslid
  - Areas of Potential Instability
  - Areas of Older Landslide Debris
  - Slopes > 15%
  - Slopes > 25%
- Potential Wetlands Presence
- Flood Zone Designation
  - Floodway
  - Floodway Fringe
  - 500 Year Flood Area
  - Area Not Studied
- Shoreline Designations
  - Aquatic
  - Natural
  - Urban Conservancy
  - Medium Intensity
  - High Intensity
  - Rural Conservancy Residential
  - Rural Conservancy Resource Land
- Critical Aquifer Recharge Area

Notes:

400.0 0 200.00 400.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

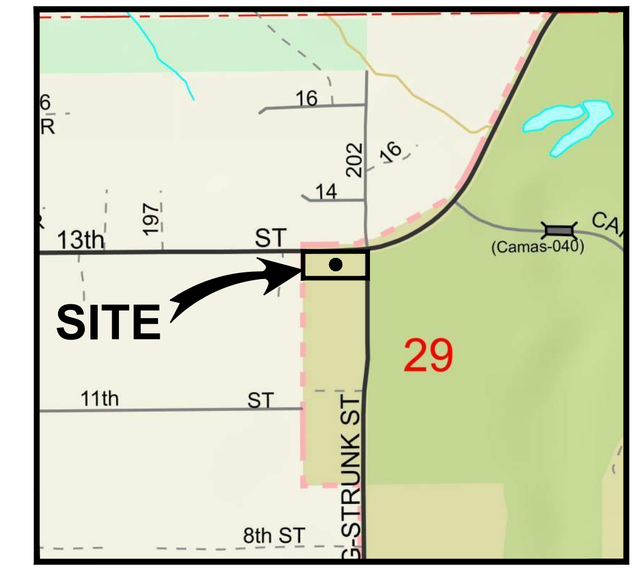
This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. Ta (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.

13th Street Site Plan

Located in the NW ¼ of Section 29, T2N, R3E, W.M.
City of Camas, Washington

Sheet Index

1. Predevelopment Basin Map
2. Postdevelopment Basin Map



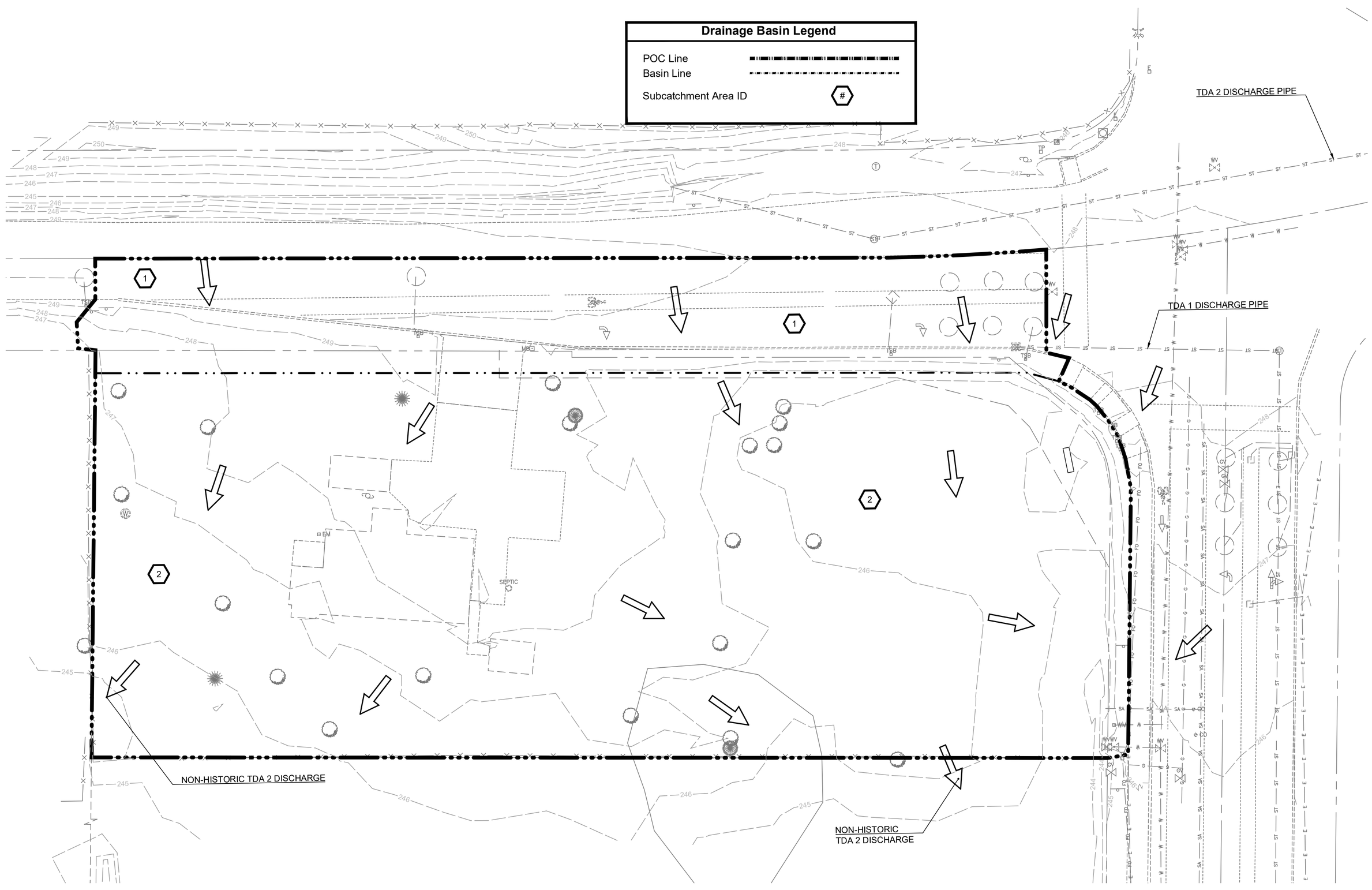
VICINITY MAP
NOT TO SCALE

Extg TDA Totals	sqft	acre	
TDA 1 Area	11,551.38	0.2652	1
Frontage Road	7,565.86	0.1737	
Frontage Landscape	3,985.52	0.0915	
TDA 2 Area	41,285.00	0.9478	2
Site Driveway	2,449.31	0.0562	
Site Sidewalk	154.38	0.0035	
Site Roof	1,936.36	0.0445	
Site Landscape	36,744.94	0.8435	
Existing Site Area Modeled as Forested	41,285.00	0.9478	

Scale 1" = 20'
20 10 0 20

Drainage Basin Legend

POC Line
Basin Line
Subcatchment Area ID #



GENERAL NOTES

APPLICANT:
Taz Kahn
3993 NW Currawong Court
Camas, WA 98607
TKahnusa@gmail.com

OWNER:
Pak USA Camas LLC
20107 NE 13th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 176148-000
20101 NE 13TH ST
Camas, WA 98607

SITE STATISTICS:
Existing Site Area: 42,257 SF (0.97 Acre)
ROW Dedication: 1,832 SF (0.04 Acre)
Developed Site: 42,257 SF (0.93 Acre)

PLS ENGINEERING

Predevelopment Basin Map For:

13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	
2	
3	
4	
5	
6	

Project No. 3632	
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

1 / 2

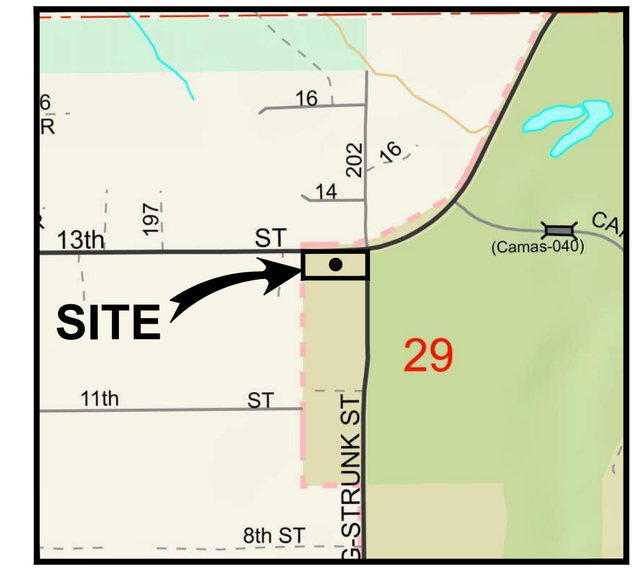
Exhibit 9 APPEAL24-1001

13th Street Site Plan

Located in the NW ¼ of Section 29, T2N, R3E, W.M.
City of Camas, Washington

Sheet Index

1. Predevelopment Basin Map
2. Postdevelopment Basin Map



VICINITY MAP
NOT TO SCALE

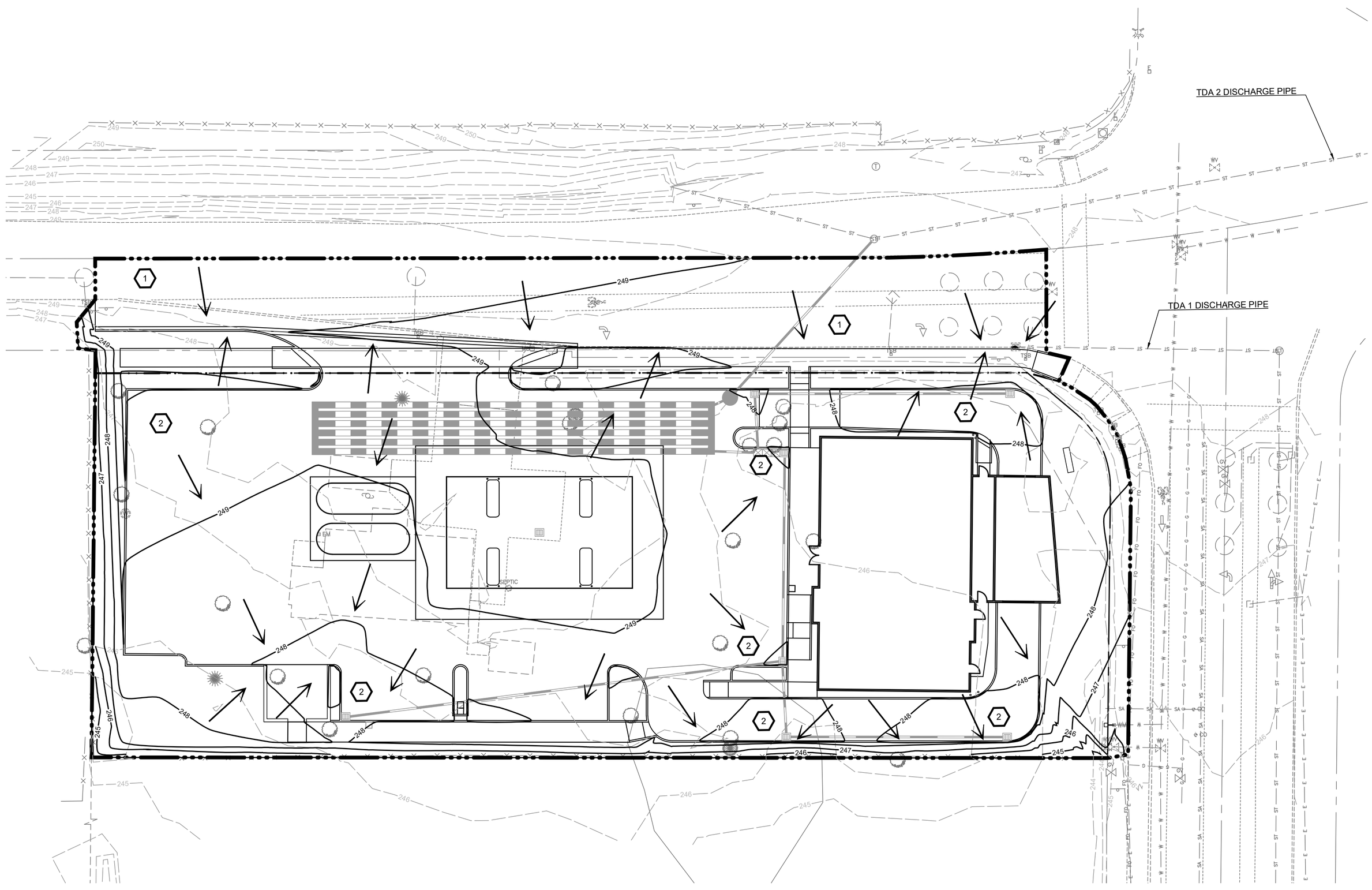
Basin Areas (sqft)						
Basin	Road	SW	Roof	Field	Landscape	Total
(1) TDA 1 Basin 1 Frontage	9,097.51	1,559.09	-	-	894.78	11,551.38
(2) TDA 2 Basin 3 Site	22,101.84	2,490.08	7,759.05	-	8,934.03	41,285.00
Total	31,199.36	4,049.16	7,759.05	-	9,828.81	52,836.38

Basin Areas (acre)						
	Road	SW	Roof	Field	Landscape	Total
(1) TDA 1 Basin 1 Frontage	0.2089	0.0358	-	-	0.0205	0.2652
(2) TDA 2 Basin 3 Site	0.5074	0.0572	0.1781	-	0.2051	0.9478
	-	-	-	-	-	-
Total	0.7162	0.0930	0.1781	-	0.2256	1.2130

Scale 1" = 20'
20 10 0 20

Drainage Basin Legend

POC Line
Basin Line
Subcatchment Area ID (#)



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SITE ADDRESS:
Parcel # 176148-000
20101 NE 13TH ST
Camas, WA 98607

SITE STATISTICS:
Existing Site Area: 42,257 SF (0.97 Acre)
ROW Dedication: 1,832 SF (0.04 Acre)
Developed Site: 42,257 SF (0.93 Acre)

PLS ENGINEERING

Post-Development Basin Map For:

13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	
2	
3	
4	
5	
6	

Project No. 3632	
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

2 / 2

Exhibit 9 APPEAL24-1001

APPENDIX B

Design Calculations and Modeling

Proposed TDA Totals		
	sqft	acre
Total Development	**52,836.38**	**1.2130**
Road	31,199.36	0.7162
Sidewalk	4,049.16	0.0930
Roof	7,759.05	0.1781
Landscape	9,828.81	0.2256
Impervious Area	43,007.57	0.9873
Pervious Area	9,828.81	0.2256
Pollution Generating Impervious Surface Area (PGIS)	31,199.36	0.7162
TDA 1	**11,551.38**	**0.2652**
Road	9,097.51	0.2089
Sidewalk	1,559.09	0.0358
Landscape	894.78	0.0205
TDA 1 New Impervious	3,090.74	0.0710
TDA 1 Replaced Impervious	7,565.86	0.1737
TDA 1 New PGIS	1,531.66	0.0352
TDA 1 Replaced PGIS	7,565.86	0.1737
TDA 2	**41,285.00**	**0.9478**
Road	22,101.84	0.5074
Sidewalk	2,490.08	0.0572
Roof	7,759.05	0.1781
Landscape	8,934.03	0.2051
TDA 2 New Impervious	32,350.97	0.7427
TDA 2 Replaced Impervious	-	-
TDA 2 New PGIS	22,101.84	0.5074
TDA 2 Replaced PGIS	-	-

Extg TDA Totals		
	sqft	acre
TDA 1 Area	11,551.38	0.2652
Frontage Road	7,565.86	0.1737
Frontage Landscape	3,985.52	0.0915
TDA 2 Area	41,285.00	0.9478
Site Driveway	2,449.31	0.0562
Site Sidewalk	154.38	0.0035
Site Roof	1,936.36	0.0445
Site Landscape	36,744.94	0.8435
Existing Site Area Modeled as Forested	41,285.00	0.9478

Basin Areas (sqft)						
Basin	**Road**	**SW**	**Roof**	**Field**	**Landscape**	**Total**
TDA 1 Basin 1 Frontage	9,097.51	1,559.09	-	-	894.78	11,551.38
TDA 2 Basin 3 Site	22,101.84	2,490.08	7,759.05	-	8,934.03	41,285.00
Total	31,199.36	4,049.16	7,759.05	-	9,828.81	52,836.38

Basin Areas (acre)						
	Road	**SW**	**Roof**	**Field**	**Landscape**	**Total**
TDA 1 Basin 1 Frontage	0.2089	0.0358	-	-	0.0205	0.2652
TDA 2 Basin 3 Site	0.5074	0.0572	0.1781	-	0.2051	0.9478
	-	-	-	-	-	-
Total	0.7162	0.0930	0.1781	-	0.2256	1.2130

WWHM Basin Treatment Flow Analysis (cfs)						
	WQ	**2-yr**	**10-yr**	**25-yr**	**50-yr**	**100-yr**
Total Site Treatment	0.1213	0.568841	0.844412	0.987932	1.097315	1.208959

Underground Storage Calculations		
17' Wide x 2' Tall is	34.0000	SF
6x24" CMP is	18.8496	SF
Rock Storage @ 40% Porocity	6.0602	SF
Total Storage	24.9097	SF
Porocity Tweaked to match	**73.26%**	
Facility Length	130.0000	LF
Total Facility Volume	4,420.0000	CF
Facility Storage	3,238.2654	CF

WWHM2012

PROJECT REPORT

General Model Information

WWHM2012 Project Name: 13thPrelimStormAnalysis

Site Name:	13th Gas Station
Site Address:	
City:	
Report Date:	11/3/2023
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.300
Version Date:	2023/01/27
Version:	4.2.19

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

TDA 2 EXTG

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Flat	0.9478
Pervious Total	0.9478
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.9478

Mitigated Land Use

TDA 2 Basin 3 Site

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Flat	0.2051
Pervious Total	0.2051
Impervious Land Use	acre
ROADS FLAT	0.5074
ROOF TOPS FLAT	0.1781
SIDEWALKS FLAT	0.0572
Impervious Total	0.7427
Basin Total	0.9478

Routing Elements

Predeveloped Routing

Mitigated Routing

Underground Detention

Bottom Length:	136.00 ft.
Bottom Width:	17.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	2
Pour Space of material for first layer:	0.7326
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0

Discharge Structure

Riser Height:	2 ft.
Riser Diameter:	10 in.
Notch Type:	Rectangular
Notch Width:	0.270 ft.
Notch Height:	0.400 ft.
Orifice 1 Diameter:	1.900 in. Elevation:0 ft.

Element Flows To:

Outlet 1 Outlet 2

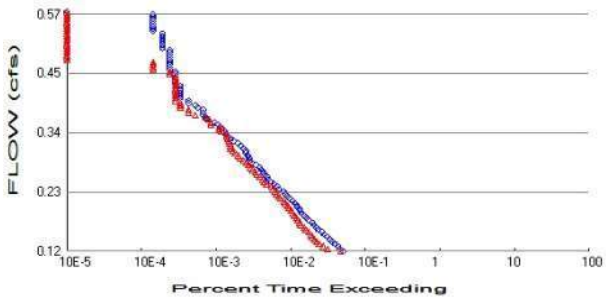
Gravel Trench Bed Hydraulic Table

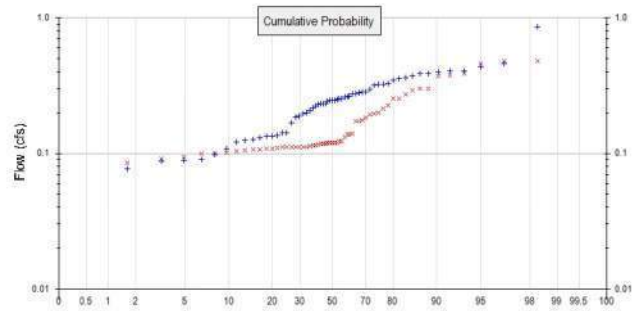
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.053	0.000	0.000	0.000
0.0222	0.053	0.000	0.014	0.000
0.0444	0.053	0.001	0.020	0.000
0.0667	0.053	0.002	0.025	0.000
0.0889	0.053	0.003	0.029	0.000
0.1111	0.053	0.004	0.032	0.000
0.1333	0.053	0.005	0.035	0.000
0.1556	0.053	0.006	0.038	0.000
0.1778	0.053	0.006	0.041	0.000
0.2000	0.053	0.007	0.043	0.000
0.2222	0.053	0.008	0.046	0.000
0.2444	0.053	0.009	0.048	0.000
0.2667	0.053	0.010	0.050	0.000
0.2889	0.053	0.011	0.052	0.000
0.3111	0.053	0.012	0.054	0.000
0.3333	0.053	0.013	0.056	0.000
0.3556	0.053	0.013	0.058	0.000
0.3778	0.053	0.014	0.060	0.000
0.4000	0.053	0.015	0.062	0.000
0.4222	0.053	0.016	0.063	0.000
0.4444	0.053	0.017	0.065	0.000
0.4667	0.053	0.018	0.066	0.000
0.4889	0.053	0.019	0.068	0.000
0.5111	0.053	0.019	0.070	0.000
0.5333	0.053	0.020	0.071	0.000
0.5556	0.053	0.021	0.073	0.000
0.5778	0.053	0.022	0.074	0.000
0.6000	0.053	0.023	0.075	0.000
0.6222	0.053	0.024	0.077	0.000

0.6444	0.053	0.025	0.078	0.000
0.6667	0.053	0.025	0.080	0.000
0.6889	0.053	0.026	0.081	0.000
0.7111	0.053	0.027	0.082	0.000
0.7333	0.053	0.028	0.083	0.000
0.7556	0.053	0.029	0.085	0.000
0.7778	0.053	0.030	0.086	0.000
0.8000	0.053	0.031	0.087	0.000
0.8222	0.053	0.032	0.088	0.000
0.8444	0.053	0.032	0.090	0.000
0.8667	0.053	0.033	0.091	0.000
0.8889	0.053	0.034	0.092	0.000
0.9111	0.053	0.035	0.093	0.000
0.9333	0.053	0.036	0.094	0.000
0.9556	0.053	0.037	0.095	0.000
0.9778	0.053	0.038	0.096	0.000
1.0000	0.053	0.038	0.098	0.000
1.0222	0.053	0.039	0.099	0.000
1.0444	0.053	0.040	0.100	0.000
1.0667	0.053	0.041	0.101	0.000
1.0889	0.053	0.042	0.102	0.000
1.1111	0.053	0.043	0.103	0.000
1.1333	0.053	0.044	0.104	0.000
1.1556	0.053	0.044	0.105	0.000
1.1778	0.053	0.045	0.106	0.000
1.2000	0.053	0.046	0.107	0.000
1.2222	0.053	0.047	0.108	0.000
1.2444	0.053	0.048	0.109	0.000
1.2667	0.053	0.049	0.110	0.000
1.2889	0.053	0.050	0.111	0.000
1.3111	0.053	0.051	0.112	0.000
1.3333	0.053	0.051	0.113	0.000
1.3556	0.053	0.052	0.114	0.000
1.3778	0.053	0.053	0.115	0.000
1.4000	0.053	0.054	0.115	0.000
1.4222	0.053	0.055	0.116	0.000
1.4444	0.053	0.056	0.117	0.000
1.4667	0.053	0.057	0.118	0.000
1.4889	0.053	0.057	0.119	0.000
1.5111	0.053	0.058	0.120	0.000
1.5333	0.053	0.059	0.121	0.000
1.5556	0.053	0.060	0.122	0.000
1.5778	0.053	0.061	0.123	0.000
1.6000	0.053	0.062	0.123	0.000
1.6222	0.053	0.063	0.127	0.000
1.6444	0.053	0.063	0.134	0.000
1.6667	0.053	0.064	0.141	0.000
1.6889	0.053	0.065	0.151	0.000
1.7111	0.053	0.066	0.161	0.000
1.7333	0.053	0.067	0.172	0.000
1.7556	0.053	0.068	0.185	0.000
1.7778	0.053	0.069	0.198	0.000
1.8000	0.053	0.070	0.211	0.000
1.8222	0.053	0.070	0.226	0.000
1.8444	0.053	0.071	0.241	0.000
1.8667	0.053	0.072	0.257	0.000
1.8889	0.053	0.073	0.274	0.000
1.9111	0.053	0.074	0.291	0.000

1.9333	0.053	0.075	0.309	0.000
1.9556	0.053	0.076	0.327	0.000
1.9778	0.053	0.076	0.346	0.000
2.0000	0.053	0.077	0.366	0.000

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.9478
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.2051
Total Impervious Area: 0.7427

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.237792
5 year	0.372265
10 year	0.445639
25 year	0.520497
50 year	0.565063
100 year	0.601747

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.143408
5 year	0.220762
10 year	0.285903
25 year	0.386617
50 year	0.47677
100 year	0.581482

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.186	0.173
1950	0.243	0.118
1951	0.322	0.120
1952	0.189	0.184
1953	0.254	0.109
1954	0.354	0.113
1955	0.197	0.109
1956	0.387	0.374
1957	0.294	0.118
1958	0.218	0.302

1959	0.127	0.091
1960	0.125	0.123
1961	0.349	0.196
1962	0.234	0.111
1963	0.260	0.119
1964	0.248	0.112
1965	0.222	0.175
1966	0.284	0.118
1967	0.248	0.116
1968	0.324	0.119
1969	0.264	0.461
1970	0.862	0.476
1971	0.136	0.100
1972	0.232	0.111
1973	0.231	0.133
1974	0.364	0.388
1975	0.198	0.109
1976	0.285	0.123
1977	0.008	0.094
1978	0.406	0.254
1979	0.275	0.215
1980	0.168	0.104
1981	0.386	0.293
1982	0.260	0.274
1983	0.432	0.172
1984	0.141	0.107
1985	0.109	0.138
1986	0.134	0.114
1987	0.234	0.137
1988	0.090	0.106
1989	0.098	0.105
1990	0.089	0.100
1991	0.253	0.111
1992	0.278	0.099
1993	0.327	0.255
1994	0.250	0.193
1995	0.207	0.299
1996	0.397	0.477
1997	0.459	0.376
1998	0.371	0.120
1999	0.278	0.198
2000	0.134	0.085
2001	0.077	0.082
2002	0.405	0.114
2003	0.319	0.139
2004	0.087	0.112
2005	0.131	0.111
2006	0.245	0.111
2007	0.121	0.228
2008	0.142	0.120

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.8622	0.4771
2	0.4595	0.4763
3	0.4322	0.4607
4	0.4060	0.3879

5	0.4054	0.3757
6	0.3967	0.3738
7	0.3870	0.3017
8	0.3860	0.2990
9	0.3714	0.2929
10	0.3637	0.2735
11	0.3544	0.2551
12	0.3485	0.2545
13	0.3270	0.2277
14	0.3237	0.2153
15	0.3216	0.1982
16	0.3187	0.1964
17	0.2943	0.1925
18	0.2848	0.1841
19	0.2841	0.1745
20	0.2782	0.1725
21	0.2776	0.1716
22	0.2748	0.1394
23	0.2638	0.1383
24	0.2598	0.1370
25	0.2598	0.1327
26	0.2543	0.1230
27	0.2529	0.1228
28	0.2500	0.1202
29	0.2480	0.1200
30	0.2476	0.1196
31	0.2446	0.1193
32	0.2435	0.1189
33	0.2343	0.1184
34	0.2338	0.1176
35	0.2319	0.1175
36	0.2309	0.1161
37	0.2223	0.1142
38	0.2183	0.1140
39	0.2075	0.1130
40	0.1982	0.1121
41	0.1973	0.1121
42	0.1885	0.1113
43	0.1857	0.1110
44	0.1681	0.1108
45	0.1421	0.1107
46	0.1410	0.1106
47	0.1364	0.1090
48	0.1344	0.1086
49	0.1343	0.1086
50	0.1308	0.1073
51	0.1269	0.1065
52	0.1254	0.1052
53	0.1211	0.1038
54	0.1087	0.1003
55	0.0983	0.0999
56	0.0905	0.0990
57	0.0892	0.0936
58	0.0875	0.0913
59	0.0775	0.0851
60	0.0078	0.0822

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1189	1055	983	93	Pass
0.1234	965	655	67	Pass
0.1279	904	571	63	Pass
0.1324	818	507	61	Pass
0.1369	757	463	61	Pass
0.1414	699	434	62	Pass
0.1459	647	404	62	Pass
0.1504	587	388	66	Pass
0.1549	549	364	66	Pass
0.1595	490	333	67	Pass
0.1640	458	319	69	Pass
0.1685	429	291	67	Pass
0.1730	410	278	67	Pass
0.1775	367	263	71	Pass
0.1820	342	250	73	Pass
0.1865	317	236	74	Pass
0.1910	298	222	74	Pass
0.1955	281	213	75	Pass
0.2000	265	199	75	Pass
0.2045	254	192	75	Pass
0.2090	238	180	75	Pass
0.2135	225	169	75	Pass
0.2180	201	153	76	Pass
0.2226	187	146	78	Pass
0.2271	175	135	77	Pass
0.2316	169	129	76	Pass
0.2361	145	122	84	Pass
0.2406	139	115	82	Pass
0.2451	126	100	79	Pass
0.2496	114	92	80	Pass
0.2541	104	89	85	Pass
0.2586	101	80	79	Pass
0.2631	95	74	77	Pass
0.2676	90	71	78	Pass
0.2721	85	66	77	Pass
0.2766	81	61	75	Pass
0.2811	71	57	80	Pass
0.2856	62	53	85	Pass
0.2902	59	49	83	Pass
0.2947	58	44	75	Pass
0.2992	56	42	75	Pass
0.3037	53	38	71	Pass
0.3082	52	35	67	Pass
0.3127	49	33	67	Pass
0.3172	45	33	73	Pass
0.3217	41	32	78	Pass
0.3262	36	31	86	Pass
0.3307	33	30	90	Pass
0.3352	30	29	96	Pass
0.3397	28	29	103	Pass
0.3442	27	25	92	Pass
0.3487	25	23	92	Pass
0.3532	24	23	95	Pass

0.3578	22	18	81	Pass
0.3623	20	18	90	Pass
0.3668	16	17	106	Pass
0.3713	15	15	100	Pass
0.3758	14	11	78	Pass
0.3803	14	9	64	Pass
0.3848	14	9	64	Pass
0.3893	12	7	58	Pass
0.3938	11	7	63	Pass
0.3983	9	7	77	Pass
0.4028	9	6	66	Pass
0.4073	7	6	85	Pass
0.4118	7	6	85	Pass
0.4163	7	6	85	Pass
0.4208	7	6	85	Pass
0.4254	7	6	85	Pass
0.4299	7	6	85	Pass
0.4344	6	6	100	Pass
0.4389	6	6	100	Pass
0.4434	6	6	100	Pass
0.4479	6	6	100	Pass
0.4524	6	5	83	Pass
0.4569	6	5	83	Pass
0.4614	5	3	60	Pass
0.4659	5	3	60	Pass
0.4704	5	3	60	Pass
0.4749	5	3	60	Pass
0.4794	5	0	0	Pass
0.4839	5	0	0	Pass
0.4884	5	0	0	Pass
0.4930	5	0	0	Pass
0.4975	5	0	0	Pass
0.5020	4	0	0	Pass
0.5065	4	0	0	Pass
0.5110	4	0	0	Pass
0.5155	4	0	0	Pass
0.5200	4	0	0	Pass
0.5245	4	0	0	Pass
0.5290	4	0	0	Pass
0.5335	3	0	0	Pass
0.5380	3	0	0	Pass
0.5425	3	0	0	Pass
0.5470	3	0	0	Pass
0.5515	3	0	0	Pass
0.5560	3	0	0	Pass
0.5606	3	0	0	Pass
0.5651	3	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Underground Detention POC	☐	154.69			☐	0.00			
Total Volume Infiltrated		154.69	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

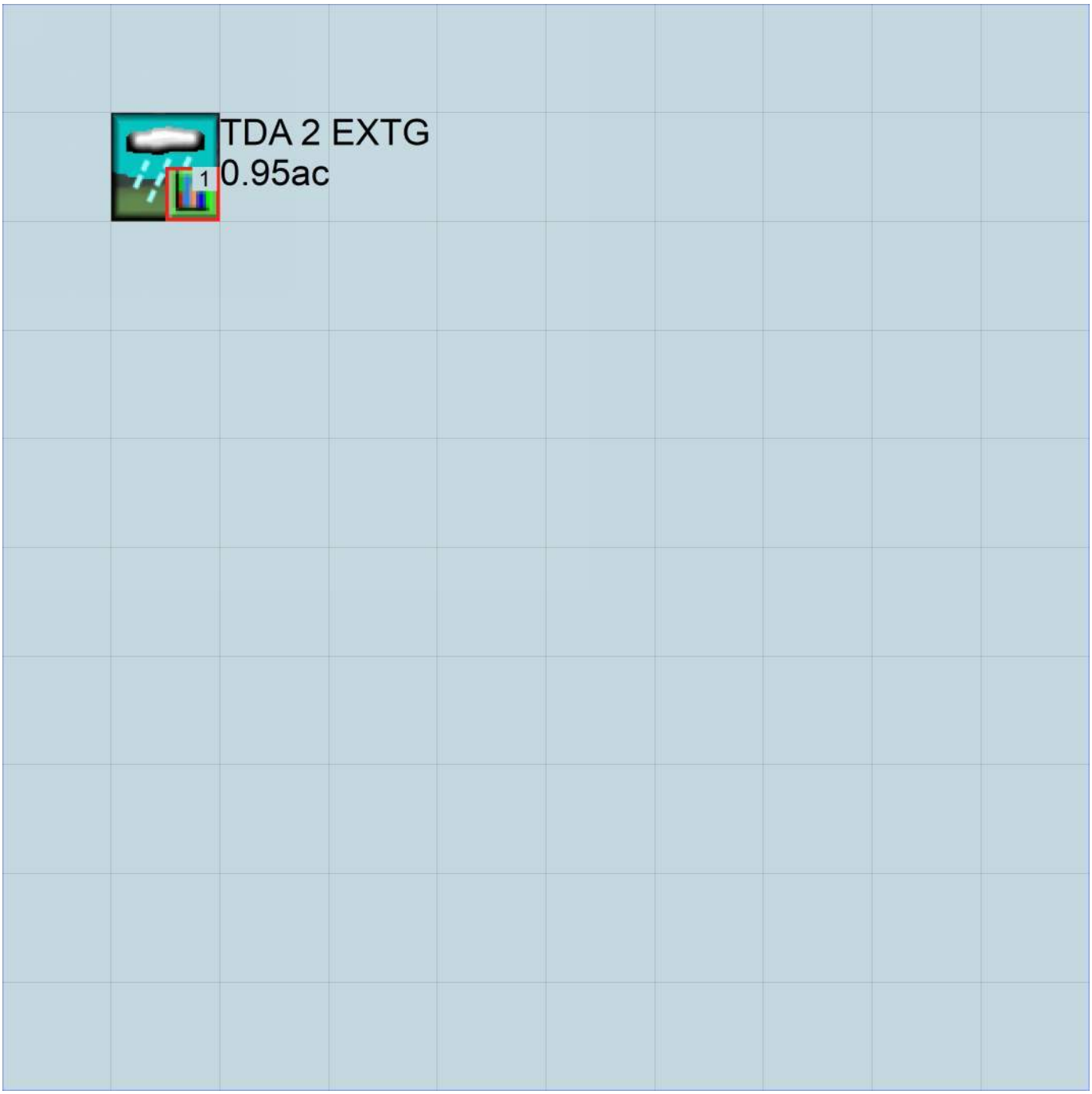
No PERLND changes have been made.

IMPLND Changes

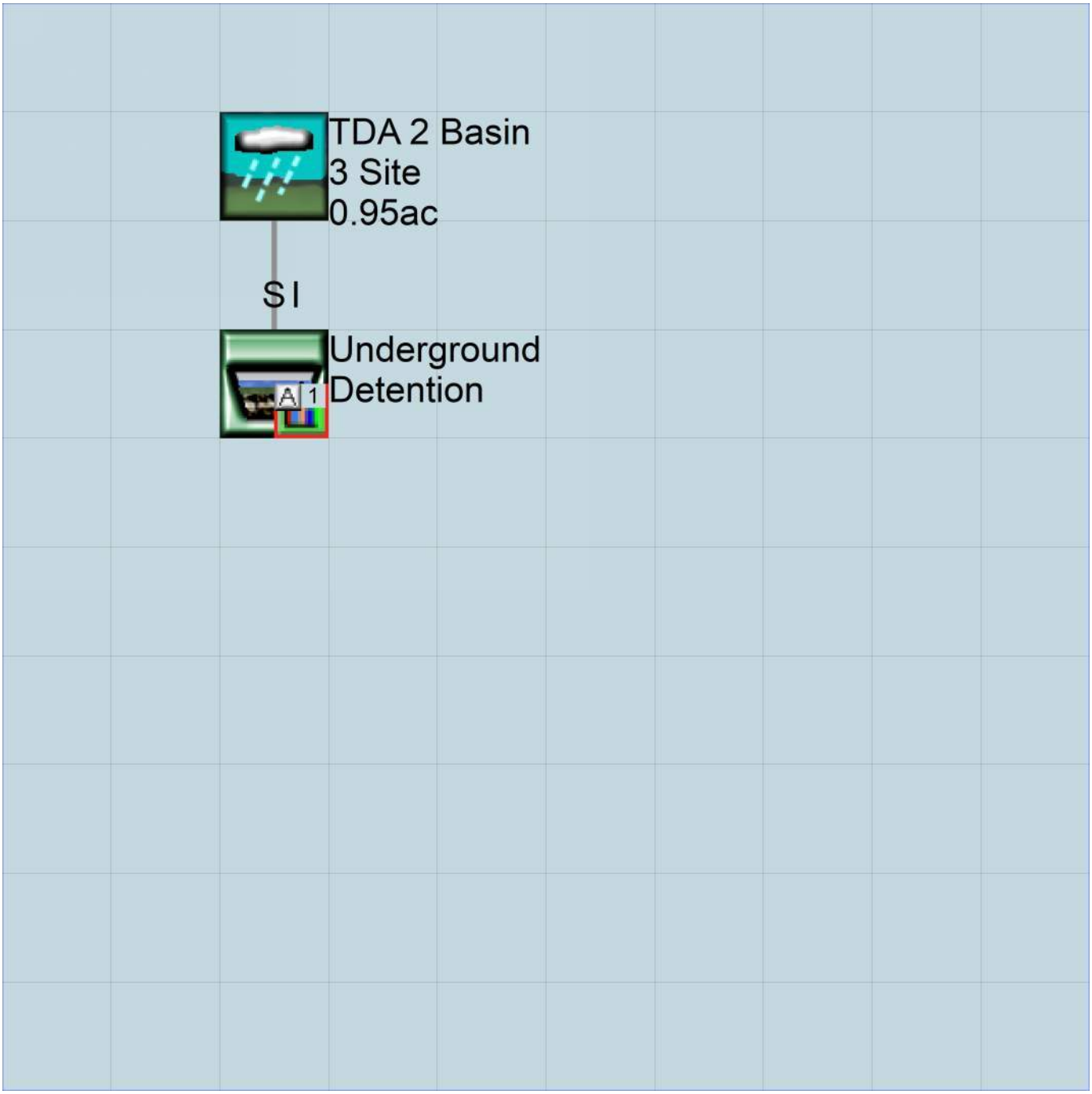
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                               ***
WDM        26   13thPrelimStormAnalysis.wdm
MESSU      25   Pre13thPrelimStormAnalysis.MES
           27   Pre13thPrelimStormAnalysis.L61
           28   Pre13thPrelimStormAnalysis.L62
           30   POC13thPrelimStormAnalysis1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      28
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        TDA 2 EXTG                 MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                           in  out           ***
   28     SG4, Forest, Flat       1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   28         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   28         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   28         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   28              0         6      0.04       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   28              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   28            0.2       0.4      0.35         2       0.4       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   28              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                       in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
TDA 2 EXTG***
PERLND  28                      0.9478     COPY   501     12
PERLND  28                      0.9478     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                        in  out                               ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                       ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                               ***
WDM        26   13thPrelimStormAnalysis.wdm
MESSU      25   Mit13thPrelimStormAnalysis.MES
           27   Mit13thPrelimStormAnalysis.L61
           28   Mit13thPrelimStormAnalysis.L62
           30   POC13thPrelimStormAnalysis1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      34
      IMPLND       1
      IMPLND       4
      IMPLND       8
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Underground Detention       MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                           in  out           ***
   34     SG4, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   34         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
```

```
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   34         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   34         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   34             0         6      0.02       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   34             0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                  ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   34           0.1       0.2      0.25         2       0.4      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   34             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                       in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    4    1    9
    4         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    8         0    0    0    0    0
```

```
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
TDA 2 Basin 3 Site***
PERLND  34                      0.2051     RCHRES   1      2
PERLND  34                      0.2051     RCHRES   1      3
IMPLND   1                      0.5074     RCHRES   1      5
IMPLND   4                      0.1781     RCHRES   1      5
IMPLND   8                      0.0572     RCHRES   1      5

******Routing******
PERLND  34                      0.2051     COPY     1     12
IMPLND   1                      0.5074     COPY     1     15
IMPLND   4                      0.1781     COPY     1     15
IMPLND   8                      0.0572     COPY     1     15
PERLND  34                      0.2051     COPY     1     13
RCHRES   1                           1     COPY   501     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<-----------------><---> User T-series  Engl Metr LKFG           ***
                                          in  out                           ***
    1     Underground Dete-016    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
```

```
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                        ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1               1      0.03       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                           ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   92    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.053076  0.000000  0.000000
  0.022222  0.053076  0.000864  0.014604
  0.044444  0.053076  0.001728  0.020653
  0.066667  0.053076  0.002592  0.025294
  0.088889  0.053076  0.003456  0.029207
  0.111111  0.053076  0.004320  0.032655
  0.133333  0.053076  0.005184  0.035771
  0.155556  0.053076  0.006049  0.038637
  0.177778  0.053076  0.006913  0.041305
  0.200000  0.053076  0.007777  0.043811
  0.222222  0.053076  0.008641  0.046181
  0.244444  0.053076  0.009505  0.048435
  0.266667  0.053076  0.010369  0.050588
  0.288889  0.053076  0.011233  0.052654
  0.311111  0.053076  0.012097  0.054642
  0.333333  0.053076  0.012961  0.056559
  0.355556  0.053076  0.013825  0.058414
  0.377778  0.053076  0.014689  0.060212
  0.400000  0.053076  0.015553  0.061958
  0.422222  0.053076  0.016418  0.063656
  0.444444  0.053076  0.017282  0.065309
  0.466667  0.053076  0.018146  0.066922
  0.488889  0.053076  0.019010  0.068497
  0.511111  0.053076  0.019874  0.070036
  0.533333  0.053076  0.020738  0.071543
  0.555556  0.053076  0.021602  0.073018
  0.577778  0.053076  0.022466  0.074464
  0.600000  0.053076  0.023330  0.075882
  0.622222  0.053076  0.024194  0.077275
  0.644444  0.053076  0.025058  0.078643
  0.666667  0.053076  0.025922  0.079987
  0.688889  0.053076  0.026787  0.081309
```

```
  0.711111  0.053076  0.027651  0.082610
  0.733333  0.053076  0.028515  0.083891
  0.755556  0.053076  0.029379  0.085153
  0.777778  0.053076  0.030243  0.086396
  0.800000  0.053076  0.031107  0.087622
  0.822222  0.053076  0.031971  0.088830
  0.844444  0.053076  0.032835  0.090023
  0.866667  0.053076  0.033699  0.091199
  0.888889  0.053076  0.034563  0.092361
  0.911111  0.053076  0.035427  0.093509
  0.933333  0.053076  0.036291  0.094642
  0.955556  0.053076  0.037155  0.095762
  0.977778  0.053076  0.038020  0.096869
  1.000000  0.053076  0.038884  0.097964
  1.022222  0.053076  0.039748  0.099046
  1.044444  0.053076  0.040612  0.100117
  1.066667  0.053076  0.041476  0.101177
  1.088889  0.053076  0.042340  0.102225
  1.111111  0.053076  0.043204  0.103263
  1.133333  0.053076  0.044068  0.104291
  1.155556  0.053076  0.044932  0.105308
  1.177778  0.053076  0.045796  0.106316
  1.200000  0.053076  0.046660  0.107314
  1.222222  0.053076  0.047524  0.108303
  1.244444  0.053076  0.048389  0.109283
  1.266667  0.053076  0.049253  0.110255
  1.288889  0.053076  0.050117  0.111218
  1.311111  0.053076  0.050981  0.112172
  1.333333  0.053076  0.051845  0.113119
  1.355556  0.053076  0.052709  0.114058
  1.377778  0.053076  0.053573  0.114989
  1.400000  0.053076  0.054437  0.115912
  1.422222  0.053076  0.055301  0.116829
  1.444444  0.053076  0.056165  0.117738
  1.466667  0.053076  0.057029  0.118640
  1.488889  0.053076  0.057893  0.119536
  1.511111  0.053076  0.058757  0.120424
  1.533333  0.053076  0.059622  0.121307
  1.555556  0.053076  0.060486  0.122182
  1.577778  0.053076  0.061350  0.123052
  1.600000  0.053076  0.062214  0.123916
  1.622222  0.053076  0.063078  0.127752
  1.644444  0.053076  0.063942  0.134049
  1.666667  0.053076  0.064806  0.141947
  1.688889  0.053076  0.065670  0.151139
  1.711111  0.053076  0.066534  0.161446
  1.733333  0.053076  0.067398  0.172749
  1.755556  0.053076  0.068262  0.184961
  1.777778  0.053076  0.069126  0.198013
  1.800000  0.053076  0.069991  0.211850
  1.822222  0.053076  0.070855  0.226428
  1.844444  0.053076  0.071719  0.241707
  1.866667  0.053076  0.072583  0.257656
  1.888889  0.053076  0.073447  0.274245
  1.911111  0.053076  0.074311  0.291448
  1.933333  0.053076  0.075175  0.309245
  1.955556  0.053076  0.076039  0.327614
  1.977778  0.053076  0.076903  0.346537
  2.000000  0.053076  0.077767  0.365998
  2.022222  0.053076  0.078947  0.396049
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP
```

```
END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1969/ 9/17 21:30

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3387.5     3438.9     3471.8
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1969/ 9/17 21:30

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -7.584E+03    1.6401  1.6401E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1969/ 9/17 21:45

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3616.7
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1969/ 9/17 21:45

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -2.061E+04    4.4577  4.4577E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1969/ 9/17 22: 0

RCHRES:     1
```

```
The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3482.2
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1969/ 9/17 22: 0

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -8.521E+03    1.8427  1.8427E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1970/ 1/22 17: 0

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3565.4
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1970/ 1/22 17: 0

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -1.600E+04    3.4612  3.4611E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1970/ 1/22 17:15

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3586.9
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1970/ 1/22 17:15

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -1.794E+04    3.8796  3.8796E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1970/ 1/22 17:30

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3469.4
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1970/ 1/22 17:30

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -7.362E+03    1.5922  1.5922E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1995/11/11  6:15

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3511.1
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1995/11/11  6:15

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
```

```
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -1.112E+04    2.4041     2.4041       2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1995/11/11  6:30

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3387.5     3438.9     3643.9
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1995/11/11  6:30

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -2.307E+04    4.9884  4.9884E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1995/11/11  6:45

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3511.3
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1995/11/11  6:45

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -1.113E+04    2.4071  2.4071E+00      2
```

Disclaimer

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WWHM2012

PROJECT REPORT

General Model Information

Project Name:	13thPrelimTreatmentAnalysis
Site Name:	13th Gas Station
Site Address:	
City:	
Report Date:	8/22/2023
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.300
Version Date:	2018/10/10
Version:	4.2.16

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

TDA 2 Treatment

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Flat	0.2916
Pervious Total	0.2916
Impervious Land Use	acre
ROADS FLAT	0.6565
ROOF TOPS FLAT	0.1781
SIDEWALKS FLAT	0.0572
Impervious Total	0.8918
Basin Total	1.1834

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

TDA 2 Treatment

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Flat	0.2916
Pervious Total	0.2916
Impervious Land Use	acre
ROADS FLAT	0.6565
ROOF TOPS FLAT	0.1781
SIDEWALKS FLAT	0.0572
Impervious Total	0.8918
Basin Total	1.1834

Element Flows To:

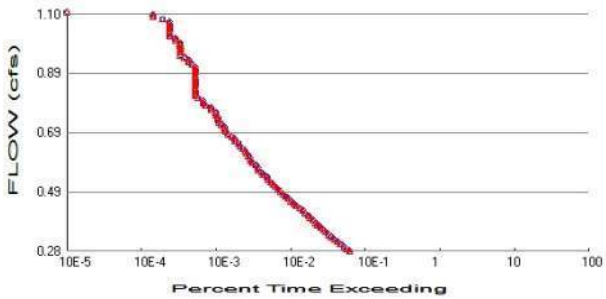
Surface	Interflow	Groundwater

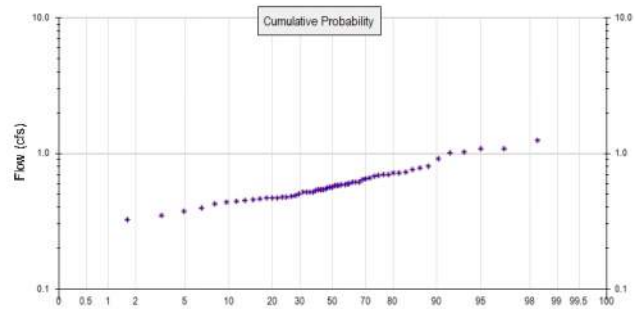
Routing Elements

Predeveloped Routing

Mitigated Routing

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.2916
Total Impervious Area: 0.8918

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.2916
Total Impervious Area: 0.8918

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.568841
5 year	0.733272
10 year	0.844412
25 year	0.987932
50 year	1.097315
100 year	1.208959

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.568841
5 year	0.733272
10 year	0.844412
25 year	0.987932
50 year	1.097315
100 year	1.208959

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.762	0.762
1950	0.501	0.501
1951	0.537	0.537
1952	0.561	0.561
1953	0.520	0.520
1954	0.718	0.718
1955	0.437	0.437
1956	0.588	0.588
1957	0.612	0.612
1958	0.685	0.685

1959	0.460	0.460
1960	0.455	0.455
1961	0.560	0.560
1962	0.491	0.491
1963	0.592	0.592
1964	0.452	0.452
1965	0.467	0.467
1966	0.541	0.541
1967	0.558	0.558
1968	1.082	1.082
1969	0.918	0.918
1970	1.244	1.244
1971	0.483	0.483
1972	0.655	0.655
1973	0.534	0.534
1974	0.549	0.549
1975	0.395	0.395
1976	0.467	0.467
1977	0.289	0.289
1978	0.681	0.681
1979	0.779	0.779
1980	0.425	0.425
1981	0.644	0.644
1982	0.647	0.647
1983	0.724	0.724
1984	0.374	0.374
1985	0.470	0.470
1986	0.712	0.712
1987	0.444	0.444
1988	0.542	0.542
1989	0.611	0.611
1990	0.579	0.579
1991	0.610	0.610
1992	0.579	0.579
1993	0.693	0.693
1994	0.478	0.478
1995	0.589	0.589
1996	0.805	0.805
1997	1.019	1.019
1998	1.075	1.075
1999	0.477	0.477
2000	0.345	0.345
2001	0.323	0.323
2002	0.693	0.693
2003	0.518	0.518
2004	0.520	0.520
2005	0.596	0.596
2006	0.580	0.580
2007	0.514	0.514
2008	1.001	1.001

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	1.2439	1.2439
2	1.0816	1.0816
3	1.0749	1.0749
4	1.0186	1.0186

5	1.0011	1.0011
6	0.9178	0.9178
7	0.8045	0.8045
8	0.7793	0.7793
9	0.7619	0.7619
10	0.7241	0.7241
11	0.7179	0.7179
12	0.7124	0.7124
13	0.6935	0.6935
14	0.6927	0.6927
15	0.6851	0.6851
16	0.6812	0.6812
17	0.6545	0.6545
18	0.6466	0.6466
19	0.6442	0.6442
20	0.6123	0.6123
21	0.6111	0.6111
22	0.6101	0.6101
23	0.5959	0.5959
24	0.5924	0.5924
25	0.5892	0.5892
26	0.5876	0.5876
27	0.5797	0.5797
28	0.5787	0.5787
29	0.5786	0.5786
30	0.5607	0.5607
31	0.5604	0.5604
32	0.5581	0.5581
33	0.5492	0.5492
34	0.5415	0.5415
35	0.5414	0.5414
36	0.5374	0.5374
37	0.5337	0.5337
38	0.5201	0.5201
39	0.5200	0.5200
40	0.5184	0.5184
41	0.5144	0.5144
42	0.5005	0.5005
43	0.4907	0.4907
44	0.4833	0.4833
45	0.4781	0.4781
46	0.4771	0.4771
47	0.4696	0.4696
48	0.4669	0.4669
49	0.4667	0.4667
50	0.4597	0.4597
51	0.4553	0.4553
52	0.4517	0.4517
53	0.4439	0.4439
54	0.4367	0.4367
55	0.4251	0.4251
56	0.3951	0.3951
57	0.3742	0.3742
58	0.3454	0.3454
59	0.3232	0.3232
60	0.2887	0.2887

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.2844	1293	1293	100	Pass
0.2926	1194	1194	100	Pass
0.3008	1088	1088	100	Pass
0.3091	977	977	100	Pass
0.3173	891	891	100	Pass
0.3255	805	805	100	Pass
0.3337	738	738	100	Pass
0.3419	682	682	100	Pass
0.3501	612	612	100	Pass
0.3583	573	573	100	Pass
0.3665	528	528	100	Pass
0.3747	489	489	100	Pass
0.3830	456	456	100	Pass
0.3912	414	414	100	Pass
0.3994	379	379	100	Pass
0.4076	360	360	100	Pass
0.4158	330	330	100	Pass
0.4240	304	304	100	Pass
0.4322	276	276	100	Pass
0.4404	248	248	100	Pass
0.4486	231	231	100	Pass
0.4569	214	214	100	Pass
0.4651	193	193	100	Pass
0.4733	179	179	100	Pass
0.4815	165	165	100	Pass
0.4897	154	154	100	Pass
0.4979	143	143	100	Pass
0.5061	130	130	100	Pass
0.5143	121	121	100	Pass
0.5225	114	114	100	Pass
0.5308	106	106	100	Pass
0.5390	101	101	100	Pass
0.5472	90	90	100	Pass
0.5554	86	86	100	Pass
0.5636	77	77	100	Pass
0.5718	76	76	100	Pass
0.5800	71	71	100	Pass
0.5882	64	64	100	Pass
0.5964	61	61	100	Pass
0.6047	60	60	100	Pass
0.6129	57	57	100	Pass
0.6211	53	53	100	Pass
0.6293	51	51	100	Pass
0.6375	48	48	100	Pass
0.6457	44	44	100	Pass
0.6539	42	42	100	Pass
0.6621	38	38	100	Pass
0.6703	37	37	100	Pass
0.6786	34	34	100	Pass
0.6868	30	30	100	Pass
0.6950	28	28	100	Pass
0.7032	27	27	100	Pass
0.7114	27	27	100	Pass

0.7196	25	25	100	Pass
0.7278	23	23	100	Pass
0.7360	22	22	100	Pass
0.7442	22	22	100	Pass
0.7525	21	21	100	Pass
0.7607	21	21	100	Pass
0.7689	18	18	100	Pass
0.7771	18	18	100	Pass
0.7853	15	15	100	Pass
0.7935	14	14	100	Pass
0.8017	14	14	100	Pass
0.8099	12	12	100	Pass
0.8181	11	11	100	Pass
0.8264	11	11	100	Pass
0.8346	11	11	100	Pass
0.8428	11	11	100	Pass
0.8510	11	11	100	Pass
0.8592	11	11	100	Pass
0.8674	11	11	100	Pass
0.8756	11	11	100	Pass
0.8838	11	11	100	Pass
0.8920	11	11	100	Pass
0.9002	11	11	100	Pass
0.9085	11	11	100	Pass
0.9167	11	11	100	Pass
0.9249	10	10	100	Pass
0.9331	9	9	100	Pass
0.9413	9	9	100	Pass
0.9495	8	8	100	Pass
0.9577	7	7	100	Pass
0.9659	7	7	100	Pass
0.9741	7	7	100	Pass
0.9824	7	7	100	Pass
0.9906	7	7	100	Pass
0.9988	7	7	100	Pass
1.0070	6	6	100	Pass
1.0152	6	6	100	Pass
1.0234	5	5	100	Pass
1.0316	5	5	100	Pass
1.0398	5	5	100	Pass
1.0480	5	5	100	Pass
1.0563	5	5	100	Pass
1.0645	5	5	100	Pass
1.0727	5	5	100	Pass
1.0809	4	4	100	Pass
1.0891	3	3	100	Pass
1.0973	3	3	100	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.1553 acre-feet
On-line facility target flow:	0.2195 cfs.
Adjusted for 15 min:	0.2195 cfs.
Off-line facility target flow:	0.1213 cfs.
Adjusted for 15 min:	0.1213 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

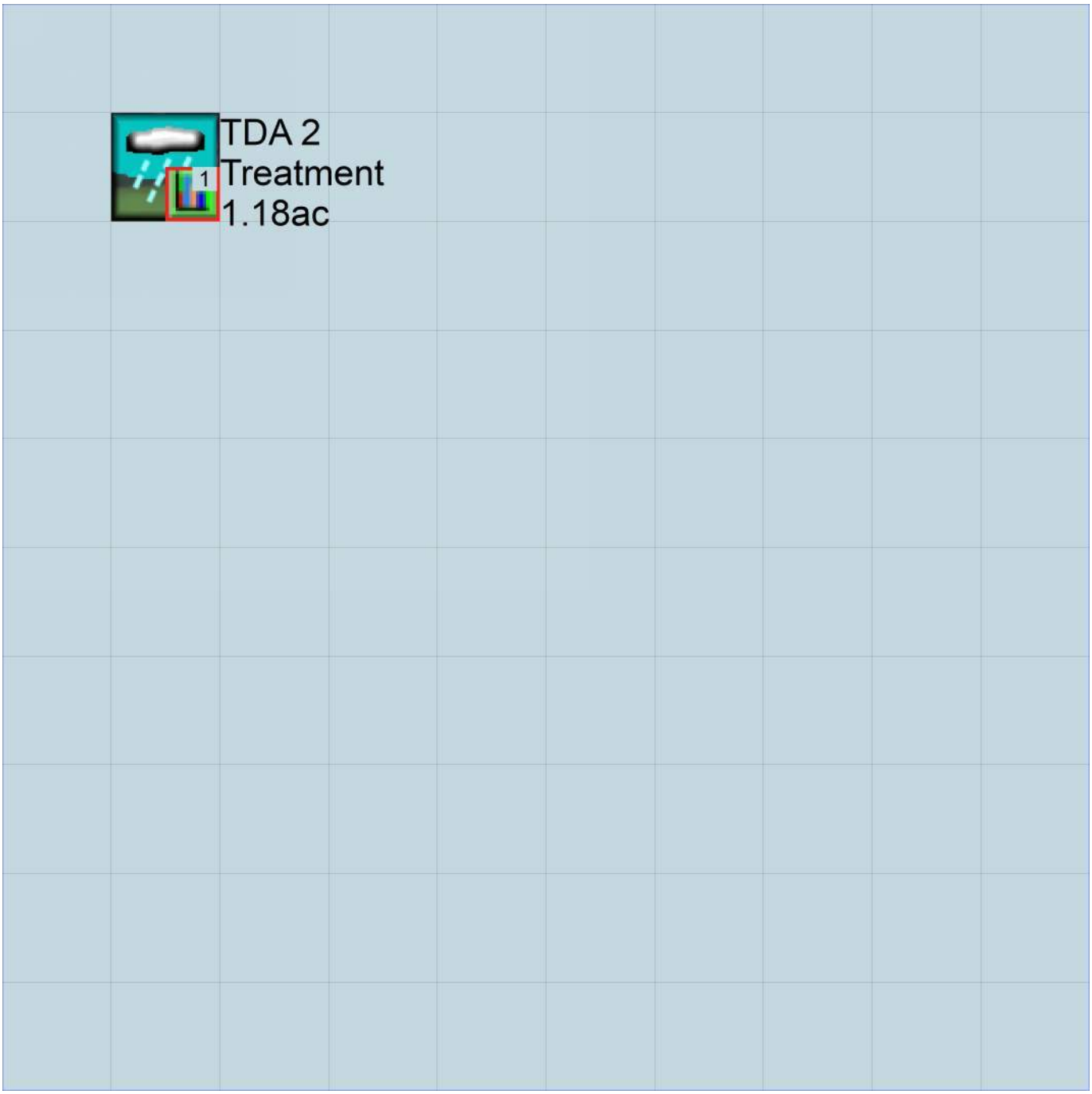
No PERLND changes have been made.

IMPLND Changes

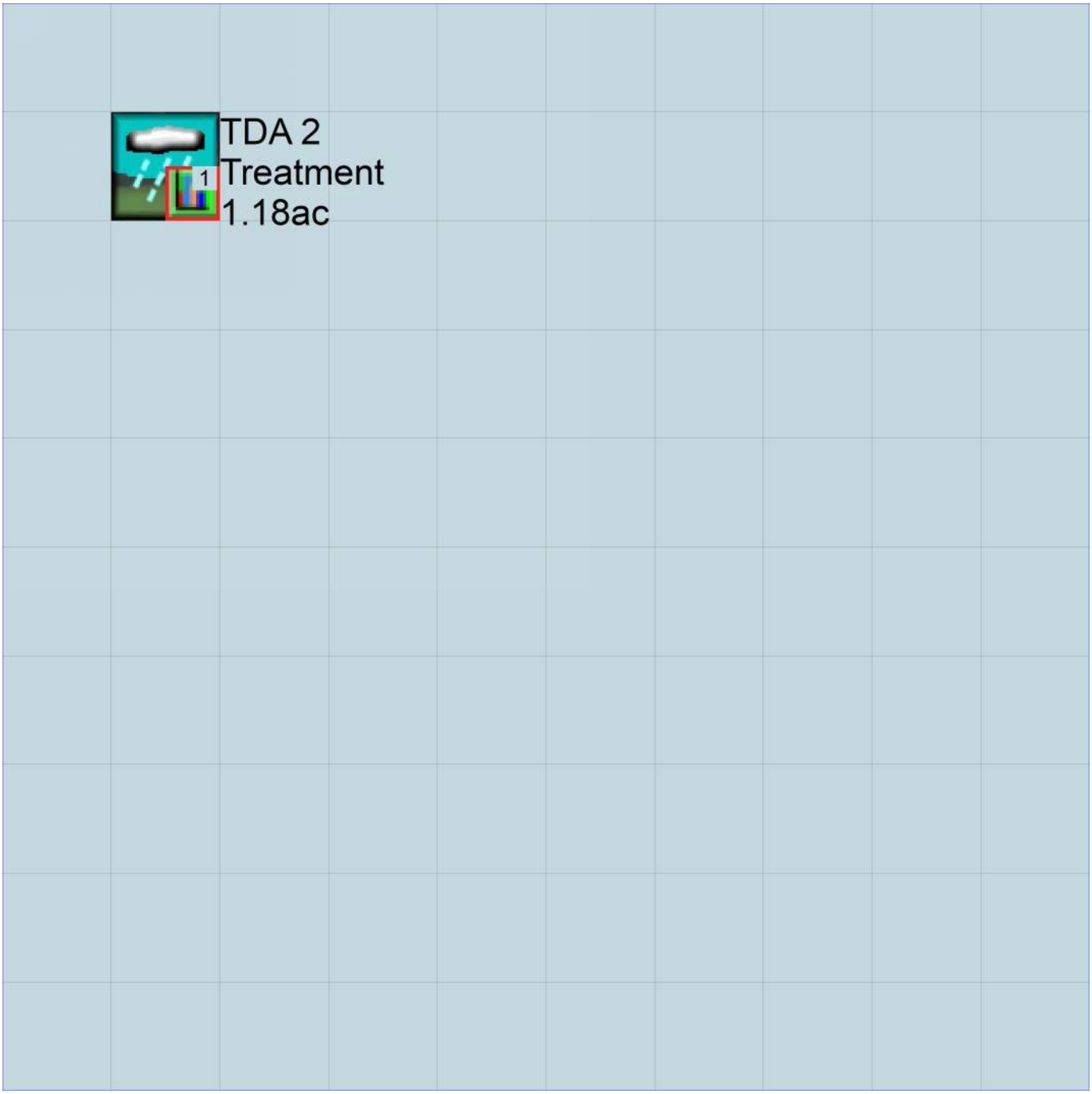
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                               ***
WDM        26   13thPrelimTreatmentAnalysis.wdm
MESSU      25   Pre13thPrelimTreatmentAnalysis.MES
           27   Pre13thPrelimTreatmentAnalysis.L61
           28   Pre13thPrelimTreatmentAnalysis.L62
           30   POC13thPrelimTreatmentAnalysis1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      34
      IMPLND       1
      IMPLND       4
      IMPLND       8
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        TDA 2 Treatment             MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                           in  out           ***
   34     SG4, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   34         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
   34         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   34         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   34             0         6      0.02       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   34             0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   34           0.1       0.2      0.25         2       0.4      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   34             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out            ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    8         0    0    0    0    0
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
TDA 2 Treatment***
PERLND  34                      0.2916     COPY   501     12
PERLND  34                      0.2916     COPY   501     13
IMPLND   1                      0.6565     COPY   501     15
IMPLND   4                      0.1781     COPY   501     15
IMPLND   8                      0.0572     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<-----------------><---> User T-series  Engl Metr LKFG            ***
                                        in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                               ***
WDM        26   13thPrelimTreatmentAnalysis.wdm
MESSU      25   Mit13thPrelimTreatmentAnalysis.MES
           27   Mit13thPrelimTreatmentAnalysis.L61
           28   Mit13thPrelimTreatmentAnalysis.L62
           30   POC13thPrelimTreatmentAnalysis1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      34
      IMPLND       1
      IMPLND       4
      IMPLND       8
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        TDA 2 Treatment             MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                           in  out           ***
   34     SG4, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   34         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
  34         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
  34         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
  34             0         6      0.02       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
  34             0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
  34           0.1       0.2      0.25         2       0.4      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
  34             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    8         0    0    0    0    0
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
TDA 2 Treatment***
PERLND  34                      0.2916     COPY   501     12
PERLND  34                      0.2916     COPY   501     13
IMPLND   1                      0.6565     COPY   501     15
IMPLND   4                      0.1781     COPY   501     15
IMPLND   8                      0.0572     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<-----------------><---> User T-series  Engl Metr LKFG            ***
                                        in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

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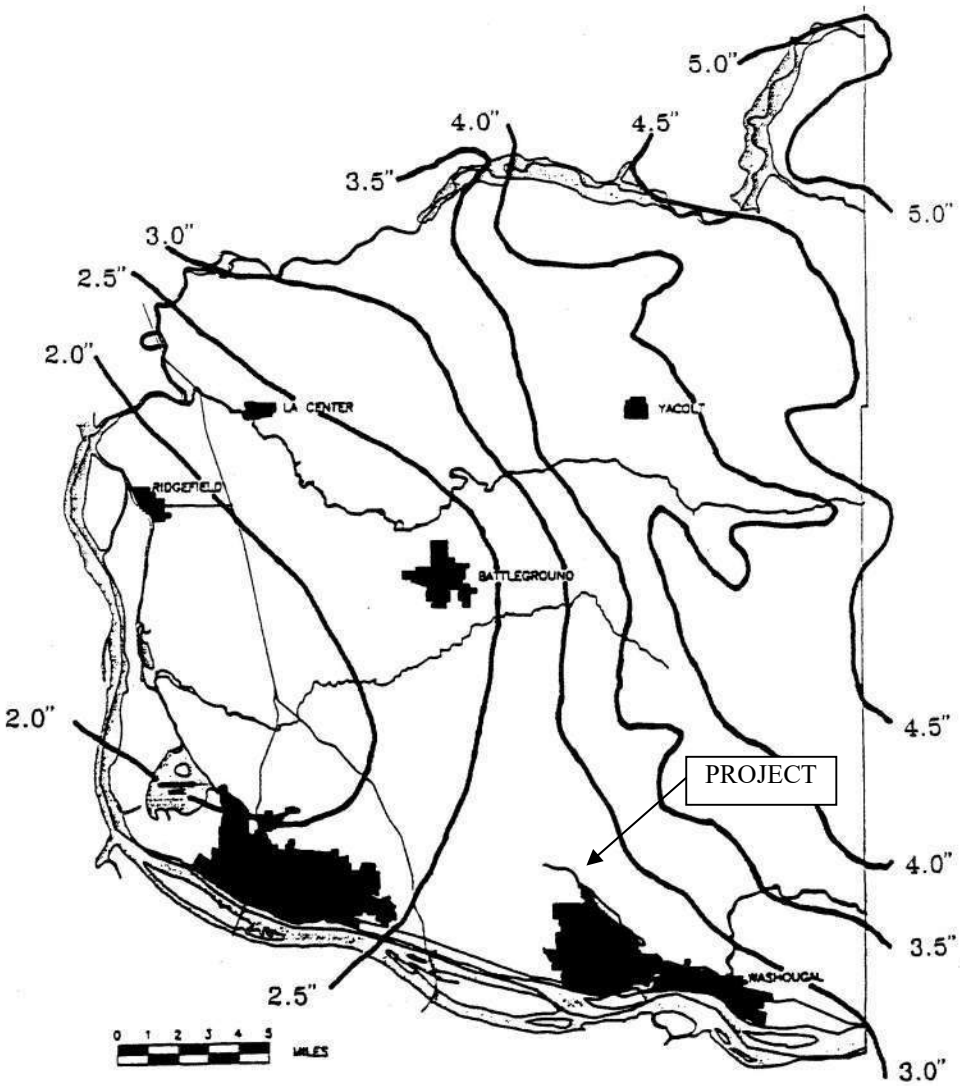
PLS ENGINEERING

Exhibit C

Isopluvial Maps for Design Storms in Clark County

2-Year, 24-Hour Isopluvials



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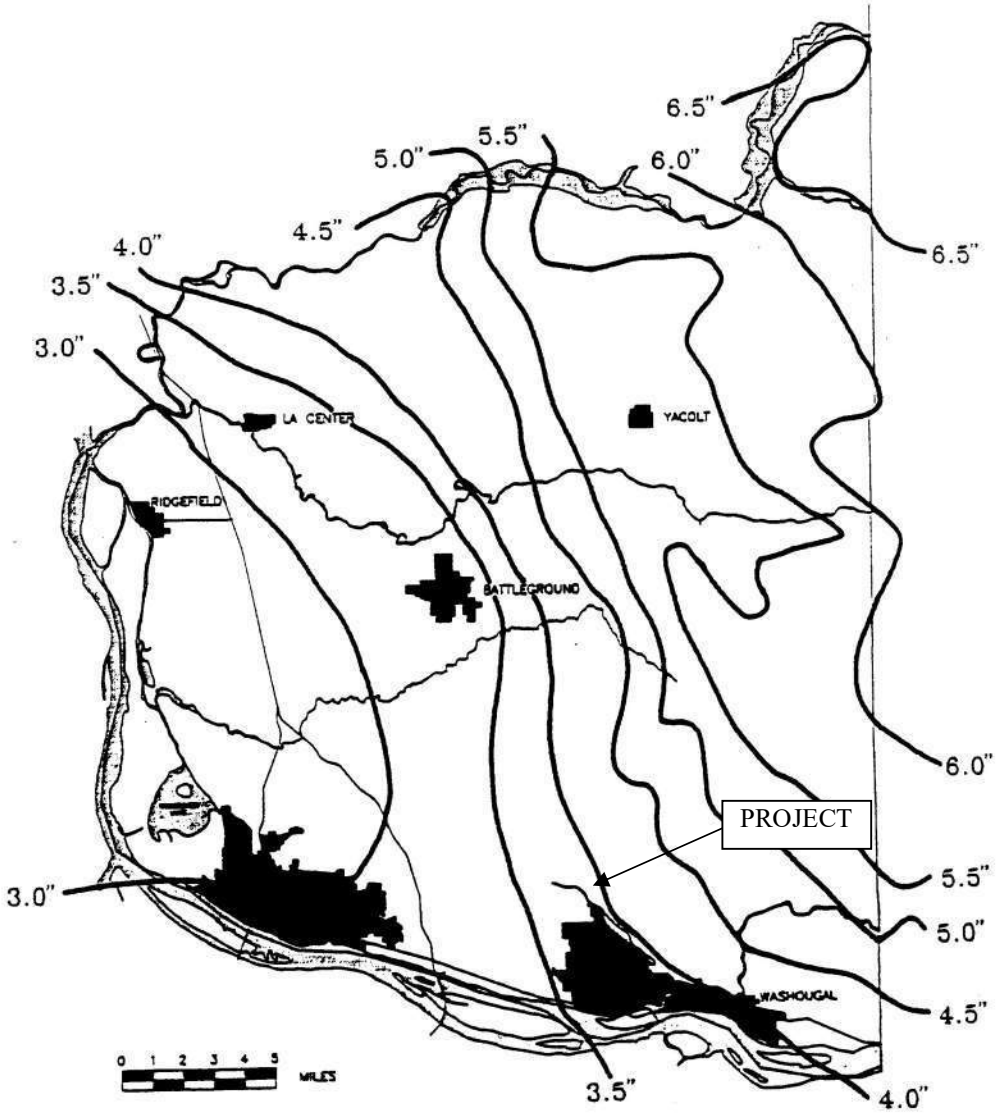
PLS ENGINEERING

Exhibit C
Isopluvial Maps for Design Storms in Clark County

10-Year, 24-Hour Isopluvials



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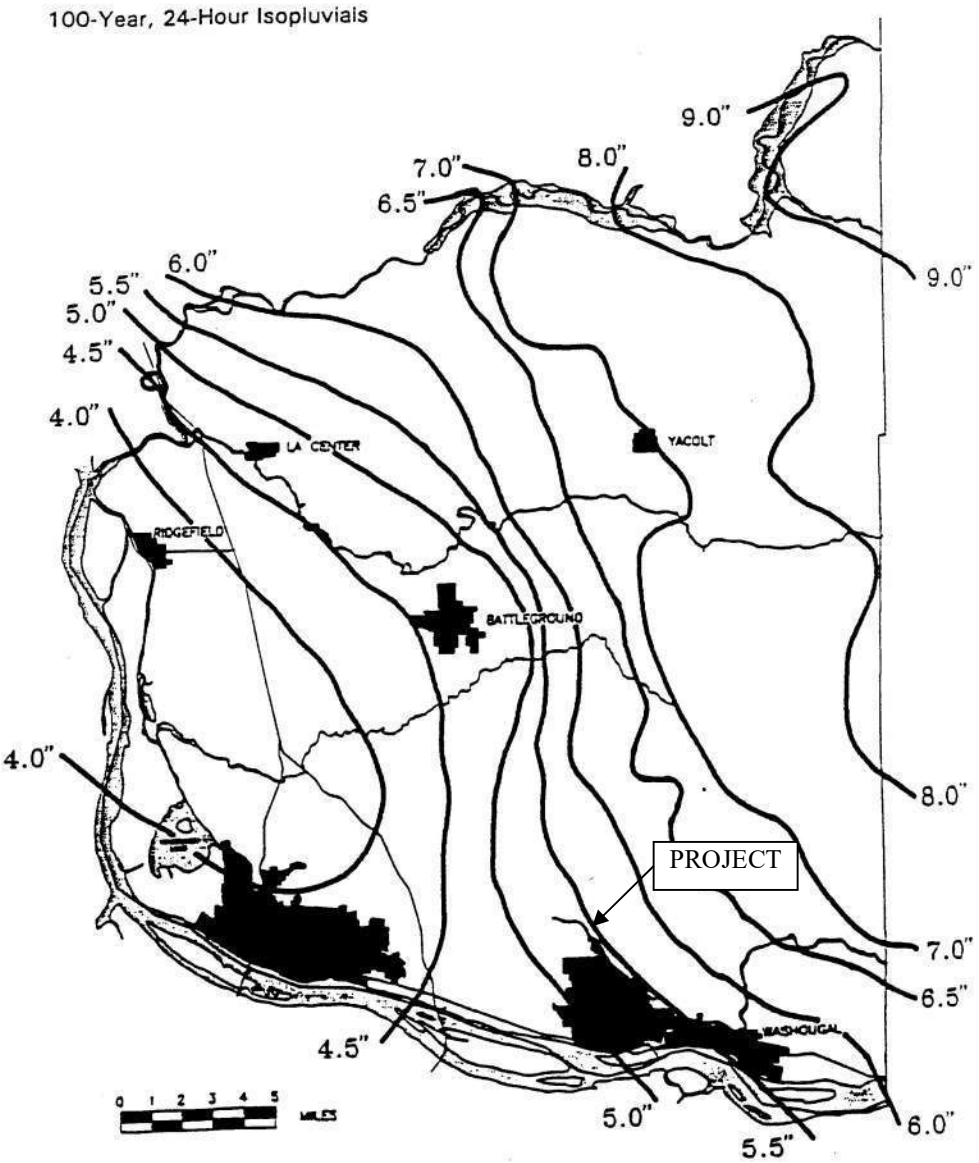
PLS ENGINEERING

Exhibit C

Isopluvial Maps for Design Storms in Clark County

100-Year, 24-Hour Isopluvials



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WASHINGTON STATE DEPARTMENT OF ECOLOGY

April 2017

GENERAL USE LEVEL DESIGNATION FOR BASIC (TSS) TREATMENT

For

CONTECH Engineered Solutions
Stormwater Management StormFilter®
With ZPG Media at 1 gpm/sq ft media surface area

Ecology's Decision:

Based on the CONTECH Engineered Solutions' (CONTECH) application submissions, Ecology hereby issues a General Use Level Designation (GULD) for the Stormwater Management StormFilter® (StormFilter):

1. **As a basic stormwater treatment practice for total suspended solids (TSS) removal,**
   - **Using ZPG™ media (zeolite/perlite/granular activated carbon), with the size distribution described below,**
   - **Sized at a hydraulic loading rate of 1 gpm/ft^2 of media surface area, per Table 1, and**
   - **Internal bypassing needs to be consistent with the design guidelines in CONTECH's current product design manual.**

Table 1. StormFilter Design Flow Rates per Cartridge

Effective Cartridge Height (inches)	12	18	27
Cartridge Flow Rate (gpm/cartridge)	5	7.5	11.3

2. **Ecology approves StormFilter systems containing ZPG™ media for treatment at the hydraulic loading rates shown in Table 1, and sized based on the water quality design flow rate for an off-line system when using an external bypass vault or a treatment vault with an internal bypass. Contech designs their StormFilter systems to maintain treatment of the water quality design flow while routing excess flows around the treatment chamber during periods of peak bypass. The water quality design flow rates are calculated using the following procedures:**
   - **Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.**

- **Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.**
- **Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.**

3. **This designation has no expiration date, but Ecology may amend or revoke it.**

<u>Ecology's Conditions of Use</u>:

The StormFilter with ZPG media shall comply with the following conditions:

1. **Design, install, operate, and maintain the StormFilter with ZPG media in accordance with applicable Contech Engineered Solutions manuals, documents, and the Ecology Decision.**

2. **Install StormFilter systems to bypass flows exceeding the water quality treatment rate. Additionally, high flows will not re-suspend captured sediments. Design StormFilter systems in accordance with the performance goals in Ecology's most recent Stormwater Manual and CONTECH's *Product Design Manual Version 4.1 (April 2006)*, or most current version, unless otherwise specified.**

3. **Owners must follow the design, pretreatment, land use application, and maintenance criteria in CONTECH's Design Manual.**

4. **Pretreatment of TSS and oil and grease may be necessary, and designers shall provide pre-treatment in accordance with the most current versions of the CONTECH's *Product Design Manual (April 2006)* or the applicable Ecology Stormwater Manual. Design pre-treatment using the performance criteria and pretreatment practices provided on Ecology's "Evaluation of Emerging Stormwater Treatment Technologies" website.**

5. **Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of manufactured filter treatment device.**

   - **Typically, CONTECH designs StormFilter systems for a target filter media replacement interval of 12 months. Maintenance includes removing accumulated sediment from the vault, and replacing spent cartridges with recharged cartridges.**

- **Indications of the need for maintenance include effluent flow decreasing to below the design flow rate, as indicated by the scumline above the shoulder of the cartridge.**
- **Owners/operators must inspect StormFilter with ZPG media for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.**
- **Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.**
- **When inspections are performed, the following findings typically serve as maintenance triggers:**
  - **Accumulated vault sediment depths exceed an average of 2 inches, or**
  - **Accumulated sediment depths on the tops of the cartridges exceed an average of 0.5 inches, or**
  - **Standing water remains in the vault between rain events, or**
  - **Bypass occurs during storms smaller than the design storm.**
- **Note: If excessive floatables (trash and debris) are present, perform a minor maintenance consisting of gross solids removal, not cartridge replacement.**

6. **CONTECH shall maintain readily available reports listed under "Application Documents" (above) as public, as well as the documentation submitted with its previous conditional use designation application. CONTECH shall provide links to this information from its corporate website, and make this information available upon request, at no cost and in a timely manner.**

7. **ZPG™ media used shall conform with the following specifications:**

- **Each cartridge contains a total of approximately 2.6 cubic feet of media. The ZPG™ cartridge consists of an outer layer of perlite that is approximately 1.3 cubic feet in volume and an inner layer, consisting of a mixture of 90% zeolite and 10% granular activated carbon, which is approximately 1.3 cubic feet in volume.**

- **Perlite Media: Perlite media shall be made of natural siliceous volcanic rock free of any debris or foreign matter. The expanded perlite shall**

have a bulk density ranging from 6.5 to 8.5 lbs per cubic foot and particle sizes ranging from 0.09" (#8 mesh) to 0.38" (3/8" mesh).

- **Zeolite Media: Zeolite media shall be made of naturally occurring clinoptilolite. The zeolite media shall have a bulk density ranging from 44 to 50 lbs per cubic foot and particle sizes ranging from 0.13" (#6 mesh) to 0.19" (#4 mesh). Additionally, the cation exchange capacity (CEC) of zeolite shall range from approximately 1.0 to 2.2 meq/g.**

- **Granular Activated Carbon: Granular activated carbon (GAC) shall be made of lignite coal that has been steam-activated. The GAC media shall have a bulk density ranging from 28 to 31 lbs per cubic foot and particle sizes ranging from a 0.09" (#8 mesh) to 0.19" (#4 mesh).**

<u>Approved Alternate Configurations</u>

Peak Diversion StormFilter

1. The Peak Diversion StormFilter allows for off-line bypass within the StormFilter structure. Design capture flows and peak flows enter the inlet bay which contains an internal weir. The internal weir allows design flows to enter the cartridge bay through a transfer hole located at the bottom of the inlet bay while the unit routs higher flows around the cartridge bay.
2. To select the size of the Peak Diversion StormFilter unit, the designer must determine the number of cartridges required and size of the standard StormFilter using the site-specific water quality design flow and the **StormFilter Design Flow Rates per Cartridge** as described above.
3. New owners may not install the Peak Diversion StormFilter at an elevation or in a location where backwatering may occur.

Applicant: Contech Engineered Solutions

Applicant's Address: 11835 NE Glenn Widing Dr.
Portland, OR 97220

Application Documents:

The applicant's master report, titled, "The Stormwater Management StormFilter Basic Treatment Application for General Use Level Designation in Washington", Stormwater Management, Inc., November 1, 2004, includes the following reports:

- (Public) *Evaluation of the Stormwater Management StormFilter Treatment System: Data Validation Report and Summary of the Technical Evaluation Engineering Report (TEER) by Stormwater Management Inc.*, October 29, 2004 Ecology's technology assessment protocol requires the applicant to hire an independent consultant to complete the following work:

1. Complete the data validation report.
2. Prepare a TEER summary, including a testing summary and conclusions compared with the supplier's performance claims.
3. Provide a recommendation of the appropriate technology use level.
4. Work with Ecology to post recommend relevant information on Ecology's website.
5. Provide additional testing recommendations, if needed."
6. This report, authored by Dr. Gary Minton, Ph. D., P.E., Resource Planning Associates, satisfies the Ecology requirement.

- (Public) "Performance of the Stormwater Management StormFilter Relative to the Washington State Department of Ecology Performance Goals for Basic Treatment," is a summary of StormFilter performance that strictly adheres to the criteria listed in the Guidance for Evaluating Emerging Stormwater Treatment Technologies, Technology Assessment Protocol – Ecology (TAPE).
- "Heritage Marketplace Field Evaluation: Stormwater Management StormFilter with ZPG™ Media," is a report showing all of the information collected at Site A as stated in the SMI Quality Assurance Project Plan (QAPP). This document contains detailed information regarding each storm event collected at this site, and it provided a detailed overview of the data and project.
- "Lake Stevens Field Evaluation: Stormwater Management StormFilter with ZPG™ Media," is a report that corresponds to Site E as stated in the SMI QAPP. This document contains detailed information regarding each storm collected at this site, and includes a detailed overview of the data and project.
- (Public) "Evaluation of the Stormwater Management StormFilter for the removal of SIL-CO-SIL 106, a standardized silica product: ZPG™ at 7.5 GPM" is a report that describes laboratory testing at full design flow.
- "Factors Other Than Treatment Performance."
- "State of Washington Installations."
- "Peak Diversion StormFilter" is a technical document demonstrating the Peak Diversion StormFilter system complies with the Stormwater Management Manual for Western Washington Volume V Section 4.5.1.

Above-listed documents noted as "public" are available by contacting CONTECH.

Applicant's Use Level Request:

That Ecology grant a General Use Level Designation for Basic Treatment for the StormFilter using ZPG™ media (zeolite/perlite/granular activated carbon) at a hydraulic loading rate of 1 gpm/ft^2 of media surface area in accordance with Ecology's 2011 *Technical Guidance Manual for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE).*

Applicant's Performance Claim:

The combined data from the two field sites reported in the TER (Heritage Marketplace and Lake Stevens) indicate that the performance of a StormFilter system configured for inline bypass with ZPG™ media and a hydraulic loading rate of 1 gpm/ft^2 of media surface area meets Ecology performance goals for Basic Treatment.

Ecology's Recommendations:

Based on the weight of the evidence and using its best professional judgment, Ecology finds that:

- StormFilter, using ZPG™ media and operating at a hydraulic loading rate of no more than 1 gpm/ft^2 of media surface area, is expected to provide effective stormwater treatment achieving Ecology's Basic Treatment (TSS removal) performance goals. Contech demonstrated this is through field and laboratory testing performed in accordance with the approved protocol. StormFilter is deemed satisfactory with respect to factors other than treatment performance (e.g., maintenance; see the protocol's Appendix B for complete list).

Findings of Fact:

- Influent TSS concentrations and particle size distributions were generally within the range of what Ecology considers "typical" for western Washington (silt-to-silt loam).
- Contech sampled thirty-two (32) storm events at two sites for storms from April 2003 to March 2004, of which Contech deemed twenty-two (22) as "qualified" and were therefore included in the data analysis set.
- Statistical analysis of these 22 storm events verifies the data set's adequacy.
- Analyzing all 22 qualifying events, the average influent and effluent concentrations and aggregate pollutant load reduction are 114 mg/L, 25 mg/L, and 82%, respectively.
- Analyzing all 22 qualifying events based on the *estimated average* flow rate during the event (versus the *measured peak* flow rate), and more heavily weighting those events near the design rate (versus events either far above or well below the design rate) does not significantly affect the reported results.
- For the 7 qualifying events with influent TSS concentrations greater than 100 mg/L, the average influent and effluent concentrations and aggregate pollutant load reduction are 241 mg/L, 34 mg/L, and 89%, respectively. If we exclude the 2 of 7 events that exceed the maximum 300 mg/L specified in Ecology's guidelines, the average influent and effluent concentrations and aggregate pollutant load reduction are 158 mg/L, 35 mg/L, and 78%, respectively.
- For the 15 qualifying events with influent TSS concentrations less than 100 mg/L, the average influent and effluent concentrations and aggregate pollutant load reduction are 55 mg/L, 20 mg/L, and 61%, respectively. If the 6 of 15 events that fall below the minimum 33 mg/L TSS specified in Ecology's guidelines are excluded, the average

influent and effluent concentrations and aggregate pollutant load reduction are 78 mg/L, 26 mg/L, and 67%, respectively.

- For the 8 qualifying events with peak discharge exceeding design flow (ranging from 120 to 257% of the design rate), results ranged from 52% to 96% TSS removal, with an average of 72%.
- Due to the characteristics of the hydrographs, the field results generally reflect flows below (ranging between 20 and 60 percent of) the tested facilities' design rate. During these sub-design flow rate periods, some of the cartridges operate at or near their *individual* full design flow rate (generally between 4 and 7.5 GPM for an 18" cartridge effective height) because their float valves have opened. Float valves remain closed on the remaining cartridges, which operate at their base "trickle" rate of 1 to 1.5 GPM.
- Laboratory testing using U.S. Silica's Sil-Co-Sil 106 fine silica product showed an average 87% TSS removal for testing at 7.5 GPM per cartridge (100% design flow rate).
- Other relevant testing at I-5 Lake Union, Greenville Yards (New Jersey), and Ski Run Marina (Lake Tahoe) facilities shows consistent TSS removals in the 75 to 85% range. *Note that the evaluators operated the I-5 Lake Union at 50%, 100%, and 125% of design flow*.
- SMI's application included a satisfactory "Factors other than treatment performance" discussion.

Note: Ecology's 80% TSS removal goal applies to 100 mg/l and greater influent TSS. Below 100 mg/L influent TSS, the goal is 20 mg/L effluent TSS.

Technology Description:

The Stormwater Management StormFilter® (StormFilter), a flow-through stormwater filtration system, improves the quality of stormwater runoff from the urban environment by removing pollutants. The StormFilter can treat runoff from a wide variety of sites including, but not limited to: retail and commercial development, residential streets, urban roadways, freeways, and industrial sites such as shipyards, foundries, etc.

Operation:

The StormFilter is typically comprised of a vault that houses rechargeable, media-filled, filter cartridges. Various media may be used, but this designation covers only the zeolite-perlite-granulated activated carbon (ZPG™) medium. Stormwater from storm drains percolates through these media-filled cartridges, which trap particulates and may remove pollutants such as dissolved metals, nutrients, and hydrocarbons. During the filtering process, the StormFilter system also removes surface scum and floating oil and grease. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharged to an open channel drainage way.

This document includes a bypass schematic for flow rates exceeding the water quality design flow rate on page 8.

StormFilter Configurations:

Contech offers the StormFilter in multiple configurations: precast, high flow, catch basin, curb inlet, linear, volume, corrugated metal pipe, drywell, and CON/Span form. Most configurations use pre-manufactured units to ease the design and installation process. Systems may be either uncovered or covered underground units.

The typical precast StormFilter unit is composed of three sections: the energy dissipater, the filtration bay, and the outlet sump. As Stormwater enters the inlet of the StormFilter vault through the inlet pipe, piping directs stormwater through the energy dissipater into the filtration bay where treatment will take place. Once in the filtration bay, the stormwater ponds and percolates horizontally through the media contained in the StormFilter cartridges. After passing through the media, the treated water in each cartridge collects in the cartridge's center tube from where piping directs it into the outlet sump by a High Flow Conduit under-drain manifold. The treated water in the outlet sump discharges through the single outlet pipe to a collection pipe or to an open channel drainage way. In some applications where you anticipate heavy grit loads, pretreatment by settling may be necessary.

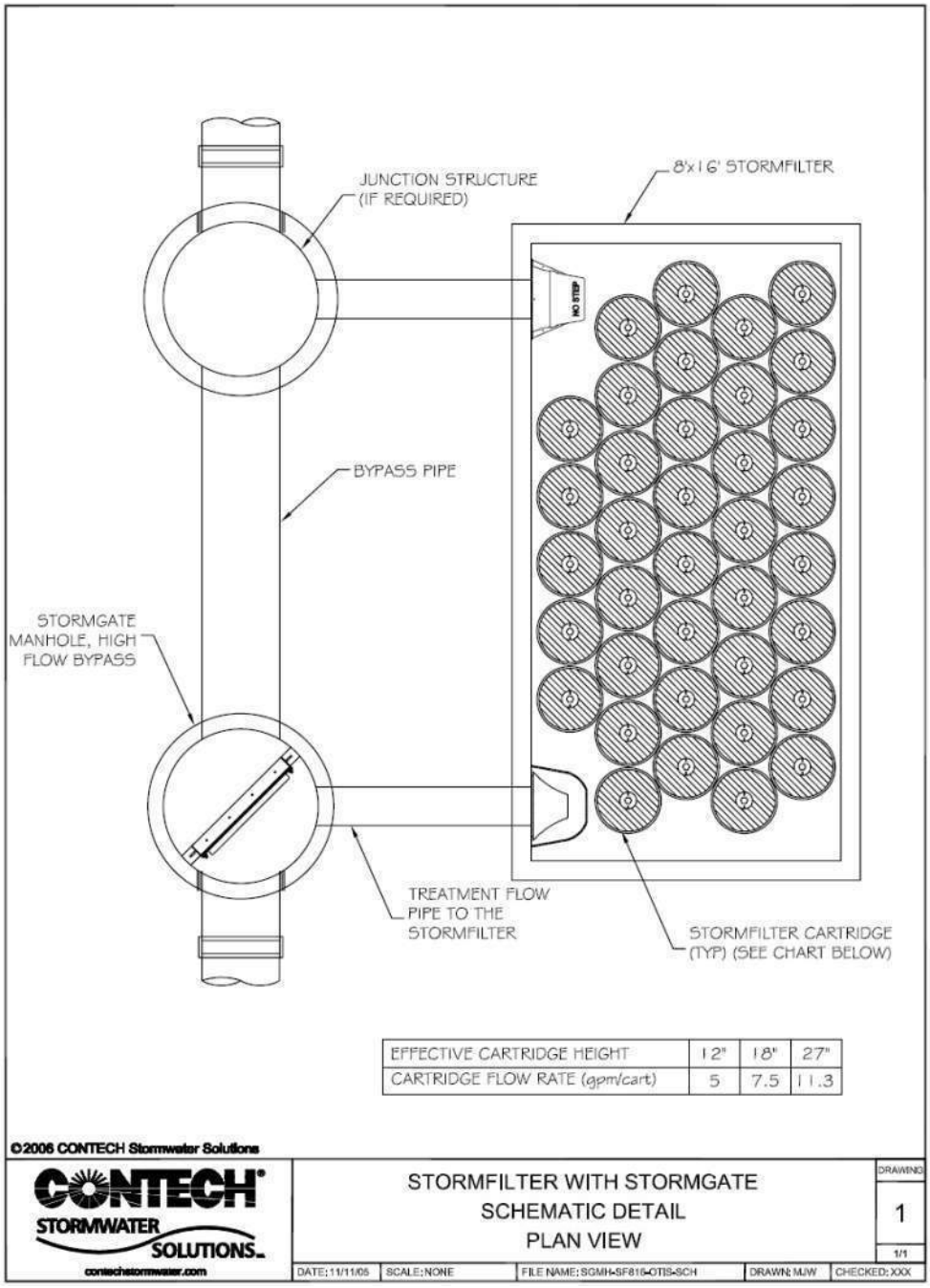

Figure 1. Stormwater Management StormFilter Configuration with Bypass

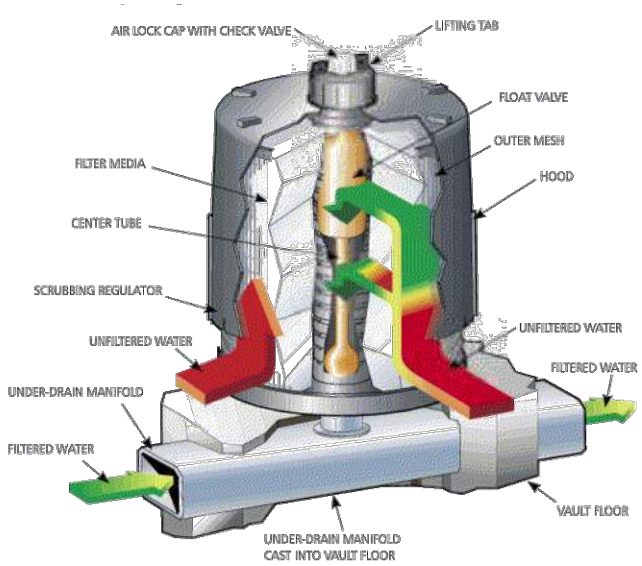

Figure 2. The StormFilter Cartridge

Cartridge Operation:

As the water level in the filtration bay begins to rise, stormwater enters the StormFilter cartridge. Stormwater in the cartridge percolates horizontally through the filter media and passes into the cartridge's center tube, where the float in the cartridge is in a closed (downward) position. As the water level in the filtration bay continues to rise, more water passes through the filter media and into the cartridge's center tube. Water displaces the air in the cartridge and it purges from beneath the filter hood through the one-way check valve located in the cap. Once water fills the center tube there is enough buoyant force on the float to open the float valve and allow the treated water to flow into the under-drain manifold. As the treated water drains, it tries to pull in air behind it. This causes the check valve to close, initiating a siphon that draws polluted water throughout the full surface area and volume of the filter. Thus, water filters through the entire filter cartridge throughout the duration of the storm, regardless of the water surface elevation in the filtration bay. This continues until the water surface elevation drops to the elevation of the scrubbing regulators. At this point, the siphon begins to break and air quickly flows beneath the hood through the scrubbing regulators, causing energetic bubbling between the inner surface of the hood and the outer surface of the filter. This bubbling agitates and cleans the surface of the filter, releasing accumulated sediments on the surface, flushing them from beneath the hood, and allowing them to settle to the vault floor.

Adjustable cartridge flow rate:

Inherent to the design of the StormFilter is the ability to control the individual cartridge flow rate with an orifice-control disc placed at the base of the cartridge. Depending on the treatment requirements and on the pollutant characteristics of the influent stream as

specified in the CONTECH *Product Design Manual*, operators may adjust the flow rate through the filter cartridges. By decreasing the flow rate through the filter cartridges, the influent contact time with the media is increased and the water velocity through the system is decreased, thus increasing both the level of treatment and the solids removal efficiencies of the filters, respectively (de Ridder, 2002).

Recommended research and development:

Ecology encourages CONTECH to pursue continuous improvements to the StormFilter. To that end, CONTECH recommends the following actions:

- Determine, through laboratory testing, the relationship between accumulated solids and flow rate through the cartridge containing the ZPG™ media. **Completed 11/05.**
- Determine the system's capabilities to meet Ecology's enhanced, phosphorus, and oil treatment goals.
- Develop easy-to-implement methods of determining that a StormFilter facility requires maintenance (cleaning and filter replacement).

Contact Information:

Applicant Contact: Jeremiah Lehman
Contech Engineered Solutions
11835 NE Glenn Widing Drive
Portland, OR, 97220
503-258-3136
jlehman@conteches.com

Applicant Web link http://www.conteches.com/

Ecology web link: http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html

Ecology Contact: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
(360) 407-6444
douglas.howie@ecy.wa.gov

Revision History

Date	**Revision**
Jan 2005	Original Use Level Designation
Dec 2007	Revision
May 2012	Maintenance requirements updated
November 2012	Design Storm and Maintenance requirements updated
January 2013	Updated format to match Ecology standard format
September 2014	Added Peak Diversion StormFilter Alternate Configuration
November 2016	Revised Contech contact information
April 2017	Revised sizing language to note sizing based on Off-line calculations

APPENDIX C

Geotechnical Report

GEOTECHNICAL ENGINEERING STUDY

13th Street Gas Station
NE 13th Street & NW Friberg-Strunk Street
Camas, Clark County, Washington
Tax Lot No. (176148000)

Prepared for:
Taz Khan
701 Columbia Street #109
Vancouver, WA 98660

Prepared By:

Donald J. Bruno, CEG
Engineering Geologist

9/31/23

State of Washington
Engineering Geologist
2177
Licensed Geologist

DONALD J. BRUNO

Project No. G26-0723

{August 2023}

Earth Engineering Inc.
PO Box 1512, Ridgefield, Washington 98642
(360) 600-6518

Earth Engineering, Inc.

Geotechnical & Environmental Consultants

Taz Khan
701 Columbia Street #109
Vancouver, Washington 98660

August 31st 2023
G26-0723

Subject: **Geotechnical Engineering Study**
13th Street Gas Station, C-Store & Car Wash
NE 13th Street & NW Friberg-Strunk Street
Camas, Clark County, Washington
(Tax Lot No. 176148000)

Hello Taz,

We are pleased to submit our engineering report for the subject property located in Camas, Washington. This report presents the results of our field exploration, selective laboratory tests, field testing and engineering analyses.

Based on the results of this study, it is our opinion that construction of the proposed commercial structures is feasible from a geotechnical standpoint, provided recommendations presented in this report are included in the project design.

We appreciate the opportunity to have been of service to you and look forward to working with you in the future. Should you have any questions about the content of this report, or if we can be of further assistance, please call.

Respectfully Submitted,
Earth Engineering Inc.,

Donald J. Bruno, CEG
Engineering Geologist

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{G26-0723}

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APPENDICES

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Exhibit 9 APPEAL24-1001

INTRODUCTION

General

This report presents the results of the geotechnical engineering study completed by Earth Engineering, Inc. for the proposed gas station, convenience store and drive thru car wash located in Camas, Washington. The general location of the site is shown on the *Vicinity Map, Figure 1.* At the time our study was performed, the site and our exploratory locations are approximately as shown on the *Site Plan, Figure 2.*

The purpose of this study was to explore subsurface conditions at the site and based on the conditions encountered provide geotechnical recommendations for the proposed construction. In addition this report includes infiltration testing for stormwater design and a seismic hazard evaluation.

Project Description

Based on the information that was provided to us by the project civil engineer (PLS), it is our understanding the site will be developed with a one story convenience store building that will provide four thousand one-hundred (4100) square feet of floor space, a one thousand one-hundred and eighty nine (1189) square foot drive thru car wash, a fuel pumping island, trash enclosure and an asphalt paved access driveway with vehicle parking spaces. Construction will also include the installation of a stormwater system and subsurface utilities.

Due to the relatively flat topography, it is anticipated that earthwork cuts and fills will be less than two feet to achieve the desired design grade. The convenience store and car wash structures will be constructed with a metal or wood frame and slab on grade floors.

Structural design loads were not available at the time this report was written. However, based on our experience with similar projects, we anticipate that wall and column loads will be approximately seven hundred and fifty (750) to one thousand five hundred (1500) pounds per lineal foot (maximum dead plus live loads). Slab on grade loads will most likely range from one hundred (100) to one hundred and fifty (150) pounds per square foot (psf).

If any of the above information is incorrect or changes, we should be consulted to review the recommendations contained in this report. In any case, it is recommended that Earth Engineering, Inc. perform a general review of the final design for the proposed construction.

SITE CONDITIONS

Surface

The rectangular shaped property encompasses approximately one acre. An existing single family residence was located at the central west area of the property. The adjacent properties to the south and west are moderately to heavily vegetated with single family homes on acreage.
NE 13th Street borders the north side and NW Friberg-Strunk Street.

Exhibit 9 APPEAL24-1001

The property is relatively level and slopes gently downward from the north to the south and southeast with an overall elevation change of approximately five feet and a gradient that is less than two percent (2%). The property has been landscaped with a manicured lawn as well as a variety of trees and flowering bushes.

Subsurface & Soil Classification

For this study, the site was explored by excavating two test pits at the approximate locations shown on the *Site Plan, Figure 2*. Infiltration testing was performed in both test pits. All soil was classified following the Unified Soil Classification System (USCS). A USCS Legend is included as Plate A1. A description of the field exploration methods is included in Appendix A.

In general, in our test pits we encountered very stiff to hard soil consisting of Silt (ML) and lean Clay (CL) to the maximum exploration depth of ten and one half (10.5) feet below the existing ground surface. Please refer to the test pit logs, Plates A-2 thru A-3, for a more detailed description of the conditions encountered.

Groundwater

During the time of our field exploration (August 2023) groundwater was not encountered in any of our test pits. It is important to note that groundwater conditions are not static; fluctuations may be expected in the level and seepage flow depending on the season, amount of, surface water runoff, and other factors. Generally, groundwater levels are higher and the seepage rate is greater in the wetter winter months (typically October through May).

General Regional Geology

General information about geologic conditions and soil in the vicinity of the site was obtained by reviewing the Geologic Map of Washington-Southwest Quadrant, Washington Division of Geology and Earth Resources, (Geologic Map GM-34, 1987). This map provides general information about geologic units in the Camas, Clark County, Washington area.

Our review of existing geological information indicates that soils in the vicinity of the subject site were formed from alluvial deposits during the Quaternary Period. Outburst flood deposits from glacial Lake Missoula deposited these sedimentary soils. The native material encountered in our test pits consists predominantly of Silt.

LABORATORY TESTING

Laboratory tests were conducted on representative soil samples to verify or modify the field soil classification of the units encountered, and to evaluate the general physical properties as well as the engineering characteristics of the soils encountered. The following provides information about the testing procedures performed on representative soil samples and the general condition of subsurface soil conditions encountered:

- *Moisture Content (ASTM-D2216-92)* tests were performed on representative samples. The native Silt has a moisture content that ranges from thirteen to forty three percent (13-43 %). The native lean clay has a moisture content of thirty eight percent (38%)

- In-Situ Soil Density (ASTM-D4564-93) utilizing the sleeve method was performed on representative samples to determine the wet and dry density of native soil. The in-situ density provides a relative indication of soil support characteristics. The average wet density of the native silt is one hundred and ten (110) pounds per cubic foot (pcf). The average dry density of this soil is ninety six (96) pcf.

Laboratory testing confirms that subsurface soil consists predominantly of Silt and lean Clay. These types of soil are sensitive to changes in moisture content. Moisture sensitive soils are discussed in more detail in the *Site Preparation and Grading* section of this report.

The results of laboratory tests performed on specific samples are provided at the appropriate sample depth on the individual test pit logs. However, it is important to note that some variation of subsurface conditions may exist. Our geotechnical recommendations are based on our interpretation of these test results.

SEISMIC HAZARD EVALUATION

The following provides a seismic hazard evaluation for the proposed commercial building and fuel island. Our evaluation is based on subsurface conditions encountered at the site during the time of our geotechnical study and a review of applicable geologic maps (Washington State Department of Natural Resources, Geologic Map of Washington-Southwest Quadrant, 1987) and the International Building Code (IBC-2018) guidelines.

In general, supportive soil at the subject site consists of very stiff to hard Silt. The geologic map indicates that no known active faults are located within one-mile of the subject site. Soils encountered at the site are classified as a type "D" soil in accordance with "Seismic Design Categories" (IBC 2018, Section 1803.5.12).

Liquefaction:

Structures are subject to damage from earthquakes due to direct and indirect action. Shaking represents direct action. Indirect action is represented by foundation failures and is typified by liquefaction. Liquefaction occurs when soil loses all shear strength for short periods of time during an earthquake. Ground shaking of sufficient duration results in the loss of grain to grain contact as well as a rapid increase in pore water pressure. This causes the soil to assume physical properties of a fluid.

To have potential for liquefaction a soil must be loose, cohesion-less (generally sands and silts), below the groundwater table, and must be subjected to sufficient magnitude and duration of ground shaking. The effects of liquefaction may be large total settlement and/or large differential settlement for structures with foundations in or above the liquefied soil. Based on the very stiff to hard soil conditions encountered and the absence of a near surface groundwater table, it is not likely that soil liquefaction would occur at the subject site during a seismic event.

DISCUSSION AND RECOMMENDATIONS

General

Based on the results of our study, it is our opinion the commercial project can be developed as planned provided the geotechnical recommendations contained in this report are incorporated into the final design. The proposed buildings (convenience store & car wash) as well as the fuel island canopy can be supported on conventional shallow spread footings bearing either entirely on competent native soil or compacted structural fill. Supporting the proposed buildings on homogeneous material will significantly decrease the potential for differential settlement across the foundation area.

This report has been prepared for specific application to this project only and in a manner consistent with that level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area for the exclusive use of Taz Khan and their representatives. This report, in its entirety, should be included in the project documents for information to the contractor. No warranty, expressed or implied, is made.

Site Preparation and Grading

The site shall be stripped and cleared of all vegetation, organic matter and any other deleterious material. Stripped material should not be mixed with any soils to be used as fill. Stripped soil could potentially be used for topsoil at landscape areas after removing vegetation and screening out organic matter.

Building and Driveway Areas:

After clearing and grading, the exposed sub-grade at building and pavement areas should be compacted to a dense non-yielding condition with suitable compaction equipment. This phase of earthwork compaction shall be performed prior to the placement of structural fill, at the bottom of all foundation excavations, interior and exterior concrete slabs, as well as the driveway-parking areas, before the placement of base rock.

Structural Fill:

Structural fill is defined as any soil placed under buildings or any other load bearing-areas. Structural fill placed under footings and slab on grade should be placed in thin horizontal lifts not exceeding eight inches and compacted to a minimum ninety-five percent (95%) of its maximum dry density (Modified Proctor ASTM D1557). The fill material should be placed within two to three percent of the optimum moisture content.

Fill under pavements should also be placed in lifts approximately eight inches in thickness, and compacted to a minimum of ninety percent (92%) of its maximum dry density (Modified Proctor ASTM D1598), except for the top twelve (12) inches which should be compacted to ninety-five percent (95%) of the maximum dry density.

Exhibit 9 APPEAL24-1001

We recommend that structural fill consist of a well graded granular material having a maximum size of two inches and no more than five percent (5%) fines passing the #200 sieve, based on the ¾ inch fraction. It is recommended that any structural fill planned for onsite use, be submitted for approval prior to import.

The placement and compaction of structural fill should be observed by a representative from our office to verify that fill has been placed and compacted in accordance with the approved project plans and specifications.

It should be noted that the depth of excavation to competent soil at foundation footings and floor slab areas could be greater or less than anticipated depending on conditions encountered. Our test pits provide general information about subsurface soil and groundwater conditions.

Wet Weather Construction & Moisture Sensitive Soils:

Field observations and laboratory testing indicates that soil encountered at the site consists of moisture sensitive Silt and lean Clay. As such in an exposed condition moisture sensitive soil can become disturbed during normal construction activity, especially when in a wet or saturated condition. Once disturbed, in a wet condition, these soils will be unsuitable for support of foundations, floor slabs and pavements.

Therefore, where soil is exposed and will support new construction, care must be taken not to disturb their condition. If disturbed soil conditions develop, the affected soil must be removed and replaced with structural fill. The depth of removal will be dependent on the depth of disturbance developed during construction. Covering the excavated area with plastic and refraining from excavation activities during rainfall will minimize the disturbance and decrease the potential degradation of supportive soils.

Earthwork grading and foundation construction will be difficult during the wet winter and spring seasons. Based on this condition we suggest that grading and foundation construction be completed during the drier summer and fall seasons.

Foundations

Based on the encountered subsurface soil conditions, preliminary building design criteria, and assuming compliance with the preceding *Site Preparation and Grading* section, the proposed building may be supported on conventional shallow spread footings bearing entirely on six inches of compacted granular structural fill.

Individual spread footings or continuous wall footings providing support for the proposed commercial building and pump island canopy may be designed for a maximum allowable bearing value of two -thousand (2000) pounds per square foot (psf).

Footings for a one level structure should be at least twelve (12) inches in width. Footings for a two-level structure should be a minimum of fifteen (15) inches in width. In either case, all footings should extend to a depth of at least eighteen (18) inches below the lowest adjacent finished sub grade for lateral support and frost heave considerations.

Exhibit 9 APPEAL24-1001

These basic allowable bearing values are for dead plus live loads and may be increased one-third for combined dead, live, wind, and seismic forces. It is estimated that total and differential footing settlements for the relatively light building will be approximately one-half and one-quarter inches, respectively.

Lateral loads can be resisted by friction between the foundation and the supporting sub grade or by passive earth pressure acting on the buried portions of the foundation. For the latter, the foundations must be poured "neat" against the existing soil or back filled with a compacted fill meeting the requirements of structural fill.

- Passive Pressure = 300 pcf equivalent fluid weight
- Coefficient of Friction = 0.40

We recommend that all footing excavations be observed by a representative of Earth Engineering, Inc. prior to placing forms or rebar, to verify that sub grade support conditions are as anticipated in this report, and/or provide modifications in the design as required.

Slab on Grade

The sub-grade for all concrete floor slab areas should be compacted to a dense non-yielding condition prior to the placement of base rock. It is important to note that the existing sub-grade soil may become too wet to re-compact due to weather conditions. If supportive soils become saturated it may be necessary to remove the unsuitable material and replace it with imported granular structural fill.

Interior floor slabs should be provided with a minimum of six inches of compacted granular structural fill after compacting the sub-grade. In areas where moisture is undesirable, a vapor barrier such as a 8-mil plastic membrane should be placed beneath the slab.

Temporary Excavations

The following information is provided solely as a service to our client. Under no circumstances should this information be interpreted to mean that Earth Engineering Inc. is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

In no case should excavation slopes be greater than the limits specified in local, state and federal safety regulations. Based on the information obtained from our field exploration and laboratory testing, the site soils expected to be encountered in excavations, very stiff to hard Silt would be classified as a Type "A" soil by OSHA guidelines.

Therefore, temporary excavations and cuts greater than four feet in height, should be sloped at an inclination no steeper than 3/4H:1V (horizontal:vertical) for type "A" soils. If slopes of this inclination, or flatter, cannot be constructed or if excavations greater than ten feet in depth are required, temporary shoring will be necessary.

Infiltration Testing

During August of 2023, infiltration testing was performed at two locations at four and one half and six feet below the existing ground surface. The approximate location of the infiltration tests are shown on the *Site Plan, Figure 2.*

Infiltration testing was conducted in general accordance with standard engineering practices The Encased Falling Head Test consists of driving a fifteen (15) inch long, six-inch diameter pipe six inches into the exposed ground surface at the bottom of the test pit. The pipe is filled with water as the soil around the bottom and below the pipe is saturated for several hours. The pipe is filled again, and the amount of time required for the water to fall, per inch, for six inches, is recorded. This step is performed a minimum of three times. The test results are averaged and calculated in inches per hour.

Testing yielded infiltration rates that ranged from 0.1 to 0.25 inches per hour. Based on these infiltration rates and the very stiff to hard soil conditions encountered, it is our opinion on-site soil is not conducive to infiltration. Alternative methods will need to be employed for stormwater control.

Site Drainage

The site should be graded so that surface water is directed off the site. Water should not be allowed to stand in any area where buildings or slabs are to be constructed. Loose surfaces should be sealed at the end of each workday by compacting the surface to reduce the potential for moisture infiltration into the soils. Final site grades should allow for drainage away from the building foundation. The ground should be sloped at a gradient of three percent for a distance of at least ten feet away from the buildings.

We recommend that a footing drain be installed around the perimeter of the building just below the invert of the footing with a gradient sufficient to initiate flow. Under no circumstances should the roof down spouts be connected to the footing drain system. We suggest that clean outs be installed at several accessible locations to allow for the periodic maintenance of the footing drain system. Details for the footing drain have been included on *Figure 3, Typical Footing Drain Detail.*

Utility Support and Back Fill

Based on the conditions encountered, the soil to be exposed by utility trenches should provide adequate support for utilities. Utility trench backfill is a concern in reducing the potential for settlement along utility alignments, particularly in pavement areas. It is also important that each section of utility line be adequately supported in the bedding material. The back fill material should be hand tamped to ensure support is provided around the pipe haunches.

Fill should be carefully placed and hand tamped to about twelve inches above the crown of the pipe before any compaction equipment is used. The remainder of the trench back fill should be placed in lifts having a loose thickness of ten inches.

A typical trench backfill section and compaction requirements for load supporting and non-load supporting areas is presented on *Figure 4, Utility Trench Backfill Detail.* Trench back fill may consist of imported granular fill provided the material is approved, placed and compacted near the optimum moisture content.

Imported granular material or on-site soil to be used as backfill should be submitted to our laboratory at least one week prior to construction so that we can provide a laboratory proctor for field density testing. If native soil is planned for use as backfill, additional testing may be required to determine the suitability of the material.

Pavements

The durability of pavements is related in part to the condition of the underlying sub grade. To provide a properly prepared sub grade for pavements, we recommend the sub grade be treated and prepared as described in the *Site Preparation and Grading* section of this report.

It is possible that some localized areas of soft, wet or unstable sub grade may still exist after this process. Before placement of any base rock, the sub grade should be compacted with suitable compaction equipment. Yielding areas that are identified should be excavated to firm material and replaced with compacted one and one quarter inch-minus clean-crushed rock. The following pavement sections are recommended for the proposed pavement areas:

- Entrance Driveway & Truck Turnaround - Four inches of Asphalt Concrete (AC) over ten inches of compacted Crushed Rock Base (CRB), over a geo-grid consisting of Tensar BX 1200 or equivalent.

- Parking Stalls for Automobiles - Three inches of Asphalt Concrete (AC) over eight inches of compacted Crushed Rock Base (CRB) material.

The geo-grid should be placed directly on the sub grade surface of the driveway prior to placement of base rock. Appropriate geo-textiles have been designed to increase the strength of the sub grade and extend pavement life.

Asphaltic Cement (AC) and Crushed Rock Base (CRB) materials should conform to WSDOT specifications. All base rock should be compacted to at least ninety-five percent (95 %) of the ASTM D1557-91 laboratory test standard.

We recommend that a minimum of eight inches of compacted CRB be placed below all exterior slabs. Exterior concrete slabs that are subject to vehicle traffic loads should be at five inches in thickness. It is also suggested that nominal reinforcement such as "6x6-10/10" welded wire mesh be installed, near midpoint, in new exterior concrete slabs and paving.

Additional Services & Earthwork Monitoring

Earth Engineering, Inc. will be available to provide consultation services related to review of the final design to verify that the recommendations within our purview have been properly interpreted and implemented in the approved construction plans and specifications. A representative from our office will be available to attend a pre-construction meeting to discuss and/or clarify all geotechnical issues related to the proposed project.

In addition, it is suggested that our office be retained to provide geotechnical services during construction to observe compliance with the design concepts and project specifications and to allow design changes in the event subsurface conditions differ from those anticipated. Our construction services would include monitoring and documenting the following:

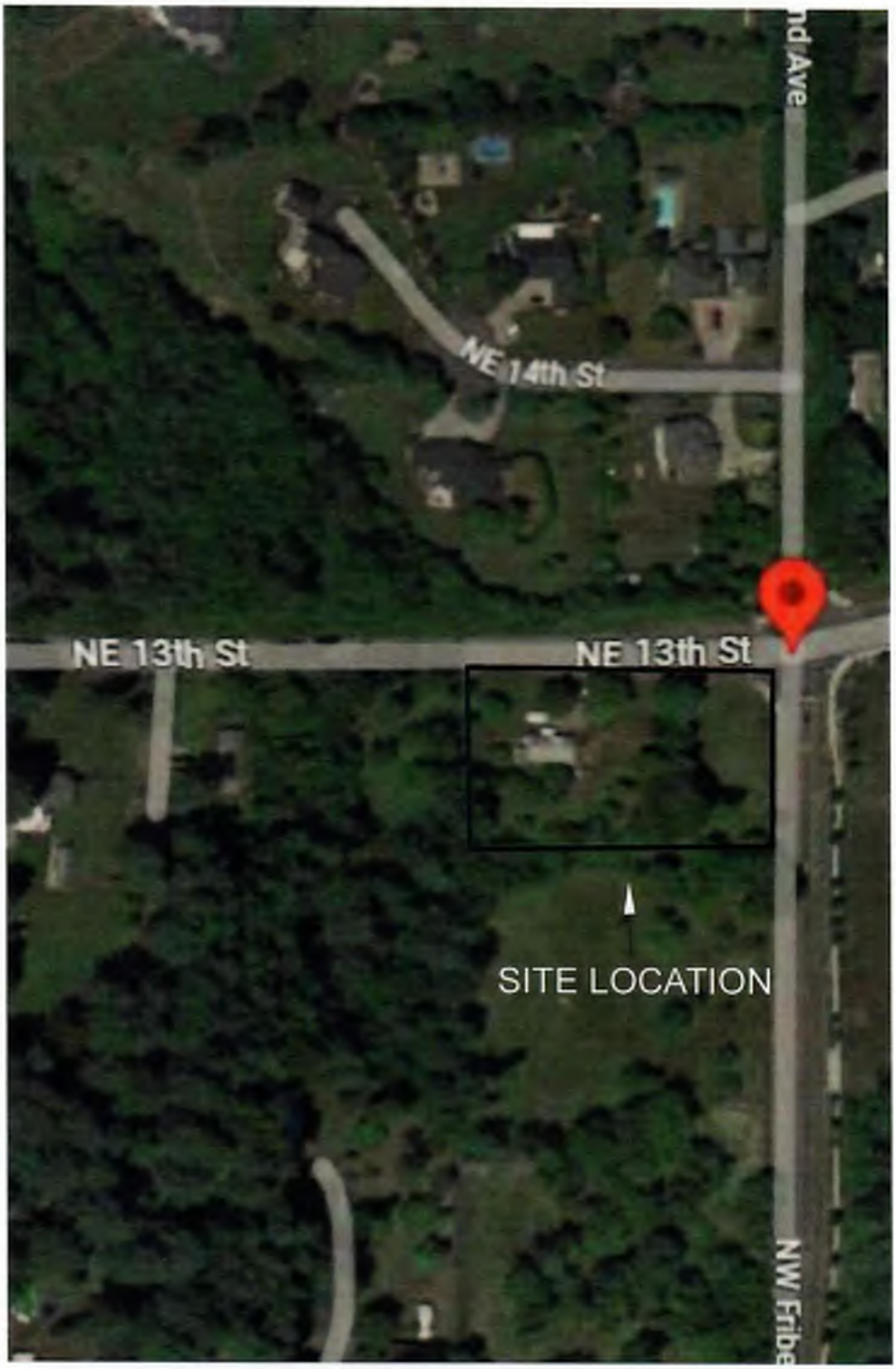
- Verify that site has been adequately stripped of organic materials.
- Observe the condition of exposed bearing soils at the building areas.
- Laboratory proctor tests for structural fill materials.
- Observe compaction and provide density testing of structural fill.
- Observe compaction and provide density testing of utility trench backfill.
- Provide footing inspection at the building & canopy footings to verify soil bearing capacity.
- Verify the installation of all building and site drainage elements.
- Provide density testing of the asphalt driveway and parking areas.

LIMITATIONS

Our recommendations and conclusions are based on the site materials observed, selective laboratory testing, engineering analyses, the design information provided to Earth Engineering, Inc. and our experience as well as engineering judgment. The conclusions and recommendations are professional opinions derived in a manner consistent with that level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area. No warranty is expressed or implied.

The recommendations submitted in this report are based upon the data obtained from the test pits. Soil and groundwater conditions may vary from those encountered. The nature and extent of variations may not become evident until construction. If variations do appear, Earth Engineering, Inc. should be requested to reevaluate the recommendations contained in this report and to modify or verify them in writing prior to proceeding with the proposed construction.

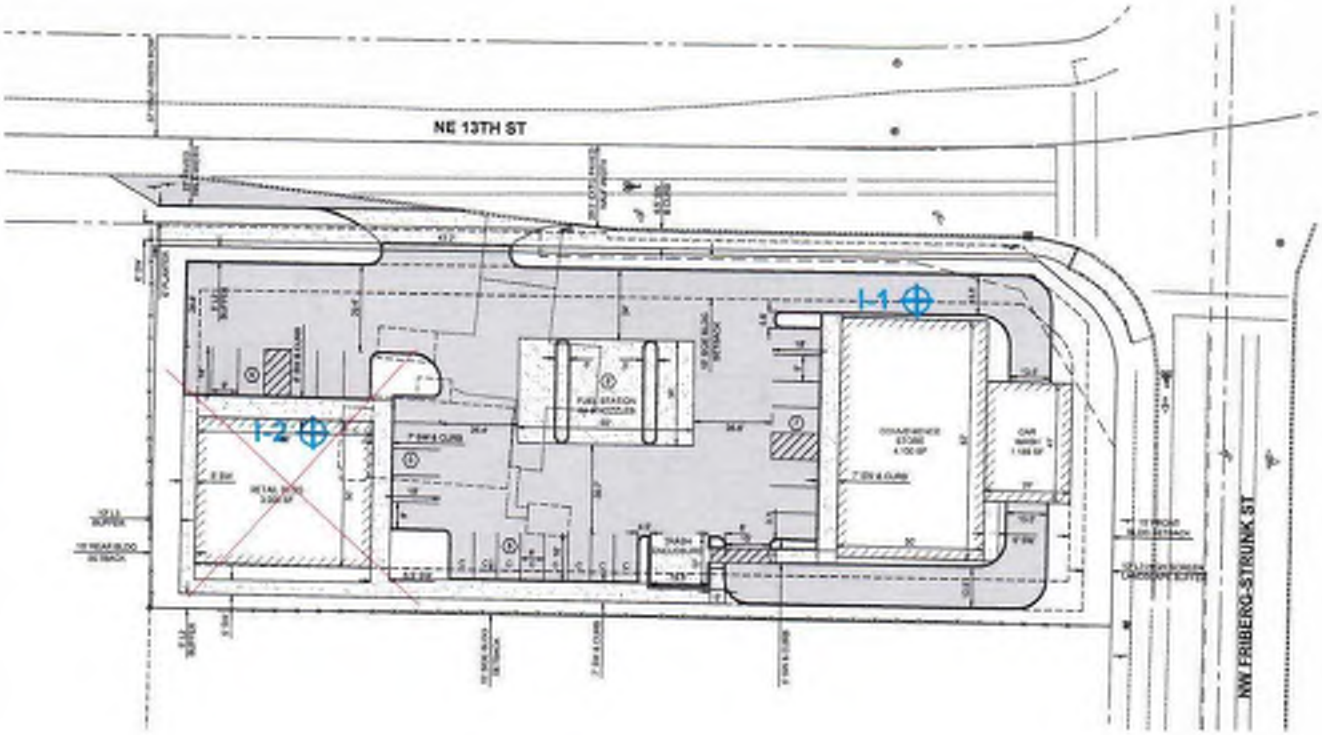
VICINITY MAP



Earth Engineering
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	TAZ KHAN	DRAWN:	EG
PROJECT: 13TH STREET GAS STATION NE 13TH ST & NW FRIBERG-STRUNK ST CAMAS, WA		DATE:	09/2023
		FIGURE:	1
		PRO. #:	G26-072

SITE PLAN

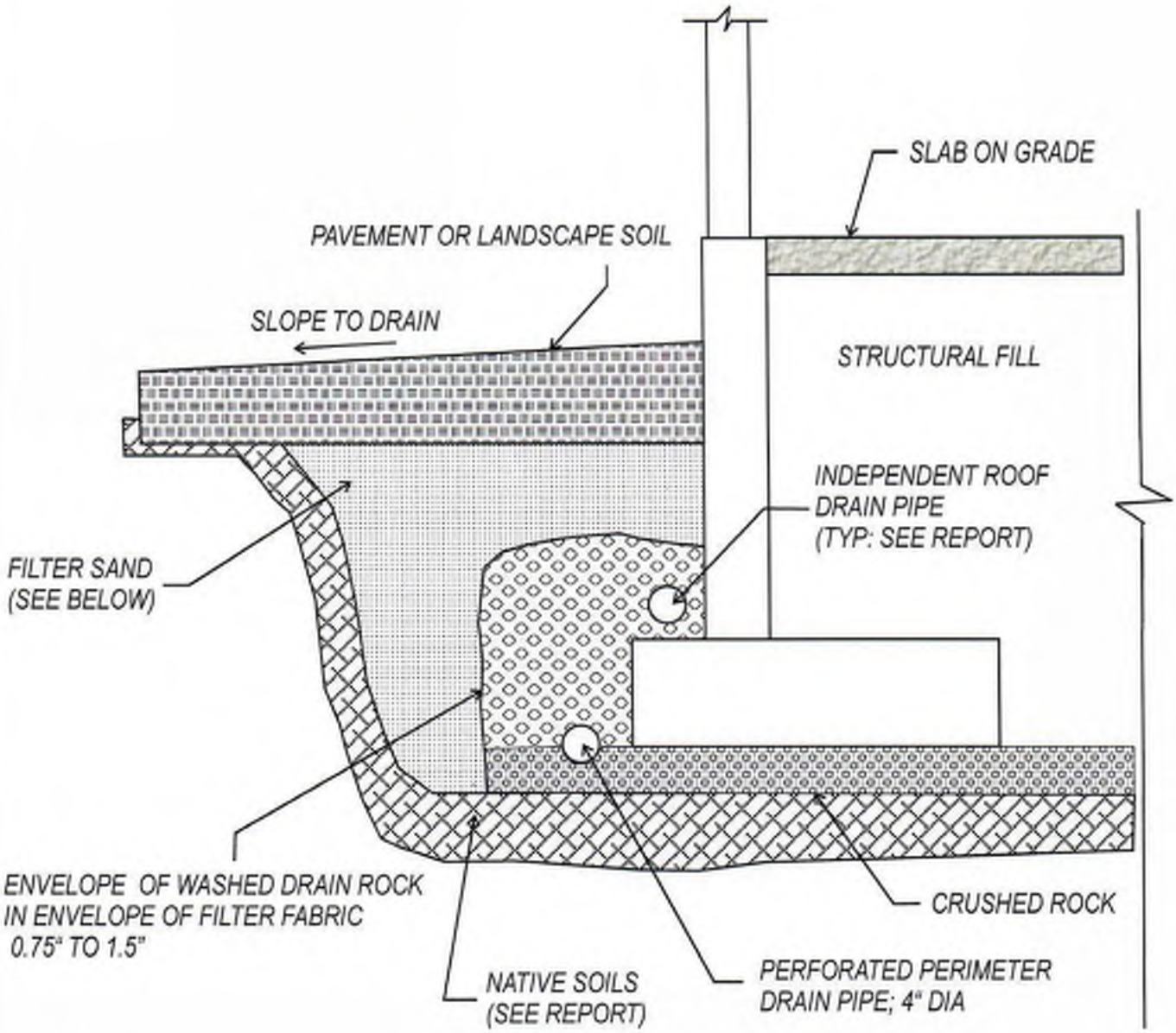


LEGEND

I-1 ⊕ Approximate Infiltration Test Location

NTS

Earth Engineering GEOTECHNICAL & ENVIRONMENTAL SERVICES	CLIENT: TAZ KHAN	DRAWN:	EG
	PROJECT: 13TH STREET GAS STATION NE 13TH ST & NW FRIBERG -STRUNK ST CAMAS, WA	DATE:	09/2023
		FIGURE:	2
		PRO. #:	G26-072



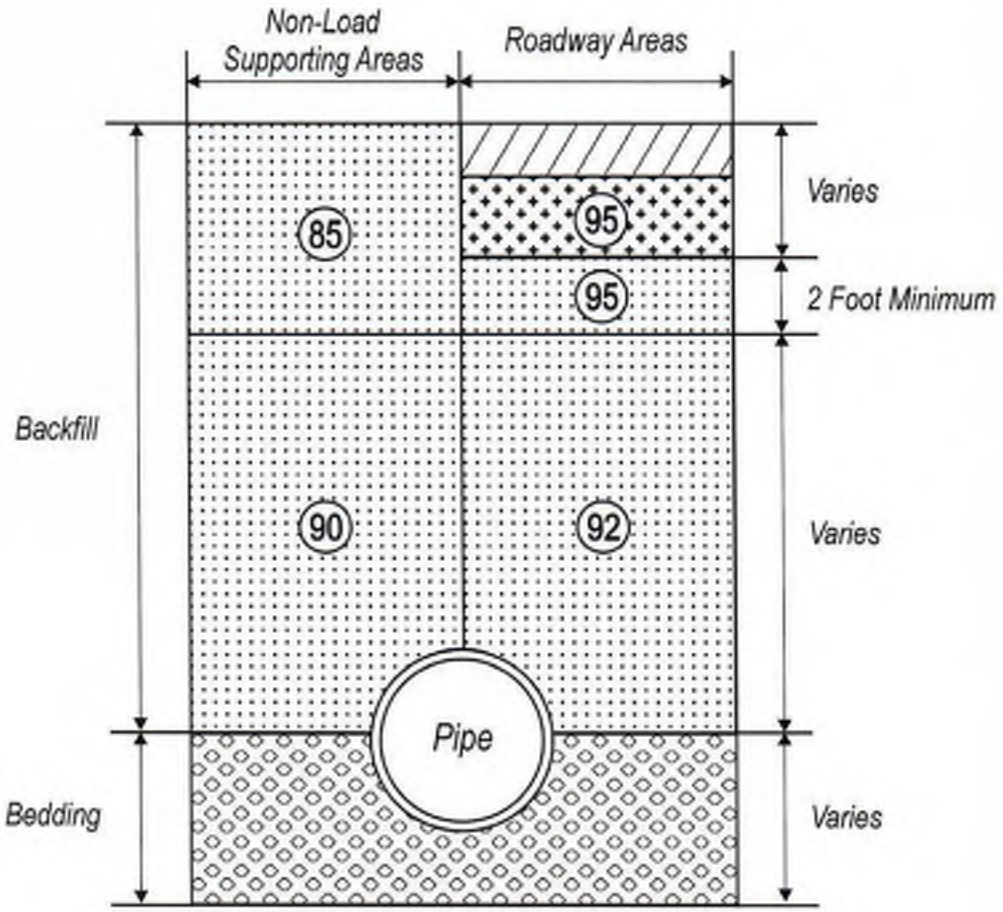
NOTES:

1. FILTER SAND - FINE AGGREGATE FOR PORTLAND CEMENT; SECTION 9=03.1(2)
2. PERFORATED OR SLOTTED RIGID PVC PIPE WITH A POSITIVE DRAINAGE GRADIENT
3. FILTER FABRIC OPTIONAL IF FILTER SAND USED

TYPICAL FOOTING DRAIN DETAIL

Not to Scale

Earth Engineering, Inc. GEOTECHNICAL & ENVIRONMENTAL SERVICES	CLIENT: 13TH STREET GAS STATION	DRAWN:	DB
	PROJECT: COMMERCIAL BUILDING NE 13TH ST. & NW FRIBERG-STRUCK ST. VANCOUVER, WA	DATE:	07/2023
		FIGURE:	3
		PRO. #:	G26-0723



LEGEND

Asphalt or Concrete Pavement

Roadway Base Material or Base Rock

Backfill: Compacted on-site soil or imported select fill material as described in the site preparation of the general Earthwork Section of the attached report text.

92 — Minimum percentage of maximum Laboratory Dry Density as determined by ASTM Test method D1557 (Modified Proctor),unless otherwise specified in the attached report text.

Bedding Material: Material type depends on type of pipe and laying conditions. Bedding should conform to the manufacturer's recommendations for the type of pipe selected.

UTILITY TRENCH BACKFILL DETAIL

Not to Scale

Earth Engineering, Inc. GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS	CLIENT: 13TH ST. GAS STATION	DRAWN:	DB
	PROJECT: COMMERCIAL BUILDING NE 13TH ST. & NW FRIBERG-STRUNK CAMAS, WA	DATE:	07/2023
		FIGURE:	4
		PRO. #:	G26-0723

APPENDIX A

(FIELD EXPLORATION)

FIELD EXPLORATION

Our field exploration was performed on August 4th 2023. Subsurface conditions at the site were explored by excavating two test pits. The test pits were excavated to a maximum depth of ten and one half (10.5) feet below the existing ground surface. The test pits were excavated using a track-hoe.

The test pits were located by pacing from property features. The locations are shown on the Site Plan, Figure 2. Field exploration was monitored by an Earth Engineering, Inc. representative, who classified the soils that we encountered and maintained a log of each test pit, obtained representative samples, and observed pertinent site features. Representative soil samples were placed in closed containers and returned to the laboratory for further examination and testing.

All samples were identified using the Standard Classification of Soils for Engineering Purposes (ASTM D2487-93) in accordance with the Unified Soil Classification System (USCS), which is presented on Plate A-1. The test pit log and boring logs are presented in Appendix A. The final log represents our interpretations of the field logs and the results of the laboratory tests on field samples.

UNIFIED SOIL CLASSIFICATION SYSTEM
LEGEND

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTION
Coarse Grained Soils More Than 50% Material Larger Than No 200 Sieve Size	Gravel and Gravelly Soils More Than 50% Coarse Fraction Retained on No 4 Sieve	Clean Gravels (little or no fines)		GW / gw	Well-Graded Gravels, Gravel-Sand Mixtures Little or no Fines
				GP / gp	Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
		Gravels with Fines (appreciable amount of fines)		GM / gm	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC / gc	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sand and Sandy Soils More Than 50% Coarse Fraction Passing No 4 Sieve	Clean Sand (little or no fines)		SW / sw	Well-graded Sands, Gravelly Sands Little or no Fines
				SP / sp	Poorly-Graded Sands, Gravelly Sands Little or no Fines
		Sands with Fines (appreciable amount of fines)		SM / sm	Silty Sands, Sand-Silt Mixtures
				SC / sc	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils More Than 50% Material Smaller Than No 200 Sieve Size	Silts and Clays	Liquid Limit Less than 50		ML / ml	Inorganic Silts and Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands; Clayey Silts w/ slight Plasticity
				CL / cl	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean
				OL / ol	Organic Silts and Organic Silty Clays of Low Plasticity
	Silts and Clays	Liquid Limit Greater than 50		MH / mh	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soils
				CH / ch	Inorganic Clays of High Plasticity, Fat Clays
				OH / oh	Organic Clays of Medium to High Plasticity, Organic Silts
Highly Organic Soils				PT / pt	Peat, Humus, Swamp Soils with High Organic Contents

Topsoil		Humus and Duff Layer
Fill		Highly Variable Constituents

Earth Engineering Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	13TH STREET GAS STATION	DRAWN:	DB
PROJECT:	COMMERCIAL BUILDING NE13TH ST. & NW FRIBERG-STRUNK ST. CAMAS, WA	DATE:	07/2023
		PLATE:	A1
		PRO. #:	G26-0723

LOG OF TEST PIT I-1

(Northeast)

ELEVATION: +/- 239 feet
EXPLORATORY EQUIPMENT: TRACK HOE
DATE: 08/04/2023

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
		6" Topsoil						
1	•			Light Brown			14	-
2								
3								
4								
5	•	- Field infiltration rate of 0.25 inches per hour **Silt (ML)** **trace sand**			Damp to Wet	Very Stiff to Hard	18	-
6								
7								
8								
9				Grey Brown				
10	•	(Native)					26	-

Bottom of test pit at 10.5 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	TAZ KHAN	DRAWN:	DB
PROJECT:	13TH ST GAS STATION NE 13TH ST & NW FRIBERG-STRUNK ST CAMAS, WA	DATE:	09/2023
		PLATE:	A-2
		PRO. #:	G26-0723

LOG OF TEST PIT I-2

(Central West)

ELEVATION: **+/- 240 feet**
EXPLORATORY EQUIPMENT: **TRACK HOE**
DATE: **08/04/2023**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1		8" Topsoil						
2	•			Light Brown to Dark Brown	Damp to Sat	Very Stiff to Hard	13	-
3		**Silt (ML)**						
4								
5								
6	•	- Field infiltration rate of 0.1 inches per hour					43	
7		(Native)						
8								
9		**lean Clay (CL)**		Light Brown Grey	Sat	Very Stiff to Hard		
10	•						38	-

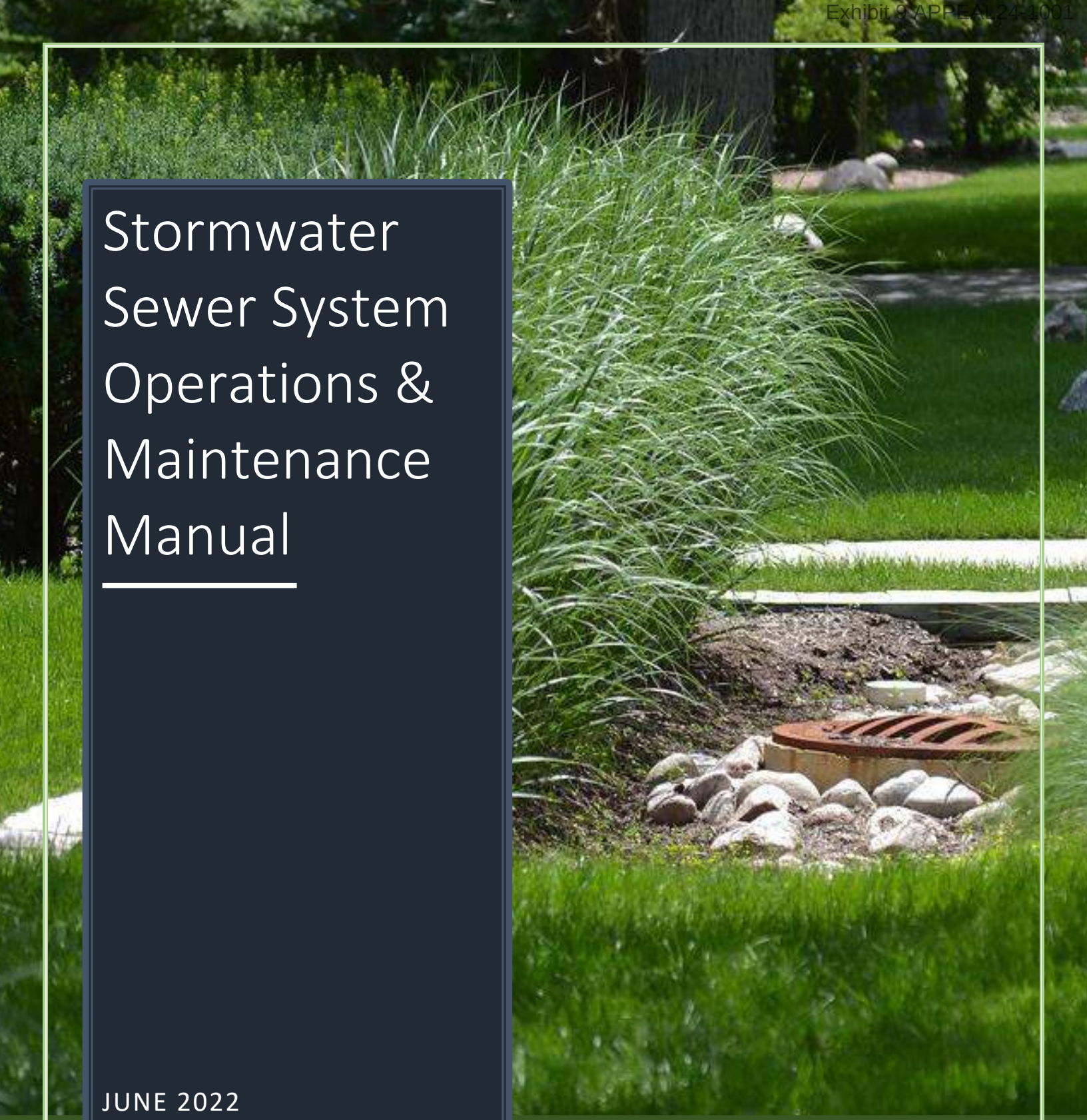
Bottom of test pit at 10.0 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	TAZ KHAN	DRAWN:	DB
PROJECT:	13TH ST GAS STATION NE 13TH ST & NW FRIBERG-STRUNK ST CAMAS, WA	DATE:	09/2023
		PLATE:	A-3
		PRO. #:	G26-0723

APPENDIX D

Operations and Maintenance Manual



Stormwater Sewer System Operations & Maintenance Manual

JUNE 2022

City of Camas
Stormwater Division | Public Works

City of Camas WASHINGTON

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Introduction

Background

All public and privately owned, roads, parking lots, residential developments, commercial or industrial developments, or school facilities have various components that make up a storm system. These components consist of conveyance pipes, catch basins, manholes, roadside ditches, stormwater facilities (such as bioswales, detention ponds, wet ponds, treatment filters, etc.), landscaping and any other structure that collects, conveys, controls, and/or treats stormwater. Regardless of the component, all storm systems eventually discharge into 'waters of the state' which are streams, rivers, lakes, and wetlands.

Under the Federal Clean Water Act (FCWA) and in compliance with the Department of Ecology's NPDES Phase II Permit, 'waters of the state' are to be protected from contamination. This in turn protects threatened and endangered species under the Federal Endangered Species Act (FESA).

One way to protect 'waters of the state' is to provide the proper maintenance of all storm system components. It is the responsibility of the City of Camas (City) to ensure that all components of the public storm system be properly maintained and operated. The City is responsible for those components that are located within the City's right-of-way, such as the conveyance pipes, manholes, catch basins, roadside ditches, and stormwater facilities. A large part of the stormwater facilities in the City are privately owned and maintained by the property owners. These property owners include, but are not limited to, Homeowners Associations (HOAs), school district, businesses, and commercial/industrial site owners.

Purpose

This manual is intended to help, both public and private stormwater facility maintenance operators, meet the requirements of City Municipal Code 14.02.090 for proper maintenance and operation of the various storm system components. Proper maintenance will help to assure that:

- Stormwater facilities operate as they were designed;
- Storm systems are cleaned of the pollutants that they trap, such as sediment and oils, so that storm systems are not overwhelmed and become pollutant sources;
- Pollutant sources are removed, or minimized, prior to entering the storm system.

Along with keeping a site from flooding, properly maintained storm system can help reduce surface water and groundwater pollution. Most sites have some type of stormwater control component designed to limit the environmental and flooding damage caused by stormwater runoff. These components require more labor intensive maintenance than a system of pipes and catch basins.

Manual Layout

This manual is broken out into various best management practice (BMP) maintenance components. For each BMP maintenance component, this manual will:

- Briefly describe the component type, e.g. facility or activity.
- Describes potential maintenance issues and/or problems.
- Describes conditions when maintenance is required.
- Minimum performance standards and suggested maintenance methods.

Additional information may be found in other manuals, such as the Washington Department of Ecology's *Stormwater Management Manual for Western Washington (SWMMWW), Vols. V*, and Ecology's LID manual.

Inspection of a stormwater facility will determine if conditions require a maintenance action. The maintenance standard is not the required condition at all times. Exceeding a condition, between inspections and/or maintenance, does not automatically constitute a violation of these standards. The inspection and maintenance schedules should be adjusted to minimize the length of time that a facility is in a condition that requires maintenance.

Emergent Treatment Technologies

Some stormwater treatment facilities are designed and installed with emerging technologies that are not standard at the time of their installation. If not found in this manual, a treatment facility may be an emerging technology approved by Washington Department of Ecology; the maintenance standards can be found at Emerging Stormwater Treatment Technologies.

Mosquito Control

Mosquitoes are annoying and sometimes pose a serious risk to public health. They can transmit diseases such as West Nile Virus and equine encephalitis. Above-ground stormwater facilities should be designed to allow water to flow through or infiltrate in less than 48 hours. Presence of mosquitos in a stormwater facility may indicate a clogged outlet, compromised infiltration capacity, or other defect that should trigger inspection and may require maintenance.

If mosquitos are identified during a stormwater facility maintenance or inspection and are a concern, a request to the Clark County Mosquito Control District for service or information regarding mosquito control can be made online at Mosquito Control District or at the 24-hour request line, 360-397-8430.

Material Disposal and Spills

The disposal of waste, e.g. sediment or standing water, from the maintenance of the stormwater facilities and storm system components shall be conducted in accordance with federal, state, and local regulations, including the Solid Waste Handling Standards chapter 173-350 WAC, Minimum Functional Standards for Solid

Waste Handling chapter 173-304 WAC and Appendix IV-B: Management of Street Waste Solids and Liquids of the SWMMWW. Dangerous waste must be handled following, Dangerous Waste Regulations chapter 173-303 WAC. Vegetation to be recycled and disposed of at local receptacle locations.

For major spills, coordinate removal/cleanup with the City at 360-817-1563 and notify Department of Ecology at 360-407-6300.

Vegetated Facilities

Biofiltration Swale

Biofiltration swales use grass or other dense vegetation to filter sediment and oily materials out of stormwater. Usually, they look like flat-bottomed channels with grass growing in them. As water passes through the vegetation, pollutants are removed through the effects of filtration, infiltration and settling.

See SWMMWW Appendix V-A, Table V-A.8 for biofiltration swale maintenance standards. If available, reference record drawings for seed mix and groundcover replacements, or see SWMMWW BMP T9.10, Tables V-7.3 and V-7.4. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.

Wet Biofiltration Swale

A wet biofiltration swale is a variation of basic biofiltration swale for use where the centerline slope is slight, groundwater table are high, or a continuous low base flow is likely to result in wet soil conditions for long periods of time. Where continuously wet soil exceeds about 2 weeks, typically grasses will die. Thus, vegetation specifically adapted to wet soil conditions is needed. Different vegetation requires modification of several of the design and maintenance requirements from the basic biofiltration swale.

See SWMMWW Appendix V-A, Table V-A.9 for wet biofiltration swale maintenance standards. If available, reference record drawings for seed mix and groundcover replacements, or see SWMMWW BMP T9.20, Table V-7.5. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.

Filter Strip

Filter strips are linear strips of grass that remove sediment and oils from stormwater by filtering it. Stormwater is treated as it sheet flows across the filter strip. Usually, filter strips are placed along the edge of linear paved areas, such as parking lots and roads. Where designed filter strips are installed; road shoulders should only be graded to maintain level flow off the road.

See SWMMWW Appendix V-A, Table V-A.10 for filter strip maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP T9.10, Table V-7.3.

Detention Pond

Detention pond facilities are designed to hold and slowly release stormwater by use of a pond with a specially designed control structure. Styles vary greatly from well-manicured to natural appearing. Generally, native vegetation is preferred for reduced maintenance and enhance wildlife habitat. Some facilities are designed to appear as natural water bodies or are in a park-like setting.

See SWMMWW Appendix V-A, Table V-A.1 for detention pond maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP D.1, Table V-12.3. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.

Wet Pond

A wet pond is an open basin that retains a permanent pool of water year-round or only during the wet season. The volume of the wet pond allows sediment and other pollutants to settle out of the runoff. Wetland vegetation is typically planted within the wet pond to provide additional treatment through nutrient removal. Detention quantity control can be provided with additional temporary storage volume above the permanent pool elevation.

See SWMMWW Appendix V-A, Table V-A.11 for wet pond maintenance standards. If available, reference record drawings for seed mix and plants replacement, or see SWMMWW BMP D.1, Table V-12.3 for seed mix and BMP T10.10, Table V-8.1 for plants. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.

Infiltration Facility

Infiltration facilities dispose of water by holding it in an area where it can soak into the ground. These are open facilities that may either drain rapidly and have grass bases or have perpetual ponds where water levels rise and fall with stormwater flows. Infiltration facilities may be designed to handle all of the runoff from an area or they may overflow and bypass larger storms.

Since the facility is designed to pass water into the ground, generally after passing through a sediment trap/manhole, anything that can cause the base to clog will reduce the performance and is a large concern. Generally, infiltration basins are managed like detention ponds, but with greater emphasis on maintaining the capacity to infiltrate stormwater.

See SWMMWW Appendix V-A, Table V-A.2 for infiltration facility maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP D.1, Table V-12.3. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.

Rain Garden

Rain gardens are non-engineered, shallow, landscaped depressions with compost-amended soils and adapted plants. The depression temporarily stores stormwater runoff from adjacent areas. Some or all the influent stormwater passes through the amended soil profile and into the underlying native soil. Stormwater that exceeds the storage capacity is designed to overflow to an adjacent drainage system.

If available, reference record drawings for plant replacements, or see Rain Garden Handbook for Western Washington, Appendix A for recommendation on rain garden plants. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.

Rain Garden			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Evidence of trash and debris	Remove trash and debris
Side slopes	Erosion	Persistent soil erosion on slopes	Replenish mulch areas throughout rain garden - on the sides and bottom of the rain garden and around the perimeter (and on berm if applicable).
Bottom area	Sediment	Visible sediment that reduces drainage rate	Remove sediment accumulation
		Sediment deposited from water entering the rain garden	Remove sediment, determine the source, and stabilize area
	Leaves	Matted accumulation of leaves reducing drainage rate	Remove leaves
Ponded water	Ponding	Ponded water remains for more than 3 days after the end of a storm	Remove sediment, leaf litter and/or debris accumulation
Pipe inlet/outlet	Pipe	Water is backing up in pipe	Clear pipes of sediment and debris with snake and/or flush with water
		Damaged or cracked drain pipes	Repair or seal cracks, or replace as needed
Inlet rock pad	Erosion	Rock or cobble is removed, missing and flow is eroding soil.	Replace rock and reestablish pad
Weeds	Weeds	Weeds are present	Remove weeds and apply mulch after weeding
Vegetation	Dying Vegetation	Dying, dead or unhealthy plants	Remove diseased plants or plant parts and dispose, then replace
	Sight Distance	Vegetation reduces sight distances and sidewalk	Keep sidewalks and sight distances on roadways clear
	Blockage	Vegetation is crowding inlets and outlets	Remove vegetation crowding inlets and outlets
	Poor Vegetation Growth	Yellowing, poor growth, poor flowering, spotting or curled leaves, weak roofs, or stems	Test soil to identify specific nutrient deficiencies.
			Do not use synthetic fertilizers
			Consider selecting different plant for soil conditions
Mulch	Bare Soil	Bare spots are present or mulch depth less than 2 inches	Supplement mulch with hand tools to a depth of 2 to 3 inches, keep mulch away from woody stems.

Bioretention

Bioretention facilities are engineered facilities that store and treat stormwater by filtering it through a specified soil profile. Water that enters the facility ponds in an earthen depression or other basin (e.g., concrete planter) before it infiltrates into the underlaying bioretention soil. Stormwater that exceeds the surface storage capacity overflow to an adjacent drainage system. Treated water is either infiltrated into the underlying native soil or collected by an underdrain and discharged. An underdrain system can be comprised of perforated or slotted pipe, wrapped in an aggregate blanket.

See SWMMWW Appendix V-A, Table V-A.21 for bioretention maintenance standards. If available, reference record drawings for plant replacements, or see LID Technical Guidance Manual for Puget Sound, Appendix 1 for plant recommendations. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.

Conveyance Ditch

Ditches are often manmade open-channels that convey stormwater runoff. These ditches are maintained to prevent localized flooding.

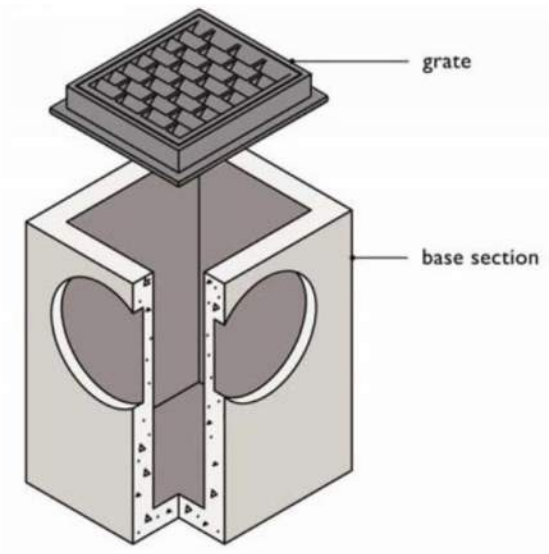
Conveyance Ditch			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Sediment	Sediment exceeds 20% of ditch depth or affects the historic or designed hydraulic capacity.	Remove sediment deposits. When finished, ditch should be level from side to side and drain freely in intended direction.
	Standing Water	Excessive standing water in ditch between storms due to ditch not draining freely	If possible, repair cause of poor drainage. This may include but is not limited to the following activities: remove sediment or trash blockages, improve grade of ditch.
	Eroded or Unstable Side Slopes	When grass is sparse, bare or eroded, patches occur in more than 20% of the ditch	Determine why grass growth is poor and correct that condition. Replant with plugs of grass at eight-inch intervals or reseed. If cause is excessive moisture replace grass with wetland plantings.
	Vegetation	Grass is excessively tall (greater than 15 inches). Nuisance weeds and other vegetation start to take over ditch.	Mow vegetation and/or remove nuisance vegetation so that flow is not impeded. Grass should be mowed to a height of 3 to 4 inches.
	Bare Soil	Poor vegetation coverage.	Reseed poor vegetation areas. Reference "Low Grow" seed mix, see SWMMWW BMP C120 Table II-3.4
	Inlet/Outlet Pipes or Culverts	Inlet/outlet area clogged with sediment and/or debris	Remove material so that there is no clogging or blockage in the inlet and outlet area
	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from ditch.
	Erosion/Scouring	Eroded or scoured ditch bottom	Permanently stabilize ditch bottom

Stormwater Structures

Catch Basin

A catch basin is an underground concrete structure with a slotted grate that collects stormwater runoff and route it through the underground pipes. Catch basins typically provide a sump below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. Some catch basins are fitted with a spill control device such as an inverted elbow on the outlet pipe to control grease or oils. The most common tool for cleaning catch basins is a vactor truck which is used to remove sediment and debris from the sump. The sediment and oils if not removed from the catch basins have the potential to pollute downstream waterbodies. Unless you have Occupational Safety and Health Administration (OSHA) approved confined space training and equipment, never enter a catch basin. There is a considerable risk of poisonous gas and injury.

See SWMMWW Appendix V-A, Table V-A.5 for catch basin maintenance standards.



Field/Ditch Inlet

An inlet is a concrete, plastic or steel structure fitted with a slotted grate to collect stormwater runoff and route through underground pipes. A field inlet has a flat grate, and a ditch inlet has an angled grate. These inlets typically provide a sump below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. Some of these inlets are fitted with a spill control device such as an inverted elbow on the outlet pipe to control grease or oils. The most common tool for cleaning out the inlet is a vactor truck which is used to remove sediment and debris from the sump. The sediment and oils if not removed from the inlet has the potential to pollute downstream water bodies. Unless you have OSHA approved confined space training and equipment, never enter an inlet. There is a considerable risk of poisonous gas and injury.

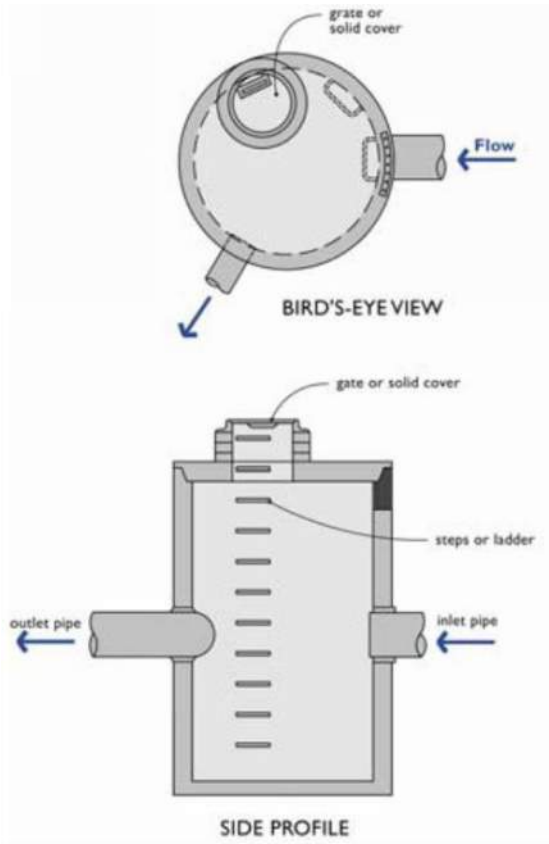
Field Inlet

Ditch Inlet

Field Inlet/Ditch Inlet			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash & Debris	Trash or debris blocking inletting capacity by more than 10%.	Remove trash or debris blocking grate opening.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	Remove dead animals or vegetation present within the field/ditch inlet.
	Sediment	Sediment has accumulated to within six inches of the invert of the lowest pipe	Remove sediment
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch.	Repair top slab to be free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Make adjustments so that frame is sitting flush on the riser rings or top slab and is firmly attached.
	Fractures or Cracks in Field Inlet Walls/Bottom	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Regrout pipe and secure at field inlet wall.
	Settlement/ Misalignment	If failure of field inlet has created a safety, function, or design problem.	Replace or repair field inlet to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the inlet opening.	Remove vegetation blockage from basin opening.
	Contamination and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
Metal Grates	Grate Not in Place	Grate is missing or only partially in place. Any open field inlet requires maintenance.	Replace missing grate, cover field inlet
	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Repair grate opening
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Replace missing grate or repair broken member(s)

Manhole

Manholes are large cylindrical underground structures usually set at storm sewer pipe connections. Manholes are used in storm sewer system at any change in direction, slope, pipe material or pipe size. Some manholes have sumps and fitted with stormwater flow control structures such as orifices or weirs. Unless you have OSHA approved confined space training and equipment, never enter a manhole. There is a considerable risk of poisonous gas and injury.

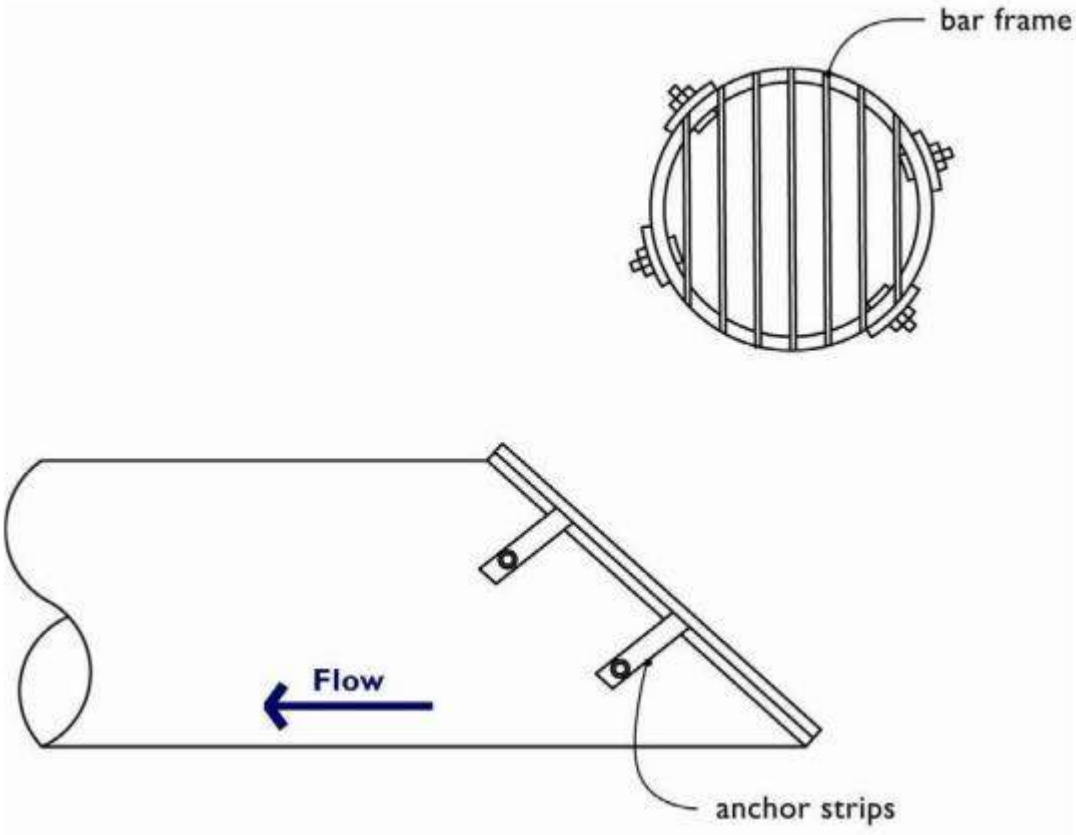


Manhole			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Trash or debris has accumulated to within six inches of the invert of the lowest pipe.	Remove all trash or debris from manhole.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Remove trash or debris from inlet and outlet pipes.
	Sediment	Sediment has accumulated to within six inches of the invert of the lowest pipe.	Remove all sediment from manhole
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch.	Repair top slab to be free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Make adjustments so that frame is sitting flush on the riser rings or top slab and is firmly attached.
	Fractures or Cracks in Manhole Walls/Bottom	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering manhole through cracks.	Regrout pipe and secure at manhole wall.
	Settlement/ Misalignment	If failure of manhole has created a safety, function, or design problem.	Replace or repair manhole to design standards.
Cover	Cover Not in Place	Cover is missing or only partially in place. Any open manhole requires maintenance.	Replace missing cover, cover manhole.
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Repair opening mechanism
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure.	Make adjustments so that one maintenance person can remove the manhole cover.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Repair or replace ladder to meet design standards and allow maintenance person safe access.
Control Structure/Flow Restrictor	See Control Structure/Flow Restrictor		

Debris Barrier

Debris barriers and trash racks are barred covers to pipe openings. They prevent large objects from entering pipes and keeps pets and people out of the pipes as well.

See SWMMWW Appendix V-A, Table V-A.6 for debris barrier maintenance standards.



Profile View

Sediment Trap

A sediment trap is a concrete structure typically fitted with slotted grate or multiple slotted grates. The concrete structure provides a storage volume (sump) below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. A sediment trap can be a fully enclosed concrete structure (above or below ground) with a sump, inlet pipe(s) and outlet pipe.

Sediment Trap			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Trash and debris which is located immediately in front of the sediment trap opening or is blocking the inlet capacity of the basin by more than 10%	Remove trash and debris
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	Remove dead animals or vegetation present within the sediment trap.
	Sediment (non-enclosed structure)	Sediment depth exceeds 2 inches.	Remove sediment
	Sediment (enclosed structure)	Sediment depth within 6 inches from lowest invert	Remove sediment
	Fractures or Cracks in Sediment Trap	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering sediment trap through cracks.	Regrout pipe and secure at sediment trap wall.
	Settlement/ Misalignment	If failure of sediment trap has created a safety, function, or design problem.	Replace or repair sediment trap to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the sediment trap opening	Remove vegetation
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Remove contaminants and/or pollutants. (Coordinate removal/cleanup with local water quality response agency)
Slotted Grate	Trash and Debris	Trash and debris that is blocking more than 20% of the grate surface inlet capacity	Remove trash and debris from grate
	Damaged or Missing Grate	Grate missing or broken member(s) of the grate	Replace or repair grate to design standards.
Cover (enclosed structure)	Cover Not in Place	Cover is missing or only partially in place.	Replace missing cover
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure or latch broken	Make adjustments so that one maintenance person can remove the cover and/or repair broken latch.

Energy Dissipater

Energy dissipaters are critical for preventing erosion at storm drain outfalls. There are a variety of designs, including wire gabion baskets, rock splash pads, trenches, and specially designed pools or manholes. They are installed on or near the inlet or outlet to a closed pipe system to prevent erosion at these locations.

See SWMMWW Appendix V-A, Table V-A.7 for energy dissipater maintenance standards.

Discharge Point

Stormwater facility discharge points may convey drainage from the stormwater facility into open channels, ditches, ponds, wetlands, streams, or lakes. Stormwater facility discharge points need to be assessed to make sure stormwater is not causing any negative impacts to these drainage areas.

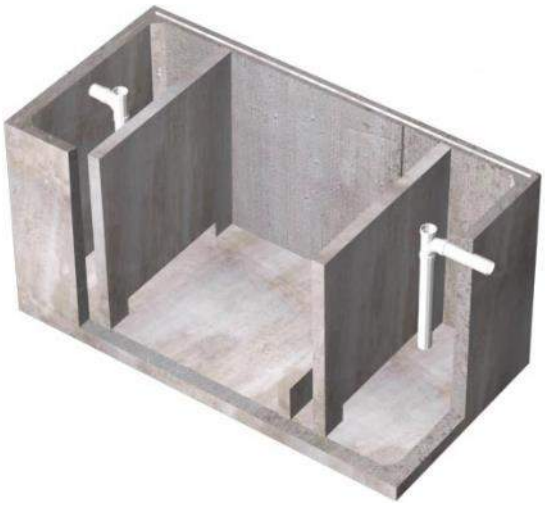
Discharge Point			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Monitoring	Contaminants and Pollution	Any evidence of oil, gasoline, sewage, contaminants, or other pollutants	Identify and remove source. The effluent discharge should be clear and free of odor. Notify City at (360) 817-1567.
	Ditch or Stream Banks Eroding	Erosion, scouring, or head cuts in ditch or stream banks downstream of facility discharge point due to flow channelization or higher flows.	Stabilize ditch or stream banks. Report to City for engineer evaluation.
General	Missing or Moved Rock	Only one layer of rock exists above native soil in an area five square feet or larger, or any exposure of native soil	Replace or repair rock pad to design standards
	Erosion	Soil erosion in or adjacent to rock pad	Replace or repair rock pad to design standards
	Sediment	Sediment blocking 20% of the pipe diameter	Remove sediment
	Obstructions	Roots or debris enters pipe or deforms pipe, reducing flow	Remove roots from pipe by mechanical methods; do not use root-dissolving chemicals in storm sewer pipes. If necessary, remove vegetation over the line.
	Pipe Rusted or Deteriorated	Any part of the piping that is crushed or deformed excessively or any other failure to the piping	Repair or replace pipe
Energy Dissipater	See Energy Dissipater		

Oil/Water Separators

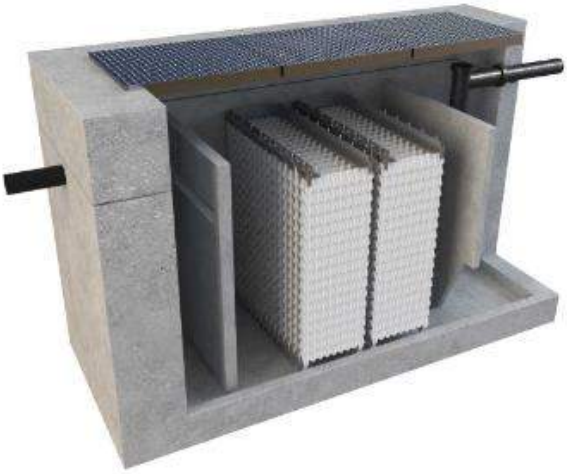
An oil/water separator is an underground vault that treats stormwater by mechanically separating oil from water. The oil rises to the surface and floats on the water and sediment settles to the bottom. Oil/water separators are typically utilized in locations where high oil concentrations in the stormwater runoff are anticipated (e.g., service and fuel stations). Oil/water separators are most commonly used as the first pretreatment facility in a series of stormwater management facilities.

These facilities have special problems for maintenance and should be serviced by contractors. The main issues are working in confined spaces and properly handling any sludge and oil cleaned from vaults or oil/water separators. Manufacturer's recommendations for maintenance should be followed at a minimum.

See SWMMWW Appendix V-A, Table V-A.16 for baffle oil/water separator maintenance standards and Table V-A.17 for coalescing plate oil/water separator maintenance standards.



Baffle Oil/Water Separator

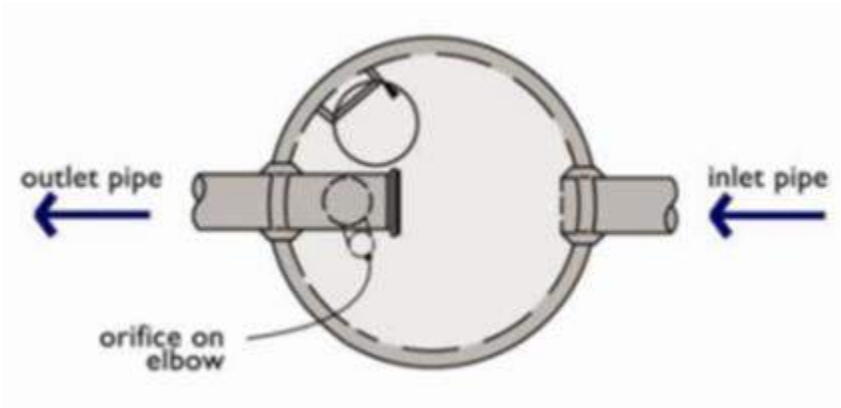


Coalescing Plate Oil/Water Separator

Flow Control Structures/Flow Restrictors

Flow control structures and flow restrictors direct or restrict flow in or out of facility components. Outflow controls on detention facilities are a common example where flow control structures slowly release stormwater at a specific rate. The flow is regulated by a combination of orifices (holes with specifically sized diameters) and weirs (plates with rectangular or 'V' shaped notch). Lack of maintenance of the control structure can result in the plugging of an orifice. If these flow controls are damaged, plugged, bypassed, or not working properly, the facility could overtop or release water too quickly.

See SWMMWW Appendix V-A, Table V-A.4 for control structure/flow restrictor maintenance standards.



Plan View

Storm Sewer Pipe

Storm sewer pipes convey stormwater. Storm pipes are constructed of many different types of materials and are sometimes perforated to allow groundwater to be collected by the storm system. Storm pipes are cleaned to remove sediment or blockages when problems are identified. Storm pipes must be clear of obstructions and breaks to prevent localized flooding.

Storm Sewer Pipe			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Obstructions, Including Roots	Obstruction exists in pipe, reducing flow capacity	Remove obstruction. Use mechanical methods. Do not put root-dissolving chemicals in storm sewer pipes. If necessary, remove the vegetation over the line.
	Pipe Dented or Broken	Inlet/outlet pipe damaged or broken	Repair or replace pipe
	Pipe rusted or deteriorated	Any part of the piping that is crushed or deformed excessively or any other failure to the piping	Repair or replace pipe
	Sediment and Debris	Sediment or debris depth is greater than 15% of the pipe diameter	Clean pipe. Evaluate source of sediment upstream of the pipe and stabilize if possible.
	Broken Trash Screen	Trash screen is broken or missing parts	Repair or replace trash screen
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.

Closed Detention System

A closed detention system functions similarly to a detention pond but with the storage volume provided by an underground structure. The structure is typically constructed of large diameter pipe, plastic chamber structure or a concrete vault. These systems are typically utilized for sites that do not have space available for an above-ground system and are more commonly associated with commercial sites.

Underground detention systems are enclosed spaces where harmful chemicals and vapors can accumulate. Therefore, the maintenance of these facilities should be conducted by an individual trained and certified to work in hazardous confined spaces.

See SWMMWW Appendix V-A, Table V-A.3 for closed detention maintenance standards.

Drywell

Drywells are perforated, open-bottomed manholes used to infiltrate stormwater into the ground. While not the intended use, drywells trap sediment and some of the oil pollutants in stormwater runoff. Drywells are more likely to fill with oily sediment in areas that lack swales or other treatment facilities. Fine oil sediment can clog drywells and lead to localized street flooding. Also, pollutants discharged into drywells can migrate into groundwater. Drywells were often installed in closed topographic depressions, areas with will-drained soils, or areas having inadequate storm sewers. Often, drywells contain groundwater.

Drywell			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Does not Dissipate Stormwater	Does not dissipate stormwater	Replace or repair
	Opening Clogged	Openings are clogged, reducing capacity	Clear openings or convert existing drywell to a sediment trap and install a new drywell or drainage trench. To convert to a sediment trap: grout holes, cover base with concrete, and add piping. Alterations to any storm facility cannot be done without approval from the City of Camas.
	Standing Water	Standing water indicates the drywell is into the groundwater table	Rebuild drywell to prevent stormwater from going directly into groundwater
	Trash and Debris	Trash or debris blocking any inlet or outlet pipe	Remove trash and debris
	Sediment	Sediment in drywell exceeds 60 percent of the depth below the lowest pipe	Remove sediment
	Structure Damage	Structure unsound	Replace or repair drywell to design standards.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
Cover	Cover Not in Place	Cover is missing or only partially in place.	Replace missing cover
	Cover Difficult to Remove	One maintenance person cannot remove cover after applying normal lifting pressure.	Make adjustments so that one maintenance person can remove the drywell cover.

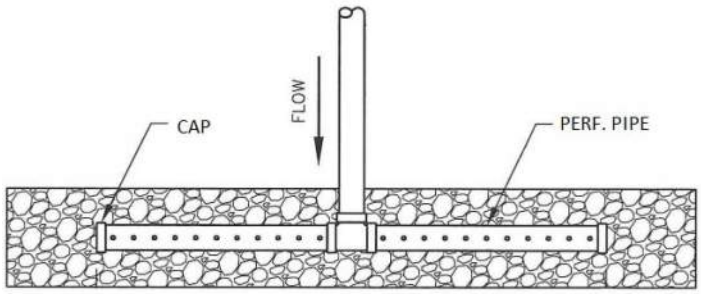
Pond Leveler System

The pond leveler system consists of an intake cage and outlet pipe. This system is used to bypass beaver dams. The pond leveler system creates a permanent leak through the beaver dam that the beavers cannot stop.

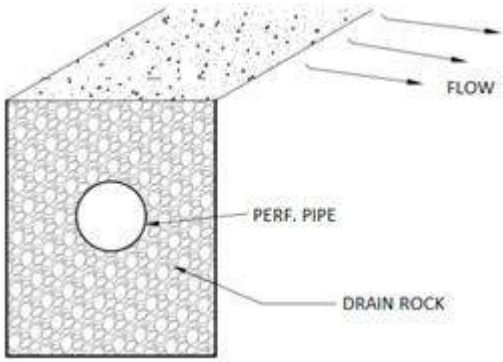
Pond Leveler			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Intake Cage	Debris and sediment	Debris and sediment build up around cage	Remove debris and sediment build up around cage. Recommended tools: potato rake and a narrow, stiff shop broom.
	Structure	Broken cage, resulting in holes larger than 6" diameter.	Repair hole with similar cage material, attach with hog rings.
	Obstruction to inflow pipe	Debris obstructing pipe flow inside intake cage	Remove obstruction
Outflow Pipe	Obstruction	Debris obstructing outflow	Remove obstruction

Dispersion Trench

Dispersion trench are grave-filled trenches, which serve to spread runoff over vegetated pervious areas. This BMP reduce peak flows, provide some infiltration, and water quality benefits.



Plan View



Cross Section

Dispersion Trench			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from site.
	Poisonous Vegetation and noxious weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations.	Remove noxious weeds. Compliance with State or local eradication policies required. Apply requirements of adopted IPM policies for the use of herbicides.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
	Rodent Holes	Any evidence of rodent holes.	Fill holes.
Perforated Pipe	Sediment and/or obstruction	Sediment and/or obstruction impeding the flow, causing backup	Remove sediment and/or obstruction

Special Facilities

Manufactured Media Filter

Manufacture media filters are passive, flow-through, stormwater treatment systems. They are comprised of manholes or vaults that house media-filled filter cartridges. Stormwater passes through a filtering medium, which traps particulates and/or absorb pollutants such as dissolved metals and hydrocarbons. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharge to a pond or open channel drainage way.

The filter media can be housed in cartridge filters enclosed in concrete vaults or catch basins. Structures will have vault doors or manhole lids for maintenance access. Various types of filter media are available from different manufactures. Determine the type of filter media used and consult manufacturer for maintenance recommendations.

See SWMMWW Appendix V-A, Table V-A.15 for manufactured media filters maintenance standards.

Manufactured Media Filter – Additional Maintenance Standards			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Below Ground Vault or Manhole	Sediment Accumulation in Vault (no first chamber)	Sediment depth exceeds 4-inches on vault floor.	Remove sediment from vault floor. May require replacing media cartridges, consult manufacturer.

Permeable Pavement

Permeable pavement is a paving system which allows rainfall to percolate through the surface into the underlying soil or an aggregate bed, where stormwater is stored and infiltrated to underlying subgrade, or removed by an overflow drainage system.

See SWMMWW Appendix V-A, Table V-A.22 for permeable pavement maintenance standards.

Modular Wetland

Modular wetlands linear is a biofiltration system that utilizes horizontal flow which allows for a smaller footprint, higher treatment capacity and design versatility. This system can be utilized downstream of storage for additional volume control and treatment. The modular wetland is contained in an underground vault that has different chambers containing media. Some modular wetlands can have plants growing out of it, but it is not required for the system to function. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharge to a pond or open channel drainage way.

Modular Wetland			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Missing or damaged components	Missing or damaged internal components or cartridges	Replace missing or repair damaged internal components or cartridges
Inlet or Outlet	Obstruction	Obstruction to inlet or outlet that impedes flow	Remove obstruction
Pretreatment Chamber	Floatables	Excessive accumulation of floatables, in which the length and width of the chamber is fully impacted more than 18"	Remove floatables
	Sediment	Excessive accumulation of sediment, more than 6"in depth	Remove sediment
Filter Cartridges	Sediment	Excessive accumulation of sediment on media, more than 85% clogged (blackish color)	Replace media
Vegetation (if applicable)	Overgrown	Overgrown vegetation	Trim/prune vegetation in accordance with landscaping and safety needs
Structure	Cracks in structure	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through cracks	Repair cracks in vault

Tree Box Filter

Tree box filter is a stormwater treatment system incorporating high performance biofiltration media to remove pollutants from stormwater runoff.

Tree Box Filter			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Inlet	Excessive sediment or trash accumulation	Accumulated sediments or trash impair free flow of water into system	Remove sediment and/or trash
Mulch cover	Trash and debris	Excessive trash and/or debris accumulation	Remove trash and/or debris.
	Standing water	Ponding of water over mulch due to excessive fine sediment accumulation or spill of petroleum oils	Remove mulch and replace, contact manufacturer for advice
Vegetation	Plant not growing or in poor condition	Soil/mulch too wet, evidence of spill, incorrect plant selection, pest infestation, vandalism to plants	Plants should be healthy and pest free, contact manufacturer for advice
	Plant growth excessive	Plants should be appropriate to the species and location	Trim/prune plants in accordance with landscaping and safety needs
Structure	Cracks in structure	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through cracks	Repair cracks in vault

Miscellaneous Items

Fences, Gates and Water Quality Signs

Fences are installed around the perimeter of stormwater facilities as a means of protecting the public, as they restrict entrance to the facility. Gates are installed to allow for maintenance access. Gates will be secured, typically with a double lock system (daisy chain) that allows access to the City and to the property owner's maintenance crew.

Water Quality Signs are installed on the fences, or on sign poles, within public view as a means of educating the public as to the presence of a stormwater facility. These signs also have a number located in the upper right hand corner that is cross referenced, at the City, to an address and maintenance responsibility. The publicly owned storm facility signs are green and the privately owned storm facility signs are white.

Public Storm Sign (Green)

Private Storm Sign (White)

Fence, Gate and Water Quality Sign			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Gate or Fence Allows Unauthorized Entry	Openings in fence, missing gate, openings beneath fence allowing unauthorized access	Repaired gate and/or fence to prevent unauthorized access
	Locking Mechanism	Mechanism cannot be opened by one maintenance person with proper tools	Repair/replace lock
		No lock on gate, allows unauthorized entry	Add lock
	Damaged Parts	Posts out of plumb more than six inches	Plumb post
		Top rails of plump more than six inches	Repair top rails so that it is free of bends greater than 1 inch
	Erosion	Erosion has resulted in an opening under a fence that allows entry by people or pets	Replace soil under fence so that no opening exceeds 4 inches in height
	Sign	Sign is leaning more than 8 inches off vertical	Reset sign to plumb
		Sign is missing or 20% of surface is unreadable	Replace sign

Access Roads and Easements

Many stormwater facilities have access roads to bring in heavy equipment for facility maintenance. These roads are typically gravel and should be maintained for inspection access and ease of equipment entry. All facilities should allow access for the inspection process. The easement area should be adequately or otherwise stabilized. Bare soil areas will generate higher levels of stormwater runoff and increase erosion and sedimentation in stormwater facilities.

Access Road and Easements			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Erosion	Soils are bare or eroded	Seed or use other stabilization BMP
	Road Surface	Conditions of road surface may lead to erosion of the facility or limit access	Repair road
	Erosion of Ground Surface	Noticeable rills are seen in landscaped areas	Identify causes of erosion and implement BMPs to slow down/spread out the water. Fill, contour, and seed eroded areas. If needed, re-grade affected areas.
	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from site.
	Poisonous Vegetation and Noxious Weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations.	Remove noxious weeds. Compliance with State or local eradication policies required. Apply requirements of adopted IPM policies for the use of herbicides.
	Tree Growth and Hazard Trees	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If dead, diseased, or dying trees are identified.	Remove hazardous tree that impede with maintenance access and activities. Remove trees that are damaging the pipe system and/or blocking drain inlet. Remove dead, diseased, or dying trees. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood).
	Weeds (Non-poisonous)	Weeds growing in more than 20% of the landscaped area (tree and shrubs only).	Remove weeds
	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Destroy or remove insects from site. Apply insecticides in compliance with adopted IPM policies.

Pavement Sweeping

Pavement sweeping is performed as a means of removing sand, dirt, and litter from streets and curb gutters. Sweeping also reduces dust during dry weather. Pavement sweeping plays a large part in stormwater maintenance because it limits the amount of sediment washed into the municipal storm sewer system. The water quality procedure for street sweeping focuses on sediment removal and disposal. Reducing the amount of sediment washed into catch basins, curb inlets, detention facilities, drywells, and other facilities can save money because sweeping is generally cheaper that removing sediment from facilities. Sweeping also helps protect facilities from clogging with sediment.

Typically, the City sweeps the downtown area once a week and the whole city about three times per year. Most of the downtown area does not have water quality treatment. Pavement sweeping is the main source for pollution control.

Repair/Replacement Activities

Minor Culvert Repair (Not in a Stream)

This activity is for the replacement or repair of culverts and inlets. It applies only to structures that are in ditches that are specifically for storm drainage. These are ditches that do not carry water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, consult with the Washington Department of Fish and Wildlife and the City of Camas Public Works Department.

Major Culvert Repair (at a Stream Crossing)

This activity is the replacement or repair of culverts and inlets bridging a stream or ditch with flowing water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, consult the Washington Department of Fish and Wildlife and the City of Camas Public Works Department.

These projects must meet all regulatory requirements such as State Environmental Policy Act (SEPA), Shoreline Permit, Hydraulic Project Approval (HPA) and Flood Plain.

Vegetation Management

The City recognizes the special importance of the rivers, streams, wetlands, ponds, and stormwater control and treatment facilities. The sensitive nature of such habitat, their plant and animal communities, and their direct link with other waterways require that we establish specific policies to ensure their health. All landscape management decisions for controlling unwanted vegetation, diseases, and pests should follow the Integrated Pest Management (IPM) principles and decision-making rationale.

Integrated Pest Management (IPM) Principles

1. Correctly identify the pest problem and understand their life cycle. Refer to online resources such as Washington State Noxious Weed Control Board and Washington Invasive Species Council.
2. Every landscape has a population of some pest insects, weeds, and diseases. Once the pest has been identified and studied, determine if low levels of the pest are tolerable. Small numbers of certain pests may not be harmful. If this is the case, simply continue to monitor the pest population.
3. If pest exceed tolerance thresholds, choose a safe and effective control method.
    a. Cultural methods of vegetation and pest control are preferred and are first employed. Cultural control changes the pest's environment: landscape fabric, mulch, soil amendments, altering the irrigation method of duration, crop rotation, crop covers, etc.
    b. Mechanical means of vegetation and pest control are next in line of preference and are utilized where feasible. Mechanical means consist of digging, hand-pulling, mowing, tilling, trapping, etc.
    c. Biological methods of vegetation and pest control are considered before chemical means, where they are feasible. Biological control uses natural enemies: beneficial insects, managed grazing, bird boxes and perches, etc.
    d. Chemical methods are used only when no other feasible methods exist. Chemical control is the use of pesticides to remove vegetation and pests.
4. Observe and record the results of the control treatment. Evaluate the effectiveness. If necessary, modify maintenance practices to support a healthy landscape and prevent recurrence of the pest.

A licensed pesticide applicator is required for performing any chemical application in stormwater facilities. Applicators must be licensed in Washington State with an aquatic endorsement (WAC 16-228-1545). Applicator must submit a copy of their license to the City prior to starting work. Aquatic pesticide products are recommended. No chemical application shall be applied directly in the water. Do not apply pesticide when it is raining. Check the weather and ensure there are multiple dry days before and after application. Do not apply pesticide on windy days to prevent drift movement of pesticide from target areas.

For vegetated areas outside of stormwater facilities, Washington State pesticide application laws and rules are followed, Chapter 17.21 RCW and Chapter 16-228 WAC.

Plants and Groundcover

Use plants that will thrive in the growing conditions of each facility. Growing conditions are affected by moisture, soil conditions, and light. Plants native to western Washington are preferred. Recommended plants, seed mixes and groundcover list for biofiltration swales, bioretention systems, rain gardens, and other facility types are given in the respective BMP maintenance sections. It is best to reference the stormwater facility record drawings for vegetation replacements, if available. Fertilization of vegetated stormwater facilities should be avoided.

The City has adopted a list of approved plants for use in development projects, and to assist homeowners in choosing appropriate plantings. The list also has prohibited undesirable plants. Only plants approved for use on the City of Camas Plant Materials are allowed within the City's right-of-way.

Mulches and other ground coverings are useful during the installation and restoration of landscapes as well as their ongoing maintenance. Mulches meet a variety of needs. They suppress weeds, help to retain moisture around plants, reduce possible erosion and provide visual enhancement. Possible risk impacts to consider when using mulch are inadvertent introduction of non-native plants or migration of mulch material into waterways.

Possible scenarios where trees should be removed and/or trimmed in a stormwater facility (always check if the stormwater facility has a liner before tree removal):

- Trees that pose a risk to a stormwater structure due to root growth should be removed.
- Trees that are growing on spillways that would impede drainage should be removed.
- Hazardous trees should be removed.
- Trees/shrubs that hinder accessibility to access roads should be trimmed or removed.

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APPENDIX E

Stormwater Pollution Prevention Plan

Stormwater Pollution Prevention Plan

For
NE 13th Street Site Plan

Prepared For
Taz Kahn
3993 NW Currawong Court
Camas, WA 98607

Owner	Developer	Operator/Contractor
Taz Kahn 3993 NW Currawong Court Camas, WA 98607	Same as Owner	Unknown

Project Site Location
20101 NE 13th Street
Camas, WA 98607
Parcel #176148-000

SWPPP Prepared By
PLS Engineering, Inc.
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519

SWPPP Preparation Date
August 2023

Approximate Project Construction Dates
March 2024

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Appendix A Site plans

- Vicinity map (with all discharge points)
- Site plan with TESC measures

Appendix B Construction BMPs

- Possibly reference in BMPs, but likely it will be a consolidated list so that the applicant can photocopy from the list from the SWMMWW.

Appendix C Alternative Construction BMP list

- List of BMPs not selected, but can be referenced if needed in each of the 12 elements

Appendix D General Permit

Appendix E Site Log and Inspection Forms

Appendix F Engineering Calculations

1.0 Introduction

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the Monte Verde construction project in Camas, Washington. The site is located on Parcel 173184000. Current address for the site is 22205 NE 28th Street, Camas, WA 98607 and the existing site is approximately 8.61 acres. Current proposed development associated with this SWPPP includes the construction of 34 single family lots along with the associated infrastructure. The stormwater plan associated with this project provides for stormwater management of all runoff from the site using two private infiltration trenches, and one stormwater detention facility. Stormwater runoff from the pollution generating surfaces will be treated by a ConTech media cartridge before being infiltrated.

Construction activities will include excavation, grading, construction of paving and sidewalk to serve the site, construction of an infiltration trench to mitigate for impacts to stormwater runoff from the new paving, and installation of utilities to serve the site including sanitary sewer, storm sewer, potable water, electrical, phone, and cable TV. The purpose of this SWPPP is to describe the proposed construction activities and all temporary and permanent erosion and sediment control (TESC) measures, pollution prevention measures, inspection/monitoring activities, and recordkeeping that will be implemented during the proposed construction project. The objectives of the SWPPP are to:

1. Implement Best Management Practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. Prevent violations of surface water quality, ground water quality, or sediment management standards.

3. Prevent, during the construction phase, adverse water quality impacts including impacts on beneficial uses of the receiving water by controlling peak flow rates and volumes of stormwater runoff at the Permittee's outfalls and downstream of the outfalls.

This SWPPP was prepared using the Ecology SWPPP Template downloaded from the Ecology website. This SWPPP was prepared based on the requirements set forth in the Construction Stormwater General Permit and the *Stormwater Management Manual for Western Washington* (SWMMWW). The report is divided into seven main sections with several appendices that include stormwater related reference materials. The topics presented in the each of the main sections are:

- Section 1 – INTRODUCTION. This section provides a summary description of the project, and the organization of the SWPPP document.

- Section 2 – SITE DESCRIPTION. This section provides a detailed description of the existing site conditions, proposed construction activities, and calculated stormwater flow rates for existing conditions and post–construction conditions.

- Section 3 – CONSTRUCTION BMPs. This section provides a detailed description of the BMPs to be implemented based on the 12 required elements of the SWPPP (SWMMEW 2004).

- Section 4 – CONSTRUCTION PHASING AND BMP IMPLEMENTATION. This section provides a description of the timing of the BMP implementation in relation to the project schedule.

- Section 5 – POLLUTION PREVENTION TEAM. This section identifies the appropriate contact names (emergency and non-emergency), monitoring personnel, and the onsite temporary erosion and sedimentation control inspector

- Section 6 – INSPECTION AND MONITORING. This section provides a description of the inspection and monitoring requirements such as the parameters of concern to be monitored, sample locations, sample frequencies, and sampling methods for all stormwater discharge locations from the site.

- Section 7 – RECORDKEEPING. This section describes the requirements for documentation of the BMP implementation, site inspections, monitoring results, and changes to the implementation of certain BMPs due to site factors experienced during construction.

Supporting documentation and standard forms are provided in the following Appendices:

Appendix A – Site plans
Appendix B – Construction BMPs
Appendix C – Alternative Construction BMP list
Appendix D – General Permit
Appendix E – Site Log and Inspection Forms
Appendix F – Engineering Calculations

2.0 Site Description

2.1 Existing Conditions

Current Addresses for the site is 20101 NE 13th Street, Camas, WA 98607. The site is approximately 0.97 acres. The property's topography is moderately sloped from a high point at the NW corner of the site to low areas along at the South boundary of the site. The site has an existing house will be removed. The remaining area consists of grass, and trees, and landscaping.

The soils are mapped by the NRCS as Wind River gravelly loam (WrB) for the majority of the site, and Cove silty clay loam (CwA) at the SW corner and Eastern edge of the site.

2.2 Proposed Construction Activities

The project proposes to develop a gas station with a mini-mart and car wash on a single lot. Construction activities will include excavation, grading, construction of paving and sidewalk to serve the site, construction of stormwater facilities to mitigate for impacts to stormwater runoff from the new paving, and installation of utilities to serve the site including sanitary sewer, storm sewer, potable water, electrical, phone, and cable TV.

Temporary erosion and sediment control facilities will be installed prior to site construction to handle construction-phase stormwater runoff. The schedule and phasing of BMPs during construction is provided in Section 4.0.

Stormwater runoff has been calculated using Western Washington Hydrology Model (WWHM). The stormwater facilities were designed to treat and detain the runoff generated by the site prior to discharge.

After the site has been graded and all new utilities are installed, the building construction will commence. Trees will also be planted in the landscape areas noted in the Landscape Plan. Temporary seeding will occur over the lots to establish vegetative cover until such time as individual buildings are developed and permanent landscaping occurs.

3.0 Construction Stormwater BMPs

3.1 The 13 BMP Elements

3.1.1 Element #1 – Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Trees that are to be preserved, as well as all sensitive areas and their buffers, shall be clearly delineated, both in the field and on the plans. In general, natural vegetation and native topsoil shall be retained in an undisturbed state to the maximum extent possible. The BMPs relevant to marking the clearing limits that will be applied for this project include:

- Preserving Native Vegetation (BMP C101)
- Silt Fence (BMP C233)

Alternate BMPs for marking clearing limits are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.2 Element #2 – Establish Construction Access

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads, and wheel washing, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters. All wash wastewater shall be controlled on site. The specific BMPs related to establishing construction access that will be used on this project include:

- Stabilized Construction Entrance (BMP C105)

Alternate construction access BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.3 Element #3 – Control Flow Rates

In order to protect the properties and waterways downstream of the project site, stormwater discharges from the site will be controlled. The specific BMPs for flow control that shall be used on this project include:

- Downspout Full Infiltration - Infiltration Trenches (BMP T5.10B).
- Infiltration Trenches (BMP R5.11).

Alternate flow control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, the project must comply with Minimum Requirement 7 (Ecology 2005).

In general, discharge rates of stormwater from the site will be controlled where increases in impervious area or soil compaction during construction could lead to downstream erosion, or where necessary to meet local agency stormwater discharge requirements (e.g. discharge to combined sewer systems).

3.1.4 Element #4 – Install Sediment Controls

All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site or prior to being discharged to an infiltration facility. The specific BMPs to be used for controlling sediment on this project include:

- Silt Fence (BMP C233)
- Storm Drain Inlet Protection (BMP C220)

Silt fencing and storm drain inlet protection will be adequate for sediment control during summer months. Alternate sediment control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

In addition, sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers, as needed, to minimize tracking of sediments on vehicle tires away from the site and to minimize washoff of sediments from adjacent streets in runoff.

Whenever possible, sediment laden water shall be discharged into onsite, relatively level, vegetated areas (BMP C240 paragraph 5, page 4-102).

In some cases, sediment discharge in concentrated runoff can be controlled using permanent stormwater BMPs (e.g., infiltration swales, ponds, trenches). Sediment loads can limit the effectiveness of some permanent stormwater BMPs, such as those used for infiltration or biofiltration; however, those BMPs designed to remove solids by settling (wet ponds or detention ponds) can be used during the construction phase. When permanent stormwater BMPs will be used to control sediment discharge during construction, the structure will be protected from excessive sedimentation with adequate erosion and sediment control BMPs. Any accumulated sediment shall be removed after construction is complete and the permanent stormwater BMP will be restabilized with vegetation per applicable design requirements once the remainder of the site has been stabilized.

The following BMPs will be implemented as end-of-pipe sediment controls as required to meet permitted turbidity limits in the site discharge(s). Prior to the implementation of these technologies, sediment sources and erosion control and soil stabilization BMP efforts will be maximized to reduce the need for end-of-pipe sedimentation controls.

- Construction Stormwater Filtration (BMP C251)
- Construction Stormwater Chemical Treatment (BMP C 250) (implemented only with prior written approval from Ecology).

3.1.5 Element #5 – Stabilize Soils

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. The specific BMPs for soil stabilization that shall be used on this project include:

- Temporary and Permanent Seeding (BMP C120)
- Mulching (BMP C121)
- Nets and Blankets (BMP C122)
- Plastic Covering (BMP C123)
- Topsoiling (BMP C125)
- Surface Roughening (BMP C130)
- Dust Control (BMP C140)
- Early application of gravel base on areas to be paved

Alternate soil stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, no soils shall remain exposed and unworked for more than 7 days during the dry season (May 1 to September 30) and 2 days during the wet season (October 1 to April 30). Regardless of the time of year, all soils shall be stabilized at the end of the shift before a holiday or weekend if needed based on weather forecasts.

In general, cut and fill slopes will be stabilized as soon as possible and soil stockpiles will be temporarily covered with plastic sheeting. All stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

3.1.6 Element #6 – Protect Slopes

All cut and fill slopes will be designed, constructed, and protected in a manner that minimizes erosion. The following specific BMPs will be used to protect slopes for this project:

- Temporary and Permanent Seeding (BMP C120)

Alternate slope protection BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.7 Element #7 – Protect Drain Inlets

All storm drain inlets and culverts made operable during construction or inlets near the site that could potentially receive surface runoff from the construction site shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep street wash water separate from entering storm drains until treatment can be provided. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets and culverts that could potentially be impacted by sediment-laden runoff on and near the project site. The following inlet protection measures will be applied on this project:

Drop Inlet Protection

- Block and Gravel Drop Inlet Protection
- Gravel and Wire Drop Inlet Protection
- Catch Basin Filter

If the BMP options listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D), or if no BMPs are listed above but deemed necessary during construction, the Certified Erosion and Sediment Control Lead shall implement one or more of the alternative BMP inlet protection options listed in Appendix C.

3.1.8 Element #8 – Stabilize Channels and Outlets

Where site runoff is to be conveyed in channels or discharged to a stream or some other natural drainage point, efforts will be taken to prevent downstream erosion. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

- Outlet Protection (BMP C209)

Alternate channel and outlet stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, all temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the expected peak 10-minute velocity of flow from a Type 1A, 10-year, 24-hour recurrence interval storm for the developed condition. Alternatively, the 10-year, 1-hour peak flow rate indicated by an approved continuous runoff simulation model, increased by a factor of 1.6, shall be used. Stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent streambanks, slopes, and downstream reaches shall be provided at the outlets of all conveyance systems.

3.1.9 Element #9 – Control Pollutants

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well organized, and free of debris. If required, BMPs to be implemented to control specific sources of pollutants are discussed below.

Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.
- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Chemical storage:

- Any chemicals stored in the construction areas will conform to the appropriate source control BMPs listed in Volume IV of the Ecology stormwater manual. In Western WA, all chemicals shall have cover, containment, and protection provided on site, per BMPC153 for Material Delivery, Storage and Containment in SWMMWW 2005
- Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application procedures and rates shall be followed.

Excavation and tunneling spoils dewatering waste:

- Dewatering BMPs and BMPs specific to the excavation and tunneling (including handling of contaminated soils) are discussed under Element 10.

Demolition:

- Dust released from demolished sidewalks, buildings, or structures will be controlled using Dust Control measures (BMP C140).
- Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection (BMP C220 as described above for Element 7).
- Process water and slurry resulting from sawcutting and surfacing operations will be prevented from entering the waters of the State by implementing Sawcutting and Surfacing Pollution Prevention measures (BMP C152).

Concrete and grout:

- Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures (BMP C151).

Sanitary wastewater:

- Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.
- Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system or to the sanitary sewer as part of Wheel Wash implementation (BMP C106).

Solid Waste:

- Solid waste will be stored in secure, clearly marked containers.

Other:

- Other BMPs will be administered as necessary to address any additional pollutant sources on site.

The facility does not require a Spill Prevention, Control, and Countermeasure (SPCC) Plan under the Federal regulations of the Clean Water Act (CWA).

3.1.10 Element #10 – Control Dewatering

3.1.13 Element #13 – Protect Low Impact Development BMPs

- Protect all bioretention and rain garden BMP's from sedimentation through installation and maintenance of erosion control BMP's on portions of the site that drain into them. Restore the BMP's to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden bioretention/ rain garden soils, and replacing the removed soils with soils meeting the design specification.
- Prevent compacting bioretention and rain garden BMP's by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction by construction equipment.
- Control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff into permeable pavements or base materials.
- Pavements fouled with sediments or no longer passing an initial infiltration test must be cleaned using procedures from Book 4 of the manufacturer's procedures.
- Keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils

3.2 Site Specific BMPs

Site specific BMPs are shown on the TESC Plan Sheets and Details in Appendix A. These site-specific plan sheets will be updated annually.

3.3 Additional Advanced BMPs

- The following BMPs are advanced and are only recommended if construction activities are complex enough to warrant them; or if the site has the potential for significant impacts to water quality. The following BMPs are directed at "end-of-pipe" treatment for sedimentation issues related to turbid runoff from construction sites. Effective BMPs are most often the simple BMPs and focus on the minimization of erosion before sedimentation is an issue. The following BMPs will most likely be implemented only after other BMP options are exhausted, or if the construction activity is large and off-site sedimentation or turbid runoff occurs or is inevitable.
- For BMP 250, written pre-approval, through Ecology is required (see SWMMWW 2005):
- BMP C250: Construction Stormwater Chemical Treatment
- BMP C251: Construction Stormwater Filtration.

4.0 Construction Phasing and BMP Implementation

The BMP implementation schedule will be driven by the construction schedule. The following provides a sequential list of the proposed construction schedule milestones and the corresponding BMP implementation schedule. The list contains key milestones such as wet season construction.

The BMP implementation schedule listed below is keyed to proposed phases of the construction project and reflects differences in BMP installations and inspections that relate to wet season construction. The project site is located west of the Cascade Mountain Crest. As such, the dry season is considered to be from May 1 to September 30 and the wet season is considered to be from October 1 to April 30.

- Estimate of Construction start date: 3/01/24
- Estimate of Construction finish date: 9/30/27
- Mobilize equipment on site: 3/01/24
- Mobilize and store all ESC and soil stabilization products: 3/01/24
- Install ESC measures: 3/01/24
- Install stabilized construction entrance: 3/01/24
- Begin clearing and grubbing: 3/01/24
- Demolish existing structures: 3/01/24
- Begin site grading 3/01/24
- Site grading ends 3/30/24
- Excavate and install new utilities and services: 4/01/24
- Excavation for building foundations 3/06/24
- Begin building construction: 3/06/24
- Complete utility construction 3/06/24
- Begin implementing soil stabilization and sediment control BMPs throughout the site in preparation for wet season: 3/06/24
- Wet Season starts: 10/01/24
- Site inspections and monitoring conducted weekly and for applicable rain events as detailed in Section 6 of this SWPPP: 3/01/24
- Implement Element #12 BMPs and manage site to minimize soil disturbance during the wet season: 3/01/24
- Complete road paving 5/30/24
- Building construction complete: 9/06/25
- Dry Season starts: 5/01/24

5.0 Pollution Prevention Team

5.1 Roles and Responsibilities

The pollution prevention team consists of personnel responsible for implementation of the SWPPP, including the following:

- Certified Erosion and Sediment Control Lead (CESCL) – primary contractor contact, responsible for site inspections (BMPs, visual monitoring, sampling, etc.); to be called upon in case of failure of any ESC measures.
- Resident Engineer – For projects with engineered structures only (sediment ponds/traps, sand filters, etc.): site representative for the owner that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's site supervisor or representative
- Emergency Ecology Contact – individual to be contacted at Ecology in case of emergency.
- Emergency Owner Contact – individual that is the site owner or representative of the site owner to be contacted in the case of an emergency.
- Non-Emergency Ecology Contact – individual that is the site owner or representative of the site owner than can be contacted if required.
- Monitoring Personnel – personnel responsible for conducting water quality monitoring; for most sites this person is also the Certified Erosion and Sediment Control Lead.

5.2 Team Members

Names and contact information for those identified as members of the pollution prevention team are provided in the following table.

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	Unknown	
Resident Engineer	Travis Johnson	(360)944-6519
Emergency Ecology Contact	Unknown	
Emergency Owner Contact	Unknown	
Non-Emergency Ecology Contact	Unknown	
Monitoring Personnel	Unknown	

6.0 Site Inspections and Monitoring

Monitoring includes visual inspection, monitoring for water quality parameters of concern, and documentation of the inspection and monitoring findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book. This SWPPP may function as the site log book if desired, or the forms may be separated and included in a separate site log book. However, if separated, the site log book but must be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

6.1 Site Inspection

All BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. The inspector will be a Certified Erosion and Sediment Control Lead (CESCL) per BMP C160. The name and contact information for the CESCL is provided in Section 5 of this SWPPP.

Site inspection will occur in all areas disturbed by construction activities and at all stormwater discharge points. Stormwater will be examined for the presence of suspended sediment, turbidity, discoloration, and oily sheen. The site inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair or replace any of the BMPs to improve the quality of stormwater discharges. All maintenance and repairs will be documented in the site log book or forms provided in this document. All new BMPs or design changes will be documented in the SWPPP as soon as possible.

6.1.1 Site Inspection Frequency

Site inspections will be conducted at least once a week and within 24 hours following any discharge from the site. For sites with temporary stabilization measures, the site inspection frequency can be reduced to once every month.

6.1.2 Site Inspection Documentation

The site inspector will record each site inspection using the site log inspection forms provided in Appendix E. The site inspection log forms may be separated from this SWPPP document, but will be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

6.2 Stormwater Quality Monitoring

The construction site will comply with the requirements set forth in the 2015 Construction Stormwater General Permit (revised 2017) seen in Appendix D. A Certified Erosion and Sediment Control Lead shall be on-site or on-call at all times.

The following text describes the monitoring for the proposed development.

6.2.1 Turbidity Sampling

The receiving water body, Lacamas Creek Watershed, is impaired for turbidity. Mandatory BMPs (Best Management Practices) and erosion control practices put in place by the permit will appropriately minimize the turbidity of the stormwater discharge. Monitoring requirements for the proposed project will include weekly turbidity sampling to monitor site discharges for water quality compliance as required by the NPDES Construction Stormwater General Permit, provided that site discharges occur. It should be noted that the site is designed such that all site runoff will be infiltrated so it is likely that discharges will be rare or may not occur at all. Sampling will be conducted at all discharge points at least once per calendar week.

Turbidity sampling during construction will be completed weekly in order to confirm that erosion control measures are meeting the water quality standards for turbidity (Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharge, but has not excluded these discharges, compliance with special Conditions S4 (monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL (S8.E.1.c)). Special Conditions S4 establishes that the key benchmark values that require action are 25 NTU for turbidity (equivalent to 32 cm transparency) and 250 NTU for turbidity (equivalent to 6 cm transparency). If the 25 NTU benchmark for turbidity (equivalent to 32 cm transparency) is exceeded, the following steps will be conducted:

1. Ensure all BMPs specified in this SWPPP are installed and functioning as intended.
2. Assess whether additional BMPs should be implemented, and document revisions to the SWPPP as necessary.
3. Sample discharge location daily until the analysis results are less than 25 NTU (turbidity) or greater than 32 cm (transparency).

If the turbidity is greater than 25 NTU (or transparency is less than 32 cm) but less than 250 NTU (transparency greater than 6 cm) for more than 3 days, additional treatment BMPs will be implemented within 24 hours of the third consecutive sample that exceeded the benchmark value. Additional treatment BMPs to be considered will include, but are not limited to, off-site treatment, infiltration, filtration and chemical treatment.

If the 250 NTU benchmark for turbidity (or less than 6 cm transparency) is exceeded at any time, the following steps will be conducted:

1. Notify Ecology by phone within 24 hours of analysis (see Section 5.0 of this SWPPP for contact information).
2. Continue daily sampling until the turbidity is less than 25 NTU (or transparency is greater than 32 cm).

3. Initiate additional treatment BMPs such as off-site treatment, infiltration, filtration and chemical treatment within 24 hours of the first 250 NTU exceedance.
4. Implement additional treatment BMPs as soon as possible, but within 7 days of the first 250 NTU exceedance.
5. Describe inspection results and remedial actions taken in the site log book and in monthly discharge monitoring reports as described in Section 7.0 of this SWPPP.

In the event that Turbidity results are greater than 25 NTUs, or the site is determined to be out of compliance with surface water quality standards for turbidity, the following BMPs should be established, re-established or implemented as determined necessary by the Certified Erosion and Sediment Control lead (CESCL) in order to bring the site back into compliance:

BMP C105: Stabilized Construction Entrance / Exit (repair construction entrance as necessary)

BMP C106: Wheel Wash (repair wheel wash as necessary)

BMP C120: Temporary and permanent Seeding

BMP C124: Sodding

BMP C140: Dust Control

BMP C209: Outlet Protection

BMP C220: Storm Drain Inlet Protection (add more inlet protection, as necessary

BMP C233: Silt Fence (add more silt fencing as necessary)

7.0 Reporting and Recordkeeping

7.1 Recordkeeping

7.1.1 Site Log Book

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book.

7.1.2 Records Retention

Records of all monitoring information (site log book, inspection reports/checklists, etc.), this Stormwater Pollution Prevention Plan, and any other documentation of compliance with permit requirements will be retained during the life of the construction project and for a minimum of three years following the termination of permit coverage in accordance with permit condition S5.C.

7.1.3 Access to Plans and Records

The SWPPP, General Permit, Notice of Authorization letter, and Site Log Book will be retained on site or within reasonable access to the site and will be made immediately available upon request to Ecology or the local jurisdiction. A copy of this SWPPP will be provided to Ecology within 14 days of receipt of a written request for the SWPPP from Ecology. Any other information requested by Ecology will be submitted within a reasonable time. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with permit condition S5.G.

7.1.4 Updating the SWPPP

In accordance with Conditions S3, S4.B, and S9.B.3 of the General Permit, this SWPPP will be modified if the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site or there has been a change in design, construction, operation, or maintenance at the site that has a significant effect on the discharge, or potential for discharge, of pollutants to the waters of the State. The SWPPP will be modified within seven days of determination based on inspection(s) that additional or modified BMPs are necessary to correct problems identified, and an updated timeline for BMP implementation will be prepared.

7.2 Reporting

7.2.1 Discharge Monitoring Reports

Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period, the Permittee shall submit the form as required, with the words "No discharge" entered in the place of monitoring results. The DMR due date is 15 days following the end of each month.

Water quality sampling results will be submitted to Ecology monthly on Discharge Monitoring Report (DMR) forms in accordance with permit condition S5.B. If there was no discharge during a given monitoring period, the form will be submitted with the words "no discharge" entered in place of the monitoring results. If a benchmark was exceeded, a brief summary of inspection results and remedial actions taken will be included. If sampling could not be performed during a monitoring period, a DMR will be submitted with an explanation of why sampling could not be performed.

7.2.2 Notification of Noncompliance

If any of the terms and conditions of the permit are not met, and it causes a threat to human health or the environment, the following steps will be taken in accordance with permit section S5.F:

1. Ecology will be immediately notified of the failure to comply.
2. Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Any time turbidity sampling indicates turbidity is 250 nephelometric turbidity units (NTU) or greater or water transparency is 6 centimeters or less, the Ecology regional office will be notified by phone within 24 hours of analysis as required by permit condition S5.A (see Section 5.0 of this SWPPP for contact information).

In accordance with permit condition S2.A, a complete application form will be submitted to Ecology and the appropriate local jurisdiction (if applicable) to be covered by the General Permit.

Appendix A – Site Plans

See Plans.

Appendix B – Construction BMPs

Stabilized Construction Entrance (BMP C105)

Silt Fence (BMP C233)

Storm Drain Inlet Protection (BMP C220)

Infiltration Trench (BMP T7.20)

Temporary and Permanent Seeding (BMP C120)

Mulching (BMP C121)

Nets and Blankets (BMP C122)

Plastic Covering (BMP C123)

Topsoiling (BMP C125)

Dust Control (BMP C140)

Early application of gravel base on areas to be paved

Outlet Protection (BMP C209)

Appendix C – Alternative BMPs

The following includes a list of possible alternative BMPs for each of the 12 elements not described in the main SWPPP text. This list can be referenced in the event a BMP for a specific element is not functioning as designed and an alternative BMP needs to be implemented.

Element #1 - Mark Clearing Limits
High Visibility Plastic or Metal Fence (BMP C103)
Stake and Wire Fence (BMP C104)
Element #2 - Establish Construction Access
Wheel Wash (BMP C106)
Water Bars (BMP C203)
Element #3 - Control Flow Rates
Wattles (BMP C235)

Element #4 - Install Sediment Controls
Straw Bale Barrier (BMP C230)
Gravel Filter Berm (BMP C232)
Straw Wattles (BMP C235)
Portable Water Storage Tanks (Baker Tanks)
Construction Stormwater Chemical Treatment (BMP C250)
Construction Stormwater Filtration (BMP C251)

Element #5 - Stabilize Soils
Polyacrylamide (BMP C126)

Element #6 - Protect Slopes
Straw Wattles (BMP C235)
Surface Roughening (BMP C240)

Element #8 - Stabilize Channels and Outlets
Level Spreader (BMP C206)
Check Dams (BMP C207)

Element #9 – Control Pollutants
Concrete Handling (BMP C151)
Construction Stormwater Chemical Treatment (BMP C250)
Construction Stormwater Filtration (BMP C251)

Element #10 - Control Dewatering
Vegetated Filtration (BMP C236)
Additional Advanced BMPs to Control Dewatering:

Appendix D – General Permit

Appendix E – Site Inspection Forms (and Site Log)

The results of each inspection shall be summarized in an inspection report or checklist that is entered into or attached to the site log book. It is suggested that the inspection report or checklist be included in this appendix to keep monitoring and inspection information in one document, but this is optional. However, it is mandatory that this SWPPP and the site inspection forms be kept onsite at all times during construction, and that inspections be performed and documented as outlined below.

At a minimum, each inspection report or checklist shall include:

a. Inspection date/times

b. Weather information: general conditions during inspection, approximate amount of precipitation since the last inspection, and approximate amount of precipitation within the last 24 hours.

c. A summary or list of all BMPs that have been implemented, including observations of all erosion/sediment control structures or practices.

d. The following shall be noted:

   i. locations of BMPs inspected,

   ii. locations of BMPs that need maintenance,

   iii. the reason maintenance is needed,

   iv. locations of BMPs that failed to operate as designed or intended, and

   v. locations where additional or different BMPs are needed, and the reason(s) why

e. A description of stormwater discharged from the site. The presence of suspended sediment, turbid water, discoloration, and/or oil sheen shall be noted, as applicable.

f. A description of any water quality monitoring performed during inspection, and the results of that monitoring.

g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.

h. A statement that, in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the SWPPP and the NPDES permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation.

i. Name, title, and signature of person conducting the site inspection; and the following statement: "I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief".

When the site inspection indicates that the site is not in compliance with any terms and conditions of the NPDES permit, the Permittee shall take immediate action(s) to: stop, contain, and clean up the unauthorized discharges, or otherwise stop the noncompliance; correct the problem(s); implement appropriate Best Management Practices (BMPs), and/or conduct maintenance of existing BMPs; and achieve compliance with all applicable standards and permit conditions. In addition, if the noncompliance causes a threat to human health or the environment, the Permittee shall comply with the Noncompliance Notification requirements in Special Condition S5.F of the permit.

Site Inspection Form

General Information			
Project Name:			
Inspector Name:		**Title:** **CESCL # :**	
Date:		**Time:**	
Inspection Type:	☐ After a rain event ☐ Weekly ☐ Turbidity/transparency benchmark exceedance ☐ Other		
Weather			
Precipitation	Since last inspection	In last 24 hours	
Description of General Site Conditions:			

Inspection of BMPs							
Element 1: Mark Clearing Limits							
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
		Y	N	Y	N	NIP	
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
		Y	N	Y	N	NIP	
Element 2: Establish Construction Access							
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
		Y	N	Y	N	NIP	
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
		Y	N	Y	N	NIP	

Element 3: Control Flow Rates

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 4: Install Sediment Controls

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 5: Stabilize Soils

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 6: Protect Slopes

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 7: Protect Drain Inlets

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 8: Stabilize Channels and Outlets

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 9: Control Pollutants							
BMP:							
Location	Inspected		Functioning				Problem/Corrective Action
	Y	N		Y	N	NIP	
BMP:							
Location	Inspected		Functioning				Problem/Corrective Action
	Y	N		Y	N	NIP	
Element 10: Control Dewatering							
BMP:							
Location	Inspected		Functioning				Problem/Corrective Action
	Y	N		Y	N	NIP	
BMP:							
Location	Inspected		Functioning				Problem/Corrective Action
	Y	N		Y	N	NIP	
BMP:							
Location	Inspected		Functioning				Problem/Corrective Action
	Y	N		Y	N	NIP	

Stormwater Discharges From the Site		
	Observed?	Problem/Corrective Action

	Y	N
Location		
Turbidity		
Discoloration		
Sheen		
Location		
Turbidity		
Discoloration		
Sheen		

Water Quality Monitoring		
Was any water quality monitoring conducted?	☐ Yes	☐ No
If water quality monitoring was conducted, record results here:		
If water quality monitoring indicated turbidity 250 NTU or greater; or transparency 6 cm or less, was Ecology notified by phone within 24 hrs?	☐ Yes	☐ No
If Ecology was notified, indicate the date, time, contact name and phone number below:		
Date:		
Time:		
Contact Name:		
Phone #:		
General Comments and Notes		
Include BMP repairs, maintenance, or installations made as a result of the inspection.		
Were Photos Taken?	☐ Yes	☐ No
If photos taken, describe photos below:		

APPENDIX F

Environmental Documentation

CRITICAL AREAS REPORT

October 2, 2023

13th Street Gas Station
Camas, WA

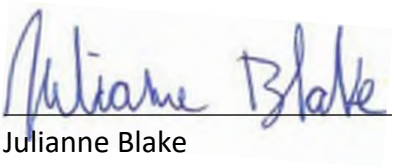
Prepared for

PAK USA Camas, LLC
c/o Taz Khan
3993 NW Currawong Court
Camas, WA 98607
(512) 779-4999

Prepared by
Ecological Land Services
1157 3rd Avenue, Suite 220A • Longview, WA 98632
(360) 578-1371 • Project Number 3934.01

SIGNATURE PAGE

The information in this report was compiled and prepared under the supervision and direction of the undersigned.



Julianne Blake
Biologist III

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Appendix A – Routine Determination Method and Plant Indicator Rating Definitions
Appendix B – Wetland Determination Data Form
Appendix C – Precipitation Information

INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by PAK USA Camas, LLC to complete a critical areas assessment for wetlands and fish and wildlife habitat conservation areas, for the purpose of future development. The site is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). Field work was conducted on August 29, 2023. This report summarizes the findings of the site visit in accordance with *Camas Municipal Code (CMC) Title 16 Environment* (2023).

SITE DESCRIPTION

The 0.97-acre site consists of Clark County Tax Parcel 176148000 and is accessed by a paved driveway off NE 13th Street. The site is zoned as Business Park (BP) and currently contains a single-family mobile home, shed, carport, and paved driveway. The site is bordered to the north by NE 13th Street, to the east by NW Friberg-Strunk Street, to the south by undeveloped land and commercial development in progress, and to the west by undeveloped land and a single-family residence (Figure 2).

Vegetation onsite consists primarily of regularly mowed grasses, ornamental shrubs, and coniferous and deciduous trees. Topography onsite is generally flat with NE 13th Street and NW Friberg-Strunk Street roughly two feet higher in elevation than the site. One Oregon white oak (*Quercus garryana,* FACU) was identified onsite along the southern property boundary.

METHODOLOGY

The property was evaluated for the presence of wetlands using the Routine Determination Method according to the U.S. Army Corps of Engineers' 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual* (Environmental Laboratory 1987)*; Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010). The Routine Determination Method and defining wetland criteria are discussed further in Appendix A. Wetlands are regulated as "Waters of the United States" by the U.S. Army Corps of Engineers (Corps) and as "Waters of the State" by the Washington Department of Ecology (Ecology), and locally by The City of Camas (City).

ELS biologists evaluated the property on August 29, 2023, to determine the presence or absence of critical areas including streams, wetlands, and priority habitats. One Oregon white oak (oak) was identified onsite, and no wetlands, streams, or other priority habitats were identified. Vegetation, soil, and hydrology data were collected from one test plot (TP) to determine whether wetlands were present onsite. No wetlands were present onsite. TP-1 was taken in the southwest corner of the site in an area with mapped hydric soils. The oak dripline and test plot location were mapped using a hand-held Global Positioning System (GPS) unit capable of sub-meter accuracy under ideal conditions.

VEGETATION

General vegetation consists primarily of regularly mowed grass and ornamental trees and shrubs (Photoplates 1 and 2). One Oregon white oak was observed along the southern site boundary. The plant indicator status following the plant scientific name is defined by the *National Wetland Plant List Indicator Rating Definitions* (Corps 2012) and can be found in Appendix A.

Dominant vegetation consisted of domestic apple trees (*Malus* spp., assumed FAC), Japanese maple (*Acer palmatum*, UPL), rhododendron (*Rhododendron* spp., assumed FACU), Oregon white oak, osoberry (*Oemleria cerasiformis*, FACU), mowed English hawthorn saplings (*Crataegus monogyna*, FAC), swordfern (*Polystichum munitum*, FACU), and fescue grass (*Festuca* spp., assumed FAC). The wetland determination data form contains vegetation information at TP-1 and is in Appendix B.

SOILS

The Natural Resources Conservation Service (NRCS) designates soils onsite as cove silty clay loam, thin solum, 0 to 3 percent slopes (CwA), and Wind River gravelly loam, 0 to 8 percent slopes (WrB) (Figure 3, NRCS 2023B). Of the two soil types found onsite, cove silty clay loam, thin solum, 0 to 3 percent slopes is designated as hydric.

According to soil profile descriptions developed by NRCS, cove silty clay loam, thin solum, is characterized as a poorly drained soil, forming on floodplains, with a depth to water table of 0 to 12 inches below ground surface (BGS). A typical soil profile includes silty clay loam from 0 to 14 inches, clay from 14-21 inches, and silt loam from 21 to 60 inches BGS. Wind River gravelly loam is categorized as a somewhat excessively drained soil with a typical soil profile of gravelly loam from 0 to 4 inches, coarse sandy loam from 4 to 24 inches, and loamy coarse sand from 24 to 60 inches BGS. Wind River gravelly loam forms on floodplains from alluvium parent material and has an average depth to water table of more than 80 inches.

Evaluated soils were characterized as loamy with a value of 4, and a chroma of 3, with no observations of redoximorphic concentrations and meeting no hydric soil indicators. Mapped hydric soils do not necessarily mean that an area is or is not a wetland—hydrology, hydrophytic wetland vegetation, and hydric soils must all be present to classify an area as a wetland. The test plot data form is in Appendix B.

HYDROLOGY

No evidence of wetland hydrology was observed at TP-1 or onsite.

PRECIPITATION

Precipitation data was gathered from the NOAA Regional Climate Centers *Clark County, Washington, WETS Station: Battle Ground*, which is located closest to the site. No rainfall occurred the day of the site visit or in the two weeks prior. Rainfall in June, July, and August was below exceedance levels and approximately 94 percent of August rainfall occurred prior to the site visit. Furthermore, review of the USACE Antecedent Precipitation Tool (APT) indicates rainfall

in the two months preceding the August 29th site visit was drier than normal with a score of 6. A copy of the APT data is provided in Appendix C. Table 1 summarizes the precipitation data.

Table 1. Precipitation Summary

Precipitation (inches)								
Date of Visit	Two Weeks Prior	3 Months Prior		30%	70%	DAREM[1]		
		30 Days Ending	Observed			Value	Weight	Total
8/29/23	8/15/23 – 8/28/23	8/29/23	0.05	0.25	0.99	1	3	3
0.0	0.0	7/30/23	0.0	0.24	0.82	1	2	2
		6/30/23	0.83	1.48	2.80	1	1	1
Rainfall 3 months prior was: **drier than normal** (sum 6-9), normal (sum 10-14), wetter than normal (sum 15-18).[1]								6
Year to Date Average Rainfall[2,3]: 50.06								
Year to Date Actual Rainfall[3]: 45.32								

[1] Direct Antecedent Rainfall Evaluation Methods (Sumner et al 2009)
[2] Includes 94% of August Rainfall
[3] Based on a water year, October 2022 – August 2023

Critical Area Inventories

National Wetlands Inventory

The National Wetlands Inventory (NWI) map does not indicate any wetlands onsite (Figure 4, USFWS 1988). ELS agrees with the NWI mapping, as no wetlands were identified onsite.

Clark County Critical Area Inventory

The Clark County Critical Area Inventory (CCCAI) map does not indicate any wetlands onsite but does indicate potential wetlands presence on the property to the south. Hydric soils are mapped along the eastern site boundary and the southwestern corner, and a habitat area is mapped over the majority of the eastern portion of the site (Figure 5). ELS partially agrees with the CCAI as no wetlands were identified onsite and one oak was observed in the vicinity of the mapped habitat area. The potential wetlands mapped to the south of the site are located in the footprint of a commercial development that has received permit approval. However, ELS does not agree with the extent of the mapped habitat area as only one oak was identified onsite and no other critical habitats were identified.

Washington Department of Natural Resources Stream Type

The Washington Department of Natural Resources (WDNR) Stream Type Map does not depict any streams onsite (Figure 6, WDNR 2023). ELS agrees with the WDNR mapping as no streams were observed onsite.

Priority Habitats and Species

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) maps indicate oak woodland and caves or cave-rich areas on the southern boundary of the site

and within 300 feet of the site to the southwest (Figure 7, WDFW 2023). ELS confirmed the presence of a single oak along the southern site boundary, but no oak woodlands or caves were observed onsite.

Critical area inventory maps are typically used to gather general information about a region and due to the large scale necessary for regional mapping, are limited in accuracy for localized analyses.

Critical Areas Summary

Priority Habitats

Oregon White Oak

Oregon white oaks are considered a priority habitat and are regulated by the Washington Department of Fish and Wildlife (WDFW) and locally by the City of Camas. According to WDFW's Management Recommendations for Washington's priority habitats: Oregon white oak woodlands (Larsen and Morgan, 1998), in urban or urbanizing areas west of the Cascades, priority oak habitat is defined as single oaks, stands of pure oak, or oak/conifer associations, one acre or greater in size. WDFW may also consider individual Oregon white oak trees a priority habitat when found to be particularly valuable to wildlife [i.e., contains many cavities, has a large diameter at breast height (DBH), is used by priority species, or has a large canopy]. The site is within the City of Camas. WDFW recommendation is that in urban and urbanizing areas, single trees should be maintained if they are deemed important to species highly associated with Oregon white oak. Oaks and their associated floras comprise distinct woodland ecosystems with various plant communities providing valuable habitat that contributes to wildlife diversity; oak woodlands provide a mix of feeding, resting, and breeding habitat for many wildlife species (Larsen and Morgan 1998).

The WDFW Priority Habitats and Species online mapping tool depicts oak woodlands within the vicinity of the observed oak along the southern site boundary. One oak tree measuring approximately 52 inches DBH was mapped along the southern site boundary during site reconnaissance (Figure 2). The oak has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. The oak location was mapped using a GPS system capable of submeter accuracy in ideal conditions. According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

Table 2: Oak Summary

Canopy Area	Diameter at Breast Height	Number of Trunks	Noteworthy Habitat Features
0.08 acres	52 inches	1	• Canopy is interconnected with adjacent trees, but not other oaks • Two large cavities

LIMITATIONS

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

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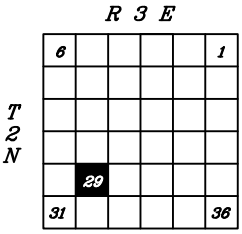
FIGURES AND PHOTOPLATES

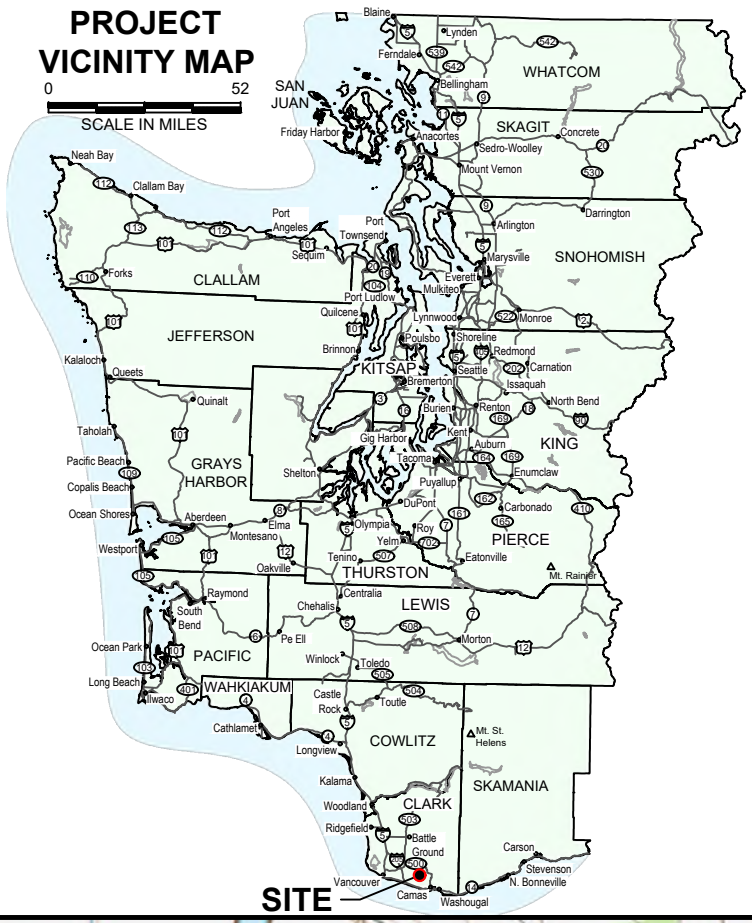
WASHINGTON

45.6321° Latitude
-122.4664° Longitude

LOCATION MAP



PROJECT VICINITY MAP



NOTE:
Quadrangle topographic map from USGS.

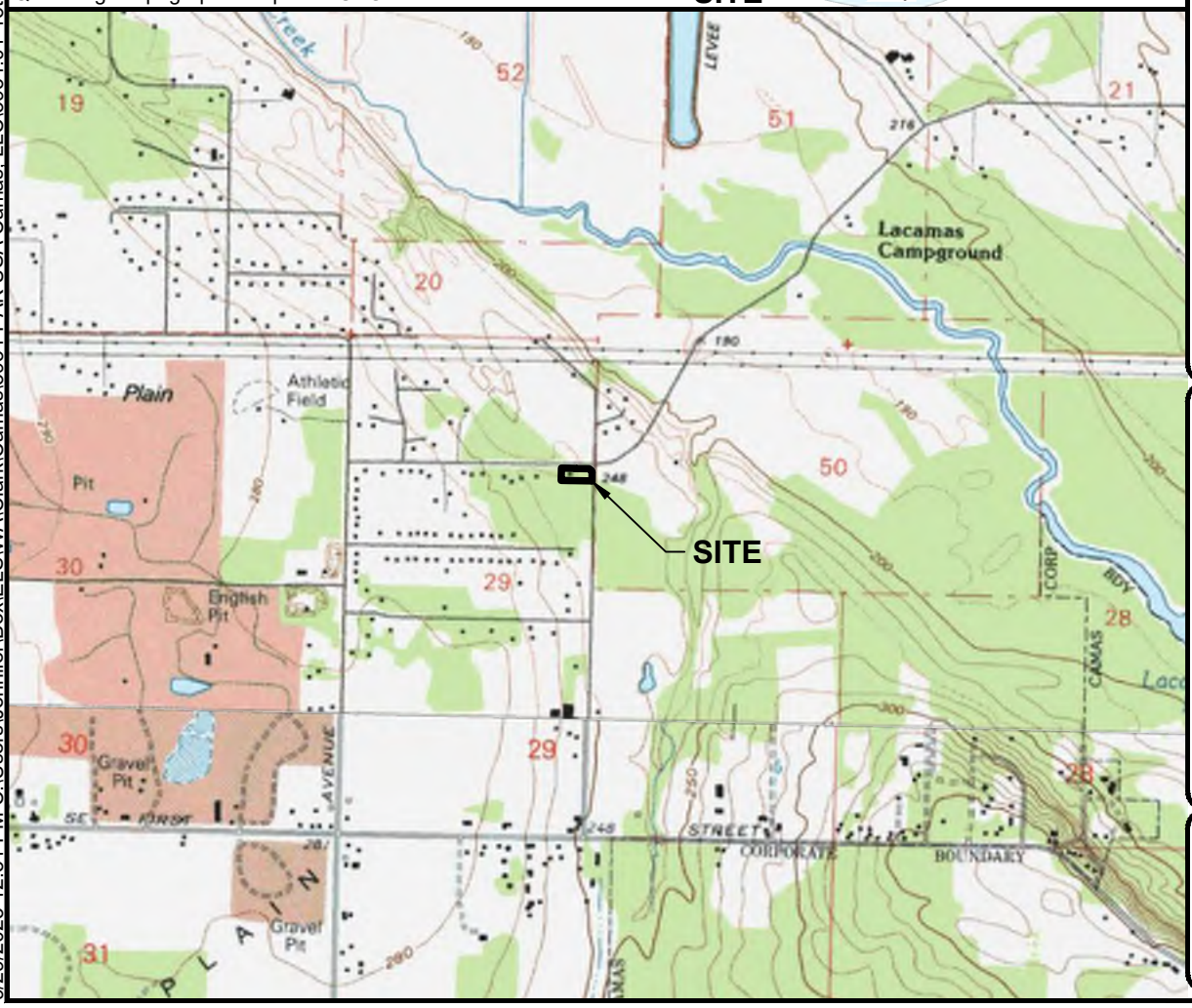


Figure 1
VICINITY MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com
Ecological Land Services

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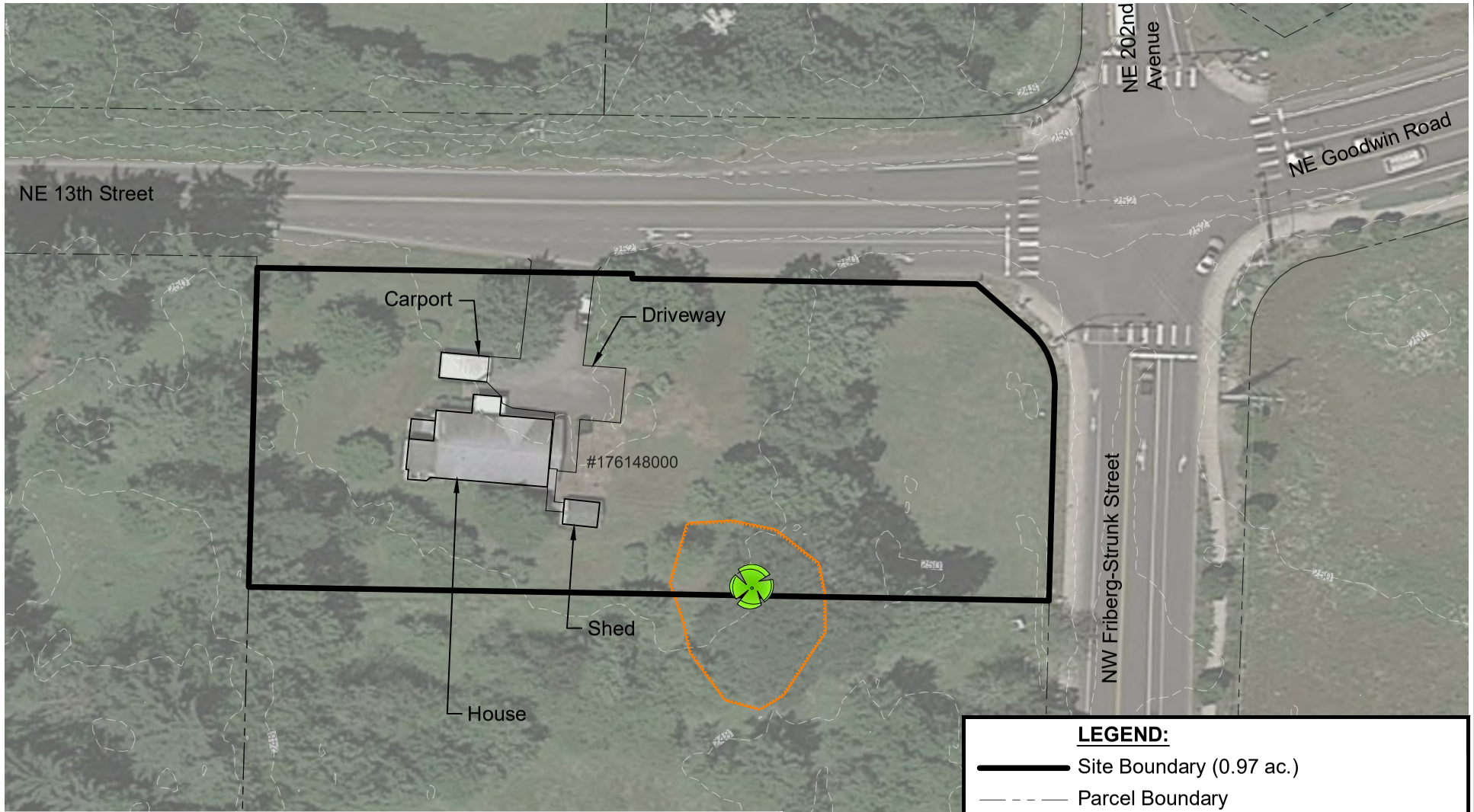

NOTE(S):

1. Aerial from Google Earth™ (6/17/2021).
2. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
3. Parcel data from Clark County GIS Department.
4. Topography from 2013 Clark County Lidar provided by WDNR at https://lidarportal.dnr.wa.gov.

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www.eco-land.com

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 2
EXISTING CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

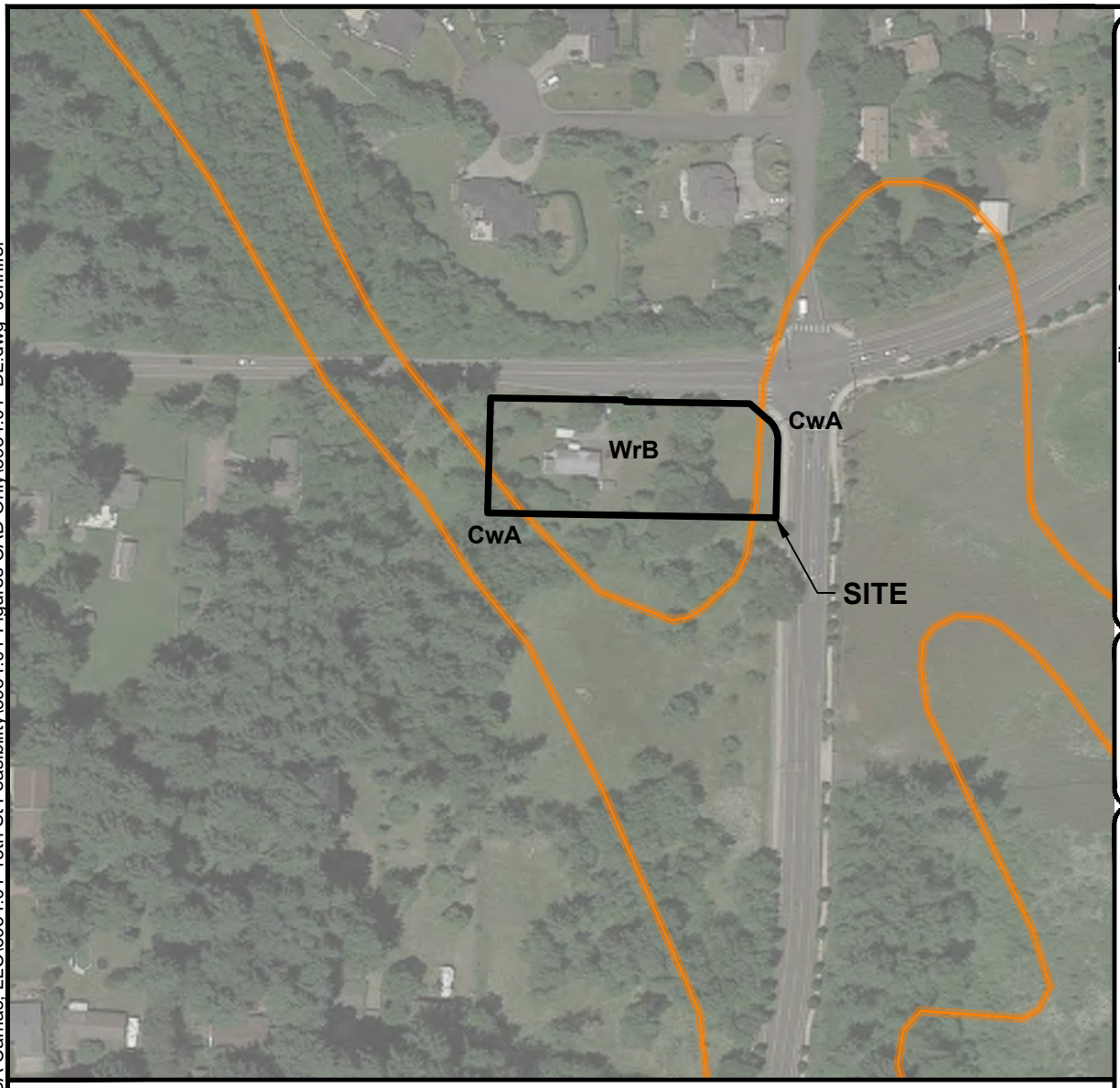

Figure 3
NRCS SOIL SURVEY
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
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0 200 400
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N W E S

LEGEND:

Site Boundary
NRCS Soil Boundary
CwA Cove silty clay loam, thin solum, 0 to 3 percent slopes. **Hydric.**
WrB Wind River gravelly loam, 0 to 8 percent slopes. Not hydric.

NOTE(S):
1. Map provided on-line by NRCS at web address: *http://websoilsurvey.nrcs.usda.gov/app/*

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No mapped wetlands indicated onsite by US Fish & Wildlife Service.

LEGEND:

Site Boundary

Wetlands

Riverine

NOTE(S):

1. Map provided on-line by US Fish & Wildlife Service at web address: *https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper*

Figure 4
USFWS NATIONAL WETLANDS INVENTORY
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

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SCALE IN FEET

N W E S

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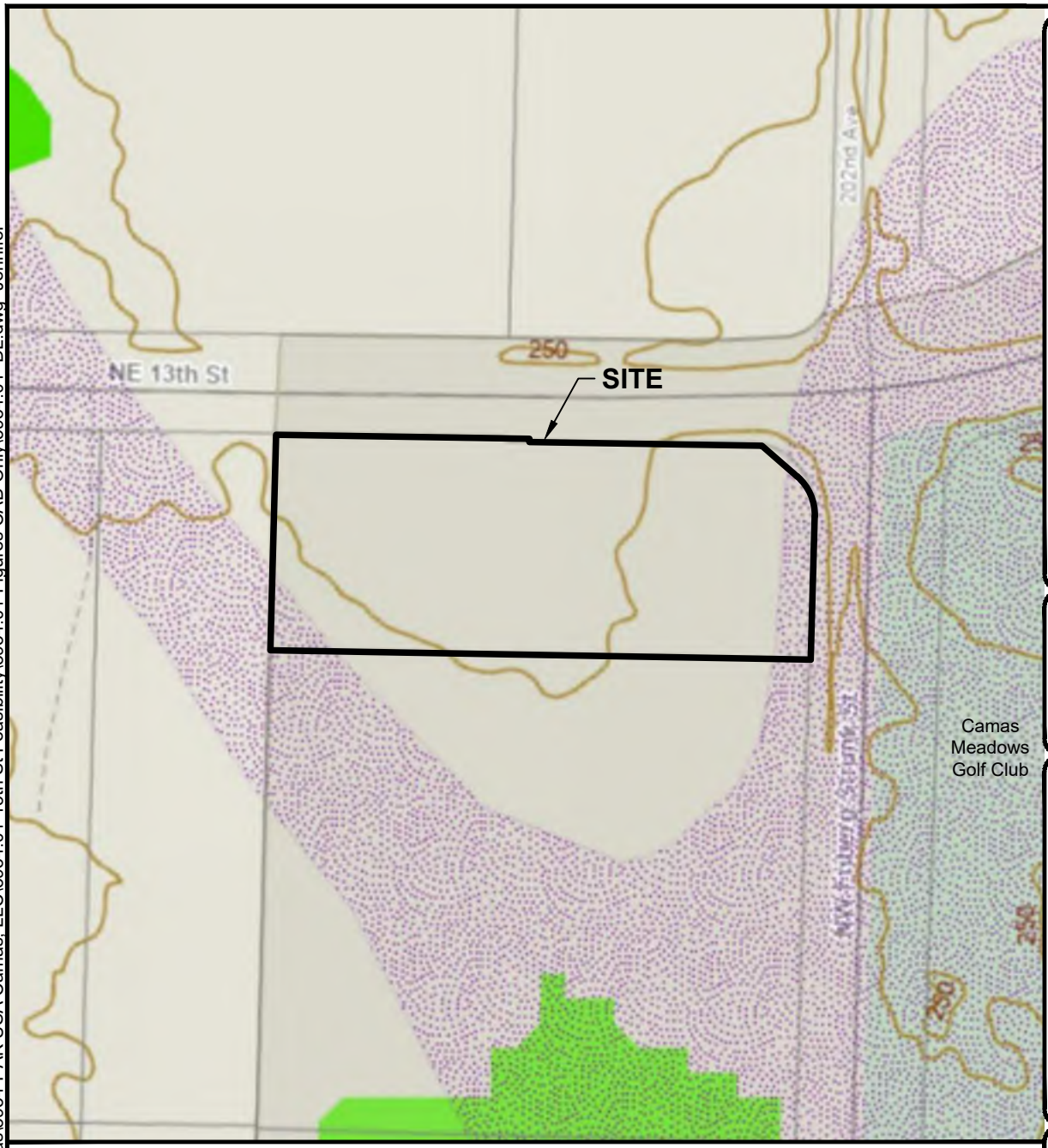

Figure 5
CLARK COUNTY CRITICAL AREAS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
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SCALE IN FEET

N W E S

LEGEND:

Site Boundary

Slopes and Geologic Hazards Group
Contour Lines
Contour Lines - 10 ft

Soils and Wetlands Inventory
Hydric Soils
Potential Wetlands Presence
Permitted Wetland

NOTE(S):
1. Map provided on-line by Clark County at web address: *https://gis.clark.wa.gov/mapsonline/index.cfm?site=Environmental*

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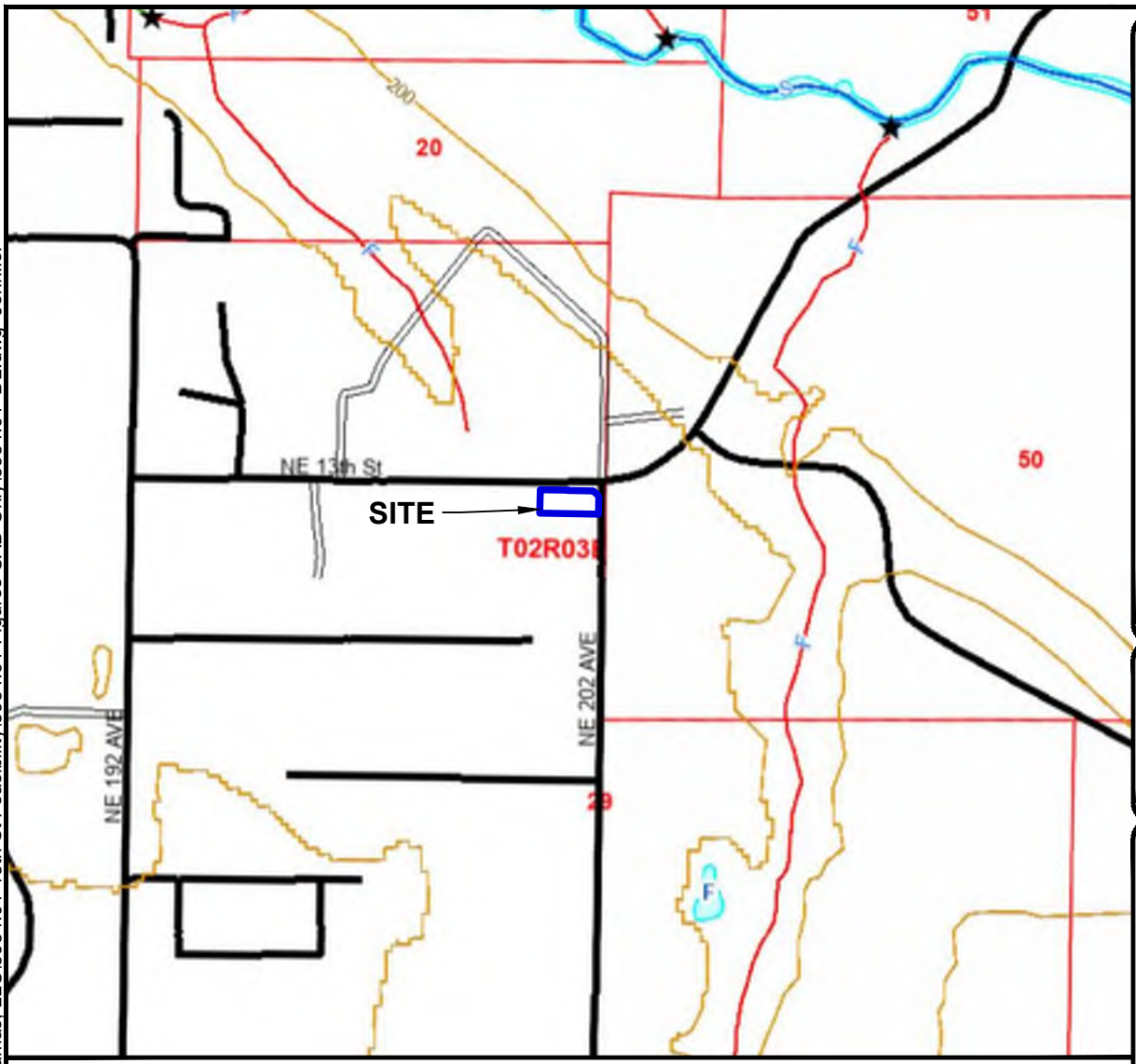

No mapped streams indicated onsite by the Washington State Department of Natural Resources (DNR).

LEGEND:

Site Boundary

40-foot Contours
- 40 ft. Contours

Water Courses (FP)
- Type S
- Type F
- Type N, Np, Ns
- U, unknown
- X, non-typed per WAC 222-16

WRIA Boundaries
- WRIA Boundaries

DNR Roads
- Paved Road
- Unpaved Road/Surface Unknown

Unpaved Road/Surface Unknown
- Water Type Breaks (FP)

NOTE: Map provided on-line by Washington State Department of Natural Resources at web address: *http://fortress.wa.gov/dnr/app1/Fpars/viewer.htm*

Figure 6
WDNR STREAM TYPE MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com
Ecological Land Services

0 1000 2000
SCALE IN FEET

N W E S

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Figure 7
WDFW PRIORITY HABITAT AND SPECIES
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
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www.eco-land.com

0 200 400
SCALE IN FEET

N W E S

LEGEND:

- Site Boundary
- Parcel Boundary
- Oak Woodland - Habitat Feature

By Township
Caves or Cave-rich Areas

NOTE: Map provided on-line by Washington State Department of Fish & Wildlife at web address: *http://apps.wdfw.wa.gov/phsontheweb/*

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Photo 1 was taken facing east and shows general conditions onsite.

Photo 2 was taken facing west and shows general conditions onsite. The oak is visible on the left.

Photo 3 shows the onsite Oregon white oak.

Ecological
nd Services

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305

DATE: 08.29.2023
DWN: JB
PRJ. MGR: JB
PROJ.#: 3934.01

Photoplate 1
13th Street Gas Station
Camas, WA
Section 29, Township 2N, Range 3E, W.M.

Photo 4 was taken facing north at TP-1 and shows general conditions onsite.

Photo 5 was taken facing west.

Photo 6 was taken facing west at TP-1.

Photo 7 was taken facing east at TP-1 and shows general conditions onsite.

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nd Services

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Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305

DATE: 08.29.2023
DWN: JB
PRJ. MGR: JB
PROJ.#: 3934.01

Photoplate 2
13th Street Gas Station
Camas, WA
Section 29, Township 2N, Range 3E, W.M.

APPENDIX A

ROUTINE DETERMINATION METHOD AND PLANT INDICATOR RATING DEFINITIONS

Routine Determination Method

The Routine Determination Method is defined according to the U.S. Army Corps of Engineers' 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual* (Environmental Laboratory 1987)*; Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010). The Routine Determination Method examines three parameters – vegetation, soils, and hydrology – to determine if wetlands exist in a given area. Hydrology is critical in determining what is a wetland, but if often difficult to assess because hydrologic conditions can change periodically (hourly, daily, or seasonally). Consequently, it is necessary to determine if hydrophytic vegetation and hydric soils are present, which would indicate that water is present for a long enough duration to support a wetland plant community. By definition, wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Vegetation Indicator Status

The indicator status, following the scientific names of plant species, indicates the likelihood of the species to be found in wetlands according to the *National Wetland Plant List Indicator Rating Definitions* (Corps 2012). Listed from most likely to least likely to be found in wetlands, the indicator status categories are:

- **OBL** (obligate wetland) - occur almost always under natural conditions in wetlands.
- **FACW** (facultative wetland) - usually occur in wetlands, but occasionally found in non-wetlands.
- **FAC** (facultative) - equally likely to occur in wetlands or non-wetlands.
- **FACU** (facultative upland) - usually occur in non-wetlands, but occasionally found in wetlands.
- **UPL** (obligate upland) - occur almost always under natural conditions in non-wetlands.
- **NI** (no indicator) - insufficient data to assign to an indicator category.

APPENDIX B

WETLAND DETERMINATION DATA FORM

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 13th Street Gas Station City/County: Camas/Clark Sampling Date: 08/29/2023
Applicant/Owner: PAK USA Camas, LLC State: WA Sampling Point: TP-1
Investigator(s): J. Blake Section, Township, Range: S29, T2N, R3E
Landform (hillslope, terrace, etc.): Floodplains Local relief: (concave, convex, none): Convex Slope (%): 0-3%
Subregion (LRR): LRRA MLRA2 Lat: 45.6318544 Long: -122.4669931 Datum: NAD83
Soil Map Unit Name: Cove silty clay loam, thin solum, 0 to 3 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes☐ No☒ (If no, explain Remarks.)
Are Vegetation☐, Soil☐, or Hydrology☐ significantly disturbed? Are "Normal Circumstances" present? Yes☒ No☐
Are Vegetation☐, Soil☐, or Hydrology☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** **Yes☐ No☒**
Hydric Soils Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks: TP-1 is located in the southwest corner of the site in an area with mapped hydric soils. TP-1 does not meet all three wetland indicators and is therefore in uplands. Hydrologic conditions were not typical for this time of year, as antecedent rainfall was determined to be drier than normal for the two months prior to the site visit.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Malus* spp.*	20%	yes	FAC
2. *Fraxinus latifolia*	20%	yes	FACW
3. *Robinia pseudoacacia*	20%	yes	FACU
4. *Crataegus monogyna*	15%	yes	FAC
50% = 38 20% = 15	75%	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
50% = ___ 20% = ___	%	=Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *Festuca* spp*	93%	yes	FAC
2. *Iris* spp.*	5%	no	FACW
3. *Rubus ursinus*	2%	no	FACU
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
50% = 50 20% = 20	100%	=Total Cover	
Woody Vine Stratum (Plot size: 15 ft radius)			
1. *Rubus armeniacus*	5%	yes	FAC
2.	%		
50% = 3 20% = 1	5%	=Total Cover	

% Bare Ground in Herb Stratum 0%

Dominance Test Worksheet

Number of Dominant Species That Are OBL, FACW, or FAC:	5	(A)
Total Number of Dominant Species Across All Strata:	6	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	83	(A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x 1=	
FACW species		x 2=	
FAC species		x 3=	
FACU species		x 4=	
UPL species		x 5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A=_____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 – Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes☒ No☐**

Remarks: *Festuca* spp.* and *Malus* spp.* indicator statuses assumed FAC. *Iris* spp.* indicator status assumed FACW.

SOIL

Sampling Point: TP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/3	100%		%			Loam	
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosal (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Minerals (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and Wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: Hardpan
Depth (inches): 6

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (min. of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (Inches): _____
Water Table Present?	Yes ☐	No ☒	Depth (Inches): _____
Saturation Present? (Includes Capillary fringe)	Yes ☐	No ☒	Depth (Inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

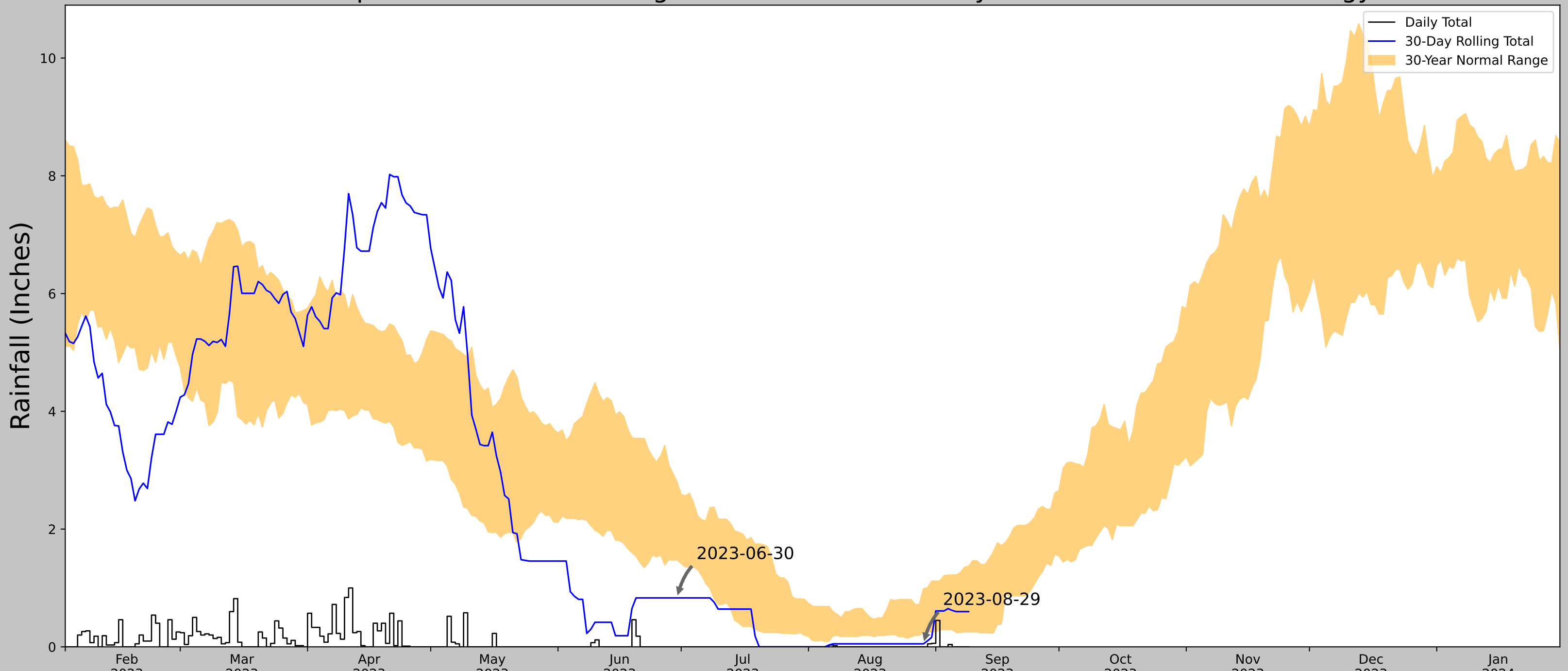
Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrologic conditions were not typical for this time of year, as antecedent rainfall was determined to be drier than normal for the two months prior to the site visit.

APPENDIX C

PRECIPITATION INFORMATION

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	45.632018, -122.467297
Observation Date	2023-08-29
Elevation (ft)	253.44
Drought Index (PDSI)	Severe drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-29	0.253543	0.986221	0.051181	Dry	1	3	3
2023-07-30	0.24252	0.814961	0.0	Dry	1	2	2
2023-06-30	1.475197	2.795276	0.830709	Dry	1	1	1
Result							Drier than Normal - 6

US Army Corps of Engineers.

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
BATTLE GROUND	45.7717, -122.5286	284.121	10.094	30.681	4.852	11318	69
BATTLE GROUND 0.8 N	45.794, -122.5443	316.929	1.716	32.808	0.828	0	1
BATTLE GROUND 1.2 NE	45.7958, -122.5275	361.877	1.666	77.756	0.879	0	20
VANCOUVER 4 NNE	45.6775, -122.6514	220.144	8.8	63.977	4.523	4	0
MERWIN DAM	45.955, -122.5625	224.081	12.769	60.04	6.513	31	0

OAK BANK USE PLAN

October 2, 2023

13th Street Gas Station
Camas, WA

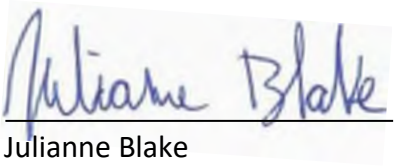
Prepared for

PAK USA Camas, LLC
c/o Taz Khan
3993 NW Currawong Court
Camas, WA 98607
(512) 779-4999

Prepared by
Ecological Land Services
1157 3rd Avenue, Suite 220A • Longview, WA 98632
(360) 578-1371 • Project Number 3934.01

SIGNATURE PAGE

The information in this report was compiled and prepared under the supervision and direction of the undersigned.



Julianne Blake
Biologist III

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INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by PAK USA Camas, LLC to prepare this Oak Bank Use Plan to address Oregon white oak (oak) impacts resulting from the construction of a fuel station, convenience store, and associated parking lot. The site is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). Field work was conducted on August 29, 2023. The project will remove one existing oak (*Quercus garryana*) and impact 0.08 acres (3,456 square feet) of oak canopy. Canopy impacts will be offset by purchasing 0.238 credits from Terrace Oak Bank (Bank). This Bank Use Plan was prepared according to the *Camas Municipal Code (CMC) Title 16 Environment* (2023) and Washington Department of Fish and Wildlife's (WDFW) *Management recommendations for Washington's priority habitats: Oregon white oak woodlands (1998)*.

RESPONSIBLE PARTIES

PROPERTY OWNER/APPLICANT
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Project Description

The project area is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). The project consists of constructing a fuel station, convenience store, and associated parking lot. The parking lot will contain electric vehicle charging stations and vacuum pumps as well as pedestrian crossing areas (Figure 3). The existing oak will be removed as part of the project, removing 0.08 acres (3,546 square feet) of oak canopy. Canopy impacts will be mitigated by purchasing 0.238 credits from Terrace Oak Bank. Construction is anticipated to start upon receipt of all necessary permits.

Best management practices (BMPs) that will be completed prior to construction include designating staging and stockpile areas outside of critical areas and associated buffers, establishing a standard construction entrance, and installing silt fencing to prevent sedimentation. When site preparation is complete, construction will occur. A water truck will be available to prevent dust blowing during construction, if needed. Equipment used may include haul trucks, bulldozers, excavators, pavers, and hand tools. Upon completion of construction activities, disturbed areas that will not be paved will be seeded with a native grass seed mix.

Existing Conditions

Existing and Surrounding Land Uses

The 0.97-acre site consists of Clark County Tax Parcel 176148000 and is accessed by a paved driveway off NE 13th Street. The site is zoned as Business Park (BP) and currently contains a single-family mobile home, shed, carport, and paved driveway. The site is bordered to the north by NE 13th Street, to the east by NW Friberg-Strunk Street, to the south by undeveloped land and commercial development in progress, and to the west by undeveloped land and a single-family residence (Figure 2).

Existing Critical Areas

A site visit was completed by ELS in August 2023 following the appropriate technical manuals: *The Routine Determination Method according to the Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010). During the field visit, no wetlands were identified onsite (ELS 2023).

The WDFW Priority Habitats and Species online mapping tool depicts oak woodlands within the vicinity of the observed oak along the southern site boundary. One oak measuring approximately 52 inches diameter at breast height (DBH) was mapped along the southern site boundary during site reconnaissance (Figure 2). The oak has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. The oak location was mapped using a GPS system capable of submeter accuracy in ideal conditions. According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

Table 1. Oak Summary

Total Canopy Area	DBH	Number of Trunks	Noteworthy Habitat Features
0.08 acres 3,456 square feet	52 inches	1	• Canopy is interconnected with adjacent trees, but not other oaks • Two large cavities

Avoidance and Minimization

The preferred mitigation sequencing of first avoidance, then minimization, and finally compensation for unavoidable impacts was taken into consideration during the design process of this project; however, due to the single oak tree being located in an area of the site needed for a required driveway, avoiding Oregon white oak impacts altogether is not feasible. The Oregon white oak proposed for removal is the only oak tree onsite.

Unavoidable Oregon White Oak Impacts

Removal of the oak will result in the loss of 0.08 acres (3,456 square feet) of Oregon white oak priority habitat as measured by the oak canopy coverage (drip line). The following table summarizes proposed oak impacts.

Table 2. Oak Impact Summary

Identifier	DBH	Canopy Coverage	Total Impact
Oregon White Oak (Single Mature Tree)	52 inches	0.08 acres 3,456 square feet	0.08 acres 3,456 square feet

Impacted Priority Habitat Functions

ELS assessed the functions provided by the oak during a site visit on August 29, 2023. The functional assessment is based on Washington Department of Fish and Wildlife's (WDFW) *Management Recommendations for Washington's Priority Habitats, Oregon White Oak Woodlands* (Guidance) (Larsen and Morgan 1998).

Habitat Functions

Oak woodlands are considered "priority habitat and species" by WDFW and are protected locally by the City of Camas Municipal Code (*CMC*). According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

In urban or urbanizing areas west of the Cascades, WDFW defines priority oak habitat as single oaks, or stands of pure oak, or oak/conifer associations, 1 acre or greater in size. WDFW may also consider individual Oregon white oak trees a priority habitat when found to be particularly valuable to wildlife (i.e., contains many cavities, has a large DBH, is used by priority species, or has a large canopy) (Larsen and Morgan 1998). The project site is within the City of Camas (City). WDFW recommendation is that in urban and urbanizing areas, single trees should be maintained

if they are deemed important to species highly associated with Oregon white oak. Oaks and their associated flora comprise distinct woodland ecosystems with various plant communities providing valuable habitat that contributes to wildlife diversity. Oak woodlands provide a mix of feeding, resting, and breeding habitat for many wildlife species (Larsen and Morgan 1998).

The oak proposed for removal has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. Due to the placement of the oak within the City boundaries and lack of habitat connectivity, larger animals or those not adapted to urban conditions are not likely to be present. Therefore, removing the oak would likely result in habitat loss and a food source only for birds and small mammals that are well adapted to urban conditions.

Oregon White Oak Mitigation Selection Rationale

The Oregon white oak proposed for removal is located in the service area for the Terrace Oak Bank (Bank). The oak tree is approximately 4 miles southeast of the Bank, in the Lacamas Creek Watershed which is in the southeastern portion of the service area (Figure 4). The proposed oak removal will be mitigated by purchasing credits from the Bank at ratios specified in the Terrace Oak Bank's Mitigation Banking Instrument (MBI).

Rationale for selecting this mitigation bank is as follows:

- The oak onsite does not provide habitat for other priority species that should be replaced onsite. Habitat functions will be impacted for species common to urban areas, which can be fully replaced at the Bank.

- The habitat functions lost from the proposed oak removal correspond directly with the habitat creation purpose, goals, and objectives at the Bank which identifies 13.93 acres of existing Oregon white oak woodland WDFW Priority Habitat that will be restored to pre-agricultural conditions through creation, enhancement, and preservation. Creation and enhancement will be accomplished through planting oak saplings and/or native understory plantings, removing of Douglas-fir, and establishing a conservation easement over the entire 13.93 acres.

The 2008 *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule* (Corps) recommends purchasing mitigation bank credits for ecological considerations (lower risk of failure and lower temporal loss of resources and services) and to avoid the maintenance and contingency issues and outright failures that often accompany permittee-responsible mitigation sites. Use of the Terrace Oak Bank substantially lowers the risk of failure and temporal loss of resource functions and services over newly established, permittee-responsible mitigation sites and offsite mitigation is anticipated to be more meaningful and beneficial to the watershed's habitat functions.

Functions Provided at Oak Bank

The general goal of the Bank is to restore the approximately 13.93 acres to a state similar to its pre-agricultural condition through creation, enhancement, and preservation of an existing Oregon white oak woodland. All functions related to oak habitat are expected to increase as a result of design implementation. The primary ecological goals of the Bank are as follows:

- Removal of all existing impervious surfaces, including buildings, large equipment, gravel and paved areas, and debris, followed by replanting oak saplings and native understory species.
- Removal of invasive species in creation, enhancement, and preservation areas, primarily English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus armeniacus*).
- Removal of Douglas-fir (*Pseudotsuga menziesii*) overstory as recommended by WDFW to reduce competition and further degradation of the Oregon white oak woodland from shading.
- Replanting of both creation and enhancement areas with oak saplings and and native understory species to augment and expand existing Oregon white oak habitat.
- Preserve the Bank through a conservation easement.

Wildlife Habitat

The proposed development site plan will provide diverse habitat for a variety of large and small mammals, songbirds, waterfowl, amphibians, and insects by improving the condition of the existing Oregon White Oak habitat through creation and enhancement that includes replanting of oaks and native understory, removing invasive species, non-native debris, and impervious surfaces, and eliminating Douglas-fir encroachment.

Anticipated Functional Lift

The creation, enhancement, and Douglas-fir stand release activities proposed in the Bank will provide a variety of benefits lifting overall habitat functions. Invasive species eradication and installing oak trees and native understory in open areas will increase the site's potential to provide habitat by providing improved and increased diversity of plant species, structure, and interspersion of habitat. Removing Douglas-fir competition will allow the existing oaks to increase branching and smaller oak trees to become better established. The changes will increase acorn production, provide additional food for wildlife, and support a greater diversity of wildlife species as will removing impervious surfaces and debris. All functions impacted by removing an oak tree at the project site will be fully mitigated at the Bank.

Proposed Mitigation Credits

As stated in the MBI (October 28th, 2020), the local jurisdiction with regulatory authority will determine both how impacts are measured[1] and the mitigation ratios required. The mitigation

[1] i.e., square foot of canopy area/root zone, DBH, etc.

credits required for impacts to Oregon white oak will be determined by using the local jurisdiction's mitigation ratio (6:1) and multiplying this ratio by a "risk reduction factor" of 0.5. Impacts to high functioning Oregon White Oak Priority Habitat stands will be determined by the regulatory agencies on a case-by-case basis. Table 3 summarizes the impact type, mitigation ratio, and total credits proposed for compensation.

Table 3. Credits for Oak Impacts at Terrace Oak Bank

Impact Type	Impact Amount	Mitigation Ratio	Risk Reduction Multiplier	Mitigation Area Required	Proposed Credit Purchase
Canopy loss	0.08 acres (3,456 sq. ft.)	6:1	0.5	0.238 acres (10,368 sq. ft.)	0.238 credits

Credit Purchase or Transfer Timing

Following permit issuance, PAK USA Camas, LLC, as the applicant, will enter into a Buy/Sell Agreement with Terrace Oak Bank, for purchase of mitigation credits (in the quantity specified in Table 3) that would appropriately mitigate for the proposed project impacts. The actual purchase of credits will occur upon permit issuance. Prior to impacting the project oak, the applicant will submit proof of transfer of mitigation credits to project managers for the City of Camas. Proof of the mitigation transfer will be provided in the form of a notification letter to the approving agencies. Upon service of this notification, the mitigation requirement to purchase 0.238 mitigation credits will be fully satisfied.

Confirmation of Mitigation Credit Availability

Proof of the current number of available mitigation credits at the Terrace Oak Bank site will be confirmed by the approving agency, City of Camas and through the advising members of the Oak Bank Review Team.

Chair:
Brent Davis, Wetland and Habitat Review Program Manager
Clark County Community Development
P.O. Box 9810
Vancouver, WA 98666-9810
(360) 397-2375 ext. 4152
brent.davis@clark.wa.gov

Advisory Members:
Dave Howe, Area Habitat Biologist
Washington Department of Fish and Wildlife
5525 S 11th Street
Ridgefield, WA 98642
(360) 906-6729
david.howe@dfw.wa.gov

Carlo Abbruzzese, Pacific Cascade Region Natural Areas Manager
Washington Department of Natural Resources
2508 NW 126th Circle
Vancouver, WA 98685
(360) 577-2025
carlo.abbruzzese@dnr.wa.gov

LIMITATIONS

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

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Interagency Review Team for Washington State. February 19, 2009. *Using Credits from Wetland Mitigation Banks: Guidance to Applicants on Submittal Contents for Bank Use Plans*. Online http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/pdf/mitig_ plan_guidance.pdf. Accessed August 2023.

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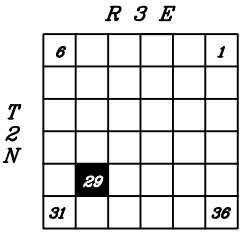
FIGURES

WASHINGTON

45.6321° Latitude
-122.4664° Longitude

LOCATION MAP



PROJECT VICINITY MAP

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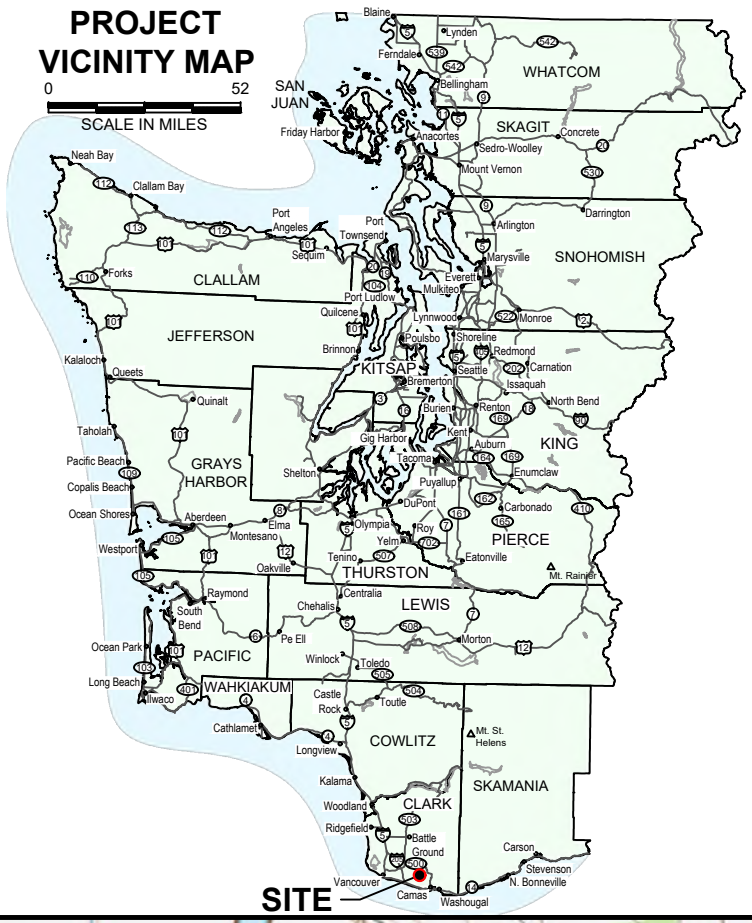

NOTE:
Quadrangle topographic map from USGS.

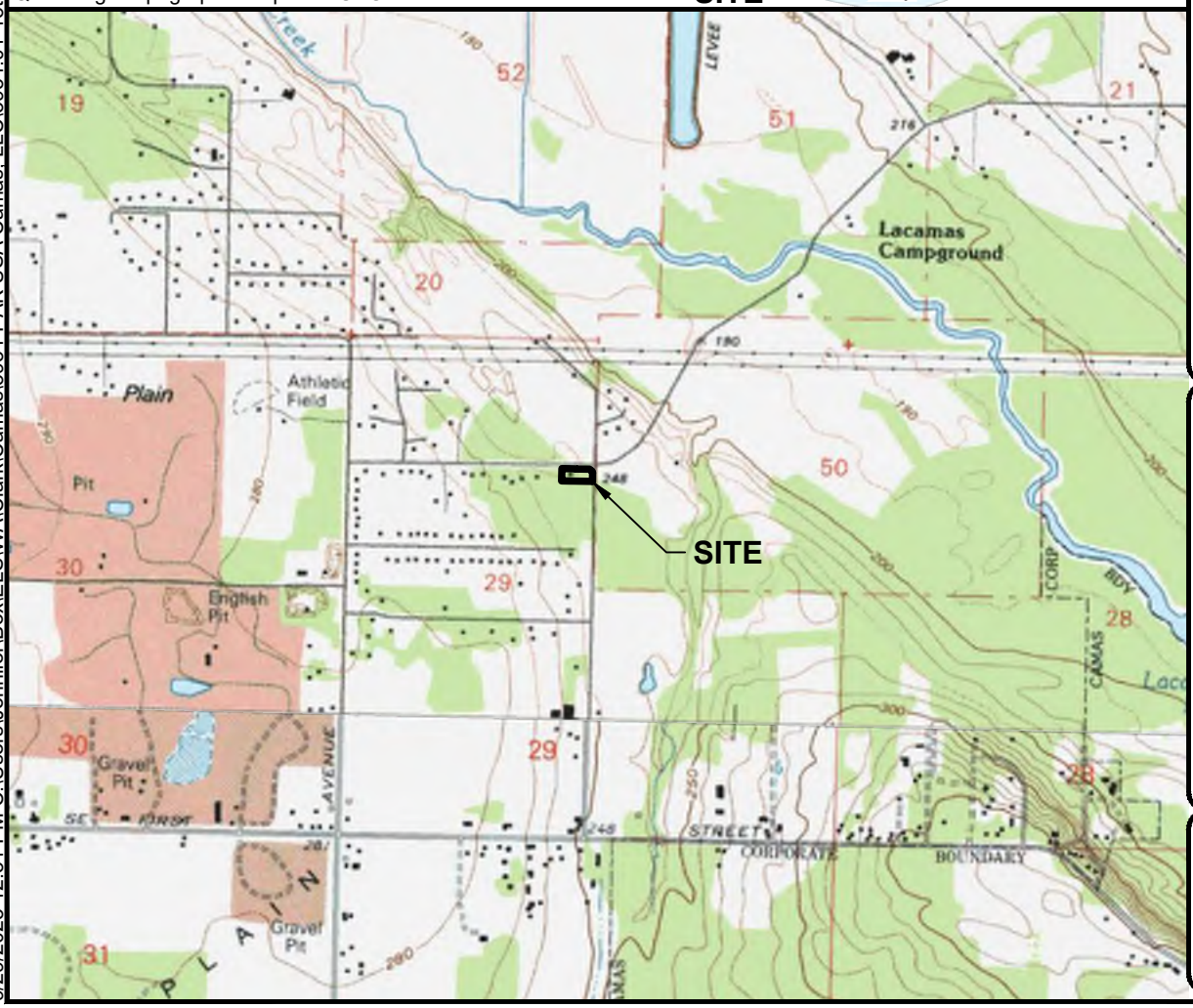

Figure 1
VICINITY MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
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www.eco-land.com
Ecological Land Services

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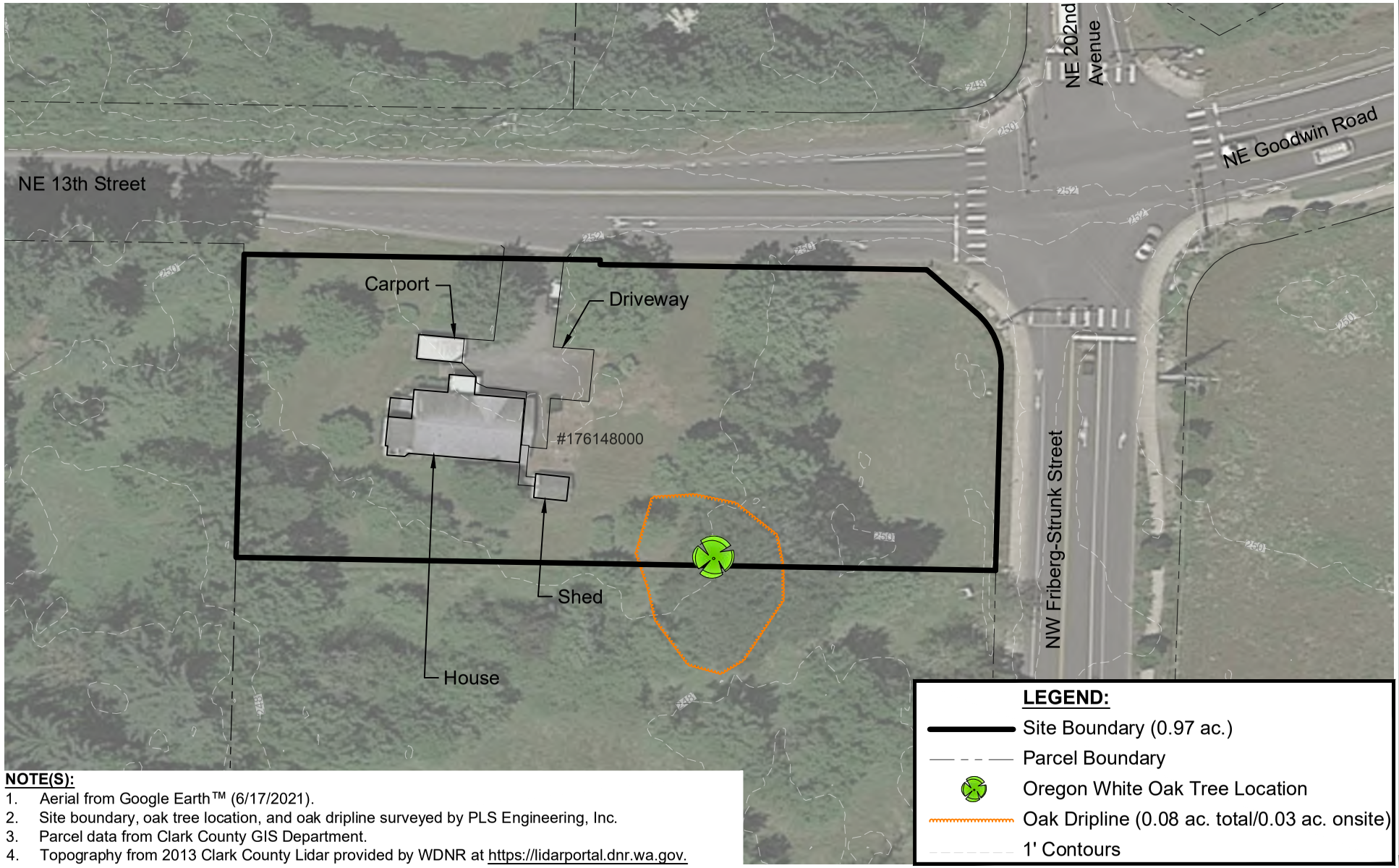

NOTE(S):

1. Aerial from Google Earth™ (6/17/2021).
2. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
3. Parcel data from Clark County GIS Department.
4. Topography from 2013 Clark County Lidar provided by WDNR at https://lidarportal.dnr.wa.gov.

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DATE: 9/29/23
DWN: JKJ
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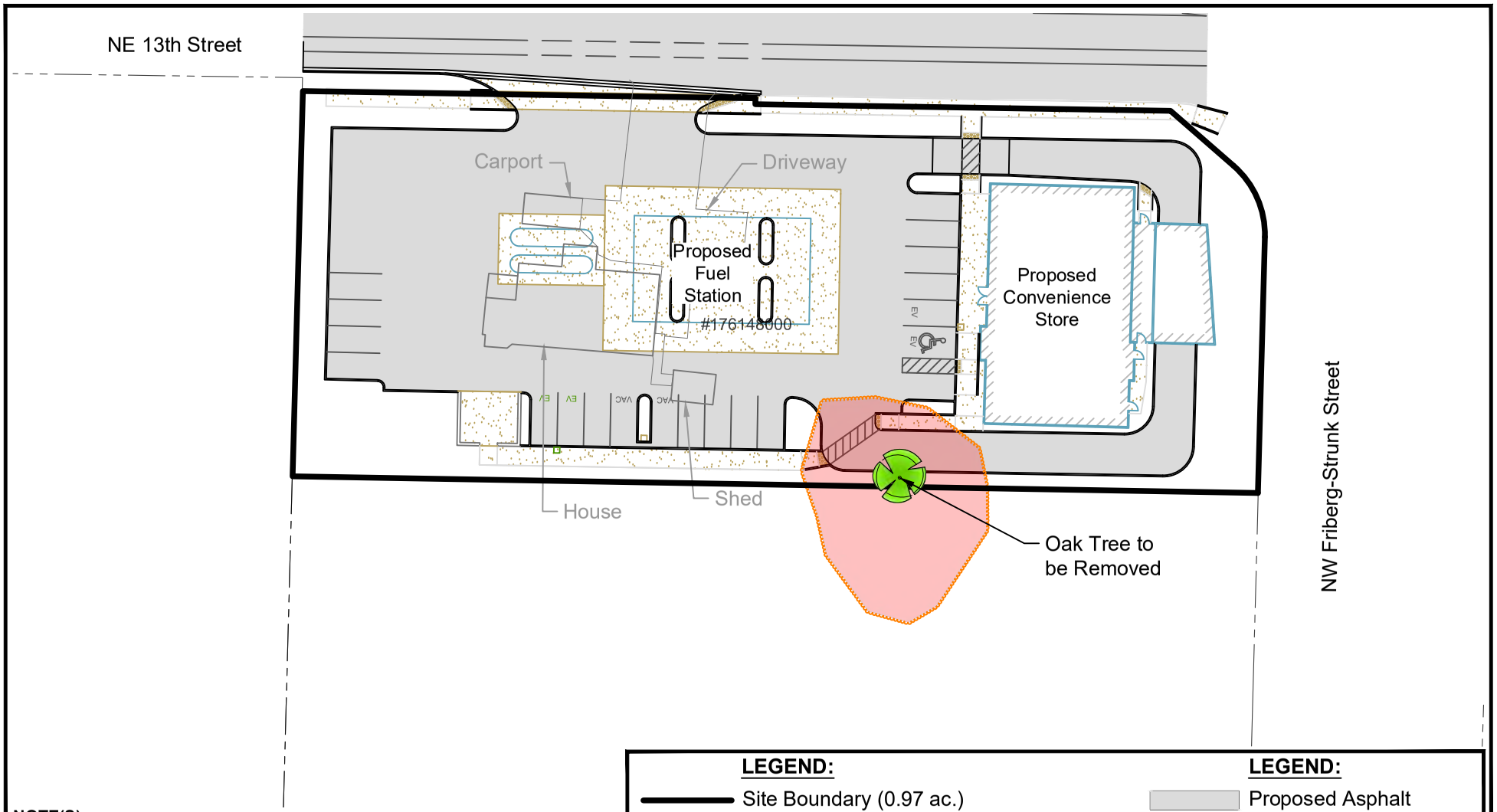
PROJECT NO: 3934.01

Figure 2
EXISTING CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.



NOTE(S):

1. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
2. Parcel, ditch, and culvert data from Clark County GIS Department.
3. Site plan by PLS Engineering.

LEGEND:

- Site Boundary (0.97 ac.)
- Parcel Boundary
- Oregon White Oak Tree Location
- Oak Dripline (0.08 ac. total/0.03 ac. onsite)

LEGEND:

- Proposed Asphalt
- Proposed Concrete
- Oak Dripline Impact (3,546 sq. ft./0.08 ac.)

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DATE: 9/29/23
DWN: JKJ
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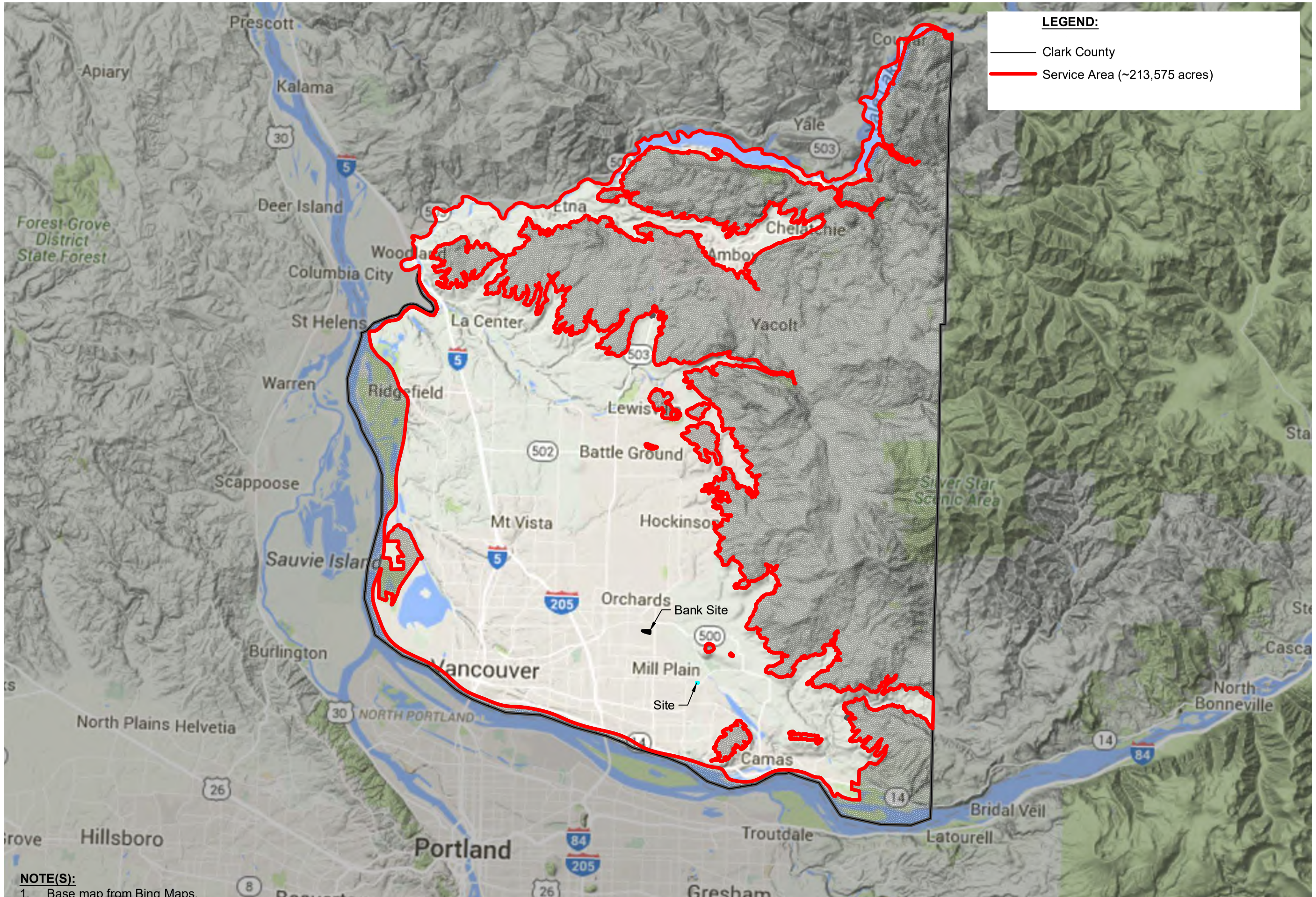
CHK:
PROJECT NO: 3934.01

Figure 3
PROPOSED CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.



NOTE(S):
1. Base map from Bing Maps.

Figure 4
TERRACE OAK BANK SERVICE AREA
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/26/23
DWN: JKJ
REQ. BY: JB
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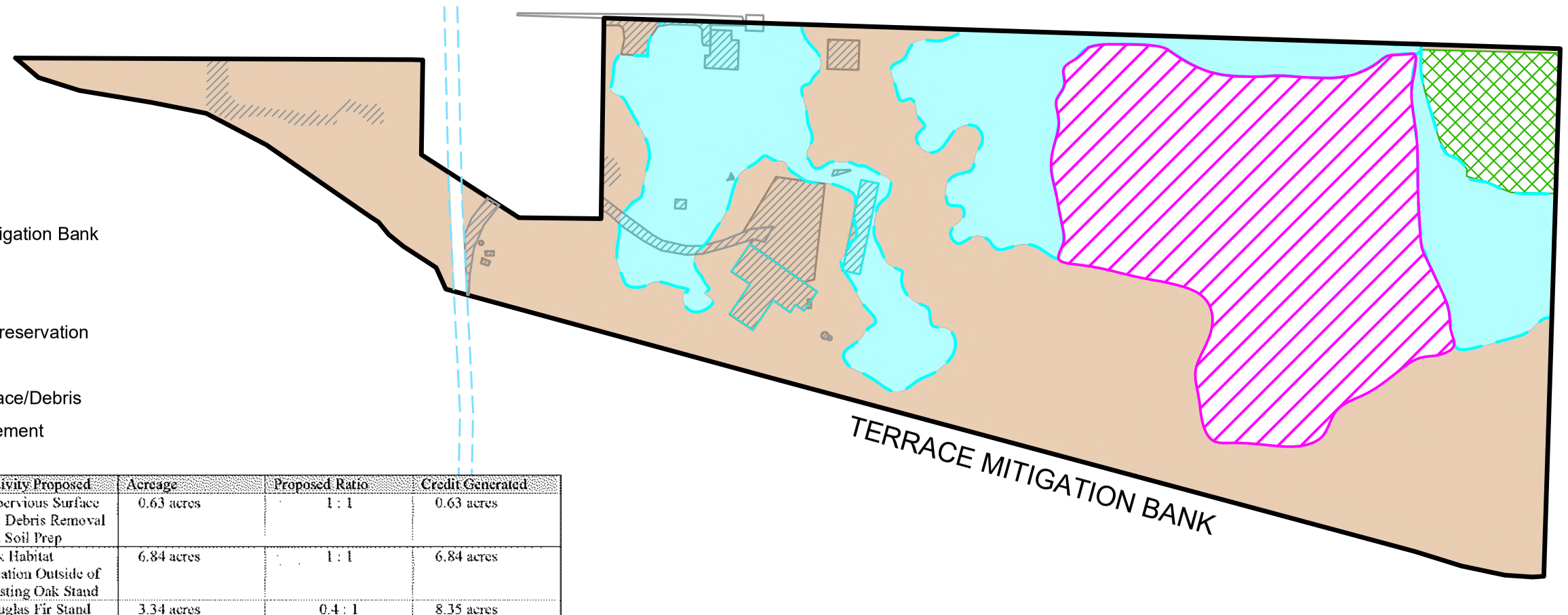
Exhibit 9 APPEAL24-1001



LEGEND:

- Terrace Oak Mitigation Bank
- Creation
- Enhancement
- Upland Forest Preservation
- Stand Release
- Impervious Surface/Debris
- Water Line Easement

Activity Proposed	Acreage	Proposed Ratio	Credit Generated
Impervious Surface and Debris Removal and Soil Prep	0.63 acres	1 : 1	0.63 acres
Oak Habitat Creation Outside of Existing Oak Stand	6.84 acres	1 : 1	6.84 acres
Douglas Fir Stand Release	3.34 acres	0.4 : 1	8.35 acres
Enhancement of Existing Oak Stand	3.20 acres	0.4 : 1	8.00 acres
Upland Forest Preservation	0.50 acres	0.5 : 1	1.00 acres
Totals	14.51 acres[1]		24.82 acres

[1] Total acreage includes areas of activity overlap and does not include 0.05 acres of water line easement, so is not reflective of the 13.93 acres represented in the legal survey of Oak Bank area.

Table 2. Oak Mitigation Bank Activity Descriptions.

Activity Proposed	Type of Activity/Area
Impervious Surface and Debris Removal and Soil Prep	• Includes: • Buildings, driveways, gravel pads or any other impervious area to be removed (regardless of whether oak tree canopy already covers the area) • Removal of debris piles throughout the site • Loosening of soils following impervious/debris removal
Oak Habitat Creation Outside of Existing Oak Stand	• Includes open areas of all types not currently covered by oak canopy • Areas to be replanted with oak saplings and native understory
Douglas Fir Stand Release	• Includes area of dense fir canopy within existing oak stand • Douglas fir over-story to be removed through harvest or tree girdling/snag creation
Enhancement of Existing Oak Stand	• Includes areas of existing oak canopy • Enhancement areas will have non-natives removed and understory planted with native shrubs typically associated with oak woodlands
Upland Forest Preservation	• Includes areas of deciduous forest adjacent to oak canopy, providing upland forest habitat • Area will be preserved through administration of a conservation easement

Figure 5
TERRACE OAK BANK SITE DESIGN
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

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TRAFFIC ANALYSIS REPORT

FOR

NE 13TH STREET GAS STATION

NE 13TH STREET

CAMAS

SUBMITTED BY

CHARBONNEAU ENGINEERING LLC

September 2023

Project 23-24

TRAFFIC ANALYSIS REPORT

FOR

NE 13TH STREET GAS STATION

NE 13TH STREET

CAMAS

Prepared By

CHARBONNEAU Engineering LLC

9-13-23

September 2023

Project 23-24

8516 SW 61st Avenue, Portland, OR 97219 Phone: 971.322.8003

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- City of Vancouver Trip Assignment within Concurrency Corridor Intersections
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INTRODUCTION

This traffic analysis has been prepared to evaluate and document the operations and safety conditions for the NE 13th Street Gas Station development being planned in Camas, Washington. The development will construct a gas station with eight fueling positions, market, and car wash totaling 1,189 square feet. One single-family home will be demolished on the site.

The site is located at address #20101 NE 13th Street, on a 0.95-acre property (tax lot #176148-000). Currently a single-family home occupies the property. Figure 'a' in the appendix is a vicinity map highlighting the project location.

Both the City of Camas and City of Vancouver specified the transportation elements that needed to be addressed within the Pre-Application staff report (Camas – File #PA22-32). Therefore, it was necessary to evaluate several intersections in terms of traffic operations, safety, and for concurrency purposes.

TRAFFIC ANALYSIS CONSIDERATIONS

In order to address and evaluate the required transportation elements the following major tasks were performed.

- Inventory and record pertinent information such as traffic control devices, circulation patterns, lane conditions, pedestrian & bicycle facilities, transit zones, parking, and street characteristics.
- Record data on typical weekdays during the AM and PM peak traffic hours.
- Collect traffic count data at three study intersections.
- Address the City of Vancouver's concurrency needs including the number of trips distributed within the designated corridors and the associated proportionate share fees.
- Level of service (LOS) analysis of the study intersections and site access intersection to measure the approach delays for comparison to the City of Camas standards.
- Determination of vehicular queuing at the site access.
- Review intersection sight distance at the proposed access location.
- Documentation of the proposed access spacing and compare to the City's standards.
- Review traffic crash data furnished by WSDOT. Determine the intersection crash rates for the study intersections and verify if safety improvements are needed.

SITE DESCRIPTION, STREETS, ACCESS, AND CRITICAL INTERSECTIONS

Development of the NE 13th Street Gas Station facility includes construction of an eight fueling position gas station, market, and car wash totaling 1,189 square feet. The site consists of a 0.95-acre parcel that is situated within the southwest intersection corner at NE 13th Street and NW Friberg-Strunk Street.

Access to the proposed development will be provided with a separate driveway connection to NE 13th Street. No access will occur on NW Friberg-Strunk Street. The proposed access will be controlled by stop signing on the approach to NE 13th Street. The project site plan (Figure 'b') illustrates the access location.

The study intersections in the area include NE 13th Street at NE 192nd Avenue and at NW Friberg-Strunk Street and SE 1st Street at NW Friberg-Strunk Street. Each of the locations are controlled by signalization.

Northeast 192nd Avenue at NE 13th Street is configured as a tee-shaped design with single-lane approaches on the south and east legs. The north leg includes a separate left turn lane and southbound through lane. A marked pedestrian crosswalk is in place on the intersection's north leg.

NE 13th Street at NW Friberg-Strunk Street is a four-way design with separate right turn lanes on the west and south legs. The east approach includes a separate left turn lane. The north leg has a single lane approach. Pedestrian crosswalks occur on each approach.

NW Friberg-Strunk Street at SE 1st Street is a four-way design with a separate right turn lane on the north leg. The east and west approaches include separate left turn lanes. The south leg has a single lane approach. Pedestrian crosswalks occur on each approach.

The existing and proposed lane configurations and traffic control are presented in Figure `c` in the report's appendix.

Southeast 13th Street is classified as a minor arterial within the Camas City limits and the City's minimum access spacing is 660 feet. The travel speed is posted at 35 MPH along the project site's frontage. The street grade is flat and the alignment is tangent. There is one travel lane in each direction with narrow paved/gravel surfaced shoulders of approximately one foot wide. Drainage ditches are present adjacent to the shoulders.

TRAFFIC OPERATIONAL ANALYSIS

In order to evaluate traffic flow and delay the study intersections were analyzed for level of service (LOS) conditions, delay, queuing, and safety. The intersections evaluated included NE 13th Street at NE 192nd Avenue and at NW Friberg-Strunk Street, and SE 1st Street at NW Friberg-Strunk Street. The site access at NE 13th Street was also evaluated.

To perform the LOS analysis new traffic counts were conducted. The counts were collected in August 2023 during the AM peak (7:00-9:00 AM) and PM peak (4:00-6:00 PM) traffic hours. Figure 1 illustrates the existing traffic volume data for the AM & PM peak hours.

Union High School is located approximately a half-mile south of the gas station/market site was not in session when the traffic counts were recorded. Therefore, to account for the

school's trips it was necessary to model the school's traffic. Using an enrollment of 1,970 students as provided by the school district, the trips were calculated using the ITE trip generation rates (LUC #525) for public high schools. Figure 2 illustrates the school's traffic assignments for the AM & PM peak hours.

Figure 3 presents the year 2023 traffic flow for the combined (existing plus modeled high school) traffic scenario.

In-Process traffic was accounted for in the project and is presented on Figure 4. Several approved (and not yet built) development projects were identified by the City. These included the following;

- Camas Heights – NE 28th St
- Green Mountain B1 South Phase
- Panattoni Industrial Bldg-Lot 6
- Lacamas Tech Center
- Village at Camas Meadows
- Parklands at Camas Meadows
- Green Mountain Estates
- Oak Tree Station

Three years of traffic growth at 2% per year was added to the existing traffic to account for future conditions. Figure 5 represents the year 2026 background traffic scenario and incorporates three years of growth traffic at 2% per year, in-process traffic, and existing traffic plus the modeled high school traffic.

Pass-By traffic is permitted in the trip generation calculations according to the ITE Trip Generation Handbook for the gas station use (LUC #945). These are trips that access the site from existing traffic flow within the area. Figure 6 illustrates these trips, which are included with the total traffic scenario.

VEHICULAR TRIP GENERATION

Trip rates presented in the Institute of Transportation Engineers (ITE) Trip Generation manual, 11th edition (year 2021) were utilized to estimate the site's trip generation. The trip generation is summarized in Table 1 (following page).

Trip rates for ITE land use code #945 (gas station w/market) and land use code #948 (automated car wash) was applied for the trip generation calculations. Trip credits were taken into account for the existing single-family home that occupies the property is also listed in the table.

Table 1 Trip Generation Summary

ITE Land Use	Units	Weekday						
		ADT	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
PROPOSED SITE TRIPS								
Gas Station with Market (#945)	8 fueling positions							
Generation Rate [1]		265.12	16.06	50%	50%	18.42	50%	50%
Total Driveway Trips		**2,121**	**128**	64	64	**147**	74	73
Pass-By Trips[2] (AM=62%; PM=56%)			79	40	39	82	41	41
Automated Car Wash (#948)	1,189 sq. ft.							
Generation Rate [1,3,4]		142.00	9.94	50%	50%	14.20	50%	50%
Total Driveway Trips		**169**	**12**	6	6	**17**	9	8
EXISTING SITE TRIPS (TRIP CREDITS)								
Single-Family (#210)	1 single-family home							
Generation Rate [1]		9.43	0.70	26%	74%	0.94	63%	37%
Total Driveway Trips		**-9**	**-1**	0	-1	**-1**	-1	0
Net Total Trips[5]		**2,281**	**139**	70	69	**163**	82	81
Site Pass-by Trips		**0**	**79**	40	39	**82**	41	41
Net New Trips[6]		**2,281**	**60**	30	30	**81**	41	40

[1] Source: *Trip Generation* , 11th Edition, ITE, 2021, average rates.

[2] Pass-by percentages based on Trip Generation Handbook, 3rd Edition, ITE, 2017.

[3] ADT rate estimated as 10 times the PM peak hour rate.

[4] AM peak rate estimated as 70% of PM peak rate. AM peak distribution is reverse of PM peak distribution.

[5] Net Total Trips = Proposed Total Site Trips - Existing Total Site Trips.

[6] Net New Trips = Net Total Trips - Site Pass-by Trips.

Development of project is expected to generate a net of 2,281 daily trips, 60 net AM peak hour trips, and 81 net PM peak hour trips.

The NE 13th Street Gas Station trip distribution was based on the existing count data and engineering judgment. This information is presented on Figure 7. The corresponding trip assignments are presented on Figures 8a and 8b for the AM & PM peak hours, respectively. Figure 9 illustrates the year 2026 total traffic conditions.

CAPACITY ANALYSIS

Capacity analyses were performed to determine the levels of service for the weekday peak hours. Synchro v11.1 software was used to determine the approach delays and level of service (LOS) for the site access study intersections. The program is based on the year 2016 Highway Capacity Manual methodology. Table 2 summarizes the analysis results. Copies of the capacity analysis summaries are included in the appendix.

Table 2 Capacity Analysis Summary

Intersection	Type of Control	Peak Hour	Traffic Scenario											
			2023 Adjusted Existing				2026 Background				2026 Total			
			Crit. Mov't	LOS	Delay	v/c	Crit. Mov't	LOS	Delay	v/c	Crit. Mov't	LOS	Delay	v/c
NE 192nd Avenue & NE 13th Street	Signal	AM	-	C	20.5	0.56	-	D	41.1	0.70	-	D	50.4	0.75
		PM	-	C	34.6	0.65	-	F	81.8	0.82	-	F	100.6	0.86
	Mitigated [1]	*AM*	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	D	35.8	0.71	-	D	41.2	0.73
Site Access & NE 13th Street	Two-way Stop	AM	NB	C	17.9	0.00	NB	C	24.0	0.01	NB	D	30.8	0.36
		PM	NB	A	0.0	0.00	NB	A	0.0	0.00	NB	D	31.1	0.40
NW Friberg-Strunk St & NE 13th Street	Signal	AM	-	B	13.2	0.27	-	B	17.7	0.35	-	B	17.7	0.35
		PM	-	B	16.3	0.27	-	C	23.2	0.36	-	C	23.1	0.37
NW Friberg-Strunk St & SE 1st St/NW Lake Rd	Signal	AM	-	C	25.7	0.28	-	C	24.5	0.30	-	C	24.9	0.30
		PM	-	B	16.7	0.29	-	B	17.6	0.33	-	B	17.7	0.33

Notes: 2016 Highway Capacity Manual methodology used in analysis, Synchro v11. NB - Northbound, Crit. Mov't - Critical movement or critical approach.

[1] Mitigation: Widen NE 13th Street approach at NE 192nd Avenue to provide a separate westbound left turn lane and westbound shared through-right lane.

With the exception of NE 13th Street at NE 192nd Avenue the analysis has documented that the study intersections will operate acceptable at LOS `D` or better in the year 2026 total traffic scenario and meet the City's level of service standards.

At NE 13th Street and NE 192nd Avenue the analysis determined that the intersection will operate at LOS `F` during the PM peak hour in the year 2026 background and total traffic scenarios. The failing condition is attributed to the growth and in-process traffic. The City has recognized and documented in the TSP that future improvements will be necessary on NE 13th Street (Goodwin Road) to accommodate heavier traffic. A year 2035 improvement is listed in Table 6 within the TSP that proposes street widening which should mitigate the issue. Specifically the current study finds that adding a separate westbound left turn lane at the NE 192nd Avenue signal will mitigate the failing condition to acceptable LOS `D`. However, no mitigation is proposed in conjunction with the gas station & market development as the failure is due to the background traffic conditions.

Generally, LOS 'A', 'B', 'C', and 'D' are desirable service levels ranging from no vehicle delays to average or longer than average delays in the peak hours. Level 'E' represents long delays indicating signalization warrants need to be reviewed and signals considered only if warrants are met. Level 'F' indicates that intersection improvements, such as widening and signalization, may be required. According to the Highway Capacity Manual (HCM), the following delay times are associated with the LOS at stop controlled unsignalized and signalized intersections.

Level of Service criteria defined in Highway Capacity Manual

Level of Service (LOS)	Unsignalized Control Stopped Delay (sec/veh)	Signalized Control Stopped Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

QUEUING ANALYSIS

Queue lengths at the proposed site access intersection with NE 13th Street were assessed based on the 95th percentile demand values for the year 2026 total traffic scenarios. Both the AM & PM peak hour results were established in the Synchro analysis. Copies of the reports are included in the appendix.

During the AM peak hour the northbound site access approach is expected to experience a queue of one to two vehicles. For the westbound to southbound left turn from NE 13th Street into the site the projected queue is one car.

During the PM peak hour the northbound site access approach is expected to experience a queue of two vehicles. For the westbound to southbound left turn from NE 13th Street into the site the projected queue is one car.

INTERSECTION SIGHT DISTANCE

The development's access on NE 13th Street was analyzed for intersection sight distance requirements in accordance with the AASHTO standards. Northeast 13th Street has a posted speeds of 35 MPH and therefore the intersection sight distance standard is 390 feet.

A review of the sight distance at the site's access revealed that there are no restrictions in either direction along NE 13th Street and over 500 feet of sightline is available. Therefore, the intersection sight distance standard is met.

For safety reasons the sightlines must be maintained and potential obstructions due to street grade, buildings, parking, signing, fencing, landscaping, above ground utilities, or other objects shall not be permitted.

LEFT TURN LANE REQUIREMENTS

A left turn lane warrant was assessed for the westbound to southbound movement from NE 13th Street for traffic entering the site. The AM & PM peak hours were evaluated for the year 2026 total traffic scenario.

The turn lane is not warranted in the PM peak hour.

The warrant curve shown on Exhibit 1310-7a in the appendix indicates that a left turn is marginally met based on a 40 MPH travel speed. However, the travel speed on NE 13th Street is 35 MPH which if plotted indicates the warrant would not be met. It is also noted that the queuing analysis for the westbound left turn movement has confirmed that up to one vehicle may queue to make a left turn resulting in a LOS `A` condition. As a result adding a westbound left turn lane on NE 13th Street is not proposed in conjunction with gas station, market, and car wash development.

The warrant figure is included in the appendix.

ACCESS SPACING & SPACING STANDARDS

The proposed access location was assessed for conformance to the City's access spacing standards. NE 13th Street is classified as a minor arterial and the City's minimum spacing is 660 feet.

The proposed access spacing will occur at approximately 200 feet west of the signalized intersection at Friberg-Strunk Street and therefore does not meet the spacing standard. Placing the site access any further to the west is not viable from an operational standpoint because trucks (including gas tanker trucks) need the turning capability to maneuver on-site in order to exit the lot. It is noted that the pre-application staff report indicates that the City would support the substandard spacing condition if the design is supported by a deviation request. The request will be presented in a separate document.

ACCIDENT HISTORY

Crash data for study intersections was obtained from WSDOT staff and reviewed to help identify if there were any traffic safety issues. The study period covered five years from January 2018 through December 2022 for the intersections at NE 13th Street/NE 192nd Avenue, NE 13th Street/Friberg-Strunk Street, and SE 1st Street/Friberg-Strunk Street.

The crash rates presented in Table 3 are based on the number of accidents per million entering vehicles (MEV) per year. Typically, an intersection is not considered unsafe unless its accident rate exceeds the threshold value of 1.0 accidents per MEV.

The study intersections did not experience a crash rate greater than 0.27 crashes per MEV/year and therefore no safety improvements are proposed.

Table 3 Crash Rate Results

Intersection	Crash History (Years)	Number of Crashes	Crashes per year	Annual Traffic Entering (veh/yr)	Crash rate per M.E.V.*
NE 192nd Ave & NE 13th St	5.26	9	1.7	6391700	**0.27**
NW Friberg-Strunk St & NE 13th St	5.26	3	0.6	3944592	**0.14**
SE 1st St & NW Friberg-Strunk St	5.26	5	1.0	5774444	**0.16**

* M.E.V. - million entering vehicles.

PEDESTRIANS, BICYCLES, & BUSES

No sidewalk is present on NE 13th Street adjacent to the project site's frontage. Sidewalk will be constructed with the development along the property's NE 13th Street frontage (south street side). Sidewalk is present on Friberg-Strunk Street.

Bike lanes are not provided on NE 13th Street. Bike lanes are present on Friberg-Strunk Street. Additional bicycle lanes are not planned with the development.

C-Tran does not provide transit service in the immediate area of the development. It does provide service between the Camas City Center and the 99th Street Transit Center in Vancouver.

CITY OF VANCOUVER CONCURRENCY DOCUMENTATION

Table 4 lists the City of Vancouver's intersections that are identified for future improvements. The table includes the number of peak hour site trips that will impact the locations, cost per trip, and the proportionate share fee equating to $153,050.

Table 4 Proportionate Share Project Intersections & Fees

Intersection	Cost Per Trip	Peak Trips	Proportionate Share
AM PEAK HOUR			
Grove St / Columbia House Blvd / SR-14 WB off-ramp	$600.00	0	$0.00
PM PEAK HOUR			
137th Avenue - from NE 49th St to Fourth Plain Blvd	$3,000.00	0	$0.00
Fourth Plain Boulevard & NE 152nd Avenue	$333.00	0	$0.00
Leiser Rd/St. Helens Av/MacArthur Blvd (future)	$2,000.00	0	$0.00
SE 176th Avenue & SE 20th Street	$400.00	0	$0.00
NE 192nd Avenue & NE 13th Street	$400.00	57	$22,800.00
SE 192nd Avenue & SE 34th Street	$150.00	13	$1,950.00
SE 192nd Avenue & SR-14 ramp terminals	$2,000.00	13	$26,000.00
MacArthur Boulevard & Andresen Road roundabout	$2,285.00	0	$0.00
MacArthur Boulevard & Devine Road roundabout	$2,226.00	0	$0.00
NE 172nd Avenue & NE 18th Street	$300.00	20	$6,000.00
NE 179th Place & NE 18th Street	$900.00	20	$18,000.00
NE 187th Avenue & NE 18th Street	$1,200.00	24	$28,800.00
NE 162nd Avenue and NE 9th Street	$1,500.00	0	$0.00
NE 172nd Avenue and NE 9th Street	$4,100.00	0	$0.00
NE 192nd Avenue and NE 9th Street	$1,100.00	33	$36,300.00
NE 187th Avenue & SE 1st Street	$1,100.00	12	$13,200.00
PROPORTIONATE SHARE TOTAL			**$153,050.00**

Table 5 provides a summary of the development's trips that are projected to travel in the City's adopted Transportation Management Zone (TMZ) corridors during the PM peak hour.

Table 5 Number of Site Generated Trips Using Adopted TMZ Corridors

TMZ Corridor	Limits of Corridor	PM Peak Hour Trips
Fourth Plain Boulevard	Mill Plain Boulevard to I-5	0
	I-5 to Andresen Road	0
	Andresen Road to I-205	0
	I-205 to NE 162nd Avenue	0
Burton Road / NE 28th Street	NE 18th Street to NE 112th Avenue	0
	NE 112th Avenue to NE 138th Avenue	0
	NE 138th Avenue to NE 162nd Avenue	0
NE 18th Street	NE 112th Avenue to NE 138th Avenue	4
	NE 138th Avenue to NE 162nd Avenue	8
Mill Plain Boulevard	Fourth Plain Boulevard to I-5	0
	I-5 to Andresen Road	0
	Andresen Road to I-205	0
	I-205 to NE 136th Avenue	4
	NE 136th Avenue to NE 164th Avenue	8
	NE 164th Avenue to NE 192nd Avenue	8
St. Johns / Ft. Van Way	Mill Plain Boulevard to NE 63rd Street	0
Andresen Road	Mill Plain Boulevard to SR-500	0
	SR-500 to NE 78th Street	0
NE 112th Avenue	Mill Plain Boulevard to NE 28th Street	0
	NE 28th Street to NE 51st Street	0
NE 136th / 137th Avenue	Mill Plain Boulevard to NE 28th Street	0
	NE 28th Street to Fourth Plain Boulevard	0
NE 162nd/164th Avenue	SE 1st Street to Fourth Plain Boulevard	0
	SR-14 to SE 1st Street	0
SE 192nd Avenue	SR-14 to NE 18th Street	57

Table 6 lists the number of site trips projected to impact the Mill Plain Blvd corridor intersections.

Table 6 Number of Site Generated Trips Impacting the Mill Plain Boulevard Corridor Intersections

Intersection	PM Peak Hour											
	SB			WB			NB			EB		
	R	T	L	R	T	L	R	T	L	R	T	L
Mill Plain Boulevard & Chkalov Drive/112th Avenue	-	-	-	-	-	-	-	-	-	-	-	-
Mill Plain Boulevard & SE 117th Avenue	-	-	-	-	-	-	-	-	-	-	-	-
Mill Plain Boulevard & SE 120th Avenue	-	-	-	-	-	-	-	-	-	-	-	-
Mill Plain Boulevard & SE 123rd/124th Avenue	-	-	-	-	-	-	-	-	-	-	-	-
Mill Plain Boulevard & SE 126th Avenue	-	-	-	-	-	-	-	-	-	-	-	-
Mill Plain Boulevard & Park Plaza Drive	-	-	-	-	-	-	-	-	-	-	-	-
Mill Plain Boulevard & SE 136th Avenue	-	-	-	-	2	-	-	-	-	-	2	-
Mill Plain Blvd. & Hearthwood Blvd./Park Crest Avenue	-	-	-	-	2	-	-	-	-	-	2	-
Mill Plain Boulevard & SE 164th Avenue	-	-	-	-	4	-	-	-	-	-	4	-
Mill Plain Boulevard & SE 172nd Avenue	-	-	-	-	4	-	-	-	-	-	4	-
Mill Plain Boulevard & SE 192nd Avenue	4	6	-	-	-	-	-	7	-	-	-	4

SUMMARY AND RECOMMENDATIONS

Development of the NE 13th Street Gas Station facility includes construction of a gas station with eight fueling positions, market, and car wash totaling 1,189 square feet. One existing home on the property will be demolished. The project will generate a net of 2,281 daily trips, 60 AM peak hour trips, and 81 PM peak hour trips.

The site is situated in the southwest corner of the intersection at NE 13th Street and Friberg-Strunk Street. Access to the proposed development will be provided with one driveway on NE 13th Street. The driveway will be controlled by stop signing. Intersection sight distance at the access point exceeds the minimum standard (390 feet) as over 500 feet of sightline is available in both directions on NE 13th Street. For safety reasons the sightlines must be maintained and potential obstructions due to street grade, buildings, parking, signing, fencing, landscaping, above ground utilities, or other objects shall not be permitted.

The capacity analysis has determined that only one intersection will fail. The signalized intersection at NE 13th Street and NE 192nd Avenue will operate at LOS `F` during the PM peak hour in the year 2026 background and total traffic scenarios. The failing condition is attributed to the growth and in-process traffic. The City has recognized and documented in the TSP that long range future improvements will be necessary on NE 13th Street (Goodwin Road) to accommodate heavier traffic. A year 2035 improvement is listed in Table 6 within the TSP that proposes street widening which should mitigate the issue. Specifically, the current study finds that adding a separate left turn lane on the westbound approach will mitigate the failing condition to acceptable LOS `D`. However, no mitigation is proposed in conjunction with the gas station & market development as the failure is due to the background traffic conditions.

No new traffic signals are proposed in conjunction with the proposed development.

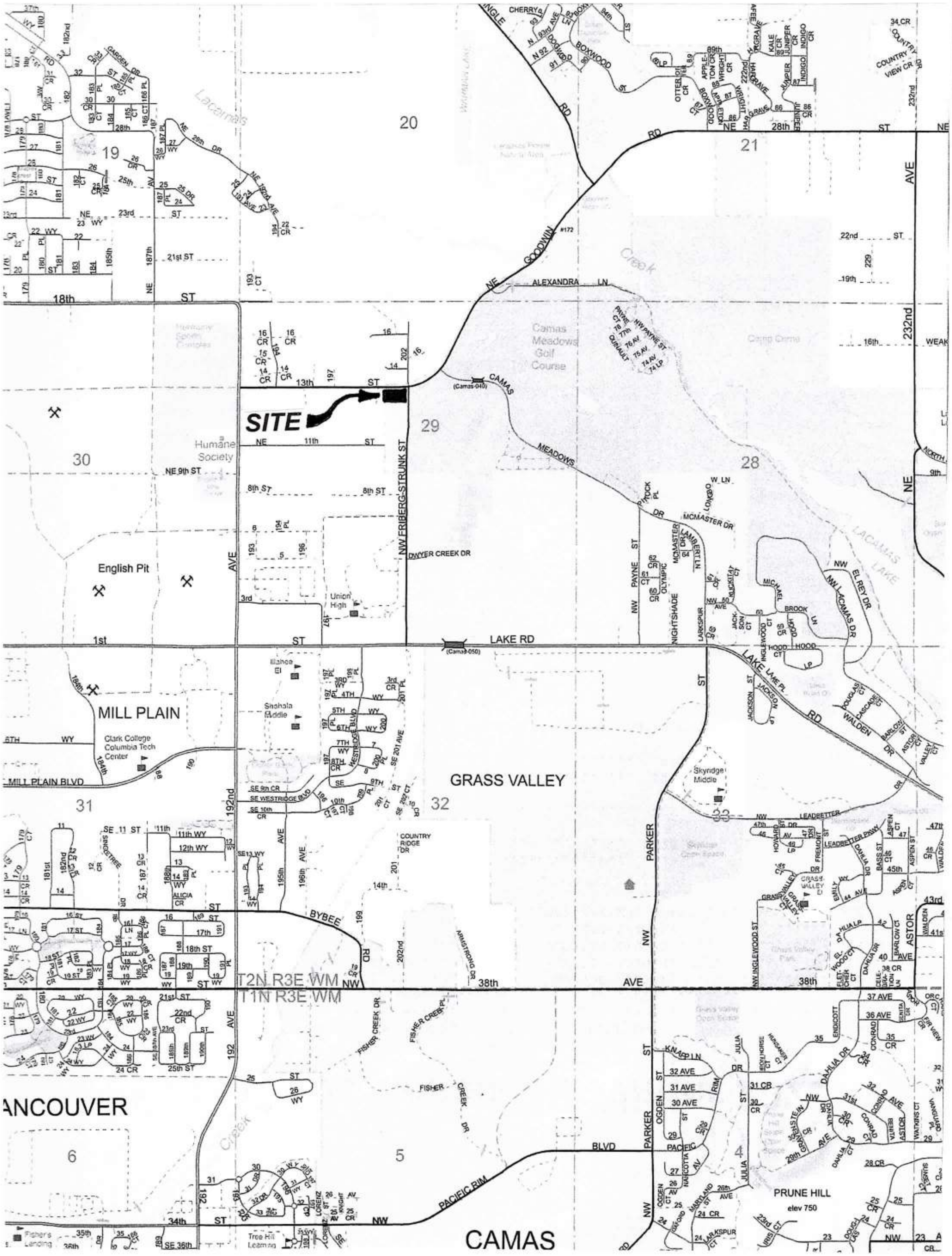
A left turn lane warrant was assessed for the westbound to southbound movement from NE 13th Street for traffic entering the site. The AM & PM peak hours were evaluated for the year 2026 total traffic scenario. The turn lane is not warranted in the PM peak hour. The warrant curve (Exhibit 1310-7a in the appendix) indicates that a left turn is marginally met based on a 40 MPH travel speed. However, the travel speed on NE 13th Street is 35 MPH which if plotted indicates the warrant would not be met. It is also noted that the queuing analysis for the westbound left turn movement has confirmed that up to one vehicle may queue to make a left turn resulting in a LOS `A` condition. Considering these factors adding a westbound left turn lane on NE 13th Street is not proposed in conjunction with the development.

The City of Vancouver's concurrency requirements are documented and referenced in Tables #4, #5, & #6.

Based on the findings of the traffic analysis no off-site improvements to the transportation system are recommend.

APPENDIX

- Vicinity Map Figure `a`
- Site Plan Figure `b`
- Lane Configuration & Traffic Control Figure `c`
- Traffic Flow Figures
  - Figure 1 Year 2023 Existing Traffic (without Union H.S. traffic)
  - Figure 2 Union High School Modeled Peak Hour Traffic
  - Figure 3 Year 2023 Existing Traffic (with Union H.S. traffic)
  - Figure 4 In-Process Traffic (eight projects)
  - Figure 5 Year 2023 Background Traffic
  - Figure 6 Pass-By Trips
  - Figure 7 Trip Distribution
  - Figure 8a Trip Assignment, AM Peak Hour
  - Figure 8b Trip Assignment, PM Peak Hour
  - Figure 9 Year 2023 Total Traffic
- Traffic Count Data
- In-Process Traffic Flow Maps (eight development projects)
- Left Turn Lane Warrant
- Peak Hour Signal Warrant
- Crash History Summary
- City of Vancouver Trip Distribution within Concurrency Corridor Intersections
- City of Vancouver Trip Assignment within Concurrency Corridor Intersections
- Year 2035 Acknowledged TSP Mitigation, Friberg at Goodwin/13th Street Improvements
- Synchro Capacity Analysis Reports



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PROJECT: 23-24

NOTES:
NO SCALE

N

VICINITY MAP
13TH STREET GAS STATION

FIGURE

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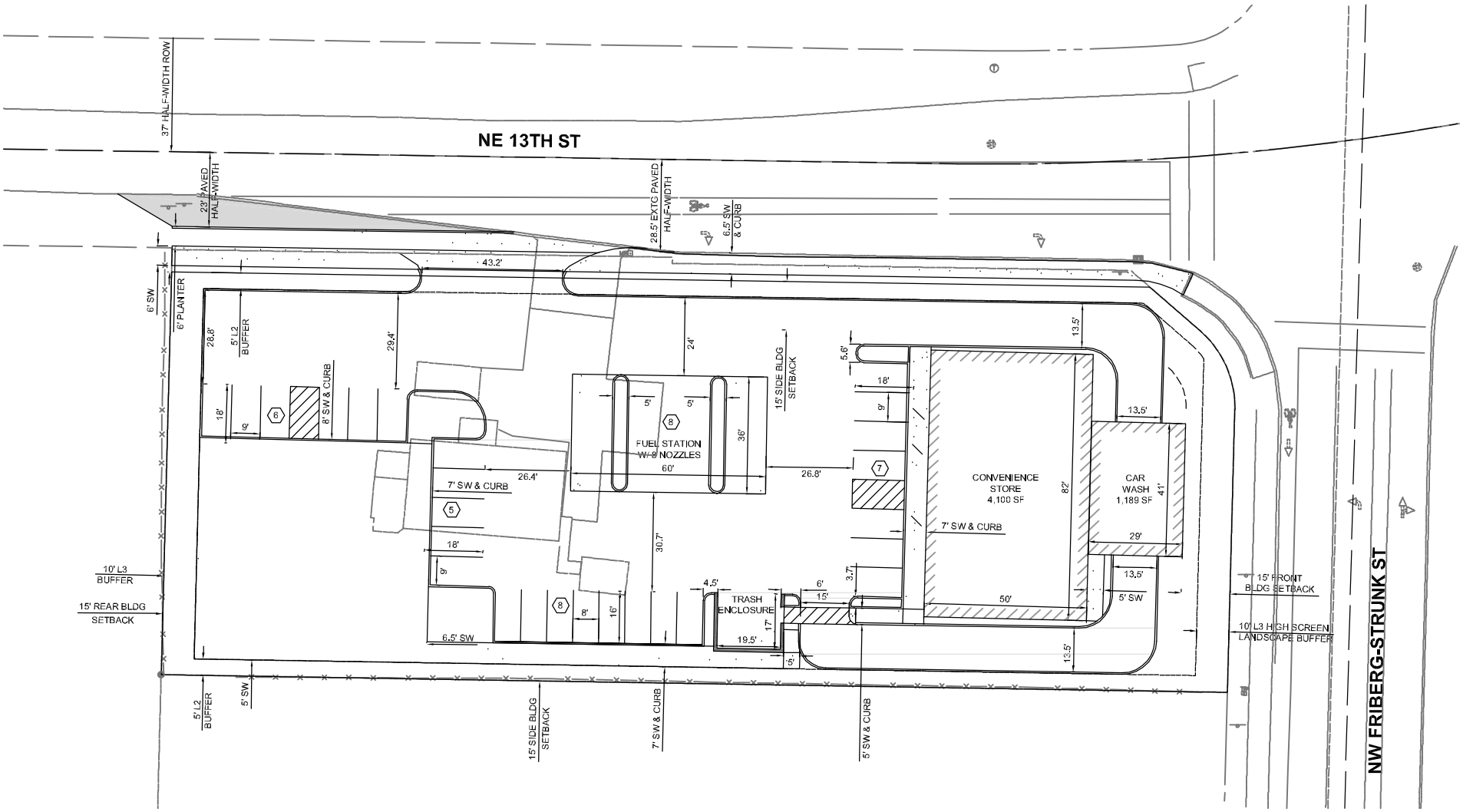

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PROJECT: 23-24

NOTES: NO SCALE

N

SITE PLAN

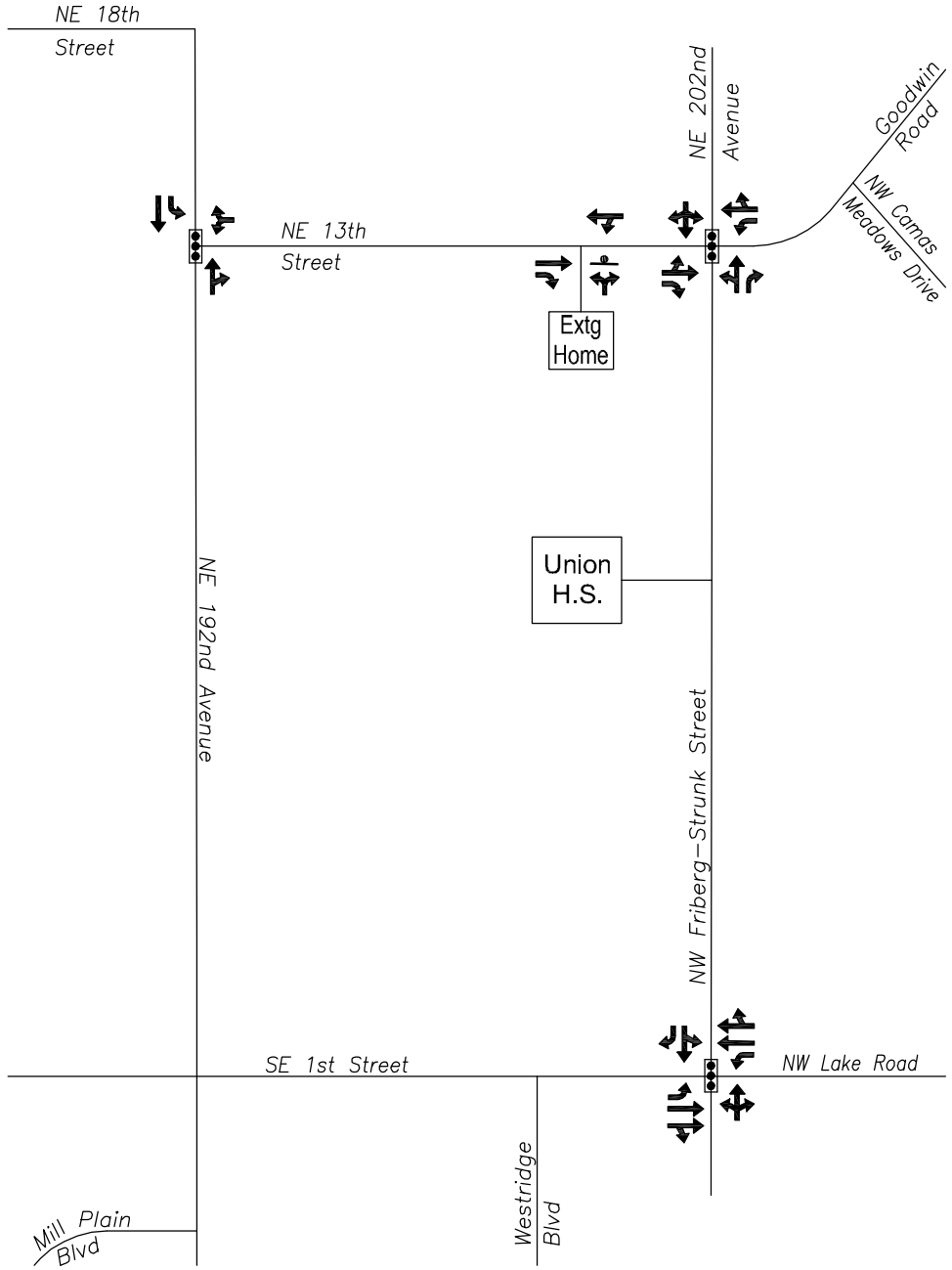
13TH STREET GAS STATION

FIGURE

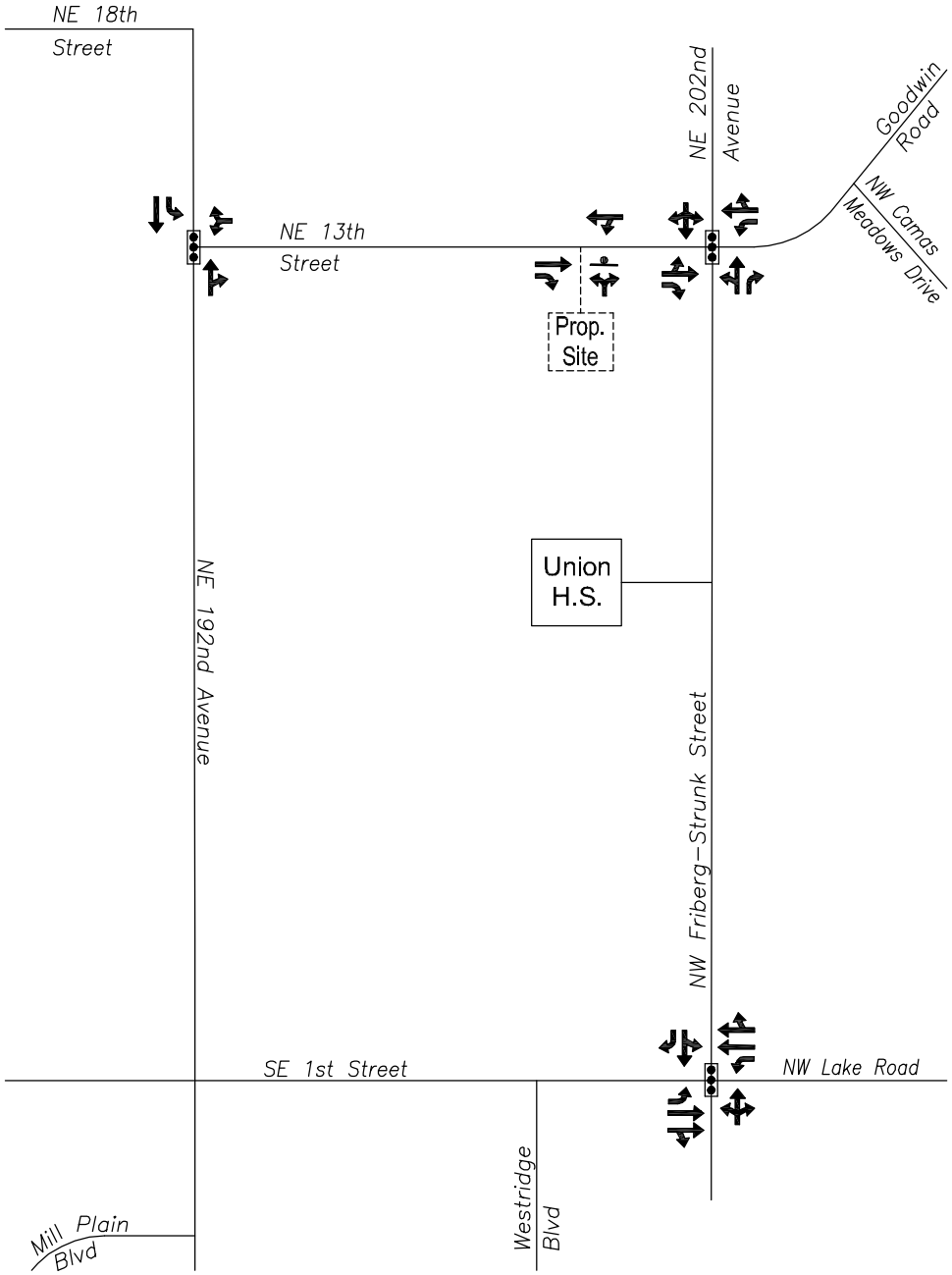
b

Exhibit 10 APPEAL24-1001

PLOT DATE: 09.08.23 FILE: 2324flow.dwg



EXISTING



PROPOSED

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PROJECT: 23-24

NOTES:

LANE CONFIGURATIONS AND TRAFFIC CONTROL

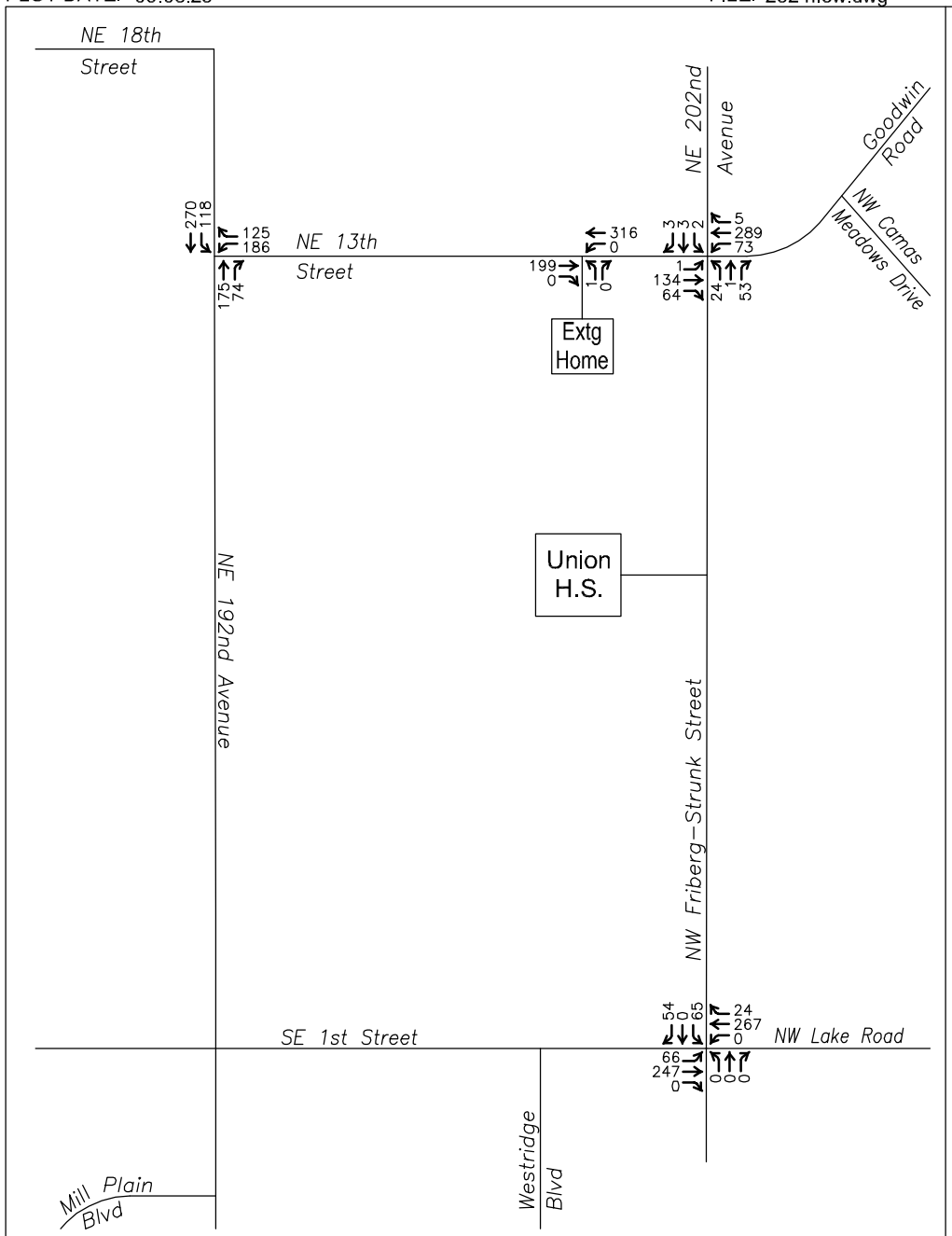
13TH STREET GAS STATION

FIGURE

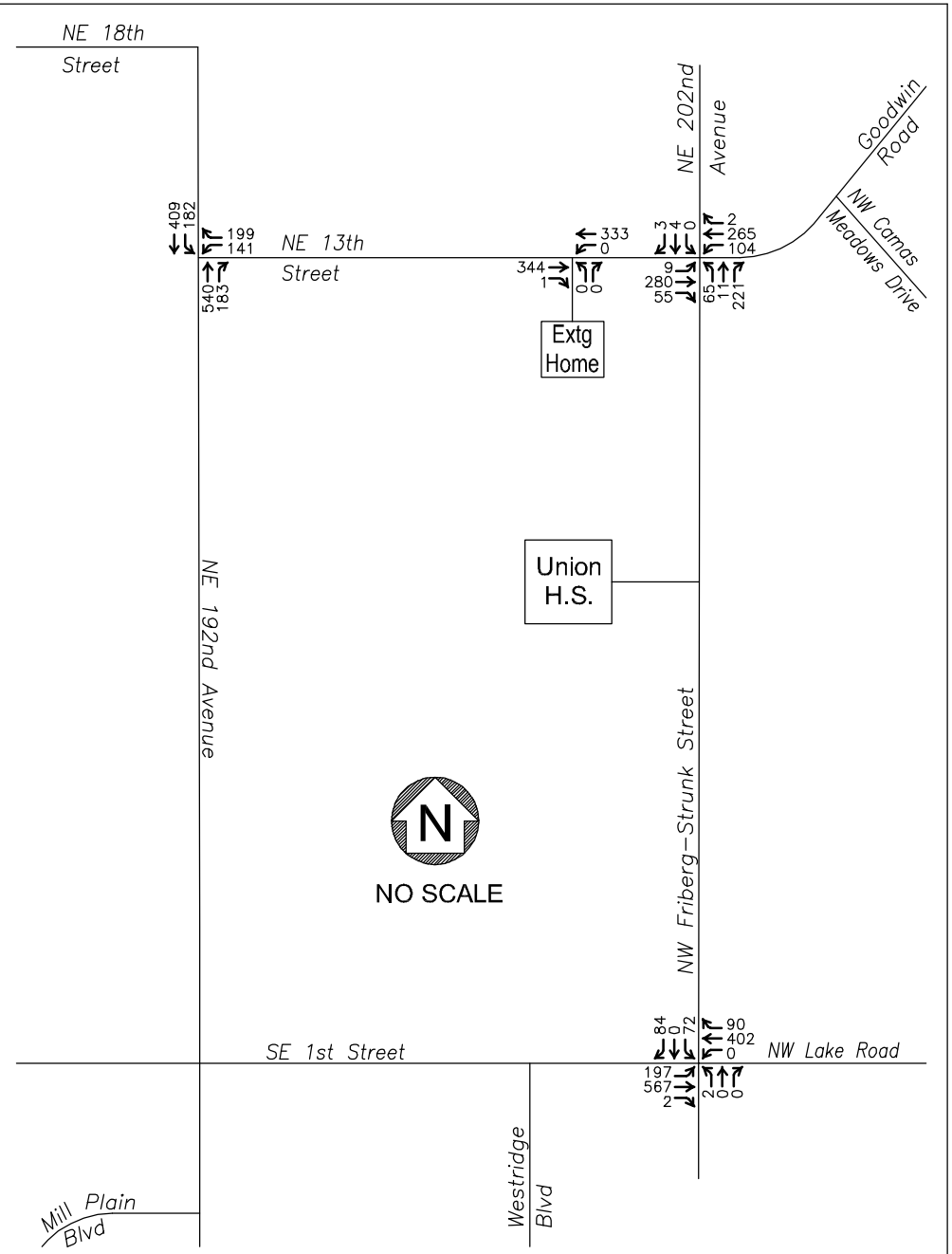
C

Exhibit 10 APPEAL24-1001

PLOT DATE: 09.08.23 FILE: 2324flow.dwg



AM PEAK HOUR



PM PEAK HOUR

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334

PROJECT: 23-24

NOTES:

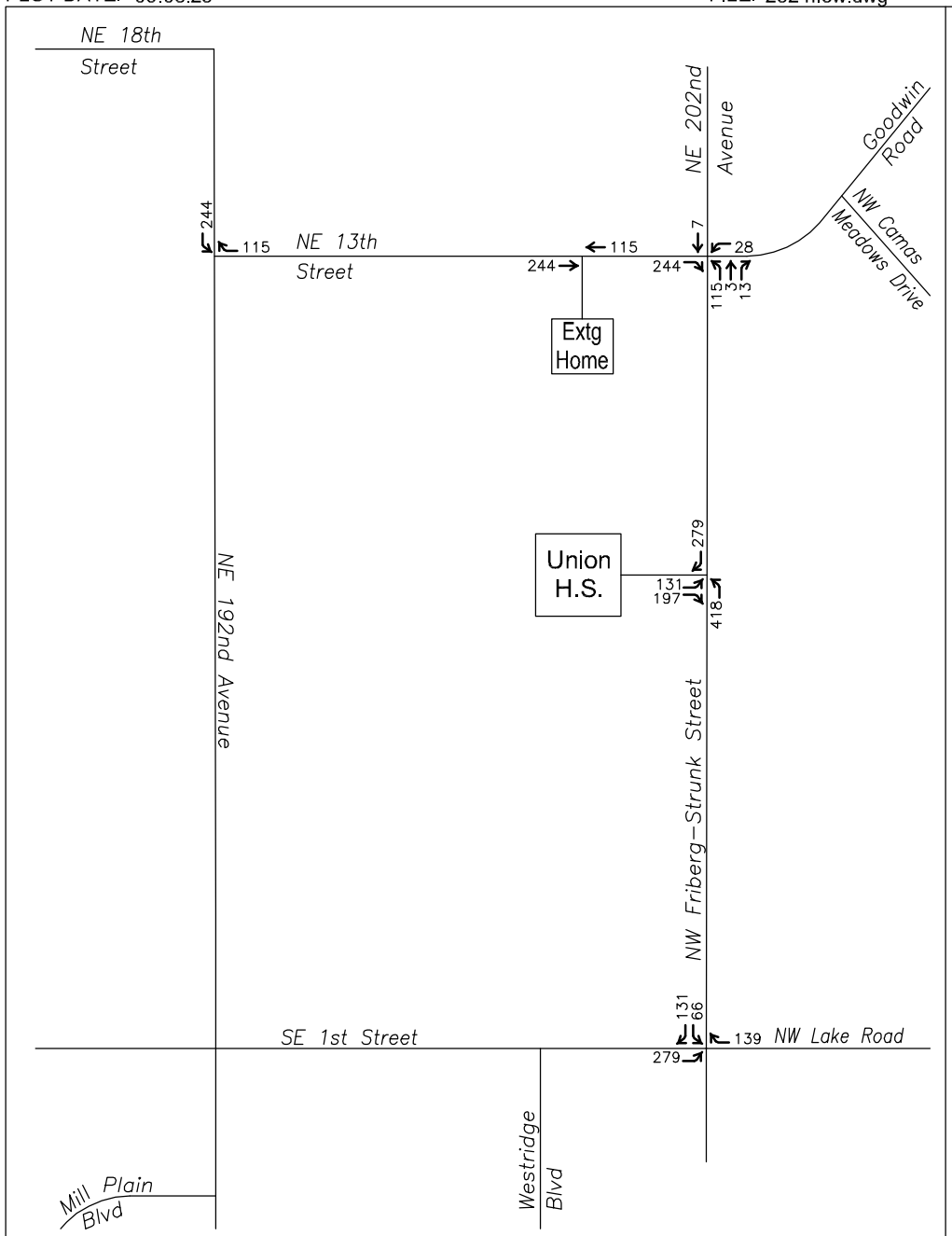
2023 EXISTING TRAFFIC
- WITHOUT UNION HIGH SCHOOL TRAFFIC -
13TH STREET GAS STATION

FIGURE

1

Exhibit 10 APPEAL24-1001

PLOT DATE: 09.08.23 FILE: 2324flow.dwg



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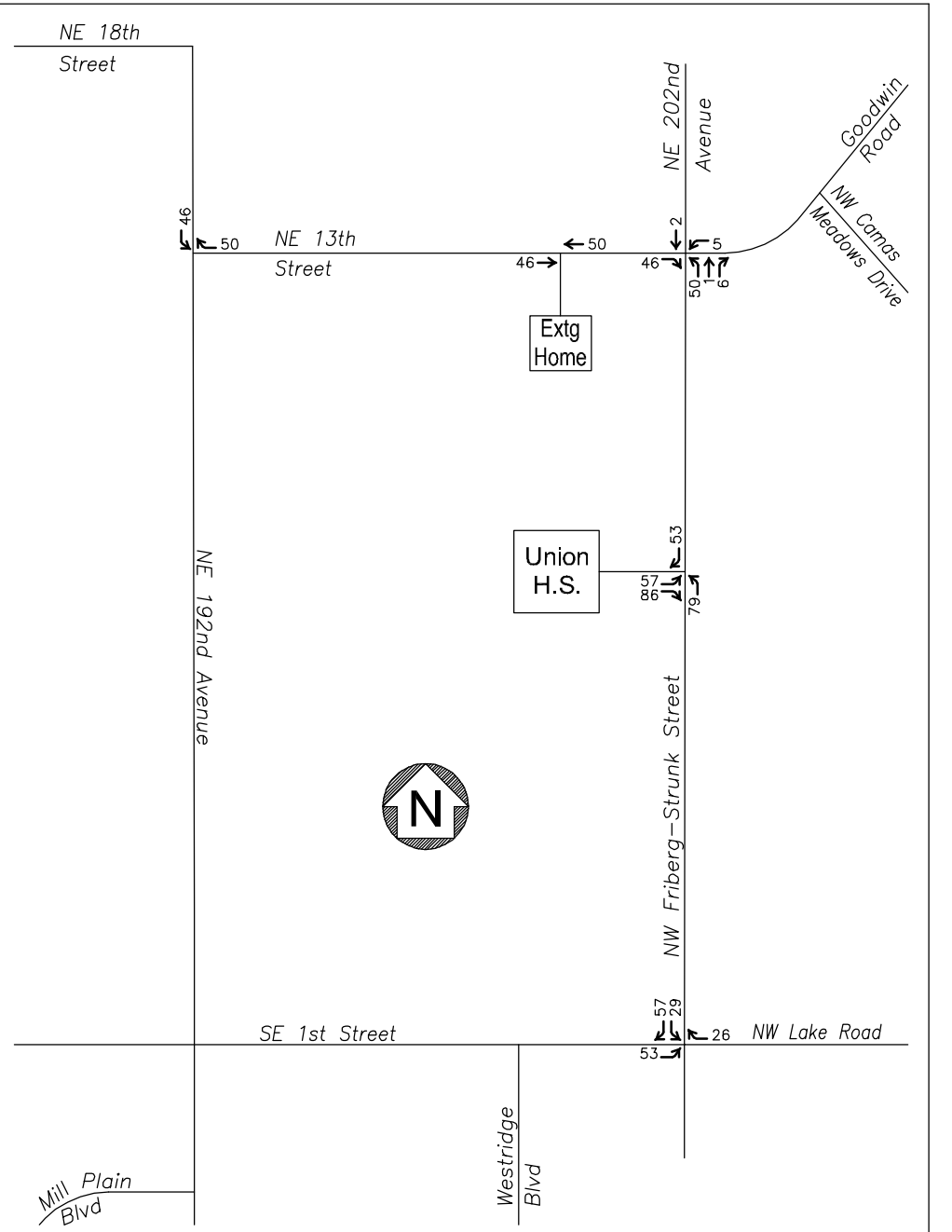

PM PEAK HOUR

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PROJECT: 23-24

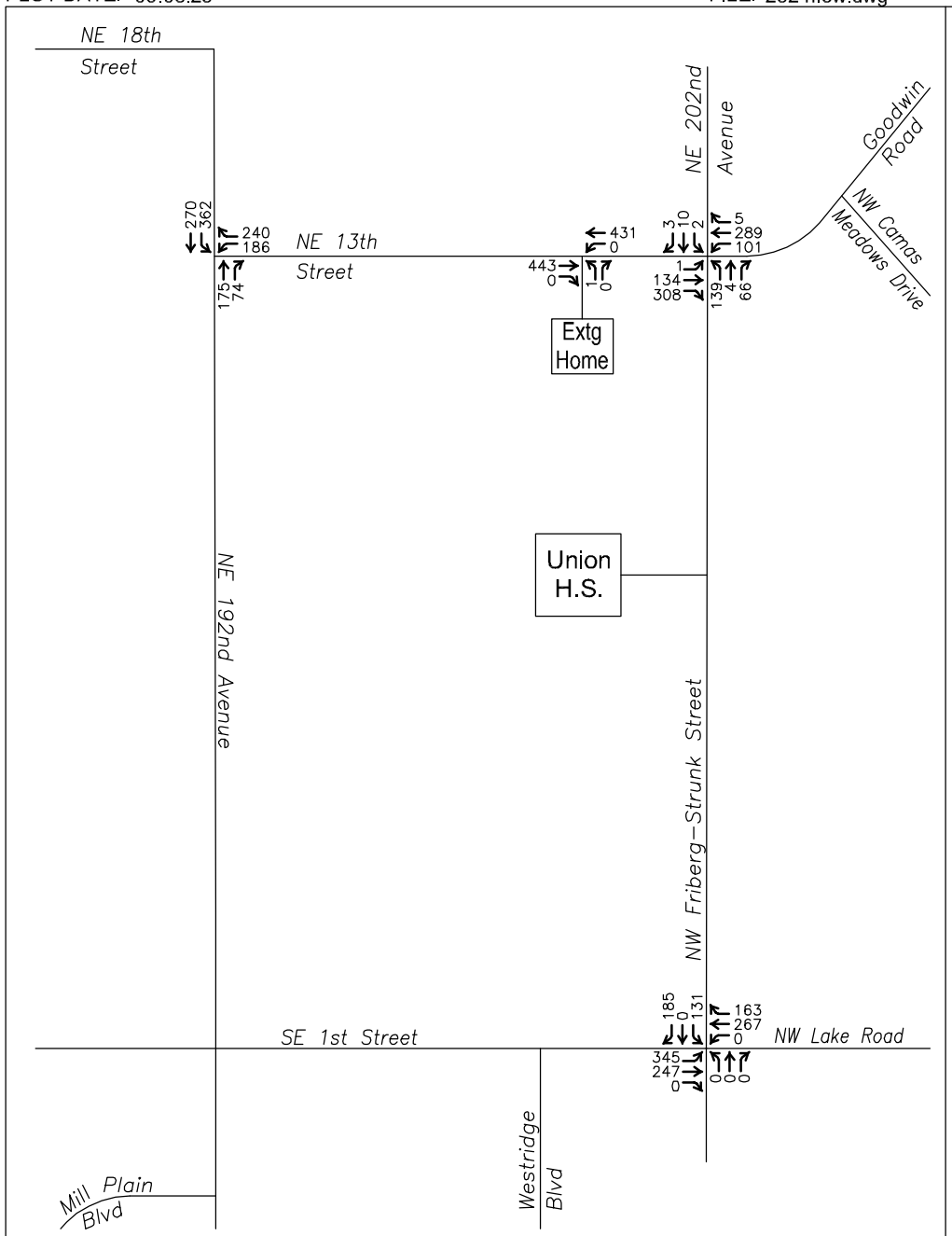
NOTES: The Union HS trip generation is based on High School (ITE 525) trip rates and an enrollment of 1,970 students.

UNION HIGH SCHOOL TRAFFIC
- MODELED -
13TH STREET GAS STATION

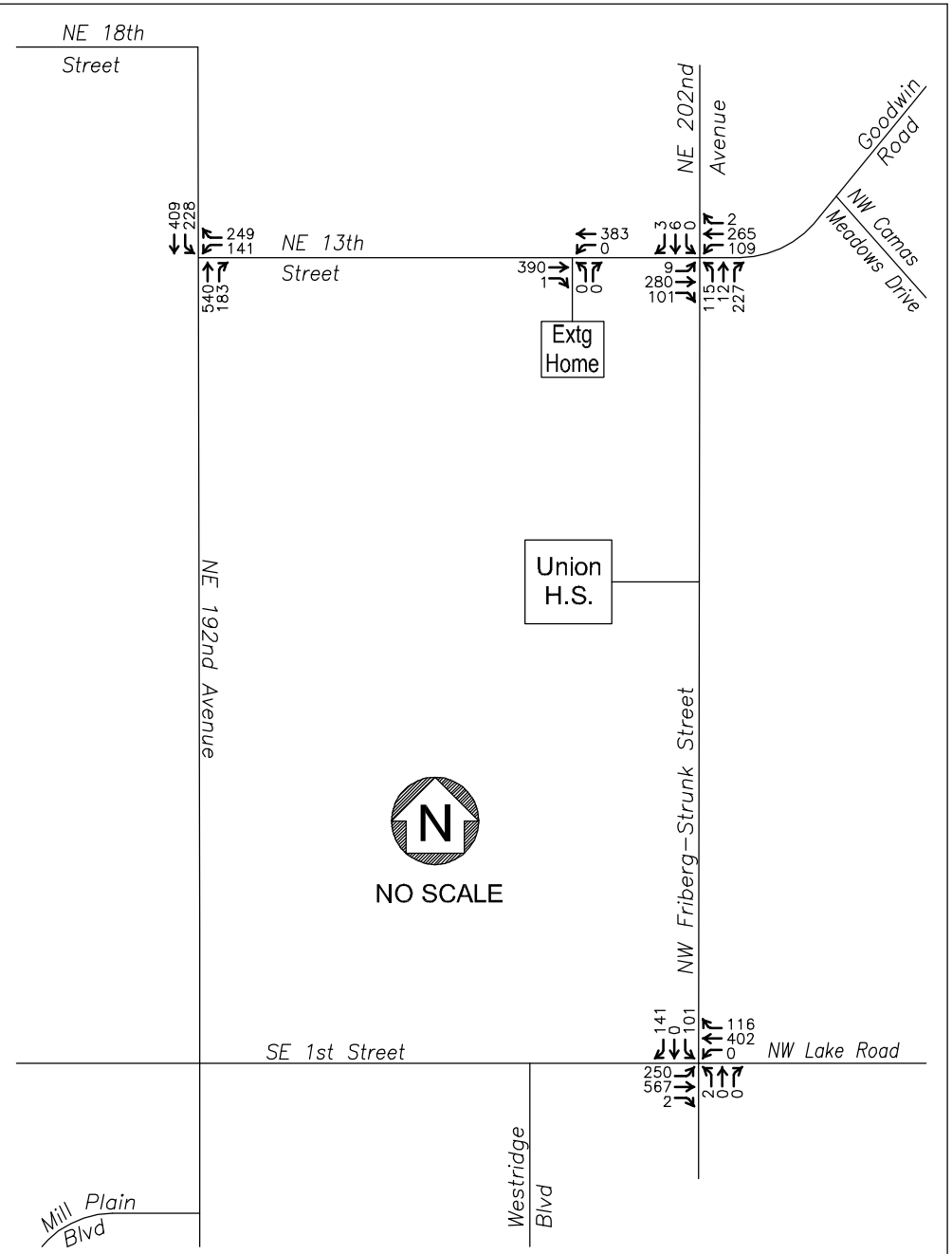
FIGURE 2

Exhibit 10 APPEAL24-1001

PLOT DATE: 09.08.23 FILE: 2324flow.dwg



AM PEAK HOUR



PM PEAK HOUR

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PROJECT: 23-24

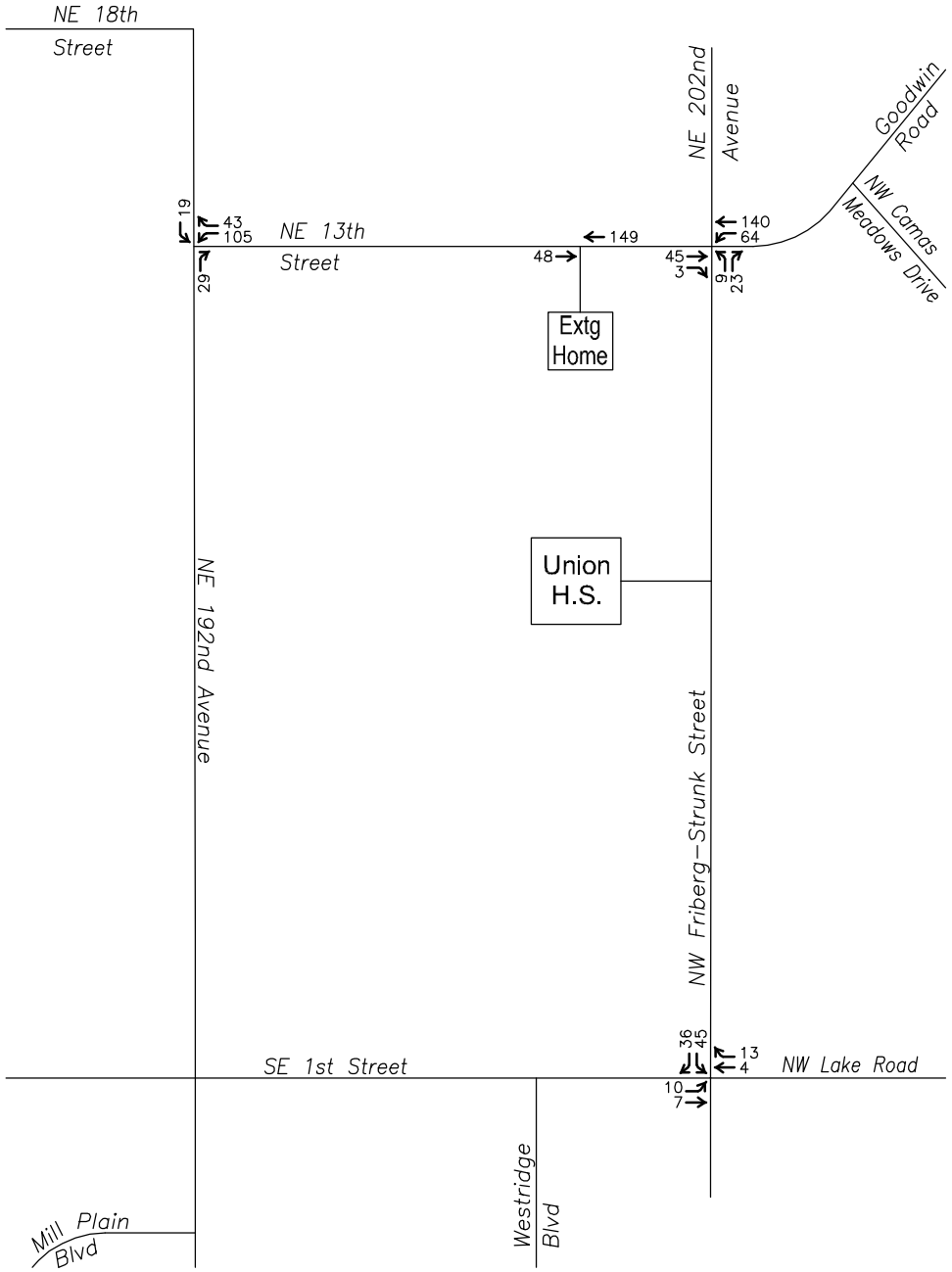
NOTES:

2023 ADJUSTED EXISTING TRAFFIC
- WITH UNION HIGH SCHOOL TRAFFIC -
13TH STREET GAS STATION

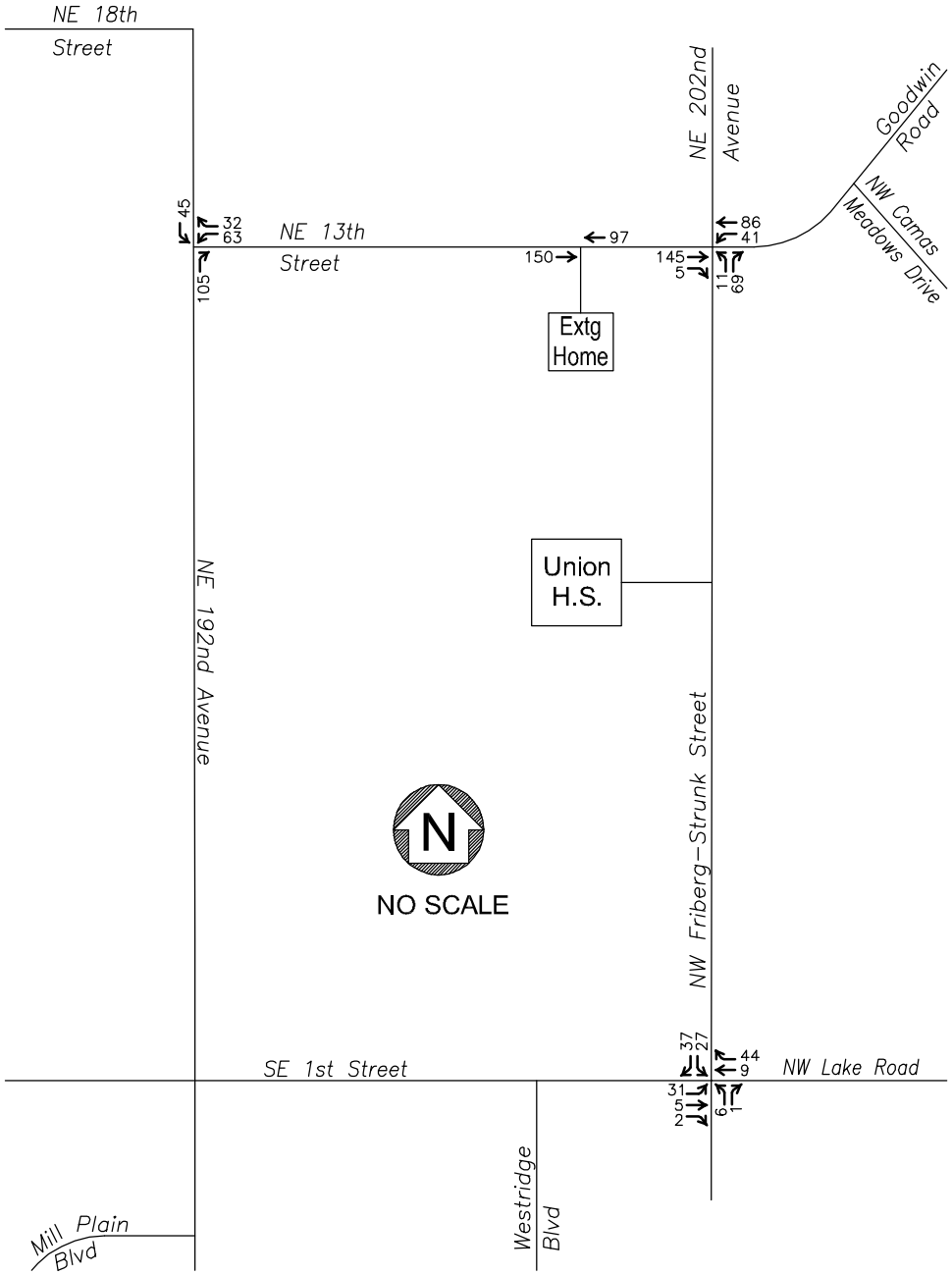
FIGURE

3

PLOT DATE: 09.08.23 FILE: 2324flow.dwg



AM PEAK HOUR



PM PEAK HOUR

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PROJECT: 23-24

NOTES:

IN-PROCESS TRAFFIC

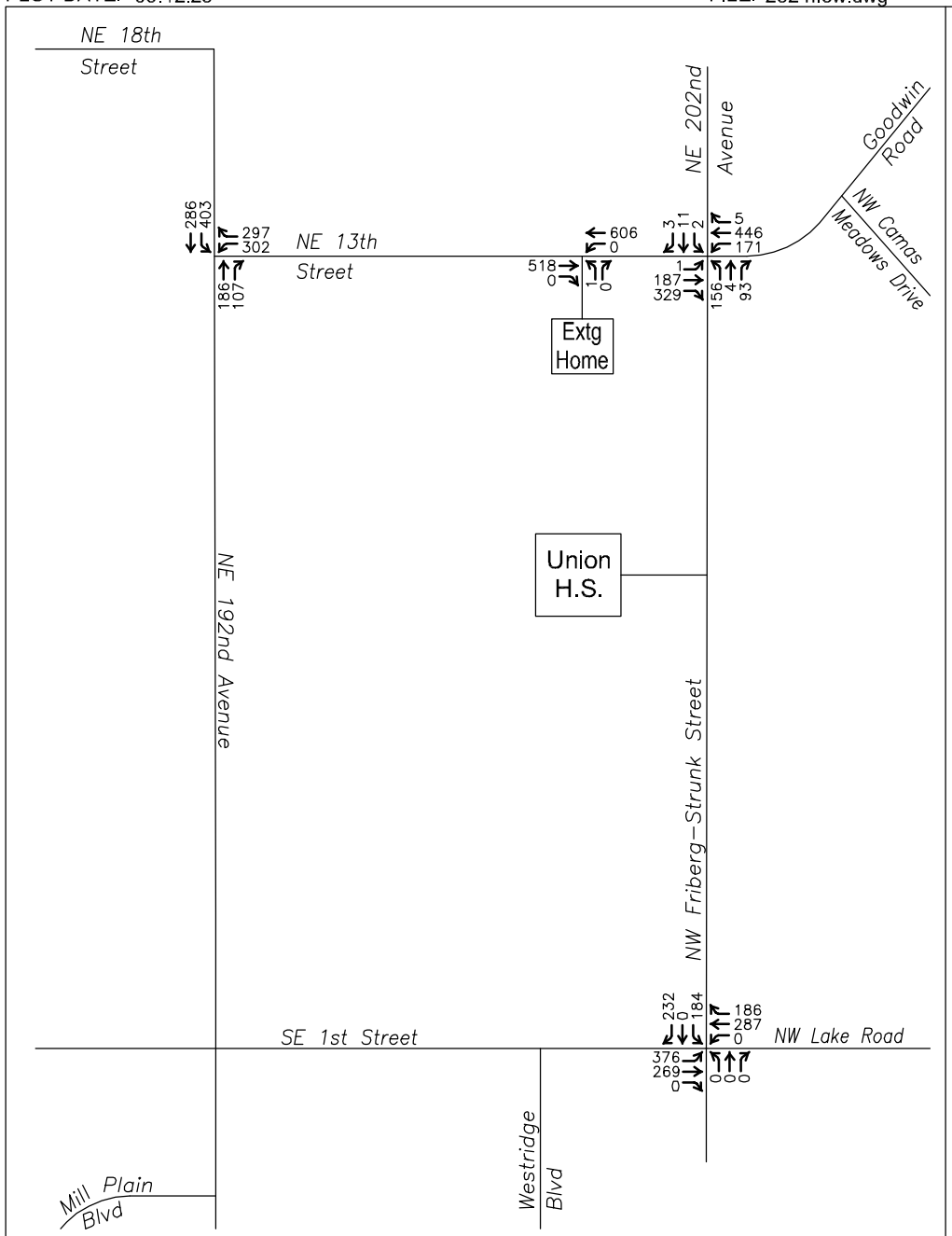
13TH STREET GAS STATION

FIGURE

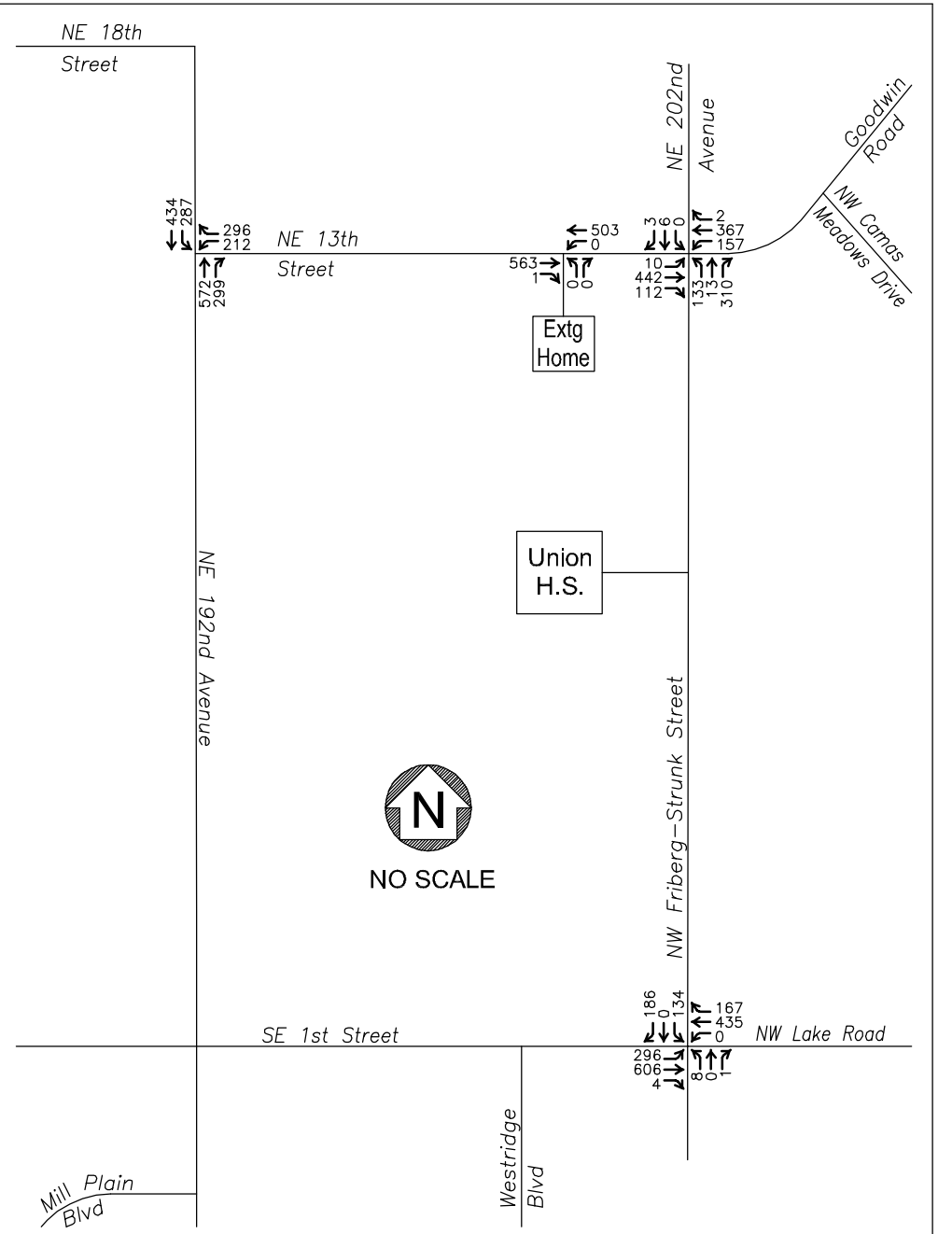
4

Exhibit 10 APPEAL24-1001

PLOT DATE: 09.12.23 FILE: 2324flow.dwg



AM PEAK HOUR



PM PEAK HOUR

338 CHARBONNEAU ENGINEERING LLC

PROJECT: 23-24

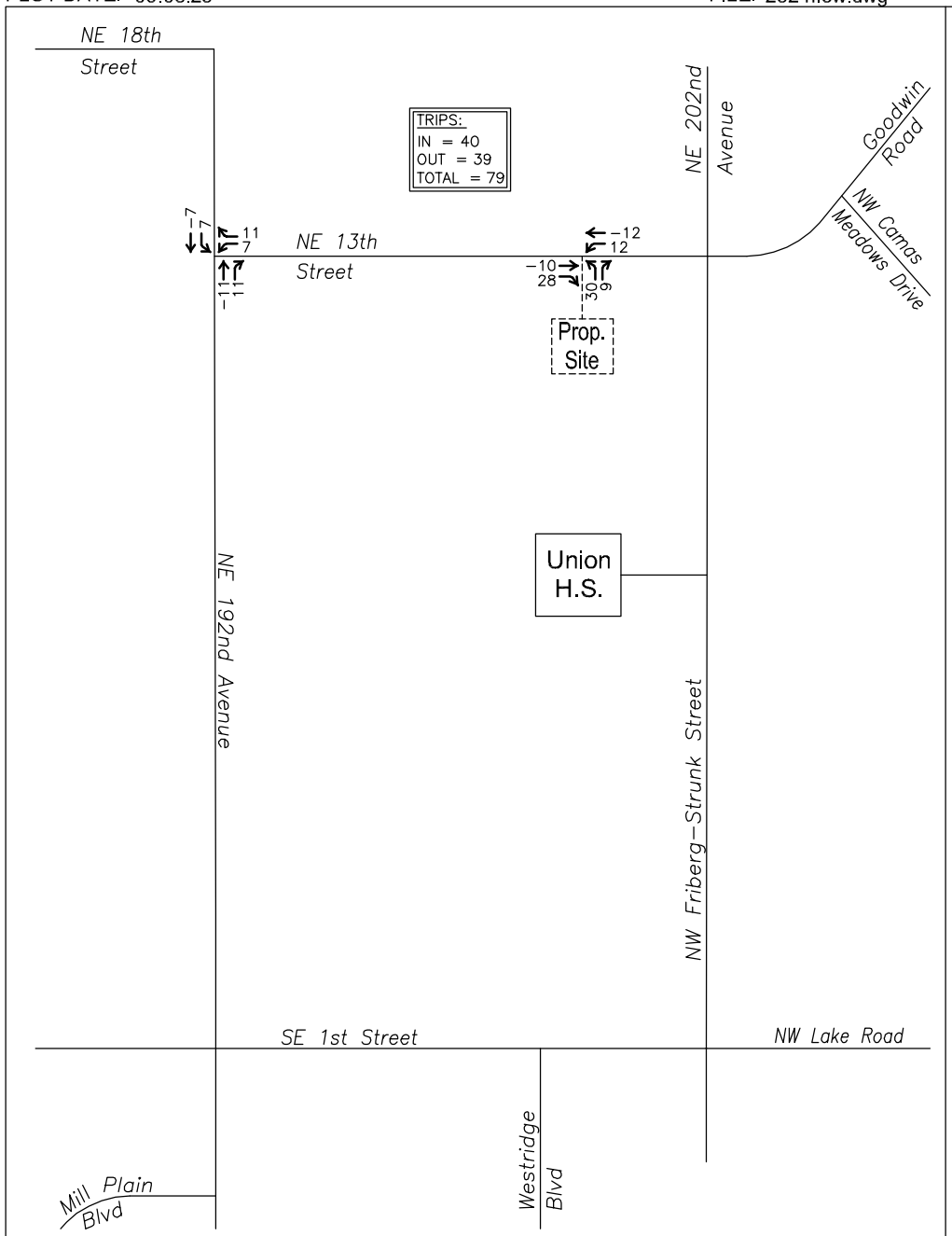
NOTES: 2026 Background Traffic = 2023 Adjusted Existing Traffic + growth (2%/yr for 3 yrs) + In-process Traffic.

2026 BACKGROUND TRAFFIC
13TH STREET GAS STATION

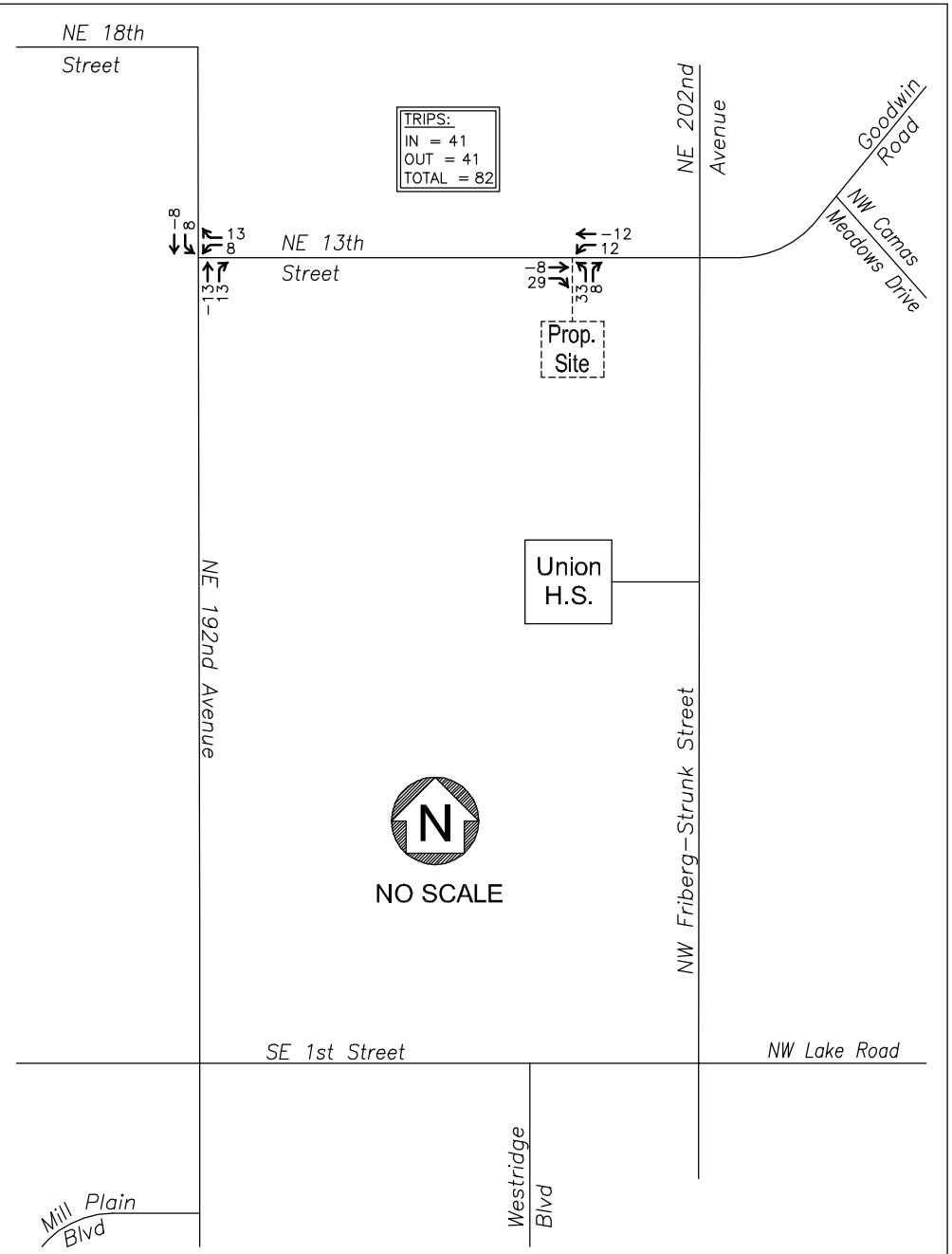
FIGURE 5

Exhibit 10 APPEAL24-1001

PLOT DATE: 09.08.23 FILE: 2324flow.dwg



AM PEAK HOUR



PM PEAK HOUR

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PROJECT: 23-24

NOTES: Pass-by trips based on rates published in the *ITE Trip Generation Handbook*.

PASS-BY TRIPS

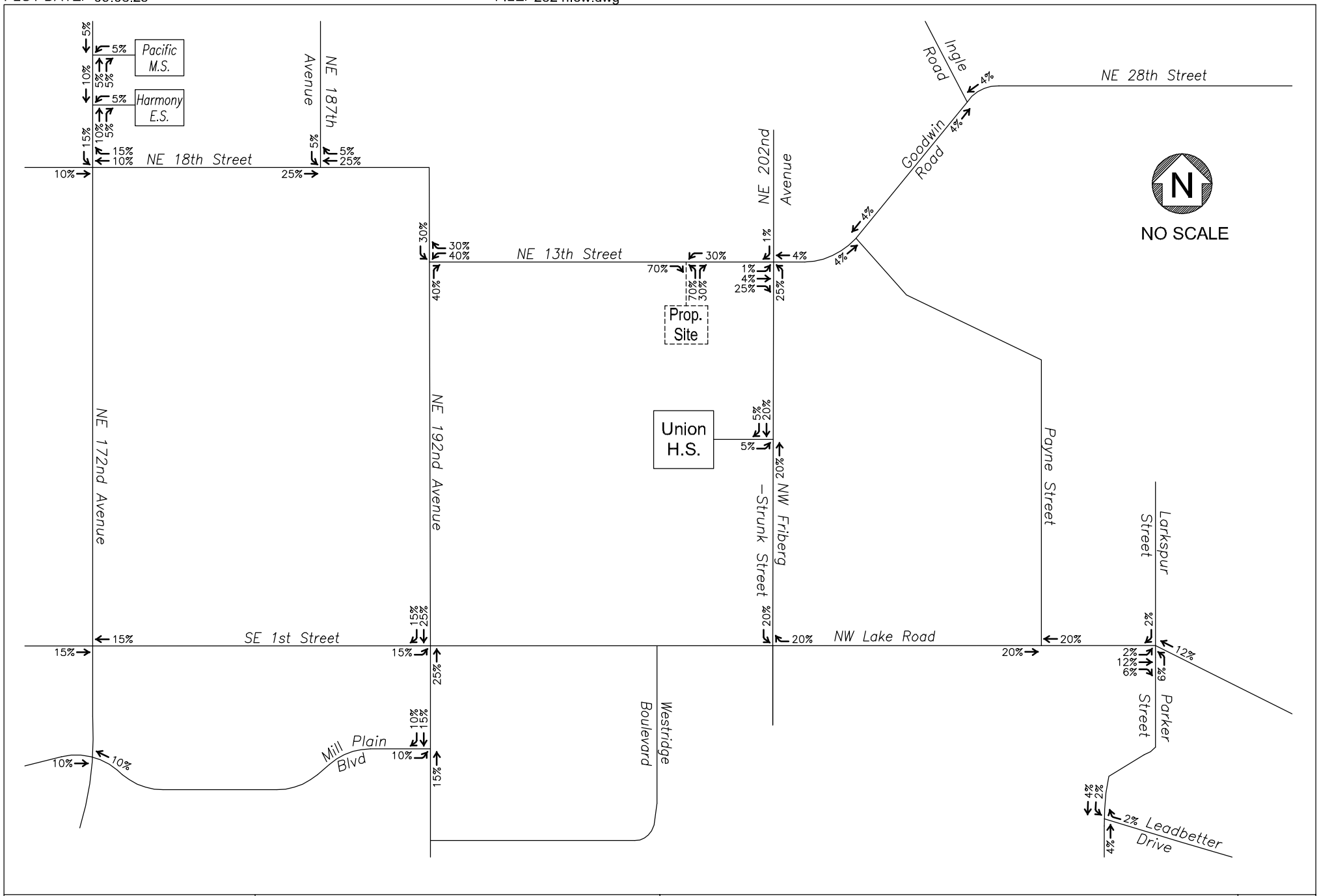
13TH STREET GAS STATION

FIGURE

6

Exhibit 10 APPEAL24-1001

PLOT DATE: 09.08.23 FILE: 2324flow.dwg



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PROJECT: 23-24

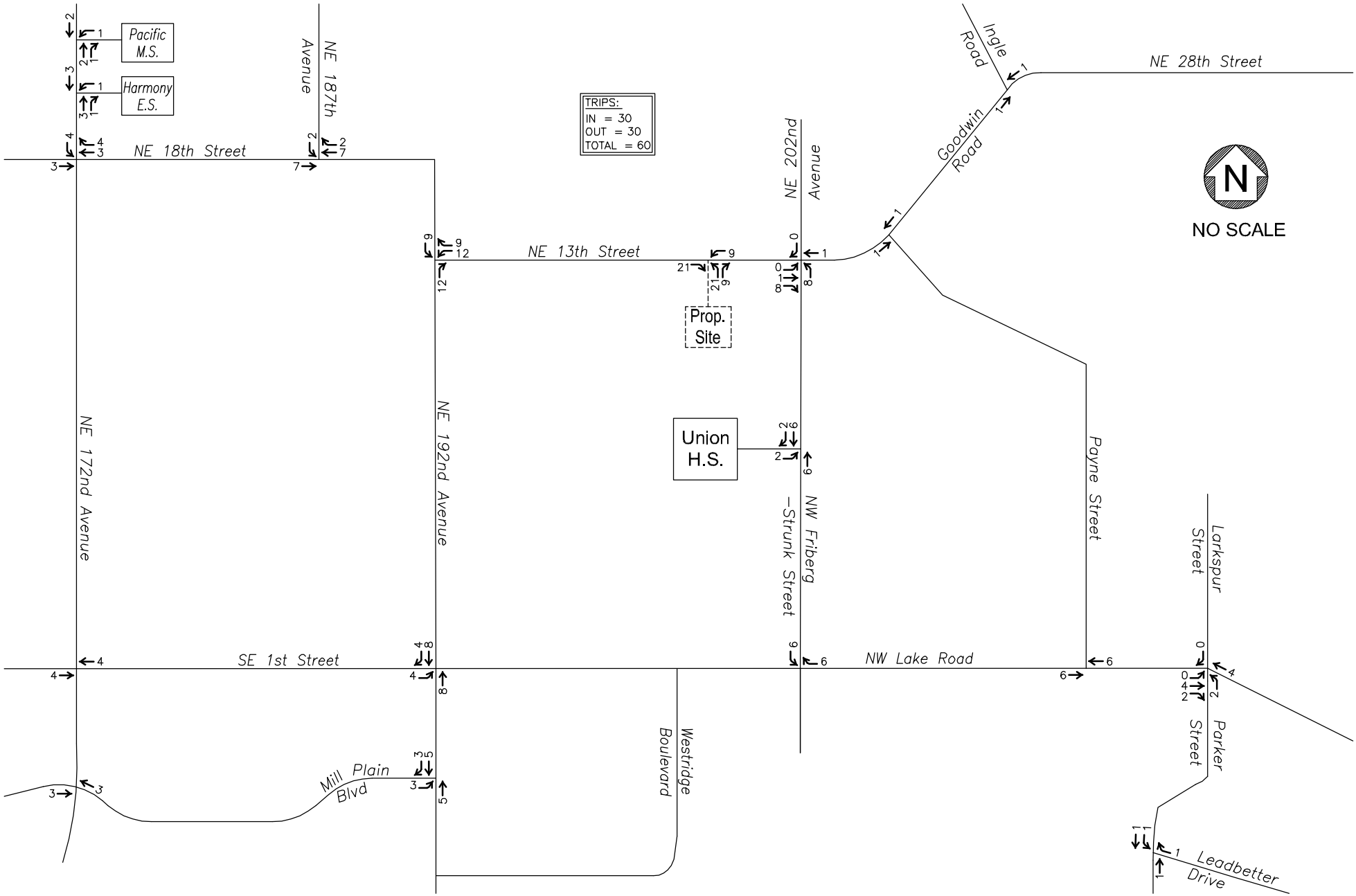
NOTES: The site's trip distribution is based on existing traffic patterns and engineering judgment.

NEW TRIP DISTRIBUTION
AM PEAK HOUR AND PM PEAK HOUR
13TH STREET GAS STATION

FIGURE 7

Exhibit 10 APPEAL24-1001

PLOT DATE: 09.08.23 FILE: 2324flow.dwg



CHARBONNEAU ENGINEERING LLC

341

PROJECT: 23-24

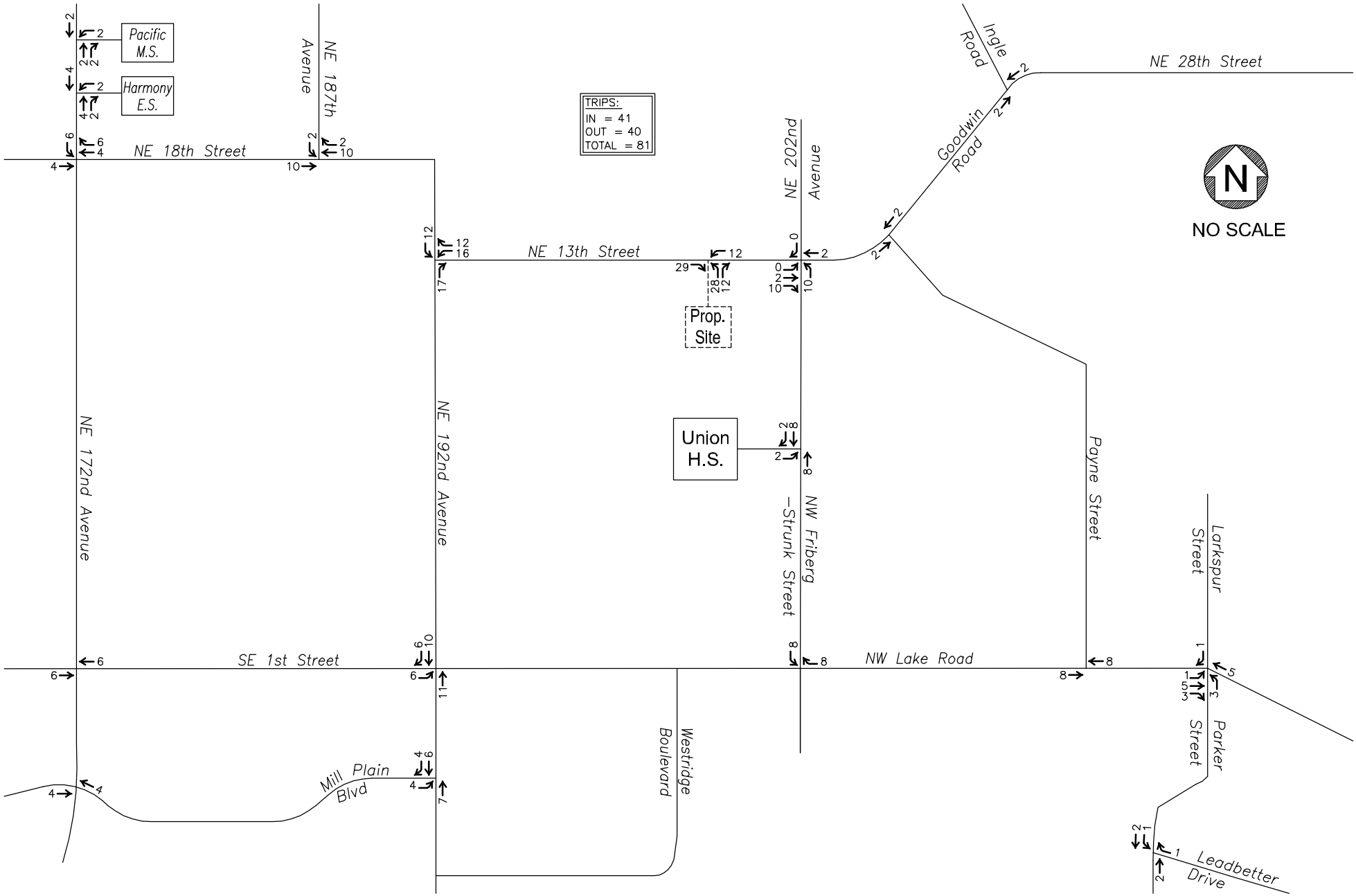
NOTES: The site's trip generation is based on Gas Station with Market (ITE 945) and Automated Car Wash (ITE 948) trip rates.

NEW TRIP ASSIGNMENT
AM PEAK HOUR
13TH STREET GAS STATION

FIGURE 8a

Exhibit 10 APPEAL24-1001

PLOT DATE: 09.08.23 FILE: 2324flow.dwg



CHARBONNEAU ENGINEERING LLC

342

PROJECT: 23-24

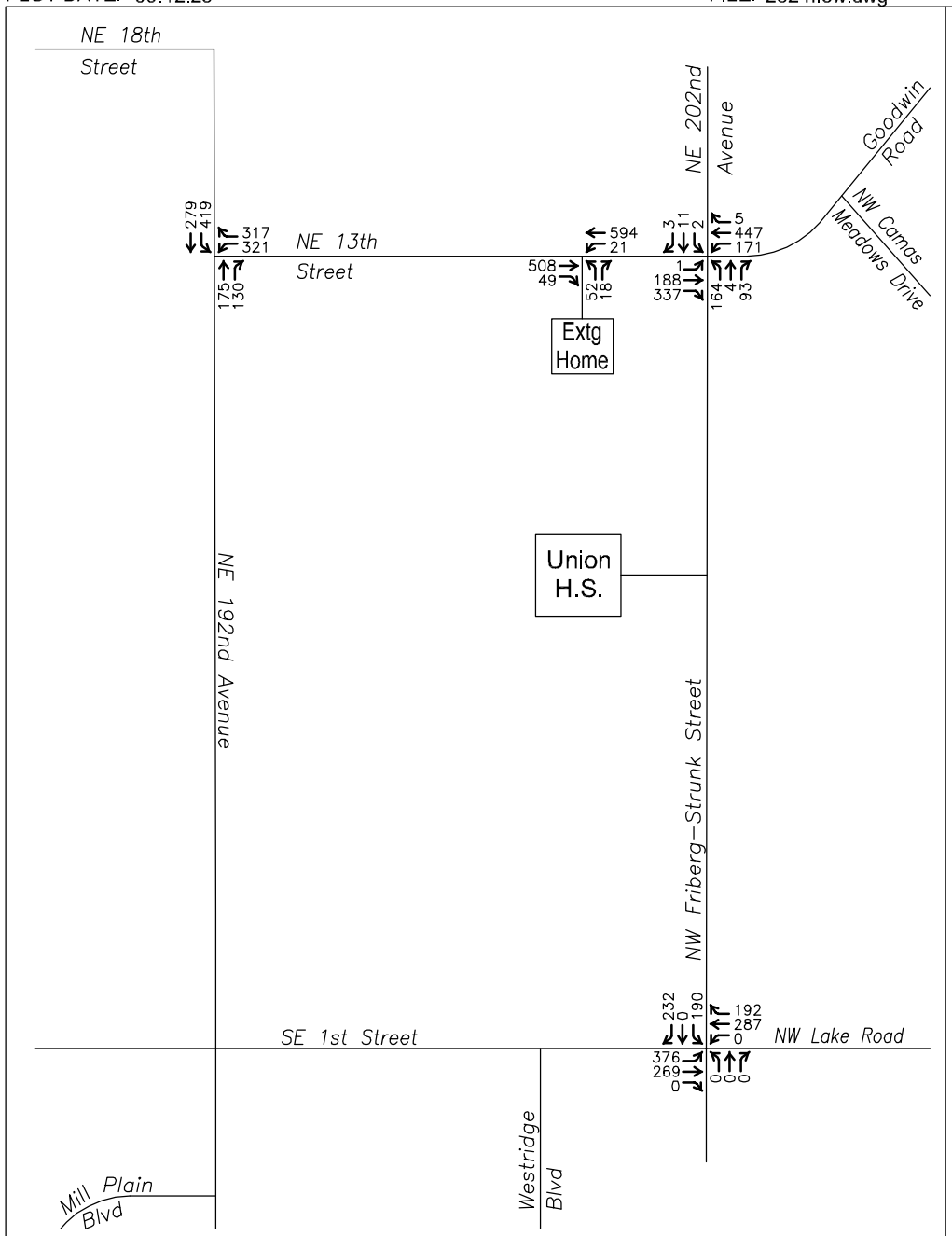
NOTES: The site's trip generation is based on Gas Station with Market (ITE 945) and Automated Car Wash (ITE 948) trip rates.

NEW TRIP ASSIGNMENT
PM PEAK HOUR
13TH STREET GAS STATION

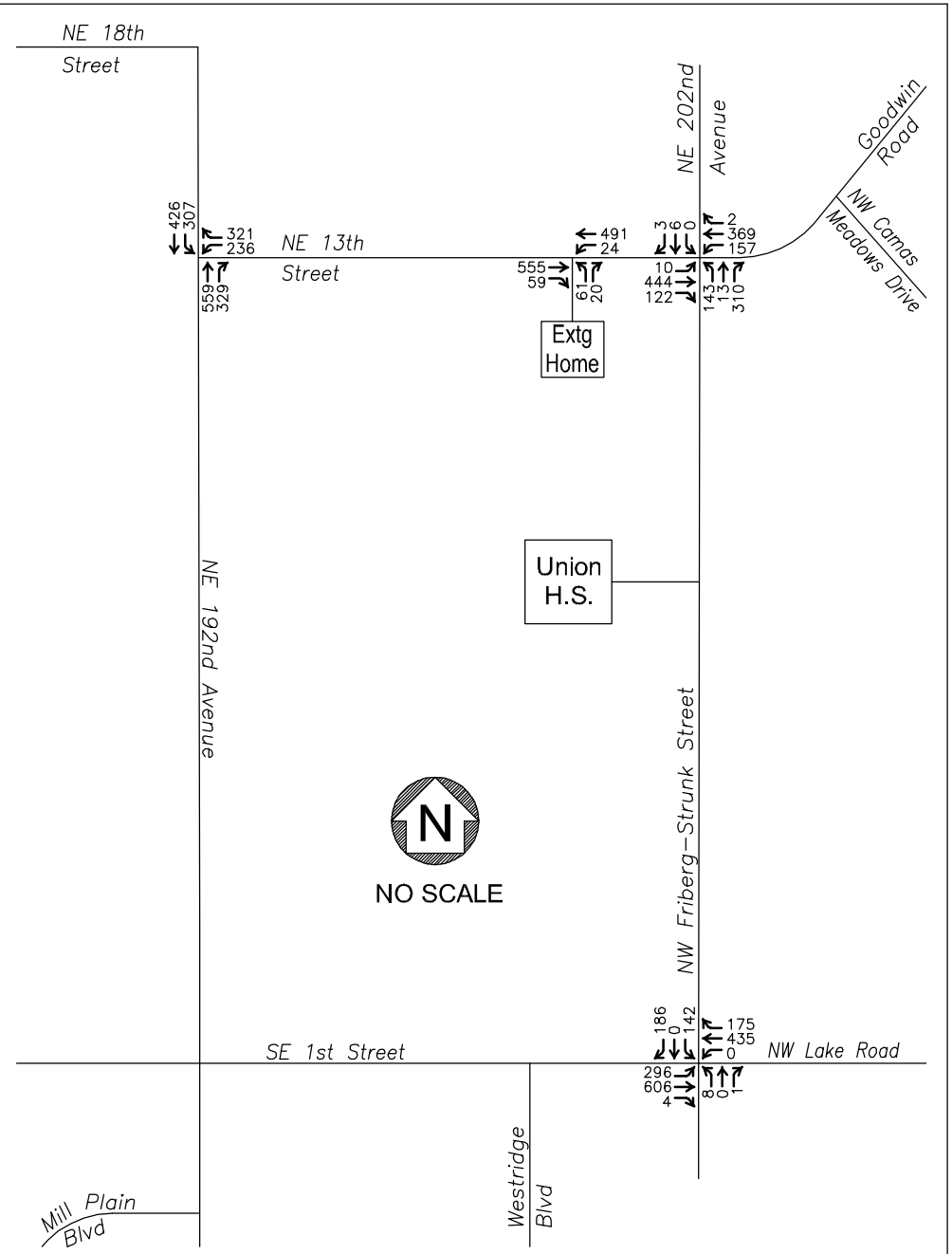
FIGURE 8b

Exhibit 10 APPEAL24-1001

PLOT DATE: 09.12.23 FILE: 2324flow.dwg



AM PEAK HOUR



PM PEAK HOUR

CHARBONNEAU ENGINEERING LLC

343

PROJECT: 23-24

NOTES: 2026 Total Traffic = 2026 Background Traffic + Pass-by Traffic + New Trip Assignment.

2026 TOTAL TRAFFIC

13TH STREET GAS STATION

FIGURE

9

Exhibit 10 APPEAL24-1001

File Name: NE 192nd Ave at NE 13th St
Start Date: 8/1/2023
Start Time: 7:00 AM
Site Code: 1

Peak Hour: 7:55-8:55AM
Peak 15-min: 8:40-8:55AM

ALL VEHICLES	Northbound NE 192nd Ave					Southbound NE 192nd Ave					Eastbound NE 13th St					Westbound NE 13th St						
Time Period	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	5-min Total	Hourly Totals
7:00 AM	0	16	4	0	0	3	12	0	0	0	0	0	0	0	0	11	0	8	0	0	54	824
7:05 AM	0	11	1	0	0	1	17	0	0	0	0	0	0	0	0	11	0	7	0	0	48	836
7:10 AM	0	9	7	0	0	3	18	0	0	0	0	0	0	0	0	11	0	9	0	0	57	851
7:15 AM	0	11	4	0	0	4	17	0	0	0	0	0	0	0	0	6	0	10	0	0	52	882
7:20 AM	0	12	2	0	0	7	16	0	0	0	0	0	0	0	0	14	0	4	0	0	55	906
7:25 AM	0	18	6	0	0	9	19	0	0	0	0	0	0	0	0	10	0	6	0	0	68	919
7:30 AM	0	13	5	0	0	9	17	0	0	0	0	0	0	0	0	16	0	13	0	0	73	938
7:35 AM	0	22	2	0	0	17	15	0	0	0	0	0	0	0	0	10	0	14	0	0	80	935
7:40 AM	0	8	2	0	0	16	19	0	0	0	0	0	0	0	0	15	0	14	0	0	74	933
7:45 AM	0	13	4	0	0	9	24	0	0	0	0	0	0	0	0	15	0	20	0	0	85	937
7:50 AM	0	13	8	0	0	15	26	0	0	0	0	0	0	0	0	15	0	12	0	0	89	945
7:55 AM	0	14	7	0	0	15	25	0	0	0	0	0	0	0	0	15	0	13	0	0	89	948
8:00 AM	0	13	4	0	0	10	16	0	0	0	0	0	0	0	0	11	0	12	0	0	66	945
8:05 AM	0	17	4	0	0	10	17	0	0	0	0	0	0	0	0	8	0	7	0	0	63	
8:10 AM	0	15	12	0	0	9	29	0	0	0	0	0	0	0	0	13	0	10	0	0	88	
8:15 AM	0	14	7	0	0	6	17	0	0	0	0	0	0	0	0	19	0	13	0	0	76	
8:20 AM	0	16	5	0	0	4	18	0	0	0	0	0	0	0	0	16	0	9	0	0	68	
8:25 AM	0	14	11	0	0	9	27	0	0	0	0	0	0	0	0	18	0	8	0	0	87	
8:30 AM	0	11	10	0	0	5	25	0	0	0	0	0	0	0	0	16	0	3	0	0	70	
8:35 AM	0	19	3	0	0	8	21	0	0	0	0	0	0	0	0	13	0	14	0	0	78	
8:40 AM	0	15	2	0	0	8	22	0	0	0	0	0	0	0	0	18	0	13	0	0	78	
8:45 AM	0	18	3	0	0	16	27	0	0	0	0	0	0	0	0	14	0	15	0	0	93	
8:50 AM	0	9	6	0	0	18	26	0	0	0	0	0	0	0	0	25	0	8	0	0	92	
8:55 AM	0	16	7	0	0	12	17	0	0	0	0	0	0	0	0	19	0	15	0	0	86	

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	NB RTOR	SB Left	SB Thru	SB Right	SB U-Turn	SB RTOR	EB Left	EB Thru	EB Right	EB U-Turn	EB RTOR	WB Left	WB Thru	WB Right	WB U-Turn	WB RTOR
Cars	0	167	72	0	0	113	248	0	0	0	0	0	0	0	0	184	0	121	0	0
Trucks	0	8	2	0	0	5	22	0	0	0	0	0	0	0	0	2	0	4	0	0
Peak Vols	0	175	74	0	0	118	270	0	0	0	0	0	0	0	0	186	0	125	0	0
Trucks %	4.0%					7.0%					0%					1.9%				
Peds	0					1					0					1				

PHF= 0.90

File Name: NE 192nd Ave at NE 13th St
Start Date: 8/1/2023
Start Time: 4:00 PM
Site Code: 1

Peak Hour: 4:30-5:30PM
Peak 15-min: 4:45-5:00PM

ALL VEHICLES	Northbound NE 192nd Ave					Southbound NE 192nd Ave					Eastbound NE 13th St					Westbound NE 13th St						
Time Period	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	5-min Total	Hourly Totals
4:00 PM	0	40	12	0	0	4	28	0	0	0	0	0	0	0	0	7	0	14	0	0	105	1547
4:05 PM	0	36	10	0	0	12	21	0	0	0	0	0	0	0	0	19	0	10	0	0	108	1577
4:10 PM	0	22	11	0	0	18	43	0	0	0	0	0	0	0	0	21	0	13	0	0	128	1601
4:15 PM	0	51	16	0	0	10	24	0	0	0	0	0	0	0	0	19	0	9	0	0	129	1611
4:20 PM	0	43	11	0	0	19	23	0	0	0	0	0	0	0	0	10	0	11	0	0	117	1629
4:25 PM	0	44	9	0	0	12	29	0	0	0	0	0	0	0	0	7	0	13	0	0	114	1648
4:30 PM	0	46	15	0	0	16	27	0	0	0	0	0	0	0	0	9	0	14	0	0	127	1654
4:35 PM	0	47	12	0	0	20	28	0	0	0	0	0	0	0	0	8	0	15	0	0	130	1643
4:40 PM	0	37	19	0	0	13	33	0	0	0	0	0	0	0	0	12	0	18	0	0	132	1642
4:45 PM	0	38	21	0	0	21	32	0	0	0	0	0	0	0	0	13	0	20	0	0	145	1650
4:50 PM	0	45	15	0	0	10	30	0	0	0	0	0	0	0	0	12	0	27	0	0	139	1630
4:55 PM	0	50	19	0	0	16	57	0	0	0	0	0	0	0	0	10	0	21	0	0	173	1600
5:00 PM	0	47	9	0	0	14	36	0	0	0	0	0	0	0	0	13	0	16	0	0	135	1546
5:05 PM	0	50	17	0	0	8	42	0	0	0	0	0	0	0	0	8	0	7	0	0	132	
5:10 PM	0	41	17	0	0	19	36	0	0	0	0	0	0	0	0	12	0	13	0	0	138	
5:15 PM	0	37	11	0	0	22	38	0	0	0	0	0	0	0	0	22	0	17	0	0	147	
5:20 PM	0	51	15	0	0	11	27	0	0	0	0	0	0	0	0	12	0	20	0	0	136	
5:25 PM	0	51	13	0	0	12	23	0	0	0	0	0	0	0	0	10	0	11	0	0	120	
5:30 PM	0	37	13	0	0	14	25	0	0	0	0	0	0	0	0	10	0	17	0	0	116	
5:35 PM	0	50	16	0	0	16	28	0	0	0	0	0	0	0	0	13	0	6	0	0	129	
5:40 PM	0	42	12	0	0	19	33	0	0	0	0	0	0	0	0	15	0	19	0	0	140	
5:45 PM	0	44	14	0	0	15	35	0	0	0	0	0	0	0	0	10	0	7	0	0	125	
5:50 PM	0	33	10	0	0	16	31	0	0	0	0	0	0	0	0	7	0	12	0	0	109	
5:55 PM	0	41	14	0	0	11	26	0	0	0	0	0	0	0	0	12	0	15	0	0	119	

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	NB RTOR	SB Left	SB Thru	SB Right	SB U-Turn	SB RTOR	EB Left	EB Thru	EB Right	EB U-Turn	EB RTOR	WB Left	WB Thru	WB Right	WB U-Turn	WB RTOR
Cars	0	540	174	0	0	182	405	0	0	0	0	0	0	0	0	139	0	197	0	0
Trucks	0	0	9	0	0	0	4	0	0	0	0	0	0	0	0	2	0	2	0	0
Peak Vols	0	540	183	0	0	182	409	0	0	0	0	0	0	0	0	141	0	199	0	0
Trucks %	1.2%					0.7%					0%					1.2%				
Peds	0					0					0					0				

PHF= 0.90

File Name: NW Friberg-Strunk St at NE 13th St
Start Date: 8/1/2023
Start Time: 7:00 AM
Site Code: 2

Peak Hour: 7:30-8:30AM
Peak 15-min: 7:35-7:50AM

ALL VEHICLES	Northbound NE Friberg-Strunk St					Southbound NE 202nd Ave					Eastbound NE 13th St					Westbound NE Goodwin Rd						
Time Period	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	5-min Total	Hourly Totals
7:00 AM	4	0	3	0	0	0	0	1	0	0	0	6	1	0	0	4	12	1	0	0	32	571
7:05 AM	1	0	4	0	0	0	0	1	0	0	0	2	0	0	0	0	18	0	0	0	26	592
7:10 AM	2	0	4	0	0	0	0	0	0	0	0	5	2	0	0	7	16	0	0	0	36	601
7:15 AM	2	0	6	0	0	0	0	1	0	0	0	11	2	0	0	3	12	0	0	0	37	622
7:20 AM	1	0	4	0	0	0	0	0	0	0	0	6	4	0	0	12	15	0	0	0	42	636
7:25 AM	0	0	2	0	0	0	0	2	0	0	0	8	2	0	0	6	18	0	0	0	38	635
7:30 AM	2	0	3	0	0	0	0	1	0	0	0	8	8	0	0	4	24	0	0	0	50	652
7:35 AM	4	0	5	0	0	0	1	0	0	0	0	8	9	0	0	4	19	1	0	0	51	652
7:40 AM	0	0	5	0	0	0	1	0	0	0	0	10	13	0	0	8	31	1	0	0	69	647
7:45 AM	5	0	8	0	0	0	0	0	0	0	0	10	5	0	0	9	35	0	0	0	72	634
7:50 AM	2	0	7	0	0	0	1	0	0	0	0	13	5	0	0	4	18	1	0	0	51	625
7:55 AM	4	0	5	0	0	1	0	1	0	0	0	16	7	0	0	8	25	0	0	0	67	632
8:00 AM	2	0	4	0	0	0	0	1	0	0	0	10	4	0	0	12	20	0	0	0	53	628
8:05 AM	2	0	2	0	0	0	0	0	0	0	0	7	3	0	0	4	17	0	0	0	35	
8:10 AM	1	1	5	0	0	0	0	0	0	0	0	16	6	0	0	7	21	0	0	0	57	
8:15 AM	0	0	2	0	0	0	0	0	0	0	0	11	1	0	0	5	32	0	0	0	51	
8:20 AM	0	0	4	0	0	1	0	0	0	0	0	10	2	0	0	2	21	1	0	0	41	
8:25 AM	2	0	3	0	0	0	0	0	0	0	1	15	1	0	0	6	26	1	0	0	55	
8:30 AM	0	1	4	0	0	1	0	1	0	0	0	17	3	0	0	3	19	1	0	0	50	
8:35 AM	6	0	4	0	0	0	0	0	0	0	0	10	2	0	0	7	17	0	0	0	46	
8:40 AM	1	0	6	0	0	0	0	0	0	0	0	7	2	0	0	9	31	0	0	0	56	
8:45 AM	2	0	1	0	0	2	1	0	0	0	1	11	7	0	0	5	33	0	0	0	63	
8:50 AM	2	0	1	0	0	0	0	0	0	0	0	14	6	0	0	10	25	0	0	0	58	
8:55 AM	2	0	5	0	0	1	0	1	0	0	0	8	10	0	0	6	29	1	0	0	63	

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	NB RTOR	SB Left	SB Thru	SB Right	SB U-Turn	SB RTOR	EB Left	EB Thru	EB Right	EB U-Turn	EB RTOR	WB Left	WB Thru	WB Right	WB U-Turn	WB RTOR		
Cars	24	1	51	0	0	2	3	3	0	0	1	127	62	0	0	70	286	5	0	0		
Trucks	0	0	2	0	0	0	0	0	0	0	0	7	2	0	0	3	3	0	0	0		
Peak Vols	24	1	53	0	0	2	3	3	0	0	1	134	64	0	0	73	289	5	0	0		
Trucks %	2.6%					0.0%					4.5%					1.6%					PHF=	0.85
Peds	0					0					0					0						

File Name: NW Friberg-Strunk St at NE 13th St
Start Date: 8/1/2023
Start Time: 4:00 PM
Site Code: 2

Peak Hour: 4:40-5:40PM
Peak 15-min: 4:40-4:55PM

ALL VEHICLES	Northbound NE 192nd Ave					Southbound NE 192nd Ave					Eastbound NE 13th St					Westbound NE 13th St						
Time Period	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	5-min Total	Hourly Totals
4:00 PM	8	0	16	0	0	0	0	0	0	0	0	15	2	0	0	5	16	0	0	0	62	982
4:05 PM	4	0	18	0	0	0	0	0	0	0	2	16	2	0	0	7	24	0	0	0	73	988
4:10 PM	2	2	26	0	0	0	0	0	0	0	0	20	4	0	0	5	26	0	0	0	85	997
4:15 PM	13	0	18	0	0	0	0	0	0	0	1	21	6	0	0	4	40	0	0	0	103	992
4:20 PM	1	0	22	0	0	0	1	0	0	0	0	28	0	0	0	8	15	0	0	0	75	977
4:25 PM	3	1	19	0	0	0	0	0	0	0	0	19	4	0	0	4	17	0	0	0	67	982
4:30 PM	6	0	15	0	0	0	0	0	0	0	0	28	4	0	0	3	22	0	0	0	78	1016
4:35 PM	6	1	9	0	0	0	0	0	0	0	0	23	2	0	0	13	20	0	0	0	74	1001
4:40 PM	8	1	25	0	0	0	0	0	0	0	0	26	6	0	0	7	21	0	0	0	94	1019
4:45 PM	11	0	19	0	0	0	0	0	0	0	0	31	6	0	0	11	26	0	0	0	104	1008
4:50 PM	4	0	15	0	0	0	0	0	0	0	0	27	6	0	0	6	30	0	0	0	88	982
4:55 PM	3	0	12	0	0	0	0	0	0	0	1	22	3	0	0	11	27	0	0	0	79	970
5:00 PM	4	0	20	0	0	0	0	1	0	0	0	23	3	0	0	5	12	0	0	0	68	969
5:05 PM	3	3	21	0	0	0	1	0	0	0	0	20	3	0	0	8	23	0	0	0	82	
5:10 PM	5	5	14	0	0	0	0	0	0	0	0	20	3	0	0	8	25	0	0	0	80	
5:15 PM	7	1	15	0	0	0	0	0	0	0	1	25	6	0	0	6	25	2	0	0	88	
5:20 PM	6	1	19	0	0	0	1	0	0	0	4	18	4	0	0	7	20	0	0	0	80	
5:25 PM	6	0	26	0	0	0	0	0	0	0	2	23	7	0	0	11	26	0	0	0	101	
5:30 PM	3	0	16	0	0	0	1	1	0	0	1	11	5	0	0	9	16	0	0	0	63	
5:35 PM	5	0	19	0	0	0	1	1	0	0	0	34	3	0	0	15	14	0	0	0	92	
5:40 PM	7	1	16	0	0	0	0	4	0	0	0	25	6	0	0	7	17	0	0	0	83	
5:45 PM	3	0	17	0	0	1	4	1	0	0	0	21	4	0	0	12	15	0	0	0	78	
5:50 PM	5	0	14	0	0	1	1	0	0	0	0	25	3	0	0	8	19	0	0	0	76	
5:55 PM	2	0	20	0	0	0	0	1	0	0	0	25	4	0	0	8	18	0	0	0	78	

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	NB RTOR	SB Left	SB Thru	SB Right	SB U-Turn	SB RTOR	EB Left	EB Thru	EB Right	EB U-Turn	EB RTOR	WB Left	WB Thru	WB Right	WB U-Turn	WB RTOR
Cars	65	11	219	0	0	0	4	3	0	0	9	280	55	0	0	104	262	2	0	0
Trucks	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Peak Vols	65	11	221	0	0	0	4	3	0	0	9	280	55	0	0	104	265	2	0	0
Trucks %	0.7%					0.0%					0.0%					0.8%				
Peds	4					4					1					3				

PHF= 0.89

File Name: NW Friberg-Strunk St at SE 1st St
Start Date: 8/1/2023
Start Time: 4:00 PM
Site Code: 3

Peak Hour: 7:35-8:35AM
Peak 15-min: 7:45-8:00AM

	Northbound N/A					Southbound NE Friberg-Strunk St					Eastbound SE 1st St					Westbound NW Lake Rd						
Time Period	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	5-min Total	Hourly Totals
7:00 AM	0	0	0	0	0	3	0	2	0	0	2	12	0	0	0	0	15	4	0	0	38	637
7:05 AM	0	0	0	0	0	1	0	1	0	0	5	13	0	0	0	0	18	1	0	0	39	674
7:10 AM	0	0	0	0	0	3	0	1	0	0	2	14	0	0	0	0	15	3	0	0	38	692
7:15 AM	0	0	0	0	0	5	0	2	0	0	7	13	0	0	0	0	10	4	0	0	41	705
7:20 AM	0	0	0	0	0	5	0	4	0	0	2	17	0	0	0	0	22	2	0	0	52	708
7:25 AM	0	0	0	0	0	5	0	8	0	0	4	9	0	0	0	0	13	0	0	0	39	710
7:30 AM	1	0	0	0	0	5	0	2	0	0	2	12	0	0	0	0	13	3	0	0	38	713
7:35 AM	0	0	0	0	0	6	0	3	0	0	5	16	0	0	0	0	18	3	0	0	51	723
7:40 AM	0	0	0	0	0	9	0	6	0	0	9	15	0	0	0	0	26	0	0	0	65	711
7:45 AM	0	0	0	0	0	5	0	7	0	0	9	23	0	0	0	0	26	5	0	0	75	701
7:50 AM	0	0	0	0	0	5	0	8	0	0	7	25	0	0	0	0	25	2	0	0	72	685
7:55 AM	0	0	0	0	0	7	0	4	0	0	7	32	0	0	0	0	37	2	0	0	89	678
8:00 AM	0	0	0	0	0	7	0	5	0	0	3	32	0	0	0	0	26	2	0	0	75	672
8:05 AM	0	0	0	0	0	9	0	5	0	0	2	18	0	0	0	0	21	2	0	0	57	
8:10 AM	0	0	0	0	0	6	0	2	0	0	5	12	0	0	0	0	22	4	0	0	51	
8:15 AM	0	0	0	0	0	5	0	5	0	0	2	16	0	0	0	0	16	0	0	0	44	
8:20 AM	0	0	0	0	0	2	0	3	0	0	5	21	0	0	0	0	21	2	0	0	54	
8:25 AM	0	0	0	0	0	3	0	2	0	0	5	16	0	0	0	0	14	2	0	0	42	
8:30 AM	0	0	0	0	0	1	0	4	0	0	7	21	0	0	0	0	15	0	0	0	48	
8:35 AM	0	0	0	0	0	2	0	3	0	0	2	15	0	0	0	0	11	6	0	0	39	
8:40 AM	1	0	0	0	0	3	0	6	0	0	7	16	0	0	0	1	19	2	0	0	55	
8:45 AM	0	0	0	0	0	2	0	6	0	0	5	21	0	0	0	0	24	1	0	0	59	
8:50 AM	1	0	0	0	0	4	0	14	0	0	2	23	0	0	0	0	18	3	0	0	65	
8:55 AM	0	0	0	0	0	4	0	7	0	0	11	28	0	0	0	0	26	7	0	0	83	

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	NB RTOR	SB Left	SB Thru	SB Right	SB U-Turn	SB RTOR	EB Left	EB Thru	EB Right	EB U-Turn	EB RTOR	WB Left	WB Thru	WB Right	WB U-Turn	WB RTOR
Cars	0	0	0	0	0	63	0	53	0	0	64	240	0	0	0	0	265	24	0	0
Trucks	0	0	0	0	0	2	0	1	0	0	2	7	0	0	0	0	2	0	0	0
Peak Vols	0	0	0	0	0	65	0	54	0	0	66	247	0	0	0	0	267	24	0	0
Trucks %	0%					2.5%					2.9%					0.7%				
Peds	0					7					2					1				

PHF= 0.77

File Name: NW Friberg-Strunk St at SE 1st St
Start Date: 8/1/2023
Start Time: 4:00 PM
Site Code: 3

Peak Hour: 4:45-5:45PM
Peak 15-min: 5:10-5:25PM

ALL VEHICLES	Northbound N/A					Southbound NE Friberg-Strunk St					Eastbound SE 1st St					Westbound NW Lake Rd						
Time Period	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	Left	Thru	Right	U-Turn	RTOR	5-min Total	Hourly Totals
4:00 PM	0	0	0	0	0	2	0	3	0	0	15	53	0	0	0	0	46	10	0	0	129	1294
4:05 PM	1	0	0	0	0	2	0	6	0	0	15	34	0	0	0	0	29	4	0	0	91	1277
4:10 PM	0	0	0	0	0	1	0	7	0	0	25	31	1	0	0	0	28	3	0	0	96	1308
4:15 PM	0	0	0	0	0	1	0	7	0	0	17	54	1	0	0	0	24	7	0	0	111	1343
4:20 PM	0	0	0	0	0	7	0	6	0	0	16	47	0	0	0	0	28	5	0	0	109	1356
4:25 PM	0	0	0	0	0	5	0	5	0	0	21	42	0	0	0	0	36	7	0	0	116	1373
4:30 PM	0	0	0	0	0	1	0	3	0	0	15	35	0	0	0	0	26	6	0	0	86	1386
4:35 PM	0	0	0	0	0	10	0	8	0	0	14	37	0	0	0	0	33	10	0	0	112	1415
4:40 PM	0	0	0	0	0	6	0	7	0	0	22	42	0	0	0	0	35	6	0	0	118	1401
4:45 PM	0	0	0	0	0	6	0	12	0	0	17	48	1	0	0	0	36	11	0	0	131	1416
4:50 PM	0	0	0	0	0	8	0	6	0	0	15	39	0	0	0	0	22	5	0	0	95	1399
4:55 PM	0	0	0	0	0	7	0	4	0	0	12	38	0	0	0	0	34	5	0	0	100	1401
5:00 PM	0	0	0	0	0	3	0	8	0	0	11	33	0	0	0	0	49	8	0	0	112	1409
5:05 PM	0	0	0	0	0	4	0	6	0	0	20	45	0	0	0	0	39	8	0	0	122	
5:10 PM	2	0	0	0	0	4	0	10	0	0	18	44	0	0	0	0	43	10	0	0	131	
5:15 PM	0	0	0	0	0	4	0	8	0	0	15	56	0	0	0	0	35	6	0	0	124	
5:20 PM	0	0	0	0	0	9	0	7	0	0	15	53	1	0	0	0	35	6	0	0	126	
5:25 PM	0	0	0	0	0	9	0	5	0	0	26	49	0	0	0	0	29	11	0	0	129	
5:30 PM	0	0	0	0	0	4	0	4	0	0	19	57	0	0	0	0	24	7	0	0	115	
5:35 PM	0	0	0	0	0	7	0	5	0	0	11	41	0	0	0	0	26	8	0	0	98	
5:40 PM	0	0	0	0	0	7	0	9	0	0	18	64	0	0	0	0	30	5	0	0	133	
5:45 PM	0	0	0	0	0	6	0	10	0	0	15	48	0	0	0	0	30	5	0	0	114	
5:50 PM	0	0	0	0	0	5	0	10	0	0	16	36	0	0	0	0	23	7	0	0	97	
5:55 PM	0	0	0	0	0	5	0	7	0	0	20	45	0	0	0	0	27	4	0	0	108	

Time Period	NB Left	NB Thru	NB Right	NB U-Turn	NB RTOR	SB Left	SB Thru	SB Right	SB U-Turn	SB RTOR	EB Left	EB Thru	EB Right	EB U-Turn	EB RTOR	WB Left	WB Thru	WB Right	WB U-Turn	WB RTOR
Cars	2	0	0	0	0	72	0	84	0	0	197	565	2	0	0	0	400	90	0	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0
Peak Vols	2	0	0	0	0	72	0	84	0	0	197	567	2	0	0	0	402	90	0	0
Trucks %	0.0%					0.0%					0.3%					0.4%				
Peds	0					0					0					0				

PHF= 0.93

0% Build-Out Camas Heights Subdivision - 8/24/23

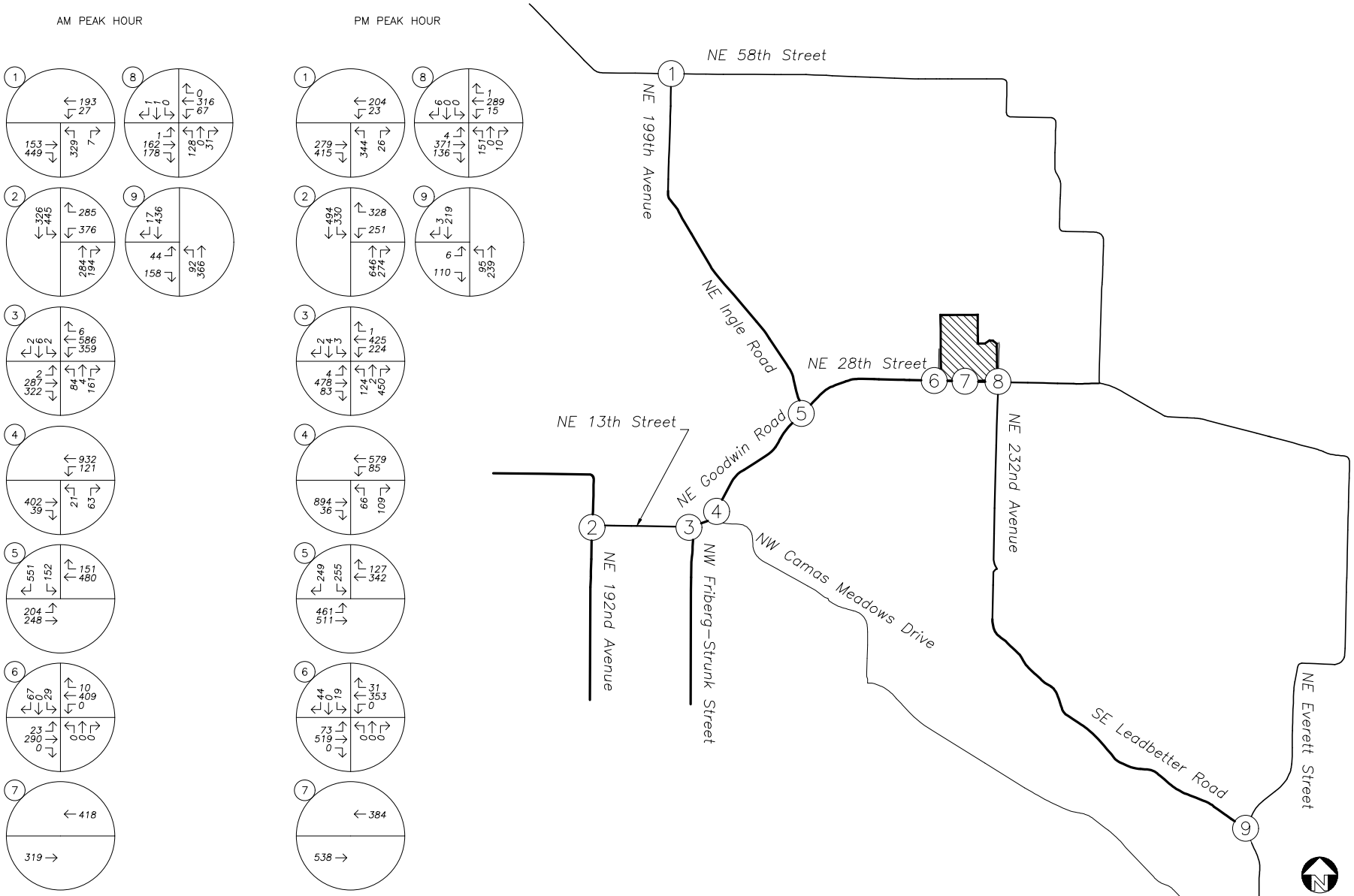


Figure 5
Camas Heights
10/22/2021

TRAFFIC VOLUMES
Year 2023 Background Conditions
AM & PM Peak Hours

lancaster mobley

Exhibit 10 APPEAL24-1001

0% Build-Out Camas Heights Subdivision - 8/24/23

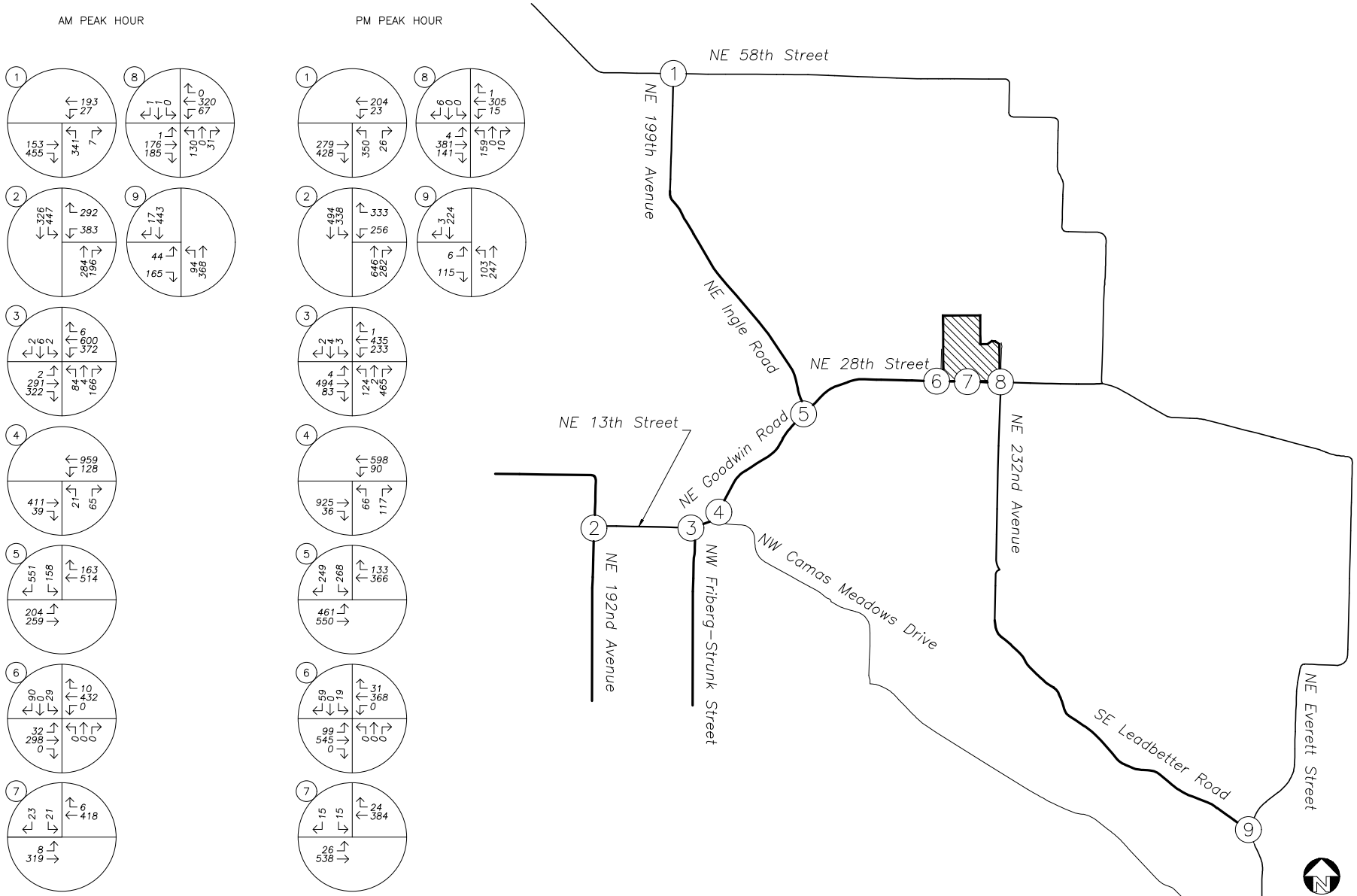


Figure 6
Camas Heights
10/22/2021

TRAFFIC VOLUMES
Year 2023 Buildout Conditions
AM & PM Peak Hours

lancaster mobley

Exhibit 10 APPEAL24-1001

CURRENT PROPOSED DEVELOPMENT PLAN

The B1 South Phase consists of 124 attached units and 2 single-family detached homes and is expected to be completed by 2020. It is located in the southwest portion of the overall site, directly south of Phase 1. Access will be provided via the neighborhood collector built with Phase 1, which connects to NE Ingle Road. In the future, this neighborhood collector will connect to Phase 3 of the site.

Trip Generation

Trip generation estimates for the proposed development were generated based on information provided in the standard reference manual *Trip Generation, 9th Edition* published by the Institute of Transportation Engineers (ITE – Reference 2). Table 1 summarizes the daily, weekday AM, and weekday PM peak-hour trips for the B1 South Phase assumed development.

Table 1: Trip Generation Estimate – B1 South Phase

Land Use	ITE Code	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Residential Condominium/ Townhouse	230	124 units	720	55	9	46	65	43	22
Single-Family Detached Housing	210	2 units	20	2	1	1	2	1	1
Total Residential (126 units)			**740**	**57**	**10**	**47**	**67**	**44**	**23**

Table 2 summarizes the overall master plan trip generation and then deducts for the cumulative Phase 1[1], Phase 2[1] Phase 3, and B1 South Phase trips to summarize the number of net new trips that will remain vested.

[1] While previous traffic analysis assumed 215 units in Phase 1, Phase 1 as platted consists of 201 units. While previous traffic analysis assumed 230 units in Phase 2, Phase 2 is now platted for 228 units. The updated trip totals are shown in Table 2.

Exhibit 10 APPEAL24-1001

Table 2: Master Plan Trip Generation and Build-out Debiting (Includes Phase 1, 2 and 3)

Land Use	ITE Code	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Apartment	220	536 units	3,570	275	55	220	330	215	115
Single-Family Detached Housing	210	764 units	7,270	575	145	430	765	480	285
Total Residential (1,300 units)			**10,840**	**850**	200	650	1,095	695	400
Internalization (6% Daily,54% PM)			630	0	0	0	60	30	30
Shopping Center	820	90,000 square feet	6,340	145	90	55	560	270	290
Internalization (10% Daily, 11% PM)			*630*	*0*	*0*	*0*	*60*	*30*	*30*
Pass-By Trips (34%)			*1,940*	*50*	*25*	*25*	*170*	*85*	*85*
Total Vested Trips			17,180	995	290	705	1,655	965	690
Less Internalization			*1,260*	*0*	*0*	*0*	*120*	*60*	*60*
Less Pass-by trips			*1,940*	*50*	*25*	*25*	*170*	*85*	*85*
Vested Net New Trips for Full Build-out			***13,980***	***945***	***265***	***680***	***1,365***	***820***	***545***
Deduct for Net New Trips for Phase 1			*1,914*	*150*	*40*	*110*	*200*	*125*	*75*
Deduct for Net New Trips for Phase 2			*2,170*	*170*	*40*	*130*	*230*	*145*	*85*
Deduct for Net New Trips for Phase 3			*1,514*	*120*	*30*	*90*	*160*	*100*	*60*
Deduct for Net New Trips for B1 South Phase[1]			*740*	*55*	*10*	*45*	*70*	*45*	*25*
Remaining Trips			**7,642**	**450**	**145**	**305**	**705**	**405**	**300**

[1]Consistent with the accounting for the other phases, peak hour trips have been rounded to the nearest five trips for the overall trip generation debiting.

As seen in Table 2, after accounting for Phase 1, Phase 2, Phase 3 and B1 South Phase development, a total of 7,642 daily; 450 weekday AM peak hour; and 705 weekday PM peak hour trips remain in the master plan approval.

Trip Distribution and Assignment

The distribution of site-generated trips onto the study area roadway system was estimated utilizing the trip distribution provided in the Master Plan TIA. *Appendix C* illustrates the trip assignment.

EVALUATION OF OUTSTANDING MITIGATION NEEDS

The Master Plan TIA identified recommended mitigations for intersections not meeting standards under background and/or total traffic conditions. As part of each phase's transportation compliance letter, the TIA recommended evaluation of the following:

- Need for an eastbound right-turn lane at NE 199th Avenue/NE 58th Street (SR 500). As part of the Phase 3 Transportation Compliance Letter, this recommendation was adapted to provide a proportionate share contribution to a future roundabout, per direction from WSDOT.
- NE Ingle Road/NE Goodwin Road operations (including traffic signal warrant analysis).

Exhibit 10 APPEAL24-1001

- Assessment of proportionate share contribution at NE 192nd Avenue/NE 13th Street.

NE 199th Avenue/NE 58th Street (SR 500)

The Master Plan TIA recommended that future subdivision applications provide an updated assessment as to the potential need for providing a right-turn taper or lane at NE 199th Avenue/NE 58th Street (SR 500), considering both the need for a right-turn taper or lane and delay with the northbound left-turn. Based on subsequent discussions with WSDOT and Clark County staff, WSDOT has identified a single-lane roundabout as the preferred mitigation at the intersection in lieu of installation of a westbound right-turn lane. Recognizing the cost of designing and constructing a roundabout exceeds the impacts associated with the Green Mountain Master Plan and represents an "ultimate" long-term improvement need, WSDOT and Clark County will coordinate to administer a proportionate share impact mitigation methodology.

Payment of proportionate share mitigation towards the future roundabout will allow Green Mountain Master Plan development (as well as other subsequent development) a basis to satisfy transportation concurrency while providing a funding mechanism to allow the public agencies to advance intersection improvements. The proportionate cost share of intersection improvements attributable to Green Mountain B1 South Phase will be based on weekday PM peak hour trips through the intersection. The B1 South Phase is projected to add 14 site-generated trips to the intersection during the weekday PM peak hour (refer to Appendix C).

NE Ingle Road/NE Goodwin Road

In the Master Plan TIA, the intersection of NE Ingle Road/NE Goodwin Road was projected to not meet City of Camas intersection operating standards in the 2029 background conditions during the weekday PM peak hour and the 2029 total traffic conditions during both the weekday AM and PM peak hours. Therefore, the following series of mitigations were recommended in conjunction with the Master Plan development:

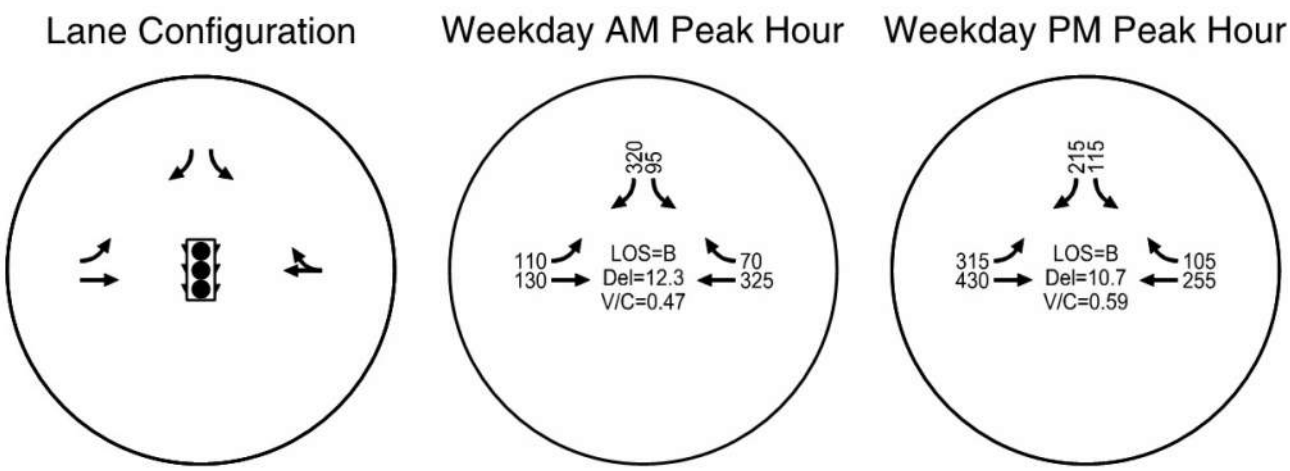
- Construct an eastbound left-turn lane on NE Goodwin Road at NE Ingle Road with the first Phase 1 trip *(completed)*.
- Construct a westbound right-turn lane on NE Goodwin Road at NE Ingle Road with the 203rd Phase 1 trip (prior to occupancy of 203rd single family home on site). The right-turn lane should provide at least 100 feet of storage *(this improvement was reprioritized after signalization of NE Goodwin Road at NE Ingle Road. It is anticipated that the right-turn lane will be constructed prior to or in-conjunction with completion of the phase that fronts Goodwin Road in the turn-lane area)*.

Exhibit 10 APPEAL24-1001

- Construct a three-lane roadway section (with center two-way left-turn lane) on NE Goodwin Road along the site frontage in conjunction with standard frontage improvements as adjacent development occurs *(will be constructed with Phase 2 development)*.
- Upon completion of Phase 1 site development (including construction of the eastbound left-turn lane on NE Goodwin Road at NE Ingle Road with Phase 1), the developer shall monitor the need for installation of a traffic signal with each future subdivision application at the intersection and construct a traffic signal when the intersection no longer satisfies City of Camas performance standard (LOS "D" and v/c of 0.90 or better) *and* the intersection volumes meet traffic signal warrants (subject to direction from the City of Camas) *(recommended with Phase 3 site development)*.

Signalized intersection operations are provided in Exhibit 1 assuming Phase 1, Phase 2, Phase 3 and B1 South Phase site development as well as approved background traffic. Given ongoing construction activity in the area, traffic counts previously collected in October 2016 for the Phase 2 TCL were used with four years of growth added[2] to inform an updated operations analysis. The count sheets are provided in *Appendix D*. *Appendix E* contains the 2020 total traffic conditions traffic operations worksheets.

Exhibit 1: NE Ingle Road/NE Goodwin Road 2020 Total Traffic Lane Configuration and Operations



As seen in Exhibit 1, with buildout of the B1 South Phase and the prior approved master plan development phases, the intersection is projected to satisfy City of Camas performance standard (LOS "D" and v/c of 0.90 or better).

[2] Based on direction provided in the original traffic study, a 1% growth was applied to City of Camas roadways.

Exhibit 10 APPEAL24-1001

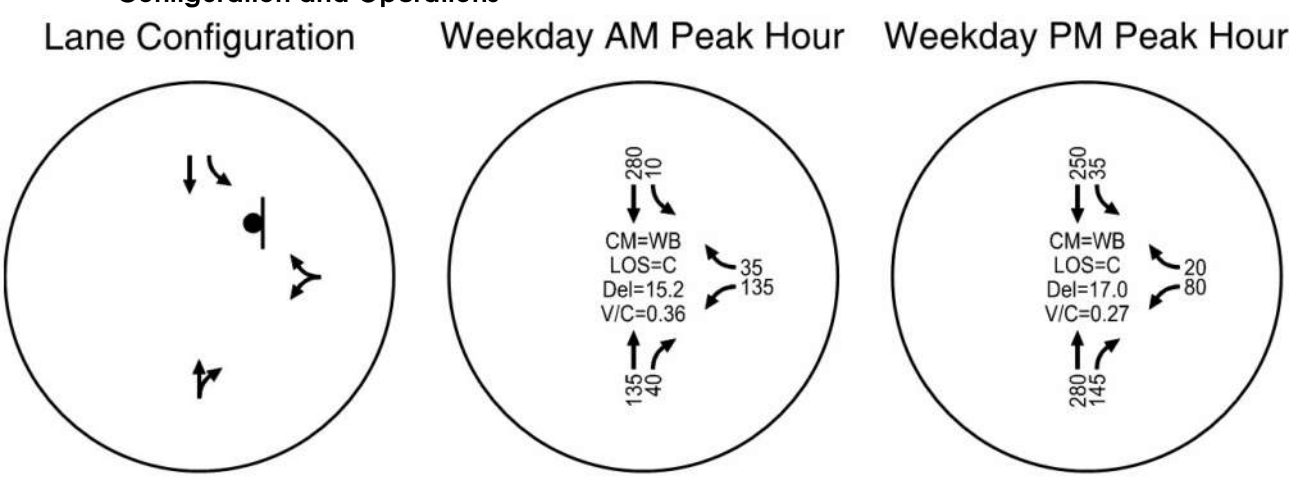
NE 192nd Avenue/NE 13th Street

The Master Plan TIA identified a proportionate cost sharing methodology to fund future construction of a northbound right-turn lane and a westbound right-turn lane on NE 13th Avenue at NE 192nd Avenue, provided in *Appendix F*. Under this methodology, each weekday PM peak hour trip would be assessed a fee of $391. Based on the B1 South Phase trip assignment (refer to *Appendix C*), the B1 South Phase adds 31 trips to the intersection of NE 192nd Avenue/NE 13th Street and therefore should be responsible for contributing $12,121 towards future improvements at the intersection.

ON-SITE CIRCULATION AND OPERATIONS

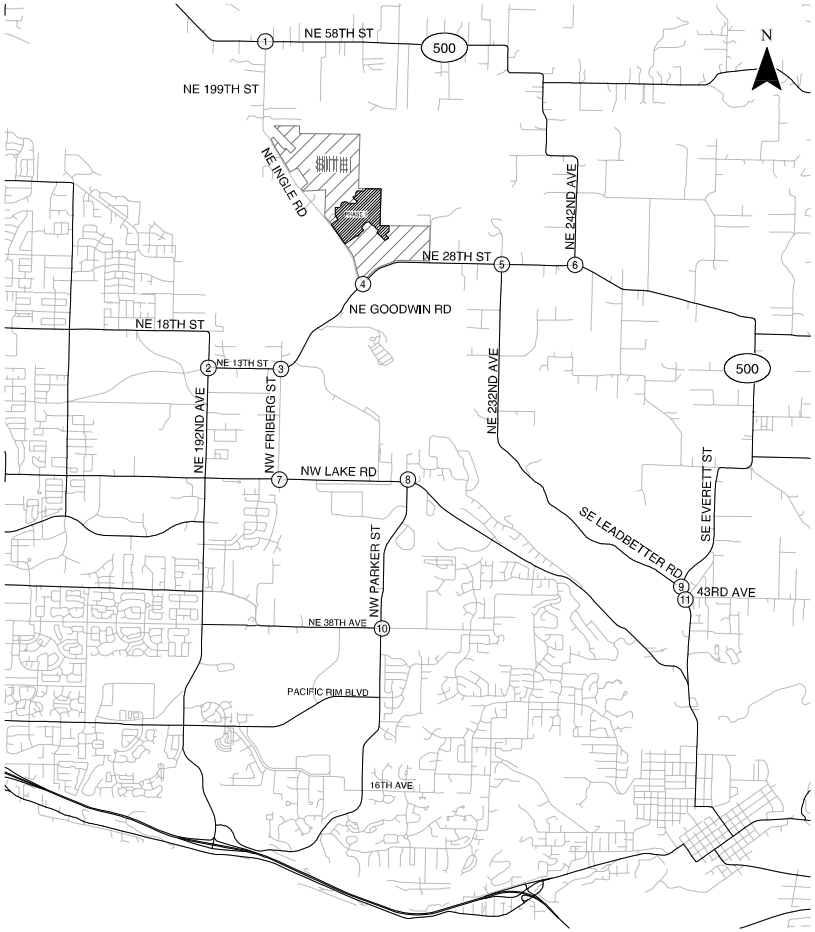
As seen in Figure 2, the B1 South Phase is located in the southwest portion of the overall site, immediately south of Phase 1. Access will be provided via a local roadway off the neighborhood circulator that connects to NE Ingle Road, developed with Phase 1. The neighborhood circulator will be located along the east edge of the B1 South Phase and connect to Phase 2 and NE 28th Street in the future. All trips were assumed to utilize the neighborhood circulator access on NE Ingle Road developed with Phase 1. The Phase 1 access was analyzed in the April 2015 memorandum *Phase 1 Access Assessment*, provided in *Appendix G*. Operations were reassessed with the additional B1 South Phase trips, as well as through trips on NE Ingle Road associated with prior approved phases and background growth. The weekday AM and PM peak hour operations are shown in Exhibit 2. *Appendix E* contains the traffic operations worksheets.

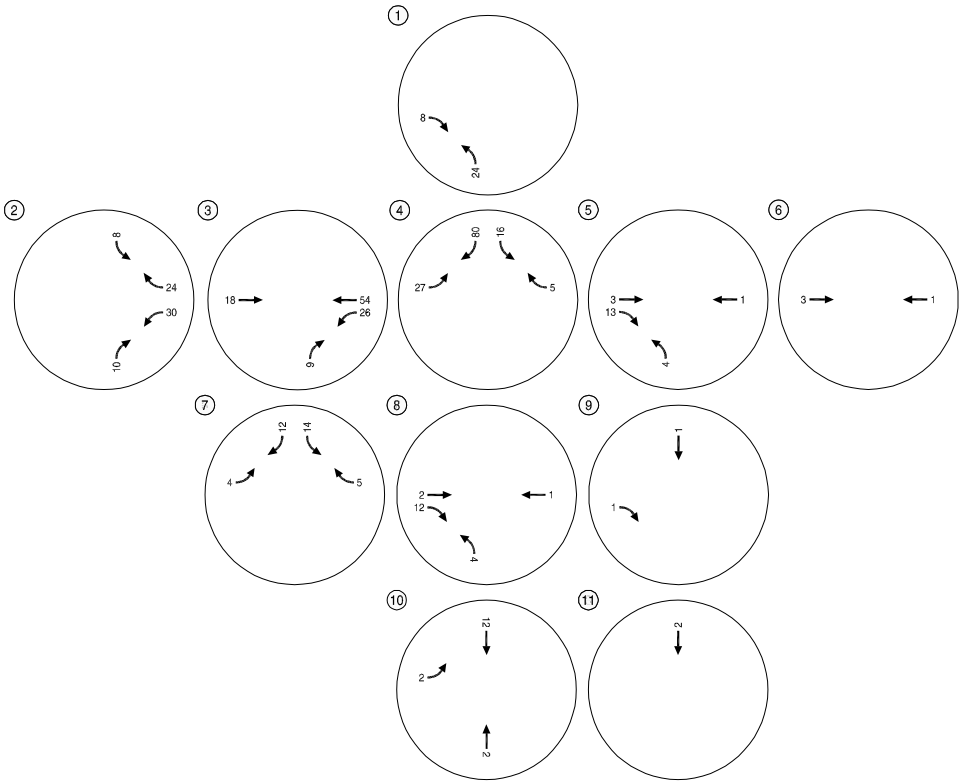
Exhibit 2: NE Ingle Road Neighborhood Circulator Site Access – 2020 Total Traffic Lane Configuration and Operations



As seen in the exhibit, the access is projected to operate acceptably during both the weekday AM and PM peak hours. The anticipated 95th percentile queueing is provided in Table 3. Queues are rounded up to the nearest 25 feet.

90% Build-Out Green Mountain PRD Phase 1 8/24/23





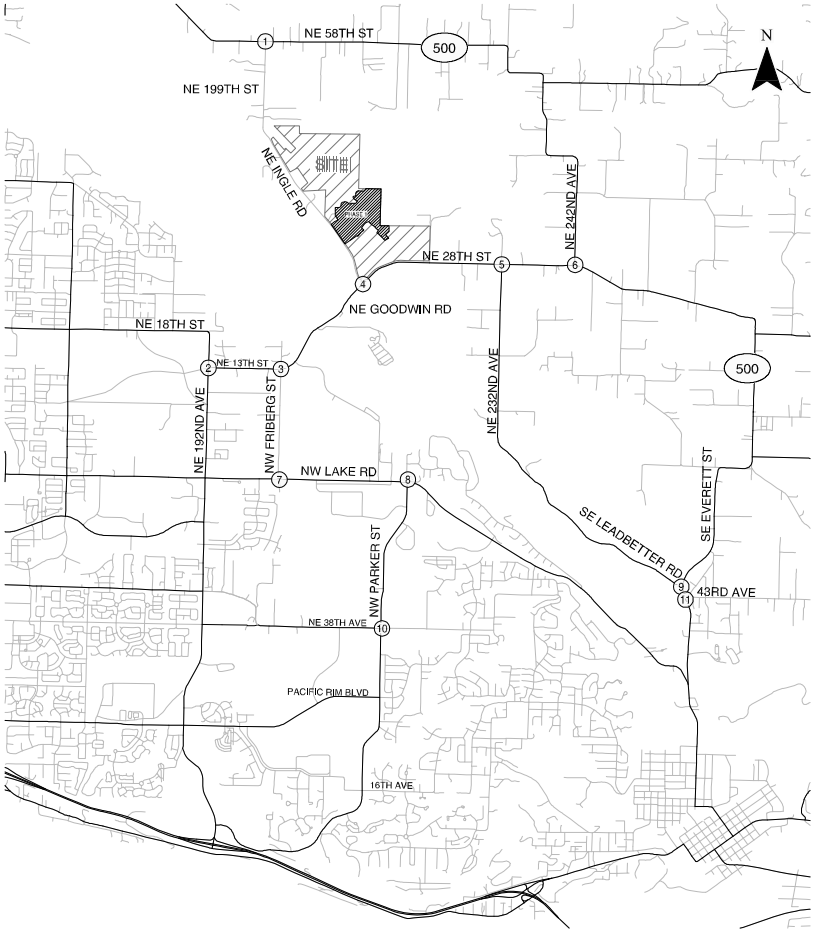
Total Estimated Trip Assignment - Phase 1
Weekday AM Peak Hour
Camas, Washington

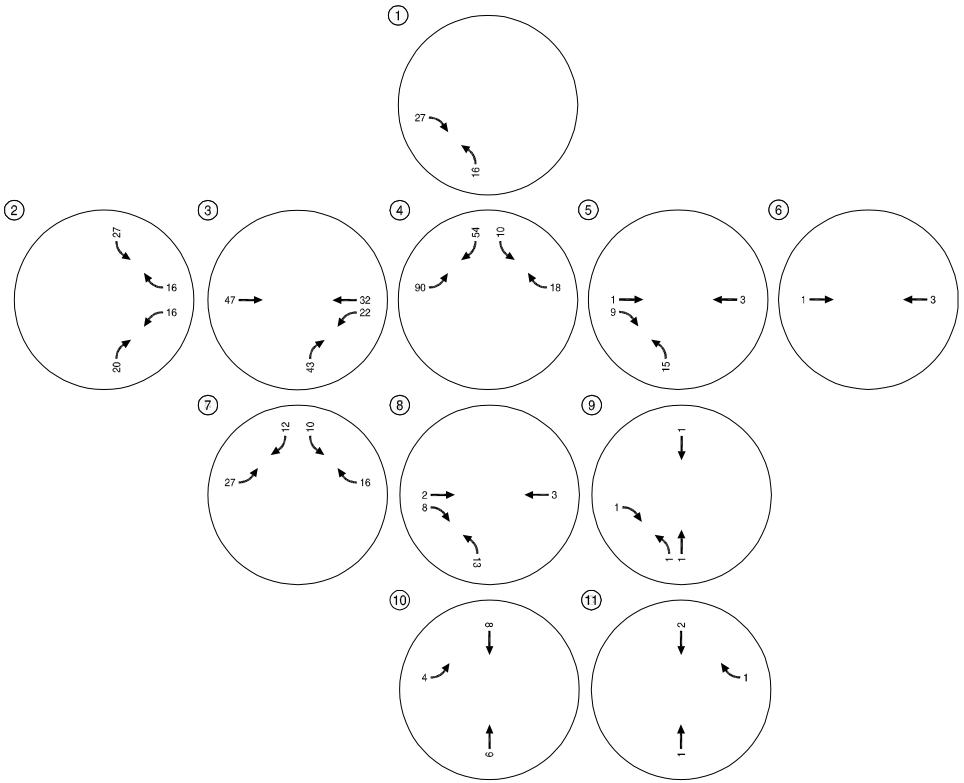
Figure
7

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Exhibit 10 APPEAL24-1001

90% Build-Out Green Mountain PRD Phase 1 8/24/23





Total Estimated Trip Assignment - Phase 1
Weekday PM Peak Hour
Camas, Washington

Figure 8

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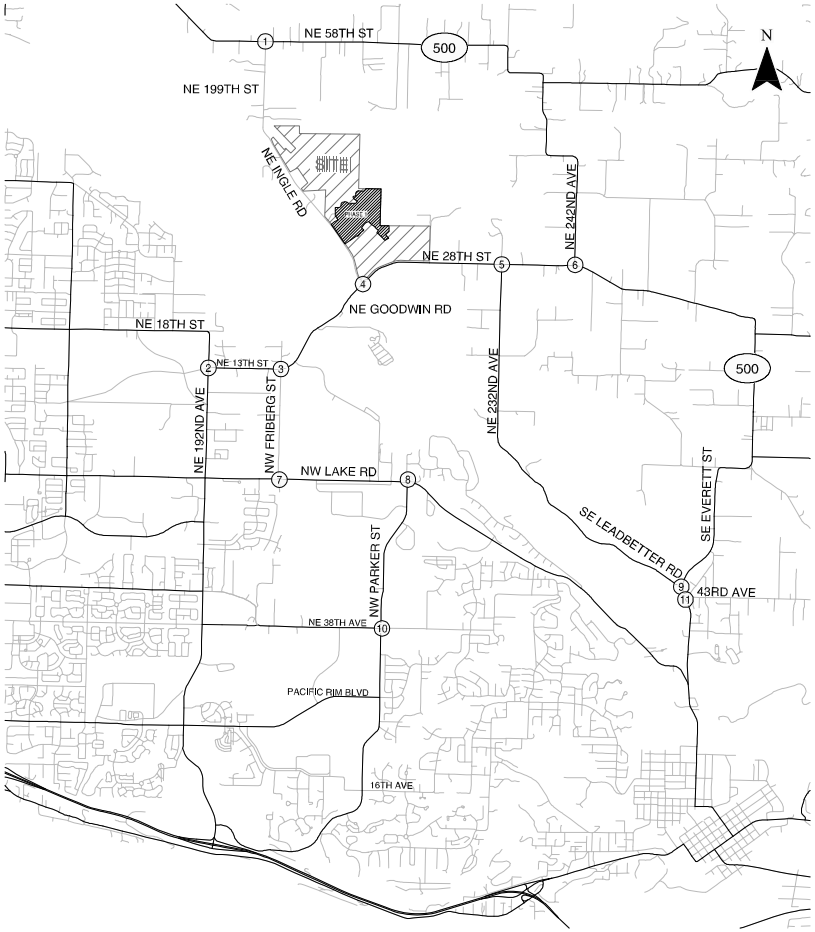
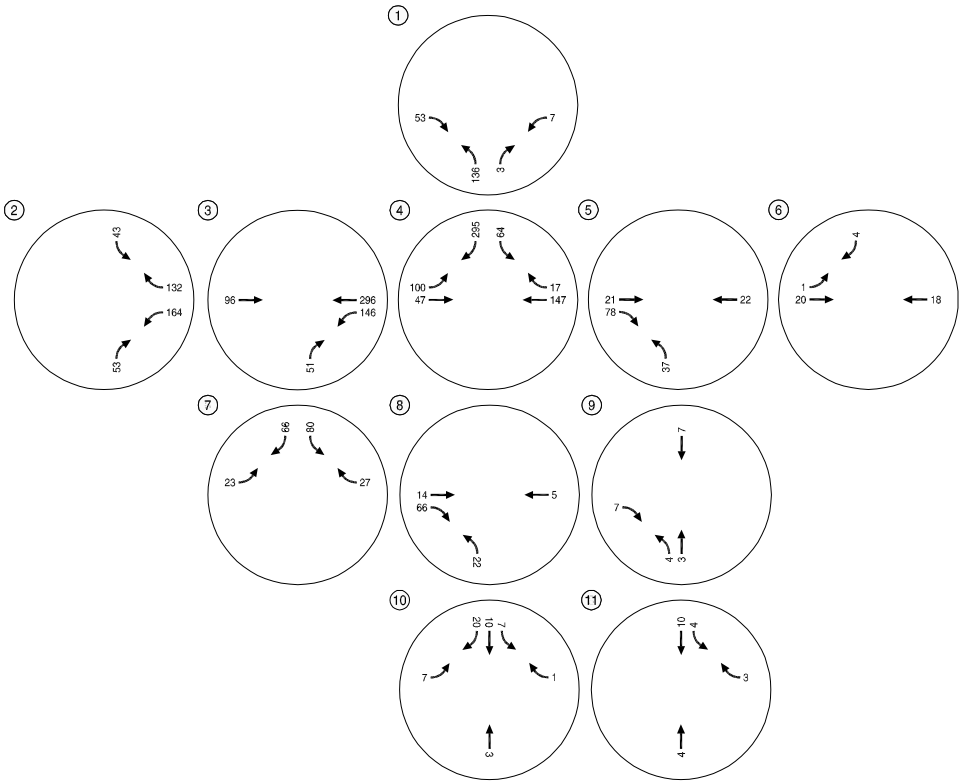
H:\projfile\13865 - Green Mountain Master Plan\dwgs\figs\13865_traffic study -Nov update.dwg Nov 20, 2014 - 2:28pm - klaustsen Layout Tab: 8_tPh1PM

Exhibit 10 APPEAL24-1001

90% Build-Out Green Mountain PRD Phase 1 8/24/23





Total Estimated Trip Assignment - Full Build-Out
Weekday AM Peak Hour
Camas, Washington

Figure 9

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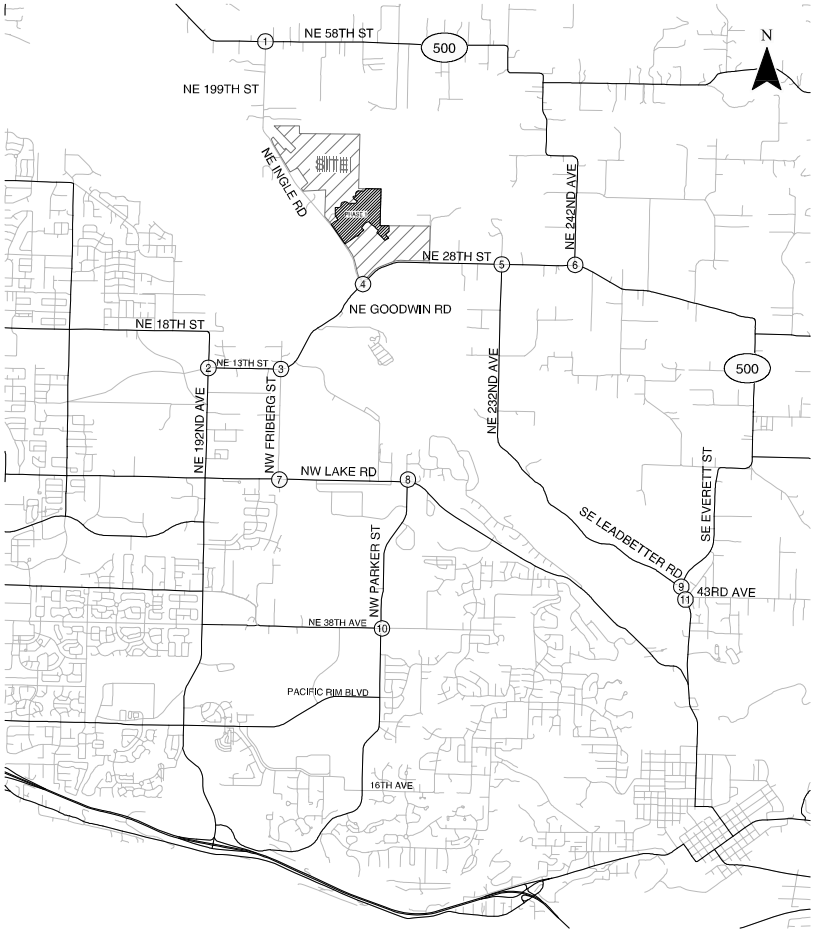
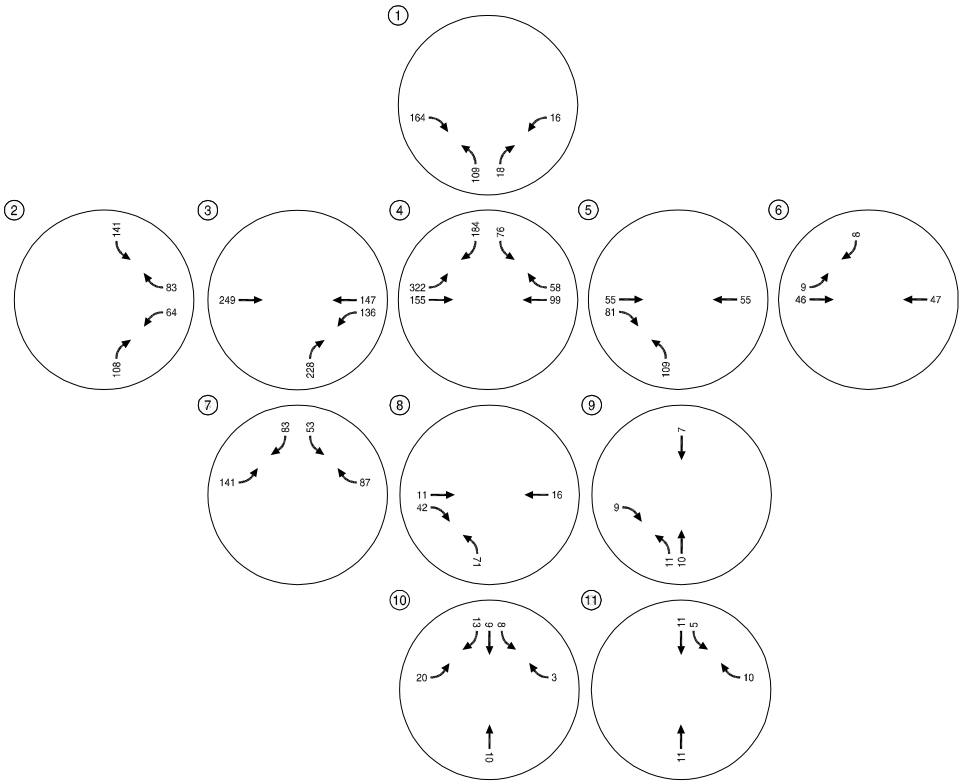
90% Build-Out Green Mountain PRD Phase 1 8/24/23





Total Estimated Trip Assignment - Full Build-Out
Weekday PM Peak Hour
Camas, Washington

Figure
10

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Exhibit 10 APPEAL24-1001

40% Build-Out 8/24/23

Lacamas Tech Center
Camas, WA

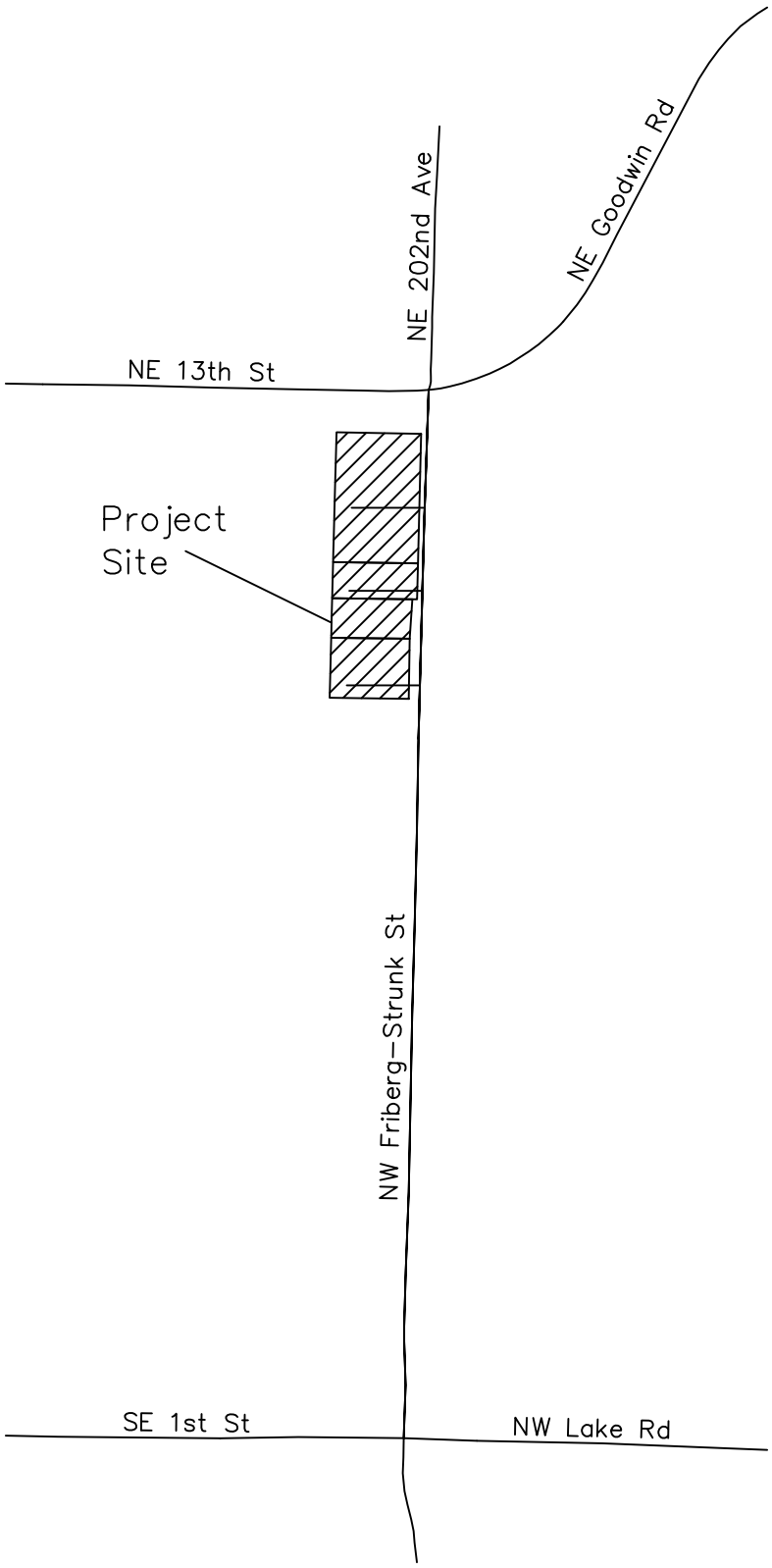


FIGURE 1
Site Vicinity Map

NOT TO SCALE

18047_Figures.Dwg

Lacamas Tech Center
Camas, WA

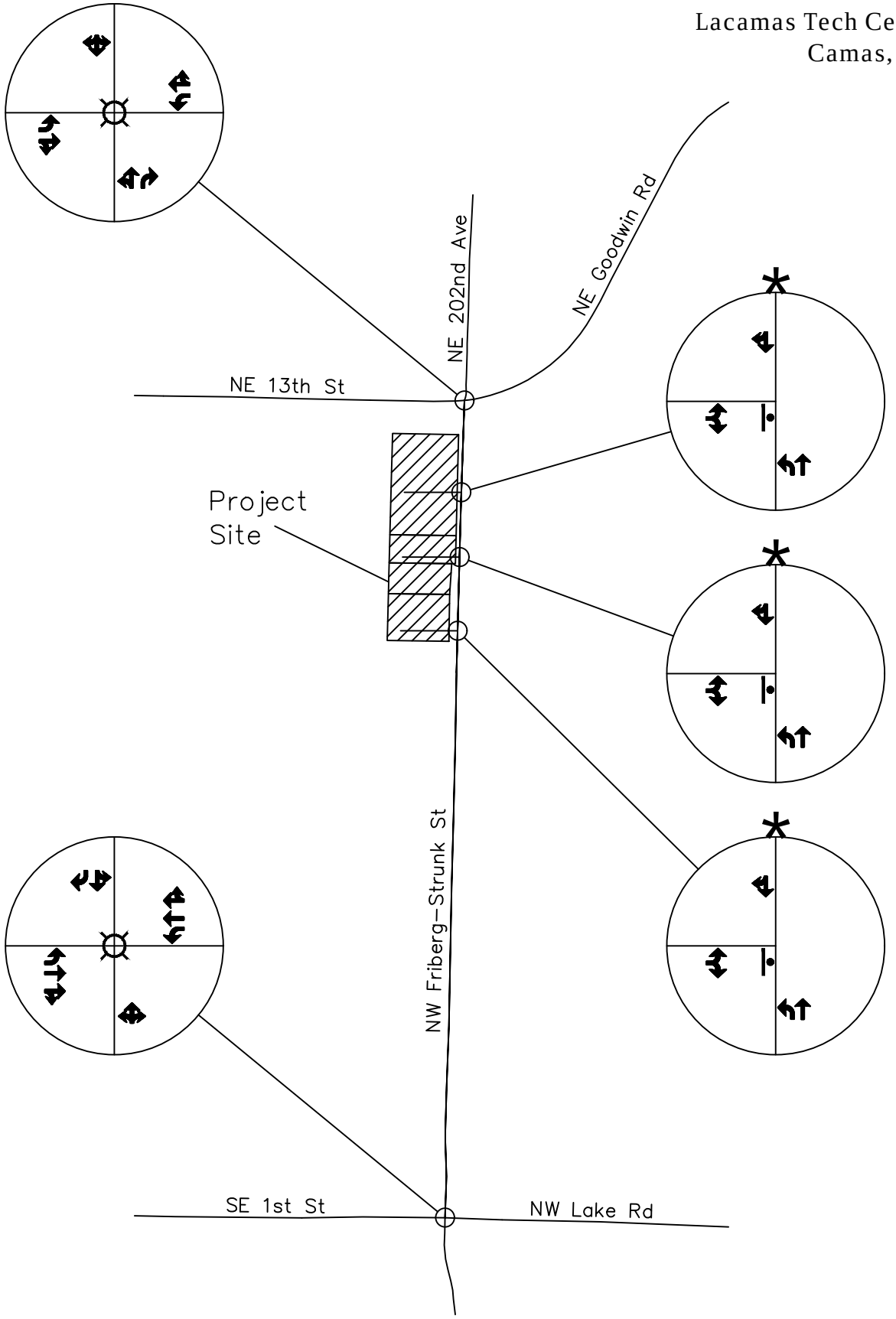


FIGURE 3
Existing Lane Configuration and Traffic Control

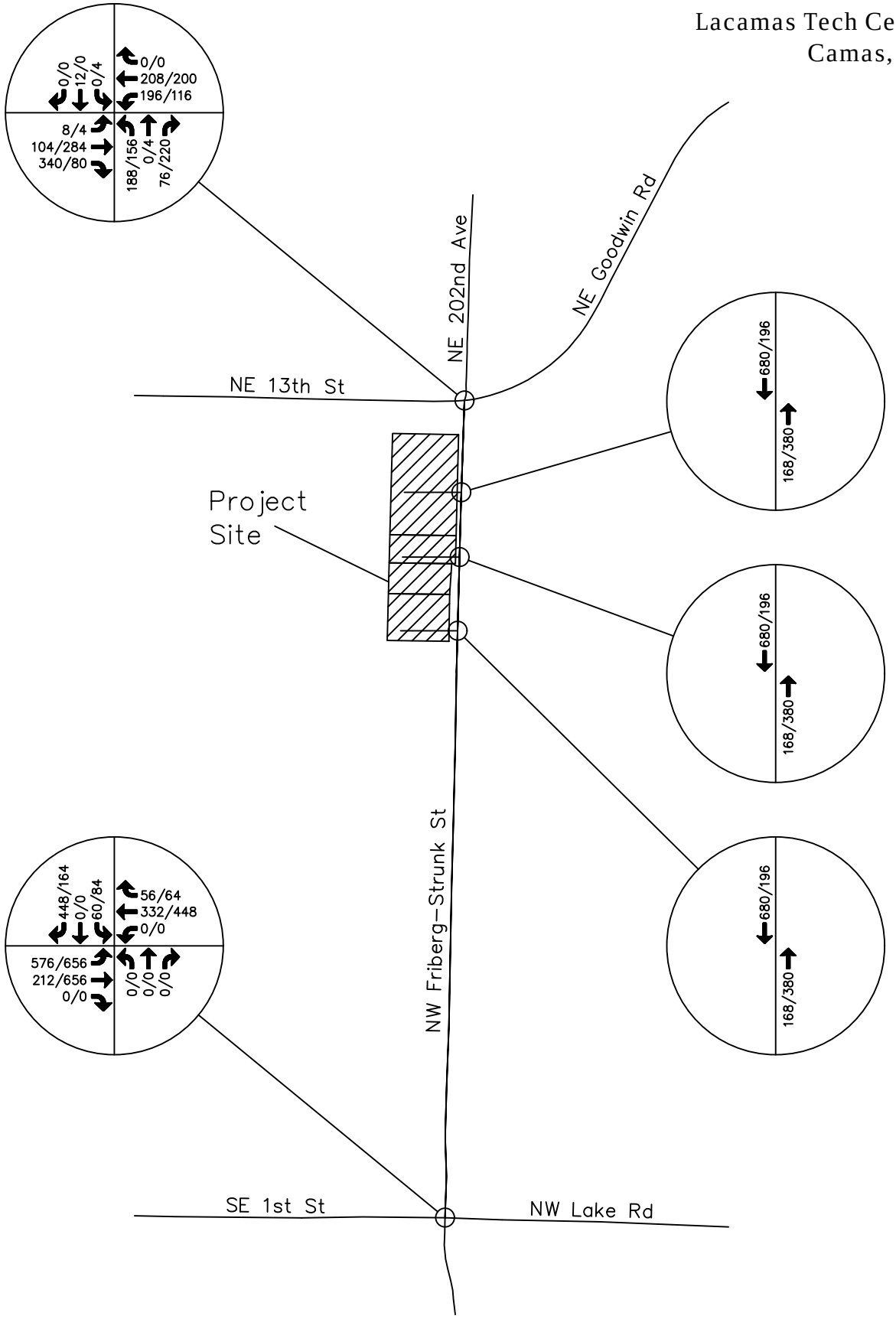
LEGEND

Lane Usage
Traffic Signal
Stop Sign
2025 "With Project" Lane Configuration and Traffic Control

NOT TO SCALE

18047_Figures.Dwg

Lacamas Tech Center
Camas, WA



LEGEND

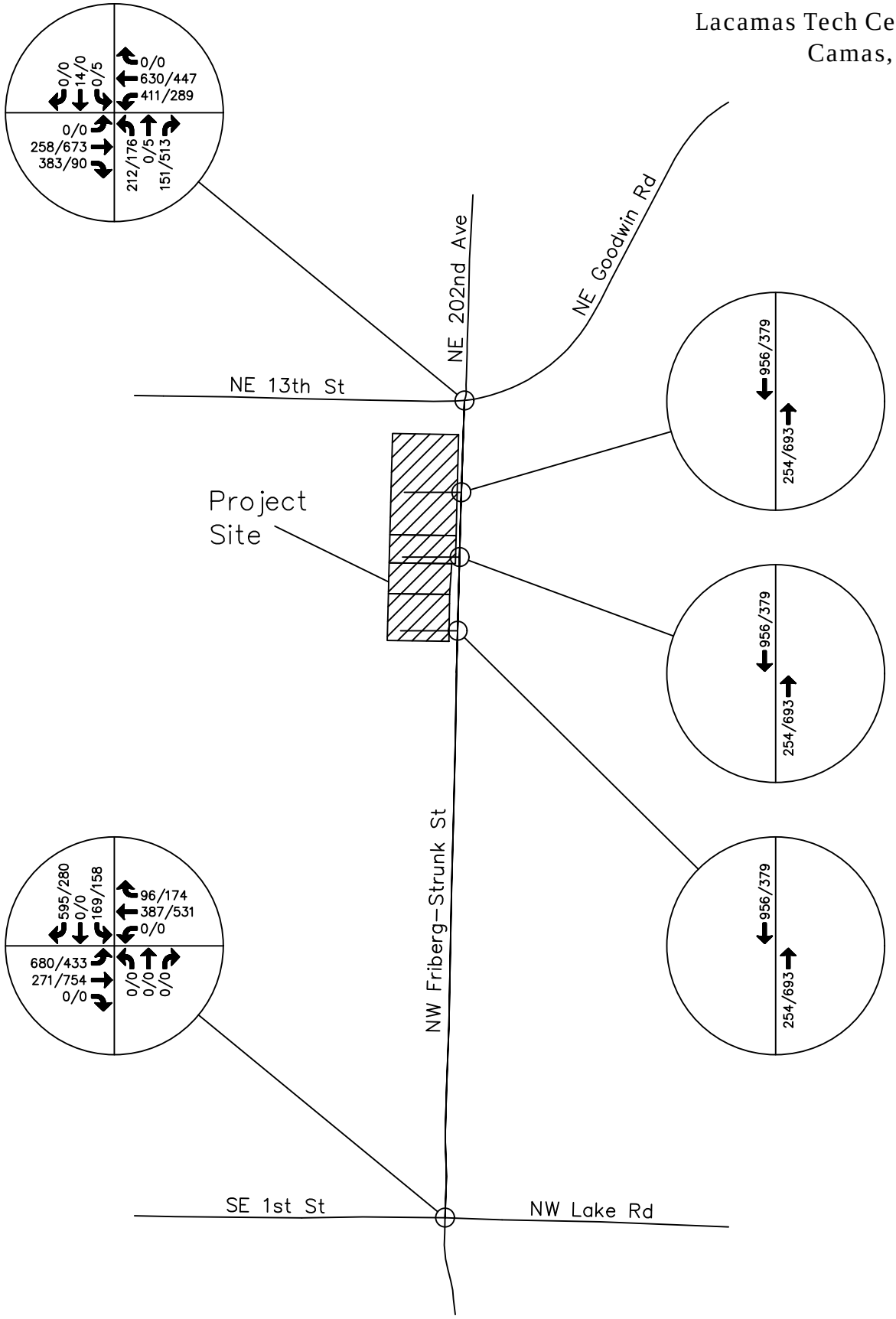
128/200 A.M./P.M. Peak Hour Traffic Volume

NOT TO SCALE

FIGURE 4
Existing A.M. and P.M.
Peak Hour Traffic Volumes

18047_Figures.Dwg

Lacamas Tech Center
Camas, WA



LEGEND

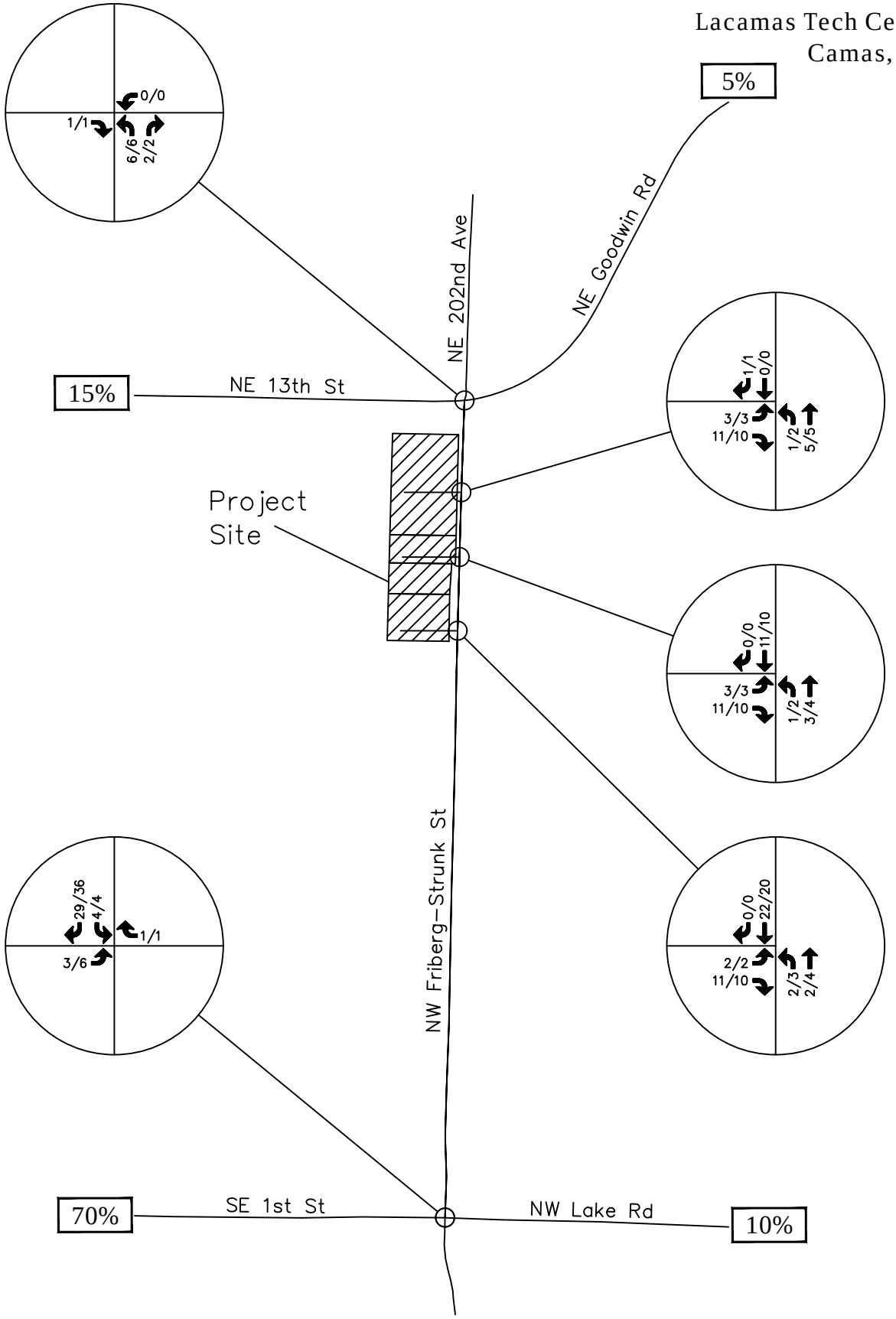
128/200 A.M./P.M. Peak Hour Traffic Volume

NOT TO SCALE

FIGURE 5
2025 "Without Project"
A.M. and P.M. Peak Hour Traffic Volumes

18047_Figures.Dwg

Lacamas Tech Center
Camas, WA



LEGEND

128/200 A.M./P.M. Peak Hour Traffic Volume

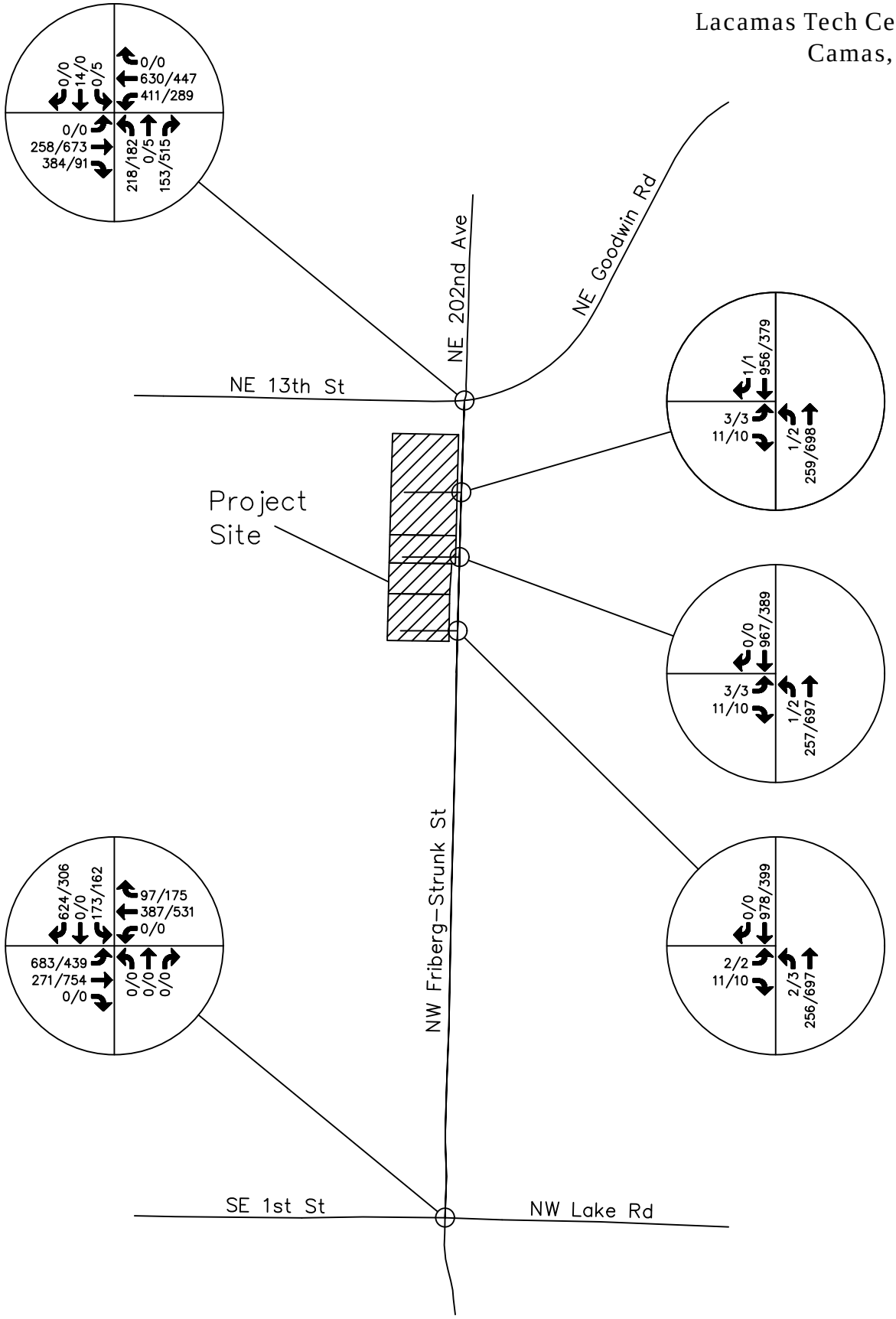
10% Peak Hour Trip Distribution

NOT TO SCALE

FIGURE 6
Trip Distribution and Assignment Traffic Volumes

18047_Figures.Dwg

Lacamas Tech Center
Camas, WA



LEGEND

128/200 A.M./P.M. Peak Hour Traffic Volume

NOT TO SCALE

FIGURE 7
2022 "With Project"
A.M. and P.M. Peak Hour Traffic Volumes

18047_Figures.Dwg

0% Build-Out 8/24/23

Oak Tree Station TIA
Camas, WA

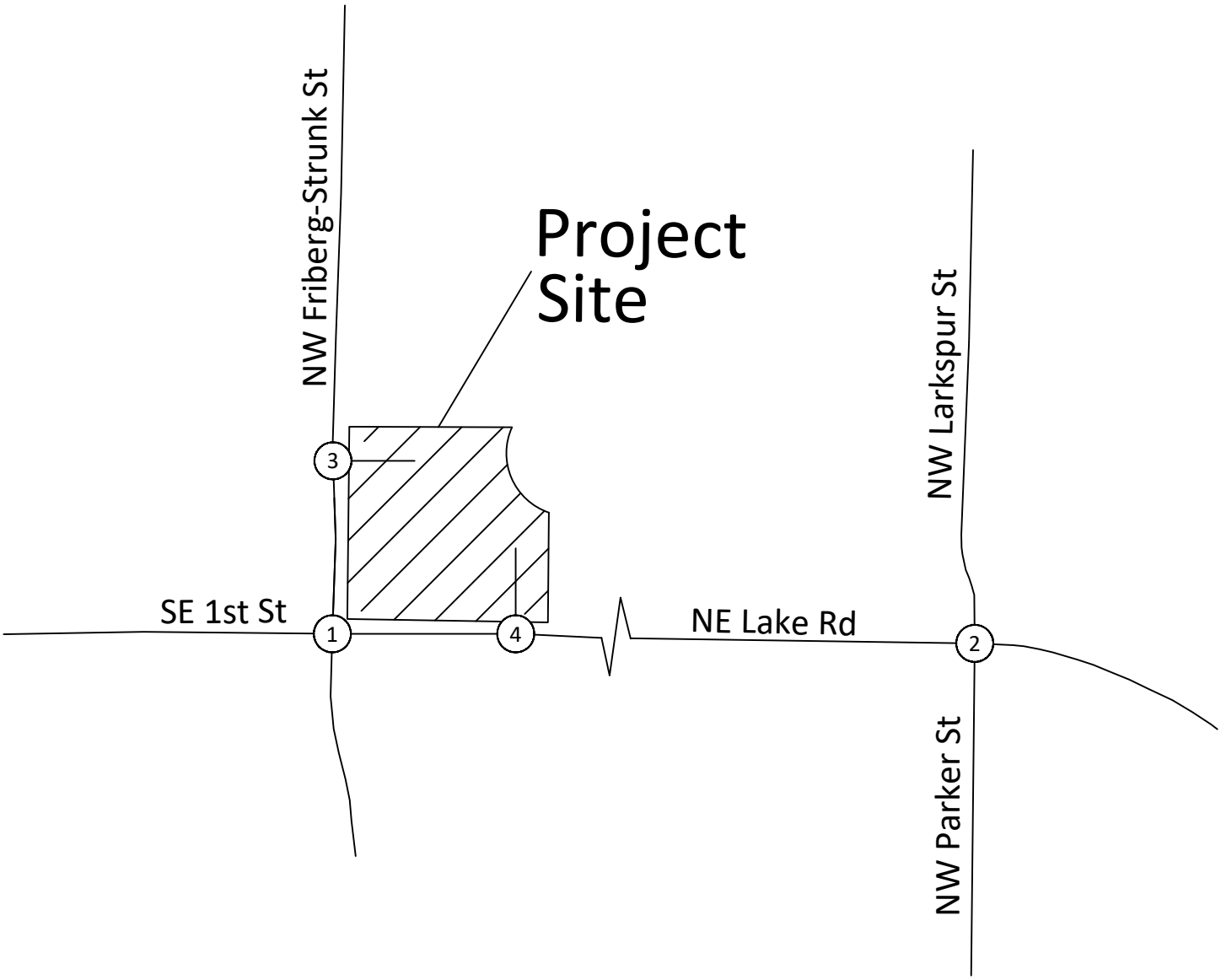
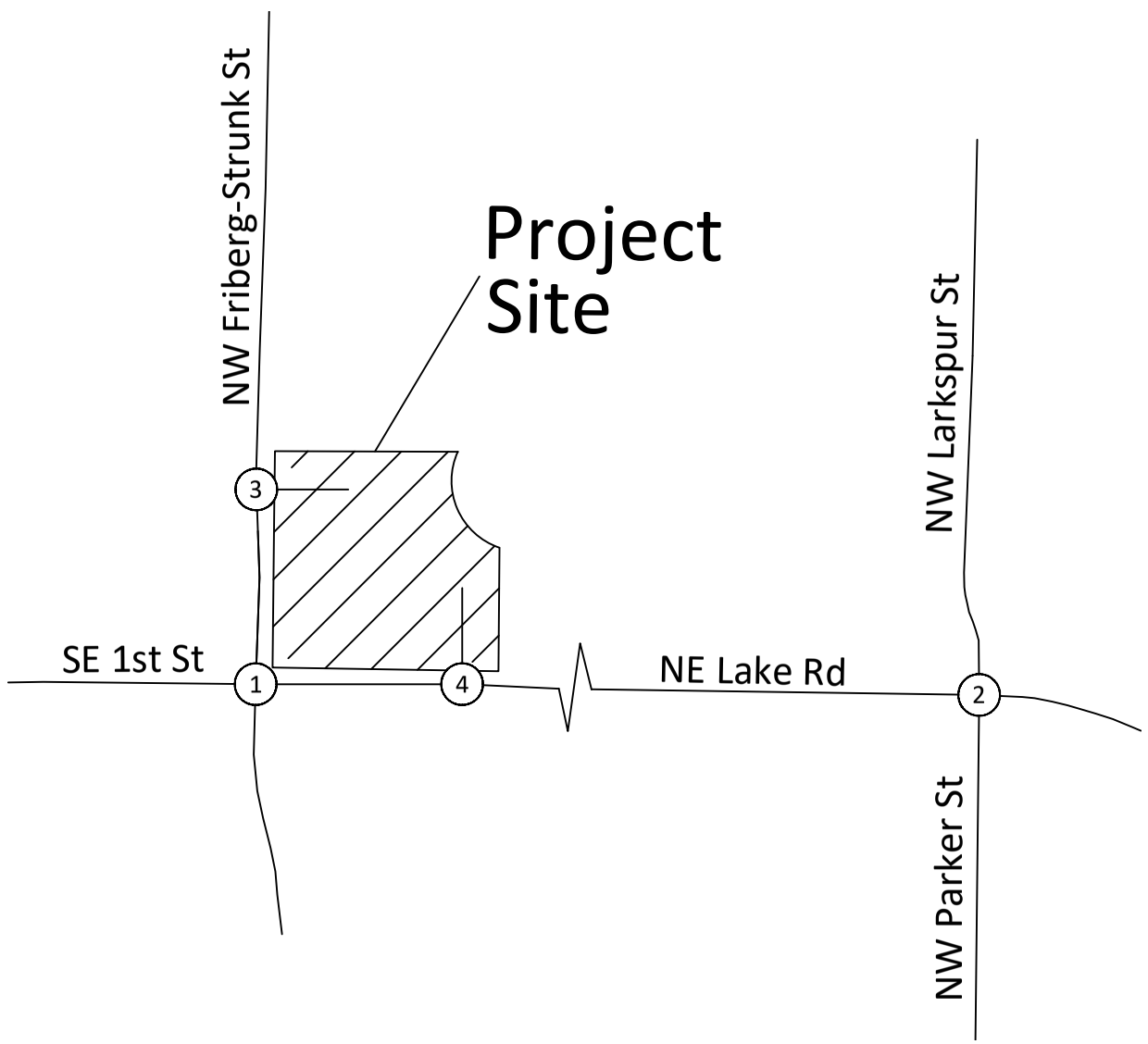
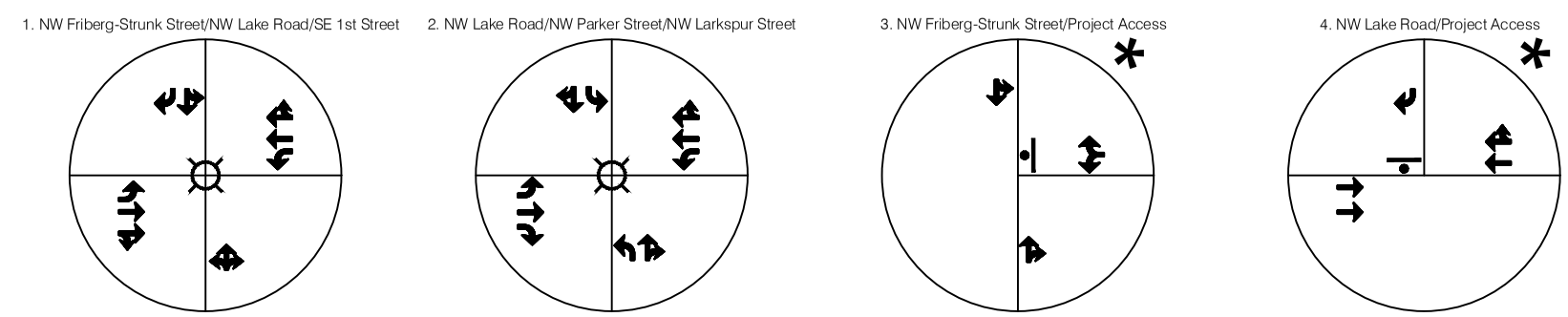


FIGURE 1
Vicinity Map

NOT TO SCALE

22047_Figures.Dwg





LEGEND

- Lane Usage
- Traffic Signal
- Stop Sign
- Roundabout
- * 2027 "With Project" Lane Configuration

NOT TO SCALE

FIGURE 3
Existing Lane Configuration and Traffic Control

22047_Figures.Dwg

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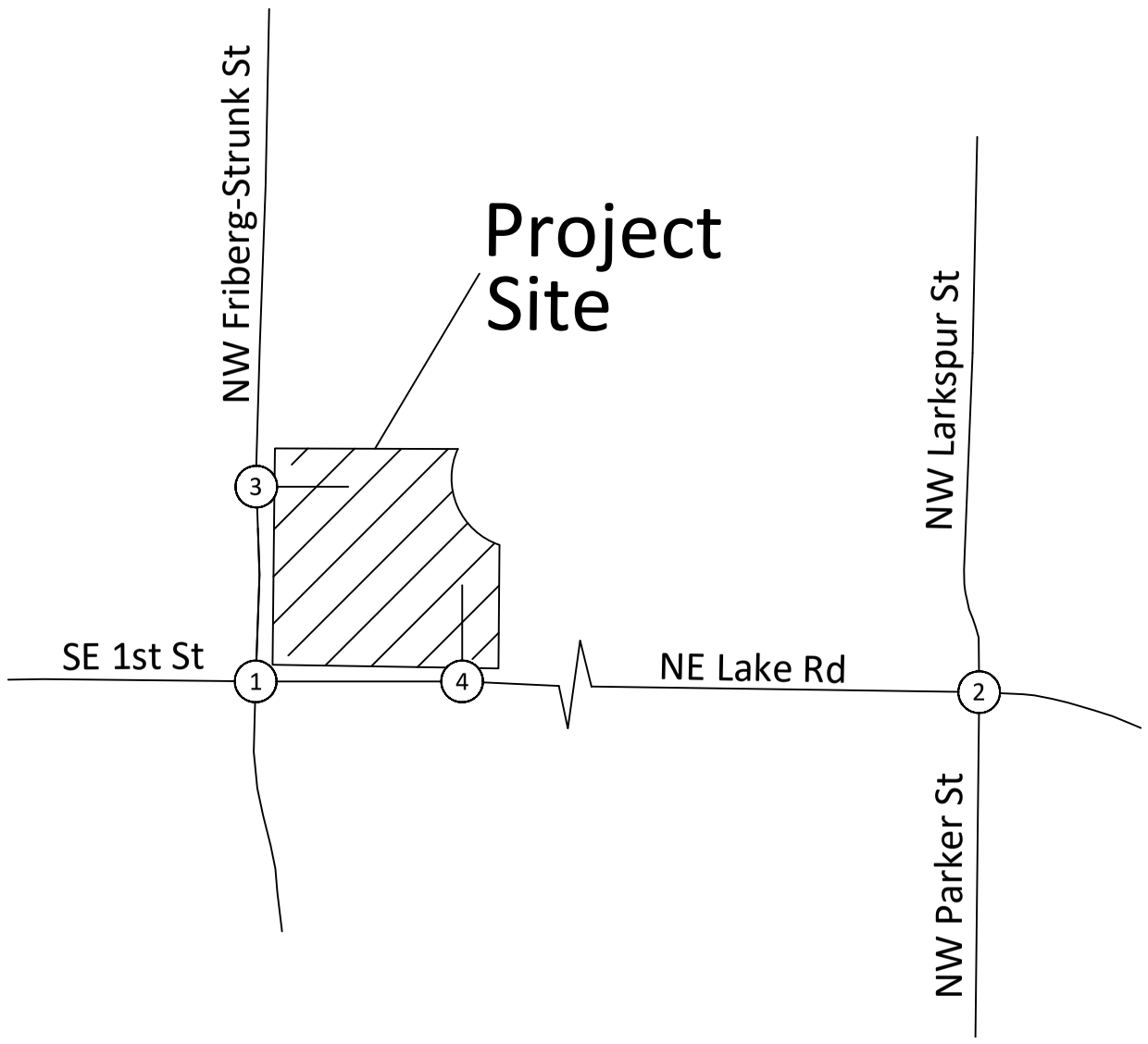
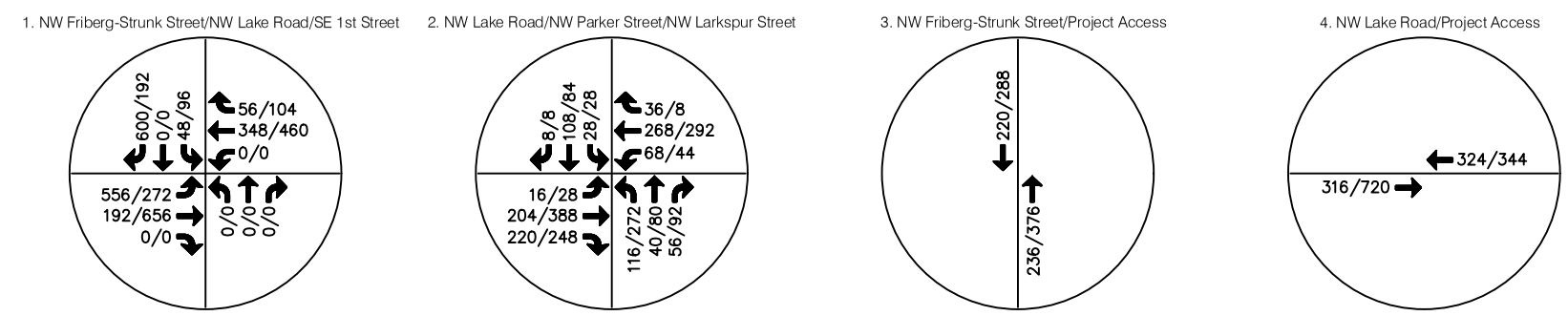




LEGEND

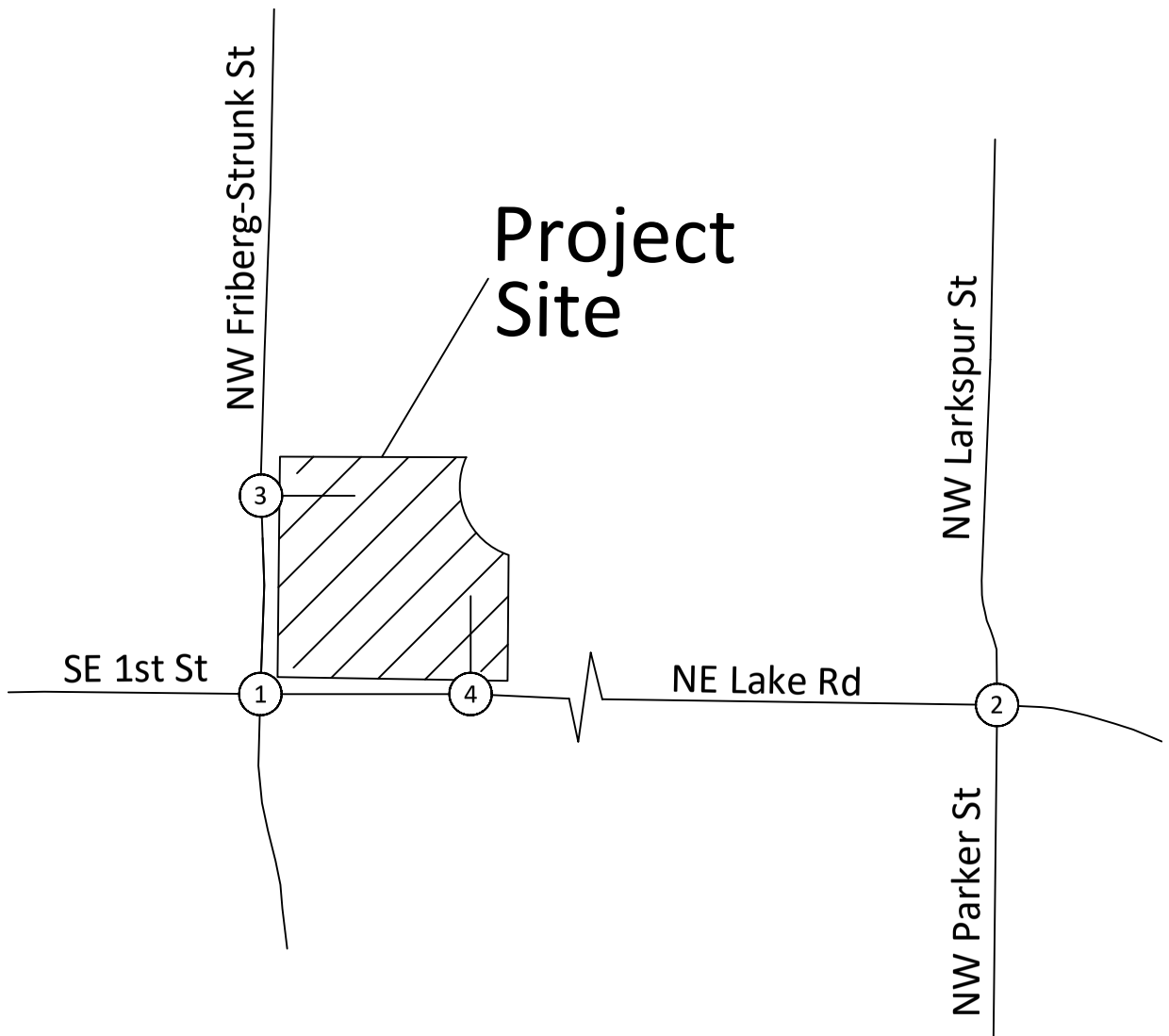
128/200 A.M./P.M. Peak Hour Traffic Volume

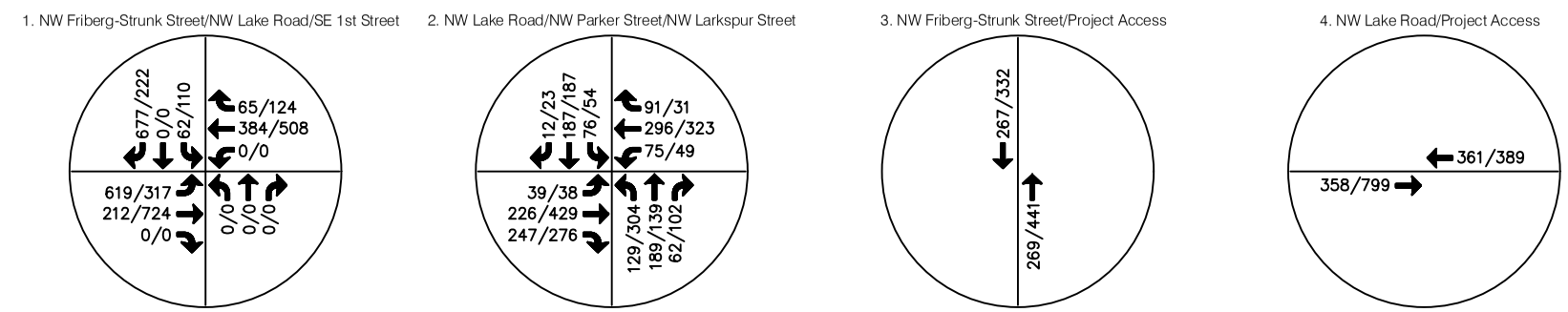
NOT TO SCALE

FIGURE 4
Existing A.M. and P.M.
Peak Hour Traffic Volumes

22047_Figures.Dwg

Exhibit 10 APPEAL24-1001





LEGEND

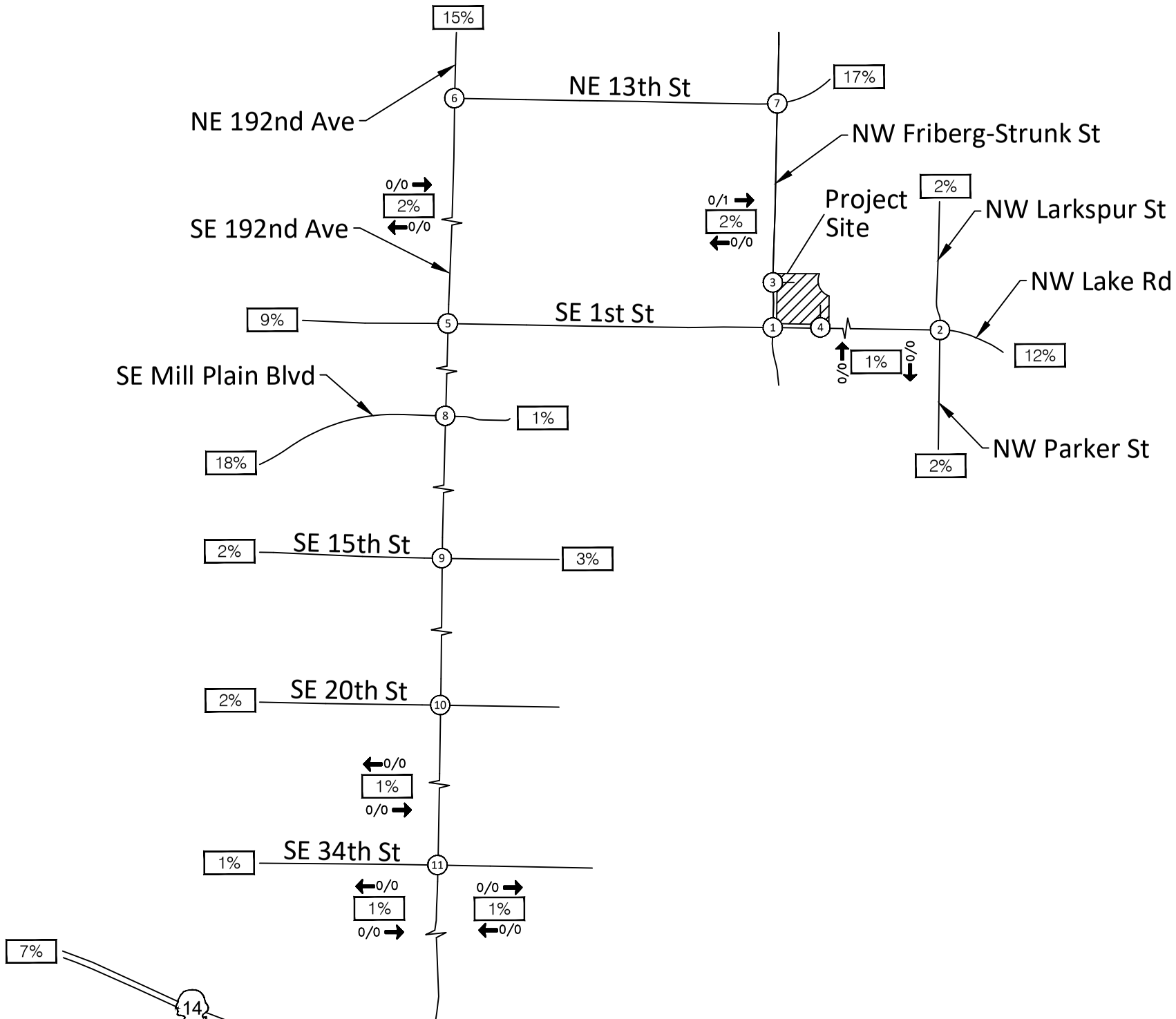
128/200 A.M./P.M. Peak Hour Traffic Volume

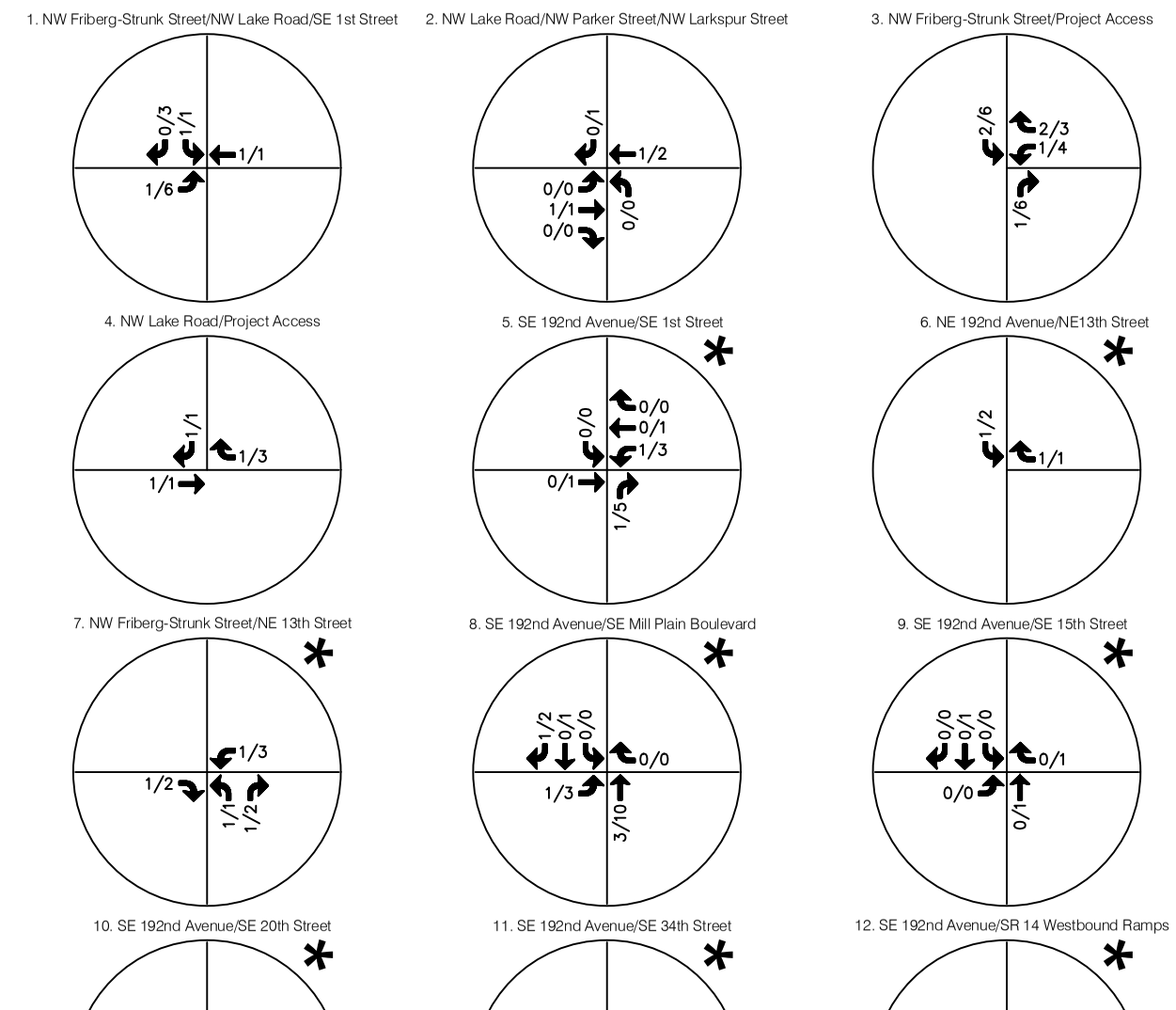
NOT TO SCALE

FIGURE 5
2027 "Without Project"
A.M. and P.M. Peak Hour Traffic Volumes

22047_Figures.Dwg

Exhibit 10 APPEAL24-1001





LEGEND

128/200 A.M./P.M. Peak Hour Traffic Volume

10% Peak Hour Trip Distribution

* Not Study Area Intersections. Shown for Trip Distribution and Assignment Purposes Only

NOT TO SCALE

FIGURE 6a
Phase 1
Trip Distribution and Assignment
Net Traffic Volumes

22047_Figures.Dwg

Exhibit 10 APPEAL24-1001

Oak Tree Station TIA
Camas, WA

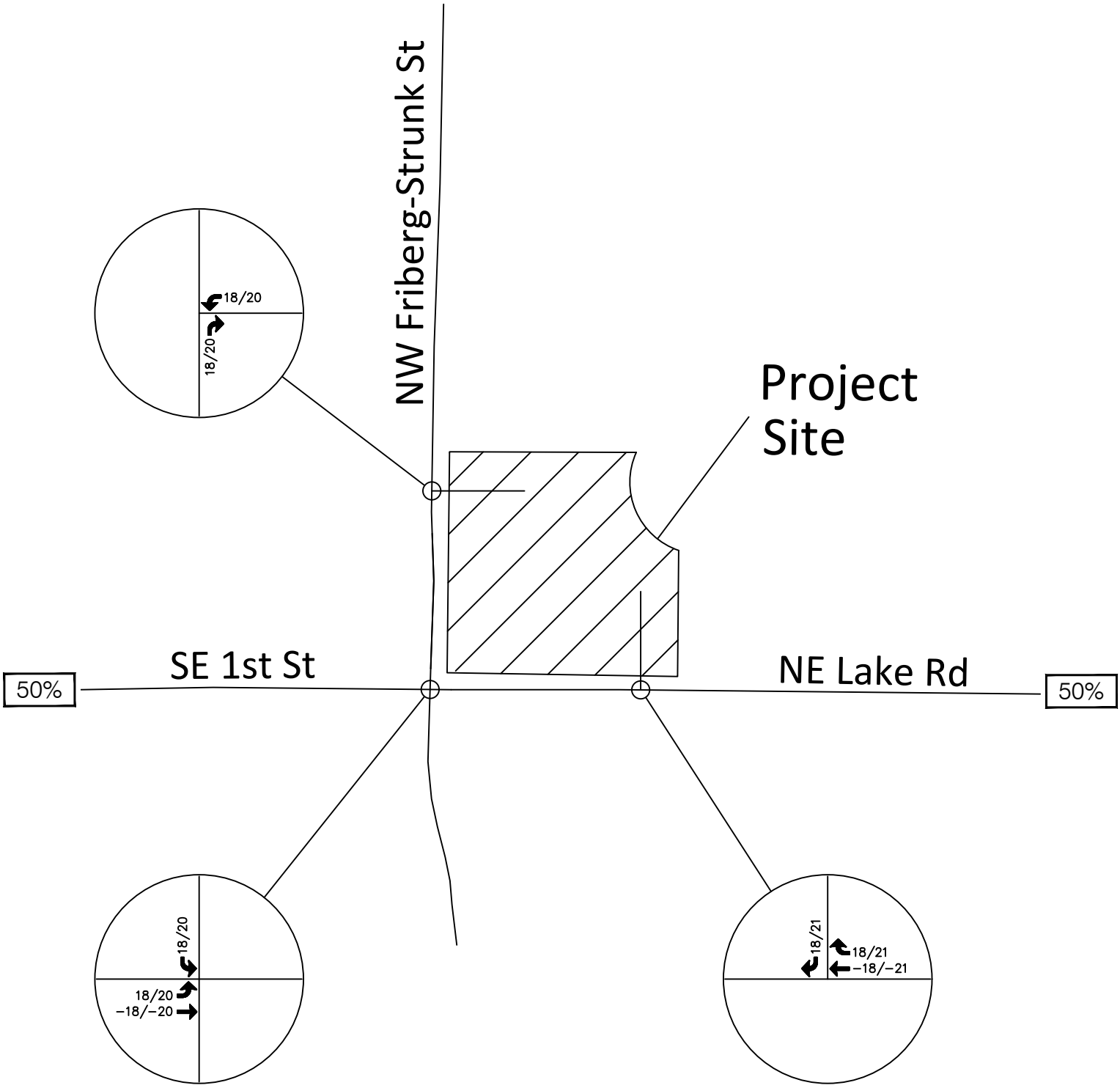
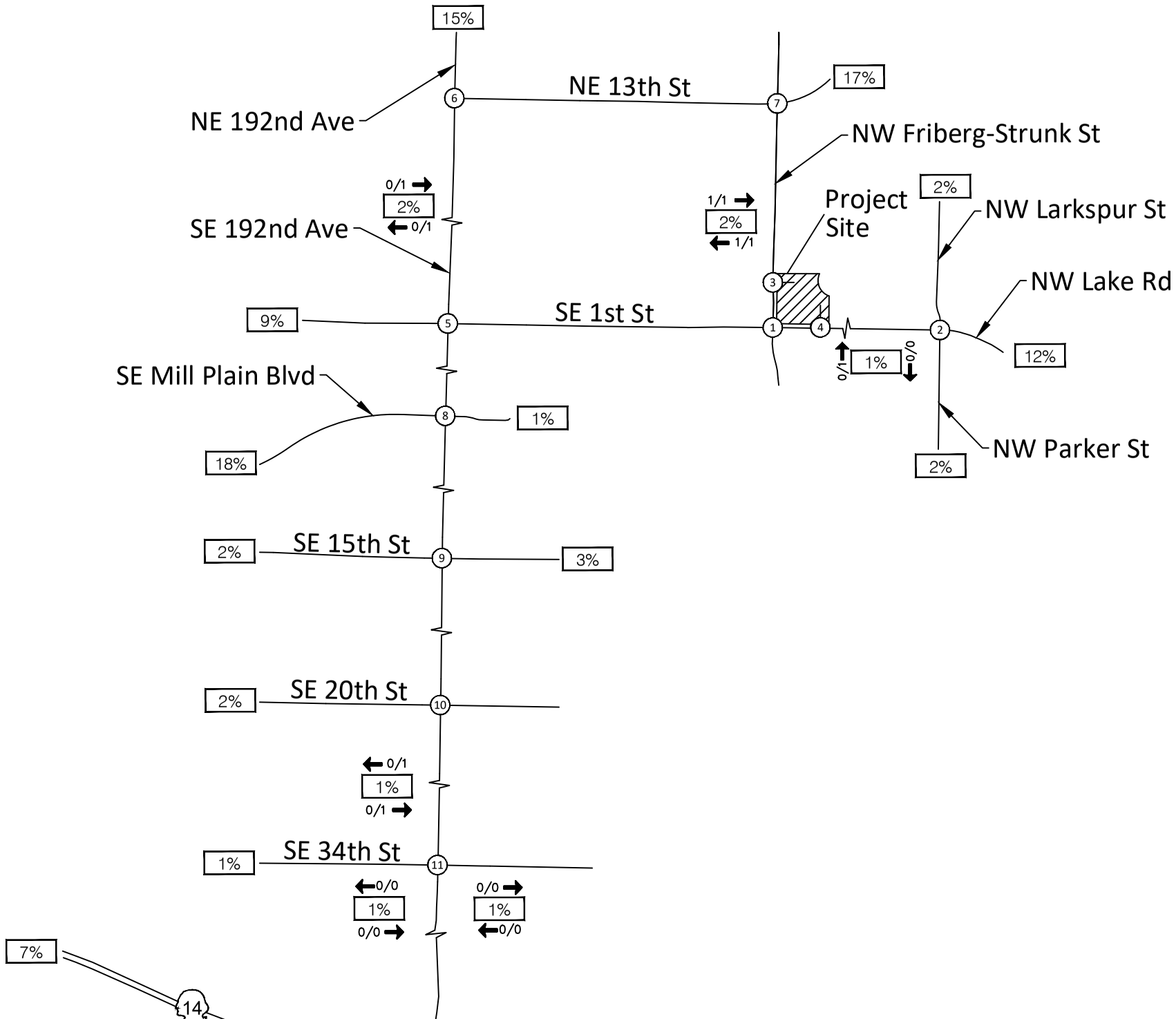
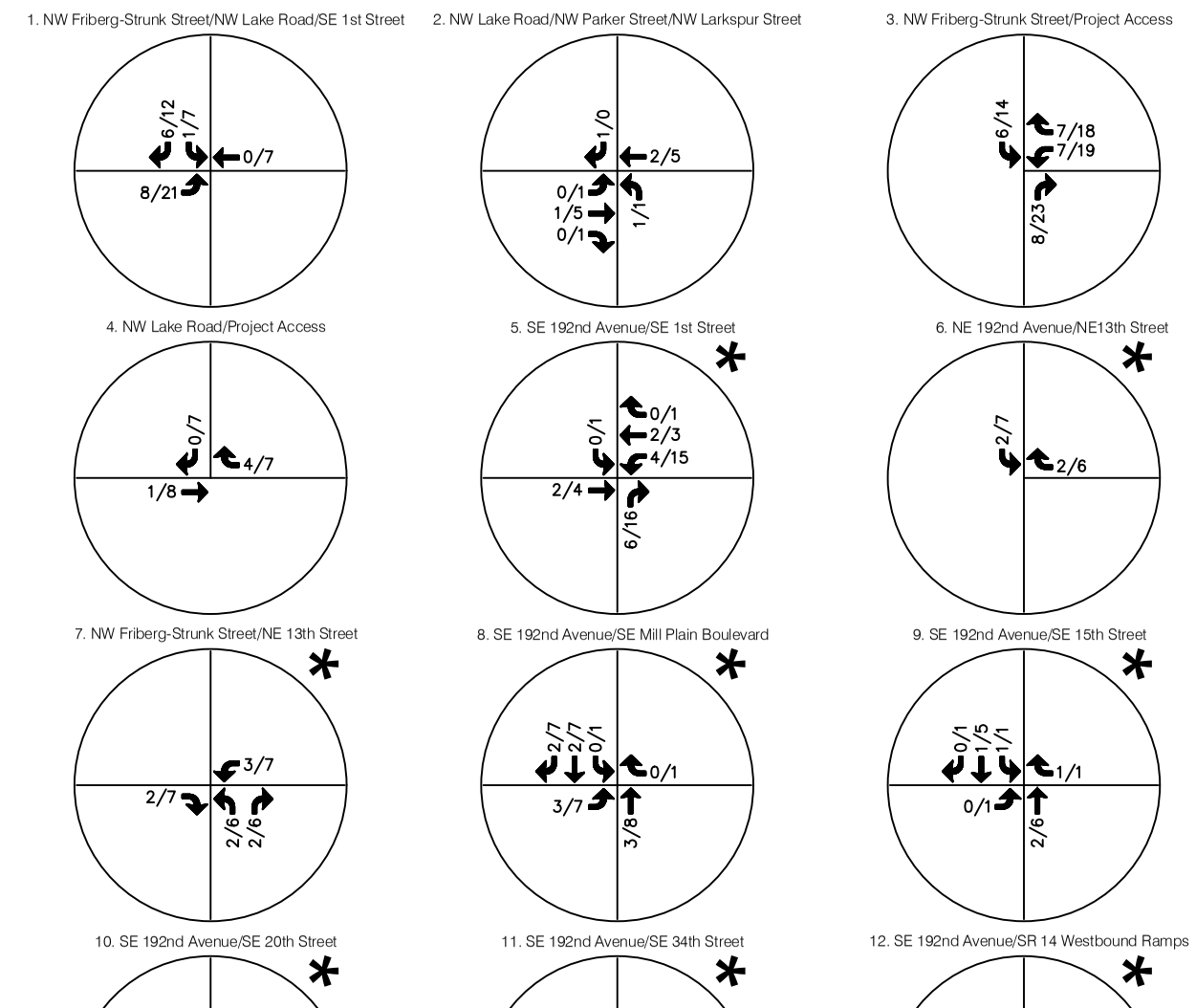


FIGURE 6b
Phase 1 Pass-By/Diverted Trips
Trip Distribution and Assignment
Net Traffic Volumes

NOT TO SCALE

22047_Figures.Dwg





LEGEND

128/200 A.M./P.M. Peak Hour Traffic Volume

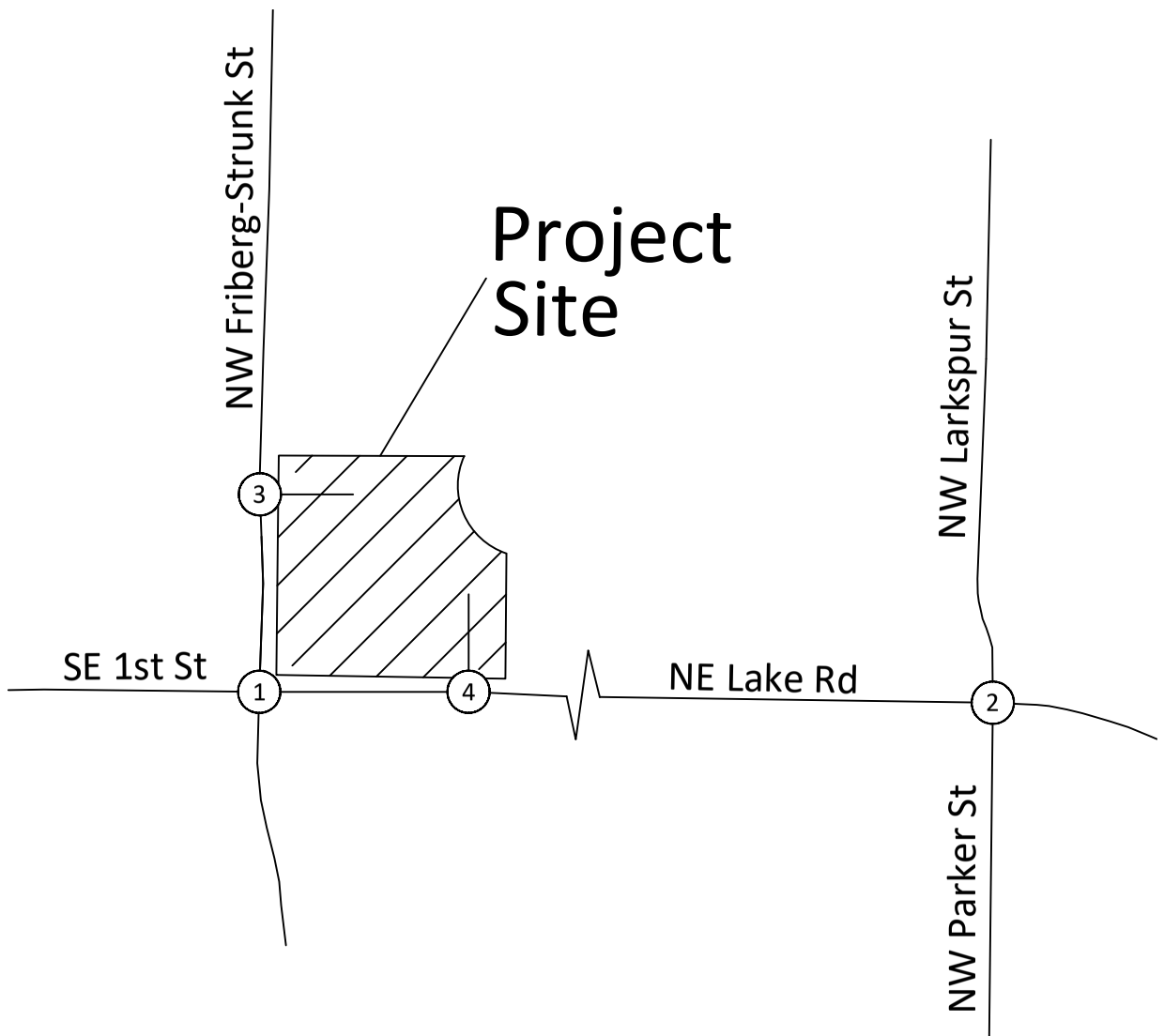
10% Peak Hour Trip Distribution

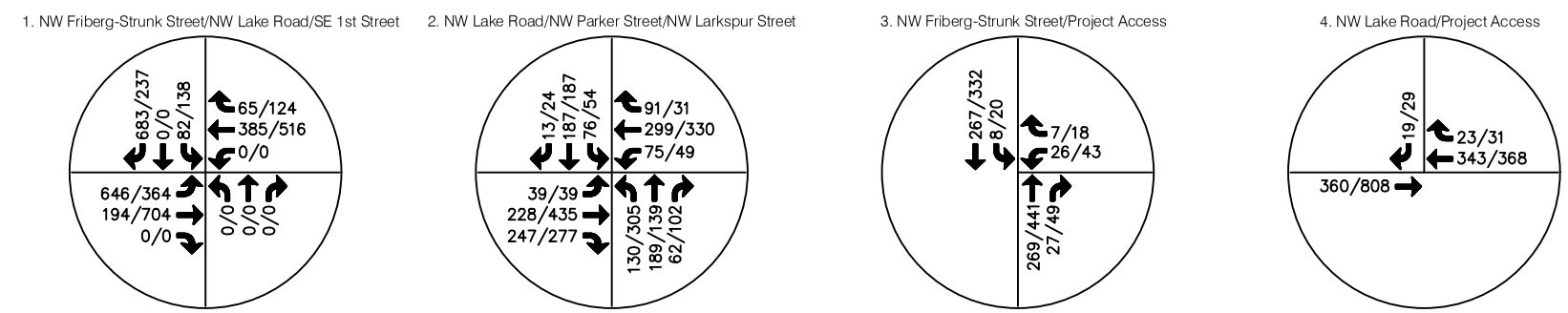
* Not Study Area Intersections. Shown for Trip Distribution and Assignment Purposes Only

NOT TO SCALE

FIGURE 6c
Phase 2
Trip Distribution and Assignment
Traffic Volumes

22047_Figures.Dwg





LEGEND

128/200 A.M./P.M. Peak Hour Traffic Volume

NOT TO SCALE

FIGURE 7
2027 "With Project"
A.M. and P.M. Peak Hour Traffic Volumes

22047_Figures.Dwg

Exhibit 10 APPEAL24-1001

0% Build-Out 8/24/23

GOODWIN ROAD INDUSTRIAL
TRAFFIC IMPACT ANALYSIS

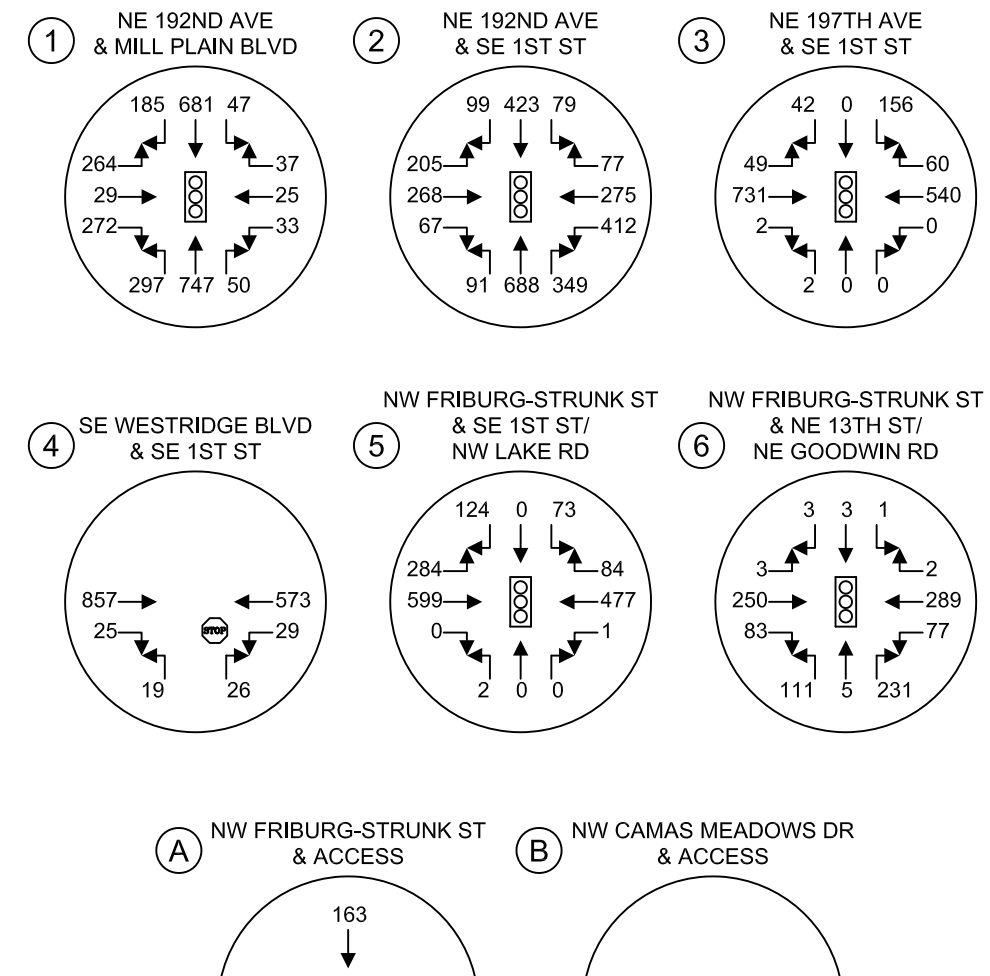
1. INTRODUCTION

The main goals of this study focus on the analysis of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the adjacent street system, baseline vehicular volumes, and entering sight distance data. Forecasts of future traffic and dispersion patterns on the street system are then determined using established trip generation and distribution techniques. As a final step, appropriate conclusions and mitigation measures are defined.

2. PROJECT DESCRIPTION

The Goodwin Road Industrial project is a proposed warehouse facility comprising up to 185,000 square feet. The subject site, located in the city of Camas, is bordered to the west by NW Friburg-Strunk Street and is located on the southern corner of the NE Goodwin Road & NW Camas Meadows Drive intersection. The site is comprised within 11.14-acre tax parcel #: 172974000. Access to and from the site is proposed via one driveway extending east from NW Friburg-Strunk Street and one driveway extending south from NW Camas Meadows Drive. Figure 1 below shows the vicinity map and adjacent street system. A conceptual site plan illustrating the proposed site layout is presented in Figure 2.

Figure 1: Vicinity Map



HEATH & ASSOCIATES

TRAFFIC AND CIVIL ENGINEERING

GOODWIN INDUSTRIAL

EXISTING PM PEAK HOUR VOLULMES

FIGURE 3

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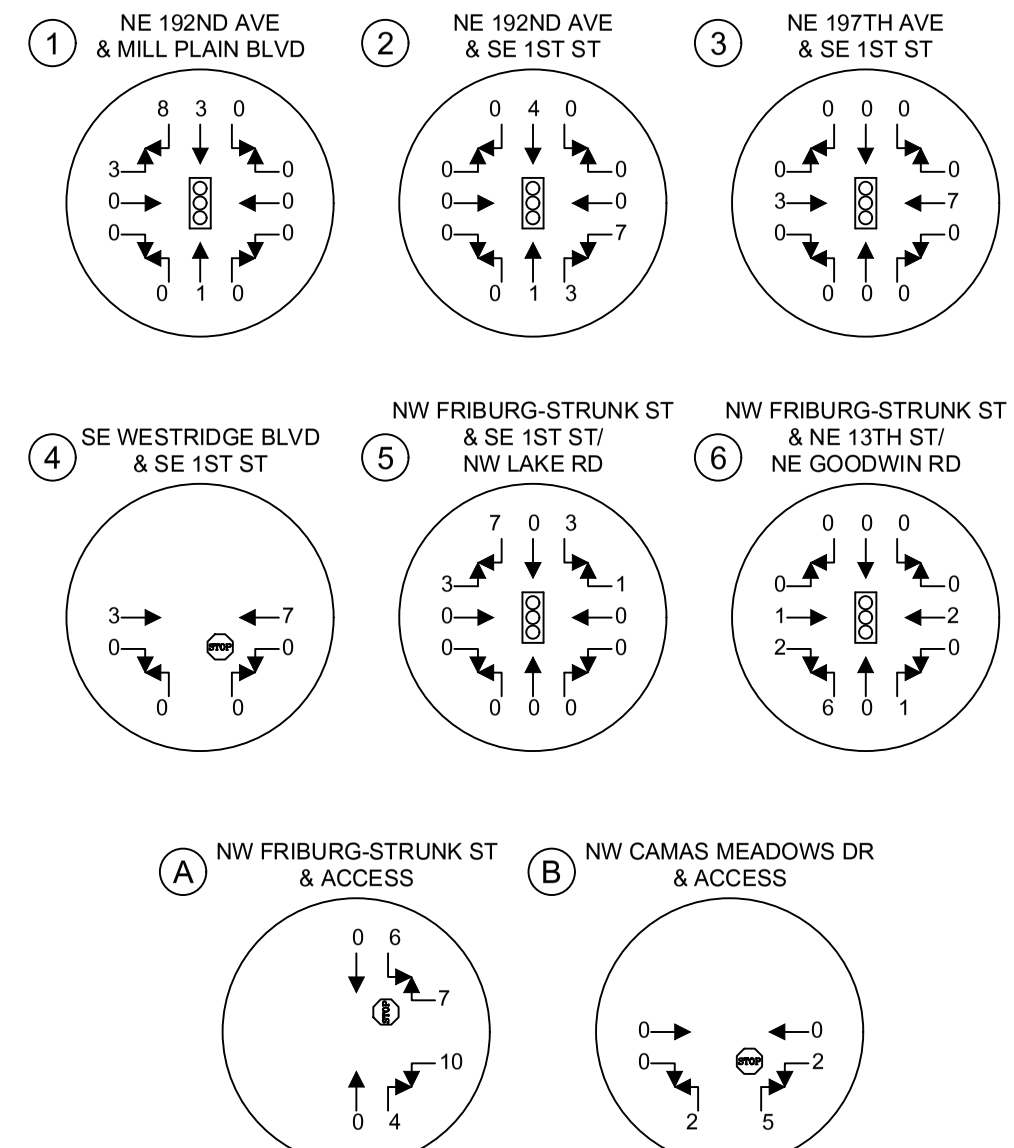


HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

GOODWIN INDUSTRIAL
PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 4

PO Box 397 Puyallup, WA 98371 (253) 770 1401 heathtraffic.com

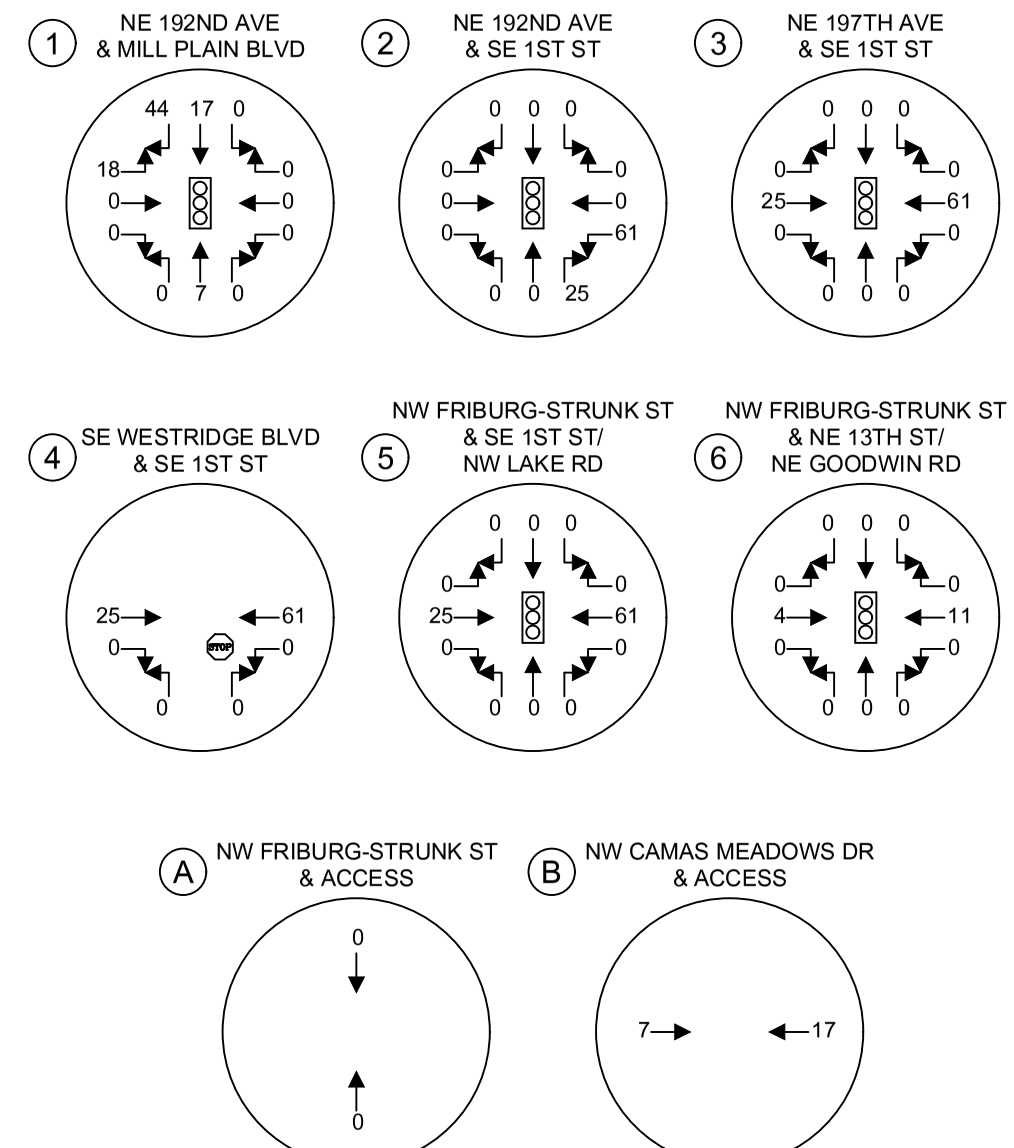
Exhibit 10 APPEAL24-1001

N

INTERSECTIONS OF STUDY

1. NE 192ND AVE & MILL PLAIN BLVD
2. NE 192ND AVE & SE 1ST ST
3. NE 197TH AVE & SE 1ST ST
4. SE WESTRIDGE BLVD & SE 1ST ST
5. NW FRIBURG-STRUNK ST & SE 1ST ST/NW LAKE RD
6. NW FRIBURG-STRUNK ST & NE 13TH ST/NE GOODWIN RD

A. NW FRIBURG-STRUNK ST & ACCESS
B. NW CAMAS MEADOWS DR & ACCESS



HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

GOODWIN INDUSTRIAL
PM PEAK HOUR PIPELINE VOLUMES
FIGURE 5

PO Box 397 Puyallup, WA 98371 (253) 770 1401 heathtraffic.com

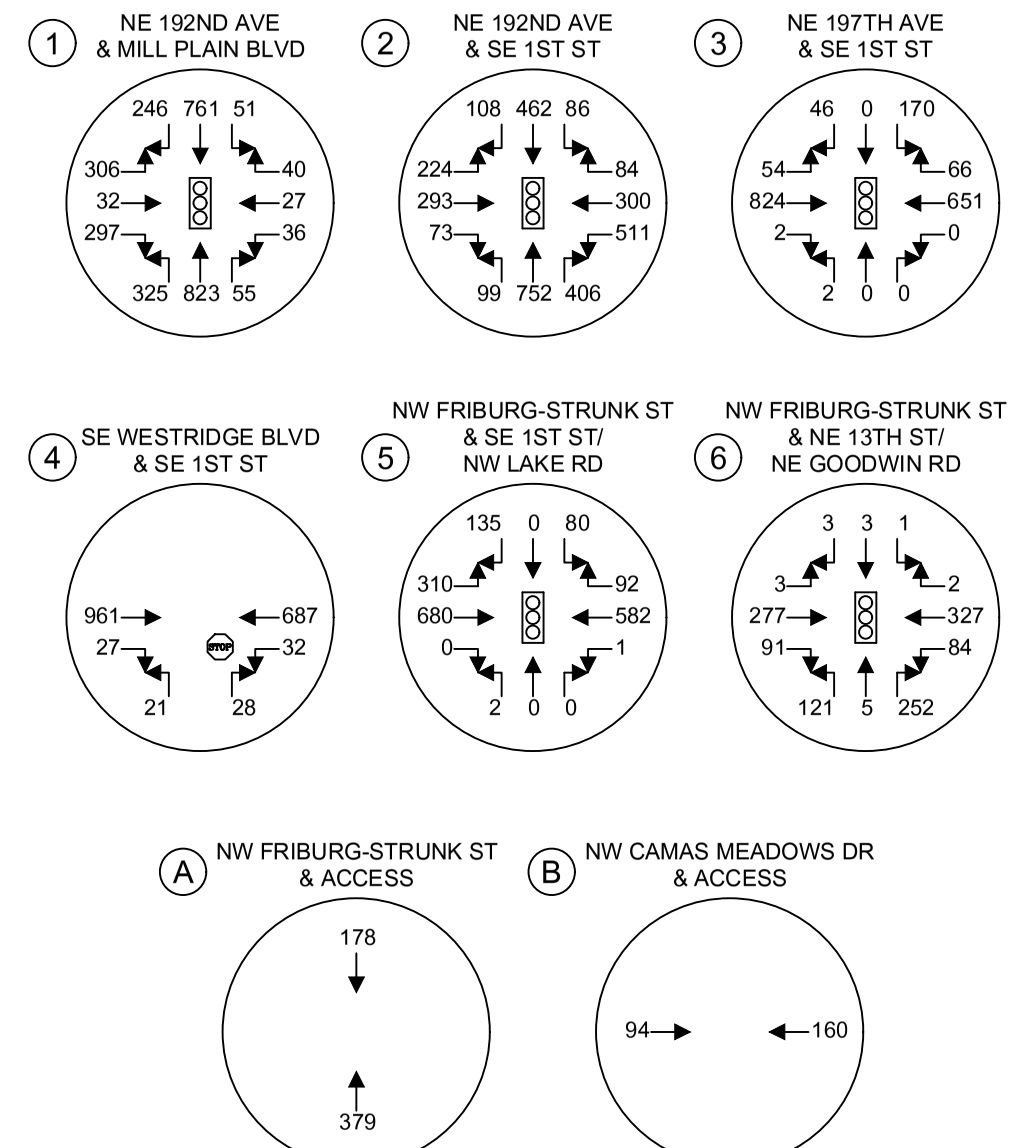
Exhibit 10 APPEAL24-1001

N

INTERSECTIONS OF STUDY

1. NE 192ND AVE & MILL PLAIN BLVD
2. NE 192ND AVE & SE 1ST ST
3. NE 197TH AVE & SE 1ST ST
4. SE WESTRIDGE BLVD & SE 1ST ST
5. NW FRIBURG-STRUNK ST & SE 1ST ST/NW LAKE RD
6. NW FRIBURG-STRUNK ST & NE 13TH ST/NE GOODWIN RD

A. NW FRIBURG-STRUNK ST & ACCESS
B. NW CAMAS MEADOWS DR & ACCESS



HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

GOODWIN INDUSTRIAL

FORECAST 2025 PM PEAK HOUR BACKGROUND VOLUMES
FIGURE 6

PO Box 397 Puyallup, WA 98371 (253) 770 1401 heathtraffic.com

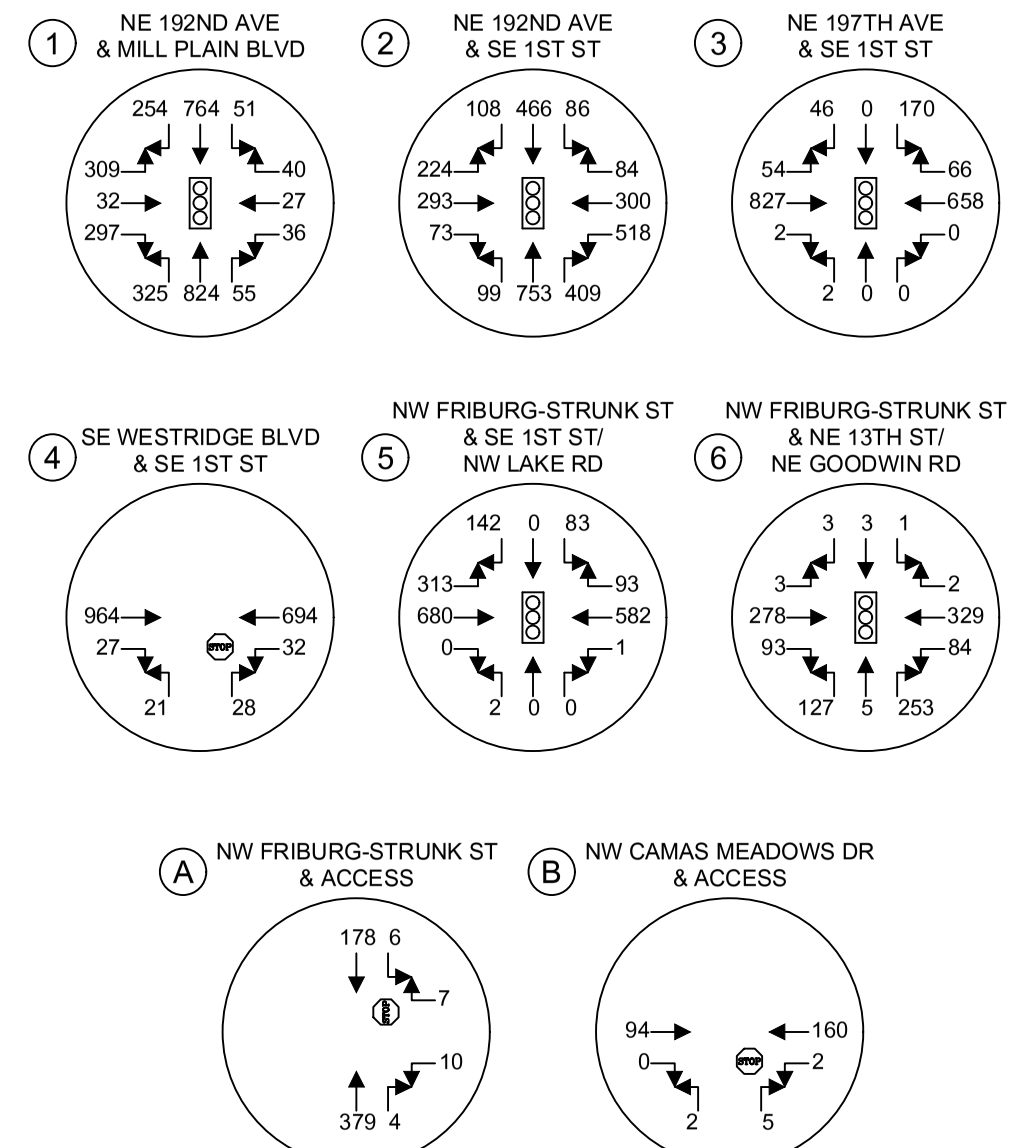
Exhibit 10 APPEAL24-1001

N

INTERSECTIONS OF STUDY

1. NE 192ND AVE & MILL PLAIN BLVD
2. NE 192ND AVE & SE 1ST ST
3. NE 197TH AVE & SE 1ST ST
4. SE WESTRIDGE BLVD & SE 1ST ST
5. NW FRIBURG-STRUNK ST & SE 1ST ST/NW LAKE RD
6. NW FRIBURG-STRUNK ST & NE 13TH ST/NE GOODWIN RD

A. NW FRIBURG-STRUNK ST & ACCESS
B. NW CAMAS MEADOWS DR & ACCESS



HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

GOODWIN INDUSTRIAL
FORECAST 2025 PM PEAK HOUR VOLUMES WITH PROJECT
FIGURE 7

PO Box 397 Puyallup, WA 98371 (253) 770 1401 heathtraffic.com

Exhibit 10 APPEAL24-1001

80% Build-Out 8/24/23

Parklands at Camas Meadows TIA
Camas, WA

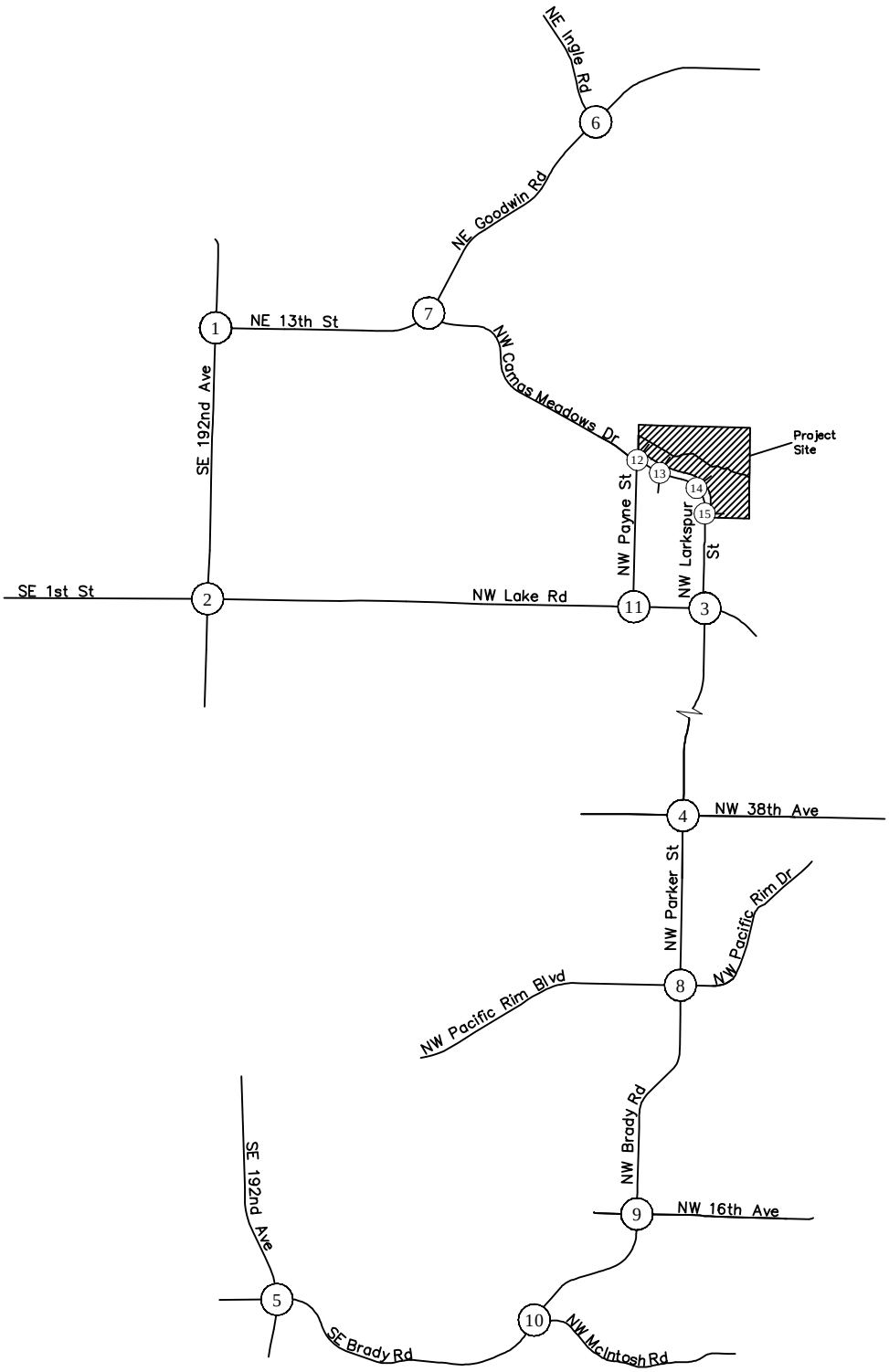
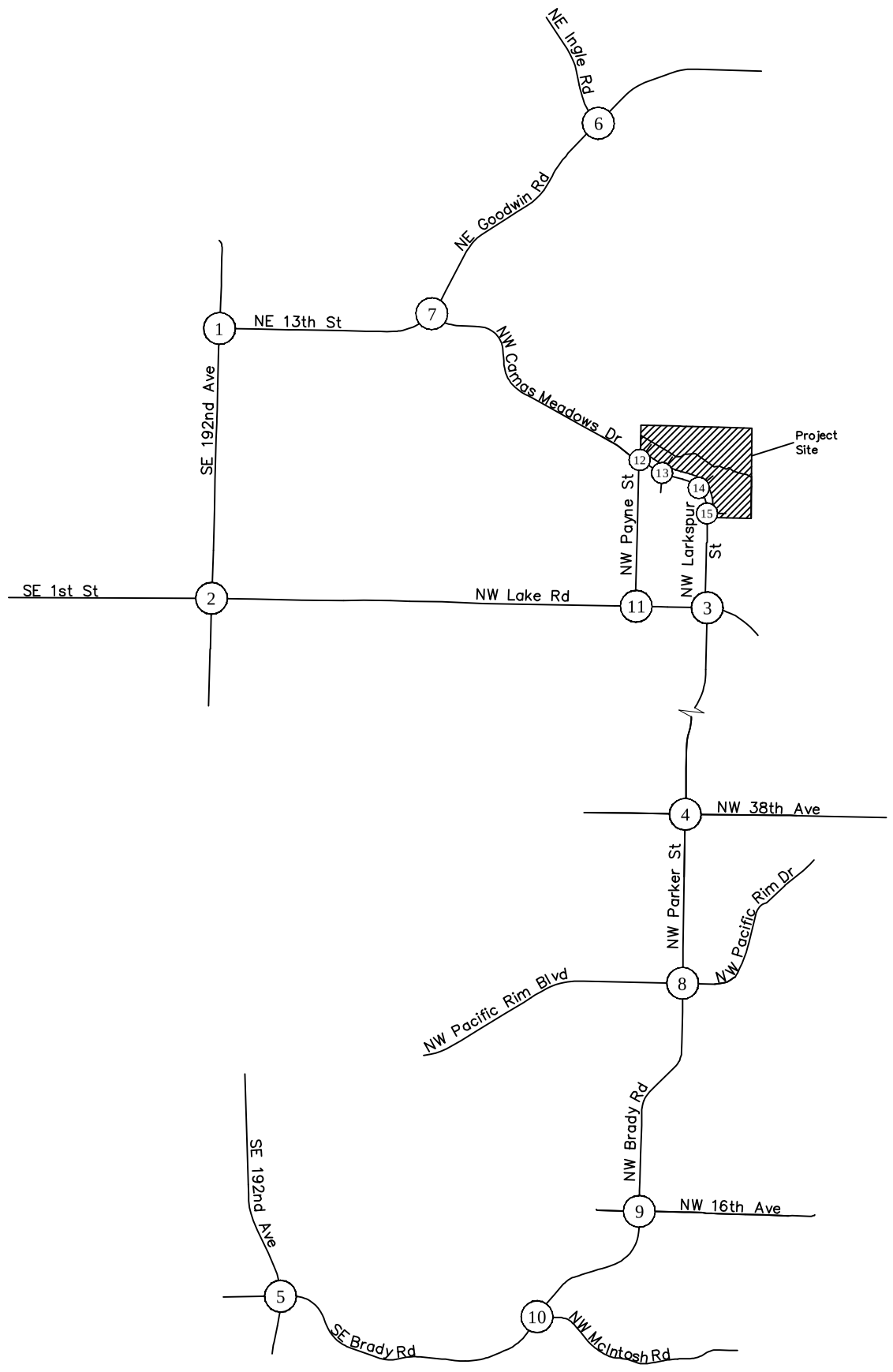
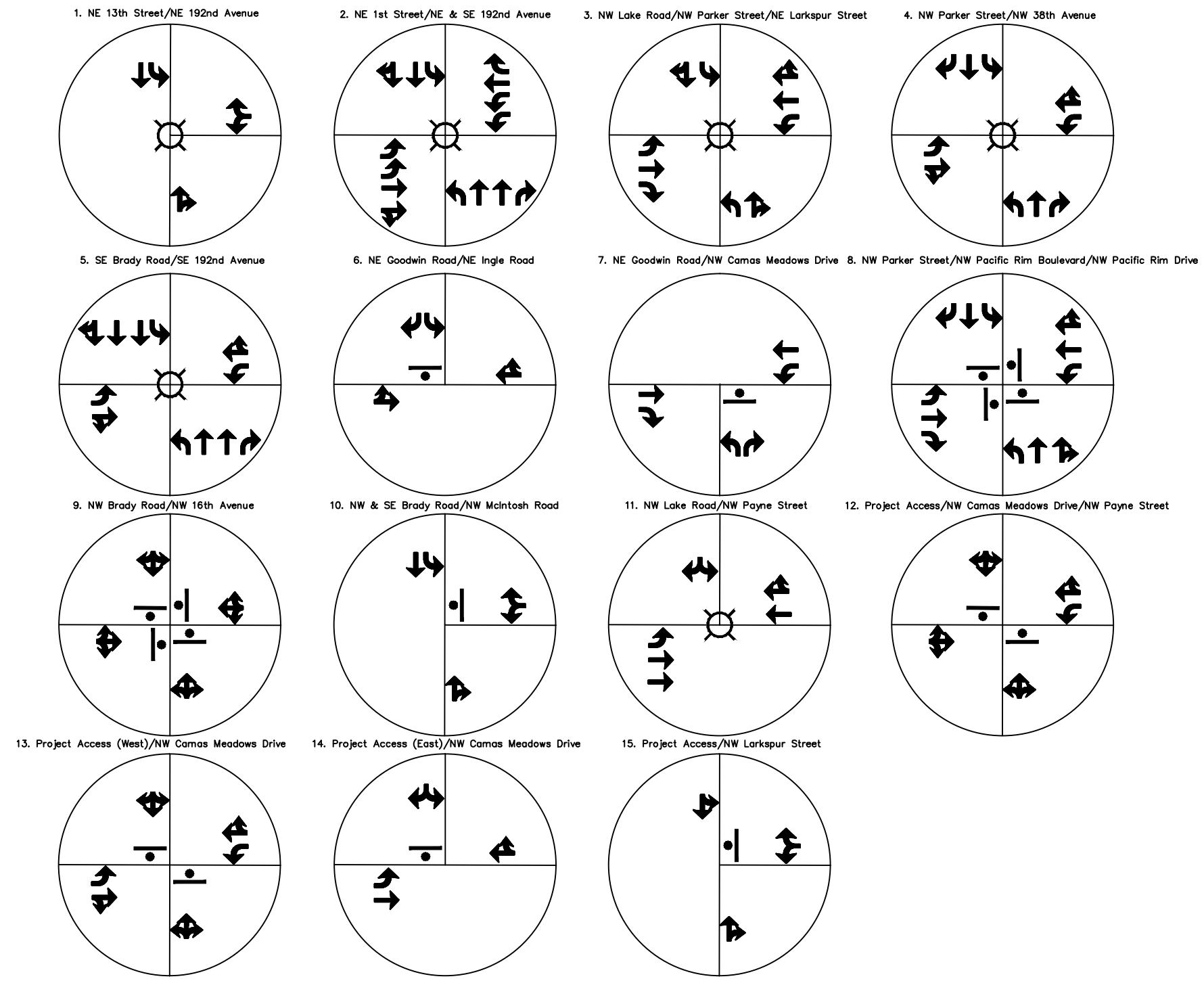


FIGURE 1
Site Vicinity Map

NOT TO SCALE

315021.0Figures.Dwg





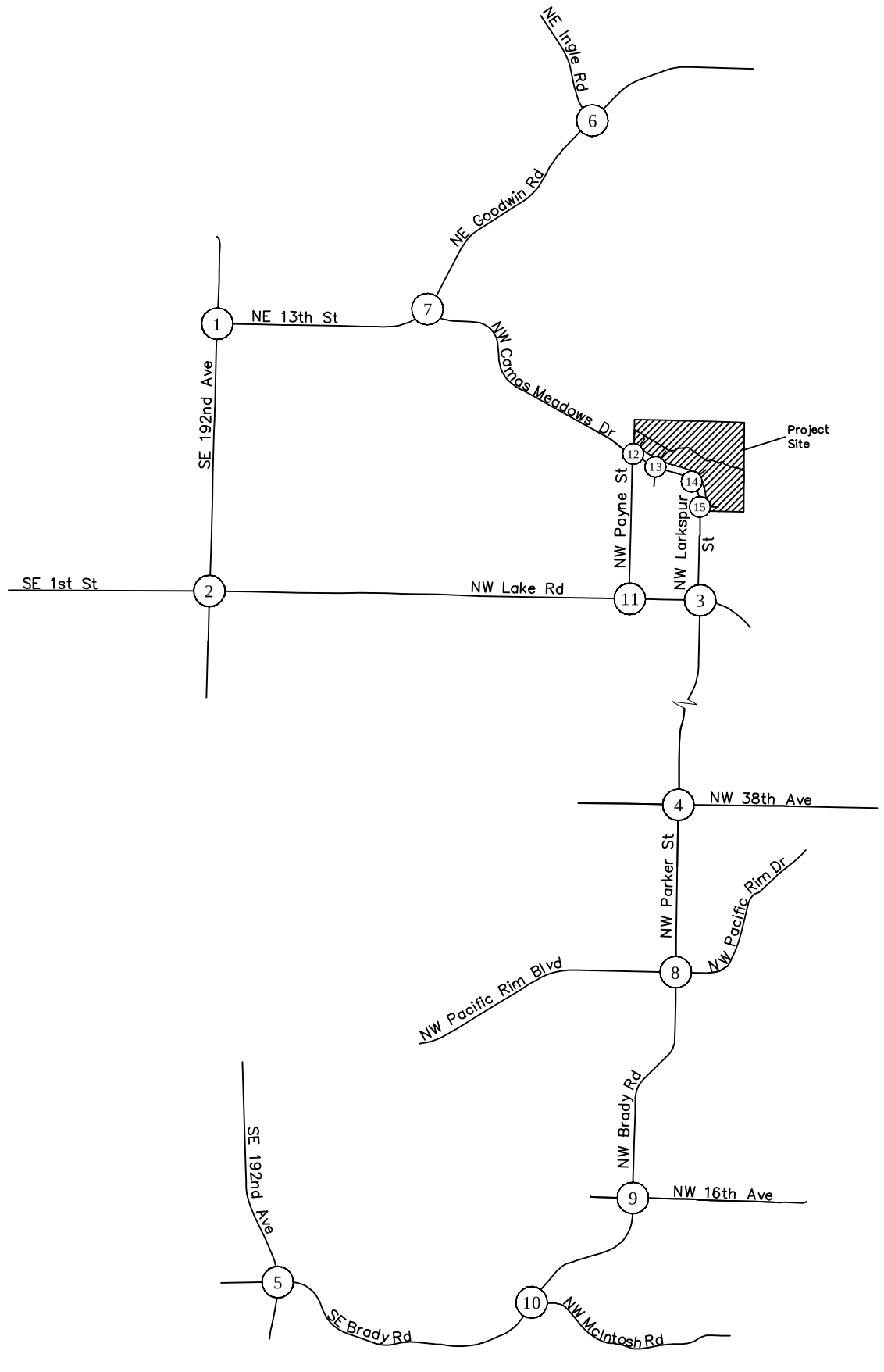
NOT TO SCALE

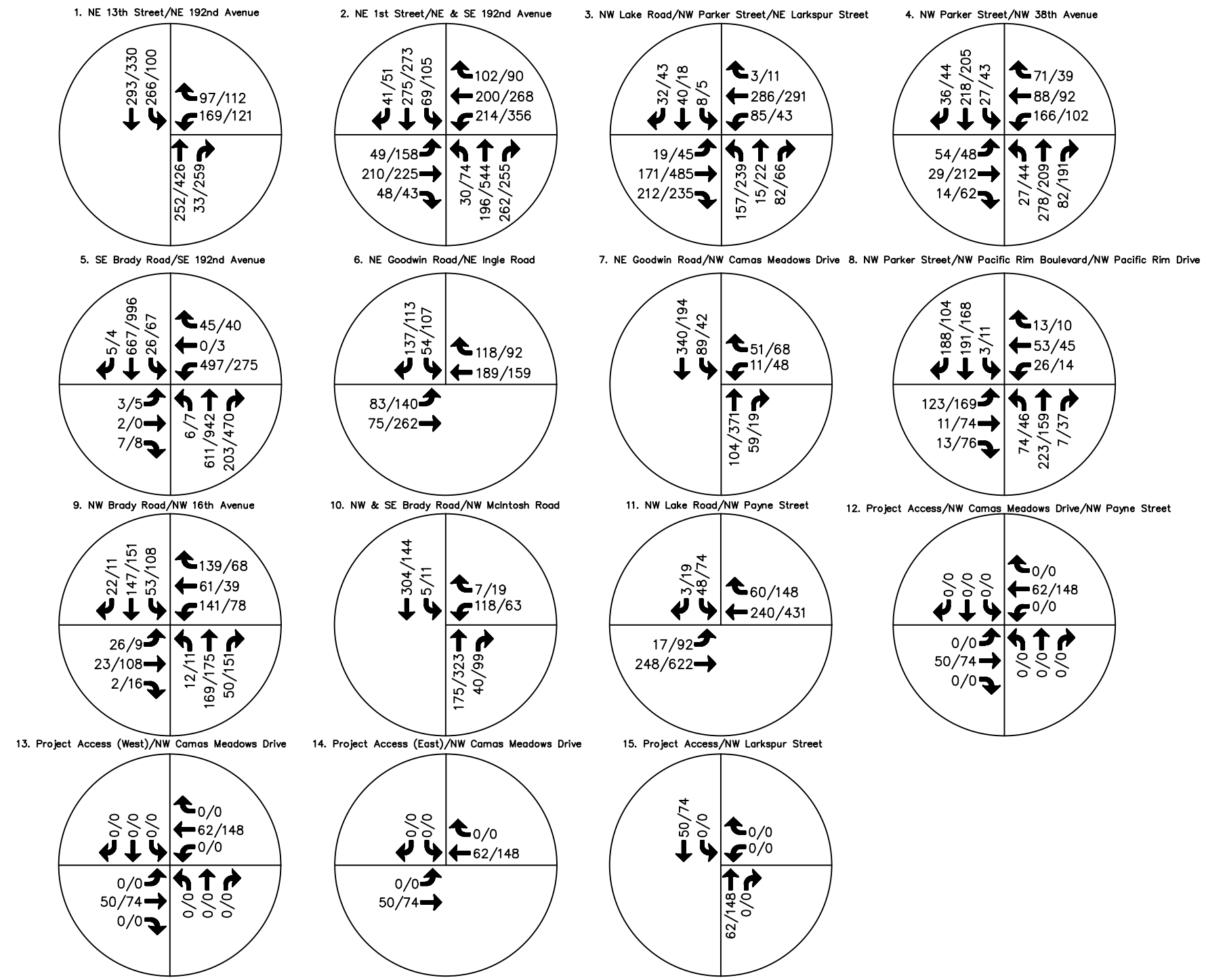
LEGEND

- Lane Usage
- Traffic Signal
- Stop Sign

FIGURE 3
Existing Lane Configuration and Traffic Control

Exhibit 10 APPEAL24-1001





LEGEND

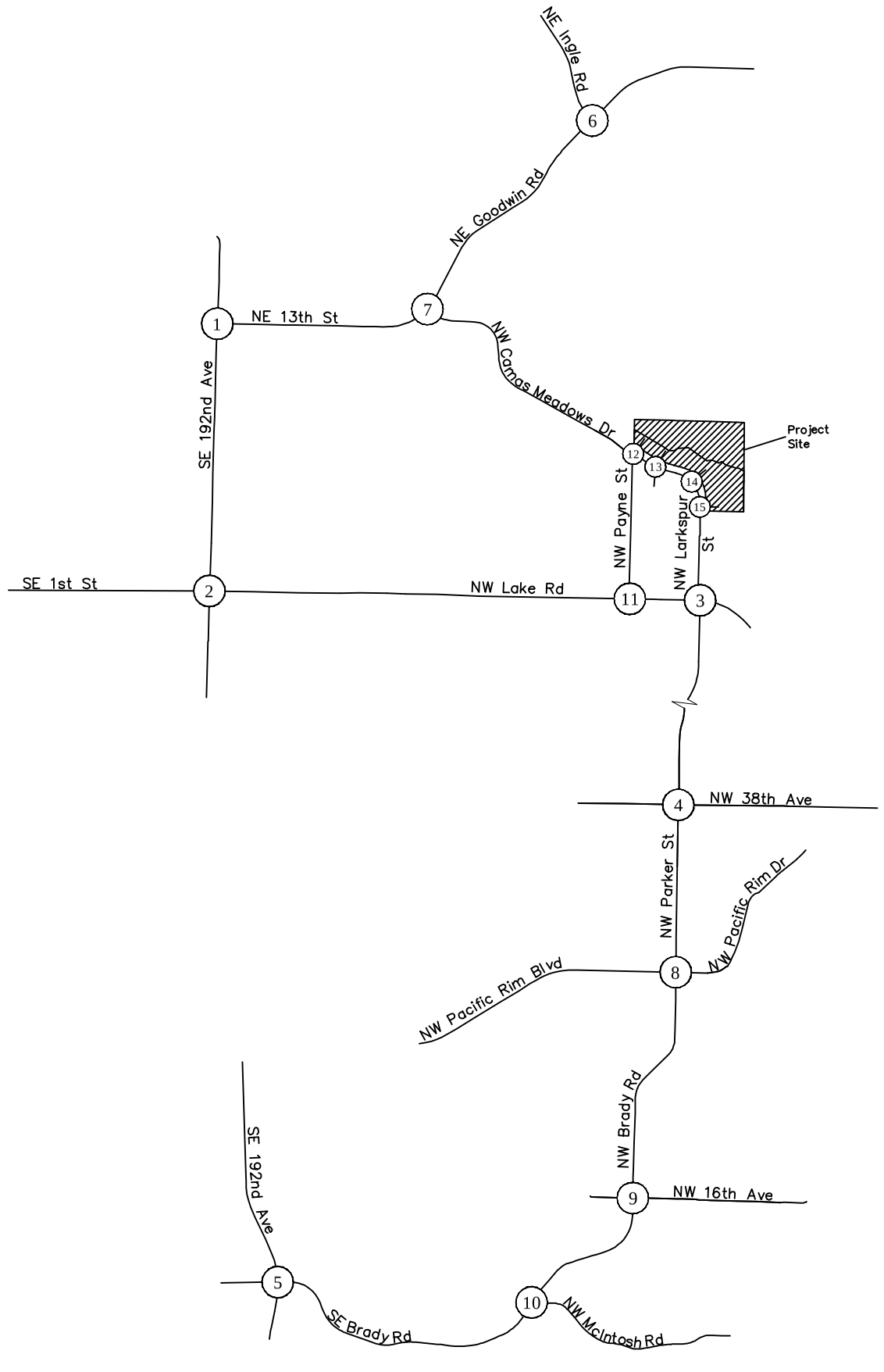
128/200 A.M./P.M. Peak Hour Traffic Volume

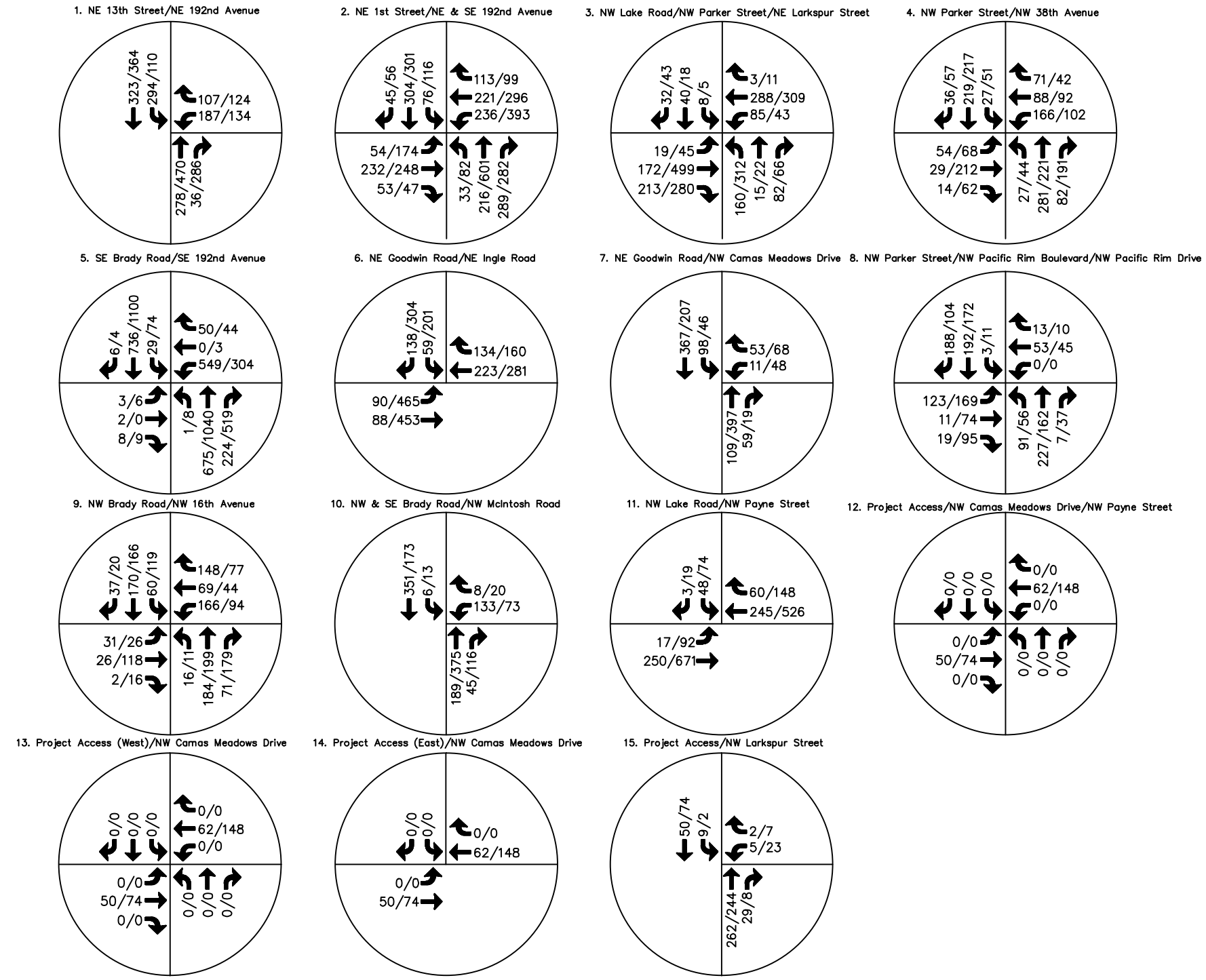
NOT TO SCALE

FIGURE 4
2015 Existing A.M. and P.M. Peak Hour Traffic Volumes

315021.0Figures.Dwg

Exhibit 10 APPEAL24-1001





LEGEND

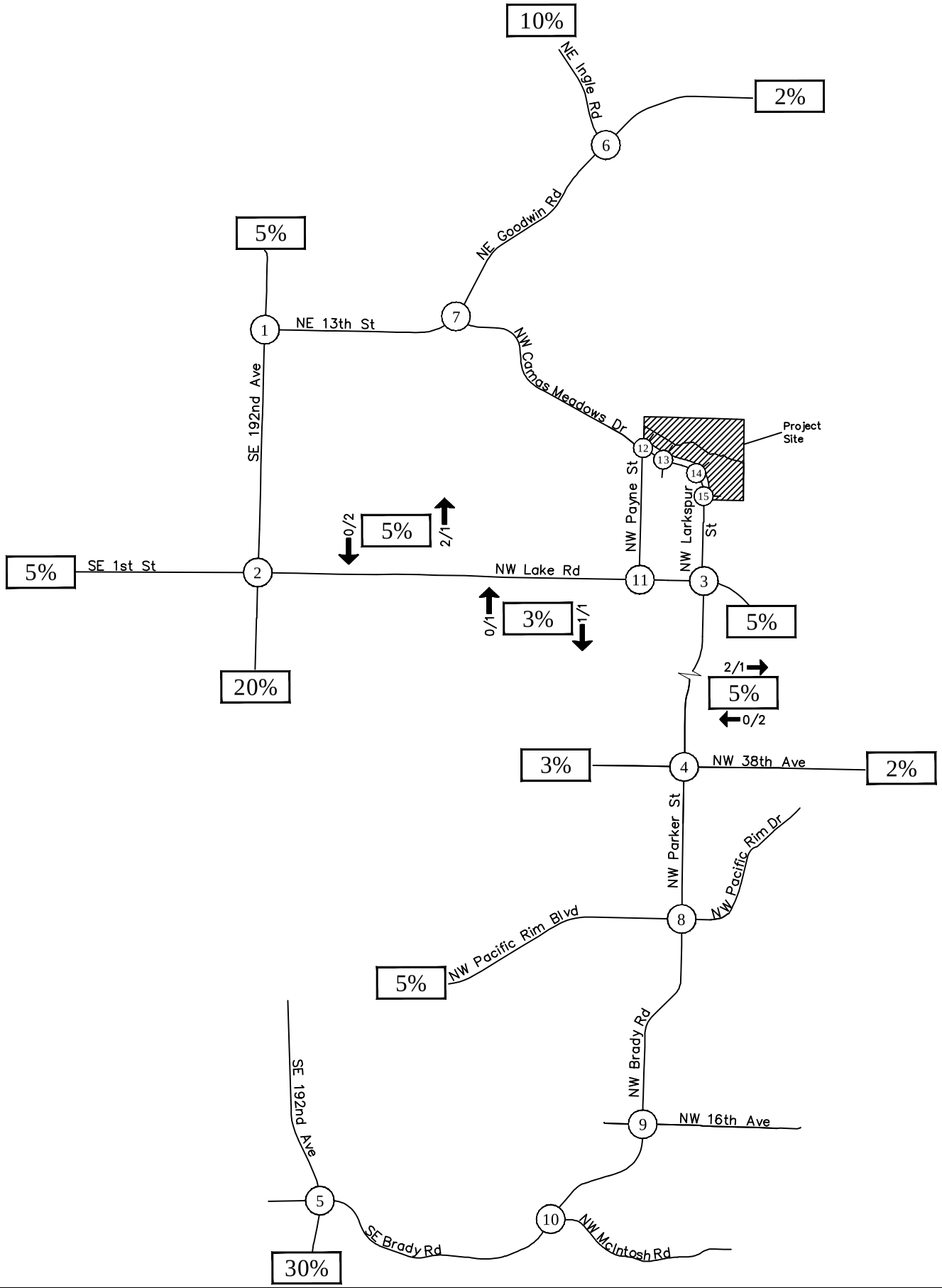
128/200 A.M./P.M. Peak Hour Traffic Volume

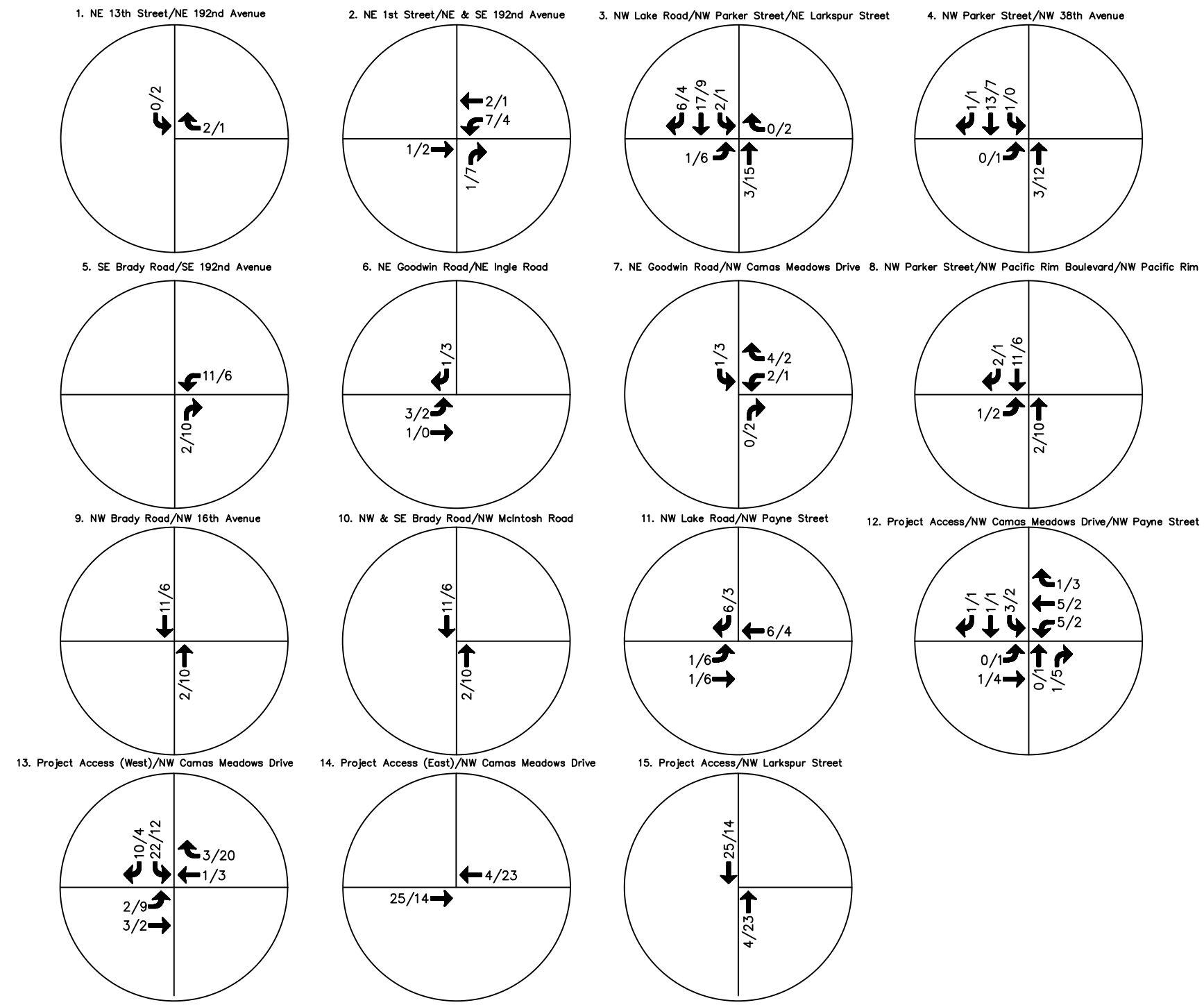
NOT TO SCALE

FIGURE 5
2020 "Without Project"
A.M. and P.M. Peak Hour Traffic Volumes

315021.0Figures.Dwg

Exhibit 10 APPEAL24-1001





LEGEND

128/200 A.M./P.M. Peak Hour Traffic Volume

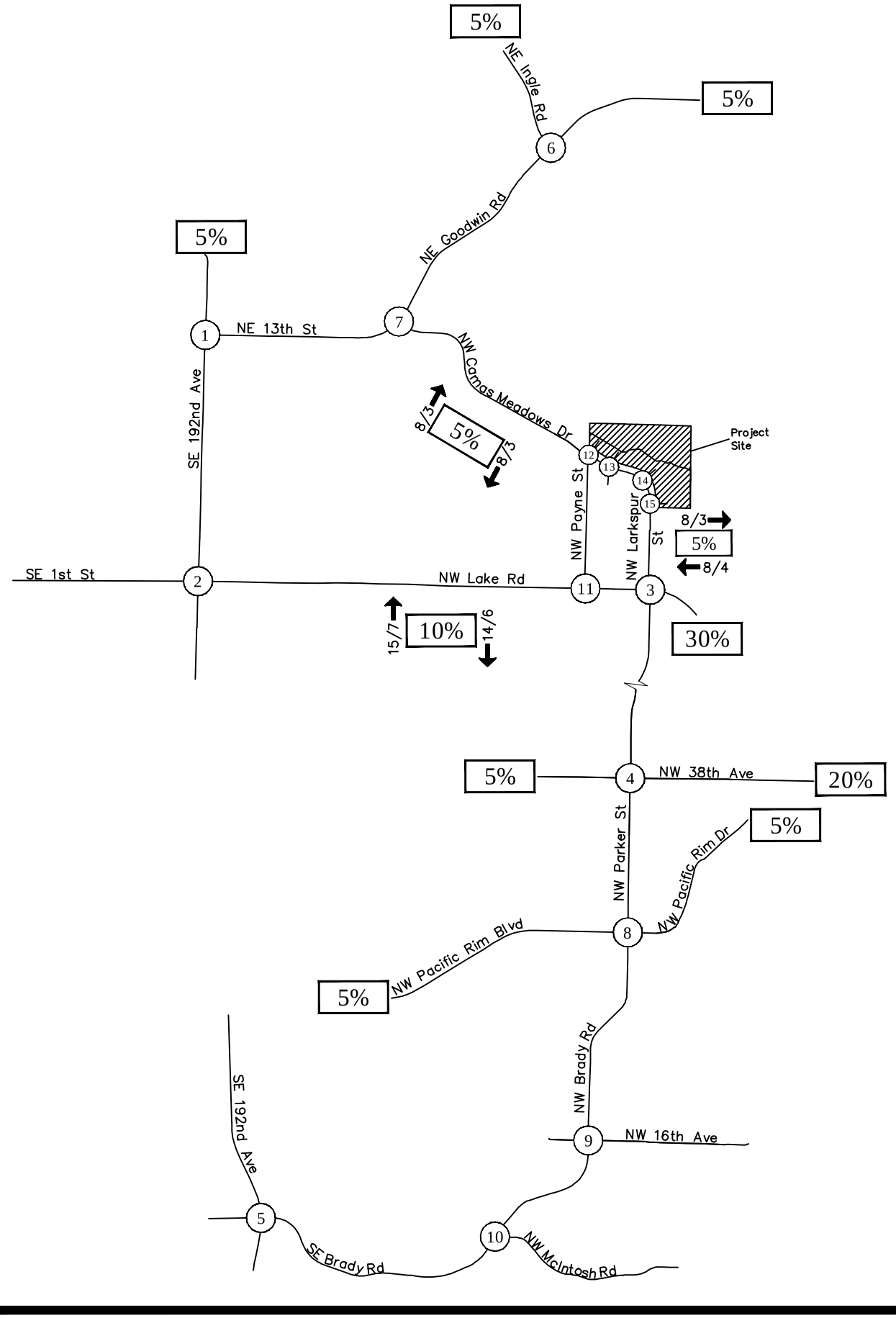
10% A.M. and P.M. Peak Hour Trip Distribution

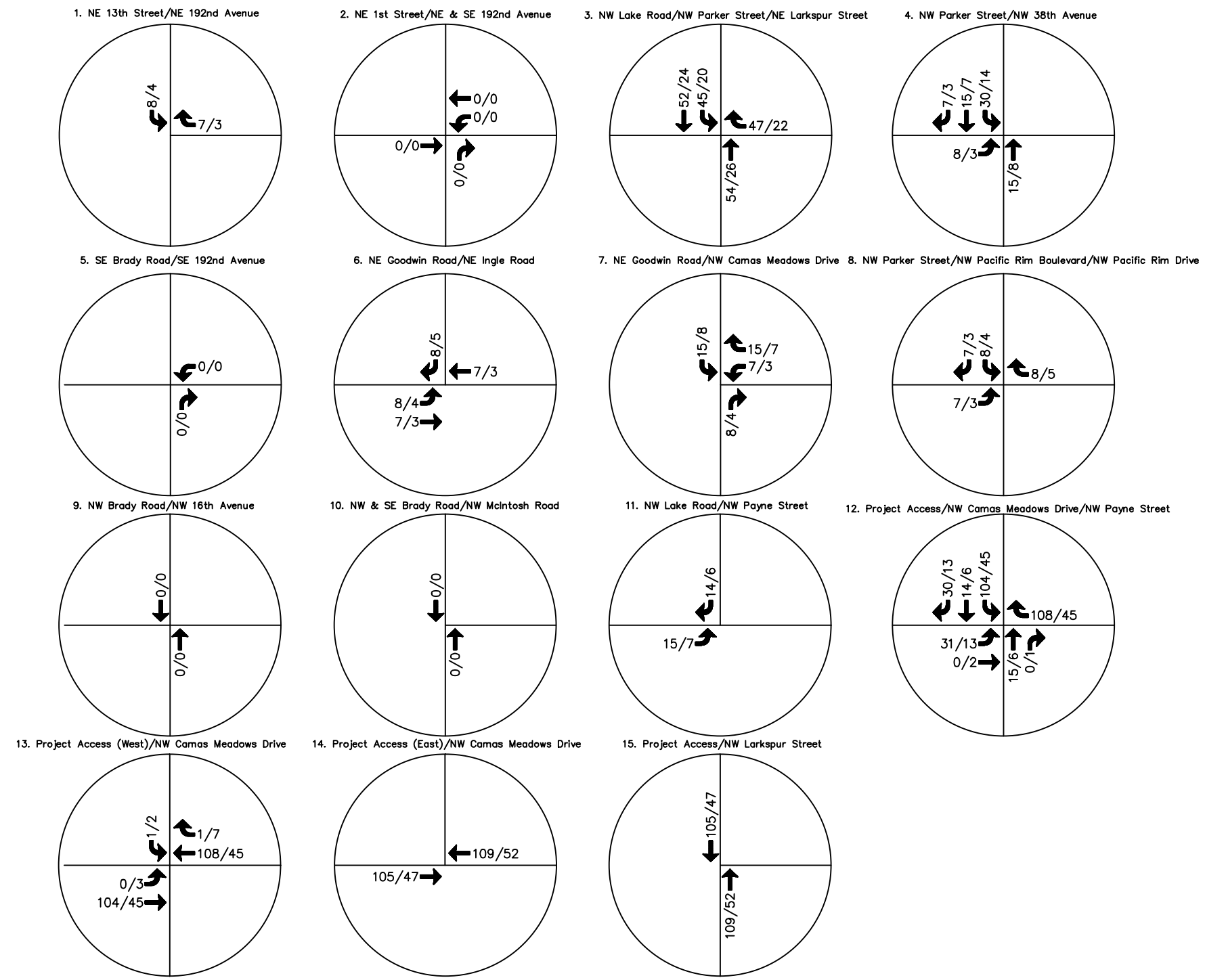
NOT TO SCALE

FIGURE 6a
"Residential"
Trip Distribution and Assignment
Traffic Volumes

315021.0Figures.Dwg

Exhibit 10 APPEAL24-1001





NOT TO SCALE

LEGEND

100/128 A.M./P.M. Peak Hour Traffic Volumes

10% A.M. and P.M. Peak Hour Trip Distribution

FIGURE 6b
"Coffee Shop/Quality Restaurant"
Trip Distribution and Assignment
Traffic Volumes

315021.0Figures.Dwg

Exhibit 10 APPEAL24-1001

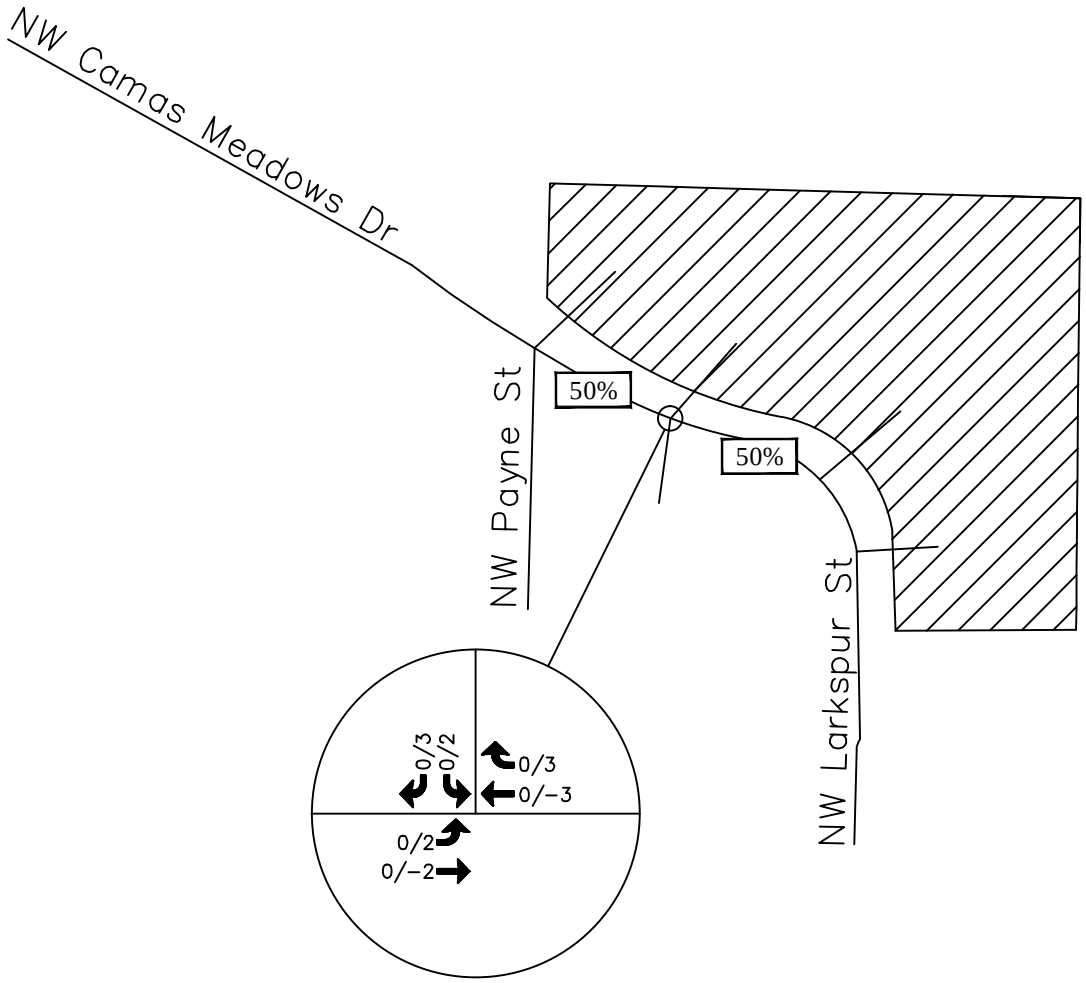
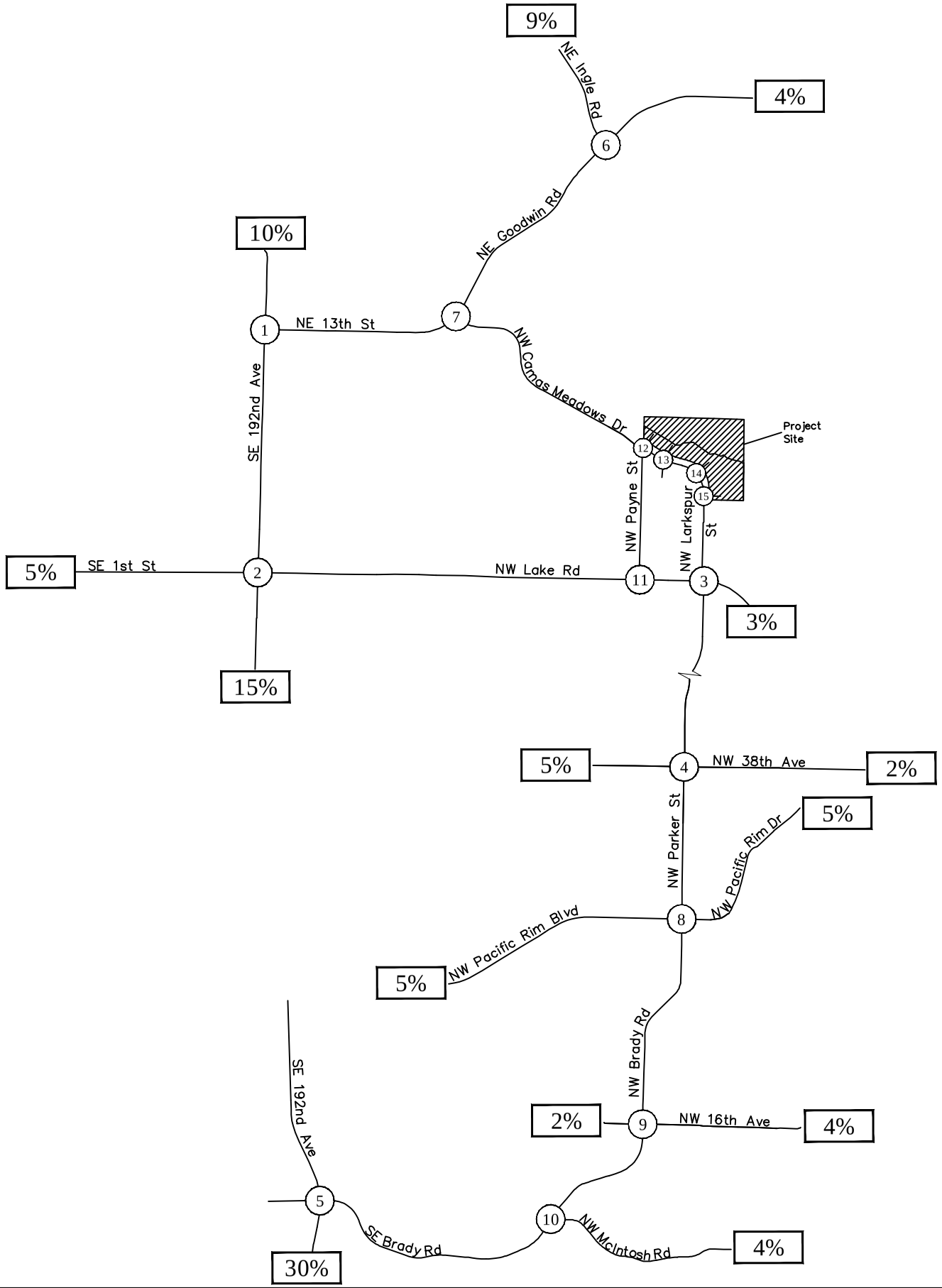
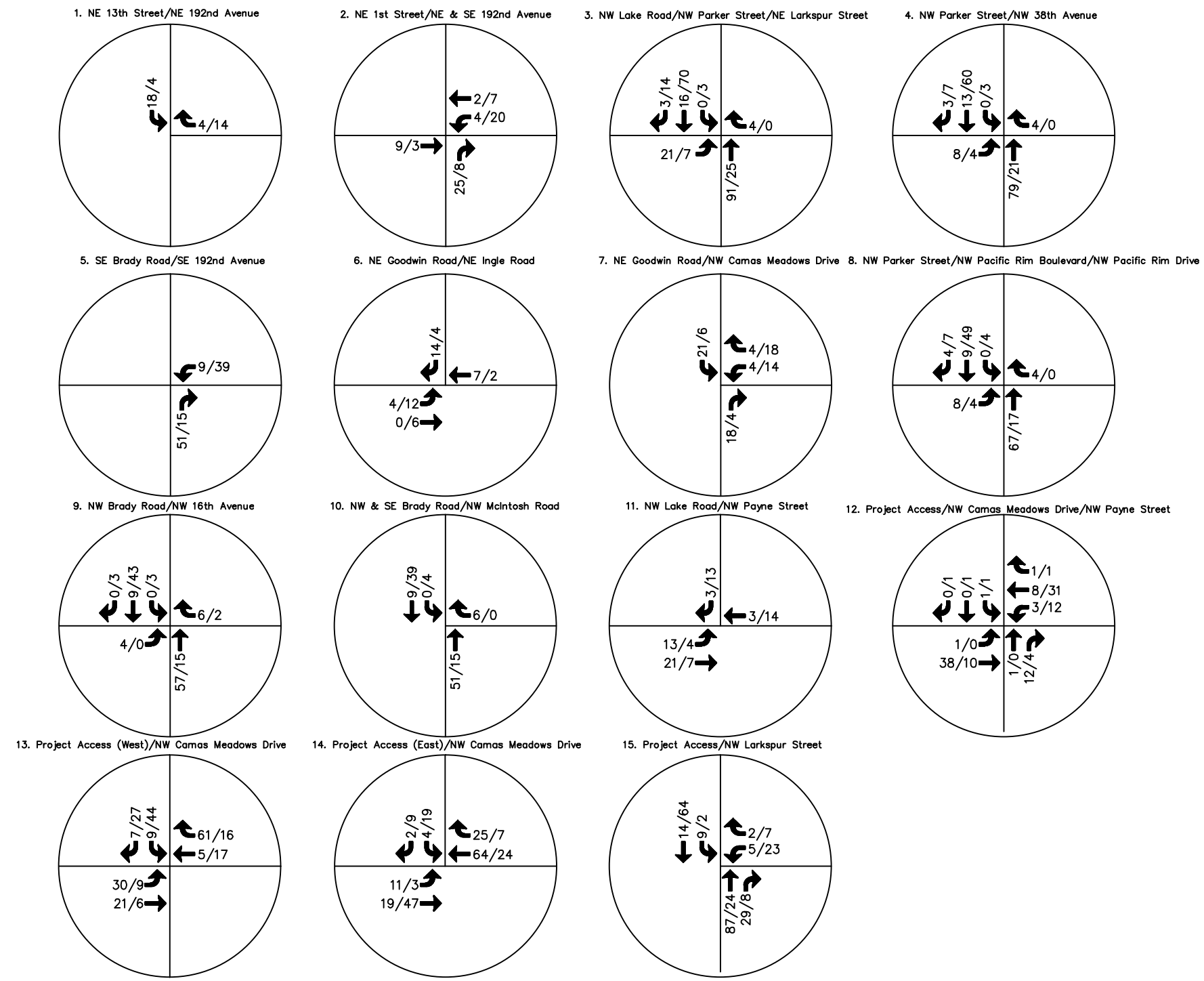


FIGURE 6c
"Quality Restaurant"
Pass-By Trips
Traffic Volumes

NOT TO SCALE





NOT TO SCALE

LEGEND

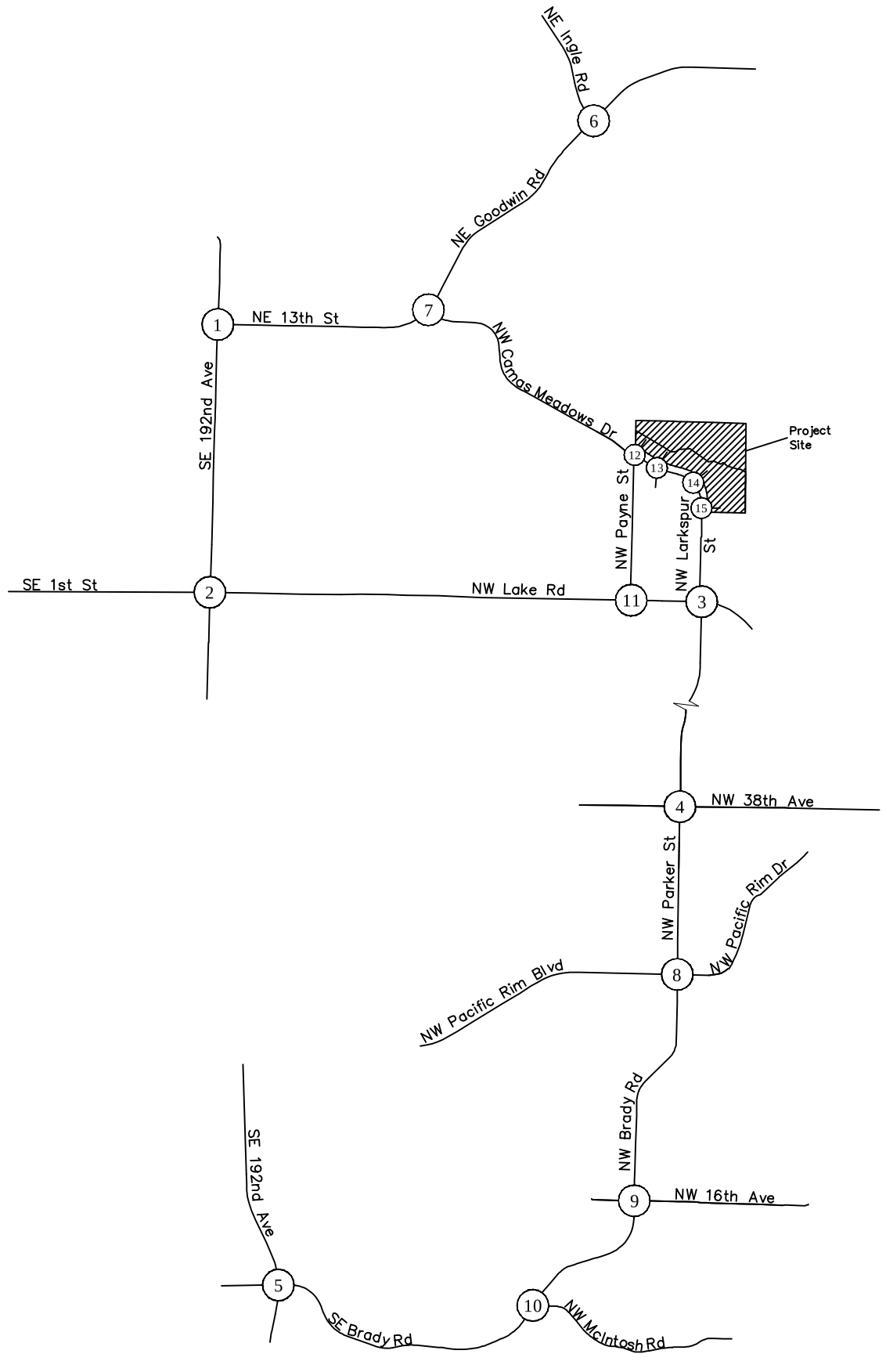
100/128 A.M./P.M. Peak Hour Traffic Volumes

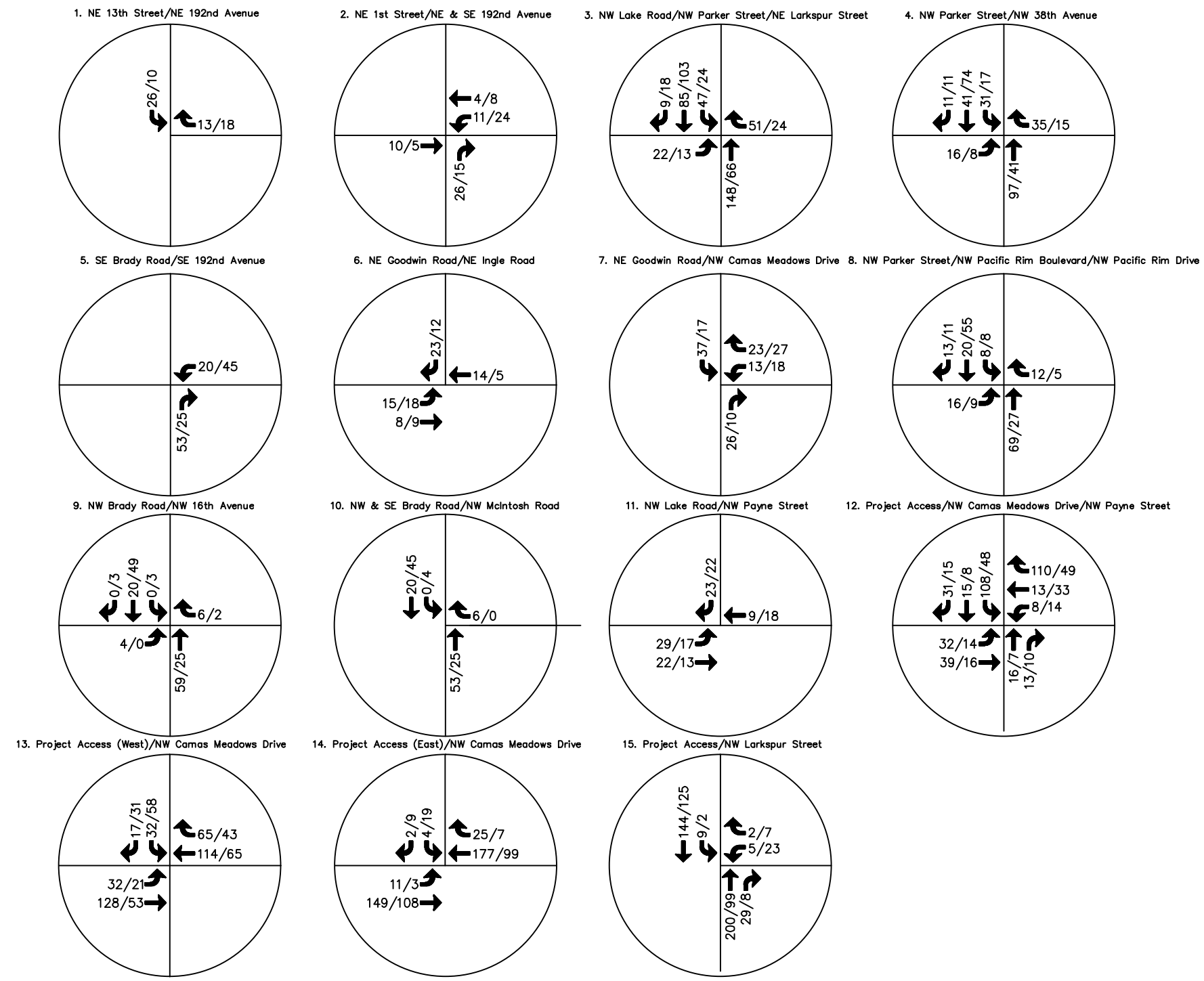
10% A.M. and P.M. Peak Hour Trip Distribution

FIGURE 6d
"Business Park"
Trip Distribution and Assignment
Traffic Volumes

315021.0Figures.Dwg

Exhibit 10 APPEAL24-1001





LEGEND

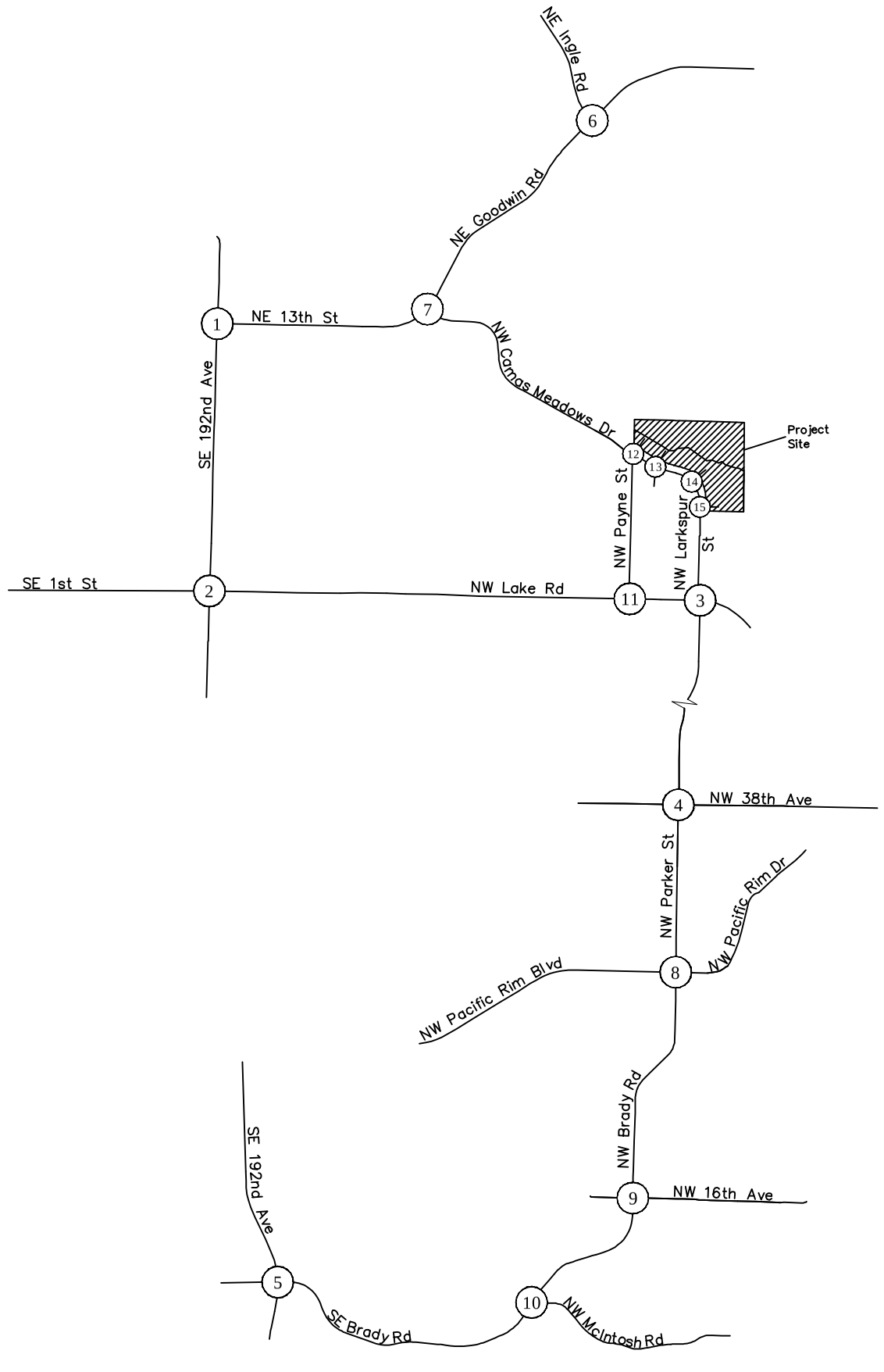
100/128 A.M./P.M. Peak Hour Traffic Volumes

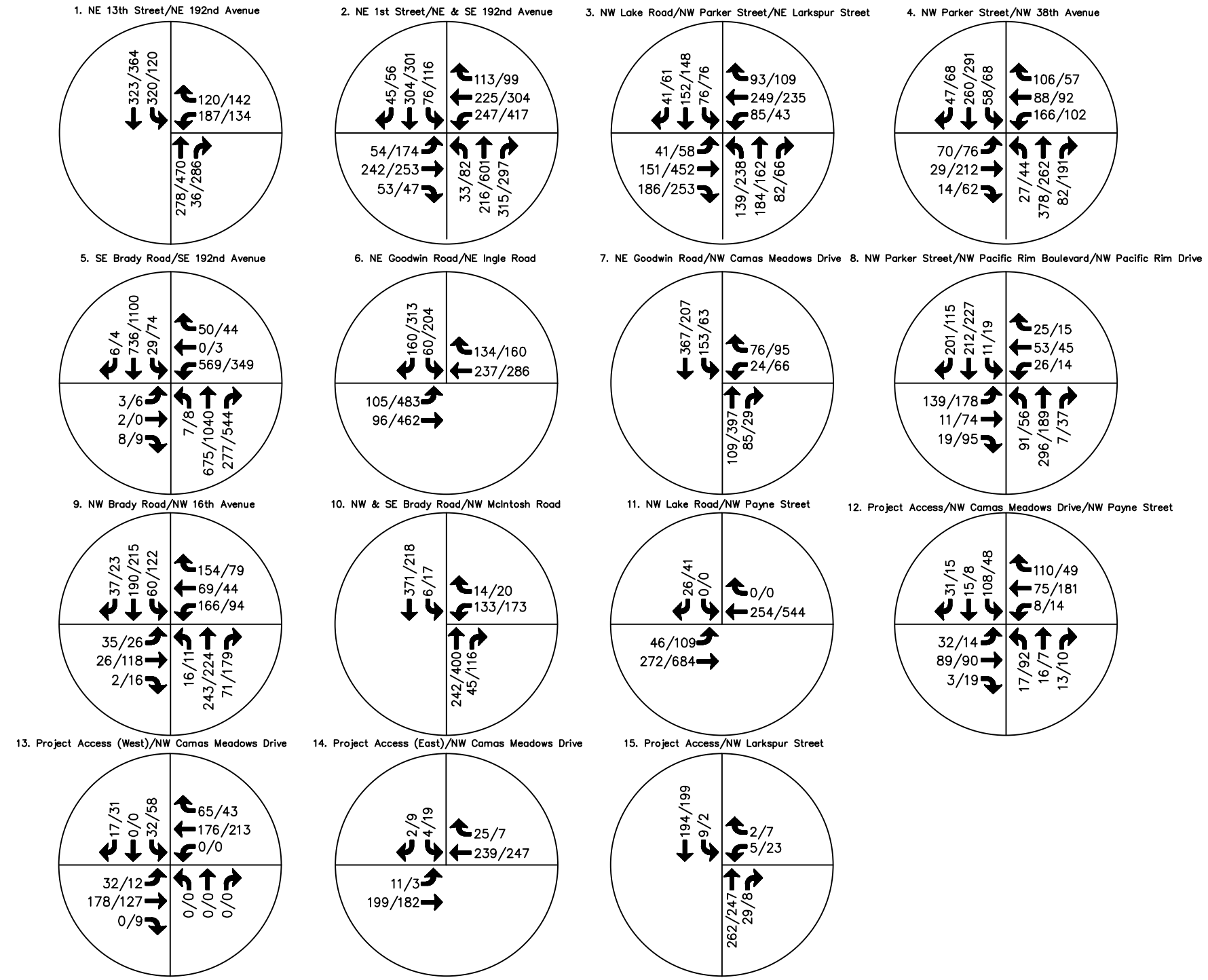
NOT TO SCALE

FIGURE 6e
"Combined Use"
Trip Distribution and Assignment
Traffic Volumes

315021.0Figures.Dwg

Exhibit 10 APPEAL24-1001





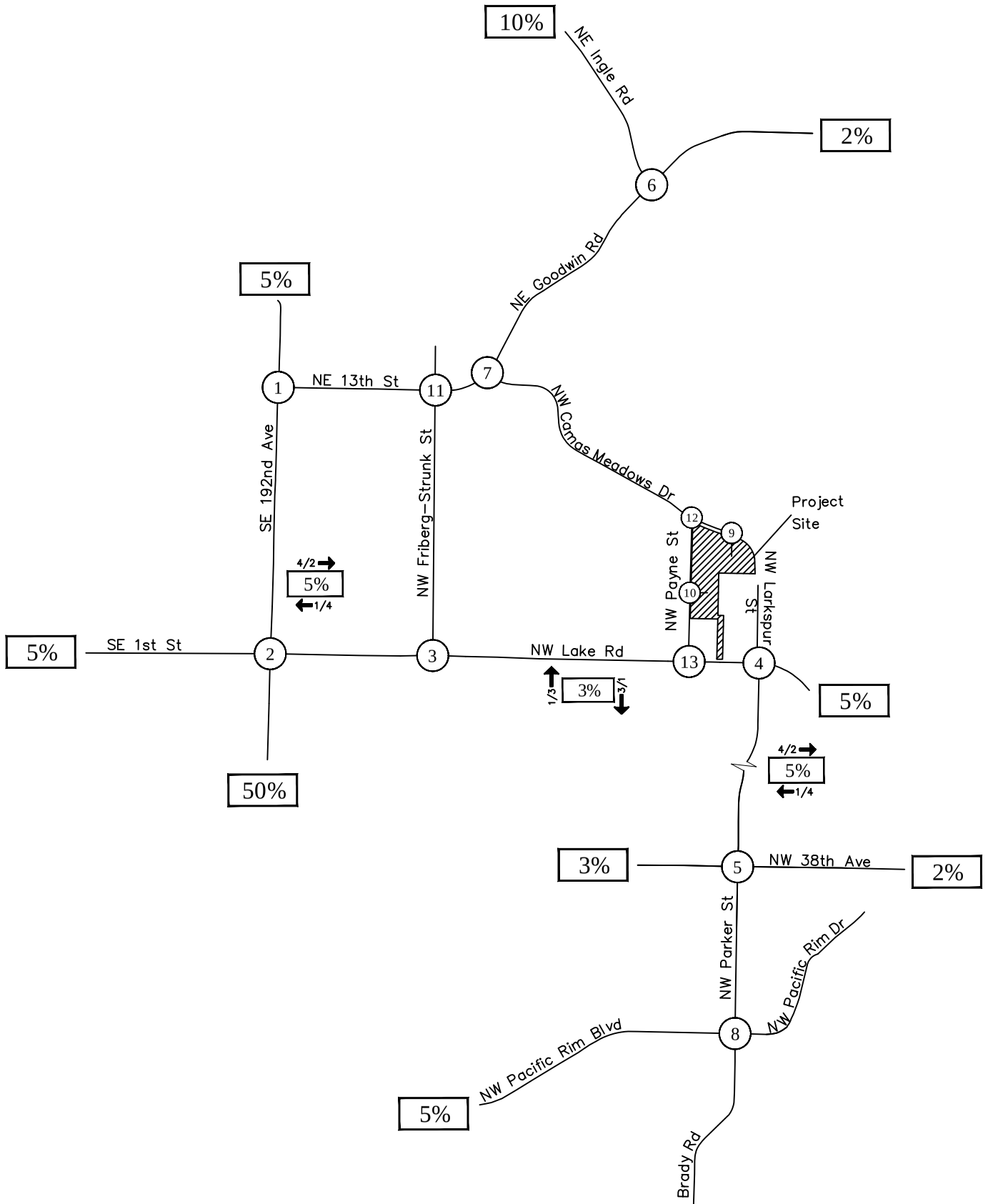
LEGEND

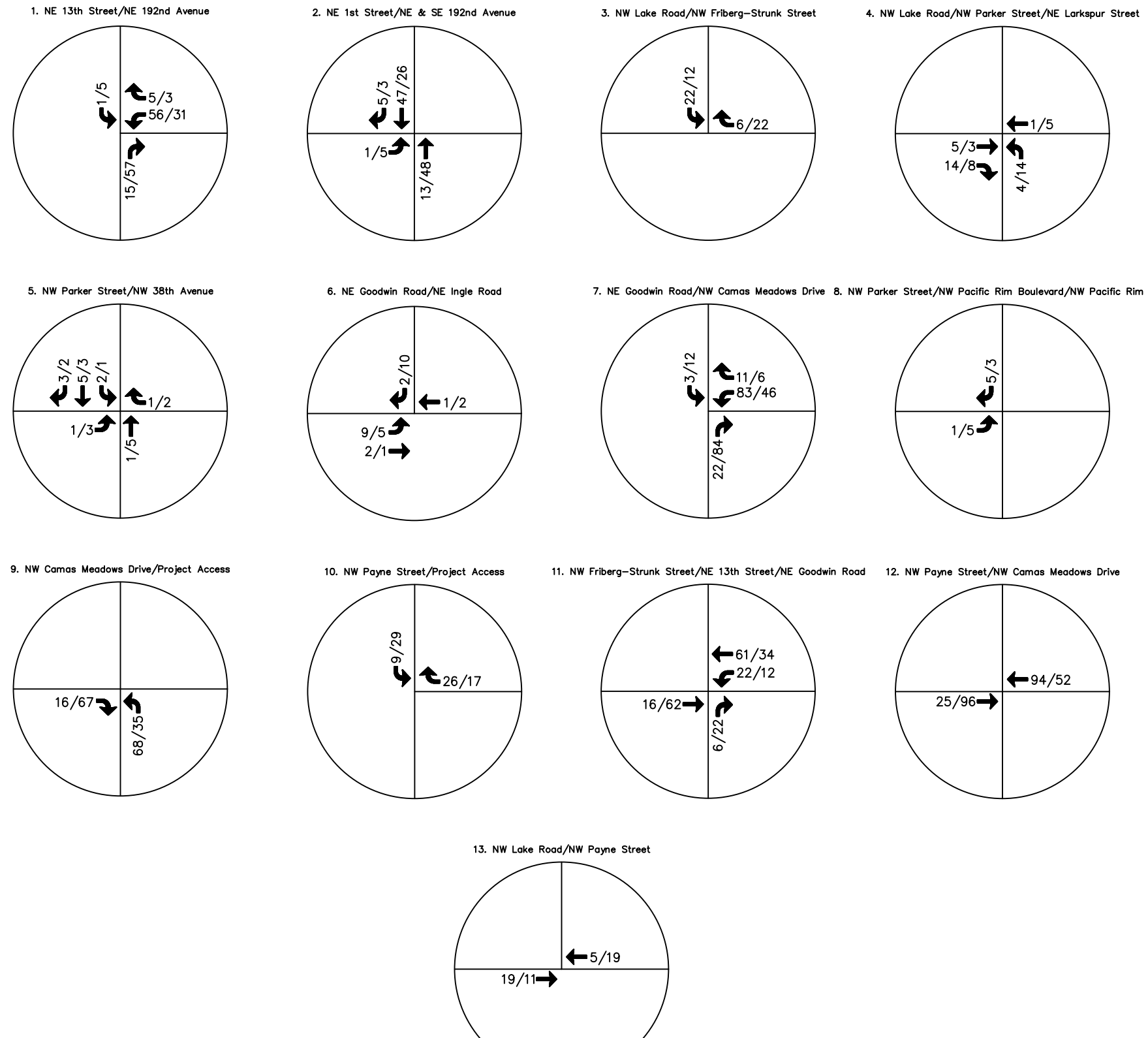
128/200 AM/PM Peak Hour Traffic Volume

NOT TO SCALE

FIGURE 7
2020 "With Project"
A.M. and P.M. Peak Hour Traffic Volumes

Exhibit 10 APPEAL24-1001





LEGEND

128/200 A.M./P.M. Peak Hour Traffic Volume

10% A.M. and P.M. Peak Hour Trip Distribution

NOT TO SCALE

FIGURE 6
Trip Distribution and Assignment
Traffic Volumes

16025_Figures.Dwg

Exhibit 10 APPEAL24-1001

CURRENT PROPOSED DEVELOPMENT PLAN

The B1 South Phase consists of 124 attached units and 2 single-family detached homes and is expected to be completed by 2020. It is located in the southwest portion of the overall site, directly south of Phase 1. Access will be provided via the neighborhood collector built with Phase 1, which connects to NE Ingle Road. In the future, this neighborhood collector will connect to Phase 3 of the site.

Trip Generation

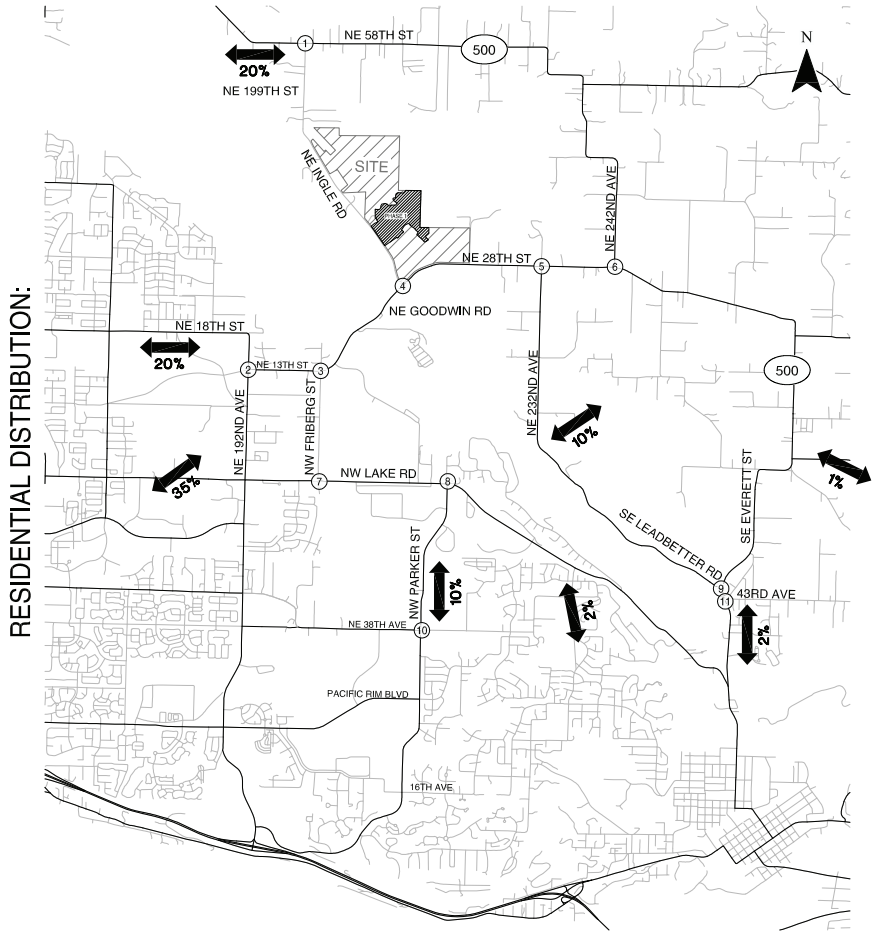
Trip generation estimates for the proposed development were generated based on information provided in the standard reference manual *Trip Generation, 9th Edition* published by the Institute of Transportation Engineers (ITE – Reference 2). Table 1 summarizes the daily, weekday AM, and weekday PM peak-hour trips for the B1 South Phase assumed development.

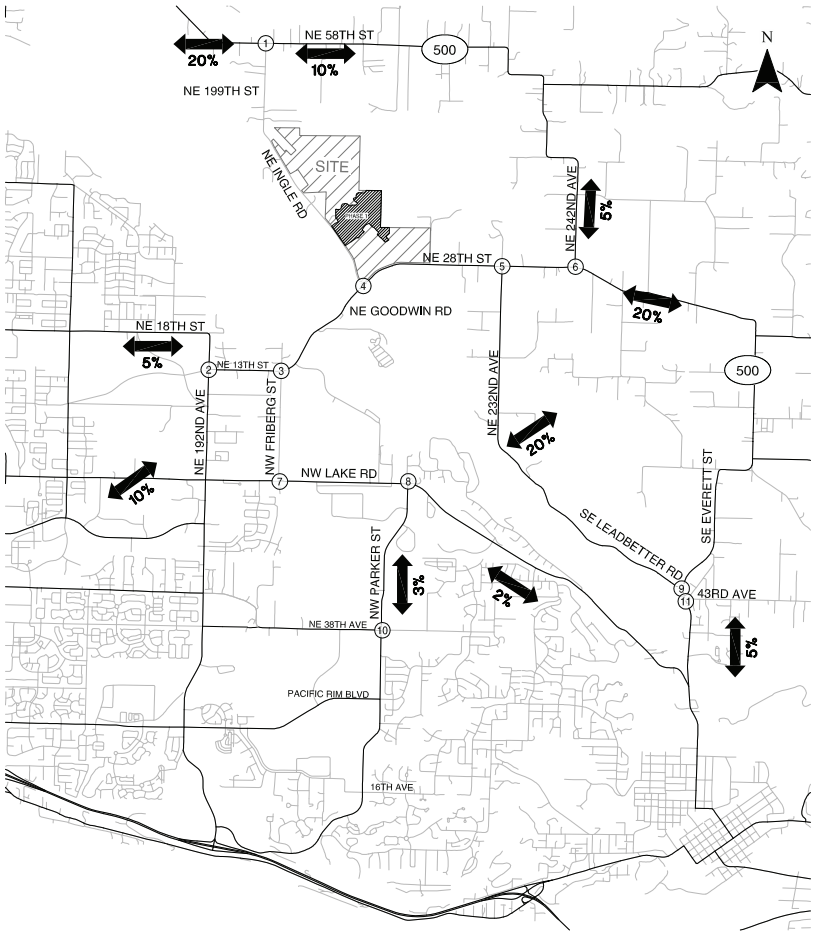
Table 1: Trip Generation Estimate – B1 South Phase

Land Use	ITE Code	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Residential Condominium/ Townhouse	230	124 units	720	55	9	46	65	43	22
Single-Family Detached Housing	210	2 units	20	2	1	1	2	1	1
Total Residential (126 units)			**740**	**57**	**10**	**47**	**67**	**44**	**23**

Table 2 summarizes the overall master plan trip generation and then deducts for the cumulative Phase 1[1], Phase 2[1] Phase 3, and B1 South Phase trips to summarize the number of net new trips that will remain vested.

[1] While previous traffic analysis assumed 215 units in Phase 1, Phase 1 as platted consists of 201 units. While previous traffic analysis assumed 230 units in Phase 2, Phase 2 is now platted for 228 units. The updated trip totals are shown in Table 2.





Estimated Trip Distribution Pattern
Camas, Washington

Figure
6

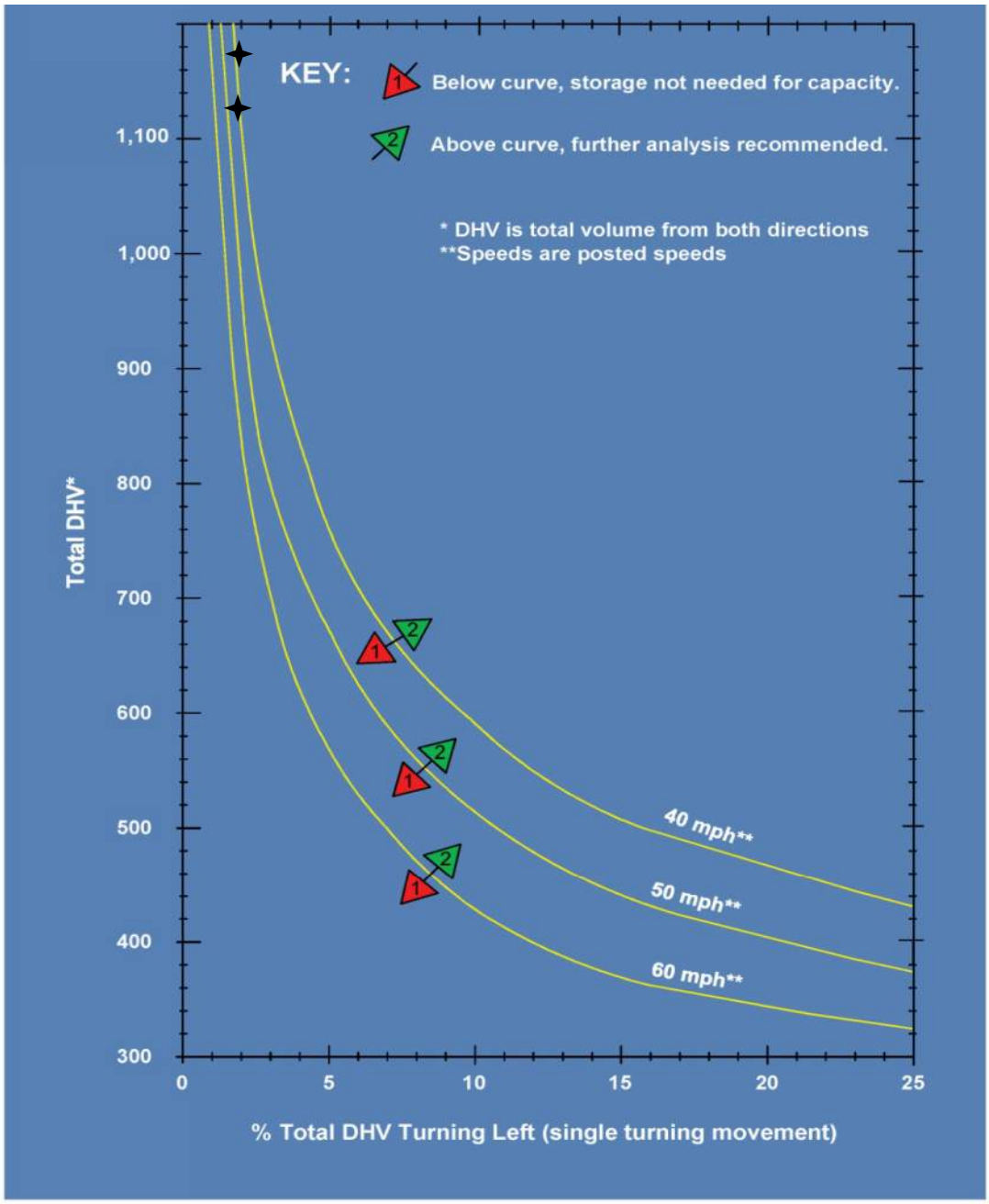


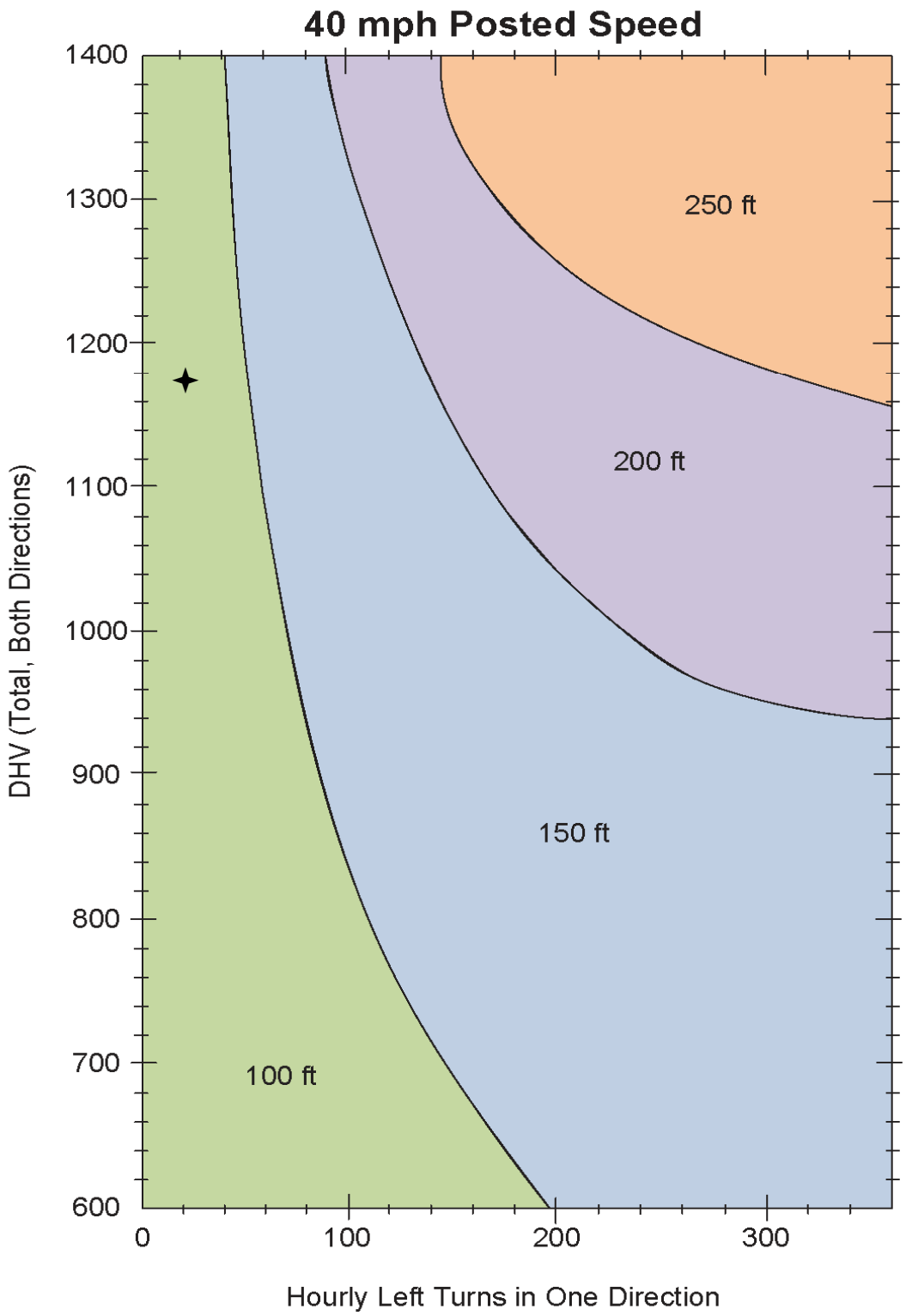
Exhibit 1310-7a. Left-turn Storage Guidelines-: Two-Lane, Unsignalized.

Storage requirements for critical left-turn movements at unsignalized intersections on 2-lane highways.

Intersection	Mov't	Analysis Period	Speed V (mph)	Left Turns in Advancing Volume (vph)	Advancing Volume V_A (vph)	Opposing Volume V_O (vph)	Total DHV	% Left Turns in DHV L	Storage Req'd (ft)
Site Access and NE 13th Street	WB LT	2026 Total Traffic-AM Peak	35	21	615	557	1,172	2%	100 ft
		2026 Total Traffic-PM Peak		24	515	614	1,129	2%	None

Source: WSDOT Design Guide, February 2019.

Exhibit 1310-8a Left-Turn Storage Length: Two-Lane, Unsignalized (40mph)

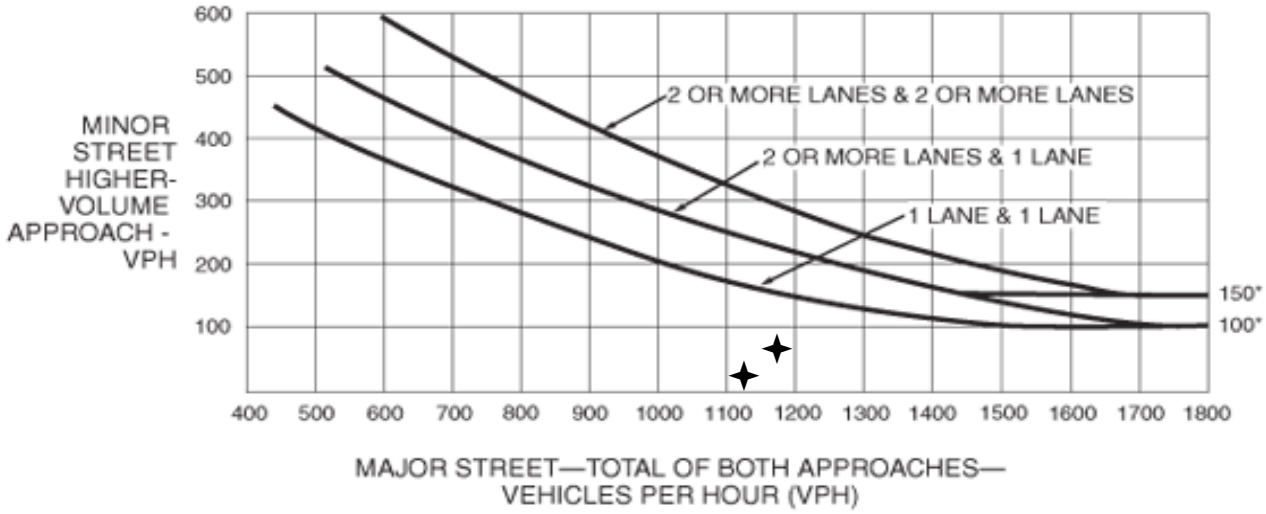


Charbonneau Engineering LLC

PROJECT: #23-24 13th Street Gas Station

DATE: 09.09.23

Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Table for Figure 4C-3

One lane and one lane		Two or more lanes and one lane		Two or more lanes and two or more lanes	
VPH on the major street (Total of both approaches)	VPH on the minor street (Higher volume approach)	VPH on the major street (Total of both approaches)	VPH on the minor street (Higher volume approach)	VPH on the major street (Total of both approaches)	VPH on the minor street (Higher volume approach)
1800	100	1800	100 or 150*	1800	150
1700	100	1700	100 or 150*	1700	150
1600	100	1600	120 or 150*	1600	170
1500	100	1500	145 or 150*	1500	180
1400	120	1400	155	1400	220
1300	130	1300	190	1300	250
1200	150	1200	220	1200	285
1100	175	1100	250	1100	340
1000	200	1000	285	1000	370
900	245	900	325	900	425
800	285	800	360	800	475
700	325	700	420	700	540
600	360	600	460	600	590
500	420	500	Not available	500	Not available

* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Peak hour volume warrant for signalization data.

Intersection	Analysis Period	Major Street Speed (mph)	Major Street		Minor Street High Volume Approach		Signal Warranted?
			Volume (vph)	Lanes (#)	Volume (vph)	Lanes (#)	
Site Access and NE 13th Street	2026 Total Traffic - AM Peak	35	1,172	1	70	1	No
	2026 Total Traffic - PM Peak		1,129		81		No

Source: *Manual on Uniform Traffic Control Devices (MUTCD)*, 2009 Edition.

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN THE CITIES OF CAMAS & VANCOUVER

01/01/2018 - Avail 2023 (04/04/23) *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

Indexed Primary Trafficway	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	REPORT NUMBER	DATE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEH 1 COMPASS DIR FROM	VEH 1 COMPASS DIR TO	VEH 2 COMPASS DIR FROM	VEH 2 COMPASS DIR TO
NE GOODWIN RD	7801	NW FRIBERG STRUNK ST				NE 13TH ST	EC42777	05/02/2022	0	0	1	0	0	East	West		
NE GOODWIN RD	7800		108	F	E	NE 13TH ST	E853679	10/20/2018	0	0	1	0	0	West	East		
NW FRIBERG STRUNK ST	0	NE 13TH ST					E914095	04/23/2019	0	0	1	0	0	South	Northwest		
NE 13TH ST	0	NE 192ND AVE					EA33917	05/09/2020	0	0	1	0	0	West	North		
NE 13TH ST	19409	NE 192ND AVE					EC40931	04/20/2022	1	0	2	0	0	East	West	e Stopped	e Stopped
NE 13TH ST	19200		75	F	E	NE 192ND AVE	E891662	02/09/2019	1	0	2	0	0	East	West	e Stopped	e Stopped
NE 13TH ST	19200		33	F	E	NE 192ND AVE	EC66129	07/18/2022	0	0	2	0	0	South	East	e Stopped	e Stopped
NE 192ND AVE	1190	NE 13TH ST					EC64739	07/14/2022	0	0	2	0	0	North	East	e Stopped	e Stopped
NE 192ND AVE	1168	NE 13TH ST					EB73778	09/24/2021	0	0	2	0	0	North	East	South	North
NE 192ND AVE	0	NE 13TH ST					E974878	10/18/2019	0	0	2	0	0	East	North	South	North
NE 192ND AVE	1200		181	F	S	NE 13TH ST	EC53185	06/06/2022	1	0	3	0	0	South	North	e Stopped	e Stopped
NE 192ND AVE	1200		50	F	S	NE 13TH ST	EC31583	03/24/2022	0	0	3	0	0	South	North	e Stopped	e Stopped
NW FRIBERG STRUNK ST	200		112	F	N	NW LAKE RD	E869653	12/06/2018	2	0	4	0	0	North	South	e Stopped	e Stopped
NW LAKE RD	9900	NW FRIBERG STRUNK ST					E774352	02/20/2018	0	0	2	0	0	East	East	West	East
SE 1ST ST	0	NW FRIBERG STRUNK ST					EA42305	06/22/2020	1	0	2	0	0	East	West	West	North
SE 1ST ST	20199	NW FRIBERG STRUNK ST					ED49006	04/04/2023	0	0	2	0	0	West	East	West	East
SE 1ST ST	0	NW FRIBERG STRUNK ST					E846435	10/08/2018	0	0	2	0	0	West	North	East	West

Exhibit 1A. Trip Distribution for Corridor Intersections.

Corridor: Andresen Road	Limits: Mill Plain Boulevard to SR-500											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Mill Plain Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
E. 18th Street/N.E. 18th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 25th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fourth Plain Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SR-500	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Corridor: Andresen Road	Limits: SR-500 to NE 78th Street											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
SR-500	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 40th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vancouver Mall Drive	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 58th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Minnehaha/NE 63rd Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 78th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Corridor: Fourth Plain Boulevard	Limits: Mill Plain Boulevard to I-5											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Mill Plain Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fruit Valley Road/Kotobuki Way	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kauffman Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Main Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
I-5 southbound off-/on-ramps	0%	----	0%	0%	0%	----	----	----	----	----	0%	0%
I-5 northbound off-/on-ramps	----	----	----	0%	0%	----	0%	0%	0%	----	0%	0%

Corridor: Fourth Plain Boulevard	Limits: I-5 to Andresen Road											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
I-5 northbound off-/on-ramps	----	----	----	0%	0%	----	0%	0%	0%	----	0%	0%
St. Johns Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fort Vancouver Way	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Grand Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Falk Road	0%	----	0%	0%	0%	----	----	----	----	----	0%	0%
Stapleton Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Andresen Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Exhibit 1A. Trip Distribution for Corridor Intersections. (continued)

Corridor: Fourth Plain Boulevard	Limits: Andresen Road to I-205											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Andresen Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 86th Avenue	----	----	----	----	0%	0%	0%	----	0%	0%	0%	----
Thurston Way	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
I-205 SB on-ramp/Oak View Drive	----	----	----	0%	0%	0%	0%	0%	0%	0%	0%	0%
I-205 SB off-ramp/Van Mall Drive	0%	0%	0%	0%	0%	----	0%	0%	0%	----	0%	0%
I-205 NB on-ramp/NE 54th Street	0%	0%	0%	0%	0%	0%	----	----	----	0%	0%	0%

Corridor: Fourth Plain Boulevard (SR-500)	Limits: I-205 to NE 162nd Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
I-205 NB on-ramp/NE 54th Street	0%	0%	0%	0%	0%	0%	----	----	----	0%	0%	0%
Covington Road/Gher Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 112th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 117th Avenue (SR 503/500)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 121st Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 137th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ward Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 162nd Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Corridor: Mill Plain Boulevard	Limits: Fourth Plain Boulevard to I-5											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Fourth Plain Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kauffman Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Main Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
I-5 southbound on-/off-ramps	0%	0%	0%	----	0%	0%	----	----	----	0%	0%	----
I-5 northbound on-/off-ramps	----	----	----	0%	0%	----	0%	0%	0%	----	0%	0%

Corridor: Mill Plain Boulevard	Limits: I-5 to Andresen Road											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
I-5 northbound on-/off-ramps	----	----	----	0%	0%	----	0%	0%	0%	----	0%	0%
Fort Vancouver Way	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Grand Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
MacArthur Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Andresen Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Exhibit 1A. Trip Distribution for Corridor Intersections. (continued)

Corridor: Mill Plain Boulevard	Limits: Andresen Road to I-205											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Andresen Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lieser Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 97th/98th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
I-205 southbound on-/off-ramps	0%	----	0%	0%	0%	----	----	----	----	0%	0%	----
I-205 northbound on-/off-ramps	0%	----	----	0%	0%	----	0%	----	----	----	0%	0%

Corridor: Mill Plain Boulevard	Limits: I-205 to NE 136th Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
I-205 northbound on-/off-ramps	0%	----	----	0%	0%	----	0%	----	----	----	0%	0%
Chkalov Drive	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE/SE 117th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE/SE 120th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SE 123rd/NE 124th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SE 126th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park Plaza Dr/SE 131st Av	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE/SE 136th Avenue	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	5%	0%

Corridor: Mill Plain Boulevard	Limits: NE 136th Avenue to NE 164th Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE/SE 136th Avenue	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	5%	0%
SE 139th Avenue	----	----	----	----	5%	0%	0%	----	0%	0%	5%	----
Olympia Drive	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	5%	0%
Hearthwood Blvd/Park Crest Av	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	5%	0%
SE 148th Avenue	0%	----	0%	0%	5%	----	----	----	----	----	5%	0%
SE 155th Avenue	0%	----	0%	0%	5%	----	----	----	----	----	5%	0%
SE 157th Avenue	0%	----	0%	0%	5%	----	----	----	----	----	5%	0%
SE 160th Avenue	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	5%	0%
SE 164th Avenue	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	10%	0%

Corridor: Mill Plain Boulevard	Limits: NE 164th Avenue to NE 192nd Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
SE 164th Avenue	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	10%	0%
SE 168th Avenue	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%
SE 172nd Av/Tech Center Dr	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%
SE 177th Avenue	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%
SE 192nd Avenue	10%	15%	0%	0%	0%	0%	0%	15%	0%	0%	0%	10%

Exhibit 1A. Trip Distribution for Corridor Intersections. (continued)

Corridor: NE 18th Street	Limits: NE 112th Avenue to NE 138th Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 112th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 125th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 138th Avenue	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	5%	0%

Corridor: NE 18th Street	Limits: NE 138th Avenue to NE 162nd Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 138th Avenue	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	5%	0%
NE 148th Court/Place	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	10%	0%
NE 155th Avenue	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	10%	0%
NE 162nd Avenue	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	10%	0%

Corridor: Burton Road/NE 28th Street	Limits: NE 18th Street to NE 112th Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 18th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 86th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 98th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 112th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Corridor: Burton Road/NE 28th Street	Limits: NE 112th Avenue and NE 138th Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 112th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 119th Avenue/Four Seasons	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 124th Avenue (South)	----	----	----	----	0%	0%	0%	----	0%	0%	0%	----
NE 124th Avenue (North)	0%	----	0%	0%	0%	----	----	----	----	----	0%	0%
NE 129th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 138th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Corridor: NE 28th Street	Limits: NE 138th Avenue to NE 162nd Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 136th/138th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 148th Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 152nd Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 162nd Avenue	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Exhibit 1A. Trip Distribution for Corridor Intersections. (continued)

Corridor: Ft. Vancouver Way/St. Johns Boulevard Limits: Mill Plain Boulevard to NE 63rd Street

Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Mill Plain Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
McLoughlin Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fourth Plain Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
St. Johns Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
E 33rd Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SR 500	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 44th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Minnehaha/NE 63rd Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Corridor: NE 112th Avenue (also Chkalov Drive) Limits: Mill Plain Boulevard to Burton Road/NE 28th Street

Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Mill Plain Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 9th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 18th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Burton Road/NE 28th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Corridor: NE 112th Avenue Limits: Burton Road/NE 28th Street to NE 51st Street

Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Burton Road/NE 28th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 49th Street	----	0%	0%	0%	----	0%	0%	0%	----	----	----	----
NE 51st Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Corridor: NE 136th/138th Avenue Limits: Mill Plain Boulevard to NE 28th Street

Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Mill Plain Boulevard	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	5%	0%
NE 4th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 18th Street	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	5%	0%
NE 28th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Corridor: NE 137th/138th Avenue Limits: NE 28th Street to Fourth Plain Boulevard

Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 28th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 39th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 49th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fourth Plain Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Exhibit 1A. Trip Distribution for Corridor Intersections. (continued)

Corridor: SE 164th Avenue	Limits: SR-14 to SE 1st Street											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
SR-14 eastbound ramps	----	0%	0%	----	----	----	0%	0%	----	0%	----	0%
SR-14 westbound ramps	0%	0%	----	0%	----	0%	----	0%	0%	----	----	----
Cascade Park Dr/SE 34th St	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Village Loop/SE 29th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
McGillivray Boulevard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Village Loop/SE 20th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SE 15th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SE 12th Court/Tech Center Drive	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mill Plain Boulevard	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	10%	0%
SE 1st Street	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	15%	0%

Corridor: NE 162nd/SE 164th Avenue	Limits: SE 1st Street to Fourth Plain Road											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
SE 1st Street	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	15%	0%
NE 11th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 18th Street	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	10%	0%
NE 28th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 34th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 39th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Poplar Street/NE 45th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE 65th Street	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fourth Plain Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Corridor: NE/SE 192nd Avenue	Limits: SR-14 to NE 18th Street											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
SR-14 eastbound ramps	----	0%	15%	----	----	----	0%	0%	----	0%	----	0%
SR-14 westbound ramps	0%	15%	----	15%	----	0%	----	0%	0%	----	----	----
Brady Road	----	15%	0%	0%	----	0%	0%	15%	----	----	----	----
SE 34th Street/Pacific Rim Blvd	0%	15%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%
SE 31st Street	----	15%	0%	0%	----	0%	0%	15%	----	----	----	----
SE 20th Street	0%	15%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%
SE 15th Street	0%	15%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%
SE 12th Way	0%	15%	----	----	----	----	----	15%	0%	0%	----	0%
Westridge Boulevard	----	15%	0%	0%	----	0%	0%	15%	----	----	----	----
Mill Plain Boulevard	10%	15%	0%	0%	0%	0%	0%	15%	0%	0%	0%	10%
SE 1st Street	15%	25%	0%	0%	0%	0%	0%	25%	0%	0%	0%	15%
NE 6th Street	----	40%	0%	0%	----	0%	0%	40%	----	----	----	----
NE 9th Street	0%	40%	----	----	----	----	----	40%	0%	0%	----	0%
NE 11th Street	----	40%	0%	0%	----	0%	0%	40%	----	----	----	----
NE 13th Street	----	0%	30%	30%	----	40%	40%	0%	----	----	----	----
NE 18th Street	----	----	----	----	0%	0%	0%	----	30%	30%	0%	----

Exhibit 1B. Trip Assignment for Corridor Intersections.

Corridor: Andresen Road	Limits: Mill Plain Boulevard to SR-500											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Mill Plain Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
E. 18th Street/N.E. 18th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 25th Street	0	0	0	0	0	0	0	0	0	0	0	0
Fourth Plain Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
SR-500	0	0	0	0	0	0	0	0	0	0	0	0

Corridor: Andresen Road	Limits: SR-500 to NE 78th Street											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
SR-500	0	0	0	0	0	0	0	0	0	0	0	0
NE 40th Street	0	0	0	0	0	0	0	0	0	0	0	0
Vancouver Mall Drive	0	0	0	0	0	0	0	0	0	0	0	0
NE 58th Street	0	0	0	0	0	0	0	0	0	0	0	0
Minnehaha/NE 63rd Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 78th Street	0	0	0	0	0	0	0	0	0	0	0	0

Corridor: Fourth Plain Boulevard	Limits: Mill Plain Boulevard to I-5											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Mill Plain Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
Fruit Valley Road/Kotobuki Way	0	0	0	0	0	0	0	0	0	0	0	0
Kauffman Avenue	0	0	0	0	0	0	0	0	0	0	0	0
Main Street	0	0	0	0	0	0	0	0	0	0	0	0
I-5 southbound off-/on-ramps	0	----	0	0	0	----	----	----	----	----	0	0
I-5 northbound off-/on-ramps	----	----	----	0	0	----	0	0	0	----	0	0

Corridor: Fourth Plain Boulevard	Limits: I-5 to Andresen Road											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
I-5 northbound off-/on-ramps	----	----	----	0	0	----	0	0	0	----	0	0
St. Johns Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
Fort Vancouver Way	0	0	0	0	0	0	0	0	0	0	0	0
Grand Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
Falk Road	0	----	0	0	0	----	----	----	----	----	0	0
Stapleton Road	0	0	0	0	0	0	0	0	0	0	0	0
Andresen Road	0	0	0	0	0	0	0	0	0	0	0	0

Exhibit 1B. Trip Assignment for Corridor Intersections. (continued)

Corridor: Fourth Plain Boulevard						Limits: Andresen Road to I-205						
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Andresen Road	0	0	0	0	0	0	0	0	0	0	0	0
NE 86th Avenue	----	----	----	----	0	0	0	----	0	0	0	----
Thurston Way	0	0	0	0	0	0	0	0	0	0	0	0
I-205 SB on-ramp/Oak View Drive	----	----	----	0	0	0	0	0	0	0	0	0
I-205 SB off-ramp/Van Mall Drive	0	0	0	0	0	----	0	0	0	----	0	0
I-205 NB on-ramp/NE 54th Street	0	0	0	0	0	0	----	----	----	0	0	0

Corridor: Fourth Plain Boulevard (SR-500)						Limits: I-205 to NE 162nd Avenue						
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
I-205 NB on-ramp/NE 54th Street	0	0	0	0	0	0	----	----	----	0	0	0
Covington Road/Gher Road	0	0	0	0	0	0	0	0	0	0	0	0
NE 112th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 117th Avenue (SR 503/500)	0	0	0	0	0	0	0	0	0	0	0	0
NE 121st Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 137th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
Ward Road/NE 147th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 162nd Avenue	0	0	0	0	0	0	0	0	0	0	0	0

Corridor: Mill Plain Boulevard						Limits: Fourth Plain Boulevard to I-5						
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Fourth Plain Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
Kauffman Avenue	0	0	0	0	0	0	0	0	0	0	0	0
Main Street	0	0	0	0	0	0	0	0	0	0	0	0
I-5 southbound on-/off-ramps	0	0	0	----	0	0	----	----	----	0	0	----
I-5 northbound on-/off-ramps	----	----	----	0	0	----	0	0	0	----	0	0

Corridor: Mill Plain Boulevard						Limits: I-5 to Andresen Road						
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
I-5 northbound on-/off-ramps	----	----	----	0	0	----	0	0	0	----	0	0
Fort Vancouver Way	0	0	0	0	0	0	0	0	0	0	0	0
Grand Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
MacArthur Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
Andresen Road	0	0	0	0	0	0	0	0	0	0	0	0

Exhibit 1B. Trip Assignment for Corridor Intersections. (continued)

Corridor: Mill Plain Boulevard	Limits: Andresen Road to I-205											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Andresen Road	0	0	0	0	0	0	0	0	0	0	0	0
Lieser Road	0	0	0	0	0	0	0	0	0	0	0	0
NE 97th/98th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
I-205 southbound on-/off-ramps	0	----	0	0	0	----	----	----	----	0	0	----
I-205 northbound on-/off-ramps	0	----	----	0	0	----	0	----	----	----	0	0

Corridor: Mill Plain Boulevard	Limits: I-205 to NE 136th Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
I-205 northbound on-/off-ramps	0	----	----	0	0	----	0	----	----	----	0	0
Chkalov Drive	0	0	0	0	0	0	0	0	0	0	0	0
NE/SE 117th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE/SE 120th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
SE 123rd/NE 124th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
SE 126th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
Park Plaza Dr/SE 131st Av	0	0	0	0	0	0	0	0	0	0	0	0
NE/SE 136th Avenue	0	0	0	0	2	0	0	0	0	0	2	0

Corridor: Mill Plain Boulevard	Limits: NE 136th Avenue to NE 164th Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE/SE 136th Avenue	0	0	0	0	2	0	0	0	0	0	2	0
SE 139th Avenue	----	----	----	----	2	0	0	----	0	0	2	----
Olympia Drive	0	0	0	0	2	0	0	0	0	0	2	0
Hearthwood Blvd/Park Crest Av	0	0	0	0	2	0	0	0	0	0	2	0
SE 148th Avenue	0	----	0	0	2	----	----	----	----	----	2	0
SE 155th Avenue	0	----	0	0	2	----	----	----	----	----	2	0
SE 157th Avenue	0	----	0	0	2	----	----	----	----	----	2	0
SE 160th Avenue	0	0	0	0	2	0	0	0	0	0	2	0
SE 164th Avenue	0	0	0	0	4	0	0	0	0	0	4	0

Corridor: Mill Plain Boulevard	Limits: NE 164th Avenue to NE 192nd Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
SE 164th Avenue	0	0	0	0	4	0	0	0	0	0	4	0
SE 168th Avenue	0	0	0	0	4	0	0	0	0	0	4	0
SE 172nd Av/Tech Center Dr	0	0	0	0	4	0	0	0	0	0	4	0
SE 177th Avenue	0	0	0	0	4	0	0	0	0	0	4	0
SE 192nd Avenue	4	6	0	0	0	0	0	7	0	0	0	4

Exhibit 1B. Trip Assignment for Corridor Intersections. (continued)

Corridor: NE 18th Street	Limits: NE 112th Avenue to NE 138th Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 112th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 125th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 138th Avenue	0	0	0	0	2	0	0	0	0	0	2	0

Corridor: NE 18th Street	Limits: NE 138th Avenue to NE 162nd Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 138th Avenue	0	0	0	0	2	0	0	0	0	0	2	0
NE 148th Court/Place	0	0	0	0	4	0	0	0	0	0	4	0
NE 155th Avenue	0	0	0	0	4	0	0	0	0	0	4	0
NE 162nd Avenue	0	0	0	0	4	0	0	0	0	0	4	0

Corridor: Burton Road/NE 28th Street	Limits: NE 18th Street to NE 112th Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 18th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 86th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 98th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 112th Avenue	0	0	0	0	0	0	0	0	0	0	0	0

Corridor: Burton Road/NE 28th Street	Limits: NE 112th Avenue and NE 138th Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 112th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 119th Avenue/Four Seasons	0	0	0	0	0	0	0	0	0	0	0	0
NE 124th Avenue (South)	----	----	----	----	0	0	0	----	0	0	0	----
NE 124th Avenue (North)	0	----	0	0	0	----	----	----	----	----	0	0
NE 129th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 138th Avenue	0	0	0	0	0	0	0	0	0	0	0	0

Corridor: NE 28th Street	Limits: NE 138th Avenue to NE 162nd Avenue											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 136th/138th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 148th Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 152nd Avenue	0	0	0	0	0	0	0	0	0	0	0	0
NE 162nd Avenue	0	0	0	0	0	0	0	0	0	0	0	0

Exhibit 1B. Trip Assignment for Corridor Intersections. (continued)

Corridor: Ft. Vancouver Way/St. Johns Boulevard Limits: Mill Plain Boulevard to NE 63rd Street

Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Mill Plain Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
McLoughlin Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
Fourth Plain Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
St. Johns Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
E 33rd Street	0	0	0	0	0	0	0	0	0	0	0	0
SR 500	0	0	0	0	0	0	0	0	0	0	0	0
NE 44th Street	0	0	0	0	0	0	0	0	0	0	0	0
Minnehaha/NE 63rd Street	0	0	0	0	0	0	0	0	0	0	0	0

Corridor: NE 112th Avenue (also Chkalov Drive) Limits: Mill Plain Boulevard to Burton Road/NE 28th Street

Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Mill Plain Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
NE 9th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 18th Street	0	0	0	0	0	0	0	0	0	0	0	0
Burton Road/NE 28th Street	0	0	0	0	0	0	0	0	0	0	0	0

Corridor: NE 112th Avenue Limits: Burton Road/NE 28th Street to NE 51st Street

Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Burton Road/NE 28th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 49th Street	----	0	0	0	----	0	0	0	----	----	----	----
NE 51st Street	0	0	0	0	0	0	0	0	0	0	0	0

Corridor: NE 136th/138th Avenue Limits: Mill Plain Boulevard to NE 28th Street

Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
Mill Plain Boulevard	0	0	0	0	2	0	0	0	0	0	2	0
NE 4th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 18th Street	0	0	0	0	2	0	0	0	0	0	2	0
NE 28th Street	0	0	0	0	0	0	0	0	0	0	0	0

Corridor: NE 137th/138th Avenue Limits: NE 28th Street to Fourth Plain Boulevard

Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
NE 28th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 39th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 49th Street	0	0	0	0	0	0	0	0	0	0	0	0
Fourth Plain Road	0	0	0	0	0	0	0	0	0	0	0	0

Exhibit 1B. Trip Assignment for Corridor Intersections. (continued)

Corridor: SE 164th Avenue	Limits: SR-14 to SE 1st Street											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
SR-14 eastbound ramps	----	0	0	----	----	----	0	0	----	0	---	0
SR-14 westbound ramps	0	0	----	0	---	0	----	0	0	----	----	----
Cascade Park Dr/SE 34th St	0	0	0	0	0	0	0	0	0	0	0	0
Village Loop/SE 29th Street	0	0	0	0	0	0	0	0	0	0	0	0
McGillivray Boulevard	0	0	0	0	0	0	0	0	0	0	0	0
Village Loop/SE 20th Street	0	0	0	0	0	0	0	0	0	0	0	0
SE 15th Street	0	0	0	0	0	0	0	0	0	0	0	0
SE 12th Court/Tech Center Drive	0	0	0	0	0	0	0	0	0	0	0	0
Mill Plain Boulevard	0	0	0	0	4	0	0	0	0	0	4	0
SE 1st Street	0	0	0	0	6	0	0	0	0	0	6	0

Corridor: NE 162nd/SE 164th Avenue	Limits: SE 1st Street to Fourth Plain Road											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
SE 1st Street	0	0	0	0	6	0	0	0	0	0	6	0
NE 11th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 18th Street	0	0	0	0	4	0	0	0	0	0	4	0
NE 28th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 34th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 39th Street	0	0	0	0	0	0	0	0	0	0	0	0
Poplar Street/NE 45th Street	0	0	0	0	0	0	0	0	0	0	0	0
NE 65th Street	0	0	0	0	0	0	0	0	0	0	0	0
Fourth Plain Road	0	0	0	0	0	0	0	0	0	0	0	0

Corridor: NE/SE 192nd Avenue	Limits: SR-14 to NE 18th Street											
Intersecting Roadway	Traffic Movement											
	SOUTHBOUND			WESTBOUND			NORTHBOUND			EASTBOUND		
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
SR-14 eastbound ramps	----	0	6	----	----	----	0	0	----	0	----	0
SR-14 westbound ramps	0	6	----	7	----	0	----	0	0	----	----	----
Brady Road	----	6	0	0	----	0	0	7	----	----	----	----
SE 34th Street/Pacific Rim Blvd	0	6	0	0	0	0	0	7	0	0	0	0
SE 31st Street	----	6	0	0	----	0	0	7	----	----	----	----
SE 20th Street	0	6	0	0	0	0	0	7	0	0	0	0
SE 15th Street	0	6	0	0	0	0	0	7	0	0	0	0
SE 12th Way	0	6	----	----	----	----	----	7	0	0	----	0
Westridge Boulevard	----	6	0	0	----	0	0	7	----	----	----	----
Mill Plain Boulevard	4	6	0	0	0	0	0	7	0	0	0	4
SE 1st Street	6	10	0	0	0	0	0	11	0	0	0	6
NE 6th Street	----	16	0	0	----	0	0	17	----	----	----	----
NE 9th Street	0	16	----	----	----	----	----	17	0	0	----	0
NE 11th Street	----	16	0	0	----	0	0	17	----	----	----	----
NE 13th Street	----	0	12	12	----	16	17	0	----	----	----	----
NE 18th Street	----	----	----	----	0	0	0	----	12	12	0	----

Table 6: 2035 PM Peak Hour Mitigated Intersection Level of Service

Roadway	Limits	Description	Benefits
Goodwin Road	192nd Avenue to Friberg Street	An improvement is needed to provide additional capacity between Vancouver and Camas. No specific project has been identified, but could include: • widening of 13th Street • constructing an 18th Street connection • or a combination of the two	• Modeling shows there will be a high travel demand in the future between Vancouver and northern Camas. Either two three-lane corridors or one five-lane corridor will be needed to connect 192nd and Goodwin/28th.
Goodwin Road	Friberg Street to Ingle Road	High travel demand along this corridor will require a five-lane section to provide capacity between Vancouver and northeastern Camas.	• Capacity improvement for key corridor • Safety improvement for key corridor
Goodwin Road	Ingle Road to 242nd Avenue	Traffic forecasts indicate a three-lane section, in combination with the proposed 242nd Extension/East-West Arterial Roadway will provide sufficient capacity in this corridor	• Lower cost than originally anticipated (3-lane vs. 5-lane section • Improved capacity and safety
Camas Meadows Drive	Payne to Lake Road	Extend Camas Meadows Drive from Payne Street to Lake Road along Larkspur alignment as a three-lane collector	• Improved capacity and safety • Improves operation of Lake/Parker intersection • Eliminates the need to widen 1st/Lake to accommodate eastbound through traffic
Ingle Street Extension (New East-West Connector)	Extend Ingle Street south and east between Goodwin/28th and 232nd Street	Provides an alternative route into north portion of Camas, eliminating the need for a five-lane section on Goodwin between Ingle and 242nd Avenue	• Provides additional capacity • Provides access to new development area

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TRANSPORTATION SOLUTIONS

Roadway	Limits	Description	Benefits
23rd Street Realignment	283rd Avenue to 23rd Street	Construct connection between 23rd Street Extension terminus on 283rd Avenue south of 23rd Street to 23rd Street	• Provide a direct connection between the new 23rd Street Extension (at 283rd Avenue) and the existing 23rd Street, providing access east toward Washougal
Friberg Street	1st Street to 13th Street	Widen to 3 lanes	• Provide turn lane capacity for adjacent development and growth in through traffic
38th Avenue Extension	192nd to Bybee	Construct new 3 lane roadway	• Provide a direct connection to 192nd with adequate capacity rather than a residentially fronted two lane street
38th Avenue (West)	Bybee to Parker	Widen to 3 lanes	• Provide turn lane capacity for adjacent development and growth in through traffic
38th Avenue (East)	Parker to 650 feet west of Dahlia	Widen to 3 lanes	• Provide turn lanes and increased capacity for development
Bybee Realignment	199th Avenue to 20th Street	Realign to meet new signalized intersection	• Current alignment of Bybee would not be access spacing standards between the new signal planned west of 202nd Avenue

Notes:

- 13th Street/18th Street Corridor: It is recognized that additional capacity (five lanes total) is needed between NE 192nd Avenue (in Vancouver) and NE Goodwin Road (in Camas). The area between these two points is located within Clark County and, while there are multiple alignment options, there are issues related to each. The most desirable option, in terms of vehicular demand and connectivity, would be a new route along the 18th Street alignment. However, there are known environmental issues with this alignment which would make development of a project very difficult. Another alternative would be to widen NE 13th Street between 192nd Avenue and Goodwin Road, however, this alignment goes through a neighborhood, and would require acquisition of residential property to build a five-lane section. A third alternative would provide two three-lane roadways, however, both environmental and neighborhood issues would need to be addressed. This analysis assumes that some sort of connection is provided (to be determined at a later date), that would provide capacity for the equivalent of a five lane roadway.

- Previous analysis has indicated that a five-lane section would be required along the Goodwin/28th corridor. Current analysis indicates that with the planned improvements in the North UGA area, including a parallel collector route, a three-lane section will work between Ingle and 242nd Avenue. Right-of-way should be reserved for a five-lane section, as ultimately, it may be required.

- In the 2007 Framework Plan, it was recommended that Camas Meadows Drive be realigned to intersect with 1st Street/Lake Road at Larkspur/Parker Street. A key purpose of this realignment was to consolidate access and the need for additional traffic signals along 1st Street/Lake Road. Alternatives to this realignment were considered, such as improving the existing Payne Street alignment. However, the Larkspur alignment significantly improves operations at the Lake Road/1st Street/Parker intersection and preserves pedestrian access on all intersection approaches. Pedestrian access may have been at risk on the west approach to the intersection due to the high number of eastbound right turns/northbound left turns that can be reduced by extending Parker north to align with Camas Meadows Drive. Camas Meadows Drive will be improved between Payne Street and Lake Road as a three-lane collector.

- The previous TIF Update recommended improvements to Crown Road. However, current analysis reflects changing development patterns with an increased traffic shed to the north. Current modeling indicates that the current capacity of Crown Road should be adequate to accommodate future growth in Camas.

Lanes, Volumes, Timings
1: NE 192nd Avenue & NE 13th Street

2023 Adjusted Existing Traffic, AM Peak Hour
09/09/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	186	240	175	74	362	270
Future Volume (vph)	186	240	175	74	362	270
Confl. Peds. (#/hr)	1	2		1	2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	4%	4%	7%	7%
Shared Lane Traffic (%)						
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	23.2		22.5		9.5	22.5
Total Split (s)	23.2		22.8		14.0	36.8
Total Split (%)	38.7%		38.0%		23.3%	61.3%
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	1.0		1.0		1.0	1.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	4.5		4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max		None	Max
Act Effct Green (s)	16.5		18.5		32.4	32.4
Actuated g/C Ratio	0.28		0.32		0.56	0.56
v/c Ratio	0.86		0.48		0.72	0.30
Control Delay	32.1		17.7		17.8	8.4
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	32.1		17.7		17.8	8.4
LOS	C		B		B	A
Approach Delay	32.1		17.7			13.8
Approach LOS	C		B			B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 57.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 20.5	Intersection LOS: C
Intersection Capacity Utilization 70.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: NE 192nd Avenue & NE 13th Street

HCM 6th Signalized Intersection Summary
1: NE 192nd Avenue & NE 13th Street

2023 Adjusted Existing Traffic, AM Peak Hour
09/09/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	186	240	175	74	362	270
Future Volume (veh/h)	186	240	175	74	362	270
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1796	1796
Adj Flow Rate, veh/h	207	267	194	82	402	300
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	4	4	7	7
Cap, veh/h	225	290	375	159	578	969
Arrive On Green	0.31	0.31	0.31	0.31	0.16	0.54
Sat Flow, veh/h	724	934	1227	519	1711	1796
Grp Volume(v), veh/h	475	0	0	276	402	300
Grp Sat Flow(s),veh/h/ln	1662	0	0	1746	1711	1796
Q Serve(g_s), s	16.5	0.0	0.0	7.8	9.2	5.5
Cycle Q Clear(g_c), s	16.5	0.0	0.0	7.8	9.2	5.5
Prop In Lane	0.44	0.56		0.30	1.00	
Lane Grp Cap(c), veh/h	515	0	0	534	578	969
V/C Ratio(X)	0.92	0.00	0.00	0.52	0.70	0.31
Avail Cap(c_a), veh/h	519	0	0	534	578	969
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	0.0	17.1	11.2	7.6
Incr Delay (d2), s/veh	21.9	0.0	0.0	3.5	3.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	0.0	0.0	3.2	3.2	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.9	0.0	0.0	20.7	14.8	8.4
LnGrp LOS	D	A	A	C	B	A
Approach Vol, veh/h	475		276			702
Approach Delay, s/veh	41.9		20.7			12.1
Approach LOS	D		C			B

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	14.0	22.8				36.8	23.1
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	9.5	18.3				32.3	18.7
Max Q Clear Time (g_c+I1), s	11.2	9.8				7.5	18.5
Green Ext Time (p_c), s	0.0	0.9				1.6	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Lanes, Volumes, Timings
2: Site Access & NE 13th Street

2023 Adjusted Existing Traffic, AM Peak Hour
09/09/2023

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	443	0	0	431	1	0
Future Volume (vph)	443	0	0	431	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 33.3%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	443	0	0	431	1	0
Future Vol, veh/h	443	0	0	431	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	20	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	2	2	2	2
Mvmt Flow	492	0	0	479	1	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	492	0	971	492
Stage 1	-	-	-	-	492	-
Stage 2	-	-	-	-	479	-
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	-	-	1071	-	280	577
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	623	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1071	-	280	577
Mov Cap-2 Maneuver	-	-	-	-	280	-
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	623	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	17.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	280	-	-	1071	-
HCM Lane V/C Ratio	0.004	-	-	-	-
HCM Control Delay (s)	17.9	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Lanes, Volumes, Timings — 2023 Adjusted Existing Traffic, AM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road

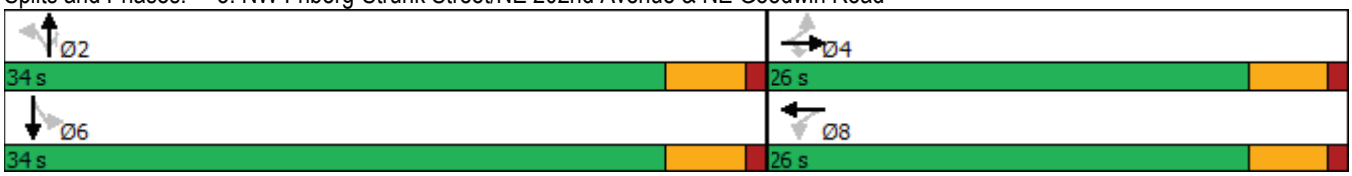
09/09/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	134	308	101	289	5	139	4	66	2	10	3
Future Volume (vph)	1	134	308	101	289	5	139	4	66	2	10	3
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	3%	3%	3%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.2	25.2	25.2	25.5	25.5		33.2	33.2	33.2	33.2	33.2	
Total Split (s)	26.0	26.0	26.0	26.0	26.0		34.0	34.0	34.0	34.0	34.0	
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%		56.7%	56.7%	56.7%	56.7%	56.7%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)		4.5	4.5	4.5	4.5			4.5	4.5		4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	
Act Effct Green (s)		15.1	15.1	15.1	15.1			29.7	29.7		29.7	
Actuated g/C Ratio		0.28	0.28	0.28	0.28			0.55	0.55		0.55	
v/c Ratio		0.31	0.52	0.35	0.67			0.22	0.09		0.02	
Control Delay		16.5	5.0	18.0	23.5			8.4	2.7		6.5	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		16.5	5.0	18.0	23.5			8.4	2.7		6.5	
LOS		B	A	B	C			A	A		A	
Approach Delay		8.5			22.1			6.6			6.5	
Approach LOS		A			C			A			A	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 53.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 13.2 — Intersection LOS: B
Intersection Capacity Utilization 50.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road



HCM 6th Signalized Intersection Summary 2023 Adjusted Existing Traffic, AM Peak Hour
3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road 09/09/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	134	308	101	289	5	139	4	66	2	10	3
Future Volume (veh/h)	1	134	308	101	289	5	139	4	66	2	10	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1870	1870	1870	1856	1856	1856	1900	1900	1900
Adj Flow Rate, veh/h	1	158	362	119	340	6	164	5	78	2	12	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	5	5	5	2	2	2	3	3	3	0	0	0
Cap, veh/h	68	515	437	323	517	9	877	25	865	134	704	218
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.55	0.55	0.55	0.55	0.55	0.55
Sat Flow, veh/h	2	1822	1547	882	1832	32	1355	45	1572	107	1280	396
Grp Volume(v), veh/h	159	0	362	119	0	346	169	0	78	18	0	0
Grp Sat Flow(s),veh/h/ln	1824	0	1547	882	0	1865	1400	0	1572	1783	0	0
Q Serve(g_s), s	0.0	0.0	11.8	6.6	0.0	8.8	3.0	0.0	1.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.7	0.0	11.8	10.3	0.0	8.8	3.2	0.0	1.3	0.2	0.0	0.0
Prop In Lane	0.01		1.00	1.00		0.02	0.97		1.00	0.11		0.22
Lane Grp Cap(c), veh/h	583	0	437	323	0	527	902	0	865	1055	0	0
V/C Ratio(X)	0.27	0.00	0.83	0.37	0.00	0.66	0.19	0.00	0.09	0.02	0.00	0.00
Avail Cap(c_a), veh/h	798	0	620	427	0	747	902	0	865	1055	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.1	0.0	18.0	19.2	0.0	17.0	6.2	0.0	5.7	5.5	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	6.4	0.7	0.0	1.4	0.5	0.0	0.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	4.4	1.2	0.0	3.4	0.8	0.0	0.3	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.4	0.0	24.4	19.9	0.0	18.4	6.6	0.0	5.9	5.5	0.0	0.0
LnGrp LOS	B	A	C	B	A	B	A	A	A	A	A	A
Approach Vol, veh/h		521			465			247			18	
Approach Delay, s/veh		21.7			18.7			6.4			5.5	
Approach LOS		C			B			A			A	

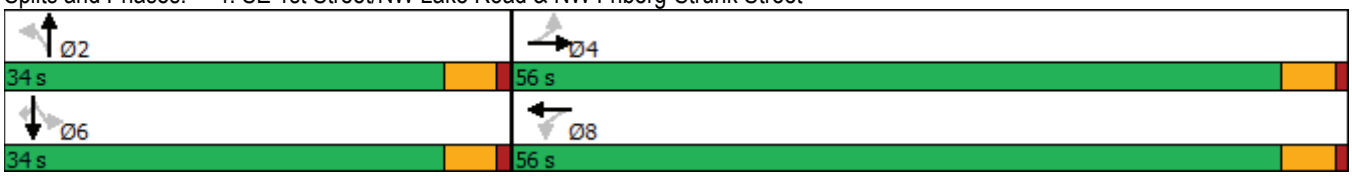
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.0	19.7	34.0	19.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	21.5	29.5	21.5
Max Q Clear Time (g_c+I1), s	5.2	13.8	2.2	12.3
Green Ext Time (p_c), s	1.1	1.4	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	345	247	0	0	267	163	0	0	0	131	0	185
Future Volume (vph)	345	247	0	0	267	163	0	0	0	131	0	185
Confl. Peds. (#/hr)	9		2	1		8	2		1	8		9
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	0%	0%	0%	3%	3%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		25.5	25.5		33.2	33.2		33.2	33.2	33.2
Total Split (s)	56.0	56.0		56.0	56.0		34.0	34.0		34.0	34.0	34.0
Total Split (%)	62.2%	62.2%		62.2%	62.2%		37.8%	37.8%		37.8%	37.8%	37.8%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	Max
Act Effct Green (s)	51.5	51.5			51.5						29.5	29.5
Actuated g/C Ratio	0.57	0.57			0.57						0.33	0.33
v/c Ratio	1.03	0.16			0.28						0.37	0.36
Control Delay	72.7	9.3			6.2						26.2	4.8
Queue Delay	0.0	0.0			0.0						0.0	0.0
Total Delay	72.7	9.3			6.2						26.2	4.8
LOS	E	A			A						C	A
Approach Delay		46.3			6.2						13.7	
Approach LOS		D			A						B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 25.7	Intersection LOS: C
Intersection Capacity Utilization 68.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street



HCM 6th Signalized Intersection Summary 2023 Adjusted Existing Traffic, AM Peak Hour
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street 09/09/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	345	247	0	0	267	163	0	0	0	131	0	185
Future Volume (veh/h)	345	247	0	0	267	163	0	0	0	131	0	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1900	1900	1900	1856	1856	1856
Adj Flow Rate, veh/h	448	321	0	0	347	212	0	0	0	170	0	240
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	3	3	3	1	1	1	0	0	0	3	3	3
Cap, veh/h	491	2017	0	80	1229	736	0	623	0	540	0	511
Arrive On Green	0.57	0.57	0.00	0.00	0.57	0.57	0.00	0.00	0.00	0.33	0.00	0.33
Sat Flow, veh/h	842	3618	0	1067	2147	1286	0	1900	0	1404	0	1560
Grp Volume(v), veh/h	448	321	0	0	288	271	0	0	0	170	0	240
Grp Sat Flow(s),veh/h/ln	842	1763	0	1067	1791	1643	0	1900	0	1404	0	1560
Q Serve(g_s), s	43.9	3.9	0.0	0.0	7.4	7.6	0.0	0.0	0.0	8.3	0.0	11.0
Cycle Q Clear(g_c), s	51.5	3.9	0.0	0.0	7.4	7.6	0.0	0.0	0.0	8.3	0.0	11.0
Prop In Lane	1.00		0.00	1.00		0.78	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	491	2017	0	80	1025	940	0	623	0	540	0	511
V/C Ratio(X)	0.91	0.16	0.00	0.00	0.28	0.29	0.00	0.00	0.00	0.31	0.00	0.47
Avail Cap(c_a), veh/h	491	2017	0	80	1025	940	0	623	0	540	0	511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.9	9.1	0.0	0.0	9.8	9.9	0.0	0.0	0.0	23.1	0.0	24.0
Incr Delay (d2), s/veh	21.4	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	1.5	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	1.3	0.0	0.0	2.6	2.4	0.0	0.0	0.0	2.8	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	9.1	0.0	0.0	10.0	10.0	0.0	0.0	0.0	24.7	0.0	27.1
LnGrp LOS	D	A	A	A	A	B	A	A	A	C	A	C
Approach Vol, veh/h		769			559			0			410	
Approach Delay, s/veh		30.8			10.0			0.0			26.1	
Approach LOS		C			A						C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.0	56.0	34.0	56.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	51.5	29.5	51.5
Max Q Clear Time (g_c+I1), s	0.0	53.5	13.0	9.6
Green Ext Time (p_c), s	0.0	0.0	1.5	3.6

Intersection Summary	
HCM 6th Ctrl Delay	23.0
HCM 6th LOS	C

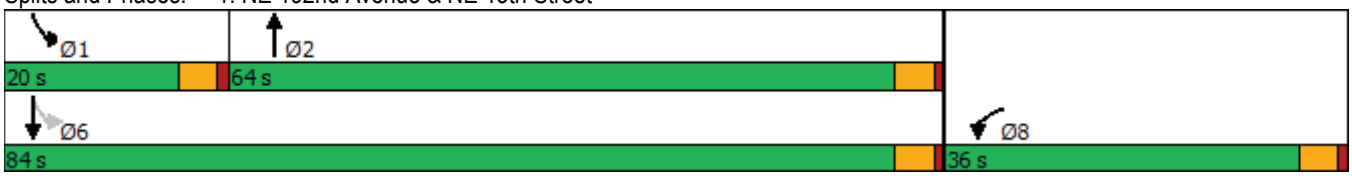
Lanes, Volumes, Timings
1: NE 192nd Avenue & NE 13th Street

2023 Adjusted Existing Traffic, PM Peak Hour
09/09/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	141	249	540	183	228	409
Future Volume (vph)	141	249	540	183	228	409
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	23.2		22.5		9.5	22.5
Total Split (s)	36.0		64.0		20.0	84.0
Total Split (%)	30.0%		53.3%		16.7%	70.0%
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	1.0		1.0		1.0	1.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	4.5		4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max		None	Max
Act Effct Green (s)	28.9		61.4		79.6	79.6
Actuated g/C Ratio	0.25		0.52		0.68	0.68
v/c Ratio	0.92		0.84		0.77	0.36
Control Delay	62.7		34.0		33.6	9.4
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	62.7		34.0		33.6	9.4
LOS	E		C		C	A
Approach Delay	62.7		34.0			18.1
Approach LOS	E		C			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 34.6	Intersection LOS: C
Intersection Capacity Utilization 86.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: NE 192nd Avenue & NE 13th Street



HCM 6th Signalized Intersection Summary
1: NE 192nd Avenue & NE 13th Street

2023 Adjusted Existing Traffic, PM Peak Hour
09/09/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	141	249	540	183	228	409
Future Volume (veh/h)	141	249	540	183	228	409
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	157	277	600	203	253	454
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	158	278	736	249	326	1249
Arrive On Green	0.26	0.26	0.55	0.55	0.08	0.66
Sat Flow, veh/h	601	1060	1347	456	1795	1885
Grp Volume(v), veh/h	435	0	0	803	253	454
Grp Sat Flow(s),veh/h/ln	1664	0	0	1803	1795	1885
Q Serve(g_s), s	31.3	0.0	0.0	43.7	7.1	12.8
Cycle Q Clear(g_c), s	31.3	0.0	0.0	43.7	7.1	12.8
Prop In Lane	0.36	0.64		0.25	1.00	
Lane Grp Cap(c), veh/h	437	0	0	985	326	1249
V/C Ratio(X)	1.00	0.00	0.00	0.82	0.78	0.36
Avail Cap(c_a), veh/h	437	0	0	985	416	1249
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	0.0	0.0	22.3	22.6	9.0
Incr Delay (d2), s/veh	41.9	0.0	0.0	7.4	6.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.7	0.0	0.0	19.1	4.4	5.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	86.0	0.0	0.0	29.7	29.5	9.8
LnGrp LOS	F	A	A	C	C	A
Approach Vol, veh/h	435		803			707
Approach Delay, s/veh	86.0		29.7			16.9
Approach LOS	F		C			B

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	13.9	70.1				84.0	36.0
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	15.5	59.5				79.5	31.5
Max Q Clear Time (g_c+I1), s	9.1	45.7				14.8	33.3
Green Ext Time (p_c), s	0.4	4.8				2.9	0.0

Intersection Summary	
HCM 6th Ctrl Delay	37.6
HCM 6th LOS	D

Lanes, Volumes, Timings
2: Site Access & NE 13th Street

2023 Adjusted Existing Traffic, PM Peak Hour
09/09/2023

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	390	1	0	383	0	0
Future Volume (vph)	390	1	0	383	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 30.2%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱		↰	⅄	
Traffic Vol, veh/h	390	1	0	383	0	0
Future Vol, veh/h	390	1	0	383	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	20	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	433	1	0	426	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	434	0	859	433
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	426	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1131	-	327	623
Stage 1	-	-	-	-	654	-
Stage 2	-	-	-	-	659	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1131	-	327	623
Mov Cap-2 Maneuver	-	-	-	-	327	-
Stage 1	-	-	-	-	654	-
Stage 2	-	-	-	-	659	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1131	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Lanes, Volumes, Timings — 2023 Adjusted Existing Traffic, PM Peak Hour

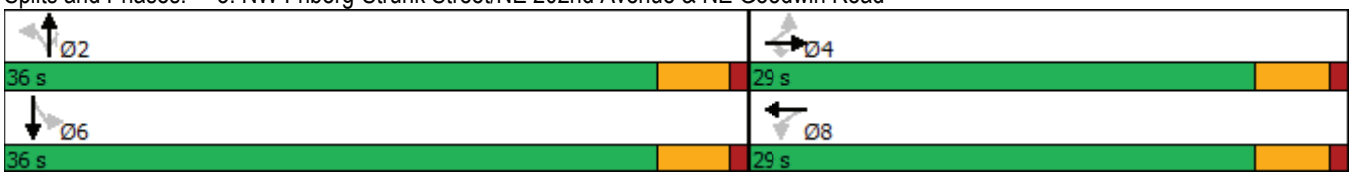
3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road

09/09/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	280	101	109	265	2	115	12	227	0	6	3
Future Volume (vph)	9	280	101	109	265	2	115	12	227	0	6	3
Confl. Peds. (#/hr)	5		5	7		7	5		7	7		5
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm		NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.2	25.2	25.2	25.5	25.5		33.2	33.2	33.2	33.2	33.2	
Total Split (s)	29.0	29.0	29.0	29.0	29.0		36.0	36.0	36.0	36.0	36.0	
Total Split (%)	44.6%	44.6%	44.6%	44.6%	44.6%		55.4%	55.4%	55.4%	55.4%	55.4%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)		4.5	4.5	4.5	4.5			4.5	4.5		4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	
Act Effct Green (s)		15.1	15.1	15.1	15.1			31.7	31.7		31.7	
Actuated g/C Ratio		0.27	0.27	0.27	0.27			0.57	0.57		0.57	
v/c Ratio		0.64	0.22	0.61	0.59			0.17	0.26		0.01	
Control Delay		24.0	4.8	31.3	22.4			7.8	2.1		6.3	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		24.0	4.8	31.3	22.4			7.8	2.1		6.3	
LOS		C	A	C	C			A	A		A	
Approach Delay		19.0			25.0			4.2			6.3	
Approach LOS		B			C			A			A	

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 55.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 61.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road



HCM 6th Signalized Intersection Summary 2023 Adjusted Existing Traffic, PM Peak Hour
3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road 09/09/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	280	101	109	265	2	115	12	227	0	6	3
Future Volume (veh/h)	9	280	101	109	265	2	115	12	227	0	6	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	10	315	113	122	298	2	129	13	255	0	7	3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	0	0	0
Cap, veh/h	68	591	506	291	592	4	807	76	844	0	669	287
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.53	0.53	0.53	0.00	0.53	0.53
Sat Flow, veh/h	18	1868	1597	964	1870	13	1300	143	1587	0	1259	540
Grp Volume(v), veh/h	325	0	113	122	0	300	142	0	255	0	0	10
Grp Sat Flow(s),veh/h/ln	1886	0	1597	964	0	1883	1443	0	1587	0	0	1799
Q Serve(g_s), s	0.0	0.0	3.1	7.1	0.0	7.7	2.8	0.0	5.3	0.0	0.0	0.2
Cycle Q Clear(g_c), s	8.4	0.0	3.1	15.4	0.0	7.7	3.0	0.0	5.3	0.0	0.0	0.2
Prop In Lane	0.03		1.00	1.00		0.01	0.91		1.00	0.00		0.30
Lane Grp Cap(c), veh/h	660	0	506	291	0	596	883	0	844	0	0	956
V/C Ratio(X)	0.49	0.00	0.22	0.42	0.00	0.50	0.16	0.00	0.30	0.00	0.00	0.01
Avail Cap(c_a), veh/h	840	0	660	384	0	778	883	0	844	0	0	956
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	16.7	0.0	14.9	23.1	0.0	16.5	7.2	0.0	7.7	0.0	0.0	6.5
Incr Delay (d2), s/veh	0.6	0.0	0.2	1.0	0.0	0.7	0.4	0.0	0.9	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	1.0	1.5	0.0	3.0	0.8	0.0	1.5	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	0.0	15.1	24.0	0.0	17.1	7.6	0.0	8.7	0.0	0.0	6.6
LnGrp LOS	B	A	B	C	A	B	A	A	A	A	A	A
Approach Vol, veh/h		438			422			397			10	
Approach Delay, s/veh		16.7			19.1			8.3			6.6	
Approach LOS		B			B			A			A	

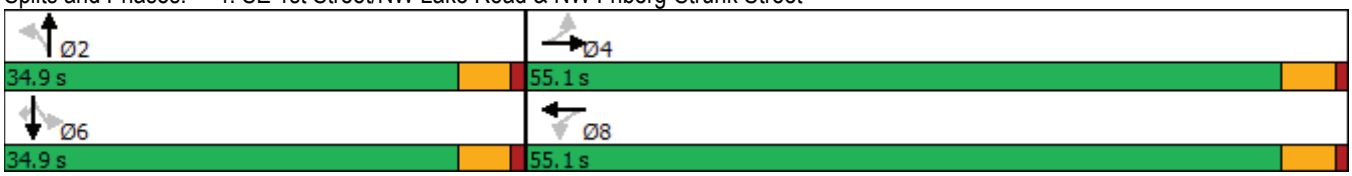
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	36.0	23.3	36.0	23.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	24.5	31.5	24.5
Max Q Clear Time (g_c+I1), s	7.3	10.4	2.2	17.4
Green Ext Time (p_c), s	1.6	1.9	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	567	2	0	402	116	2	0	0	101	0	141
Future Volume (vph)	250	567	2	0	402	116	2	0	0	101	0	141
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		25.5	25.5		33.2	33.2		33.2	33.2	33.2
Total Split (s)	55.1	55.1		55.1	55.1		34.9	34.9		34.9	34.9	34.9
Total Split (%)	61.2%	61.2%		61.2%	61.2%		38.8%	38.8%		38.8%	38.8%	38.8%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	Max
Act Effct Green (s)	30.1	30.1			30.1			31.3			31.3	31.3
Actuated g/C Ratio	0.43	0.43			0.43			0.44			0.44	0.44
v/c Ratio	0.84	0.40			0.37			0.00			0.17	0.19
Control Delay	40.8	13.8			11.7			17.5			17.2	4.3
Queue Delay	0.0	0.0			0.0			0.0			0.0	0.0
Total Delay	40.8	13.8			11.7			17.5			17.2	4.3
LOS	D	B			B			B			B	A
Approach Delay		22.0			11.7			17.5			9.7	
Approach LOS		C			B			B			A	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 70.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 16.7	Intersection LOS: B
Intersection Capacity Utilization 45.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street



HCM 6th Signalized Intersection Summary 2023 Adjusted Existing Traffic, PM Peak Hour
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street 09/09/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	567	2	0	402	116	2	0	0	101	0	141
Future Volume (veh/h)	250	567	2	0	402	116	2	0	0	101	0	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	269	610	2	0	432	125	2	0	0	109	0	152
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	422	1751	6	96	1313	377	557	0	0	695	0	653
Arrive On Green	0.47	0.47	0.47	0.00	0.47	0.47	0.41	0.00	0.00	0.41	0.00	0.41
Sat Flow, veh/h	866	3691	12	823	2768	794	1137	0	0	1476	0	1610
Grp Volume(v), veh/h	269	298	314	0	280	277	2	0	0	109	0	152
Grp Sat Flow(s),veh/h/ln	866	1805	1898	823	1805	1757	1137	0	0	1476	0	1610
Q Serve(g_s), s	21.1	7.8	7.8	0.0	7.2	7.4	0.1	0.0	0.0	0.0	0.0	4.6
Cycle Q Clear(g_c), s	28.5	7.8	7.8	0.0	7.2	7.4	2.9	0.0	0.0	2.9	0.0	4.6
Prop In Lane	1.00		0.01	1.00		0.45	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	422	856	900	96	856	833	557	0	0	695	0	653
V/C Ratio(X)	0.64	0.35	0.35	0.00	0.33	0.33	0.00	0.00	0.00	0.16	0.00	0.23
Avail Cap(c_a), veh/h	595	1218	1281	261	1218	1186	557	0	0	695	0	653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.2	12.4	12.4	0.0	12.3	12.3	15.0	0.0	0.0	14.1	0.0	14.6
Incr Delay (d2), s/veh	1.6	0.2	0.2	0.0	0.2	0.2	0.0	0.0	0.0	0.5	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	2.8	2.9	0.0	2.6	2.5	0.0	0.0	0.0	1.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	12.6	12.6	0.0	12.5	12.5	15.0	0.0	0.0	14.6	0.0	15.5
LnGrp LOS	C	B	B	A	B	B	B	A	A	B	A	B
Approach Vol, veh/h		881			557			2			261	
Approach Delay, s/veh		15.7			12.5			15.0			15.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.9	40.1	34.9	40.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	30.4	50.6	30.4	50.6
Max Q Clear Time (g_c+I1), s	4.9	30.5	6.6	9.4
Green Ext Time (p_c), s	0.0	5.1	1.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	14.6
HCM 6th LOS	B

Lanes, Volumes, Timings
1: NE 192nd Avenue & NE 13th Street

2026 Background Traffic, AM Peak Hour
09/10/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	302	297	186	107	403	286
Future Volume (vph)	302	297	186	107	403	286
Confl. Peds. (#/hr)	1	2		1	2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	4%	4%	7%	7%
Shared Lane Traffic (%)						
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	23.2		22.5		9.5	22.5
Total Split (s)	40.0		25.0		25.0	50.0
Total Split (%)	44.4%		27.8%		27.8%	55.6%
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	1.0		1.0		1.0	1.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	4.5		4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max		None	Max
Act Effct Green (s)	34.6		21.3		45.5	45.5
Actuated g/C Ratio	0.39		0.24		0.51	0.51
v/c Ratio	0.97		0.75		0.91	0.35
Control Delay	52.7		41.8		42.1	14.6
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	52.7		41.8		42.1	14.6
LOS	D		D		D	B
Approach Delay	52.7		41.8			30.7
Approach LOS	D		D			C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 89.1	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 41.1	Intersection LOS: D
Intersection Capacity Utilization 85.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: NE 192nd Avenue & NE 13th Street

HCM 6th Signalized Intersection Summary
1: NE 192nd Avenue & NE 13th Street

2026 Background Traffic, AM Peak Hour
09/10/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	302	297	186	107	403	286
Future Volume (veh/h)	302	297	186	107	403	286
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1796	1796
Adj Flow Rate, veh/h	336	330	207	119	448	318
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	4	4	7	7
Cap, veh/h	333	327	268	154	510	908
Arrive On Green	0.39	0.39	0.24	0.24	0.21	0.51
Sat Flow, veh/h	844	829	1096	630	1711	1796
Grp Volume(v), veh/h	667	0	0	326	448	318
Grp Sat Flow(s),veh/h/ln	1676	0	0	1726	1711	1796
Q Serve(g_s), s	35.5	0.0	0.0	15.8	16.7	9.6
Cycle Q Clear(g_c), s	35.5	0.0	0.0	15.8	16.7	9.6
Prop In Lane	0.50	0.49		0.37	1.00	
Lane Grp Cap(c), veh/h	661	0	0	422	510	908
V/C Ratio(X)	1.01	0.00	0.00	0.77	0.88	0.35
Avail Cap(c_a), veh/h	661	0	0	422	539	908
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	0.0	31.7	19.4	13.4
Incr Delay (d2), s/veh	37.2	0.0	0.0	12.8	14.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.0	0.0	0.0	7.8	8.0	3.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	64.4	0.0	0.0	44.5	34.0	14.4
LnGrp LOS	F	A	A	D	C	B
Approach Vol, veh/h	667		326			766
Approach Delay, s/veh	64.4		44.5			25.9
Approach LOS	E		D			C

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	23.5	26.5				50.0	40.0
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	20.5	20.5				45.5	35.5
Max Q Clear Time (g_c+I1), s	18.7	17.8				11.6	37.5
Green Ext Time (p_c), s	0.3	0.5				1.9	0.0

Intersection Summary	
HCM 6th Ctrl Delay	44.0
HCM 6th LOS	D

Lanes, Volumes, Timings
2: Site Access & NE 13th Street

2026 Background Traffic, AM Peak Hour
09/10/2023

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	518	0	0	606	1	0
Future Volume (vph)	518	0	0	606	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	518	0	0	606	1	0
Future Vol, veh/h	518	0	0	606	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	20	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	2	2	2	2
Mvmt Flow	576	0	0	673	1	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	576	0	1249	576
Stage 1	-	-	-	-	576	-
Stage 2	-	-	-	-	673	-
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	-	-	997	-	191	517
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	507	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	997	-	191	517
Mov Cap-2 Maneuver	-	-	-	-	191	-
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	507	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	24
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	191	-	-	997	-
HCM Lane V/C Ratio	0.006	-	-	-	-
HCM Control Delay (s)	24	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Lanes, Volumes, Timings — 2026 Background Traffic, AM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road

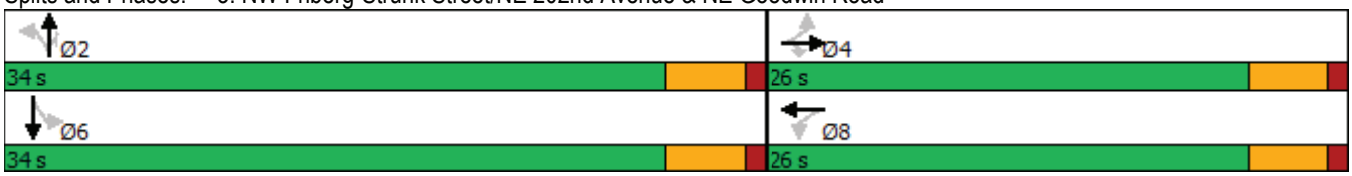
09/10/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	187	329	171	446	5	156	4	93	2	11	3
Future Volume (vph)	1	187	329	171	446	5	156	4	93	2	11	3
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	3%	3%	3%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.2	25.2	25.2	25.5	25.5		33.2	33.2	33.2	33.2	33.2	
Total Split (s)	26.0	26.0	26.0	26.0	26.0		34.0	34.0	34.0	34.0	34.0	
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%		56.7%	56.7%	56.7%	56.7%	56.7%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)		4.5	4.5	4.5	4.5			4.5	4.5		4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	
Act Effct Green (s)		19.7	19.7	19.7	19.7			29.6	29.6		29.6	
Actuated g/C Ratio		0.34	0.34	0.34	0.34			0.51	0.51		0.51	
v/c Ratio		0.36	0.50	0.54	0.85			0.28	0.13		0.02	
Control Delay		16.4	4.4	21.8	32.6			10.3	2.5		7.1	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		16.4	4.4	21.8	32.6			10.3	2.5		7.1	
LOS		B	A	C	C			B	A		A	
Approach Delay		8.7			29.6			7.4			7.1	
Approach LOS		A			C			A			A	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 58.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 17.7 — Intersection LOS: B
Intersection Capacity Utilization 60.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road



HCM 6th Signalized Intersection Summary — 2026 Background Traffic, AM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road — 09/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	187	329	171	446	5	156	4	93	2	11	3
Future Volume (veh/h)	1	187	329	171	446	5	156	4	93	2	11	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1870	1870	1870	1856	1856	1856	1900	1900	1900
Adj Flow Rate, veh/h	1	220	387	201	525	6	184	5	109	2	13	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	5	5	5	2	2	2	3	3	3	0	0	0
Cap, veh/h	61	653	554	340	661	8	786	20	773	115	645	185
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, veh/h	1	1823	1547	813	1845	21	1358	40	1572	99	1312	376
Grp Volume(v), veh/h	221	0	387	201	0	531	189	0	109	19	0	0
Grp Sat Flow(s),veh/h/ln	1825	0	1547	813	0	1867	1398	0	1572	1787	0	0
Q Serve(g_s), s	0.0	0.0	12.8	14.4	0.0	15.3	4.4	0.0	2.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	12.8	19.7	0.0	15.3	4.7	0.0	2.3	0.3	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.01	0.97		1.00	0.11		0.21
Lane Grp Cap(c), veh/h	714	0	554	340	0	669	806	0	773	945	0	0
V/C Ratio(X)	0.31	0.00	0.70	0.59	0.00	0.79	0.23	0.00	0.14	0.02	0.00	0.00
Avail Cap(c_a), veh/h	714	0	554	340	0	669	806	0	773	945	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.1	0.0	16.5	21.2	0.0	17.3	8.9	0.0	8.3	7.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	3.8	2.7	0.0	6.6	0.7	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	4.5	2.7	0.0	6.8	1.3	0.0	0.7	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	0.0	20.3	24.0	0.0	23.8	9.6	0.0	8.7	7.9	0.0	0.0
LnGrp LOS	B	A	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		608			732			298			19	
Approach Delay, s/veh		18.1			23.9			9.3			7.9	
Approach LOS		B			C			A			A	

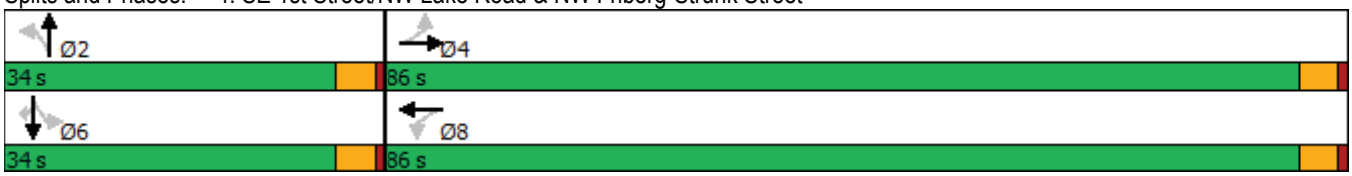
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.0	26.0	34.0	26.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	21.5	29.5	21.5
Max Q Clear Time (g_c+I1), s	6.7	14.8	2.3	21.7
Green Ext Time (p_c), s	1.3	1.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	376	269	0	0	287	186	0	0	0	184	0	232
Future Volume (vph)	376	269	0	0	287	186	0	0	0	184	0	232
Confl. Peds. (#/hr)	9		2	1		8	2		1	8		9
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	0%	0%	0%	3%	3%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		25.5	25.5		33.2	33.2		33.2	33.2	33.2
Total Split (s)	86.0	86.0		86.0	86.0		34.0	34.0		34.0	34.0	34.0
Total Split (%)	71.7%	71.7%		71.7%	71.7%		28.3%	28.3%		28.3%	28.3%	28.3%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	Max
Act Effct Green (s)	81.1	81.1			81.1						29.5	29.5
Actuated g/C Ratio	0.68	0.68			0.68						0.25	0.25
v/c Ratio	0.99	0.15			0.27						0.70	0.50
Control Delay	58.3	7.1			4.6						53.7	7.2
Queue Delay	0.0	0.0			0.0						0.0	0.0
Total Delay	58.3	7.1			4.6						53.7	7.2
LOS	E	A			A						D	A
Approach Delay		36.9			4.6						27.7	
Approach LOS		D			A						C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.6	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 71.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street



HCM 6th Signalized Intersection Summary — 2026 Background Traffic, AM Peak Hour

4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street — 09/10/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	376	269	0	0	287	186	0	0	0	184	0	232
Future Volume (veh/h)	376	269	0	0	287	186	0	0	0	184	0	232
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1900	1900	1900	1856	1856	1856
Adj Flow Rate, veh/h	488	349	0	0	373	242	0	0	0	239	0	301
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	3	3	3	1	1	1	0	0	0	3	3	3
Cap, veh/h	547	2394	0	60	1420	907	0	467	0	405	0	382
Arrive On Green	0.68	0.68	0.00	0.00	0.68	0.68	0.00	0.00	0.00	0.25	0.00	0.25
Sat Flow, veh/h	800	3618	0	1040	2091	1336	0	1900	0	1403	0	1555
Grp Volume(v), veh/h	488	349	0	0	319	296	0	0	0	239	0	301
Grp Sat Flow(s),veh/h/ln	800	1763	0	1040	1791	1635	0	1900	0	1403	0	1555
Q Serve(g_s), s	73.0	4.2	0.0	0.0	8.3	8.5	0.0	0.0	0.0	18.6	0.0	21.7
Cycle Q Clear(g_c), s	81.5	4.2	0.0	0.0	8.3	8.5	0.0	0.0	0.0	18.6	0.0	21.7
Prop In Lane	1.00		0.00	1.00		0.82	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	547	2394	0	60	1216	1111	0	467	0	405	0	382
V/C Ratio(X)	0.89	0.15	0.00	0.00	0.26	0.27	0.00	0.00	0.00	0.59	0.00	0.79
Avail Cap(c_a), veh/h	547	2394	0	60	1216	1111	0	467	0	405	0	382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.6	6.9	0.0	0.0	7.5	7.5	0.0	0.0	0.0	41.1	0.0	42.3
Incr Delay (d2), s/veh	16.9	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	6.2	0.0	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	1.4	0.0	0.0	2.9	2.7	0.0	0.0	0.0	7.0	0.0	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.5	6.9	0.0	0.0	7.6	7.7	0.0	0.0	0.0	47.3	0.0	57.4
LnGrp LOS	D	A	A	A	A	A	A	A	A	D	A	E
Approach Vol, veh/h		837			615			0			540	
Approach Delay, s/veh		26.5			7.6			0.0			52.9	
Approach LOS		C			A						D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.0	86.0	34.0	86.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	81.5	29.5	81.5
Max Q Clear Time (g_c+I1), s	0.0	83.5	23.7	10.5
Green Ext Time (p_c), s	0.0	0.0	1.2	4.1

Intersection Summary	
HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

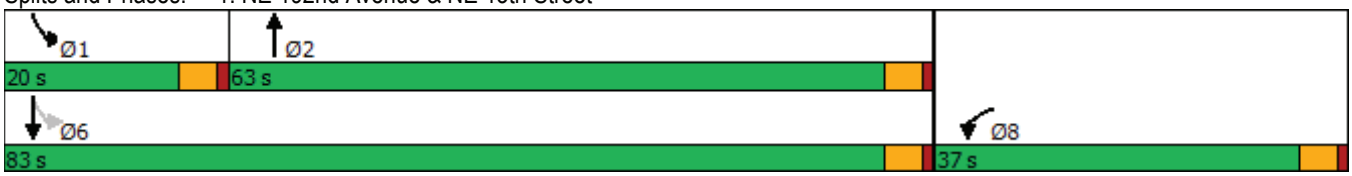
Lanes, Volumes, Timings
1: NE 192nd Avenue & NE 13th Street

2026 Background Traffic, PM Peak Hour
09/09/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	212	296	572	299	287	434
Future Volume (vph)	212	296	572	299	287	434
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	23.2		22.5		9.5	22.5
Total Split (s)	37.0		63.0		20.0	83.0
Total Split (%)	30.8%		52.5%		16.7%	69.2%
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	1.0		1.0		1.0	1.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	4.5		4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max		None	Max
Act Effct Green (s)	32.5		58.5		78.5	78.5
Actuated g/C Ratio	0.27		0.49		0.65	0.65
v/c Ratio	1.13		1.09		1.09	0.39
Control Delay	116.9		86.6		112.6	10.8
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	116.9		86.6		112.6	10.8
LOS	F		F		F	B
Approach Delay	116.9		86.6			51.3
Approach LOS	F		F			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 81.8	Intersection LOS: F
Intersection Capacity Utilization 105.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: NE 192nd Avenue & NE 13th Street



HCM 6th Signalized Intersection Summary
1: NE 192nd Avenue & NE 13th Street

2026 Background Traffic, PM Peak Hour
09/09/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	212	296	572	299	287	434
Future Volume (veh/h)	212	296	572	299	287	434
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	236	329	636	332	319	482
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	189	264	569	297	292	1233
Arrive On Green	0.27	0.27	0.49	0.49	0.13	0.65
Sat Flow, veh/h	698	974	1167	609	1795	1885
Grp Volume(v), veh/h	566	0	0	968	319	482
Grp Sat Flow(s),veh/h/ln	1675	0	0	1776	1795	1885
Q Serve(g_s), s	32.5	0.0	0.0	58.5	15.5	14.3
Cycle Q Clear(g_c), s	32.5	0.0	0.0	58.5	15.5	14.3
Prop In Lane	0.42	0.58		0.34	1.00	
Lane Grp Cap(c), veh/h	454	0	0	866	292	1233
V/C Ratio(X)	1.25	0.00	0.00	1.12	1.09	0.39
Avail Cap(c_a), veh/h	454	0	0	866	292	1233
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.8	0.0	0.0	30.8	41.6	9.6
Incr Delay (d2), s/veh	128.8	0.0	0.0	68.5	79.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	29.4	0.0	0.0	39.7	10.6	5.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	172.5	0.0	0.0	99.3	121.4	10.6
LnGrp LOS	F	A	A	F	F	B
Approach Vol, veh/h	566		968			801
Approach Delay, s/veh	172.5		99.3			54.7
Approach LOS	F		F			D

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	20.0	63.0				83.0	37.0
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	15.5	58.5				78.5	32.5
Max Q Clear Time (g_c+I1), s	17.5	60.5				16.3	34.5
Green Ext Time (p_c), s	0.0	0.0				3.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	101.7
HCM 6th LOS	F

Lanes, Volumes, Timings
2: Site Access & NE 13th Street

2026 Background Traffic, PM Peak Hour
09/09/2023

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	563	1	0	503	0	0
Future Volume (vph)	563	1	0	503	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 36.5%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	563	1	0	503	0	0
Future Vol, veh/h	563	1	0	503	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	20	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	626	1	0	559	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	627	0	1185	626
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	559	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	960	-	209	484
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	572	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	960	-	209	484
Mov Cap-2 Maneuver	-	-	-	-	209	-
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	572	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	960	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Lanes, Volumes, Timings — 2026 Background Traffic, PM Peak Hour

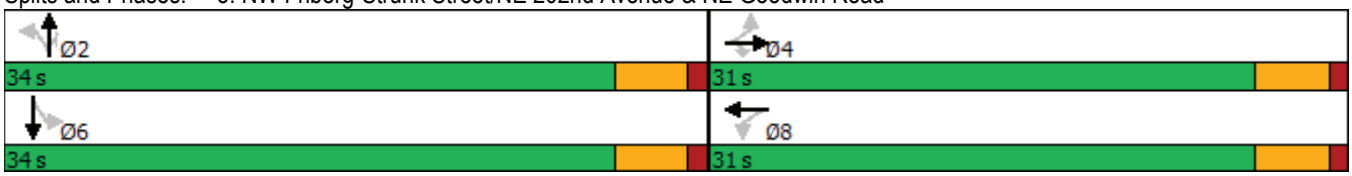
3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road

09/09/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	442	112	157	367	2	133	13	310	0	6	3
Future Volume (vph)	10	442	112	157	367	2	133	13	310	0	6	3
Confl. Peds. (#/hr)	5		5	7		7	5		7	7		5
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm		NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.2	25.2	25.2	25.5	25.5		33.2	33.2	33.2	33.2	33.2	
Total Split (s)	31.0	31.0	31.0	31.0	31.0		34.0	34.0	34.0	34.0	34.0	
Total Split (%)	47.7%	47.7%	47.7%	47.7%	47.7%		52.3%	52.3%	52.3%	52.3%	52.3%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)		4.5	4.5	4.5	4.5			4.5	4.5		4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	
Act Effct Green (s)		23.0	23.0	23.0	23.0			29.7	29.7		29.7	
Actuated g/C Ratio		0.37	0.37	0.37	0.37			0.48	0.48		0.48	
v/c Ratio		0.73	0.19	0.99	0.59			0.24	0.41		0.01	
Control Delay		23.2	3.6	91.0	19.2			11.9	6.2		8.7	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		23.2	3.6	91.0	19.2			11.9	6.2		8.7	
LOS		C	A	F	B			B	A		A	
Approach Delay		19.3			40.6			8.0			8.7	
Approach LOS		B			D			A			A	

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 61.8	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 73.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road



HCM 6th Signalized Intersection Summary — 2026 Background Traffic, PM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road — 09/09/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	442	112	157	367	2	133	13	310	0	6	3
Future Volume (veh/h)	10	442	112	157	367	2	133	13	310	0	6	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	11	497	126	176	412	2	149	15	348	0	7	3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	0	0	0
Cap, veh/h	62	765	652	265	764	4	695	65	719	0	571	245
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.45	0.45	0.45	0.00	0.45	0.45
Sat Flow, veh/h	13	1875	1600	807	1874	9	1298	144	1585	0	1259	539
Grp Volume(v), veh/h	508	0	126	176	0	414	164	0	348	0	0	10
Grp Sat Flow(s),veh/h/ln	1888	0	1600	807	0	1883	1442	0	1585	0	0	1798
Q Serve(g_s), s	0.0	0.0	3.3	12.4	0.0	10.8	4.3	0.0	10.0	0.0	0.0	0.2
Cycle Q Clear(g_c), s	14.1	0.0	3.3	26.5	0.0	10.8	4.5	0.0	10.0	0.0	0.0	0.2
Prop In Lane	0.02		1.00	1.00		0.00	0.91		1.00	0.00		0.30
Lane Grp Cap(c), veh/h	826	0	652	265	0	768	760	0	719	0	0	816
V/C Ratio(X)	0.61	0.00	0.19	0.66	0.00	0.54	0.22	0.00	0.48	0.00	0.00	0.01
Avail Cap(c_a), veh/h	826	0	652	265	0	768	760	0	719	0	0	816
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	12.4	27.0	0.0	14.6	10.9	0.0	12.4	0.0	0.0	9.7
Incr Delay (d2), s/veh	1.4	0.0	0.1	6.1	0.0	0.8	0.7	0.0	2.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	1.1	3.0	0.0	4.2	1.3	0.0	3.4	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.9	0.0	12.5	33.1	0.0	15.4	11.6	0.0	14.7	0.0	0.0	9.8
LnGrp LOS	B	A	B	C	A	B	B	A	B	A	A	A
Approach Vol, veh/h		634			590			512			10	
Approach Delay, s/veh		16.1			20.7			13.7			9.8	
Approach LOS		B			C			B			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.0	31.0	34.0	31.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	26.5	29.5	26.5
Max Q Clear Time (g_c+I1), s	12.0	16.1	2.2	28.5
Green Ext Time (p_c), s	1.9	2.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	16.9
HCM 6th LOS	B

Lanes, Volumes, Timings — 2026 Background Traffic, PM Peak Hour

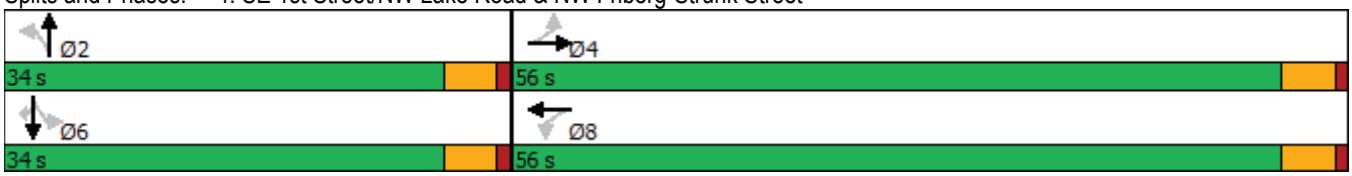
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street

09/09/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	606	4	0	435	167	8	0	1	134	0	186
Future Volume (vph)	296	606	4	0	435	167	8	0	1	134	0	186
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		25.5	25.5		33.2	33.2		33.2	33.2	33.2
Total Split (s)	56.0	56.0		56.0	56.0		34.0	34.0		34.0	34.0	34.0
Total Split (%)	62.2%	62.2%		62.2%	62.2%		37.8%	37.8%		37.8%	37.8%	37.8%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	Max
Act Effct Green (s)	40.3	40.3			40.3			30.2			30.2	30.2
Actuated g/C Ratio	0.51	0.51			0.51			0.38			0.38	0.38
v/c Ratio	0.92	0.36			0.36			0.02			0.27	0.27
Control Delay	52.0	11.8			9.7			6.2			22.3	4.5
Queue Delay	0.0	0.0			0.0			0.0			0.0	0.0
Total Delay	52.0	11.8			9.7			6.2			22.3	4.5
LOS	D	B			A			A			C	A
Approach Delay		24.9			9.7			6.2			12.0	
Approach LOS		C			A			A			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 52.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street



HCM 6th Signalized Intersection Summary — 2026 Background Traffic, PM Peak Hour

4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street — 09/09/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	296	606	4	0	435	167	8	0	1	134	0	186
Future Volume (veh/h)	296	606	4	0	435	167	8	0	1	134	0	186
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	318	652	4	0	468	180	9	0	1	144	0	200
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	437	2006	12	85	1393	532	404	4	36	607	0	561
Arrive On Green	0.55	0.55	0.55	0.00	0.55	0.55	0.35	0.00	0.35	0.35	0.00	0.35
Sat Flow, veh/h	796	3678	23	790	2554	975	927	13	104	1497	0	1610
Grp Volume(v), veh/h	318	320	336	0	330	318	10	0	0	144	0	200
Grp Sat Flow(s),veh/h/ln	796	1805	1896	790	1805	1724	1044	0	0	1497	0	1610
Q Serve(g_s), s	31.4	8.3	8.3	0.0	8.6	8.7	0.2	0.0	0.0	0.0	0.0	7.8
Cycle Q Clear(g_c), s	40.2	8.3	8.3	0.0	8.6	8.7	5.0	0.0	0.0	4.8	0.0	7.8
Prop In Lane	1.00		0.01	1.00		0.57	0.90		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	437	984	1034	85	984	940	444	0	0	607	0	561
V/C Ratio(X)	0.73	0.32	0.33	0.00	0.33	0.34	0.02	0.00	0.00	0.24	0.00	0.36
Avail Cap(c_a), veh/h	487	1098	1153	135	1098	1049	444	0	0	607	0	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.9	10.6	10.6	0.0	10.7	10.7	19.0	0.0	0.0	19.6	0.0	20.5
Incr Delay (d2), s/veh	4.8	0.2	0.2	0.0	0.2	0.2	0.1	0.0	0.0	0.9	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	2.9	3.1	0.0	3.0	2.9	0.1	0.0	0.0	2.0	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	10.8	10.8	0.0	10.9	10.9	19.1	0.0	0.0	20.5	0.0	22.3
LnGrp LOS	C	B	B	A	B	B	B	A	A	C	A	C
Approach Vol, veh/h		974			648			10			344	
Approach Delay, s/veh		16.0			10.9			19.1			21.5	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.0	50.7	34.0	50.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	51.5	29.5	51.5
Max Q Clear Time (g_c+I1), s	7.0	42.2	9.8	10.7
Green Ext Time (p_c), s	0.0	4.0	1.3	4.2

Intersection Summary	
HCM 6th Ctrl Delay	15.3
HCM 6th LOS	B

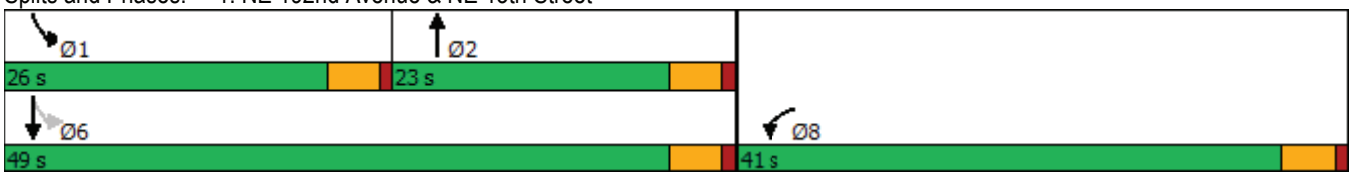
Lanes, Volumes, Timings
1: NE 192nd Avenue & NE 13th Street

2026 Total Traffic, AM Peak Hour
09/09/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	321	317	175	130	419	279
Future Volume (vph)	321	317	175	130	419	279
Confl. Peds. (#/hr)	1	2		1	2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	4%	4%	7%	7%
Shared Lane Traffic (%)						
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	23.2		22.5		9.5	22.5
Total Split (s)	41.0		23.0		26.0	49.0
Total Split (%)	45.6%		25.6%		28.9%	54.4%
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	1.0		1.0		1.0	1.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	4.5		4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max		None	Max
Act Effct Green (s)	36.5		18.5		44.5	44.5
Actuated g/C Ratio	0.41		0.21		0.49	0.49
v/c Ratio	0.99		0.89		0.97	0.35
Control Delay	56.6		58.3		58.6	15.4
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	56.6		58.3		58.6	15.4
LOS	E		E		E	B
Approach Delay	56.6		58.3			41.3
Approach LOS	E		E			D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 50.4	Intersection LOS: D
Intersection Capacity Utilization 89.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: NE 192nd Avenue & NE 13th Street



HCM 6th Signalized Intersection Summary
1: NE 192nd Avenue & NE 13th Street

2026 Total Traffic, AM Peak Hour
09/09/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	321	317	175	130	419	279
Future Volume (veh/h)	321	317	175	130	419	279
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1841	1841	1796	1796
Adj Flow Rate, veh/h	357	352	194	144	466	310
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	4	4	7	7
Cap, veh/h	342	337	207	154	495	888
Arrive On Green	0.41	0.41	0.21	0.21	0.23	0.49
Sat Flow, veh/h	843	831	980	728	1711	1796
Grp Volume(v), veh/h	710	0	0	338	466	310
Grp Sat Flow(s),veh/h/ln	1676	0	0	1708	1711	1796
Q Serve(g_s), s	36.5	0.0	0.0	17.5	18.8	9.5
Cycle Q Clear(g_c), s	36.5	0.0	0.0	17.5	18.8	9.5
Prop In Lane	0.50	0.50		0.43	1.00	
Lane Grp Cap(c), veh/h	680	0	0	361	495	888
V/C Ratio(X)	1.04	0.00	0.00	0.94	0.94	0.35
Avail Cap(c_a), veh/h	680	0	0	361	506	888
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	0.0	0.0	34.9	21.7	13.9
Incr Delay (d2), s/veh	46.7	0.0	0.0	33.5	25.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.2	0.0	0.0	10.3	10.4	3.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	73.4	0.0	0.0	68.4	47.4	15.0
LnGrp LOS	F	A	A	E	D	B
Approach Vol, veh/h	710		338			776
Approach Delay, s/veh	73.4		68.4			34.5
Approach LOS	E		E			C

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	25.5	23.5				49.0	41.0
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	21.5	18.5				44.5	36.5
Max Q Clear Time (g_c+I1), s	20.8	19.5				11.5	38.5
Green Ext Time (p_c), s	0.1	0.0				1.8	0.0

Intersection Summary	
HCM 6th Ctrl Delay	55.9
HCM 6th LOS	E

Lanes, Volumes, Timings
2: Site Access & NE 13th Street

2026 Total Traffic, AM Peak Hour
09/09/2023

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	508	49	21	594	52	18
Future Volume (vph)	508	49	21	594	52	18
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	508	49	21	594	52	18
Future Vol, veh/h	508	49	21	594	52	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	20	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	2	2	2	2
Mvmt Flow	564	54	23	660	58	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	618	0	1270	564
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	706	-
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	-	-	962	-	186	525
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	489	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	962	-	179	525
Mov Cap-2 Maneuver	-	-	-	-	179	-
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	470	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	30.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	216	-	-	962	-
HCM Lane V/C Ratio	0.36	-	-	0.024	-
HCM Control Delay (s)	30.8	-	-	8.8	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.1	-

Lanes, Volumes, Timings — 2026 Total Traffic, AM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road

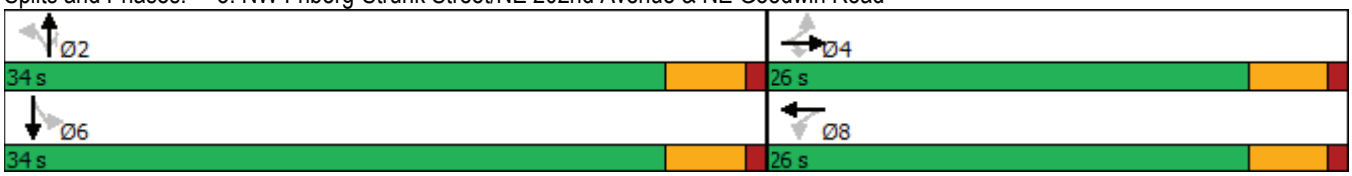
09/09/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	188	337	171	447	5	164	4	93	2	11	3
Future Volume (vph)	1	188	337	171	447	5	164	4	93	2	11	3
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	3%	3%	3%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.2	25.2	25.2	25.5	25.5		33.2	33.2	33.2	33.2	33.2	
Total Split (s)	26.0	26.0	26.0	26.0	26.0		34.0	34.0	34.0	34.0	34.0	
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%		56.7%	56.7%	56.7%	56.7%	56.7%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)		4.5	4.5	4.5	4.5			4.5	4.5		4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	
Act Effct Green (s)		19.7	19.7	19.7	19.7			29.6	29.6		29.6	
Actuated g/C Ratio		0.34	0.34	0.34	0.34			0.51	0.51		0.51	
v/c Ratio		0.36	0.51	0.54	0.85			0.29	0.13		0.02	
Control Delay		16.4	4.4	21.8	32.7			10.4	2.5		7.1	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		16.4	4.4	21.8	32.7			10.4	2.5		7.1	
LOS		B	A	C	C			B	A		A	
Approach Delay		8.7			29.7			7.6			7.1	
Approach LOS		A			C			A			A	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 58.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 17.7 — Intersection LOS: B
Intersection Capacity Utilization 61.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road



HCM 6th Signalized Intersection Summary — 2026 Total Traffic, AM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road — 09/09/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	188	337	171	447	5	164	4	93	2	11	3
Future Volume (veh/h)	1	188	337	171	447	5	164	4	93	2	11	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1870	1870	1870	1856	1856	1856	1900	1900	1900
Adj Flow Rate, veh/h	1	221	396	201	526	6	193	5	109	2	13	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	5	5	5	2	2	2	3	3	3	0	0	0
Cap, veh/h	61	653	554	337	661	8	787	19	773	115	645	185
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, veh/h	1	1823	1547	806	1846	21	1360	38	1572	99	1312	376
Grp Volume(v), veh/h	222	0	396	201	0	532	198	0	109	19	0	0
Grp Sat Flow(s),veh/h/ln	1825	0	1547	806	0	1867	1398	0	1572	1787	0	0
Q Serve(g_s), s	0.0	0.0	13.2	14.6	0.0	15.3	4.6	0.0	2.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	13.2	19.9	0.0	15.3	4.9	0.0	2.3	0.3	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.01	0.97		1.00	0.11		0.21
Lane Grp Cap(c), veh/h	714	0	554	337	0	669	806	0	773	945	0	0
V/C Ratio(X)	0.31	0.00	0.71	0.60	0.00	0.80	0.25	0.00	0.14	0.02	0.00	0.00
Avail Cap(c_a), veh/h	714	0	554	337	0	669	806	0	773	945	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.1	0.0	16.6	21.3	0.0	17.3	9.0	0.0	8.3	7.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	4.3	2.8	0.0	6.6	0.7	0.0	0.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	4.7	2.7	0.0	6.9	1.3	0.0	0.7	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	0.0	20.9	24.2	0.0	23.9	9.7	0.0	8.7	7.9	0.0	0.0
LnGrp LOS	B	A	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		618			733			307			19	
Approach Delay, s/veh		18.6			24.0			9.4			7.9	
Approach LOS		B			C			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.0	26.0	34.0	26.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	21.5	29.5	21.5
Max Q Clear Time (g_c+I1), s	6.9	15.2	2.3	21.9
Green Ext Time (p_c), s	1.4	1.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

Lanes, Volumes, Timings
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street

2026 Total Traffic, AM Peak Hour
09/09/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	376	269	0	0	287	192	0	0	0	190	0	232
Future Volume (vph)	376	269	0	0	287	192	0	0	0	190	0	232
Confl. Peds. (#/hr)	9		2	1		8	2		1	8		9
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	0%	0%	0%	3%	3%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		25.5	25.5		33.2	33.2		33.2	33.2	33.2
Total Split (s)	86.4	86.4		86.4	86.4		33.6	33.6		33.6	33.6	33.6
Total Split (%)	72.0%	72.0%		72.0%	72.0%		28.0%	28.0%		28.0%	28.0%	28.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	Max
Act Effct Green (s)	81.9	81.9			81.9						29.1	29.1
Actuated g/C Ratio	0.68	0.68			0.68						0.24	0.24
v/c Ratio	0.99	0.15			0.27						0.74	0.50
Control Delay	58.7	6.9			4.5						56.4	7.3
Queue Delay	0.0	0.0			0.0						0.0	0.0
Total Delay	58.7	6.9			4.5						56.4	7.3
LOS	E	A			A						E	A
Approach Delay		37.1			4.5						29.4	
Approach LOS		D			A						C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 24.9	Intersection LOS: C
Intersection Capacity Utilization 71.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street

HCM 6th Signalized Intersection Summary
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street

2026 Total Traffic, AM Peak Hour
09/09/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	376	269	0	0	287	192	0	0	0	190	0	232
Future Volume (veh/h)	376	269	0	0	287	192	0	0	0	190	0	232
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1900	1900	1900	1856	1856	1856
Adj Flow Rate, veh/h	488	349	0	0	373	249	0	0	0	247	0	301
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	3	3	3	1	1	1	0	0	0	3	3	3
Cap, veh/h	546	2406	0	60	1409	926	0	461	0	400	0	377
Arrive On Green	0.68	0.68	0.00	0.00	0.68	0.68	0.00	0.00	0.00	0.24	0.00	0.24
Sat Flow, veh/h	795	3618	0	1040	2065	1357	0	1900	0	1403	0	1555
Grp Volume(v), veh/h	488	349	0	0	323	299	0	0	0	247	0	301
Grp Sat Flow(s),veh/h/ln	795	1763	0	1040	1791	1631	0	1900	0	1403	0	1555
Q Serve(g_s), s	73.3	4.2	0.0	0.0	8.4	8.6	0.0	0.0	0.0	19.4	0.0	21.8
Cycle Q Clear(g_c), s	81.9	4.2	0.0	0.0	8.4	8.6	0.0	0.0	0.0	19.4	0.0	21.8
Prop In Lane	1.00		0.00	1.00		0.83	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	546	2406	0	60	1222	1113	0	461	0	400	0	377
V/C Ratio(X)	0.89	0.15	0.00	0.00	0.26	0.27	0.00	0.00	0.00	0.62	0.00	0.80
Avail Cap(c_a), veh/h	546	2406	0	60	1222	1113	0	461	0	400	0	377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.5	6.7	0.0	0.0	7.4	7.4	0.0	0.0	0.0	41.8	0.0	42.7
Incr Delay (d2), s/veh	17.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	7.0	0.0	16.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	1.4	0.0	0.0	2.9	2.7	0.0	0.0	0.0	7.3	0.0	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	6.7	0.0	0.0	7.5	7.5	0.0	0.0	0.0	48.8	0.0	58.7
LnGrp LOS	D	A	A	A	A	A	A	A	A	D	A	E
Approach Vol, veh/h		837			622			0			548	
Approach Delay, s/veh		26.5			7.5			0.0			54.2	
Approach LOS		C			A						D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	33.6	86.4	33.6	86.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.1	81.9	29.1	81.9
Max Q Clear Time (g_c+I1), s	0.0	83.9	23.8	10.6
Green Ext Time (p_c), s	0.0	0.0	1.2	4.2

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

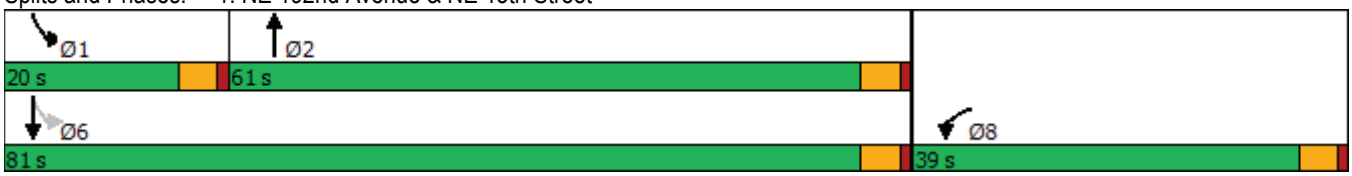
Lanes, Volumes, Timings
1: NE 192nd Avenue & NE 13th Street

2026 Total Traffic, PM Peak Hour
09/09/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	236	321	559	329	307	426
Future Volume (vph)	236	321	559	329	307	426
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8		2		1	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	23.2		22.5		9.5	22.5
Total Split (s)	39.0		61.0		20.0	81.0
Total Split (%)	32.5%		50.8%		16.7%	67.5%
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	1.0		1.0		1.0	1.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	4.5		4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max		None	Max
Act Effct Green (s)	34.5		56.5		76.5	76.5
Actuated g/C Ratio	0.29		0.47		0.64	0.64
v/c Ratio	1.17		1.15		1.16	0.39
Control Delay	131.6		111.0		137.5	11.7
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	131.6		111.0		137.5	11.7
LOS	F		F		F	B
Approach Delay	131.6		111.0			64.4
Approach LOS	F		F			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 100.6	Intersection LOS: F
Intersection Capacity Utilization 110.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: NE 192nd Avenue & NE 13th Street



HCM 6th Signalized Intersection Summary
1: NE 192nd Avenue & NE 13th Street

2026 Total Traffic, PM Peak Hour
09/09/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	236	321	559	329	307	426
Future Volume (veh/h)	236	321	559	329	307	426
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	262	357	621	366	341	473
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	204	277	524	309	292	1202
Arrive On Green	0.29	0.29	0.47	0.47	0.13	0.64
Sat Flow, veh/h	708	965	1112	655	1795	1885
Grp Volume(v), veh/h	620	0	0	987	341	473
Grp Sat Flow(s),veh/h/ln	1676	0	0	1767	1795	1885
Q Serve(g_s), s	34.5	0.0	0.0	56.5	15.5	14.6
Cycle Q Clear(g_c), s	34.5	0.0	0.0	56.5	15.5	14.6
Prop In Lane	0.42	0.58		0.37	1.00	
Lane Grp Cap(c), veh/h	482	0	0	832	292	1202
V/C Ratio(X)	1.29	0.00	0.00	1.19	1.17	0.39
Avail Cap(c_a), veh/h	482	0	0	832	292	1202
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	0.0	0.0	31.8	41.2	10.5
Incr Delay (d2), s/veh	144.0	0.0	0.0	95.8	106.2	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	33.2	0.0	0.0	44.6	12.8	5.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	186.8	0.0	0.0	127.6	147.4	11.5
LnGrp LOS	F	A	A	F	F	B
Approach Vol, veh/h	620		987			814
Approach Delay, s/veh	186.8		127.6			68.4
Approach LOS	F		F			E

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	20.0	61.0				81.0	39.0
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	15.5	56.5				76.5	34.5
Max Q Clear Time (g_c+I1), s	17.5	58.5				16.6	36.5
Green Ext Time (p_c), s	0.0	0.0				3.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	122.9
HCM 6th LOS	F

Lanes, Volumes, Timings
2: Site Access & NE 13th Street

2026 Total Traffic, PM Peak Hour
09/09/2023

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	555	59	24	491	61	20
Future Volume (vph)	555	59	24	491	61	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 56.6%	ICU Level of Service B
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	555	59	24	491	61	20
Future Vol, veh/h	555	59	24	491	61	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	20	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	617	66	27	546	68	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	683	0	1217	617
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	600	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	915	-	200	490
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	548	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	915	-	192	490
Mov Cap-2 Maneuver	-	-	-	-	192	-
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	525	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	31.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	226	-	-	915	-
HCM Lane V/C Ratio	0.398	-	-	0.029	-
HCM Control Delay (s)	31.1	-	-	9.1	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.8	-	-	0.1	-

Lanes, Volumes, Timings — 2026 Total Traffic, PM Peak Hour

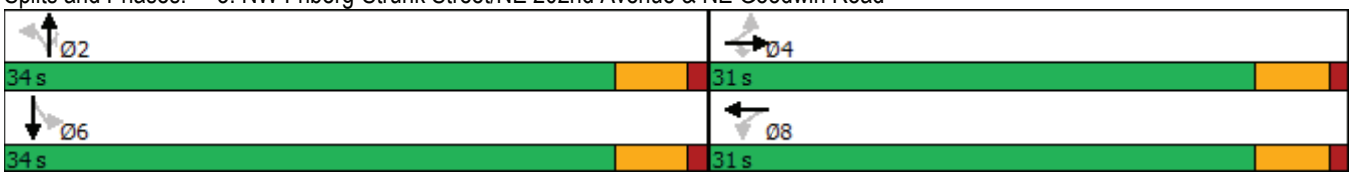
3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road

09/09/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	444	122	157	369	2	143	13	310	0	6	3
Future Volume (vph)	10	444	122	157	369	2	143	13	310	0	6	3
Confl. Peds. (#/hr)	5		5	7		7	5		7	7		5
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm		NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	4	4	4	8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.2	25.2	25.2	25.5	25.5		33.2	33.2	33.2	33.2	33.2	
Total Split (s)	31.0	31.0	31.0	31.0	31.0		34.0	34.0	34.0	34.0	34.0	
Total Split (%)	47.7%	47.7%	47.7%	47.7%	47.7%		52.3%	52.3%	52.3%	52.3%	52.3%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)		4.5	4.5	4.5	4.5			4.5	4.5		4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	
Act Effct Green (s)		23.1	23.1	23.1	23.1			29.7	29.7		29.7	
Actuated g/C Ratio		0.37	0.37	0.37	0.37			0.48	0.48		0.48	
v/c Ratio		0.73	0.20	0.99	0.59			0.26	0.41		0.01	
Control Delay		23.3	3.5	91.8	19.3			12.1	6.3		8.7	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		23.3	3.5	91.8	19.3			12.1	6.3		8.7	
LOS		C	A	F	B			B	A		A	
Approach Delay		19.1			40.8			8.2			8.7	
Approach LOS		B			D			A			A	

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 61.9	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 73.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road



HCM 6th Signalized Intersection Summary — 2026 Total Traffic, PM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road — 09/09/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	444	122	157	369	2	143	13	310	0	6	3
Future Volume (veh/h)	10	444	122	157	369	2	143	13	310	0	6	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	11	499	137	176	415	2	161	15	348	0	7	3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	0	0	0
Cap, veh/h	62	765	652	263	764	4	698	61	719	0	571	245
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.45	0.45	0.45	0.00	0.45	0.45
Sat Flow, veh/h	13	1875	1600	797	1874	9	1305	134	1585	0	1259	539
Grp Volume(v), veh/h	510	0	137	176	0	417	176	0	348	0	0	10
Grp Sat Flow(s),veh/h/ln	1888	0	1600	797	0	1883	1439	0	1585	0	0	1798
Q Serve(g_s), s	0.0	0.0	3.6	12.4	0.0	10.9	4.7	0.0	10.0	0.0	0.0	0.2
Cycle Q Clear(g_c), s	14.1	0.0	3.6	26.5	0.0	10.9	4.9	0.0	10.0	0.0	0.0	0.2
Prop In Lane	0.02		1.00	1.00		0.00	0.91		1.00	0.00		0.30
Lane Grp Cap(c), veh/h	826	0	652	263	0	768	759	0	719	0	0	816
V/C Ratio(X)	0.62	0.00	0.21	0.67	0.00	0.54	0.23	0.00	0.48	0.00	0.00	0.01
Avail Cap(c_a), veh/h	826	0	652	263	0	768	759	0	719	0	0	816
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	12.5	27.2	0.0	14.6	11.0	0.0	12.4	0.0	0.0	9.7
Incr Delay (d2), s/veh	1.4	0.0	0.2	6.5	0.0	0.8	0.7	0.0	2.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	1.2	3.1	0.0	4.2	1.5	0.0	3.4	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	0.0	12.6	33.6	0.0	15.4	11.7	0.0	14.7	0.0	0.0	9.8
LnGrp LOS	B	A	B	C	A	B	B	A	B	A	A	A
Approach Vol, veh/h		647			593			524			10	
Approach Delay, s/veh		16.1			20.8			13.7			9.8	
Approach LOS		B			C			B			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.0	31.0	34.0	31.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	26.5	29.5	26.5
Max Q Clear Time (g_c+I1), s	12.0	16.1	2.2	28.5
Green Ext Time (p_c), s	2.0	2.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	16.9
HCM 6th LOS	B

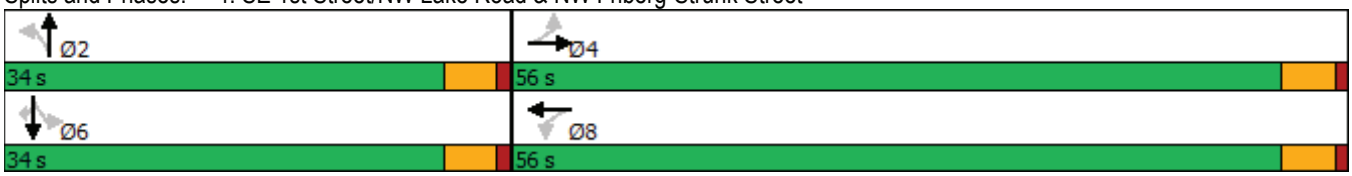
Lanes, Volumes, Timings
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street

2026 Total Traffic, PM Peak Hour
09/09/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	606	4	0	435	175	8	0	1	142	0	186
Future Volume (vph)	296	606	4	0	435	175	8	0	1	142	0	186
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		25.5	25.5		33.2	33.2		33.2	33.2	33.2
Total Split (s)	56.0	56.0		56.0	56.0		34.0	34.0		34.0	34.0	34.0
Total Split (%)	62.2%	62.2%		62.2%	62.2%		37.8%	37.8%		37.8%	37.8%	37.8%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	Max
Act Effct Green (s)	40.8	40.8			40.8			30.1			30.1	30.1
Actuated g/C Ratio	0.51	0.51			0.51			0.38			0.38	0.38
v/c Ratio	0.93	0.36			0.36			0.02			0.29	0.27
Control Delay	53.2	11.7			9.6			6.2			22.6	4.6
Queue Delay	0.0	0.0			0.0			0.0			0.0	0.0
Total Delay	53.2	11.7			9.6			6.2			22.6	4.6
LOS	D	B			A			A			C	A
Approach Delay		25.3			9.6			6.2			12.4	
Approach LOS		C			A			A			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 53.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street



HCM 6th Signalized Intersection Summary
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street

2026 Total Traffic, PM Peak Hour
09/09/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	296	606	4	0	435	175	8	0	1	142	0	186
Future Volume (veh/h)	296	606	4	0	435	175	8	0	1	142	0	186
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	318	652	4	0	468	188	9	0	1	153	0	200
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	435	2015	12	85	1380	550	396	4	36	604	0	558
Arrive On Green	0.55	0.55	0.55	0.00	0.55	0.55	0.35	0.00	0.35	0.35	0.00	0.35
Sat Flow, veh/h	790	3678	23	790	2519	1005	911	13	103	1499	0	1610
Grp Volume(v), veh/h	318	320	336	0	334	322	10	0	0	153	0	200
Grp Sat Flow(s),veh/h/ln	790	1805	1896	790	1805	1719	1026	0	0	1499	0	1610
Q Serve(g_s), s	31.9	8.3	8.3	0.0	8.8	8.9	0.2	0.0	0.0	0.0	0.0	7.9
Cycle Q Clear(g_c), s	40.8	8.3	8.3	0.0	8.8	8.9	5.4	0.0	0.0	5.3	0.0	7.9
Prop In Lane	1.00		0.01	1.00		0.58	0.90		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	435	989	1039	85	989	942	436	0	0	604	0	558
V/C Ratio(X)	0.73	0.32	0.32	0.00	0.34	0.34	0.02	0.00	0.00	0.25	0.00	0.36
Avail Cap(c_a), veh/h	480	1092	1147	130	1092	1040	436	0	0	604	0	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.1	10.6	10.6	0.0	10.7	10.7	19.3	0.0	0.0	19.9	0.0	20.8
Incr Delay (d2), s/veh	5.1	0.2	0.2	0.0	0.2	0.2	0.1	0.0	0.0	1.0	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	2.9	3.0	0.0	3.1	3.0	0.2	0.0	0.0	2.2	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	10.8	10.8	0.0	10.9	10.9	19.4	0.0	0.0	20.9	0.0	22.6
LnGrp LOS	C	B	B	A	B	B	B	A	A	C	A	C
Approach Vol, veh/h		974			656			10			353	
Approach Delay, s/veh		16.1			10.9			19.4			21.8	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.0	51.1	34.0	51.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	51.5	29.5	51.5
Max Q Clear Time (g_c+I1), s	7.4	42.8	9.9	10.9
Green Ext Time (p_c), s	0.0	3.8	1.4	4.3

Intersection Summary	
HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B

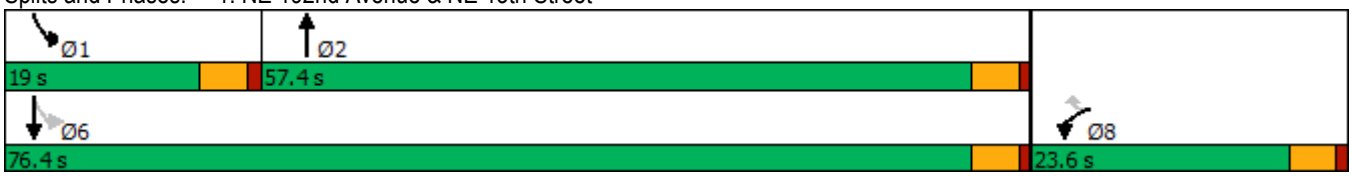
Lanes, Volumes, Timings
1: NE 192nd Avenue & NE 13th Street

2026 Background Traffic-MIT, PM Peak Hour
09/09/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	212	296	572	299	287	434
Future Volume (vph)	212	296	572	299	287	434
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	23.2	23.2	22.5		9.5	22.5
Total Split (s)	23.6	23.6	57.4		19.0	76.4
Total Split (%)	23.6%	23.6%	57.4%		19.0%	76.4%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	16.6	16.6	53.0		72.0	72.0
Actuated g/C Ratio	0.17	0.17	0.54		0.74	0.74
v/c Ratio	0.78	0.60	0.98		0.93	0.35
Control Delay	56.6	9.2	46.1		62.1	5.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	56.6	9.2	46.1		62.1	5.6
LOS	E	A	D		E	A
Approach Delay	29.0		46.1			28.1
Approach LOS	C		D			C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 97.6	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 35.8	Intersection LOS: D
Intersection Capacity Utilization 87.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: NE 192nd Avenue & NE 13th Street



HCM 6th Signalized Intersection Summary
1: NE 192nd Avenue & NE 13th Street

2026 Background Traffic-MIT, PM Peak Hour
09/09/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	212	296	572	299	287	434
Future Volume (veh/h)	212	296	572	299	287	434
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	236	329	636	332	319	482
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	343	305	617	322	332	1355
Arrive On Green	0.19	0.19	0.53	0.53	0.14	0.72
Sat Flow, veh/h	1795	1598	1167	609	1795	1885
Grp Volume(v), veh/h	236	329	0	968	319	482
Grp Sat Flow(s),veh/h/ln	1795	1598	0	1776	1795	1885
Q Serve(g_s), s	12.2	19.1	0.0	52.9	13.6	9.7
Cycle Q Clear(g_c), s	12.2	19.1	0.0	52.9	13.6	9.7
Prop In Lane	1.00	1.00		0.34	1.00	
Lane Grp Cap(c), veh/h	343	305	0	939	332	1355
V/C Ratio(X)	0.69	1.08	0.00	1.03	0.96	0.36
Avail Cap(c_a), veh/h	343	305	0	939	332	1355
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	40.5	0.0	23.6	33.9	5.3
Incr Delay (d2), s/veh	5.7	73.9	0.0	37.5	38.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	13.6	0.0	29.2	7.4	3.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	43.4	114.4	0.0	61.0	72.6	6.0
LnGrp LOS	D	F	A	F	E	A
Approach Vol, veh/h	565		968			801
Approach Delay, s/veh	84.7		61.0			32.5
Approach LOS	F		E			C

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	19.0	57.4				76.4	23.6
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	14.5	52.9				71.9	19.1
Max Q Clear Time (g_c+I1), s	15.6	54.9				11.7	21.1
Green Ext Time (p_c), s	0.0	0.0				3.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	57.0
HCM 6th LOS	E

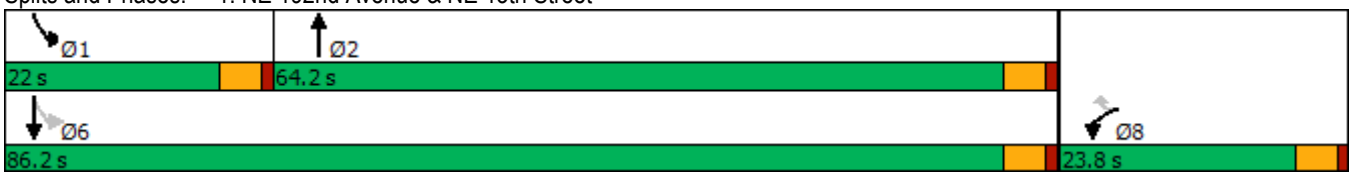
Lanes, Volumes, Timings
1: NE 192nd Avenue & NE 13th Street

2026 Total Traffic-MIT, PM Peak Hour
09/09/2023

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	236	321	559	329	307	426
Future Volume (vph)	236	321	559	329	307	426
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	23.2	23.2	22.5		9.5	22.5
Total Split (s)	23.8	23.8	64.2		22.0	86.2
Total Split (%)	21.6%	21.6%	58.4%		20.0%	78.4%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	18.4	18.4	59.7		81.7	81.7
Actuated g/C Ratio	0.17	0.17	0.55		0.75	0.75
v/c Ratio	0.87	0.63	0.99		0.96	0.34
Control Delay	72.3	9.8	50.9		71.8	5.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	72.3	9.8	50.9		71.8	5.5
LOS	E	A	D		E	A
Approach Delay	36.3		50.9			33.3
Approach LOS	D		D			C

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 109.1	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 41.2	Intersection LOS: D
Intersection Capacity Utilization 90.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: NE 192nd Avenue & NE 13th Street



HCM 6th Signalized Intersection Summary
1: NE 192nd Avenue & NE 13th Street

2026 Total Traffic-MIT, PM Peak Hour
09/09/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	236	321	559	329	307	426
Future Volume (veh/h)	236	321	559	329	307	426
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	262	357	621	366	341	473
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	315	280	603	356	351	1400
Arrive On Green	0.18	0.18	0.54	0.54	0.16	0.74
Sat Flow, veh/h	1795	1598	1112	655	1795	1885
Grp Volume(v), veh/h	262	357	0	987	341	473
Grp Sat Flow(s),veh/h/ln	1795	1598	0	1767	1795	1885
Q Serve(g_s), s	15.5	19.3	0.0	59.7	16.7	9.5
Cycle Q Clear(g_c), s	15.5	19.3	0.0	59.7	16.7	9.5
Prop In Lane	1.00	1.00		0.37	1.00	
Lane Grp Cap(c), veh/h	315	280	0	959	351	1400
V/C Ratio(X)	0.83	1.27	0.00	1.03	0.97	0.34
Avail Cap(c_a), veh/h	315	280	0	959	351	1400
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.8	45.3	0.0	25.2	38.4	4.9
Incr Delay (d2), s/veh	17.0	148.0	0.0	36.7	40.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	19.0	0.0	32.1	12.9	3.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	60.8	193.3	0.0	61.9	78.7	5.5
LnGrp LOS	E	F	A	F	E	A
Approach Vol, veh/h	619		987			814
Approach Delay, s/veh	137.2		61.9			36.2
Approach LOS	F		E			D

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	22.0	64.2				86.2	23.8
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	17.5	59.7				81.7	19.3
Max Q Clear Time (g_c+I1), s	18.7	61.7				11.5	21.3
Green Ext Time (p_c), s	0.0	0.0				3.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	72.5
HCM 6th LOS	E

Queues
1: NE 192nd Avenue & NE 13th Street

2023 Adjusted Existing Traffic, AM Peak Hour
09/09/2023

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	474	276	402	300
v/c Ratio	0.86	0.48	0.72	0.30
Control Delay	32.1	17.7	17.8	8.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.1	17.7	17.8	8.4
Queue Length 50th (ft)	118	69	79	55
Queue Length 95th (ft)	#265	132	#162	96
Internal Link Dist (ft)	2250	872		592
Turn Bay Length (ft)			200	
Base Capacity (vph)	614	580	562	993
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.77	0.48	0.72	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues 2023 Adjusted Existing Traffic, AM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road 09/09/2023

Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	159	362	119	346	169	78	18
v/c Ratio	0.31	0.52	0.35	0.67	0.22	0.09	0.02
Control Delay	16.5	5.0	18.0	23.5	8.4	2.7	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	5.0	18.0	23.5	8.4	2.7	6.5
Queue Length 50th (ft)	39	0	30	96	24	0	2
Queue Length 95th (ft)	72	38	60	152	61	15	10
Internal Link Dist (ft)	228			879	635		611
Turn Bay Length (ft)		150	185			200	
Base Capacity (vph)	726	834	491	748	752	900	1002
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.43	0.24	0.46	0.22	0.09	0.02

Intersection Summary

Queues
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street

2023 Adjusted Existing Traffic, AM Peak Hour
09/09/2023

Lane Group	EBL	EBT	WBT	SBT	SBR
Lane Group Flow (vph)	448	321	559	170	240
v/c Ratio	1.03	0.16	0.28	0.37	0.36
Control Delay	72.7	9.3	6.2	26.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	72.7	9.3	6.2	26.2	4.8
Queue Length 50th (ft)	~275	42	46	73	0
Queue Length 95th (ft)	#353	52	55	108	27
Internal Link Dist (ft)		871	1508	817	
Turn Bay Length (ft)	300				135
Base Capacity (vph)	436	2005	1992	454	664
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.03	0.16	0.28	0.37	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1: NE 192nd Avenue & NE 13th Street

2023 Adjusted Existing Traffic, PM Peak Hour
09/09/2023

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	434	803	253	454
v/c Ratio	0.92	0.84	0.77	0.36
Control Delay	62.7	34.0	33.6	9.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	62.7	34.0	33.6	9.4
Queue Length 50th (ft)	275	530	91	143
Queue Length 95th (ft)	#460	#793	#201	202
Internal Link Dist (ft)	2250	872		592
Turn Bay Length (ft)			200	
Base Capacity (vph)	505	958	352	1273
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.86	0.84	0.72	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues 2023 Adjusted Existing Traffic, PM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road 09/09/2023

Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	325	113	122	300	142	255	10
v/c Ratio	0.64	0.22	0.61	0.59	0.17	0.26	0.01
Control Delay	24.0	4.8	31.3	22.4	7.8	2.1	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	4.8	31.3	22.4	7.8	2.1	6.3
Queue Length 50th (ft)	94	0	35	85	19	0	1
Queue Length 95th (ft)	158	27	80	145	57	29	8
Internal Link Dist (ft)	228			879	635		611
Turn Bay Length (ft)		150	185			200	
Base Capacity (vph)	827	756	327	830	818	989	1027
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.15	0.37	0.36	0.17	0.26	0.01

Intersection Summary

Queues 2023 Adjusted Existing Traffic, PM Peak Hour

4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street 09/09/2023

Lane Group	EBL	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	269	612	557	2	109	152
v/c Ratio	0.84	0.40	0.37	0.00	0.17	0.19
Control Delay	40.8	13.8	11.7	17.5	17.2	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	13.8	11.7	17.5	17.2	4.3
Queue Length 50th (ft)	97	90	69	1	27	0
Queue Length 95th (ft)	195	121	99	6	85	40
Internal Link Dist (ft)		871	1508	219	817	
Turn Bay Length (ft)	300					135
Base Capacity (vph)	552	2661	2588	577	636	799
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.23	0.22	0.00	0.17	0.19

Intersection Summary

Queues
1: NE 192nd Avenue & NE 13th Street

2026 Background Traffic, AM Peak Hour
09/10/2023

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	666	326	448	318
v/c Ratio	0.97	0.75	0.91	0.35
Control Delay	52.7	41.8	42.1	14.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.7	41.8	42.1	14.6
Queue Length 50th (ft)	332	160	170	104
Queue Length 95th (ft)	#566	#292	#350	163
Internal Link Dist (ft)	2250	872		592
Turn Bay Length (ft)			200	
Base Capacity (vph)	706	433	505	906
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.94	0.75	0.89	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues 2026 Background Traffic, AM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road 09/10/2023

Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	221	387	201	531	189	109	19
v/c Ratio	0.36	0.50	0.54	0.85	0.28	0.13	0.02
Control Delay	16.4	4.4	21.8	32.6	10.3	2.5	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	4.4	21.8	32.6	10.3	2.5	7.1
Queue Length 50th (ft)	57	0	56	167	37	0	3
Queue Length 95th (ft)	98	39	104	#287	68	18	11
Internal Link Dist (ft)	228			879	635		611
Turn Bay Length (ft)		150	185			200	
Base Capacity (vph)	668	812	408	688	679	849	924
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.48	0.49	0.77	0.28	0.13	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street

2026 Background Traffic, AM Peak Hour
09/10/2023

Lane Group	EBL	EBT	WBT	SBT	SBR
Lane Group Flow (vph)	488	349	615	239	301
v/c Ratio	0.99	0.15	0.27	0.70	0.50
Control Delay	58.3	7.1	4.6	53.7	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	7.1	4.6	53.7	7.2
Queue Length 50th (ft)	333	46	50	170	0
Queue Length 95th (ft)	#454	53	54	216	31
Internal Link Dist (ft)		871	1508	817	
Turn Bay Length (ft)	300				135
Base Capacity (vph)	497	2388	2330	340	604
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.98	0.15	0.26	0.70	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1: NE 192nd Avenue & NE 13th Street

2026 Background Traffic, PM Peak Hour
09/09/2023

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	565	968	319	482
v/c Ratio	1.13	1.09	1.09	0.39
Control Delay	116.9	86.6	112.6	10.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	116.9	86.6	112.6	10.8
Queue Length 50th (ft)	~474	~831	~227	160
Queue Length 95th (ft)	#697	#1085	#412	224
Internal Link Dist (ft)	2250	872		592
Turn Bay Length (ft)			200	
Base Capacity (vph)	501	890	293	1230
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.13	1.09	1.09	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues 2026 Background Traffic, PM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road 09/09/2023

Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	508	126	176	414	164	348	10
v/c Ratio	0.73	0.19	0.99	0.59	0.24	0.41	0.01
Control Delay	23.2	3.6	91.0	19.2	11.9	6.2	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	3.6	91.0	19.2	11.9	6.2	8.7
Queue Length 50th (ft)	157	0	63	120	38	30	1
Queue Length 95th (ft)	251	26	#173	194	74	78	9
Internal Link Dist (ft)	228			879	635		611
Turn Bay Length (ft)		150	185			200	
Base Capacity (vph)	811	749	206	811	677	856	870
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.17	0.85	0.51	0.24	0.41	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues 2026 Background Traffic, PM Peak Hour

4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street 09/09/2023

Lane Group	EBL	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	318	656	648	10	144	200
v/c Ratio	0.92	0.36	0.36	0.02	0.27	0.27
Control Delay	52.0	11.8	9.7	6.2	22.3	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	11.8	9.7	6.2	22.3	4.5
Queue Length 50th (ft)	135	95	76	0	54	0
Queue Length 95th (ft)	#309	127	108	8	110	46
Internal Link Dist (ft)		871	1508	219	817	
Turn Bay Length (ft)	300					135
Base Capacity (vph)	451	2384	2321	617	540	735
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.28	0.28	0.02	0.27	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1: NE 192nd Avenue & NE 13th Street

2026 Total Traffic, AM Peak Hour
09/09/2023

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	709	338	466	310
v/c Ratio	0.99	0.89	0.97	0.35
Control Delay	56.6	58.3	58.6	15.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	56.6	58.3	58.6	15.4
Queue Length 50th (ft)	363	169	212	103
Queue Length 95th (ft)	#611	#326	#410	162
Internal Link Dist (ft)	2250	872		592
Turn Bay Length (ft)			200	
Base Capacity (vph)	718	379	481	878
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.99	0.89	0.97	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

2026 Total Traffic, AM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road

09/09/2023

Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	222	396	201	532	198	109	19
v/c Ratio	0.36	0.51	0.54	0.85	0.29	0.13	0.02
Control Delay	16.4	4.4	21.8	32.7	10.4	2.5	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	4.4	21.8	32.7	10.4	2.5	7.1
Queue Length 50th (ft)	57	0	56	168	40	0	3
Queue Length 95th (ft)	98	40	104	#288	72	18	11
Internal Link Dist (ft)	228			879	635		611
Turn Bay Length (ft)		150	185			200	
Base Capacity (vph)	668	818	406	687	676	849	922
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.48	0.50	0.77	0.29	0.13	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street

2026 Total Traffic, AM Peak Hour
09/09/2023

Lane Group	EBL	EBT	WBT	SBT	SBR
Lane Group Flow (vph)	488	349	622	247	301
v/c Ratio	0.99	0.15	0.27	0.74	0.50
Control Delay	58.7	6.9	4.5	56.4	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	6.9	4.5	56.4	7.3
Queue Length 50th (ft)	335	45	49	177	0
Queue Length 95th (ft)	#455	52	53	226	31
Internal Link Dist (ft)		871	1508	817	
Turn Bay Length (ft)	300				135
Base Capacity (vph)	493	2392	2333	335	599
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.99	0.15	0.27	0.74	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1: NE 192nd Avenue & NE 13th Street

2026 Total Traffic, PM Peak Hour
09/09/2023

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	619	987	341	473
v/c Ratio	1.17	1.15	1.16	0.39
Control Delay	131.6	111.0	137.5	11.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	131.6	111.0	137.5	11.7
Queue Length 50th (ft)	~540	~888	~262	165
Queue Length 95th (ft)	#770	#1143	#450	231
Internal Link Dist (ft)	2250	872		592
Turn Bay Length (ft)			200	
Base Capacity (vph)	528	858	293	1199
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.17	1.15	1.16	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues 2026 Total Traffic, PM Peak Hour

3: NW Friberg-Strunk Street/NE 202nd Avenue & NE Goodwin Road 09/09/2023

Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	510	137	176	417	176	348	10
v/c Ratio	0.73	0.20	0.99	0.59	0.26	0.41	0.01
Control Delay	23.3	3.5	91.8	19.3	12.1	6.3	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	3.5	91.8	19.3	12.1	6.3	8.7
Queue Length 50th (ft)	158	0	63	121	41	30	1
Queue Length 95th (ft)	252	27	#173	196	79	79	9
Internal Link Dist (ft)	228			879	635		611
Turn Bay Length (ft)		150	185			200	
Base Capacity (vph)	810	754	204	810	672	854	868
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.18	0.86	0.51	0.26	0.41	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
4: SE 1st Street/NW Lake Road & NW Friberg-Strunk Street

2026 Total Traffic, PM Peak Hour
09/09/2023

Lane Group	EBL	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	318	656	656	10	153	200
v/c Ratio	0.93	0.36	0.36	0.02	0.29	0.27
Control Delay	53.2	11.7	9.6	6.2	22.6	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.2	11.7	9.6	6.2	22.6	4.6
Queue Length 50th (ft)	136	95	76	0	60	0
Queue Length 95th (ft)	#312	127	108	8	117	46
Internal Link Dist (ft)		871	1508	219	817	
Turn Bay Length (ft)	300					135
Base Capacity (vph)	442	2368	2307	610	536	732
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.28	0.28	0.02	0.29	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PLS ENGINEERING

Engineering - Surveying - Planning * 604 W Evergreen Blvd, Vancouver, WA 98660 * P 360-944-6519 * F 360-944-6539 *

October 9, 2023

City of Camas Public Works
616 NE 4th Avenue
Camas, WA 98607

RE: 13the Street Site Plan, PA-22-32
Maximum Extent Feasible Memo for: Access Spacing Deviation & Parking Spaces Setback

Per City of Camas Design Standards Manual (CDSM), design deviation allowances will be considered on a case-by-case basis. The Maximum Extent Feasible (MEF) memo is required prior to engineering plan approval.

Deviation standards:

1. Camas Design Standards Manual (CDSM) Table 3 identifies the access spacing standards on an Arterial to be 660' minimum to 1,000' Maximum. This deviation request will show that the proposed lot development does not accommodate the 660' minimum allowed in Table 3, but the standard has been met to the maximum extent feasible.
2. Camas Design Standards Manual (CDSM) Table 1 requires on site parking to be setback 50' minimum from the sidewalk along an arterial. This deviation request will show that the proposed lot development does is too narrow to meet the criteria, but the standard has been met to the maximum extent feasible.

Reasons for deviation are as follows:

1. ***Access Spacing Deviation:***
   a. The westernmost property boundary is approximately 367-feet west of the intersection on NE 13th Street and NW Friberg-Strunk Street.
   b. The existing driveway to the current single-family residence is approximately 244-feet west of the intersection of NE 13th Street and NW Friberg-Strunk Street.
   c. The entrance must be located such that fuel delivery trucks can access the site from both directions and have room to turn around. Turning paths were calculated to identify the ideal driveway location (see attached exhibit).

2. ***Parking Spaces Setback:***
   a. The existing depth of the parcel is 131-feet. There isn't room for the required parking spaces to all be located 50' from the sidewalk.
   b. The proposed gas station mini-mart is less than 50' from the sidewalk. Parking is required in front of the mini-mart. It is impossible to provide parking in front of the mini-mart and comply with the 50' setback requirement.
   c. Proposed parking spaces for this lot that are not located in front of the mini-mart are more than 50' from the right of way.

PLS ENGINEERING

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Maximum Extent Feasible:

1. ***Access Spacing Deviation:***
   As seen in the attached exhibit, the driveway was located as far West as possible to provide for fuel delivery, and is located such that it complies with the standard to the maximum extent feasible.

2. ***Parking Spaces Setback:***
   Aside from the parking spaces required to be located in front of the convenience store, the rest of the required parking spaces were located as far away from the arterial as possible. The majority exceed 50' from the sidewalk. This meets the maximum extent feasible criteria.

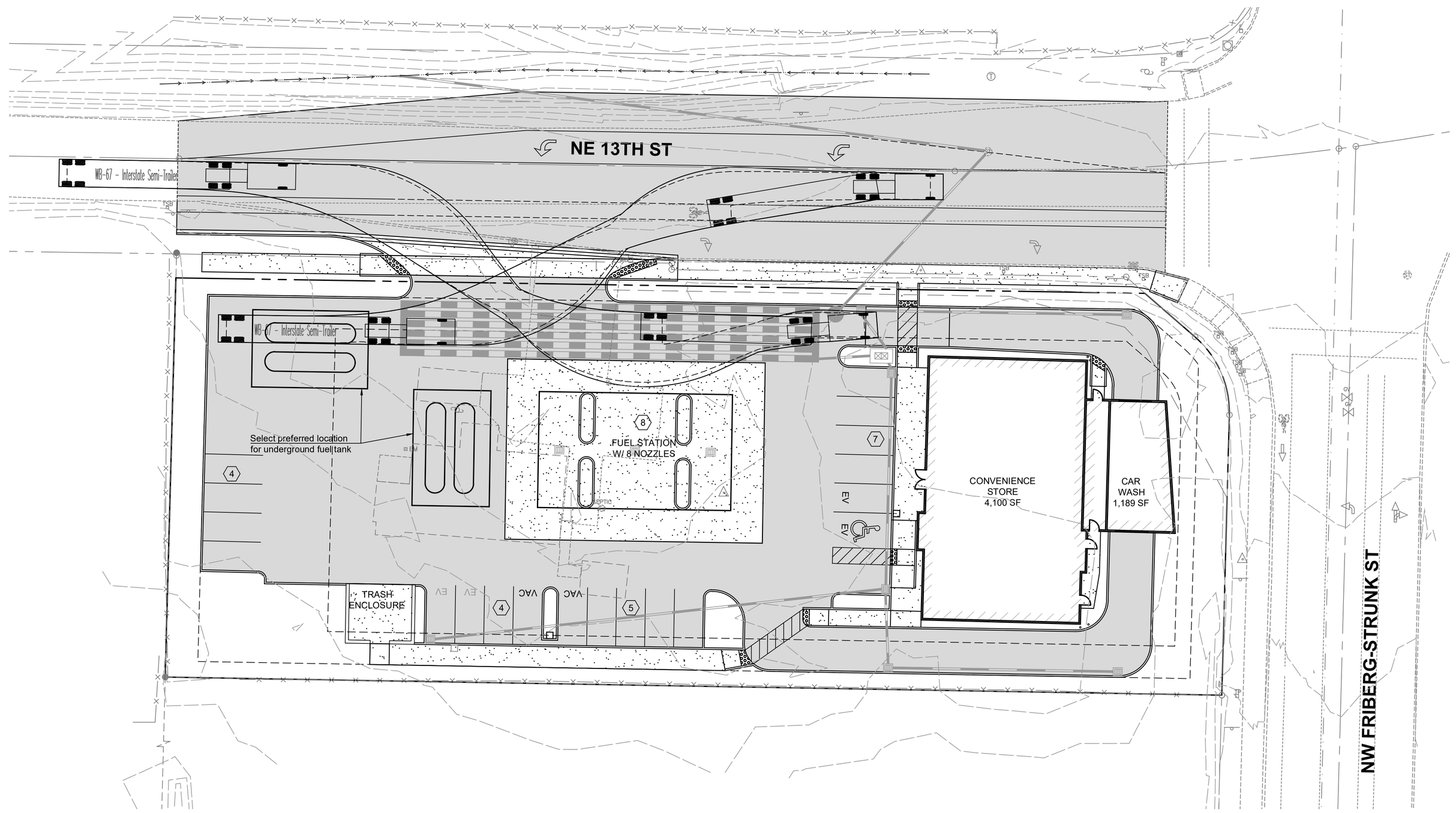
In closing, please approve these proposed design deviations.

If you have any questions or concerns, please contact me at (360) 944-6519 or scott@plsengineering.com

Sincerely,

Scott Gilliland

Scott Gilliland
PLS Engineering



Scale 1" = 20'

20 10 0 20

N

Truck Turning Exhibit A For:

13th Street Gas Station

A site located in the City of Camas, WA

PLS ENGINEERING

Engineering - Surveying - Planning

604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	
2	
3	
4	
5	
6	

Project No. 3632

SCALE:	H: 1" = 20' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	SWG
REVIEWED BY:	TGJ

01

01

CRITICAL AREAS REPORT

October 2, 2023

13th Street Gas Station

Camas, WA

Prepared for

PAK USA Camas, LLC
c/o Taz Khan
3993 NW Currawong Court
Camas, WA 98607
(512) 779-4999

Prepared by

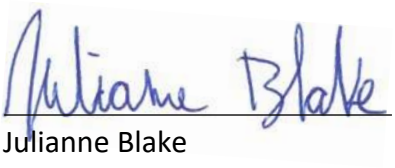
Ecological Land Services

1157 3rd Avenue, Suite 220A • Longview, WA 98632

(360) 578-1371 • Project Number 3934.01

SIGNATURE PAGE

The information in this report was compiled and prepared under the supervision and direction of the undersigned.



Julianne Blake
Biologist III

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APPENDICES

Appendix A – Routine Determination Method and Plant Indicator Rating Definitions
Appendix B – Wetland Determination Data Form
Appendix C – Precipitation Information

INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by PAK USA Camas, LLC to complete a critical areas assessment for wetlands and fish and wildlife habitat conservation areas, for the purpose of future development. The site is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). Field work was conducted on August 29, 2023. This report summarizes the findings of the site visit in accordance with *Camas Municipal Code (CMC) Title 16 Environment* (2023).

SITE DESCRIPTION

The 0.97-acre site consists of Clark County Tax Parcel 176148000 and is accessed by a paved driveway off NE 13th Street. The site is zoned as Business Park (BP) and currently contains a single-family mobile home, shed, carport, and paved driveway. The site is bordered to the north by NE 13th Street, to the east by NW Friberg-Strunk Street, to the south by undeveloped land and commercial development in progress, and to the west by undeveloped land and a single-family residence (Figure 2).

Vegetation onsite consists primarily of regularly mowed grasses, ornamental shrubs, and coniferous and deciduous trees. Topography onsite is generally flat with NE 13th Street and NW Friberg-Strunk Street roughly two feet higher in elevation than the site. One Oregon white oak (*Quercus garryana,* FACU) was identified onsite along the southern property boundary.

METHODOLOGY

The property was evaluated for the presence of wetlands using the Routine Determination Method according to the U.S. Army Corps of Engineers' 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual* (Environmental Laboratory 1987)*; Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010). The Routine Determination Method and defining wetland criteria are discussed further in Appendix A. Wetlands are regulated as "Waters of the United States" by the U.S. Army Corps of Engineers (Corps) and as "Waters of the State" by the Washington Department of Ecology (Ecology), and locally by The City of Camas (City).

ELS biologists evaluated the property on August 29, 2023, to determine the presence or absence of critical areas including streams, wetlands, and priority habitats. One Oregon white oak (oak) was identified onsite, and no wetlands, streams, or other priority habitats were identified. Vegetation, soil, and hydrology data were collected from one test plot (TP) to determine whether wetlands were present onsite. No wetlands were present onsite. TP-1 was taken in the southwest corner of the site in an area with mapped hydric soils. The oak dripline and test plot location were mapped using a hand-held Global Positioning System (GPS) unit capable of sub-meter accuracy under ideal conditions.

VEGETATION

General vegetation consists primarily of regularly mowed grass and ornamental trees and shrubs (Photoplates 1 and 2). One Oregon white oak was observed along the southern site boundary. The plant indicator status following the plant scientific name is defined by the *National Wetland Plant List Indicator Rating Definitions* (Corps 2012) and can be found in Appendix A.

Dominant vegetation consisted of domestic apple trees (*Malus* spp*.,* assumed FAC), Japanese maple (*Acer palmatum*, UPL), rhododendron (*Rhododendron* spp., assumed FACU), Oregon white oak, osoberry (*Oemleria cerasiformis*, FACU), mowed English hawthorn saplings (*Crataegus monogyna*, FAC), swordfern (*Polystichum munitum*, FACU), and fescue grass (*Festuca* spp*.*, assumed FAC). The wetland determination data form contains vegetation information at TP-1 and is in Appendix B.

SOILS

The Natural Resources Conservation Service (NRCS) designates soils onsite as cove silty clay loam, thin solum, 0 to 3 percent slopes (CwA), and Wind River gravelly loam, 0 to 8 percent slopes (WrB) (Figure 3, NRCS 2023B). Of the two soil types found onsite, cove silty clay loam, thin solum, 0 to 3 percent slopes is designated as hydric.

According to soil profile descriptions developed by NRCS, cove silty clay loam, thin solum, is characterized as a poorly drained soil, forming on floodplains, with a depth to water table of 0 to 12 inches below ground surface (BGS). A typical soil profile includes silty clay loam from 0 to 14 inches, clay from 14-21 inches, and silt loam from 21 to 60 inches BGS. Wind River gravelly loam is categorized as a somewhat excessively drained soil with a typical soil profile of gravelly loam from 0 to 4 inches, coarse sandy loam from 4 to 24 inches, and loamy coarse sand from 24 to 60 inches BGS. Wind River gravelly loam forms on floodplains from alluvium parent material and has an average depth to water table of more than 80 inches.

Evaluated soils were characterized as loamy with a value of 4, and a chroma of 3, with no observations of redoximorphic concentrations and meeting no hydric soil indicators. Mapped hydric soils do not necessarily mean that an area is or is not a wetland—hydrology, hydrophytic wetland vegetation, and hydric soils must all be present to classify an area as a wetland. The test plot data form is in Appendix B.

HYDROLOGY

No evidence of wetland hydrology was observed at TP-1 or onsite.

PRECIPITATION

Precipitation data was gathered from the NOAA Regional Climate Centers *Clark County, Washington, WETS Station: Battle Ground*, which is located closest to the site. No rainfall occurred the day of the site visit or in the two weeks prior. Rainfall in June, July, and August was below exceedance levels and approximately 94 percent of August rainfall occurred prior to the site visit. Furthermore, review of the USACE Antecedent Precipitation Tool (APT) indicates rainfall

in the two months preceding the August 29th site visit was drier than normal with a score of 6. A copy of the APT data is provided in Appendix C. Table 1 summarizes the precipitation data.

Table 1. Precipitation Summary

Precipitation (inches)								
Date of Visit	Two Weeks Prior	3 Months Prior		30%	70%	DAREM[1]		
		30 Days Ending	Observed			Value	Weight	Total
8/29/23	8/15/23 – 8/28/23	8/29/23	0.05	0.25	0.99	1	3	3
0.0	0.0	7/30/23	0.0	0.24	0.82	1	2	2
		6/30/23	0.83	1.48	2.80	1	1	1
Rainfall 3 months prior was: **drier than normal** (sum 6-9), normal (sum 10-14), wetter than normal (sum 15-18).[1]								6
Year to Date Average Rainfall[2,3]: 50.06								
Year to Date Actual Rainfall[3]: 45.32								

[1] Direct Antecedent Rainfall Evaluation Methods (Sumner et al 2009)
[2] Includes 94% of August Rainfall
[3] Based on a water year, October 2022 – August 2023

Critical Area Inventories

National Wetlands Inventory

The National Wetlands Inventory (NWI) map does not indicate any wetlands onsite (Figure 4, USFWS 1988). ELS agrees with the NWI mapping, as no wetlands were identified onsite.

Clark County Critical Area Inventory

The Clark County Critical Area Inventory (CCCAI) map does not indicate any wetlands onsite but does indicate potential wetlands presence on the property to the south. Hydric soils are mapped along the eastern site boundary and the southwestern corner, and a habitat area is mapped over the majority of the eastern portion of the site (Figure 5). ELS partially agrees with the CCAI as no wetlands were identified onsite and one oak was observed in the vicinity of the mapped habitat area. The potential wetlands mapped to the south of the site are located in the footprint of a commercial development that has received permit approval. However, ELS does not agree with the extent of the mapped habitat area as only one oak was identified onsite and no other critical habitats were identified.

Washington Department of Natural Resources Stream Type

The Washington Department of Natural Resources (WDNR) Stream Type Map does not depict any streams onsite (Figure 6, WDNR 2023). ELS agrees with the WDNR mapping as no streams were observed onsite.

Priority Habitats and Species

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) maps indicate oak woodland and caves or cave-rich areas on the southern boundary of the site

and within 300 feet of the site to the southwest (Figure 7, WDFW 2023). ELS confirmed the presence of a single oak along the southern site boundary, but no oak woodlands or caves were observed onsite.

Critical area inventory maps are typically used to gather general information about a region and due to the large scale necessary for regional mapping, are limited in accuracy for localized analyses.

Critical Areas Summary

Priority Habitats

Oregon White Oak

Oregon white oaks are considered a priority habitat and are regulated by the Washington Department of Fish and Wildlife (WDFW) and locally by the City of Camas. According to WDFW's Management Recommendations for Washington's priority habitats: Oregon white oak woodlands (Larsen and Morgan, 1998), in urban or urbanizing areas west of the Cascades, priority oak habitat is defined as single oaks, stands of pure oak, or oak/conifer associations, one acre or greater in size. WDFW may also consider individual Oregon white oak trees a priority habitat when found to be particularly valuable to wildlife [i.e., contains many cavities, has a large diameter at breast height (DBH), is used by priority species, or has a large canopy]. The site is within the City of Camas. WDFW recommendation is that in urban and urbanizing areas, single trees should be maintained if they are deemed important to species highly associated with Oregon white oak. Oaks and their associated floras comprise distinct woodland ecosystems with various plant communities providing valuable habitat that contributes to wildlife diversity; oak woodlands provide a mix of feeding, resting, and breeding habitat for many wildlife species (Larsen and Morgan 1998).

The WDFW Priority Habitats and Species online mapping tool depicts oak woodlands within the vicinity of the observed oak along the southern site boundary. One oak tree measuring approximately 52 inches DBH was mapped along the southern site boundary during site reconnaissance (Figure 2). The oak has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. The oak location was mapped using a GPS system capable of submeter accuracy in ideal conditions. According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

Table 2: Oak Summary

Canopy Area	Diameter at Breast Height	Number of Trunks	Noteworthy Habitat Features
0.08 acres	52 inches	1	• Canopy is interconnected with adjacent trees, but not other oaks • Two large cavities

LIMITATIONS

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

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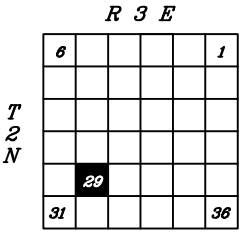
FIGURES AND PHOTOPLATES

WASHINGTON

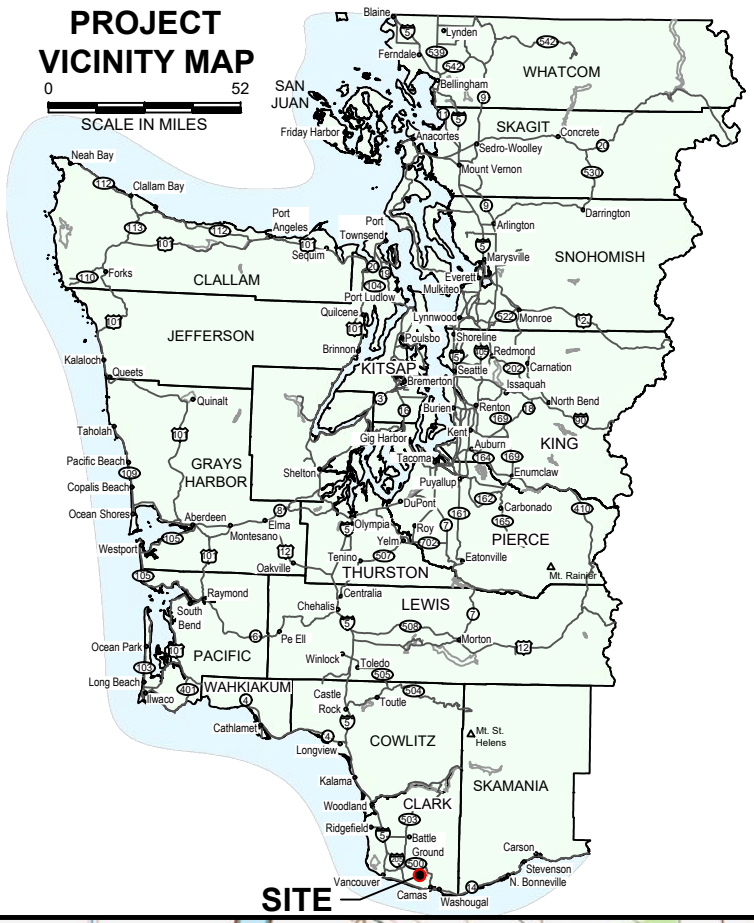
45.6321° Latitude
-122.4664° Longitude

LOCATION MAP



NOTE:
Quadrangle topographic map from USGS.

PROJECT VICINITY MAP



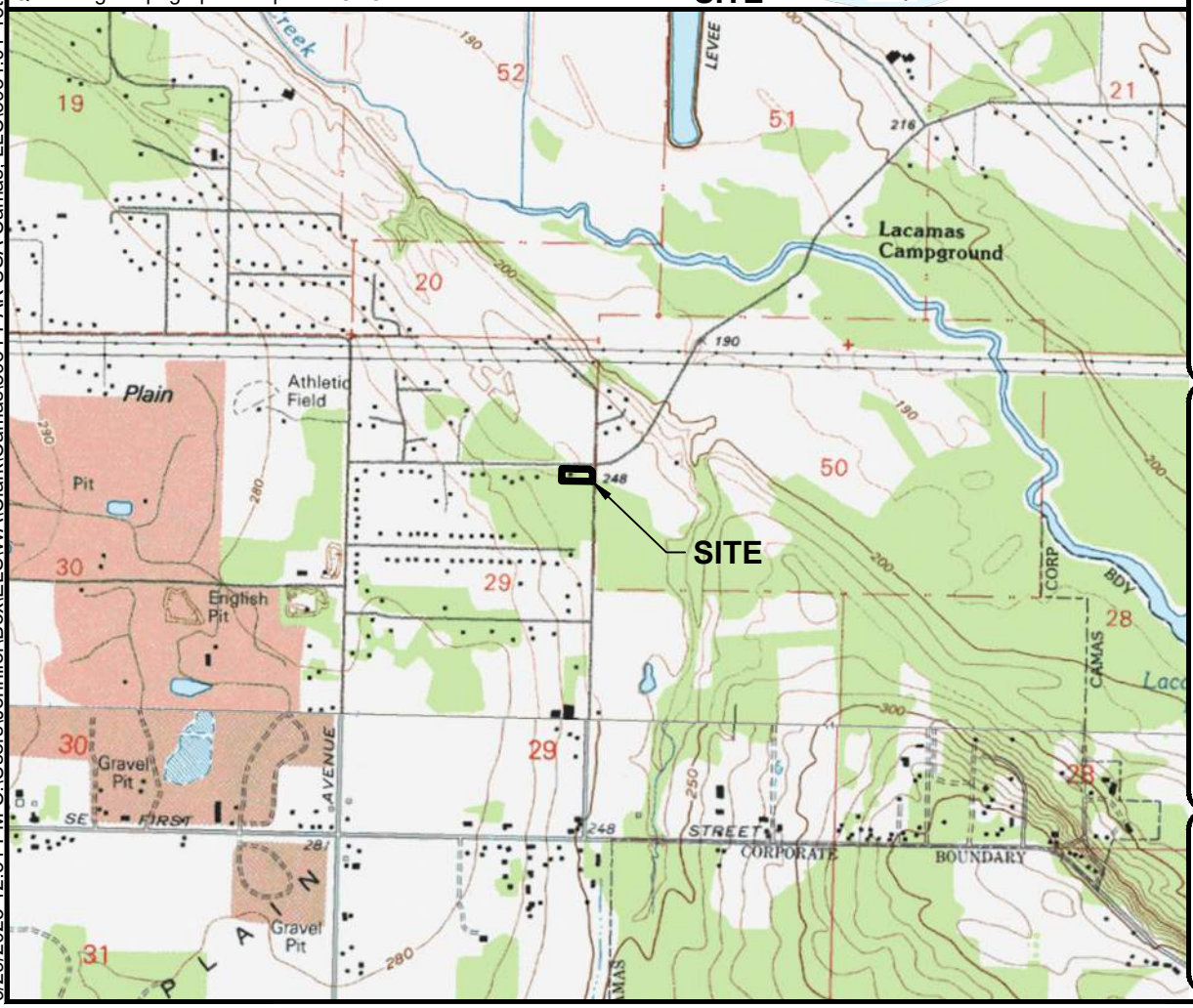


Figure 1
VICINITY MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com
Ecological Land Services

0 2000 4000
SCALE IN FEET

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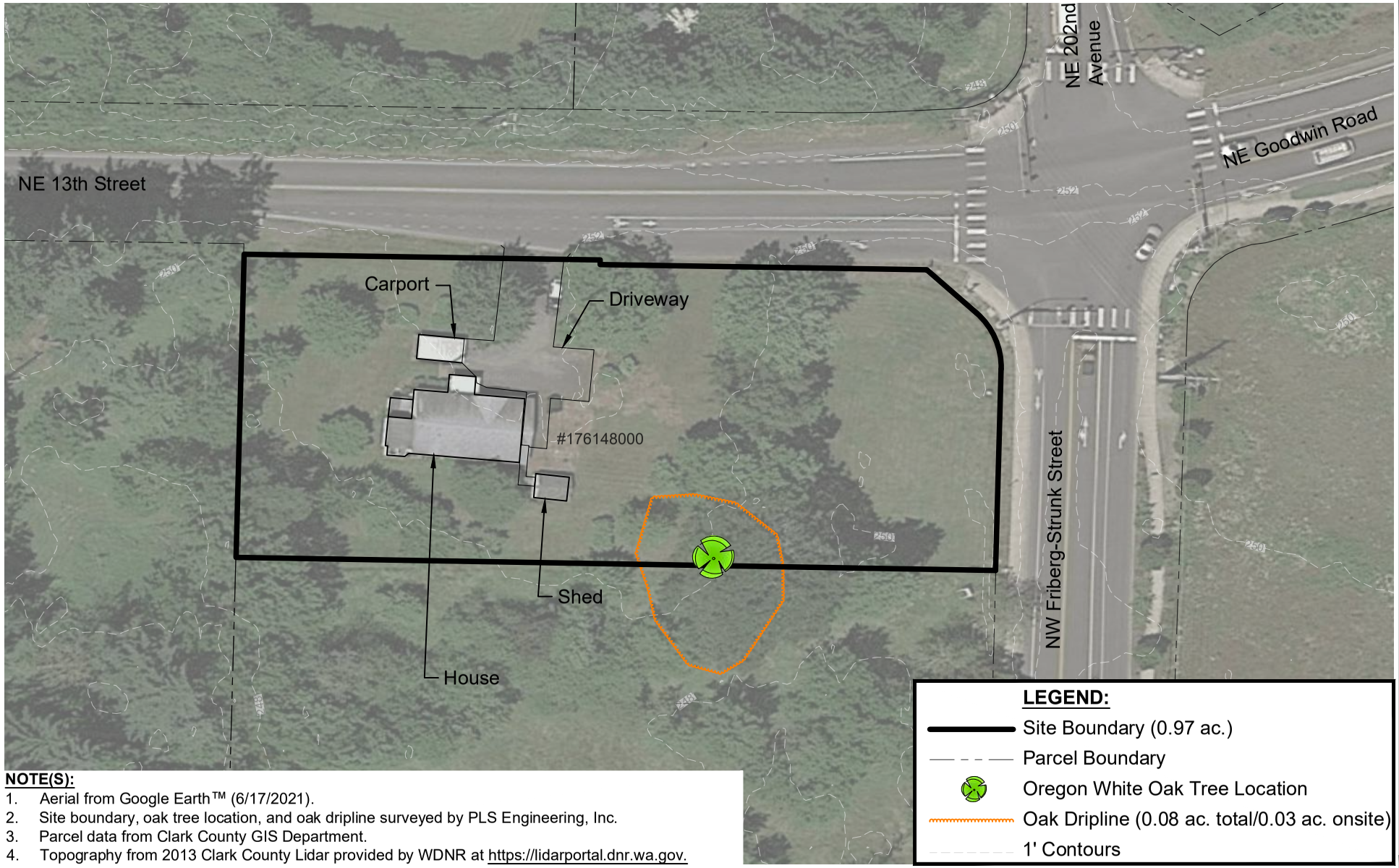

NOTE(S):

1. Aerial from Google Earth™ (6/17/2021).
2. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
3. Parcel data from Clark County GIS Department.
4. Topography from 2013 Clark County Lidar provided by WDNR at https://lidarportal.dnr.wa.gov.

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PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 2
EXISTING CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

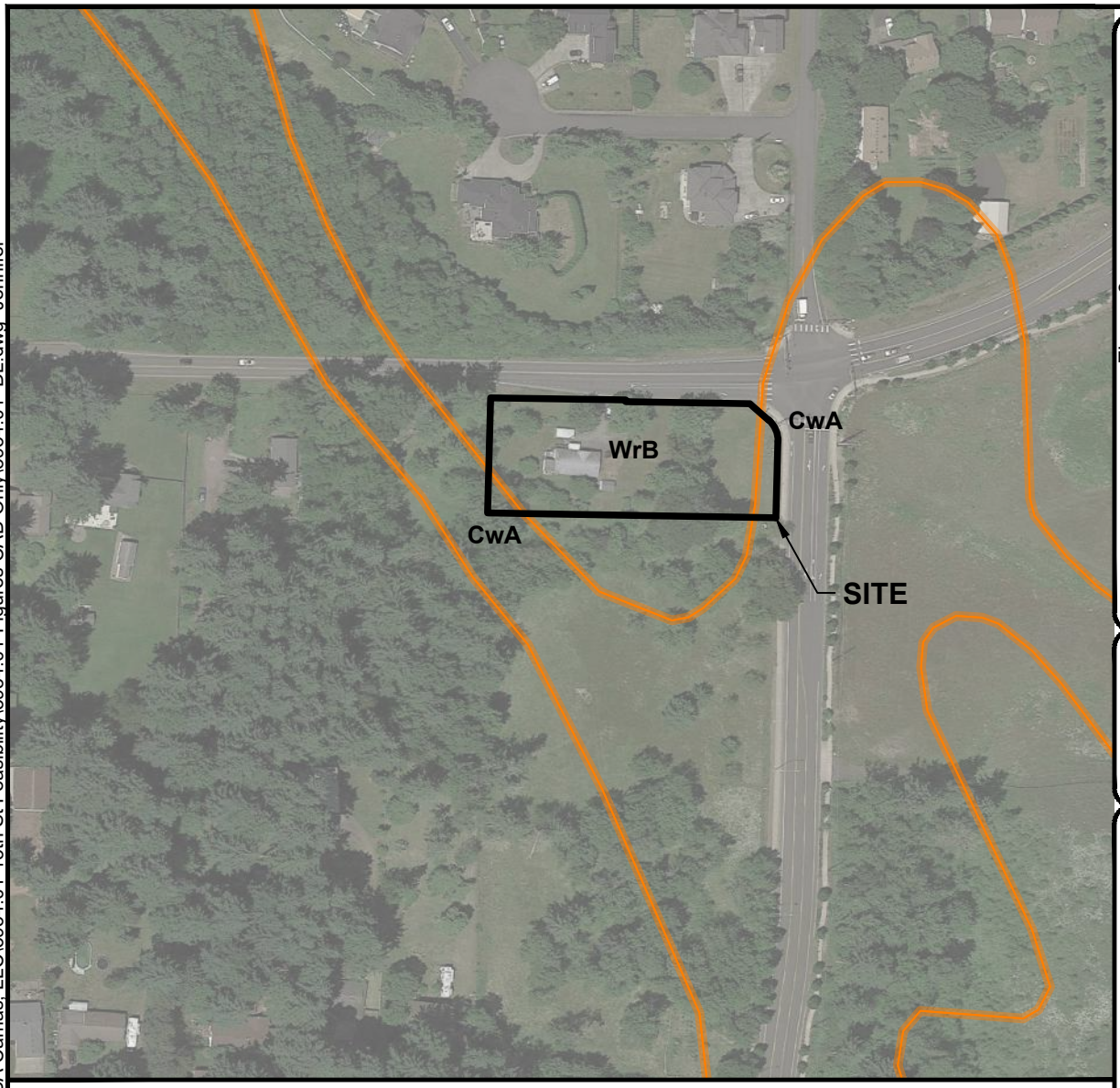

Figure 3
NRCS SOIL SURVEY
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
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LEGEND:

Site Boundary
NRCS Soil Boundary
CwA Cove silty clay loam, thin solum, 0 to 3 percent slopes. **Hydric.**
WrB Wind River gravelly loam, 0 to 8 percent slopes. Not hydric.

NOTE(S):
1. Map provided on-line by NRCS at web address: *http://websoilsurvey.nrcs.usda.gov/app/*

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No mapped wetlands indicated onsite by US Fish & Wildlife Service.

LEGEND:

Site Boundary

Wetlands

Riverine

NOTE(S):

1. Map provided on-line by US Fish & Wildlife Service at web address: *https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper*

Figure 4
USFWS NATIONAL WETLANDS INVENTORY
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
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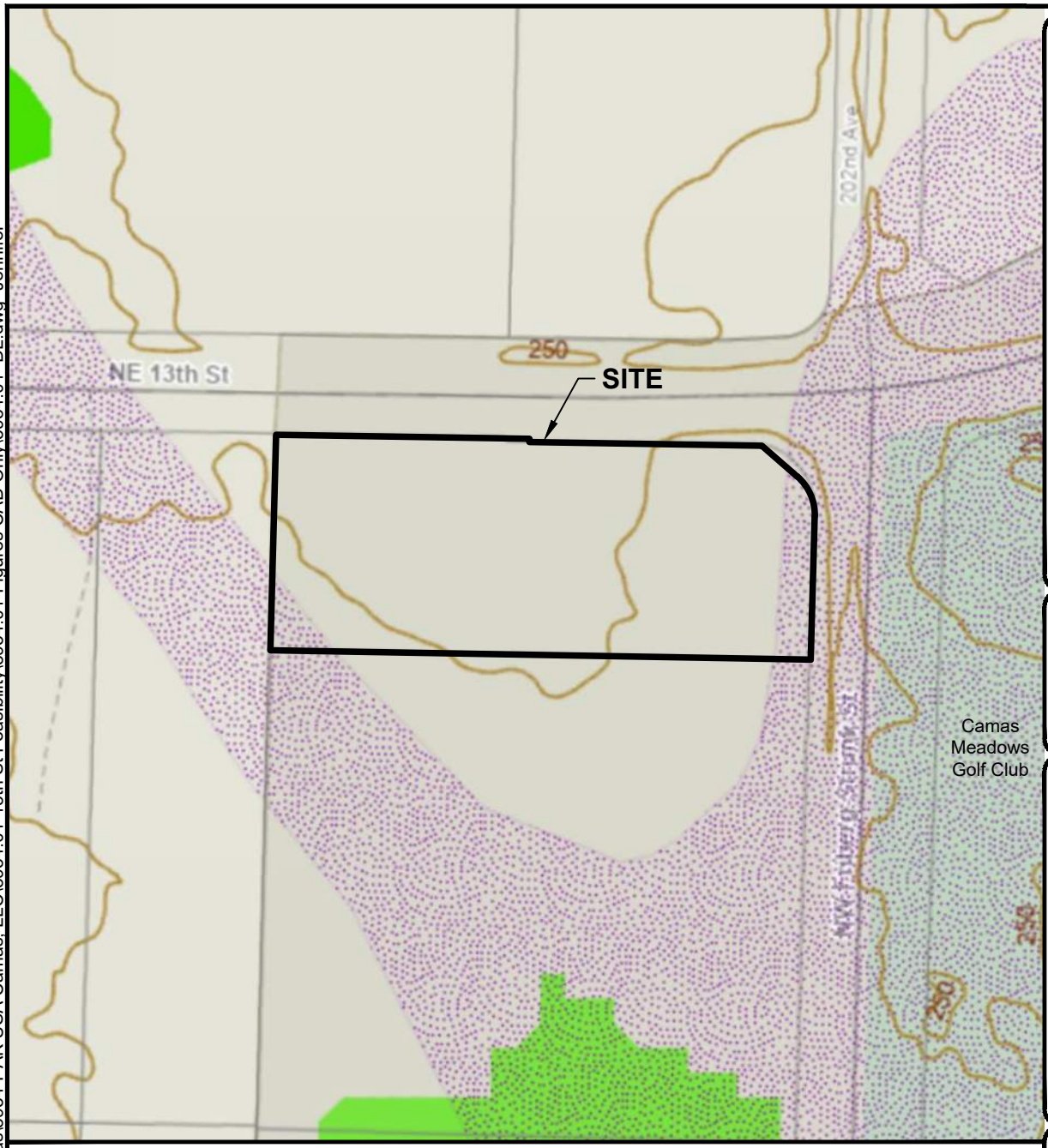

Figure 5
CLARK COUNTY CRITICAL AREAS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
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LEGEND:

Site Boundary

Slopes and Geologic Hazards Group
Contour Lines
Contour Lines - 10 ft

Soils and Wetlands Inventory
Hydric Soils
Potential Wetlands Presence
Permitted Wetland

NOTE(S):
1. Map provided on-line by Clark County at web address: *https://gis.clark.wa.gov/mapsonline/index.cfm?site=Environmental*

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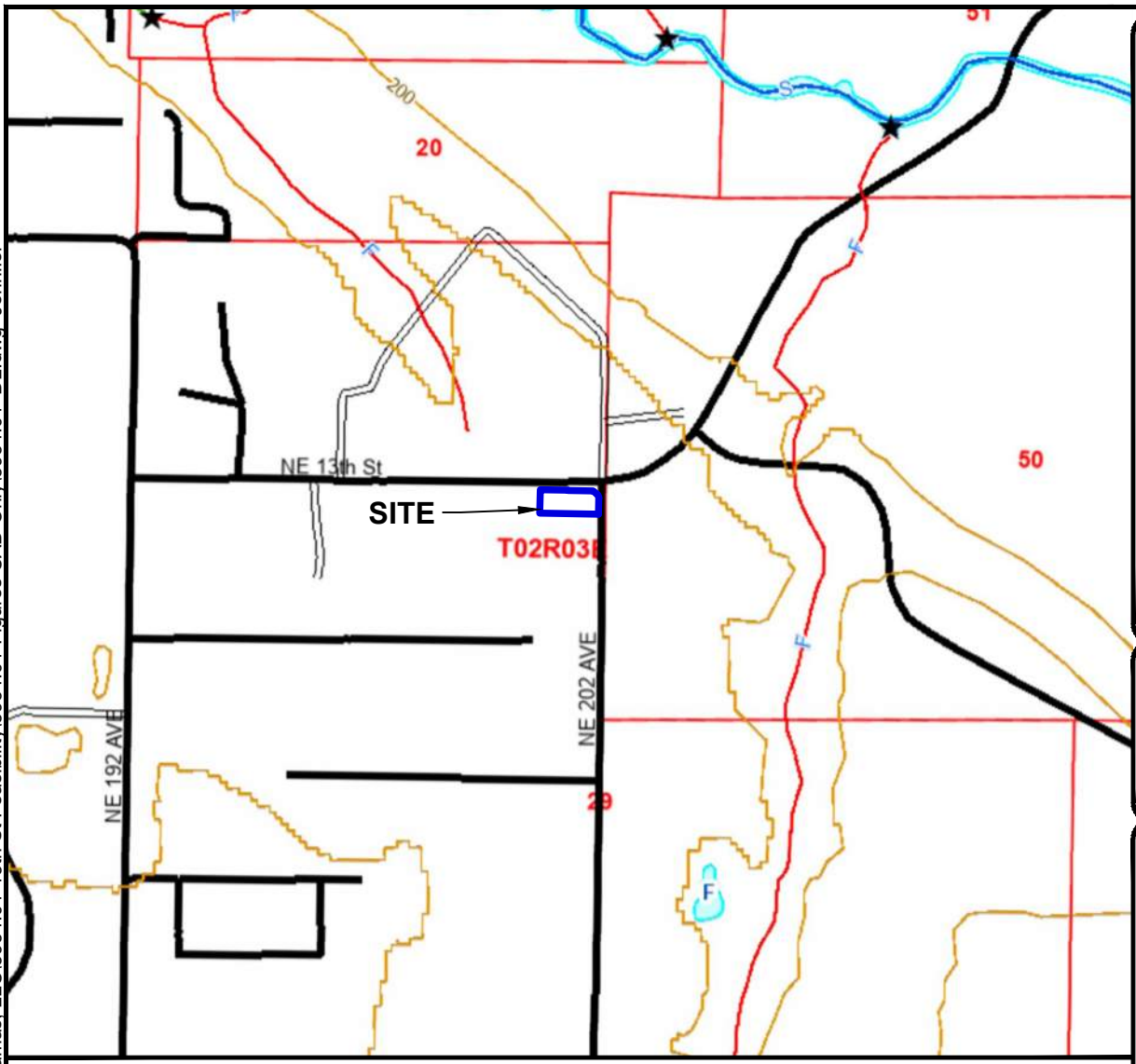

No mapped streams indicated onsite by the Washington State Department of Natural Resources (DNR).

LEGEND:

Site Boundary

40-foot Contours
- 40 ft. Contours

Water Courses (FP)
- Type S
- Type F
- Type N, Np, Ns
- U, unknown
- X, non-typed per WAC 222-16

WRIA Boundaries
- WRIA Boundaries

DNR Roads
- Paved Road
- Unpaved Road/Surface Unknown

Unpaved Road/Surface Unknown
- Water Type Breaks (FP)

NOTE: Map provided on-line by Washington State Department of Natural Resources at web address: *http://fortress.wa.gov/dnr/app1/Fpars/viewer.htm*

Figure 6
WDNR STREAM TYPE MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
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Figure 7
WDFW PRIORITY HABITAT AND SPECIES
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
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LEGEND:

- Site Boundary
- Parcel Boundary
- Oak Woodland - Habitat Feature

By Township
Caves or Cave-rich Areas

NOTE: Map provided on-line by Washington State Department of Fish & Wildlife at web address: *http://apps.wdfw.wa.gov/phsontheweb/*

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Photo 1 was taken facing east and shows general conditions onsite.

Photo 2 was taken facing west and shows general conditions onsite. The oak is visible on the left.

Photo 3 shows the onsite Oregon white oak.

Ecological
nd Services

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DATE: 08.29.2023
DWN: JB
PRJ. MGR: JB
PROJ.#: 3934.01

Photoplate 1
13th Street Gas Station
Camas, WA
Section 29, Township 2N, Range 3E, W.M.

Photo 4 was taken facing north at TP-1 and shows general conditions onsite.

Photo 5 was taken facing west.

Photo 6 was taken facing west at TP-1.

Photo 7 was taken facing east at TP-1 and shows general conditions onsite.

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DATE: 08.29.2023
DWN: JB
PRJ. MGR: JB
PROJ.#: 3934.01

Photoplate 2
13th Street Gas Station
Camas, WA
Section 29, Township 2N, Range 3E, W.M.

APPENDIX A

ROUTINE DETERMINATION METHOD AND PLANT INDICATOR RATING DEFINITIONS

Routine Determination Method

The Routine Determination Method is defined according to the U.S. Army Corps of Engineers' 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual* (Environmental Laboratory 1987)*; Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010). The Routine Determination Method examines three parameters – vegetation, soils, and hydrology – to determine if wetlands exist in a given area. Hydrology is critical in determining what is a wetland, but if often difficult to assess because hydrologic conditions can change periodically (hourly, daily, or seasonally). Consequently, it is necessary to determine if hydrophytic vegetation and hydric soils are present, which would indicate that water is present for a long enough duration to support a wetland plant community. By definition, wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Vegetation Indicator Status

The indicator status, following the scientific names of plant species, indicates the likelihood of the species to be found in wetlands according to the *National Wetland Plant List Indicator Rating Definitions* (Corps 2012). Listed from most likely to least likely to be found in wetlands, the indicator status categories are:

- **OBL** (obligate wetland) - occur almost always under natural conditions in wetlands.
- **FACW** (facultative wetland) - usually occur in wetlands, but occasionally found in non-wetlands.
- **FAC** (facultative) - equally likely to occur in wetlands or non-wetlands.
- **FACU** (facultative upland) - usually occur in non-wetlands, but occasionally found in wetlands.
- **UPL** (obligate upland) - occur almost always under natural conditions in non-wetlands.
- **NI** (no indicator) - insufficient data to assign to an indicator category.

APPENDIX B

WETLAND DETERMINATION DATA FORM

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 13th Street Gas Station City/County: Camas/Clark Sampling Date: 08/29/2023
Applicant/Owner: PAK USA Camas, LLC State: WA Sampling Point: TP-1
Investigator(s): J. Blake Section, Township, Range: S29, T2N, R3E
Landform (hillslope, terrace, etc.): Floodplains Local relief: (concave, convex, none): Convex Slope (%): 0-3%
Subregion (LRR): LRRA MLRA2 Lat: 45.6318544 Long: -122.4669931 Datum: NAD83
Soil Map Unit Name: Cove silty clay loam, thin solum, 0 to 3 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes☐ No☒ (If no, explain Remarks.)
Are Vegetation☐, Soil☐, or Hydrology☐ significantly disturbed? Are "Normal Circumstances" present? Yes☒ No☐
Are Vegetation☐, Soil☐, or Hydrology☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** **Yes☐ No☒**
Hydric Soils Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks: TP-1 is located in the southwest corner of the site in an area with mapped hydric soils. TP-1 does not meet all three wetland indicators and is therefore in uplands. Hydrologic conditions were not typical for this time of year, as antecedent rainfall was determined to be drier than normal for the two months prior to the site visit.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Malus* spp.*	20%	yes	FAC
2. *Fraxinus latifolia*	20%	yes	FACW
3. *Robinia pseudoacacia*	20%	yes	FACU
4. *Crataegus monogyna*	15%	yes	FAC
50% = 38 20% = 15	75%	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
50% = ___ 20% = ___	%	=Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *Festuca* spp*	93%	yes	FAC
2. *Iris* spp.*	5%	no	FACW
3. *Rubus ursinus*	2%	no	FACU
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
50% = 50 20% = 20	100%	=Total Cover	
Woody Vine Stratum (Plot size: 15 ft radius)			
1. *Rubus armeniacus*	5%	yes	FAC
2.	%		
50% = 3 20% = 1	5%	=Total Cover	

% Bare Ground in Herb Stratum 0%

Dominance Test Worksheet

Number of Dominant Species That Are OBL, FACW, or FAC:	5	(A)
Total Number of Dominant Species Across All Strata:	6	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	83	(A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x 1=	
FACW species		x 2=	
FAC species		x 3=	
FACU species		x 4=	
UPL species		x 5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A=_____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 – Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes☒ No☐**

Remarks: *Festuca* spp.* and *Malus* spp.* indicator statuses assumed FAC. *Iris* spp.* indicator status assumed FACW.

SOIL

Sampling Point: TP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/3	100%		%			Loam	
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosal (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Minerals (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and Wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: Hardpan
Depth (inches): 6

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (min. of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (Inches): _____
Water Table Present?	Yes ☐	No ☒	Depth (Inches): _____
Saturation Present? (Includes Capillary fringe)	Yes ☐	No ☒	Depth (Inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

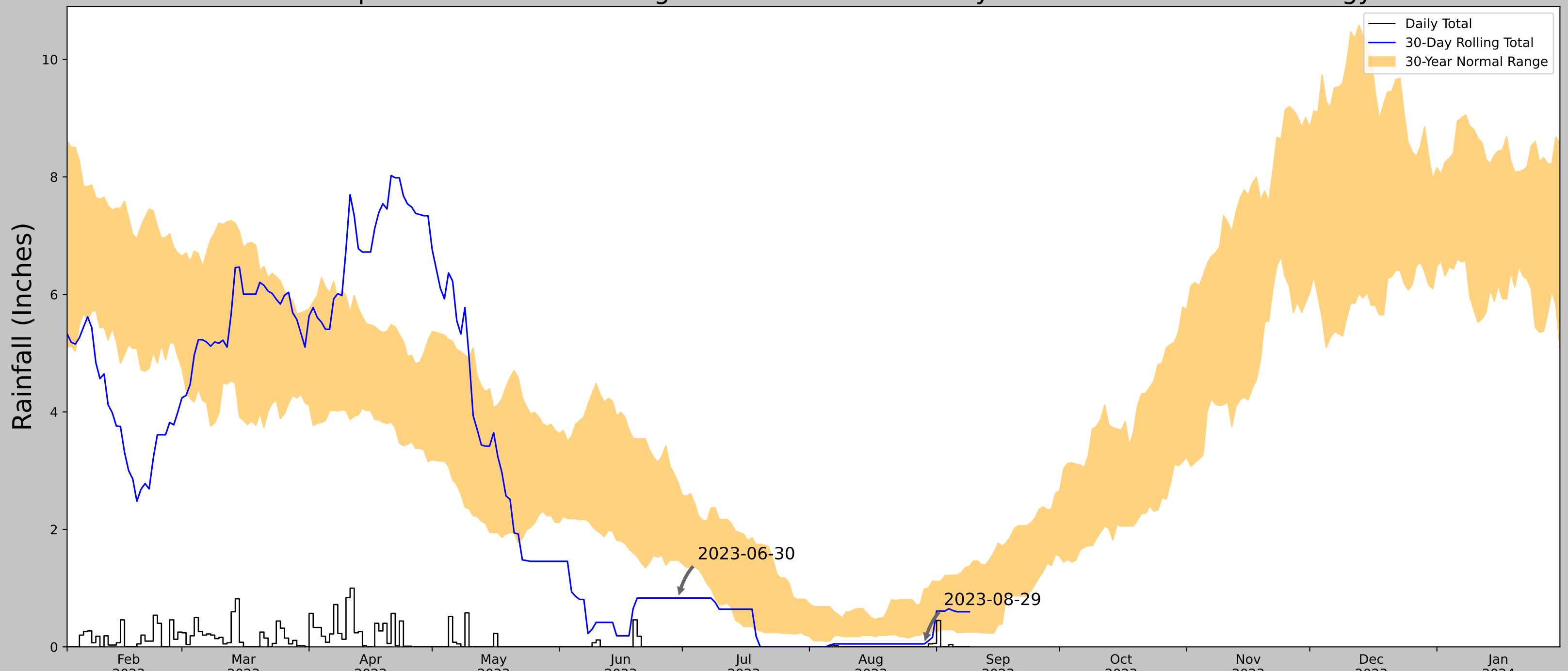
Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrologic conditions were not typical for this time of year, as antecedent rainfall was determined to be drier than normal for the two months prior to the site visit.

APPENDIX C

PRECIPITATION INFORMATION

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	45.632018, -122.467297
Observation Date	2023-08-29
Elevation (ft)	253.44
Drought Index (PDSI)	Severe drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-29	0.253543	0.986221	0.051181	Dry	1	3	3
2023-07-30	0.24252	0.814961	0.0	Dry	1	2	2
2023-06-30	1.475197	2.795276	0.830709	Dry	1	1	1
Result							Drier than Normal - 6

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
BATTLE GROUND	45.7717, -122.5286	284.121	10.094	30.681	4.852	11318	69
BATTLE GROUND 0.8 N	45.794, -122.5443	316.929	1.716	32.808	0.828	0	1
BATTLE GROUND 1.2 NE	45.7958, -122.5275	361.877	1.666	77.756	0.879	0	20
VANCOUVER 4 NNE	45.6775, -122.6514	220.144	8.8	63.977	4.523	4	0
MERWIN DAM	45.955, -122.5625	224.081	12.769	60.04	6.513	31	0

OAK BANK USE PLAN

October 2, 2023

13th Street Gas Station
Camas, WA

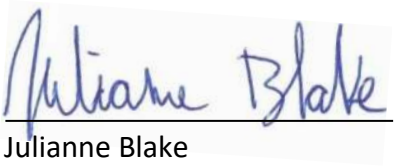
Prepared for

PAK USA Camas, LLC
c/o Taz Khan
3993 NW Currawong Court
Camas, WA 98607
(512) 779-4999

Prepared by
Ecological Land Services
1157 3rd Avenue, Suite 220A • Longview, WA 98632
(360) 578-1371 • Project Number 3934.01

SIGNATURE PAGE

The information in this report was compiled and prepared under the supervision and direction of the undersigned.



Julianne Blake
Biologist III

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INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by PAK USA Camas, LLC to prepare this Oak Bank Use Plan to address Oregon white oak (oak) impacts resulting from the construction of a fuel station, convenience store, and associated parking lot. The site is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). Field work was conducted on August 29, 2023. The project will remove one existing oak (*Quercus garryana*) and impact 0.08 acres (3,456 square feet) of oak canopy. Canopy impacts will be offset by purchasing 0.238 credits from Terrace Oak Bank (Bank). This Bank Use Plan was prepared according to the *Camas Municipal Code (CMC) Title 16 Environment* (2023) and Washington Department of Fish and Wildlife's (WDFW) *Management recommendations for Washington's priority habitats: Oregon white oak woodlands (1998)*.

RESPONSIBLE PARTIES

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Project Description

The project area is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). The project consists of constructing a fuel station, convenience store, and associated parking lot. The parking lot will contain electric vehicle charging stations and vacuum pumps as well as pedestrian crossing areas (Figure 3). The existing oak will be removed as part of the project, removing 0.08 acres (3,546 square feet) of oak canopy. Canopy impacts will be mitigated by purchasing 0.238 credits from Terrace Oak Bank. Construction is anticipated to start upon receipt of all necessary permits.

Best management practices (BMPs) that will be completed prior to construction include designating staging and stockpile areas outside of critical areas and associated buffers, establishing a standard construction entrance, and installing silt fencing to prevent sedimentation. When site preparation is complete, construction will occur. A water truck will be available to prevent dust blowing during construction, if needed. Equipment used may include haul trucks, bulldozers, excavators, pavers, and hand tools. Upon completion of construction activities, disturbed areas that will not be paved will be seeded with a native grass seed mix.

Existing Conditions

Existing and Surrounding Land Uses

The 0.97-acre site consists of Clark County Tax Parcel 176148000 and is accessed by a paved driveway off NE 13th Street. The site is zoned as Business Park (BP) and currently contains a single-family mobile home, shed, carport, and paved driveway. The site is bordered to the north by NE 13th Street, to the east by NW Friberg-Strunk Street, to the south by undeveloped land and commercial development in progress, and to the west by undeveloped land and a single-family residence (Figure 2).

Existing Critical Areas

A site visit was completed by ELS in August 2023 following the appropriate technical manuals: *The Routine Determination Method according to the Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010). During the field visit, no wetlands were identified onsite (ELS 2023).

The WDFW Priority Habitats and Species online mapping tool depicts oak woodlands within the vicinity of the observed oak along the southern site boundary. One oak measuring approximately 52 inches diameter at breast height (DBH) was mapped along the southern site boundary during site reconnaissance (Figure 2). The oak has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. The oak location was mapped using a GPS system capable of submeter accuracy in ideal conditions. According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

Table 1. Oak Summary

Total Canopy Area	DBH	Number of Trunks	Noteworthy Habitat Features
0.08 acres 3,456 square feet	52 inches	1	• Canopy is interconnected with adjacent trees, but not other oaks • Two large cavities

Avoidance and Minimization

The preferred mitigation sequencing of first avoidance, then minimization, and finally compensation for unavoidable impacts was taken into consideration during the design process of this project; however, due to the single oak tree being located in an area of the site needed for a required driveway, avoiding Oregon white oak impacts altogether is not feasible. The Oregon white oak proposed for removal is the only oak tree onsite.

Unavoidable Oregon White Oak Impacts

Removal of the oak will result in the loss of 0.08 acres (3,456 square feet) of Oregon white oak priority habitat as measured by the oak canopy coverage (drip line). The following table summarizes proposed oak impacts.

Table 2. Oak Impact Summary

Identifier	DBH	Canopy Coverage	Total Impact
Oregon White Oak (Single Mature Tree)	52 inches	0.08 acres 3,456 square feet	0.08 acres 3,456 square feet

Impacted Priority Habitat Functions

ELS assessed the functions provided by the oak during a site visit on August 29, 2023. The functional assessment is based on Washington Department of Fish and Wildlife's (WDFW) *Management Recommendations for Washington's Priority Habitats, Oregon White Oak Woodlands* (Guidance) (Larsen and Morgan 1998).

Habitat Functions

Oak woodlands are considered "priority habitat and species" by WDFW and are protected locally by the City of Camas Municipal Code (*CMC*). According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

In urban or urbanizing areas west of the Cascades, WDFW defines priority oak habitat as single oaks, or stands of pure oak, or oak/conifer associations, 1 acre or greater in size. WDFW may also consider individual Oregon white oak trees a priority habitat when found to be particularly valuable to wildlife (i.e., contains many cavities, has a large DBH, is used by priority species, or has a large canopy) (Larsen and Morgan 1998). The project site is within the City of Camas (City). WDFW recommendation is that in urban and urbanizing areas, single trees should be maintained

if they are deemed important to species highly associated with Oregon white oak. Oaks and their associated flora comprise distinct woodland ecosystems with various plant communities providing valuable habitat that contributes to wildlife diversity. Oak woodlands provide a mix of feeding, resting, and breeding habitat for many wildlife species (Larsen and Morgan 1998).

The oak proposed for removal has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. Due to the placement of the oak within the City boundaries and lack of habitat connectivity, larger animals or those not adapted to urban conditions are not likely to be present. Therefore, removing the oak would likely result in habitat loss and a food source only for birds and small mammals that are well adapted to urban conditions.

Oregon White Oak Mitigation Selection Rationale

The Oregon white oak proposed for removal is located in the service area for the Terrace Oak Bank (Bank). The oak tree is approximately 4 miles southeast of the Bank, in the Lacamas Creek Watershed which is in the southeastern portion of the service area (Figure 4). The proposed oak removal will be mitigated by purchasing credits from the Bank at ratios specified in the Terrace Oak Bank's Mitigation Banking Instrument (MBI).

Rationale for selecting this mitigation bank is as follows:

- The oak onsite does not provide habitat for other priority species that should be replaced onsite. Habitat functions will be impacted for species common to urban areas, which can be fully replaced at the Bank.

- The habitat functions lost from the proposed oak removal correspond directly with the habitat creation purpose, goals, and objectives at the Bank which identifies 13.93 acres of existing Oregon white oak woodland WDFW Priority Habitat that will be restored to pre-agricultural conditions through creation, enhancement, and preservation. Creation and enhancement will be accomplished through planting oak saplings and/or native understory plantings, removing of Douglas-fir, and establishing a conservation easement over the entire 13.93 acres.

The 2008 *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule* (Corps) recommends purchasing mitigation bank credits for ecological considerations (lower risk of failure and lower temporal loss of resources and services) and to avoid the maintenance and contingency issues and outright failures that often accompany permittee-responsible mitigation sites. Use of the Terrace Oak Bank substantially lowers the risk of failure and temporal loss of resource functions and services over newly established, permittee-responsible mitigation sites and offsite mitigation is anticipated to be more meaningful and beneficial to the watershed's habitat functions.

Functions Provided at Oak Bank

The general goal of the Bank is to restore the approximately 13.93 acres to a state similar to its pre-agricultural condition through creation, enhancement, and preservation of an existing Oregon white oak woodland. All functions related to oak habitat are expected to increase as a result of design implementation. The primary ecological goals of the Bank are as follows:

- Removal of all existing impervious surfaces, including buildings, large equipment, gravel and paved areas, and debris, followed by replanting oak saplings and native understory species.
- Removal of invasive species in creation, enhancement, and preservation areas, primarily English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus armeniacus*).
- Removal of Douglas-fir (*Pseudotsuga menziesii*) overstory as recommended by WDFW to reduce competition and further degradation of the Oregon white oak woodland from shading.
- Replanting of both creation and enhancement areas with oak saplings and and native understory species to augment and expand existing Oregon white oak habitat.
- Preserve the Bank through a conservation easement.

Wildlife Habitat

The proposed development site plan will provide diverse habitat for a variety of large and small mammals, songbirds, waterfowl, amphibians, and insects by improving the condition of the existing Oregon White Oak habitat through creation and enhancement that includes replanting of oaks and native understory, removing invasive species, non-native debris, and impervious surfaces, and eliminating Douglas-fir encroachment.

Anticipated Functional Lift

The creation, enhancement, and Douglas-fir stand release activities proposed in the Bank will provide a variety of benefits lifting overall habitat functions. Invasive species eradication and installing oak trees and native understory in open areas will increase the site's potential to provide habitat by providing improved and increased diversity of plant species, structure, and interspersion of habitat. Removing Douglas-fir competition will allow the existing oaks to increase branching and smaller oak trees to become better established. The changes will increase acorn production, provide additional food for wildlife, and support a greater diversity of wildlife species as will removing impervious surfaces and debris. All functions impacted by removing an oak tree at the project site will be fully mitigated at the Bank.

Proposed Mitigation Credits

As stated in the MBI (October 28th, 2020), the local jurisdiction with regulatory authority will determine both how impacts are measured[1] and the mitigation ratios required. The mitigation

[1] i.e., square foot of canopy area/root zone, DBH, etc.

credits required for impacts to Oregon white oak will be determined by using the local jurisdiction's mitigation ratio (6:1) and multiplying this ratio by a "risk reduction factor" of 0.5. Impacts to high functioning Oregon White Oak Priority Habitat stands will be determined by the regulatory agencies on a case-by-case basis. Table 3 summarizes the impact type, mitigation ratio, and total credits proposed for compensation.

Table 3. Credits for Oak Impacts at Terrace Oak Bank

Impact Type	Impact Amount	Mitigation Ratio	Risk Reduction Multiplier	Mitigation Area Required	Proposed Credit Purchase
Canopy loss	0.08 acres (3,456 sq. ft.)	6:1	0.5	0.238 acres (10,368 sq. ft.)	0.238 credits

Credit Purchase or Transfer Timing

Following permit issuance, PAK USA Camas, LLC, as the applicant, will enter into a Buy/Sell Agreement with Terrace Oak Bank, for purchase of mitigation credits (in the quantity specified in Table 3) that would appropriately mitigate for the proposed project impacts. The actual purchase of credits will occur upon permit issuance. Prior to impacting the project oak, the applicant will submit proof of transfer of mitigation credits to project managers for the City of Camas. Proof of the mitigation transfer will be provided in the form of a notification letter to the approving agencies. Upon service of this notification, the mitigation requirement to purchase 0.238 mitigation credits will be fully satisfied.

Confirmation of Mitigation Credit Availability

Proof of the current number of available mitigation credits at the Terrace Oak Bank site will be confirmed by the approving agency, City of Camas and through the advising members of the Oak Bank Review Team.

Chair:
Brent Davis, Wetland and Habitat Review Program Manager
Clark County Community Development
P.O. Box 9810
Vancouver, WA 98666-9810
(360) 397-2375 ext. 4152
brent.davis@clark.wa.gov

Advisory Members:
Dave Howe, Area Habitat Biologist
Washington Department of Fish and Wildlife
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Washington Department of Natural Resources
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LIMITATIONS

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

REFERENCES

City of Camas. 2023. *Camas Municipal Code (CMC) Title 16 Environment.* Camas, Washington. July 31, 2023.

Ecological Land Services, Inc. (ELS). 2023. *Critical Areas Report for 13th Street Gas Station, Camas, Washington*. September 26, 2023.

Ecological Land Services, Inc. (ELS). 2020. *Mitigation Banking Instrument for the Terrace Oak Bank, Clark County, Washington*. October 2020.

Larsen, E. M., and J. T. Morgan. 1998. *Management recommendations for Washington's priority habitats: Oregon white oak woodlands*. Washington Department of Fish and Wildlife, Olympia. 37pp.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1. U.S. Army Corps of Engineer Waterways Experiment Station. Vicksburg, Mississippi.

Interagency Review Team for Washington State. February 19, 2009. *Using Credits from Wetland Mitigation Banks: Guidance to Applicants on Submittal Contents for Bank Use Plans*. Online http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/pdf/mitig_ plan_guidance.pdf. Accessed August 2023.

U.S. Army Corps of Engineers (Corps). 2008. *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule.* 33 C.F.R. §332, Federal Register, April 30, 2008.

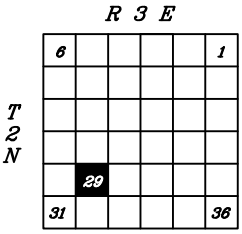
U.S. Army Corps of Engineers (Corps). 2010. *Final Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-13. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.

FIGURES

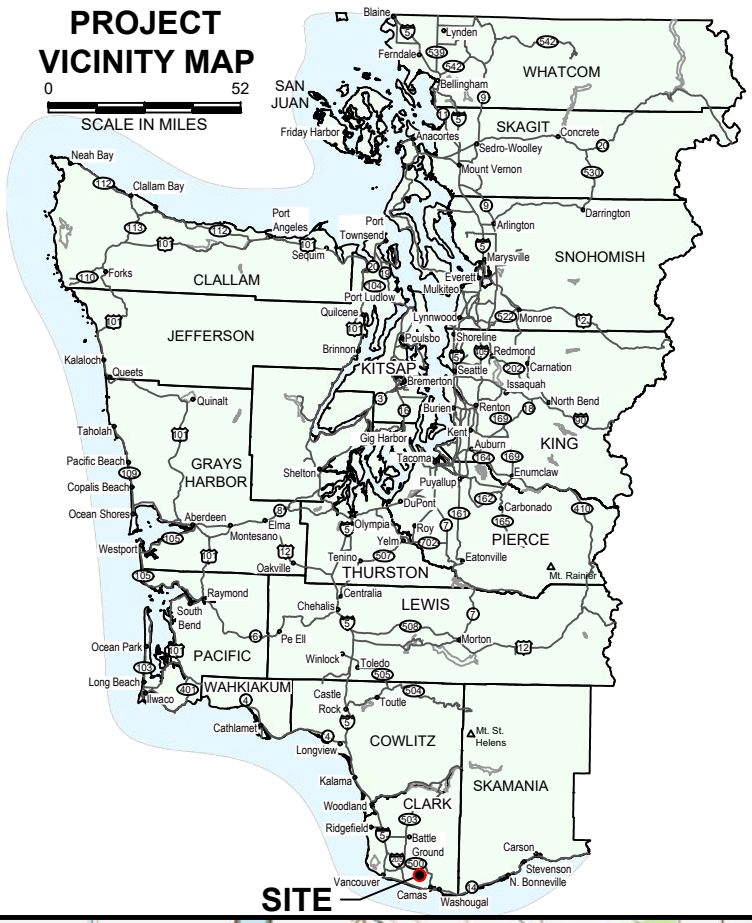
WASHINGTON

45.6321° Latitude
-122.4664° Longitude

LOCATION MAP



PROJECT VICINITY MAP



NOTE:
Quadrangle topographic map from USGS.

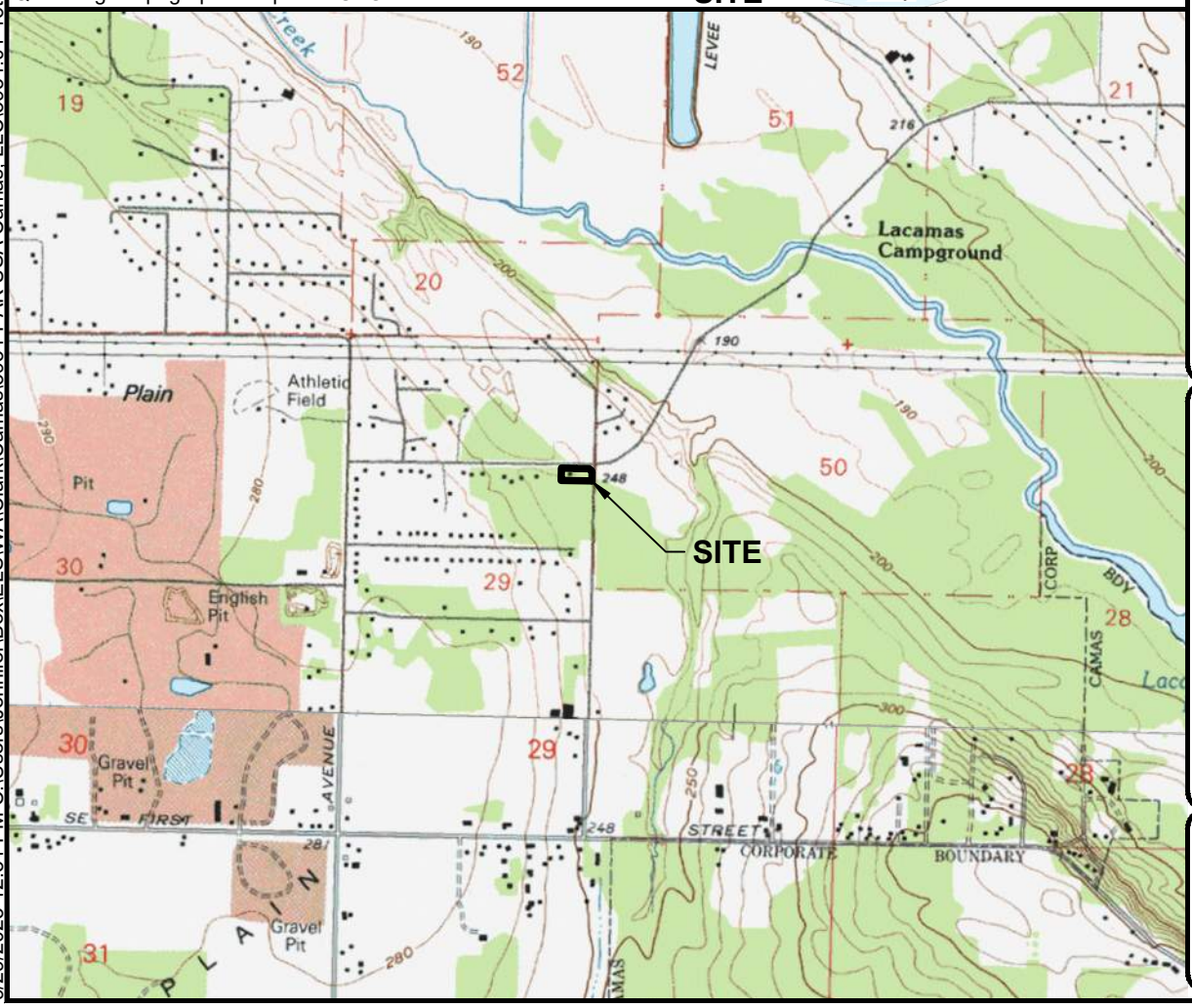


Figure 1
VICINITY MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

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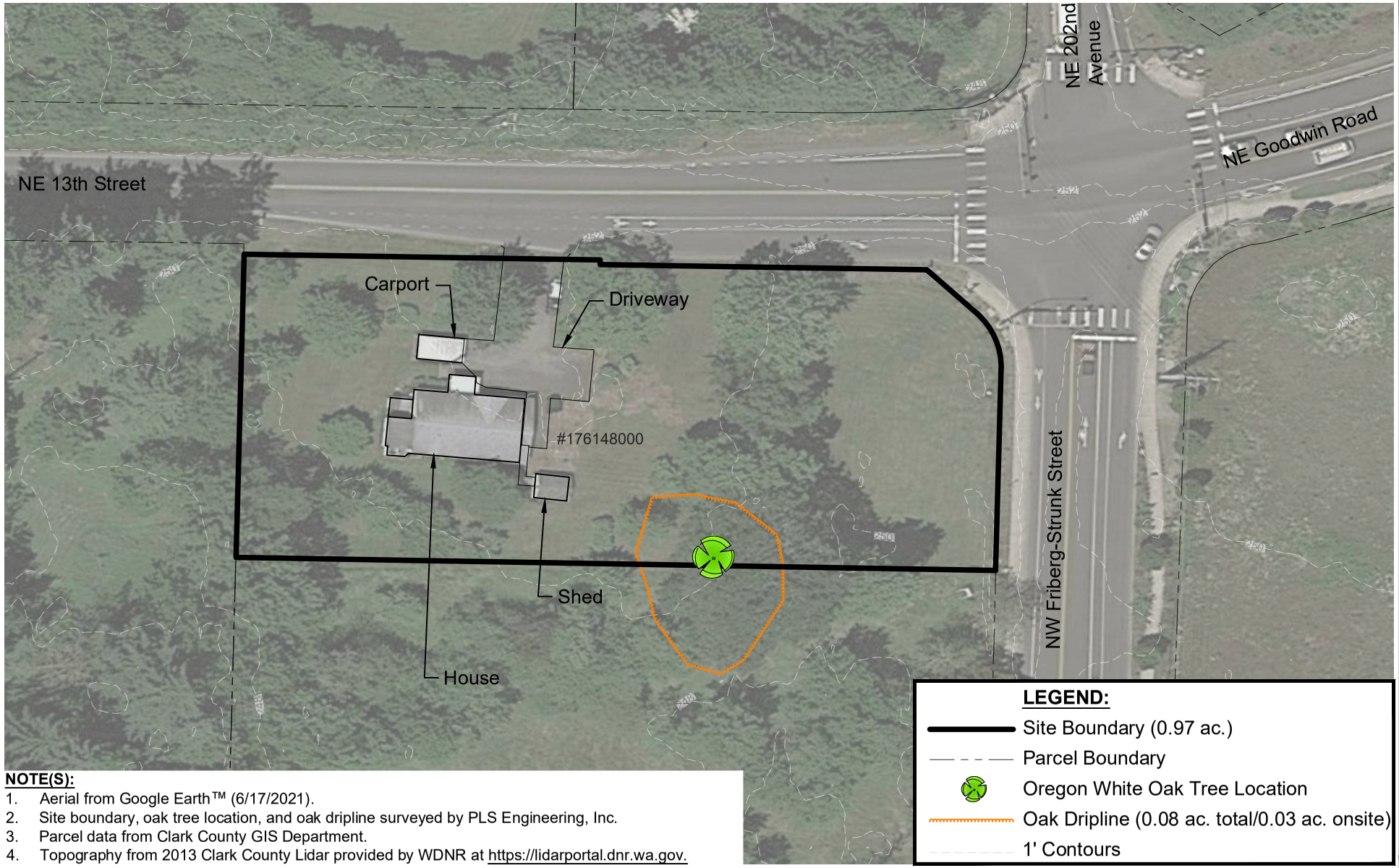
Ecological Land Services

0 2000 4000
SCALE IN FEET

N W E S

9/29/2023 12:51 PM C:\Users\Jennifer\Box\ELS\WA\Clark\Camas\3934-PAK USA Camas, LLC\3934.01-13th St Feasibility\3934.01-Figures CAD Only\3934.01_DL.dwg Jennifer



NOTE(S):

1. Aerial from Google Earth™ (6/17/2021).
2. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
3. Parcel data from Clark County GIS Department.
4. Topography from 2013 Clark County Lidar provided by WDNR at https://lidarportal.dnr.wa.gov.

N W E S

0 60 120
SCALE IN FEET

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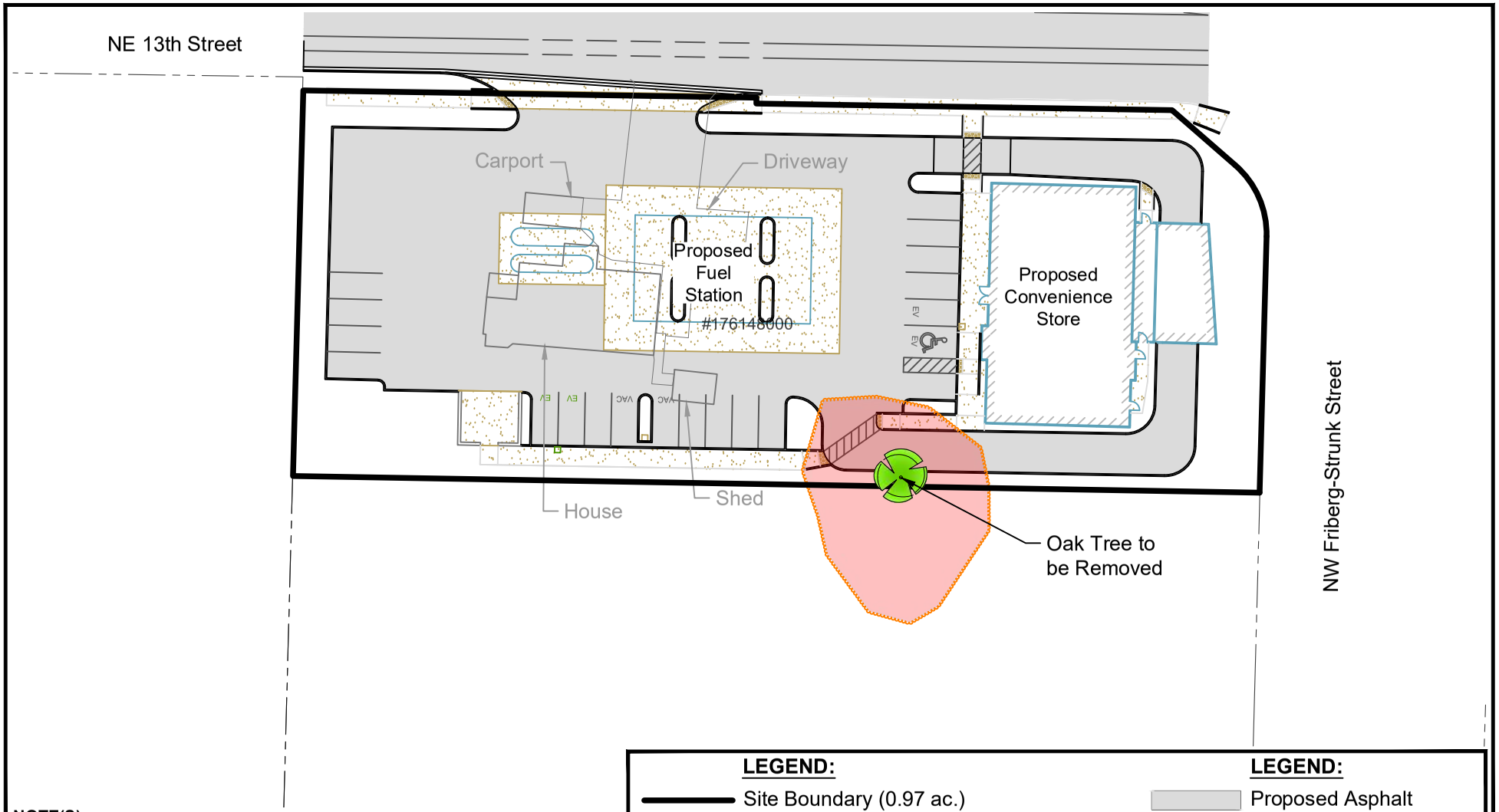
DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 2
EXISTING CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.



NOTE(S):

1. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
2. Parcel, ditch, and culvert data from Clark County GIS Department.
3. Site plan by PLS Engineering.

LEGEND:

- Site Boundary (0.97 ac.)
- Parcel Boundary
- Oregon White Oak Tree Location
- Oak Dripline (0.08 ac. total/0.03 ac. onsite)

LEGEND:

- Proposed Asphalt
- Proposed Concrete
- Oak Dripline Impact (3,546 sq. ft./0.08 ac.)

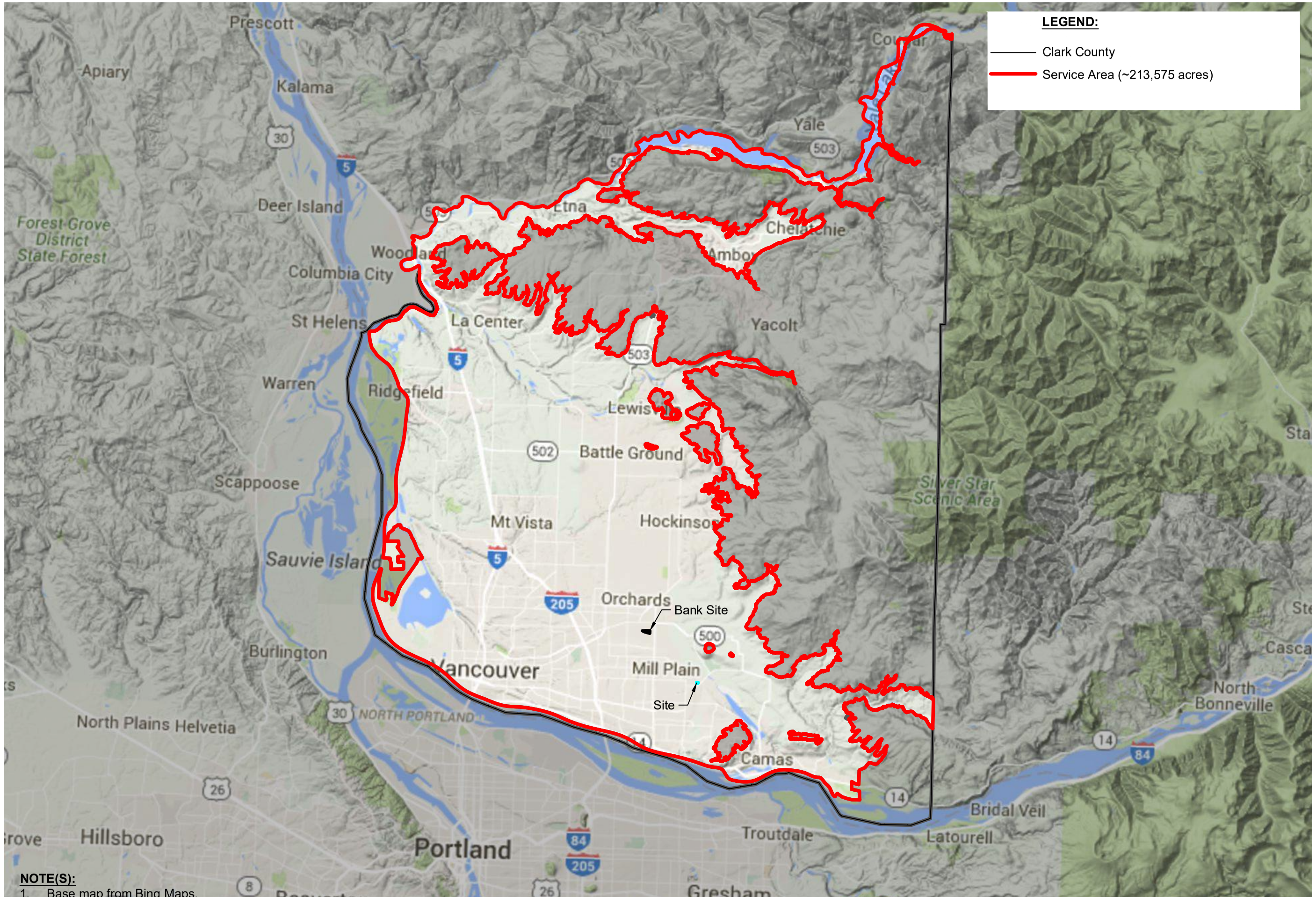
N W E S

0 50 100
SCALE IN FEET

Ecological Land Services
1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 3
PROPOSED CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.



NOTE(S):
1. Base map from Bing Maps.

Figure 4
TERRACE OAK BANK SERVICE AREA
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/26/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Ecological Land Services
11157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com

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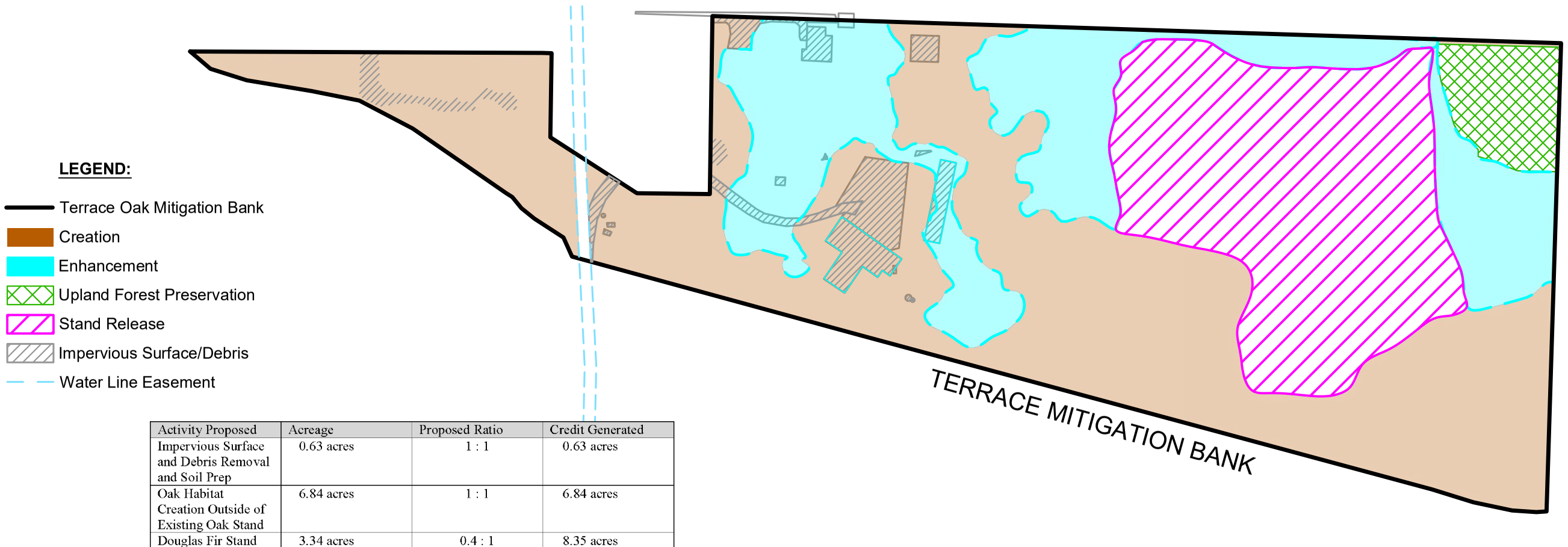

Activity Proposed	Acreage	Proposed Ratio	Credit Generated
Impervious Surface and Debris Removal and Soil Prep	0.63 acres	1 : 1	0.63 acres
Oak Habitat Creation Outside of Existing Oak Stand	6.84 acres	1 : 1	6.84 acres
Douglas Fir Stand Release	3.34 acres	0.4 : 1	8.35 acres
Enhancement of Existing Oak Stand	3.20 acres	0.4 : 1	8.00 acres
Upland Forest Preservation	0.50 acres	0.5 : 1	1.00 acres
Totals	14.51 acres[1]		24.82 acres

[1] Total acreage includes areas of activity overlap and does not include 0.05 acres of water line easement, so is not reflective of the 13.93 acres represented in the legal survey of Oak Bank area.

Table 2. Oak Mitigation Bank Activity Descriptions.

Activity Proposed	Type of Activity/Area
Impervious Surface and Debris Removal and Soil Prep	• Includes: • Buildings, driveways, gravel pads or any other impervious area to be removed (regardless of whether oak tree canopy already covers the area) • Removal of debris piles throughout the site • Loosening of soils following impervious/debris removal
Oak Habitat Creation Outside of Existing Oak Stand	• Includes open areas of all types not currently covered by oak canopy • Areas to be replanted with oak saplings and native understory
Douglas Fir Stand Release	• Includes area of dense fir canopy within existing oak stand • Douglas fir over-story to be removed through harvest or tree girdling/snag creation
Enhancement of Existing Oak Stand	• Includes areas of existing oak canopy • Enhancement areas will have non-natives removed and understory planted with native shrubs typically associated with oak woodlands
Upland Forest Preservation	• Includes areas of deciduous forest adjacent to oak canopy, providing upland forest habitat • Area will be preserved through administration of a conservation easement

Figure 5
TERRACE OAK BANK SITE DESIGN
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/26/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Ecological Land Services
1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com

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Exhibit 13 APPEAL24-1001

Owner Name	Mailing Address
CAMAS MEADOWS INDUSTRIAL LLC	1821 DOCK ST STE 100, TACOMA, WA, 98401
FAN LIMING & FAN QI REV LIV TRUST	18900 NE 25TH DR, VANCOUVER, WA, 98684
GOERTZEN JEFFERY K & GOERTZEN KELI J TRUSTEES	20009 NE 14TH ST, CAMAS, WA, 98607
LACAMAS TECH PARTNERS LLC	7408 NE 113TH CIR, VANCOUVER, WA, 98662
LUCIER ERNEST J JR	20005 NE 13TH ST, CAMAS, WA, 98607
LUCIER ERNEST JR	20005 NE 13TH ST, CAMAS, WA, 98607
NOSRATI RANDY & NOSRATI KARIN L	20107 NE 14TH ST, CAMAS, WA, 98607
PAK USA CAMAS LLC	PO BOX 452, CAMAS, WA, 98607
RICKARD RICHARD & RICKARD JOAN	1417 NE 202ND AVE, CAMAS, WA, 98607
SMALL WILLIAM & SMALL RUTH	20217 NE 16TH ST, CAMAS, WA, 98607
WILSON JUDITH A	20008 NE 11TH ST, CAMAS, WA, 98607

This document was created by the Clark County, Washington Geographic Information System

Number of Records 11
Number of Pages 1
Date Created 10/19/2023
Employee
Employee Name Jesse Manley

WFG National Title Company of Clark County
a Williston Financial Group company

5101 NE 82nd Avenue Bldg A Suite 102
Vancouver, WA 98662
Phone (360) 891-5454 Fax (360) 314-0345

IQ Credit Union

File No.:	23-105006
Loan No.:	745754-50
Loan To:	Pak USA Camas, LLC
Property:	20101 NE 13th Street Camas, WA 98607

Please find enclosed your Policy of Title Insurance with regard to the above referenced matter.

If you have any questions regarding the policy, please do not hesitate to contact the office noted above.

WFG National Title Insurance Company
a Williston Financial Group company

LOAN POLICY OF TITLE INSURANCE

SCHEDULE A

Name and Address of Title Insurance Company: **WFG National Title Insurance Company**
12909 SW 68th Parkway, Suite 350, Portland, OR 97223

File No.: **23-105006** Policy No.: **3172000-6462830**

Loan No.: **745754-50**

Address Reference: **20101 NE 13th Street, Camas, WA 98607**

Amount of Insurance: **$385,000.00** Premium: **$565.00**

Date of Policy: **February 15, 2023 3:59PM**

1. Name of Insured:

   IQ Credit Union, ISAOA

2. The estate or interest in the Land that is encumbered by the Insured Mortgage is:

   Fee Simple

3. Title is vested in:

   Pak USA Camas, LLC, a Washington limited liability company

4. The Insured Mortgage and its assignments, if any, are described as follows:

   Deed of Trust and the terms and conditions thereof:

Grantor:	**Pak USA Camas, LLC, a Washington limited liability company**
Trustee:	**Trustee Services, Inc.**
Beneficiary:	**IQ Credit Union**
Original Amount:	**$385,000.00**
Dated:	**February 9, 2023**
Recorded:	**February 15, 2023**
Recording No.:	**6104855, of Official Records**

5. The Land referred to in this policy is described as follows:

   See Exhibit "A" attached hereto and made a part hereof

Countersigned:
WFG National Title Company of Clark County WA, LLC, as Issuing Agent for WFG National Title Insurance Company

By: _____
Authorized Signature

ALTA Loan Policy (06-17-06)
Form No. 3172000 (Arbitration Removed)

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AMERICAN LAND TITLE ASSOCIATION

File No. 23-105006

EXHIBIT "A"

LEGAL DESCRIPTION

All that certain real property in the County of Clark, State of Washington, described as follows:

THE NORTH 162 FEET OF THAT PORTION OF THE NORTHWEST QUARTER OF SECTION 29, TOWNSHIP 2 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN, CLARK COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT 30 FEET WEST OF THE NORTHEAST CORNER OF THE SOUTH HALF OF THE NORTHWEST QUARTER OF SECTION 29, TOWNSHIP 2 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN; AND RUNNING THENCE WEST 330 FEET; THENCE SOUTH 1320 FEET; THENCE EAST 330 FEET; THENCE NORTH 1320 FEET TO THE POINT OF BEGINNING.

EXCEPT PUBLIC ROAD; NE 202ND AVENUE AND NE 13TH STREET.

ALSO EXCEPTING THAT PORTION CONVEYED TO CLARK COUNTY BY DEED RECORDED UNDER AUDITOR'S FILE NO. G 202602.

ALSO EXCEPTING THAT PORTION CONVEYED TO CLARK COUNTY BY DEED RECORDED UNDER AUDITOR'S FILE NO. 5066695.

TOGETHER WITH THAT CERTAIN MOBILE HOME, THE TITLE TO WHICH WAS ELIMINATED BY INSTRUMENT RECORDED DECEMBER 29, 2004, UNDER CLARK COUNTY AUDITOR'S FILE NO. 3926540, RECORDS OF CLARK COUNTY, WASHINGTON.

Tax Account No(s): 176148-000

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SCHEDULE B

EXCEPTIONS FROM COVERAGE

File No.: **23-105006** Policy No: **3172000-6462830**

PART I

This policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees, or expenses that arise by reason of:

1. Taxes and assessments for the year 2024 and subsequent years, which are not yet due and payable.
2. Easement and the terms, conditions and provisions thereof, as disclosed by that certain instrument recorded as 5066696, of Official Records.
   For:Right of Way Slope
   In favor of: City of Camas
3. Taxes and charges, together with interest, penalty and statutory foreclosure costs, if any, after delinquency:

Tax Year:	2023
Tax Type:	County
Tax ID No.:	176148-000
Taxing Entity:	Clark County Treasurer
Total Annual Tax:	$2,077.20
First Installment:	$1,038.65
First Installment Status:	Due
First Installment Due/Paid Date:	April 30, 2023
Second Installment:	$1,038.55
Second Installment Status:	Due
Second Installment Due/Paid Date:	October 31, 2023

4. Any unpaid assessments or charges, and liability for further assessments or charges by:
   City of Camas. (none due at time of policy)

END OF SCHEDULE B - PART I

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SCHEDULE B

File No.: **23-105006** Policy No: **3172000-6462830**

PART II

In addition to the matters set forth in Part I of this Schedule, the Title is subject to the following matters, and the Company insures against loss or damage sustained in the event that they are not subordinate to the lien of the Insured Mortgage:

None

END OF SCHEDULE B - PART II

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WFG National Title Insurance Company
a Williston Financial Group company

LOAN POLICY OF TITLE INSURANCE
Issued by
WFG NATIONAL TITLE INSURANCE COMPANY

POLICY NUMBER: 3172000-6462830

Any notice of claim and any other notice or statement in writing required to be given to the Company under this Policy must be given to the Company at the address shown in Section 18 of the Conditions.

COVERED RISKS

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE EXCEPTIONS FROM COVERAGE CONTAINED IN SCHEDULE B, AND THE CONDITIONS, WFG NATIONAL TITLE INSURANCE COMPANY, a South Carolina corporation (the "Company") insures, as of Date of Policy and, to the extent stated in Covered Risks 11, 13 and 14, after Date of Policy, against loss or damage, not exceeding the Amount of Insurance, sustained or incurred by the Insured by reason of:

1. Title being vested other than as stated in Schedule A.
2. Any defect in or lien or encumbrance on the Title. This Covered Risk includes but is not limited to insurance against loss from
   - (a) A defect in the Title caused by
     - (i) forgery, fraud, undue influence, duress, incompetence, incapacity, or impersonation;
     - (ii) failure of any person or Entity to have authorized a transfer or conveyance;
     - (iii) a document affecting Title not properly created, executed, witnessed, sealed, acknowledged, notarized, or delivered;
     - (iv) failure to perform those acts necessary to create a document by electronic means authorized by law;
     - (v) a document executed under a falsified, expired, or otherwise invalid power of attorney;
     - (vi) a document not properly filed, recorded, or indexed in the Public Records including failure to perform those acts by electronic means authorized by law; or
     - (vii) a defective judicial or administrative proceeding.
   - (b) The lien of real estate taxes or assessments imposed on the Title by a governmental authority due or payable, but unpaid.
   - (c) 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.

In Witness Whereof, WFG NATIONAL TITLE INSURANCE COMPANY has caused this policy to be signed and sealed by its duly authorized officers as of Date of Policy shown in Schedule A.

Issued By:
WFG National Title Company of Clark County WA, LLC**,**
as Issuing Agent for WFG National Title Insurance Company

By: _____
Authorized Signature

WFG NATIONAL TITLE INSURANCE COMPANY

By: _____
Steve Ozonian, President/CEO

ATTEST: _____
Joseph V. McCabe, EVP/General Counsel/Secretary

WFG NATIONAL TITLE INSURANCE COMPANY INCORPORATED 1974 SOUTH CAROLINA

ALTA Loan Policy (06-17-06)
Form No. 3172000 (Arbitration Removed)

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3. Unmarketable Title.
4. No right of access to and from the Land.
5. The violation or enforcement of any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (a) the occupancy, use, or enjoyment of the Land;
   (b) the character, dimensions, or location of any improvement erected on the Land;
   (c) the subdivision of land; or
   (d) environmental protection

   if a notice, describing any part of the Land, is recorded in the Public Records setting forth the violation or intention to enforce, but only to the extent of the violation or enforcement referred to in that notice.
6. An enforcement action based on the exercise of a governmental police power not covered by Covered Risk 5 if a notice of the enforcement action, describing any part of the Land, is recorded in the Public Records, but only to the extent of the enforcement referred to in that notice.
7. The exercise of the rights of eminent domain if a notice of the exercise, describing any part of the Land, is recorded in the Public Records.
8. Any taking by a governmental body that has occurred and is binding on the rights of a purchaser for value without Knowledge.
9. The invalidity or unenforceability of the lien of the Insured Mortgage upon the Title. This Covered Risk includes but is not limited to insurance against loss from any of the following impairing the lien of the Insured Mortgage
   (a) forgery, fraud, undue influence, duress, incompetency, incapacity, or impersonation;
   (b) failure of any person or Entity to have authorized a transfer or conveyance;
   (c) the Insured Mortgage not being properly created, executed, witnessed, sealed, acknowledged, notarized, or delivered;
   (d) failure to perform those acts necessary to create a document by electronic means authorized by law;
   (e) a document executed under a falsified, expired, or otherwise invalid power of attorney;
   (f) a document not properly filed, recorded, or indexed in the Public Records including failure to perform those acts by electronic means authorized by law; or
   (g) a defective judicial or administrative proceeding.
10. The lack of priority of the lien of the Insured Mortgage upon the Title over any other lien or encumbrance.
11. The lack of priority of the lien of the Insured Mortgage upon the Title
    (a) as security for each and every advance of proceeds of the loan secured by the Insured Mortgage over any statutory lien for services, labor, or material arising from construction of an improvement or work related to the Land when the improvement or work is either
        (i) contracted for or commenced on or before Date of Policy; or
        (ii) contracted for, commenced, or continued after Date of Policy if the construction is financed, in whole or in part, by proceeds of the loan secured by the Insured Mortgage that the Insured has advanced or is obligated on Date of Policy to advance; and
    (b) over the lien of any assessments for street improvements under construction or completed at Date of Policy.
12. The invalidity or unenforceability of any assignment of the Insured Mortgage, provided the assignment is shown in Schedule A, or the failure of the assignment shown in Schedule A to vest title to the Insured Mortgage in the named Insured assignee free and clear of all liens.
13. The invalidity, unenforceability, lack of priority, or avoidance of the lien of the Insured Mortgage upon the Title
    (a) resulting from the avoidance in whole or in part, or from a court order providing an alternative remedy, of any transfer of all or any part of the title to or any interest in the Land occurring prior to the transaction creating the lien of the Insured Mortgage because that prior transfer constituted a fraudulent or preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws; or

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AMERICAN LAND TITLE ASSOCIATION

(b) because the Insured Mortgage constitutes a preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws by reason of the failure of its recording in the Public Records

(i) to be timely, or

(ii) to impart notice of its existence to a purchaser for value or to a judgment or lien creditor.

14. Any defect in or lien or encumbrance on the Title or other matter included in Covered Risks 1 through 13 that has been created or attached or has been filed or recorded in the Public Records subsequent to Date of Policy and prior to the recording of the Insured Mortgage in the Public Records.

The Company will also pay the costs, attorneys' fees, and expenses incurred in defense of any matter insured against by this Policy, but only to the extent provided in the Conditions.

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:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to

(i) the occupancy, use, or enjoyment of the Land;

(ii) the character, dimensions, or location of any improvement erected on the Land;

(iii) the subdivision of land; or

(iv) environmental protection;

(v) 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.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.

3. Defects, liens, encumbrances, adverse claims, or other matters

(a) created, suffered, assumed, or agreed to by the Insured Claimant;

(b) 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;

(c) resulting in no loss or damage to the Insured Claimant;

(d) 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

(e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.

4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.

5. 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.

6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is

(a) a fraudulent conveyance or fraudulent transfer; or

(b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.

7. 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).

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CONDITIONS

1. DEFINITION OF TERMS

The following terms when used in this policy mean:

(a) "Amount of Insurance": The amount stated in Schedule A, as may be increased or decreased by endorsement to this policy, increased by Section 8(b) or decreased by Section 10 of these Conditions.

(b) "Date of Policy": The date designated as "Date of Policy" in Schedule A.

(c) "Entity": A corporation, partnership, trust, limited liability company, or other similar legal entity.

(d) "Indebtedness": The obligation secured by the Insured Mortgage including one evidenced by electronic means authorized by law, and if that obligation is the payment of a debt, the Indebtedness is the sum of (i) the amount of the principal disbursed as of Date of Policy; (ii) the amount of the principal disbursed subsequent to Date of Policy; (iii) the construction loan advances made subsequent to Date of Policy for the purpose of financing in whole or in part the construction of an improvement to the Land or related to the Land that the Insured was and continued to be obligated to advance at Date of Policy and at the date of the advance; (iv) interest on the loan; (v) the prepayment premiums, exit fees, and other similar fees or penalties allowed by law; (vi) the expenses of foreclosure and any other costs of enforcement; (vii) the amounts advanced to assure compliance with laws or to protect the lien or the priority of the lien of the Insured Mortgage before the acquisition of the estate or interest in the Title; (viii) the amounts to pay taxes and insurance; and (ix) the reasonable amounts expended to prevent deterioration of improvements; but the Indebtedness is reduced by the total of all payments and by any amount forgiven by an Insured.

(e) "Insured": The Insured named in Schedule A.

(i) The term "Insured" also includes

(A) the owner of the Indebtedness and each successor in ownership of the Indebtedness, whether the owner or successor owns the Indebtedness for its own account or as a trustee or other fiduciary, except a successor who is an obligor under the provisions of Section 12(c) of these Conditions;

(B) the person or Entity who has "control" of the "transferable record," if the Indebtedness is evidenced by a "transferable record," as these terms are defined by applicable electronic transactions law;

(C) successors to an Insured by dissolution, merger, consolidation, distribution, or reorganization;

(D) successors to an Insured by its conversion to another kind of Entity;

(E) a grantee of an Insured under a deed delivered without payment of actual valuable consideration conveying the Title

(1) if the stock, shares, memberships, or other equity interests of the grantee are wholly-owned by the named Insured,

(2) if the grantee wholly owns the named Insured, or

(3) if the grantee is wholly-owned by an affiliated Entity of the named Insured, provided the affiliated Entity and the named Insured are both wholly-owned by the same person or Entity;

(F) any government agency or instrumentality that is an insurer or guarantor under an insurance contract or guaranty insuring or guaranteeing the Indebtedness secured by the Insured Mortgage, or any part of it, whether named as an Insured or not;

(ii) With regard to (A), (B), (C), (D) , and (E) reserving, however, all rights and defenses as to any successor that the Company would have had against any predecessor Insured, unless the successor acquired the Indebtedness as a purchaser for value without Knowledge of the asserted defect, lien, encumbrance, or other matter insured against by this policy.

(f) "Insured Claimant": An Insured claiming loss or damage.

(g) "Insured Mortgage": The Mortgage described in paragraph 4 of Schedule A.

(h) "Knowledge" or "Known": Actual knowledge, not constructive knowledge or notice that may be imputed to an Insured by reason of the Public Records or any other records that impart constructive notice of matters affecting the Title.

(i) "Land": The land described in Schedule A, and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is insured by this policy.

(j) "Mortgage": Mortgage, deed of trust, trust deed, or other security instrument, including one evidenced by electronic means authorized by law.

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(k) "Public Records": Records established under state statutes at Date of Policy for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge. With respect to Covered Risk 5(d), "Public Records" shall also include environmental protection liens filed in the records of the clerk of the United States District Court for the district where the Land is located.

(l) "Title": The estate or interest described in Schedule A.

(m) "Unmarketable Title": Title affected by an alleged or apparent matter that would permit a prospective purchaser or lessee of the Title or lender on the Title or a prospective purchaser of the Insured Mortgage to be released from the obligation to purchase, lease, or lend if there is a contractual condition requiring the delivery of marketable title.

2. CONTINUATION OF INSURANCE

The coverage of this policy shall continue in force as of Date of Policy in favor of an Insured after acquisition of the Title by an Insured or after conveyance by an Insured, but only so long as the Insured retains an estate or interest in the Land, or holds an obligation secured by a purchase money Mortgage given by a purchaser from the Insured, or only so long as the Insured shall have liability by reason of warranties in any transfer or conveyance of the Title. This policy shall not continue in force in favor of any purchaser from the Insured of either (i) an estate or interest in the Land, or (ii) an obligation secured by a purchase money Mortgage given to the Insured.

3. NOTICE OF CLAIM TO BE GIVEN BY INSURED CLAIMANT

The Insured shall notify the Company promptly in writing (i) in case of any litigation as set forth in Section 5(a) of these Conditions, (ii) in case Knowledge shall come to an Insured of any claim of title or interest that is adverse to the Title or the lien of the Insured Mortgage, as insured, and that might cause loss or damage for which the Company may be liable by virtue of this policy, or (iii) if the Title or the lien of the Insured Mortgage, as insured, is rejected as Unmarketable Title. If the Company is prejudiced by the failure of the Insured Claimant to provide prompt notice, the Company's liability to the Insured Claimant under the policy shall be reduced to the extent of the prejudice.

4. PROOF OF LOSS

In the event the Company is unable to determine the amount of loss or damage, the Company may, at its option, require as a condition of payment that the Insured Claimant furnish a signed proof of loss. The proof of loss must describe the defect, lien, encumbrance, or other matter insured against by this policy that constitutes the basis of loss or damage and shall state, to the extent possible, the basis of calculating the amount of the loss or damage.

5. DEFENSE AND PROSECUTION OF ACTIONS

(a) Upon written request by the Insured, and subject to the options contained in Section 7 of these Conditions, the Company, at its own cost and without unreasonable delay, shall provide for the defense of an Insured in litigation in which any third party asserts a claim covered by this policy adverse to the Insured. This obligation is limited to only those stated causes of action alleging matters insured against by this policy. The Company shall have the right to select counsel of its choice (subject to the right of the Insured to object for reasonable cause) to represent the Insured as to those stated causes of action. It shall not be liable for and will not pay the fees of any other counsel. The Company will not pay any fees, costs, or expenses incurred by the Insured in the defense of those causes of action that allege matters not insured against by this policy.

(b) The Company shall have the right, in addition to the options contained in Section 7 of these Conditions, at its own cost, to institute and prosecute any action or proceeding or to do any other act that in its opinion may be necessary or desirable to establish the Title or the lien of the Insured Mortgage, as insured, or to prevent or reduce loss or damage to the Insured. The Company may take any appropriate action under the terms of this policy, whether or not it shall be liable to the Insured. The exercise of these rights shall not be an admission of liability or waiver of any provision of this policy. If the Company exercises its rights under this subsection, it must do so diligently.

(c) Whenever the Company brings an action or asserts a defense as required or permitted by this policy, the Company may pursue the litigation to a final determination by a court of competent jurisdiction, and it expressly reserves the right, in its sole discretion, to appeal any adverse judgment or order.

6. DUTY OF INSURED CLAIMANT TO COOPERATE

(a) In all cases where this policy permits or requires the Company to prosecute or provide for the defense of any action or proceeding and any appeals, the Insured shall secure to the Company the right to so prosecute or provide defense in the action or proceeding, including the right to use, at its option, the name of the Insured for this purpose.

Whenever requested by the Company, the Insured, at the Company's expense, shall give the Company all reasonable aid (i) in securing evidence, obtaining witnesses, prosecuting or defending the action or proceeding, or effecting settlement, and (ii) in any other lawful act that in the opinion of the Company may be necessary or desirable to establish the Title, the lien of the Insured Mortgage, or any other matter

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as insured. If the Company is prejudiced by the failure of the Insured to furnish the required cooperation, the Company's obligations to the Insured under the policy shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation, with regard to the matter or matters requiring such cooperation.

(b) The Company may reasonably require the Insured Claimant to submit to examination under oath by any authorized representative of the Company and to produce for examination, inspection, and copying, at such reasonable times and places as may be designated by the authorized representative of the Company, all records, in whatever medium maintained, including books, ledgers, checks, memoranda, correspondence, reports, e-mails, disks, tapes, and videos whether bearing a date before or after Date of Policy, that reasonably pertain to the loss or damage. Further, if requested by any authorized representative of the Company, the Insured Claimant shall grant its permission, in writing, for any authorized representative of the Company to examine, inspect, and copy all of these records in the custody or control of a third party that reasonably pertain to the loss or damage. All information designated as confidential by the Insured Claimant provided to the Company pursuant to this Section shall not be disclosed to others unless, in the reasonable judgment of the Company, it is necessary in the administration of the claim. Failure of the Insured Claimant to submit for examination under oath, produce any reasonably requested information, or grant permission to secure reasonably necessary information from third parties as required in this subsection, unless prohibited by law or governmental regulation, shall terminate any liability of the Company under this policy as to that claim.

7. OPTIONS TO PAY OR OTHERWISE SETTLE CLAIMS; TERMINATION OF LIABILITY

In case of a claim under this policy, the Company shall have the following additional options:

(a) To Pay or Tender Payment of the Amount of Insurance or to Purchase the Indebtedness.

(i) To pay or tender payment of the Amount of Insurance under this policy together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment or tender of payment and that the Company is obligated to pay; or

(ii) To purchase the Indebtedness for the amount of the Indebtedness on the date of purchase, together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of purchase and that the Company is obligated to pay.

When the Company purchases the Indebtedness, the Insured shall transfer, assign, and convey to the Company the Indebtedness and the Insured Mortgage, together with any collateral security.

Upon the exercise by the Company of either of the options provided for in subsections (a)(i) or (ii), all liability and obligations of the Company to the Insured under this policy, other than to make the payment required in those subsections, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

(b) To Pay or Otherwise Settle With Parties Other Than the Insured or With the Insured Claimant.

(i) to pay or otherwise settle with other parties for or in the name of an Insured Claimant any claim insured against under this policy. In addition, the Company will pay any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay; or

(ii) to pay or otherwise settle with the Insured Claimant the loss or damage provided for under this policy, together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay.

Upon the exercise by the Company of either of the options provided for in subsections (b)(i) or (ii), the Company's obligations to the Insured under this policy for the claimed loss or damage, other than the payments required to be made, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

8. DETERMINATION AND EXTENT OF LIABILITY

This policy is a contract of indemnity against actual monetary loss or damage sustained or incurred by the Insured Claimant who has suffered loss or damage by reason of matters insured against by this policy.

(a) The extent of liability of the Company for loss or damage under this policy shall not exceed the least of

(i) the Amount of Insurance,

(ii) the Indebtedness,

(iii) the difference between the value of the Title as insured and the value of the Title subject to the risk insured against by this policy, or

(iv) if a government agency or instrumentality is the Insured Claimant, the amount it paid in the

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acquisition of the Title or the Insured Mortgage in satisfaction of its insurance contract or guaranty.

(b) If the Company pursues its rights under Section 5 of these Conditions and is unsuccessful in establishing the Title or the lien of the Insured Mortgage, as insured,

(i) the Amount of Insurance shall be increased by 10%, and

(ii) the Insured Claimant shall have the right to have the loss or damage determined either as of the date the claim was made by the Insured Claimant or as of the date it is settled and paid.

(c) In the event the Insured has acquired the Title in the manner described in Section 2 of these Conditions or has conveyed the Title, then the extent of liability of the Company shall continue as set forth in Section 8(a) of these Conditions.

(d) In addition to the extent of liability under (a), (b), and (c), the Company will also pay those costs, attorneys' fees, and expenses incurred in accordance with Sections 5 and 7 of these Conditions.

9. LIMITATION OF LIABILITY

(a) If the Company establishes the Title, or removes the alleged defect, lien, or encumbrance, or cures the lack of a right of access to or from the Land, or cures the claim of Unmarketable Title, or establishes the lien of the Insured Mortgage, all as insured, in a reasonably diligent manner by any method, including litigation and the completion of any appeals, it shall have fully performed its obligations with respect to that matter and shall not be liable for any loss or damage caused to the Insured.

(b) In the event of any litigation, including litigation by the Company or with the Company's consent, the Company shall have no liability for loss or damage until there has been a final determination by a court of competent jurisdiction, and disposition of all appeals, adverse to the Title or to the lien of the Insured Mortgage, as insured.

(c) The Company shall not be liable for loss or damage to the Insured for liability voluntarily assumed by the Insured in settling any claim or suit without the prior written consent of the Company.

10. REDUCTION OF INSURANCE; REDUCTION OR TERMINATION OF LIABILITY

(a) All payments under this policy, except payments made for costs, attorneys' fees, and expenses, shall reduce the Amount of Insurance by the amount of the payment. However, any payments made prior to the acquisition of Title as provided in Section 2 of these Conditions shall not reduce the Amount of Insurance afforded under this policy except to the extent that the payments reduce the Indebtedness.

(b) The voluntary satisfaction or release of the Insured Mortgage shall terminate all liability of the Company except as provided in Section 2 of these Conditions.

11. PAYMENT OF LOSS

When liability and the extent of loss or damage have been definitely fixed in accordance with these Conditions, the payment shall be made within 30 days.

12. RIGHTS OF RECOVERY UPON PAYMENT OR SETTLEMENT

(a) The Company's Right to Recover

Whenever the Company shall have settled and paid a claim under this policy, it shall be subrogated and entitled to the rights of the Insured Claimant in the Title or Insured Mortgage and all other rights and remedies in respect to the claim that the Insured Claimant has against any person or property, to the extent of the amount of any loss, costs, attorneys' fees, and expenses paid by the Company. If requested by the Company, the Insured Claimant shall execute documents to evidence the transfer to the Company of these rights and remedies. The Insured Claimant shall permit the Company to sue, compromise, or settle in the name of the Insured Claimant and to use the name of the Insured Claimant in any transaction or litigation involving these rights and remedies.

If a payment on account of a claim does not fully cover the loss of the Insured Claimant, the Company shall defer the exercise of its right to recover until after the Insured Claimant shall have recovered its loss.

(b) The Insured's Rights and Limitations

(i) The owner of the Indebtedness may release or substitute the personal liability of any debtor or guarantor, extend or otherwise modify the terms of payment, release a portion of the Title from the lien of the Insured Mortgage, or release any collateral security for the Indebtedness, if it does not affect the enforceability or priority of the lien of the Insured Mortgage.

(ii) If the Insured exercises a right provided in (b)(i), but has Knowledge of any claim adverse to the Title or the lien of the Insured Mortgage insured against by this policy, the Company shall be required to pay only that part of any losses insured against by this policy that shall exceed the amount, if any, lost to the Company by reason of the impairment by the Insured Claimant of the Company's right of subrogation.

(c) The Company's Rights Against Noninsured Obligors

The Company's right of subrogation includes the

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Insured's rights against non-insured obligors including the rights of the Insured to indemnities, guaranties, other policies of insurance, or bonds, notwithstanding any terms or conditions contained in those instruments that address subrogation rights.

The Company's right of subrogation shall not be avoided by acquisition of the Insured Mortgage by an obligor (except an obligor described in Section 1(e)(i)(F) of these Conditions) who acquires the Insured Mortgage as a result of an indemnity, guarantee, other policy of insurance, or bond, and the obligor will not be an Insured under this policy.

13. ARBITRATION – INTENTIONALLY DELETED

14. LIABILITY LIMITED TO THIS POLICY; POLICY ENTIRE CONTRACT

(a) This policy together with all endorsements, if any, attached to it by the Company is the entire policy and contract between the Insured and the Company. In interpreting any provision of this policy, this policy shall be construed as a whole.

(b) Any claim of loss or damage that arises out of the status of the Title or lien of the Insured Mortgage or by any action asserting such claim shall be restricted to this policy.

(c) Any amendment of or endorsement to this policy must be in writing and authenticated by an authorized person, or expressly incorporated by Schedule A of this policy.

(d) Each endorsement to this policy issued at any time is made a part of this policy and is subject to all of its terms and provisions. Except as the endorsement expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsement, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance.

15. SEVERABILITY

In the event any provision of this policy, in whole or in part, is held invalid or unenforceable under applicable law, the policy shall be deemed not to include that provision or such part held to be invalid, but all other provisions shall remain in full force and effect.

16. CHOICE OF LAW; FORUM

(a) Choice of Law: The Insured acknowledges the Company has underwritten the risks covered by this policy and determined the premium charged therefor in reliance upon the law affecting interests in real property and applicable to the interpretation, rights, remedies, or enforcement of policies of title insurance of the jurisdiction where the Land is located.

Therefore, the court or an arbitrator shall apply the law of the jurisdiction where the Land is located to determine the validity of claims against the Title or the lien of the Insured Mortgage that are adverse to the Insured and to interpret and enforce the terms of this policy. In neither case shall the court or arbitrator apply its conflicts of law principles to determine the applicable law.

(b) Choice of Forum: Any litigation or other proceeding brought by the Insured against the Company must be filed only in a state or federal court within the United States of America or its territories having appropriate jurisdiction.

17. NOTICES, WHERE SENT

Any notice of claim and any other notice or statement in writing required to be given to the Company under this policy must be given to the Company at 12909 SW 68th Pkwy., Suite 350, Portland, OR 97223. WFG National Title Insurance Company's telephone number is (800) 334-8885. Email address: claims@wfgnationaltitle.com.

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Williston Financial Group Privacy Notice

Williston Financial Group LLC, WFG National Title Insurance Company, and each of the affiliates listed below (collectively "WFG" or the "WFG Family") believe it is important to protect your privacy and confidences. We recognize and respect the privacy expectations of our customers. We believe that making you aware of how we collect information about you, how we use that information, and with whom we share that information will form the basis for a relationship of trust between us. This Privacy Notice provides that explanation. We reserve the right to change this Privacy Notice from time to time.

WFG's primary business is providing appraisal, title insurance, and escrow services for the sale or refinance of real property. This can be a complicated process involving multiple parties, many of whom have been selected by our customers, each filling a specialized role. In part, you have hired WFG to coordinate and smooth the passage of the information necessary for an efficient settlement or closing.

In the course of this process, WFG collects a significant amount of personal and identifying information about the parties to a transaction, including sensitive items that include but are not limited to: your contact information, including email addresses, Social Security numbers, driver's license, and other identification numbers and information; financial, bank and insurance information; information about past and proposed mortgages and loans; information about properties you currently or previously owned; your mortgage application package; and the cookie, IP address, and other information captured automatically by computer systems.

Much of this information is gathered from searches of public land, tax, court and credit records to make certain that any liens, challenges or title defects are addressed properly. Some of the information that is collected is provided by you or the computer systems you use. We also may receive information from real estate brokers and agents, mortgage brokers and lenders, and others working to facilitate your transaction, as well as information from public, private or governmental databases including credit bureaus, 'no-fly' lists, and terrorist 'watch lists'.

What Information is Shared?

WFG DOES NOT SELL any of your information to non-affiliated companies for marketing or any other purpose.

However, some of the same information does get shared with persons inside and outside the WFG Family in order to facilitate and complete your transaction.

For example:

However, some of the same information does get shared with persons inside and outside the WFG Family in order to facilitate and complete current and future transactions.

For example:

- Information, draft documents, and closing costs will pass back and forth between WFG and your mortgage broker and lender to facilitate your transaction.
- Information, including purchase agreements and amendments, will pass back and forth between WFG and the real estate agents and brokers, the mortgage brokers and lenders, the lawyers and accountants, and others involved in facilitating the transaction.
- WFG may order property searches and examinations from title searchers, abstractors and title plants.
- WFG may use third parties to obtain tax information, lien information, payoff information, and condominium or homeowners' association information.
- Third parties may be engaged to prepare documents in connection with your transaction.
- Surveys, appraisals, and inspections may be ordered.
- Within the WFG Family of companies, we may divide up the work to handle each closing in the most efficient manner possible and to meet specific legal and licensing requirements. Certain parts of your closing (for example a search or disbursement) may be handled by another division or company within the WFG Family.

- When it is time for signatures, your complete closing package may be sent to a notary, remote online notary, or notary service company who will arrange to meet with you to sign documents. The notary will, in turn, send signed copies back to us along with copies of your driver's license or other identity documents, usually by mail, UPS, Federal Express or another courier service.
- Your deed, mortgage and other documents required to perfect title will be recorded with the local recorder of deeds.
- In some cases, we use an outside service to coordinate the recording or electronic-recording of those instruments, and they will receive copies of your deeds, mortgages and other recordable documents to process, scan and send on to the recording office.
- Information within your title policy may be shared with WFG National Title Insurance Company title policy issuing agents to facilitate future financial transactions involving your property.
- Various government agencies get involved. The law requires us to provide certain information to the IRS, the U.S. Department of the Treasury, local and state tax authorities, and other regulatory and governmental agencies.
- **WFG title policy issuing agents only**: personal information provided by you may be shared with a third party for the purposes of facilitating training to obtain CE/CLE credits.

You have a choice in the selection of a mortgage broker, lender, real estate broker or agent and others that make up your 'transaction team.' Information flows to and from the members of the transaction team you have selected to facilitate an efficient transaction for you.

When WFG selects and engages a third party provider, we limit the scope of the information shared with that third party to the information reasonably necessary for that service provider to provide the requested services. With most, we have entered into agreements in which they expressly commit to maintain a WFG customer's information in strict confidence and use the information only for purposes of providing the requested services, clearing title, preventing fraud and addressing claims under our title insurance policies.

How does WFG use your Information?

We may use your personal information in a variety of ways, including but not limited to:

- Provide the products, services and title insurance you have requested, and to close and facilitate your transaction.
- Provide and use historic transaction information to facilitate future financial transactions.
- Coordinate and manage the appraisal process.
- Handle a claim or provide other services relating to your title insurance policies.
- Create, manage, and maintain your account.
- Operate and improve WFG's applications and websites, including WFG MyHome®, WFG's secure communication and transaction portal. Your information is used for access management, payment processing, site administration, internal operations, troubleshooting, data analysis, testing, research, and for statistical purposes.
- Respond to your requests, feedback or inquiries.
- Comply with laws, regulations, and other legal requirements.
- Comply with relevant industry standards and our policies, including managing WFG's risk profile through reinsurance.
- Protect and enforce your rights and the rights of other users against unlawful activity, including identity theft and fraud.
- Protect and enforce our collective rights arising under any agreements entered into between WFG and you or any other third party.
- Protect the integrity and maintain security of our applications, websites, and products.
- Operate, evaluate, and improve our business.
- Provide you with information about products, services, and promotions from WFG or third parties that may interest you.
- **WFG title policy issuing agents only**: Provide you with a training platform to obtain CE/CLE credits

How Do We Store and Protect Your Personal Information?

Although no system can guarantee the complete security of your personal information, we will use our best efforts to maintain commercially reasonable technical, organizational, and physical safeguards, consistent with applicable law, to protect your personal information and our systems and sites from malicious intrusions or hacking.

How Long Do We Keep Your Personal Information?

We keep your personal information for as long as necessary to comply with the purpose for which it was collected, our business needs, and our legal and regulatory obligations. We may store some personal information indefinitely. If we dispose of your personal information, we will do so in a way that is secure and appropriate to the nature of the information subject to disposal.

Computer Information

When you access a WFG website, or communicate with us by e-mail, we may automatically collect and store more information than you are expressly providing when you fill out a survey or send an email. This may include:

- Your IP Address.
- Your email address, your alias and, social media handles.
- The type of browser and operating system you use.
- The time of your visit.
- The pages of our site you visit.
- Cookies.

In order to provide you with customized service, we make use of Web browser cookies. Cookies are files that help us identify your computer and personalize your online experience. You may disable cookies on your computer, but you may not be able to download online documents or access certain websites unless cookies are enabled.

The technical information we collect is used for administrative and technical purposes and to prevent fraud and provide identity verification. For instance, we may use it to count the number of visitors to our website and determine the most popular pages. We may also use it to review types of technology you are using, determine which link brought you to our website, assess how our advertisements on other websites are working, help with maintenance, and improve our customers' experience.

We may compare information gathered on previous visits to verify that we are interacting with the same parties and not a potential imposter.

If we ask you to fill out any forms or surveys, we will use the information we receive only for the specific purposes indicated in those forms or surveys.

The information you and your transaction team send us in emails or attached to an email, or provide through any of our online tools, is used for purposes of providing title, escrow and appraisal management services and used for the purposes described above.

In addition to the above, if you use an eClosing platform to sign your real estate transaction additional information may be collected. This may include:

- Your IP address.
- Your location.
- Your email address and your alias.
- The type of browser and operating system you use.
- The time of your visit.
- Your biometrics.
- Your image.
- Video recording of your transaction signing.
- Transaction metadata.
- Cookies.

Links to Third Party Sites

Our Applications and Websites may contain links to third-party websites and services. Please note that these links are provided for your convenience and information, and the websites and services may operate independently from us and have their own privacy policies or notices, which we strongly suggest you review. This Privacy Notice applies to WFG's applications and websites only.

Do Not Track

Because there is not an industry-standard process or defined criteria to permit a user to opt-out of tracking their online activities ("Do Not Track"), our websites do not currently change the way they operate based upon detection of a Do Not Track or similar signal. Likewise, we cannot assure that third parties are not able to collect information about your online activities on WFG websites or applications.

Social Media Integration

Our applications, websites, and products contain links to and from social media platforms. You may choose to connect to us through a social media platform, such as Facebook, Twitter, Google, etc. When you do, we may collect from the social media platform additional information from or about you, such as your screen names, profile picture, contact information, contact list, and the profile pictures of your contacts. The social media platforms may also collect information from you.

When you click on a social plug-in, such as Facebook's "Like" button, Twitter's "tweet" button, or the Google+, that particular social network's plug-in will be activated and your browser will directly connect to that provider's servers. Your action in clicking on the social plug-in causes information to be passed to the social media platform.

We do not have control over the collection, use and sharing practices of social media platforms. We therefore encourage you to review their usage and disclosure policies and practices, including their data security practices, before using social media platforms.

How Can You "Opt-Out?"

We do not sell your information; therefore there is no need to opt-out of such reselling. Under various laws, you can opt-out of the sharing of your information for more narrow purposes. For additional detail, consult the Links under the "Legal" Notices attached below.

The "Legal" Notices

To comply with various federal and state laws, we are required to provide more complete legal notices and disclosures – see links below. The state-specific statutes referenced therein may also give residents of those states additional rights and remedies.

Privacy Notice for California Residents - https://national.wfgnationaltitle.com/privacy-notice-california

Privacy Notice for Oregon Residents - https://national.wfgnationaltitle.com/privacy-notice-oregon

How to Contact Us

If you have any questions about WFG's privacy notice or how we protect your information, please contact WFG:

- By email: Consumerprivacy@willistonfinancial.com
- By telephone: 833-451-5718
- By fax: 503-974-9596
- By mail: 12909 SW 68th Pkwy, Suite 350, Portland, OR 97223

WFG FAMILY

WILLISTON FINANCIAL GROUP LLC
WFG NATIONAL TITLE INSURANCE COMPANY
WFG LENDER SERVICES, LLC
WFGLS TITLE AGENCY OF UTAH, LLC
WFG NATIONAL TITLE COMPANY OF WASHINGTON, LLC
WFG NATIONAL TITLE COMPANY OF CALIFORNIA
WFG NATIONAL TITLE COMPANY OF TEXAS, LLC D/B/A WFG NATIONAL TITLE COMPANY
UNIVERSAL TITLE PARTNERS, LLC
VALUTRUST SOLUTIONS, LLC
MYHOME, A WILLISTON FINANCIAL GROUP COMPANY, LLC (formerly known as WILLISTON ENTERPRISE SOLUTIONS & TECHNOLOGY, LLC)
WFG NATIONAL TITLE COMPANY OF CLARK COUNTY, WA, LLC, D/B/A WFG NATIONAL TITLE

Rev 12.20.2022

Rev. 12/2022

FACTS	WHAT DOES WILLISTON FINANCIAL GROUP DO WITH YOUR PERSONAL INFORMATION?
Why?	Financial companies choose how they share your personal information. Federal law gives consumers the right to limit some but not all sharing. Federal law also requires us to tell you how we collect, share, and protect your personal information. Please read this notice carefully to understand what we do.
What?	The types of personal information we collect and share depend on the product or service you have with us. This information can include: • Social Security number and other government identification information • Your name, address, phone, and email • Information about the property, any liens and restrictions • Financial Information including credit history and other debt • Financial account information, including wire transfer instructions.
How?	All financial companies need to share customers' personal information to run their everyday business. In the section below, we list the reasons financial companies can share their customers' personal information; the reasons Williston Financial Group chooses to share; and whether you can limit this sharing.

Reasons we can share your personal information	Does Williston Financial Group share?	Can you limit this sharing?
For our everyday business purposes— such as to process your transactions, maintain your account(s), respond to court orders and legal investigations, or report to credit bureaus	Yes	No
For our marketing purposes— to offer our products and services to you	Yes	No
For joint marketing with other financial companies	No	We don't share
For our affiliates' everyday business purposes— information about your transactions and experiences	Yes	No
For our affiliates' everyday business purposes— information about your creditworthiness	No	We don't share
For our affiliates to market to you	No	We don't share
For nonaffiliates to market to you	No	We don't share

To limit our sharing	• Call 833-451-5718—our menu will prompt you through your choice(s) • Visit us online: http://bit.ly/WFGsConsumerPrivacyInformationRequestPage or e-mailing us at consumerprivacy@willistonfinancial.com • Mail the form below Please note: If you are a new customer, we can begin sharing your information from the date we sent this notice. When you are no longer our customer, we continue to share your information as described in this notice. However, you can contact us at any time to limit our sharing.
Questions?	Call 833-451-5718 or Email consumerprivacy@willistonfinancial.com

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Mail-In Form			
If you have a joint policy, your choices will apply to everyone on your account.	Mark any/all you want to limit: [ ] Do not share information about my creditworthiness with your affiliates for their everyday business purposes. [ ] Do not allow your affiliates to use my personal information to market to me. [ ] Do not share my personal information with nonaffiliates to market their products and services to me.		
	Name		Mail to: Williston Financial Group PRIVACY DEPT 12909 SW 68th Pkwy, #350 Portland, OR 97223
	Address		
	City, State, Zip		
	File Number		

Who we are	
Who is providing this notice	Williston Financial Group, LLC and its affiliates and subsidiaries as listed below:
What we do	
How does Williston Financial Group protect my personal information?	To protect your personal information from unauthorized access and use, we use security measures that comply with federal law. These measures include computer safeguards and secured files and buildings. We limit access to your information to employees that need to use the information to process or protect transaction. We take industry standard (IPSEC) measures to protect against malicious intrusions or hacking
How does Williston Financial Group collect my personal information?	We collect your personal information, for example, when you • Apply for insurance • Engage us to provide appraisal, title and escrow services • Give us your contact information • Provide your mortgage information • Show your driver's license We also collect your personal information from others, such as real estate agents and brokers, mortgage brokers, lenders, credit bureaus, affiliates, and others
Why can't I limit all sharing?	Federal law gives you the right to limit only • sharing for affiliates' everyday business purposes—information about your creditworthiness • affiliates from using your information to market to you • sharing for nonaffiliates to market to you State laws and individual companies may give you additional rights to limit sharing. See below for more on your rights under state law.
What happens when I limit sharing for an account I hold jointly with someone else?	Your choices will apply to everyone on your policy.
Definitions	
Affiliates	Companies related by common ownership or control. They can be financial and nonfinancial companies. Our affiliates include companies with a common corporate identity, including those listed below.
Nonaffiliates	Companies not related by common ownership or control. They can be financial and nonfinancial companies. Nonaffilliates we share with can include real estate agents and brokers, mortgage brokers, lenders, appraisers, abstractors and title searchers and others as appropriate to facilitate your transaction.
Joint marketing	A formal agreement between nonaffiliated financial companies that together market financial products or services to you. Williston Financial Group does not jointly market.
Other important information	
As a resident or citizen of certain states, we may have to provide additional state specific privacy notices and you may have rights other than as set forth above. The links below will provide state specific information: **Privacy Notice for California Residents** - https://national.wfgnationaltitle.com/privacy-notice-california **Privacy Notice for Oregon Residents** - https://national.wfgnationaltitle.com/privacy-notice-oregon	

WFG National Title Insurance Company
a Williston Financial Group company

LOCATION ENDORSEMENT

Commitment No.:	**23-105006**	Policy No.:	**3172000-6462830**
Agent File No.:		Effective Date of Endorsement:	**February 15, 2023**
		Date Issued	**February 21, 2023**

Insured: **IQ Credit Union, ISAOA**

WFG National Title Insurance Company herein called "The Company."

The Company insures against loss or damage sustained by the Insured by reason of the failure of a 1-4 Family Residence, known as 20101 NE 13th Street, Camas, WA 98607 (street address), to be located on the Land at Date of Policy.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Issued By:
WFG National Title Company of Clark County WA, LLC**,**
as Issuing Agent for WFG National Title Insurance Company

By: _____
Authorized Signature

WFG NATIONAL TITLE INSURANCE COMPANY

By: _____
Steve Ozonian, President/CEO

ATTEST: _____
Joseph V. McCabe, EVP/General Counsel/Secretary

WFG NATIONAL TITLE INSURANCE COMPANY INCORPORATED 1974 SOUTH CAROLINA

Form No. 2206

Endorsement 22-06 (Location)
Adopted 06-17-06

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AMERICAN LAND TITLE ASSOCIATION

WFG National Title Insurance Company
a Williston Financial Group company

COMMERCIAL ENVIRONMENTAL PROTECTION LIEN ENDORSEMENT

Commitment No.:	**23-105006**	Policy No.:	**3172000-6462830**
Agent File No.:		Effective Date of Endorsement:	**February 15, 2023**
Insured:	**IQ Credit Union, ISAOA**	Date Issued	**February 21, 2023**

WFG National Title Insurance Company herein called "The Company."

The Company insures against loss or damage sustained by the Insured by reason of an environmental protection lien that, at Date of Policy, is recorded in the Public Records or filed in the records of the clerk of the United States district court for the district in which the Land is located, unless the environmental protection lien is set forth as an exception in Schedule B.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

Issued By:
WFG National Title Company of Clark County WA, LLC, **as Issuing Agent for** WFG National Title Insurance Company

By: _____
Authorized Signature

WFG NATIONAL TITLE INSURANCE COMPANY

By: _____
Steve Ozonian, President/CEO

ATTEST: _____
Joseph V. McCabe, EVP/General Counsel/Secretary

WFG NATIONAL TITLE INSURANCE COMPANY INCORPORATED 1974 SOUTH CAROLINA

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AMERICAN LAND TITLE ASSOCIATION

WFG National Title Insurance Company
a Williston Financial Group company

RESTRICTIONS, ENCROACHMENTS, MINERALS ENDORSEMENT – CURRENT VIOLATIONS

Commitment No.:	**23-105006**	Policy No.:	**3172000-6462830**
Agent File No.:		Effective Date of Endorsement:	**February 15, 2023**
Insured:	**IQ Credit Union, ISAOA**	Date Issued	**February 21, 2023**

WFG National Title Insurance Company herein called "The Company."

1. The insurance provided by this endorsement is subject to the exclusions in Section 5 of this endorsement; and the Exclusions from Coverage, the Exceptions from Coverage contained in Schedule B, and the Conditions in the policy.
2. For the purposes of this endorsement only:
   a. "Covenant" means a covenant, condition, limitation or restriction in a document or instrument in effect at Date of Policy.
   b. "Improvement" means an improvement, including any lawn, shrubbery, or trees, affixed to either the Land or adjoining land at Date of Policy that by law constitutes real property.
3. The Company insures against loss or damage sustained by the Insured by reason of:
   a. A violation at Date of Policy of a Covenant that:
      i. divests, subordinates, or extinguishes the lien of the Insured Mortgage,
      ii. results in the invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage, or
      iii. causes a loss of the Insured's Title acquired in satisfaction or partial satisfaction of the Indebtedness;
   b. A violation on the Land at Date of Policy of an enforceable Covenant, unless an exception in Schedule B of the policy identifies the violation;
   c. Enforced removal of an Improvement located on the Land as a result of a violation, at Date of Policy, of a building setback line shown on a plat of subdivision recorded or filed in the Public Records, unless an exception in Schedule B of the policy identifies the violation; or
   d. A notice of a violation, recorded in the Public Records at Date of Policy, of an enforceable Covenant relating to environmental protection describing any part of the Land and referring to that Covenant, but only to the extent of the violation of the Covenant referred to in that notice, unless an exception in Schedule B of the policy identifies the notice of the violation.

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4. The Company insures against loss or damage sustained by reason of:
   a. An encroachment of:
      i. an Improvement located on the Land, at Date of Policy, onto adjoining land or onto that portion of the Land subject to an easement; or
      ii. an Improvement located on adjoining land onto the Land at Date of Policy

      unless an exception in Schedule B of the policy identifies the encroachment otherwise insured against in Sections 4.a.i. or 4.a.ii.;
   b. A final court order or judgment requiring the removal from any land adjoining the Land of an encroachment identified in Schedule B; or
   c. Damage to an Improvement located on the Land, at Date of Policy:
      i. that is located on or encroaches onto that portion of the Land subject to an easement excepted in Schedule B, which damage results from the exercise of the right to maintain the easement for the purpose for which it was granted or reserved; or
      ii. resulting from the future exercise of a right to use the surface of the Land for the extraction or development of minerals or any other subsurface substances excepted from the description of the Land or excepted in Schedule B.
5. This endorsement does not insure against loss or damage (and the Company will not pay costs, attorneys' fees, or expenses) resulting from:
   a. any Covenant contained in an instrument creating a lease;
   b. any Covenant relating to obligations of any type to perform maintenance, repair, or remediation on the Land;
   c. except as provided in Section 3.d, any Covenant relating to environmental protection of any kind or nature, including hazardous or toxic matters, conditions, or substances;
   d. contamination, explosion, fire, flooding, vibration, fracturing, earthquake or subsidence; or
   e. negligence by a person or an Entity exercising a right to extract or develop minerals or other subsurface substances.

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By: _____
Authorized Signature

WFG NATIONAL TITLE INSURANCE COMPANY

By: _____
Steve Ozonian, President/CEO

ATTEST: _____
Joseph V. McCabe, EVP/General Counsel/Secretary

WFG NATIONAL TITLE INSURANCE COMPANY INCORPORATED 1974 SOUTH CAROLINA

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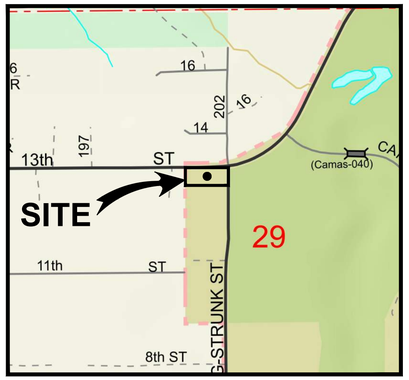
13th Street Site Plan

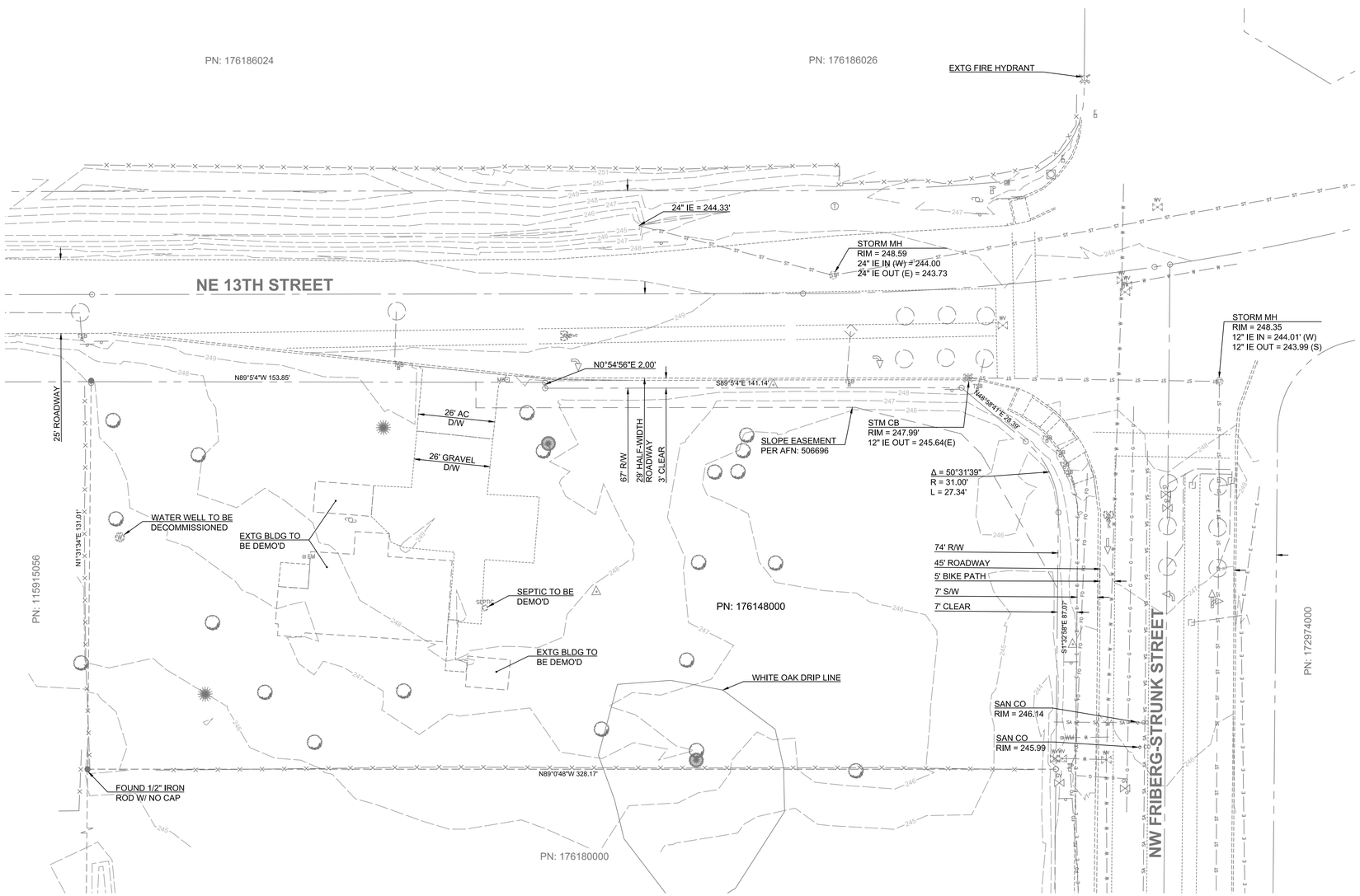
Located in the NW ¼ of Section 29, T2N, R3E, W.M.
City of Camas, Washington



VICINITY MAP
NOT TO SCALE

Sheet Index

1. Existing Conditions Plan
2. Preliminary Site Plan
3. Preliminary Utility Plan
4. Preliminary Grading Plan
5. Existing Tree Survey TP
6. Preliminary Landscape Plan L1
7. Final Landscape Details PD
8. Preliminary Irrigation Details ID



GENERAL NOTES

APPLICANT:
Taz Kahn
3993 NW Currawong Court
Camas, WA 98607
TKahnusa@gmail.com

OWNER:
Pak USA Camas LLC
20107 NE 13th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 176148-000
20101 NE 13TH ST
Camas, WA 98607

HORIZONTAL DATUM:
NAD 83 (2011) Washington State plane coordinate system, south zone, us survey feet. Based on real time kinematic corrections from the Washington State reference network.

VERTICALL DATUM:
NGVD 1929(47) based on real time kinematic corrections from the Washington State reference network.

Scale 1" = 20'
20 10 0 20

N

ENGINEERING
PLS

Existing Conditions Plan For:
13th Street Site Plan
A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions
1 2 3 4 5 6

SCOTT W. GILLILAND
STATE OF WASHINGTON
42773
REGISTERED PROFESSIONAL ENGINEER
8/31/23

Project No. 3632	
SCALE:	H: 1" = 20' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

1
8

13th Street Site Plan

Located in the NW ¼ of Section 29, T2N, R3E, W.M.
City of Camas, Washington

PARCEL STATISTICS		
ZONE: Business Park BP		
Gross Site Area	42,208 SQ FT	0.97 AC
Critical Areas	0 SQ FT	0 AC
	REQUIRED	PROPOSED
Density	N/A	N/A
Maximum Lot Coverage	50%	20%
Setbacks		
North	15'	15'
South	15'	15'
East	15'	15'
West	50'	50'
Maximum Building Height	None	28'
Total Parking Spaces *	20	20
Standard Parking Spaces	70% Min of Total	20
Compact Spaces (C)	30% Max of Total	0
Gas Fill-up Stalls *	1 Per Nozzle (8)	8
ADA Spaces (ADA)	1 Per 25 of Total (1)	1
Spaces with Electric Vehicle Charging Infrastructure (E)	10% Now (2) + 10% Future (2)	2 Now + 2 Future

*Note: The Gas stalls are not actually parking stalls and do not count towards the required ADA and EV calculations.

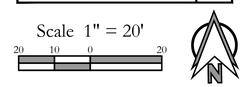
REQUIRED PARKING CALCULATIONS:

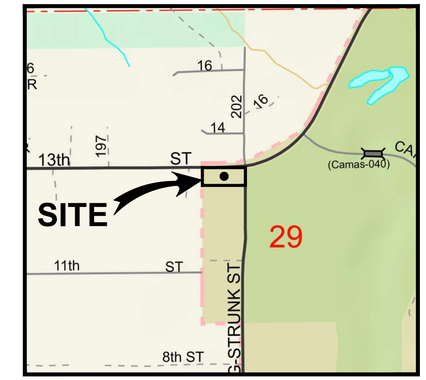
4100 sf c-store @ 1/250 sf	= 17
8 nozzle gas station @ 1/nozzle	= 8
1 stall carwash w/ 2 employees @ 2/stall+1/2 employees	= 3
Total	= 28
Excluding Gas Fill-up Stalls	= 20

Legend

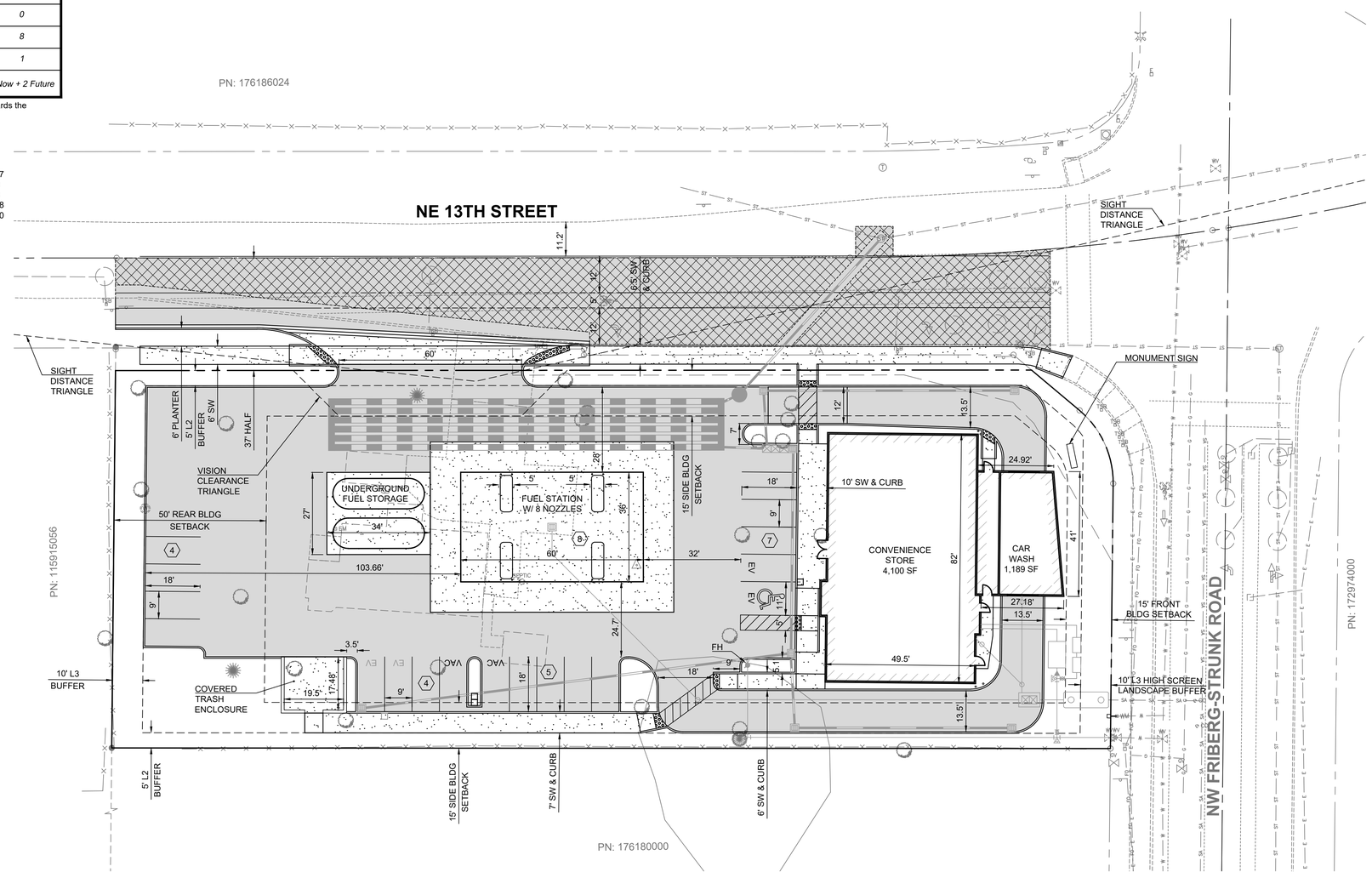
- Proposed Asphalt Concrete
- Proposed Cement Concrete
- Proposed Grind and Overlay

Scale 1" = 20'





VICINITY MAP
NOT TO SCALE



GENERAL NOTES

APPLICANT:
Taz Kahn
3993 NW Currawong Court
Camas, WA 98607
TKahnusa@gmail.com

OWNER:
Pak USA Camas LLC
20107 NE 13th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 176148-000
20101 NE 13TH ST
Camas, WA 98607

SITE STATISTICS:
Existing Site Area: 42,257 SF (0.97 Acre)
ROW Dedication: 1,832 SF (0.04 Acre)
Developed Site: 42,257 SF (0.93 Acre)

ENGINEERING
PLS

Preliminary Site Plan For:
13th Street Site Plan
A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	
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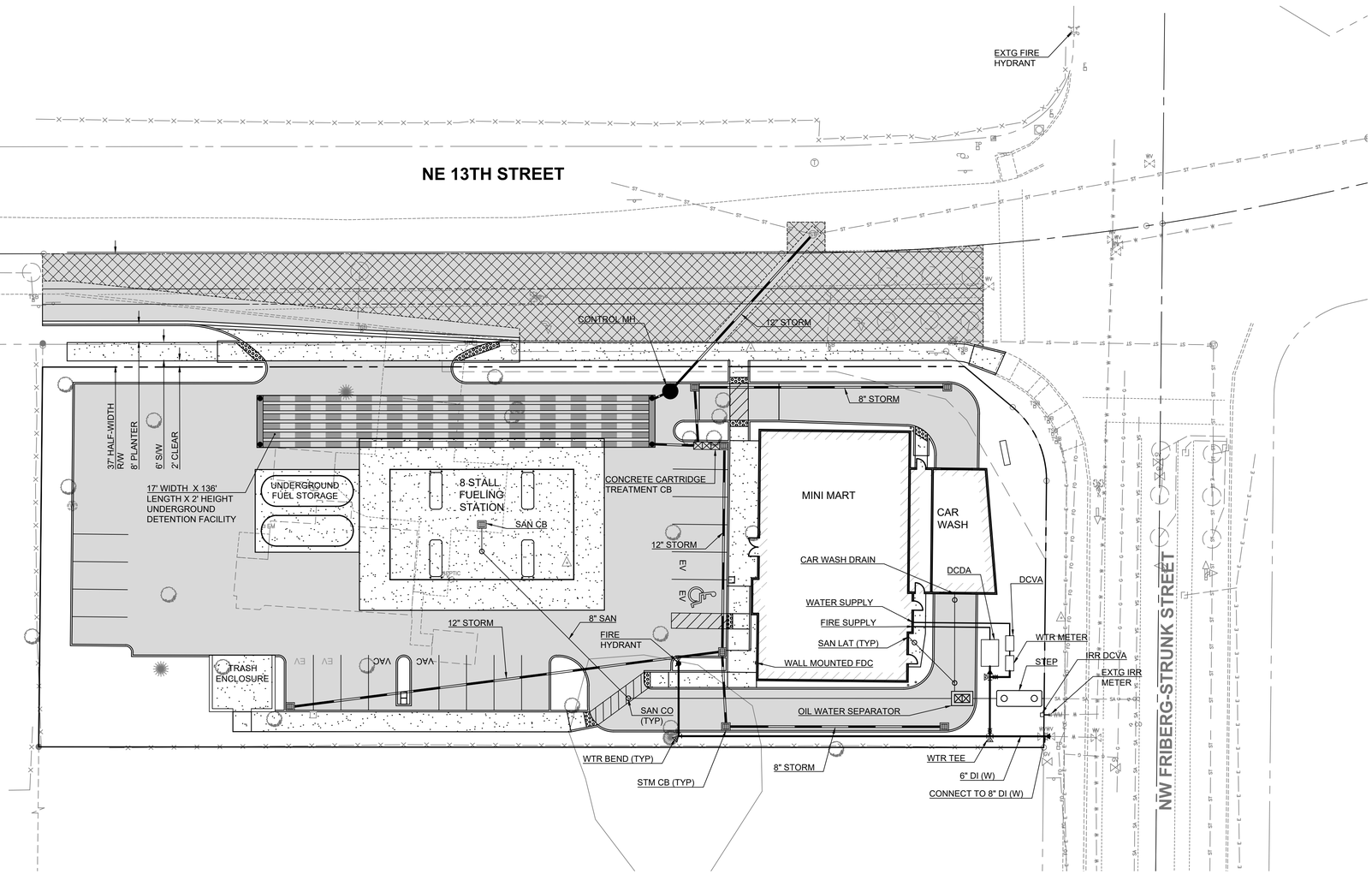
SCOTT W. GILLILAND
STATE OF WASHINGTON
42773
REGISTERED PROFESSIONAL ENGINEER
11/09/23

Project No. 3632	
SCALE:	H: 1" = 20' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

2
8



Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Grind and Overlay	

Scale 1" = 20'

20 10 0 20

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PLS ENGINEERING

Preliminary Utility Plan For:

13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

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SCOTT W. GILLILAND
STATE OF WASHINGTON
42773
REGISTERED PROFESSIONAL ENGINEER
11/22/23

Project No. 3632	
SCALE:	H: 1" = 20' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

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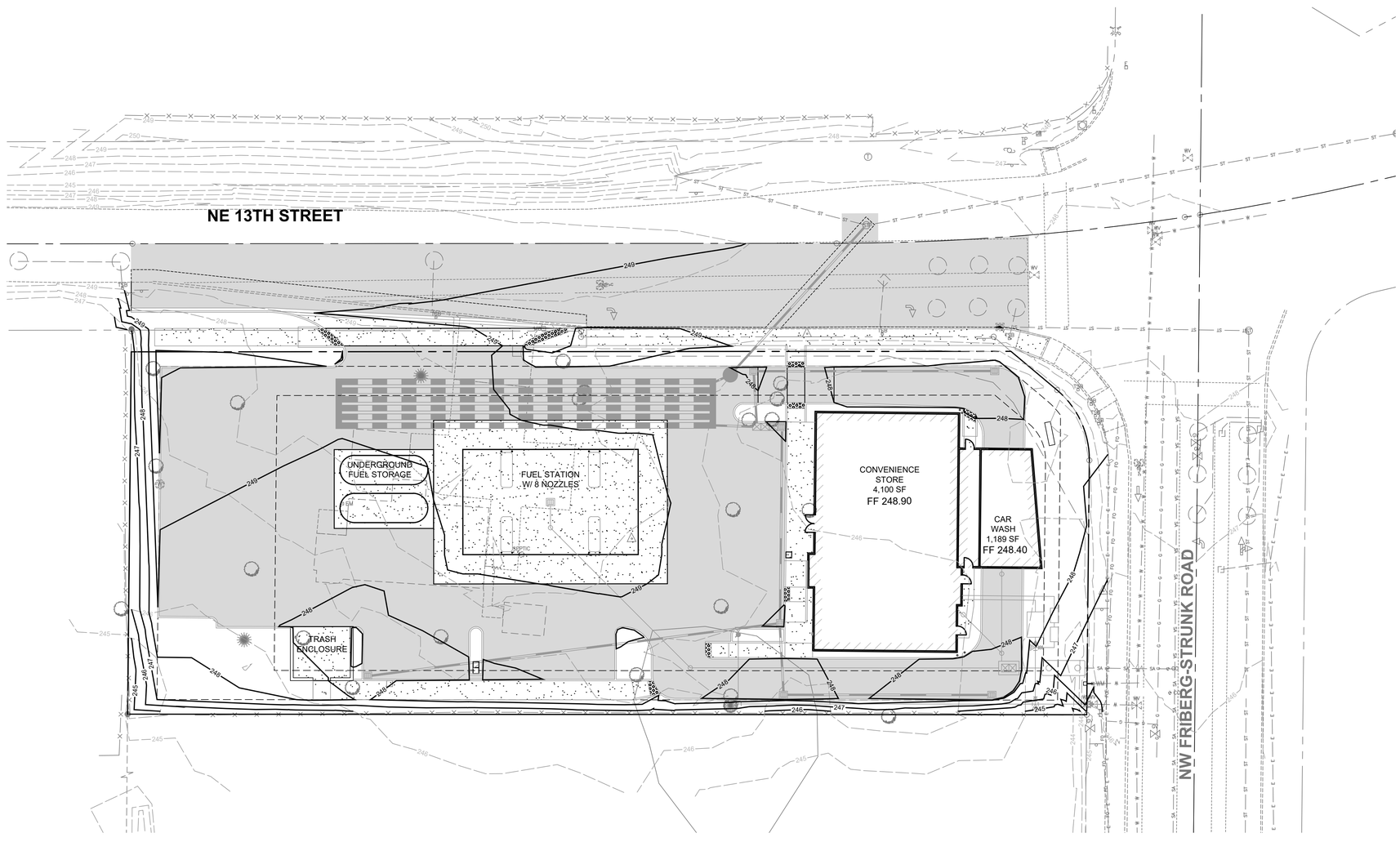

UNADJUSTED VOLUMES	
CUT	620 CY
FILL	1,730 CY

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Grind and Overlay	

Scale 1" = 20'

20 10 0 20

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PLS ENGINEERING

Preliminary Grading Plan For:

13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

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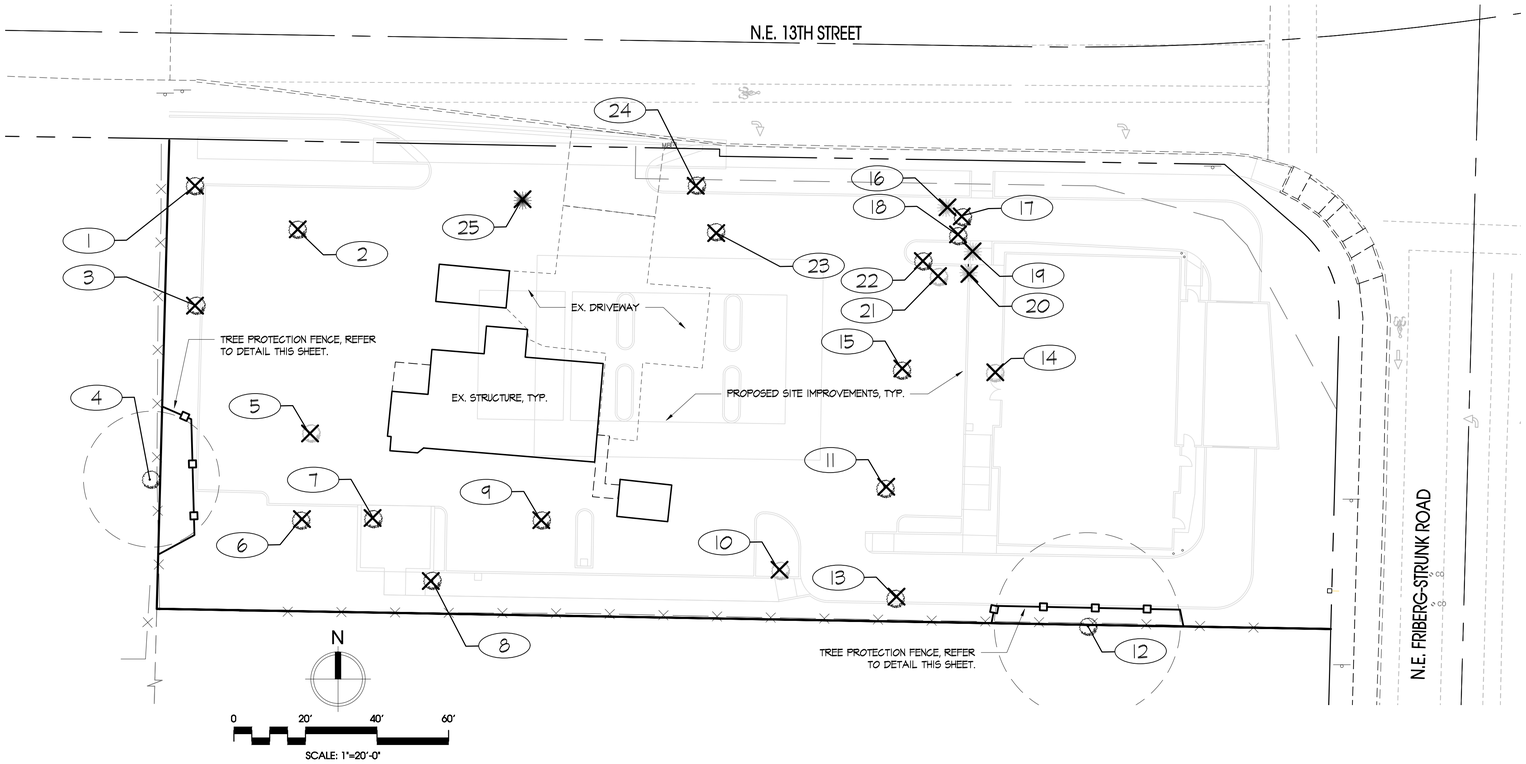
SCOTT W. GILLILAND — STATE OF WASHINGTON — 42773 — REGISTERED PROFESSIONAL ENGINEER — 11/03/23

Project No. 3632	
SCALE:	H: 1" = 20' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

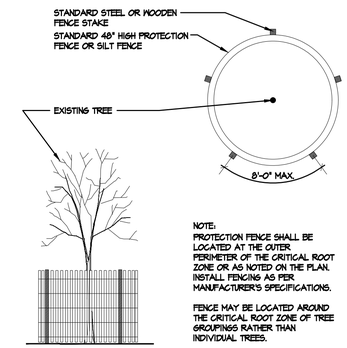
4 / 8



SITE STATISTICS	
.93± AC	SITE AREA
19	TREE UNITS REQUIRED (20 / ACRE)
0	TREE UNITS RETAINED

SYMBOL LEGEND	
SYMBOL	DESCRIPTION
	EXISTING SIGNIFICANT DECIDUOUS TREE (12" CAL. OR GREATER) EXISTING SIGNIFICANT EVERGREEN TREE (8" CAL. OR GREATER)
	EXISTING DECIDUOUS (LESS THAN 12" CAL.) EXISTING EVERGREEN TREE (LESS THAN 8" CAL.)
	EXISTING SIGNIFICANT TREES TO BE REMOVED
	ROOT PROTECTION ZONE AREA (RPZ)
	TREE PROTECTION FENCE LOCATION (4' CHAIN LINK, ORANGE PVC FENCE OR SILT FENCE) (ALSO DENOTES AREA WHERE NO IMPACTS TO THE ROOT PROTECTION ZONE SHALL OCCUR). SEE DETAIL THIS SHEET.

CERTIFIED ARBORIST
ISA
Robert Phipps,
PN-8751A



NOTE:
PROTECTION FENCE SHALL BE LOCATED AT THE OUTER PERIMETER OF THE CRITICAL ROOT ZONE OR AS NOTED ON THE PLAN. INSTALL FENCING AS PER MANUFACTURER'S SPECIFICATIONS.

FENCE MAY BE LOCATED AROUND THE CRITICAL ROOT ZONE OF TREE GROUPINGS RATHER THAN INDIVIDUAL TREES.

A Tree Protection Fencing Detail
Not To Scale — SECTION / PLAN VIEW

TREE PROTECTION TIME LINE & NARRATIVE

EXISTING ON-SITE AND OFF-SITE TREE LOCATIONS AND SIZES HAVE BEEN OBTAINED VIA SURVEY INFORMATION AND SITE OBSERVATIONS.

NO EXISTING TREES WITHIN THE PROJECT BOUNDARIES ARE PROPOSED TO BE RETAINED.

TREE PROTECTION FENCING SHALL BE PLACED AS SHOWN TO PROTECT THE OFF-SITE TREE NEAR THE S.E. CORNER OF THE SITE.

TREE PROTECTION / EROSION CONTROL FENCING SHALL BE ESTABLISHED PRIOR TO EXCAVATION. IT IS RECOMMENDED TO BE INSTALLED AT THE SAME TIME EROSION CONTROL MEASURES ARE INSTALLED. WHERE TREE FENCE AND EROSION CONTROL FENCE ARE LOCATED AT THE SAME LOCATION, EROSION FENCE THEN SERVES AS TREE PROTECTION FENCE. SEE DETAIL THIS SHEET.

TREES DETERMINED TO BE A SAFETY HAZARD AT THE TIME OF CONSTRUCTION MAY BE REMOVED. THE SITE WILL MAINTAIN A MINIMUM TREE UNIT COUNT OF 20 TREES PER ACRE IN ACCORDANCE WITH CITY OF CAMAS MUNICIPAL CODE CC 18.13.051.

TREE PROTECTION NOTES

1) NO PERSON MAY CONDUCT ANY OF THE FOLLOWING ACTIVITIES WITHIN THE DRIP LINE OF THE TREES DESIGNATED TO REMAIN INCLUDING, BUT NOT LIMITED TO: PARKING EQUIPMENT, FUELING, SERVICING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIAL AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT AND LOCATING BURN HOLES.
2) DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO THE TREES DESIGNATED FOR PROTECTION.
3) THE CONTRACTOR SHALL FOLLOW THE GRADING PLAN PROVIDED BY THE PROJECT CIVIL ENGINEER. GRADING ACTIVITIES SHALL BE CONDUCTED IN A MANNER TO MINIMIZE THE IMPACTS TO THE TREES MARKED FOR PRESERVATION.
4) THE EXCAVATOR SHALL KEEP A SHARP PAIR OF LOPPERS AND A SHARP 12" PRUNING SAW ACCESSIBLE ON-SITE DURING GRADING OPERATIONS. ANY ROOTS LARGER THAN ½" SHALL BE PRUNED TO THE FACE OF THE CUT (USING A SHARP PAIR OF LOPPERS OR A SHARP 12" PRUNING SAW) AND SHALL NOT BE TORN FROM THE GROUND BY MECHANICAL EXCAVATION.
5) SPECIAL CARE SHALL BE EXERCISED IN WORKING NEAR THE TREES TO BE RETAINED. THIS INCLUDES HAND EXCAVATING THE ROOTS AT THE EDGE OF THE EXCAVATION AND CUTTING ROOTS WITH A LOPPER OR PRUNING SAW. PRUNING THE ROOTS AT THE EDGE OF EXCAVATION WILL MINIMIZE BREAKAGE OF HEALTHY ROOTS BEYOND THE EDGE OF THE PROPOSED EXCAVATION.
6) EXCEPT FOR THE PROPOSED IMPROVEMENTS SHOWN WITHIN THE DRIP LINES OF THE TREES NOTED TO BE RETAINED THE GRADE SHALL NOT BE ELEVATED OR REDUCED FROM EXISTING GRADE.
7) IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREE'S DRIP LINE, IT SHALL BE PERMANENTLY STABILIZED.
8) THE TREES NOTED TO RETAINED SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. CLEARING OPERATIONS SHALL BE CONDUCTED SO AS TO EXPOSE THE SMALLEST PRACTICAL AREA OF SOIL TO EROSION FOR THE LEAST POSSIBLE TIME. REFER TO THE PROJECT'S EROSION CONTROL PLAN FOR MORE INFORMATION.
9) THE PROJECT SHALL NOT INSTALL AN IMPERVIOUS SURFACE OTHER THAN THOSE SPECIFICALLY SHOWN ON THE PLANS WITHIN THE DRIP LINE OF THE TREES TO BE RETAINED.
10) UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE DRIP LINE OF THE TREES TO BE RETAINED.
11) ONGOING TREE MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE LAND OWNER. TREES SHALL BE MAINTAINED IN ACCORDANCE WITH ANSI AMERICAN NATIONAL STANDARDS INSTITUTE'S AS WELL AS OTHER APPLICABLE FEDERAL, STATE AND LOCAL STANDARDS PERTAINING TO TREE CARE OPERATIONS.

- ANSI Z133 ARBORICULTURAL OPERATIONS: SAFETY REQUIREMENTS
- ANSI A300 PART 1 PRUNING

Tree Data

Tree No.	Species	DBH	RPZ	Tree Condition	Condition Notes
1	Prunus spp. (Plum)	12"	12'	poor	Diseases or Conks, Visible Decay
2	Malus spp. (Apple)	19"	19'	fair	Diseases or Conks, Leaning
3	Malus spp. (Apple)	13"	13'	fair	Dieback 30% - 60%
4	Robinia pseudoacacia (Black Locust)	19"	19'	fair	Heavy Leaning (>60%)
5	Acer palmatum (Japanese maple)	9"	9'	poor	Dieback 30% - 60%, Visible Decay
6	Thuja plicata (Western Redcedar)	18"	18'	good	
7	Malus spp. (Apple)	18"	18'	poor	Branch Failures, Biotic Damage (Pests/Fungus), Dieback 60%-90%, Diseases or Conks, Visible Decay
8	Acer palmatum (Japanese maple)	12"	12'	good	
9	Malus spp. (Apple)	17"	17'	fair	Biotic Damage (Pests/Fungus), Dieback 30% - 60%, Leaning
10	Malus spp. (Apple)	11"	11'	poor	Included Bark, Dieback 30% - 60%, Leaning
11	Acer saccharum (Sugar Maple)	22"	22'	good	Dieback 30% - 60%
12	Aesculus californica (California Buckeye)	26"	26'	fair	Branch Failures, Dieback 30% - 60%, Leaning
13	Quercus garryana (OR White Oak)	43"	43'	fair	Leaning
14	Aesculus californica (California Buckeye)	10"	10'	fair	Dieback 30% - 60%
15	Robinia pseudoacacia (Black Locust)	25"	25'	fair	Branch Failures, Dieback 30% - 60%, Leaning
16	Picea pungens (Blue Spruce)	6"	6'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
17	Acer saccharum (Sugar Maple)	18"	18'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
18	Acer saccharum (Sugar Maple)	19"	19'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
19	Picea pungens (Blue Spruce)	7"	7'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
20	Thuja occidentalis (Aborvitae)	6"	6'	poor	Branch Failures, Branches Suppressed, Co-dominant, Dieback 30% - 60%, Visible Decay
21	Malus spp. (Apple)	6"	6'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
22	Acer saccharum (Sugar Maple)	20"	20'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
23	Acer palmatum (Japanese maple)	15"	15'	good	
24	Robinia pseudoacacia (Black Locust)	33"	33'	poor	Branch Failures, Dieback 30% - 60%, Leaning, Visible Decay
25	Thuja plicata (Western Redcedar)	44"	44'	fair	Leaning, Visible Decay

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4400 NE 77th Avenue
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VANCOUVER, WA 9866
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PBS ENGINEERING ENVIRONMENTAL SURVEYING PBSUSA.COM

13TH STREET GAS STATIOIN
20101 NE 13th Street
Camas, Washington

DRAWN: CB/RP	CHECKED: CB
SCALE: 1" = 20'-0"	DATE: 11.03.23
JOB #: 23-1887	
ISSUED FOR: PLR	

REVISIONS:
1
2
3
4
5
6

SHEET NAME:
EXISTING TREE SURVEY

SHEET #:
TP

SHEET 5 OF 8

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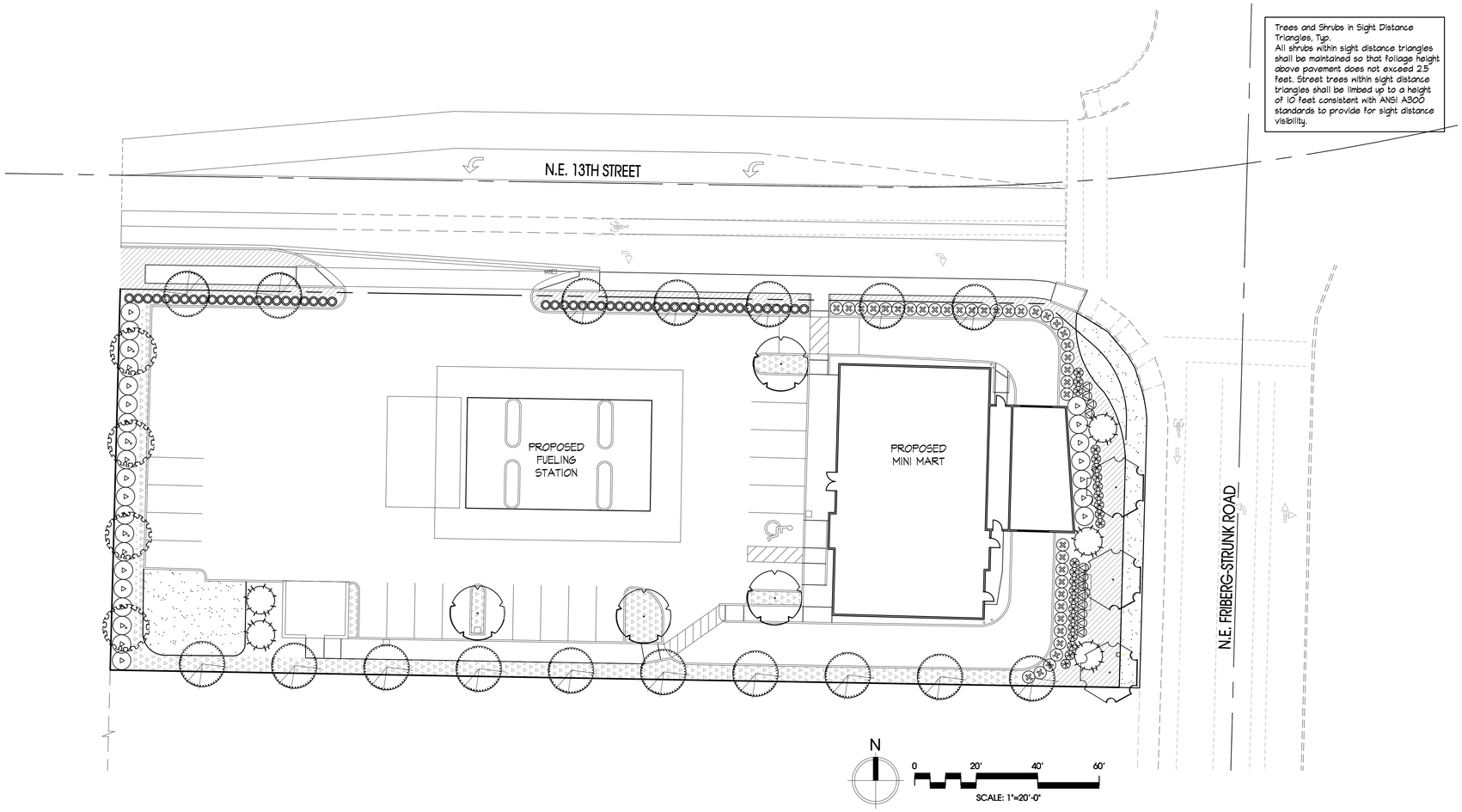

Trees and Shrubs in Sight Distance Triangles, Typ.
All shrubs within sight distance triangles shall be maintained so that foliage height above pavement does not exceed 2.5 feet. Street trees within sight distance triangles shall be limbed up to a height of 10 feet consistent with ANSI A300 standards to provide for sight distance visibility.

TREE LEGEND

SYMBOL	BOTANICAL / COMMON NAME	SIZE	QUANTITY	TREE UNITS
TREES				
	ACER RUBRUM 'ARMSTRONG' ARMSTRONG MAPLE	2" cal. min.	17	17
	CARPINUS BETULUS 'FASTIGIATA' PYRAMIDAL EUROPEAN HORNBEAM	2" cal. min.	4	4
	LIRIODENDRON TULIPERA 'JFS-OZ' EMERALD CITY TULIP TREE	2" cal. min.	3	3
	THUJA PLICATA 'HOGAN' WESTERN RED CEDAR	6' HT min.	5	5
	TILIA CORDATA 'CORZAM' CORINTHIAN LINDEN	2" cal. min.	4	4
			TOTAL TREE UNITS	33
SHRUBS				
	LIGUSTRUM JAPONICUM 'TEXANUM' WAX PRIVET	5 GAL.	38	
	MAHONIA REPENS CREEPING OREGON GRAPE	2 GAL.	12	
	MYRICA CALIFORNICA PACIFIC WAX MYRTLE	5 GAL.	27	
	PRUNUS LAUROCERASUS 'OTTO LUYKEN' OTTO LUYKEN'S LAUREL	5 GAL.	52	
	VIBURNUM DAVIDII DAVID VIBURNUM	2 GAL.	24	
GROUNDCOVER				
	ARCTOSTAPHYLOS UVA URSI 'MASS.' MASSACHUSETTS KINICKINNICK	1 GAL.	30" O.C.	
	RUBUS CALYCINOIDES CREEPING RASPBERRY	1 GAL.	30" O.C.	
	LAWN (SEED OR SOD) PER OWNER			

TREE UNIT SUMMARY

SITE AREA	.93± AC
REQUIRED TREE UNITS / ACRE	20
TOTAL REQUIRED TREE UNITS	19
EXISTING TREE UNITS RETAINED	0
TREE UNITS PROPOSED TO PLANT	33
TREE UNITS PROVIDED	33

PLANTING NOTES

1. ALL BOUNDARIES, EASEMENTS, UTILITIES AND LEGAL ENCUMBRANCES TO BE CONFIRMED WITH OWNER PRIOR TO BEGINNING WORK. PROPERTY LINES AND SURVEY INFORMATION PROVIDED BY **FLS ENGINEERING**
2. IN NO WAY IS THIS PLAN TO BE INTERPRETED TO EXCEED THE LEGAL BOUNDARIES OF THE OWNER'S REAL PROPERTY.
3. THE LANDSCAPE DESIGNER ASSUMES NO RESPONSIBILITY FOR THE LOCATION OF BOUNDARIES, UTILITIES AND WETLANDS.
4. THIS PLAN SHALL BE INSTALLED TO MEET ALL APPLICABLE CITY, COUNTY, STATE AND FEDERAL CODES.
5. THIS PLAN SHALL BE CONSIDERED PRELIMINARY UNTIL APPROVED BY ALL GOVERNING AGENCIES. IMPLEMENTATION OF THIS PLAN SHALL NOT PROCEED UNTIL ISSUANCE OF ALL RELATED PERMITS.
6. PLANT QUANTITIES ARE FOR INFORMATION ONLY. IN CASE OF ANY DISCREPANCY, THE PLAN SHALL GOVERN.
7. ALL WORK IS TO BE PERFORMED BY LICENSED CONTRACTORS AND EXPERIENCED WORKERS.
8. THE CONTRACTOR IS TO VERIFY THE LOCATION OF EXISTING UNDERGROUND UTILITIES AND STRUCTURES PRIOR TO PERFORMING ANY EXCAVATION. CONTRACTOR SHALL REPAIR ANY DAMAGE TO UTILITIES CAUSED BY THE CONTRACTOR'S WORK, AT NO ADDITIONAL COST TO THE OWNER. CONTACT ALL UTILITY PROVIDERS SERVING THE SITE AREA 48 HOURS PRIOR TO ANY EXCAVATION.
9. ALL PLANT MATERIALS SHALL MATCH SPECIFICATIONS PER SPECIES AND SHALL COMPLY WITH ANSI Z60.1 'STANDARD FOR NURSERY STOCK'.
10. THE CONTRACTOR SHALL ADHERE TO THE WASHINGTON ASSOCIATION OF NURSERYMEN'S GUIDELINES FOR PLANTING PRACTICES.
11. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING ELEMENTS ON AND OFF SITE, RESULTING FROM THE CONTRACTOR'S WORK.
12. THE CONTRACTOR IS RESPONSIBLE FOR THE VIABILITY OF ALL PLANT MATERIAL FOR 2 YEARS AFTER COMPLETION OF PLANTING. DISEASED, DYING, OR DEAD PLANT MATERIAL SHALL BE REPLACED BY THE CONTRACTOR DURING THE TWO YEAR PERIOD AND MAINTAINED FOR AN ADDITIONAL 2 YEAR PERIOD.
13. IMMEDIATELY UPON BID AWARD, CONTRACTOR SHALL SECURE THE PLANT MATERIALS AS SPECIFIED FROM AVAILABLE SOURCES. IN THE EVENT THAT PLANT MATERIALS ARE NOT AVAILABLE, CONTACT LANDSCAPE ARCHITECT FOR APPROVED SUBSTITUTIONS. NO SUBSTITUTION FOR PLANT MATERIAL WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.
14. TOP DRESS ALL SHRUB AND GROUND COVER AREAS (NOT LAWN) WITH 3" OF FIR BARK MULCH. SUBMIT SAMPLE TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION.
15. TREE LOCATIONS MAY BE ADJUSTED IN THE FIELD TO SUIT SITE REQUIREMENTS AS DIRECTED BY THE LANDSCAPE ARCHITECT.
16. THE CONTRACTOR SHALL ENSURE THAT ALL EXCAVATED PLANTING PITS HAVE POSITIVE DRAINAGE. PLANT PITS FULLY FLOODED WITH WATER SHALL DRAIN WITHIN (12) HOURS OF FILLING.
17. FINISH GRADE SHALL BE SET TO ALLOW POSITIVE DRAINAGE
18. ROTOTILL 2" OF COMPOST INTO ALL PLANTED AREAS.
19. INCORPORATE PEAT INTO THE ROOT ZONE OF RHODODENDRONS, AZALEAS AND OTHER ACID LOVING PLANTS.
20. INCORPORATE 10-20-20 FERTILIZER INTO THE ROOT ZONE OF ALL NEW PLANTINGS.
21. RONSTAR, OR APPROVED EQUAL, PREEMERGENT HERBICIDE TO BE APPLIED TO ALL PLANTED AREAS PER MANUFACTURERS INSTRUCTIONS.
22. EXISTING VEGETATION TO BE SPRAYED WITH ROUNDUP, OR APPROVED EQUAL, PER MANUFACTURERS INSTRUCTIONS. SUFFICIENT TIME SHALL BE GIVEN TO ALLOW EXISTING MATERIAL TO DIE. REMOVE EXISTING 2T.
23. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
24. CROWN LAWN AREAS AND GRADE TO PROVIDE POSITIVE DRAINAGE.
25. ROLL LAWN AREA TO INSURE PROPER COMPACTION TO MINIMIZE SETTLING.
26. AMEND SOIL IN LAWN AREAS WITH 80 LBS. OF DOLOMITE LIME AND 40 LBS. OF 10-20-20 SLOW RELEASE FERTILIZER OR EQUIVALENT. PROVIDE A 3" LAYER OF SANDY LOAM TOPSOIL FOR LAWN AND BED AREA.
27. SEED LAWN AREAS WITH GRASS SEED MANUFACTURER'S RECOMMENDATIONS. COVER SEED WITH FINE MULCH APPLIED WITH ROLLER OR HYDROSEED.
28. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
29. PLANT MATERIAL SHALL BE PLANTED W/ ROOT CROWN 1" ABOVE FINISHED GRADE TO ALLOW POSITIVE DRAINAGE AWAY FROM CROWN.
29. STAKE ALL TREES OVER 6 FT. IN HEIGHT PER DETAILS ON THIS SHEET.
30. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
31. ALL PLANTING SHALL BE HAND WATERED OR IRRIGATED BY AN AUTOMATIC UNDERGROUND SPRINKLER SYSTEM.
32. ALL PLANT MATERIALS FURNISHED ARE TO BE HEALTHY, UNIFORMLY BRANCHED AND WITH WELL DEVELOPED FIBROUS ROOT SYSTEMS.
33. ALL PLANT MATERIALS FURNISHED ARE TO BE FREE FROM DEAD OR BROKEN BRANCHES, LICHENS, SCARS, BROKEN BARK OR WOUNDS. ALL PLANT MATERIALS WILL BE INSECT, WEED, AND DISEASE FREE ACCORDING TO THE REQUIREMENTS OF THE **WASHINGTON** STATE DEPARTMENT OF AGRICULTURE FOR NURSERY PLANT MATERIALS SOLD FOR WHOLESALE OR RETAIL. ALL PRUNING WOUNDS MUST BE WELL HEALED WITH NO EVIDENCE OF DECAY.
34. FIELD CONFIRM ALL SITE CONDITIONS, AREAS AND SIZES PRIOR TO BIDDING & CONSTRUCTION. DO NOT SCALE FROM PLANS.

IRRIGATION NOTE

ALL LANDSCAPE AREAS SHALL BE HAND WATERED OR IRRIGATED WITH AN AUTOMATIC DRIP AND/OR SPRAY IRRIGATION SYSTEM. REFER TO CIVIL ENGINEERING PLANS FOR WATER SOURCE.

REFER TO SHEET PD FOR LANDSCAPE DETAILS AND NOTES
REFER TO SHEET ID FOR IRRIGATION DETAILS AND NOTES.

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STATE OF WASHINGTON
CHRISTOPHER A. BAUMAN
LICENSED LANDSCAPE ARCHITECT
EXP.

PRELIMINARY
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SUBJECT TO APPROVAL

13TH STREET GAS STATIOIN

20101 NE 13th Street
Camas, Washington

DRAWN: CB	CHECKED: CB
SCALE: 1" = 20'-0"	DATE: 11.08.23
JOB #: 23-1837	
ISSUED FOR: PLR	
REVISIONS:	
1	
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SHEET NAME:	
SHEET #: L1	
SHEET 6 OF 8	

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LANDSCAPING GENERAL NOTES:

1. DEVELOPER SHALL SUBMIT A LANDSCAPE PLAN SHOWING PLANT TYPE, LOCATION, AND QUANTITY OF PLANTS, THAT IS DESIGNED BY A QUALIFIED LANDSCAPE DESIGNER.
2. SHOW THE LOCATION OF SIDEWALK, LIGHT POLES, MAIL BOXES, DRIVEWAYS, FIRE HYDRANTS, INTERSECTIONS, AND ANY OTHER APPURTENANCE THAT MAY INFLUENCE THE PLACEMENT OF PLANTS.
3. LANDSCAPING SHALL BE SELECTED AND LOCATED TO DETER SOUND, FILTER AIR CONTAMINANTS, CURTAIL EROSION, MINIMIZE STORM WATER RUN-OFF, CONTRIBUTE TO LIVING PRIVACY, REDUCE THE VISUAL IMPACTS OF BUILDINGS/EQUIPMENT AND PAVED AREAS, SCREEN, REDUCE GLARE, AND EMPHASIZE OR SEPARATE OUTDOOR SPACES OF DIFFERENT USES OR CHARACTER.
4. LANDSCAPING SHALL BE DESIGNED TO BE HARMONIOUS WITH THE LOCAL SETTING AND WITH NEIGHBORING DEVELOPMENTS.
5. PLANTS AND TREES SHALL COMPLEMENT OR SUPPLEMENT SURROUNDING NATURAL VEGETATION.
6. PLANTS AND TREES CHOSEN SHALL BE IN SCALE WITH THE STRUCTURES AND EQUIPMENT DEVELOPMENT, KEEPING IN MIND THE MATURE SIZE OF PLANTINGS.
7. MINIMUM LANDSCAPING AS A PERCENT OF GROSS SITE AREA SHALL BE 15%.
8. DEVELOPER SHALL PROVIDE AN IRRIGATION PLAN.
   - 8.1 APPROPRIATE IRRIGATION SYSTEMS SHALL BE INSTALLED WHERE NEEDED TO ASSURE LANDSCAPING SUCCESS.
   - 8.2 DESIGN OF LANDSCAPING THAT INCLUDES XERISCAPE PRINCIPLES IS ENCOURAGED TO REDUCE LONG-TERM MAINTENANCE DEMANDS AND TO CONSERVE WATER.
   - 8.3 XERISCAPE IS DEFINED AS LANDSCAPE DESIGN, WHICH WOULD INCORPORATE PLANT MATERIALS THAT REQUIRE LITTLE OR NO IRRIGATION AND RELY ON NATURAL MOISTURE AND RAINFALL FOR SURVIVAL ONCE ESTABLISHED.
9. LANDSCAPE SHALL BE DESIGNED WITH MAINTENANCE IN MIND:
   - 9.1 DEVELOPER SHALL PROVIDE A MAINTENANCE PLAN DESCRIBING FUNDING, RESPONSIBILITY, AND FREQUENCY OF MAINTENANCE.
   - 9.2 PLANTS AND TREES THAT MINIMIZE UPKEEP AND MAINTENANCE SHALL BE SELECTED.
   - 9.3 TREES, AS THEY GROW, SHALL BE PRUNED TO THEIR NATURAL FORM TO PROVIDE AT LEAST 10 FEET OF CLEARANCE ABOVE SIDEWALKS AND 12 FEET ABOVE STREET ROADWAY SURFACES.
   - 9.4 SHRUBS SHALL BE MAINTAINED TO A MAXIMUM HEIGHT OF 42 INCHES FROM TOP OF CURB TO TOP OF PLANT. ENSURE THAT SHRUBS ARE TRIMMED BACK FROM FACE OF CURB.
10. WHERE THERE ARE OVERHEAD UTILITY LINES, TREE SPECIES THAT WILL NOT INTERFERE WITH THOSE LINES SHALL BE CHOSEN. DEVELOPER IS TO VERIFY WITH UTILITY ON SPECIES SELECTION.
11. TREES SHALL NOT BE PLANTED WITHIN 2 FEET OF ANY PERMANENT HARD SURFACE PAVING OR WALKWAY.
12. PARKING AND LOADING AREAS SHALL BE SCREENED FROM HORIZONTAL VIEW WITH THE USE OF DENSE LANDSCAPING, MOUNDS OR BERMS.
13. PERIMETER AND SECURITY FENCING SHALL BE CONSTRUCTED TO MINIMIZE VISUAL IMPACT. WALLS OR FENCES SEPARATING ADJOINING PARCELS MAY BE LOCATED AT THE PROPERTY LINE. SECURITY FENCING SHALL BLEND INTO AND BE COMPATIBLE WITH LANDSCAPING AND SURROUNDING ENVIRONMENT. FENCING SHALL HAVE EARTH TONE COLORS OF BROWN, TAN GRAY, OR GREEN, WALLS SHALL BE CONSTRUCTED OF MATERIALS COMPATIBLE WITH THE BUILDING ACRHITECTURE, LANDSCAPING, AND SURROUNDING ENVIRONMENT.
14. SITE AND BUILDING LIGHTING SHALL BE DESIGNED TO MINIMIZE GLARE OR OBJECTIONABLE EFFECTS TO THE ADJACENT PROPERTIES. SITE LIGHTING POLES SHALL NOT EXCEED 20 FEET IN HEIGHT AND SHALL DIRECT THE LIGHT DOWNWARD. LIGHTING SOURCES VIEWED FROM ABOVE OR BELOW ON ADJACENT PROPERTY SHALL BE SHIELDED. BUILDING LIGHTING IS TO BE CONCEALED AND INDIRECT. SITE LIGHTING IS TO BE DESIGNED TO PROVIDE UNIFORM DISTRIBUTION AND THE LIGHT LEVELS SHALL BE ADEQUATE FOR REASONABLE SECURITY AND SAFETY ON THE PREMISES.
15. EARTH BERMS MAY BE USED TO PROVIDE VARIATION IN THE GROUND PLANE AND FOR SCREENING INTERIOR PROTIONS OF THE SITE. CARE MUST BE TAKEN IN THEIR DESIGN TO AVOID CREATING AN ARTIFICIAL APPEARING LANDSCAPE. THE BERMED AREAS SHALL BE AS LONG, AS GRADUAL, AND AS GRACEFUL AS SPACE WILL ALLOW, AND SHOULD HAVE A MINIMUM HEIGHT ABOVE SURROUNDING GRADE OF THREE FEET. MAXIMUM SLOPES FOR BERMED AREAS SHALL BE 3:1 FOR TURF AREAS AND 2:1 FOR GROUNDCOVER AREAS.

LANDSCAPING W/IN R.O.W. NOTES:

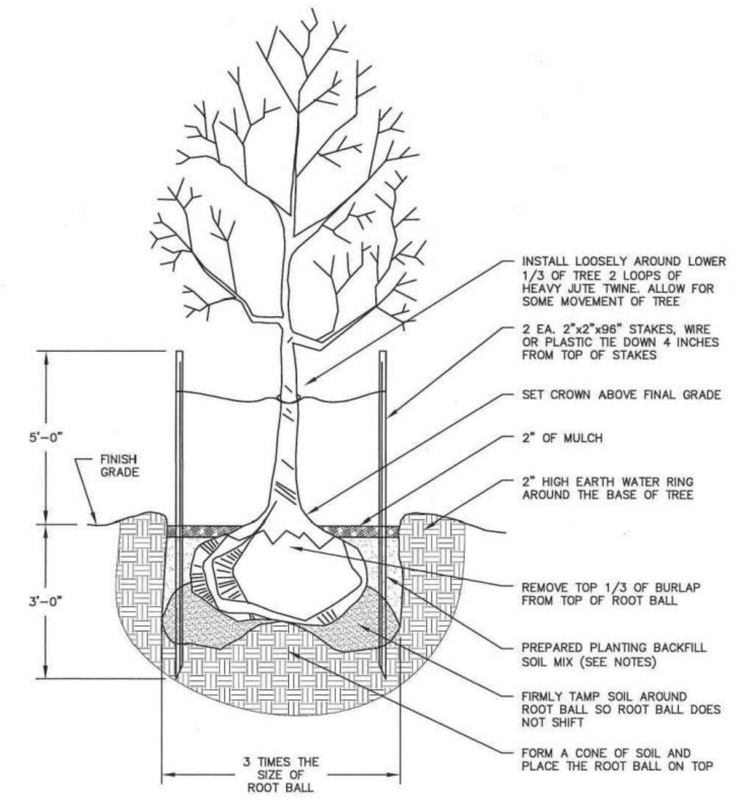
1. TREES SHALL NOT BE PLANTED CLOSER THAN 25 FEET FROM THE CURB LINE OF THE INTERSECTIONS OF STREETS OR ALLEYS, AND NOT CLOSER THAN 10 FEET FROM DRIVEWAYS, FIRE HYDRANTS, OR UTILITY POLES.
2. STREET TREES SHALL NOT BE PLANTED CLOSER THAN 20 FEET TO LIGHT STANDARDS. EXCEPT FOR PUBLIC SAFETY, NO NEW LIGHT STANDARD SHOULD BE POSITIONED CLOSER THAN 10 FEET TO ANY EXISTING STREET TREE, AND PREFERABLY SUCH LOCATIONS WILL BE AT LEAST 20 FEED DISTANCE.
3. TREES SHALL NOT BE PLANTED CLOSER THAN 2-1/2 FEET FROM THE FACE OF THE CURB EXCEPT AT INTERSECTIONS, WHERE IT SHOULD BE 25 FEET FROM THE CURB IN A CURB RETURN AREA..
4. EXISTING TREES MAY BE USED AS STREET TREES IF THERE WILL BE NO DAMAGE FROM THE DEVELOPMENT WHICH WILL KILL OR WEAKEN THE TREE.
5. VISION CLEARANCE HAZARDS SHALL BE AVOIDED AND VISION CLEARANCE STANDARDS SHALL BE ADHERED TO.

City of Camas WASHINGTON — LANDSCAPE DETAIL — LANDSCAPING NOTES — NOT TO SCALE — DETAIL NO. LS1 — DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 3 — DATE: 5/17/2019

PLANTING NOTES:

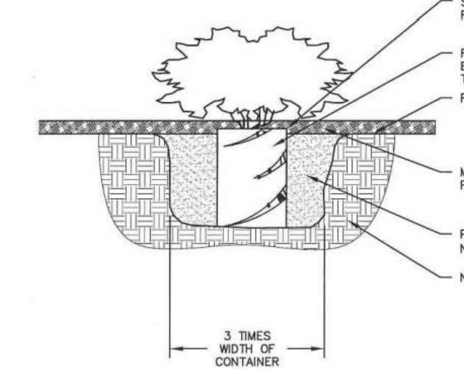
1. ALL PLANTING TO BE OF NURSERY STOCK GRADE NO. 1 OR BETTER AND MUST BE APPROVED PRIOR TO PLANTING.
2. ALL PLANTING HOLES SHALL BE EXCAVATED THREE TIMES THE DIAMETER OF THE TREE ROOT BALL OR ROOT SYSTEM.
3. DECIDUOUS TREES SHALL HAVE STRAIGHT TRUNKS, BE FULL BRANCHED, HAVE A MINIMUM CALIPER OF 2 INCHES AND BE ADEQUATELY STAKED FOR PLANTING. CALIPER OF TREES SHALL BE LARGER WHEN REQUIRED BY OTHER CITY STANDARDS OR PLANS.
4. EVERGREEN TREES SHALL BE A MINIMUM OF THREE FEET IN HEIGHT, FULLY BRANCHED AND ADEQUATELY STAKED FOR PLANTING.
5. DECIDUOUS TREES SHALL BE A MINIMUM 2" CALIPER UNLESS APPROVED BY THE CITY.
6. POTTED OR B&B PLANTS SHALL BE A MINIMUM SIZE OF 3 GALLONS UNLESS APPROVED BY THE CITY..
7. SHRUBS SHALL BE PLANTED ACCORDING TO RECOGNIZED LANDSCAPE STANDARD PRACTICE FOR MAINTENANCE, APPEARANCE, HEALTH OF THE PLANTS, AND OVERALL AESTHETICS.
8. PLANT UPRIGHT AND FACE TO GIVE BEST APPEARANCE OR RELATIONSHIP TO OTHER PLANTS AND STRUCTURES.
   - 8.1. LOOSEN AND REMOVE TWINE BINDING AND BURLAP FROM AROUND THE TOP OF EACH ROOT BALL.
   - 8.2. SET TREES AN INCH ABOVE FINISH GRADE.
   - 8.3. STAKE OR GUY TREES IMMEDIATELY AFTER PLANTING (SEE DETAIL PL3, PL4, & PL5)
   - 8.4. REMOVE STAKES OR GUY WIRES ONE YEAR AFTER INSTALLATION.
9. PLACE AND COMPACT BACKFILL SOIL MIXTURE CAREFULLY TO AVOID INJURY TO ROOTS, AND TO FILL ALL VOIDS. BACKFILL MIX SHALL CONSIST OF 1/4 APPROVED HUMUS MATERIAL TO 3/4 TOPSOIL, PLUS SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED PRIOR TO PLANTING TREES).
10. WHEN HOLE IS NEARLY FILLED, COMPLETELY SOAK AND ALLOW WATER TO DRAIN AWAY. FILL HOLE TO FINISH GRADE. PROVIDE 2 INCH HIGH BERM WATER RING AT THE BASE OF EACH TREE. REMOVE BERM AT THE END OF CONTRACT MAINTENANCE PERIOD.
11. GROUND COVER, SHALL BE PLANTED ACCORDING TO RECOGNIZED LANDSCAPE STANDARD PRACTICE FOR MAINTENANCE, APPEARANCE, OVERALL AESTHETICS, AND HEALTH OF THE PLANTS.
12. TREES, AS THEY GROW, SHALL BE PRUNED TO THEIR NATURAL FORM TO PROVIDE AT LEAST 10 FEET OF CLEARANCE ABOVE SIDEWALKS AND 14 FEET ABOVE STREET ROADWAY SURFACES.
13. TREE MAINTENANCE – IN ORDER TO INSURE ESTABLISHMENT, SURVIVAL AND GROWTH, TREES SHALL BE MULCHED WITH 4" DEEP COMPOST AND WATERED AS NECESSARY DURING THE FIRST TWO GROWING SEASONS. PRUNING TO BE AS FOLLOWS:
   - 13.1. YEAR 1 – ONLY DEAD, BROKEN, OR CROSSING BRANCHES SHALL BE PRUNED.
   - 13.2. YEAR 2 – A CLASS 1 PRUNE, PURSUANT TO NATIONAL ARBORIST ASSOCIATION STANDARDS, SHALL BE PERFORMED. THE PURPOSE OF THIS PRUNING IS TO ESTABLISH PROPER SCAFFOLD BRANCHING, RAISE THE CROWN FOR ROAD/SIDEWALK CLEARANCE, AND REMOVE ANY DEAD, DYING OR CROSSING BRANCHES.
   - 13.3. YEAR 3 – A CLASS 1 PRUNE, PURSUANT TO NATIONAL ARBORIST ASSOCIATION STANDARDS, SHALL BE PERFORMED. THE PURPOSE OF THIS PRUNING IS TO CONTINUE TO ESTABLISH THE PROPER SCAFFOLD BRANCHING, CONTINUE TO RAISE THE CROSSING FOR ROAD/SIDEWALK CLEARANCE, AND TO REMOVE ANY DEAD, DYING, OR CROSSING BRANCHES.
14. DEFNITIONS:
   - 14.1. BALLED AND BURLAPPED (B&B) – TREES AND SHRUBS WITH A LARGE BALL OF SOIL AROUND THE ROOTS WRAPPED IN BURLAP.
   - 14.2. BARE-ROOT – OFFERED BY NURSERIES IN WINTER AND EARLY SPRING WITH ALL THE SOIL REMOVED FROM THEIR ROOTS.
   - 14.3. CALIPER – THE DIAMETER OF THE TRUNK MEASURED AT 4-FEET FROM THE GROUND.
   - 14.4. GROUND COVER – LIVING MATERIAL THAT DOES NOT INCLUDE BARK CHIPS OR OTHER MULCH.

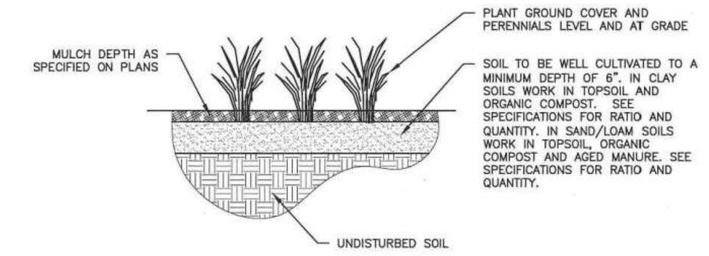
City of Camas WASHINGTON — LANDSCAPE DETAIL — PLANTING NOTES — NOT TO SCALE — DETAIL NO. LS2 — DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 3 — DATE: 5/17/2019



NOTES:
1. A ROOT BARRIER SHOULD BE INSTALLED AT THE EDGE OF PAVEMENT OR 4 FEET WIDE AND 6 FEET WIDE RECTANGLE AROUND THE TREE. SEE DETAILS PL7, PL8 & PL9
2. BACKFILL MIX SHALL CONSIST OF THE FOLLOWING: 0.75 PART TOPSOIL, 0.25 PART APPROVED HUMUS MATERIAL, SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED BEFORE PLANTING TREES).

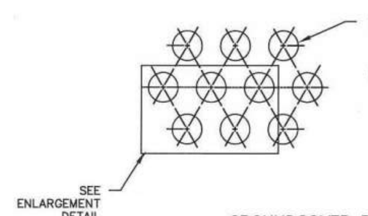
City of Camas WASHINGTON — LANDSCAPE DETAIL — DECIDUOUS BALLED/BURLAP TREE PLANTING — NOT TO SCALE — DETAIL NO. LS4 — DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 2 — DATE: 5/17/2019





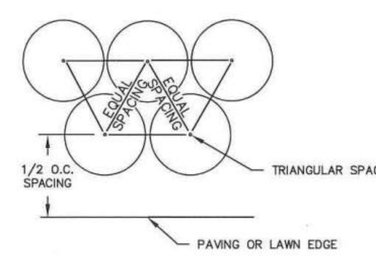
NOTES:
1. SCARIFY BOTTOM AND SIDES OF HOLE PRIOR TO PLANTING.
2. KEEP PLANTS MOIST AND SHADED UNTIL PLANTING.
3. BACKFILL MIX SHALL CONSIST OF THE FOLLOWING: 0.75 PART TOPSOIL, 0.25 PART APPROVED HUMUS MATERIAL, SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED BEFORE PLANTING).

City of Camas WASHINGTON — LANDSCAPE DETAIL — SHRUB CONTAINER PLANTING — NOT TO SCALE — DETAIL NO. LS5 — DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 2 — DATE: 5/17/2019



1. ALL GROUNDCOVER SHALL BE PLANTED AT EQUAL TRIANGULAR SPACING OR ON CENTER SPACING AS SPECIFIED ON PLANTING PLAN.
2. LOCATE GROUNDCOVER ONE HALF OF SPECIFIED SPACING DISTANCE FROM ANY CURB, SIDEWALK, OR OTHER HARD SURFACE, UNLESS OTHERWISE SPECIFIED.

GROUNDCOVER PLANTING DETAIL



ENLARGEMENT DETAIL: TRIANGULAR SPACING

City of Camas WASHINGTON — LANDSCAPE DETAIL — GROUNDCOVER PLANTING DETAIL — NOT TO SCALE — DETAIL NO. LS7 — DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 3 — DATE: 5/17/2019

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www.planningsolutionsinc.co

STATE OF WASHINGTON — LICENSED LANDSCAPE ARCHITECT

PRELIMINARY — NOT FOR CONSTRUCTION — SUBJECT TO APPROVAL

13TH STREET GAS STATIOIN

20101 NE 13th Street
Camas, Washington

DRAWN: HA/CB	CHECKED: CB
SCALE: AS SHOWN	DATE: 11.03.23
JOB #: 23-1837	
ISSUED FOR: PLR	
REVISIONS:	

SHEET NAME:
FINAL LANDSCAPE DETAILS

SHEET #: PD

SHEET 7 OF 8

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4. ALL COMPONENTS OF IRRIGATION SYSTEM SHALL BE INSTALLED AND PROPERLY ADJUSTED TO PROVIDE ADEQUATE COVERAGE AND MINIMIZATION OF OVER SPRAY ONTO WALKS, BUILDINGS, PARKING AREAS, ETC.
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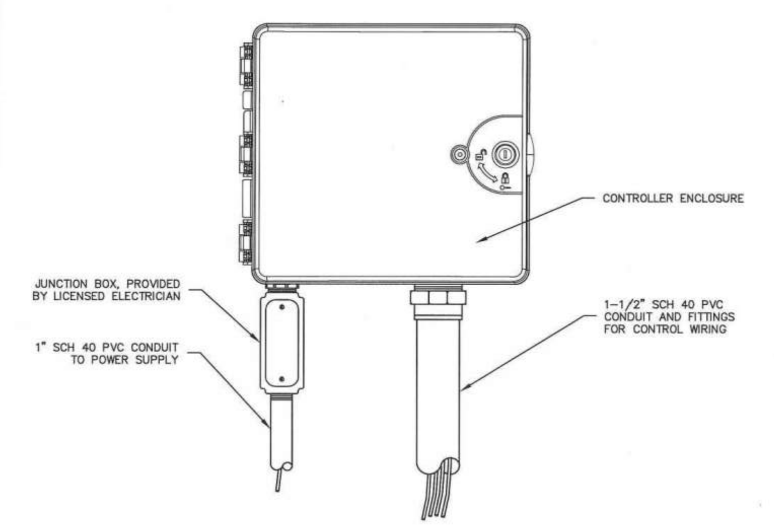
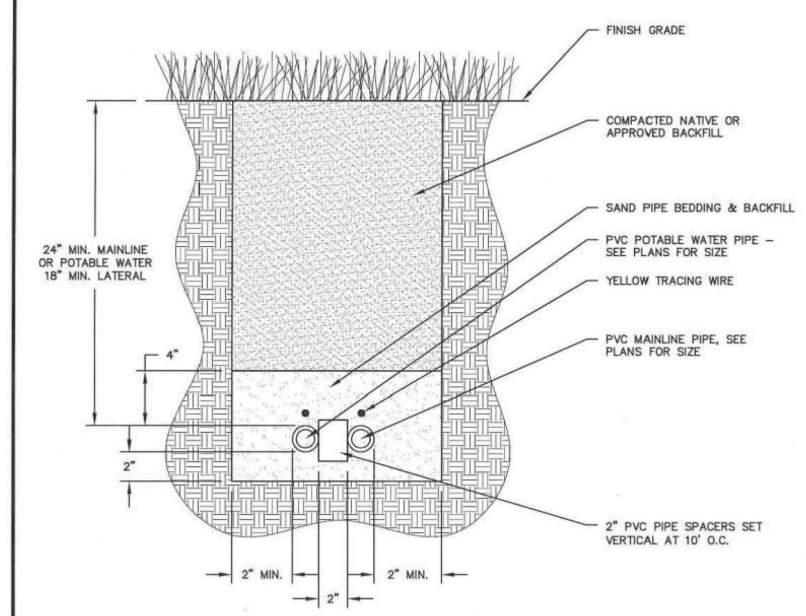
6. INSTALL ALL IRRIGATION PIPE AND CONTROL WIRES IN MINIMUM 4" PVC SLEEVE BELOW ALL PAVED SURFACES UNLESS OTHERWISE INDICATED ON THE PLANS. INSTALL SLEEVES PRIOR TO PLACEMENT OF PAVEMENTS AND PAVEMENT SUB-BASE. SEE PIPE SLEEVING DETAIL FOR FURTHER REQUIREMENTS.
7. COORDINATE IRRIGATION POINTS OF CONNECTION AND LOCATION OF AUTOMATIC CONTROL VALVES WITH THE ENGINEER. COORDINATE ALL WORK WITH OTHER TRADES, I.E. ELECTRICAL, MASONRY, ETC.
8. CONTRACTOR TO PROGRAM AUTOMATIC CONTROLLER TO ALLOW FOR THE EQUIVALENT OF 1" OF WATER PER WEEK.
9. ALL PIPES SHALL BE TRENCHED. PROVIDE POSITIVE DRAINAGE OF MAINLINE. PLACE MANUAL DRAIN AT LOW POINTS IN MAINLINE. IDENTIFY LOCATIONS ON AS-BUILTS.
10. USE 45° ELBOWS INSTEAD OF 90° ELBOWS ON ALL MAINLINES 2-1/2" AND LARGER. INSTALL CONCRETE THRUST BLOCKS AT ALL MAINLINE CHANGES IN DIRECTION. POUR MINIMUM OF 1 CUBIC FOOT OF CONCRETE ON UNDISTURBED SOIL. WRAP PIPE IN PLASTIC PRIOR TO COVERING WITH CONCRETE.
11. CONTRACTOR TO INSTALL CONTROLLER, CPU ELECTRICAL, PHONE AND ACCESSORIES AS REQUIRED. CONTRACTOR TO FURNISH CONTROL WIRES FROM VALVES TO CONTROLLER. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING 110 VOLT SERVICE FROM BUILDING TO EXISTING JUNCTION BOX IN CONTROLLER HOUSING AND CONNECT CONTROLLER SERVICE.
12. ALL TONING WIRE, WHERE REQUIRED, SHALL BE 14 GAUGE COPPER CLAD STEEL WITH HDPE DIRECT BURY INSULATION. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.
13. ALL DIRECT BURY CONTROL WIRING AND CABLING SHALL HAVE SPLICE CONNECTIONS SEALED WITH 3M DBY OR RAIN BIRD DB SERIES WIRE CONNECTORS IN A SPLICE BOX.
14. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS.
15. WATER METER SHALL BE INSTALLED BY THE CITY. CONTRACTOR RESPONSIBLE FOR CONNECTIONS DOWNSTREAM OF WATER METER.
16. CONTRACTOR TO VERIFY WATER PRESSURE TO ENSURE THAT PRESSURE MATCHES THE SYSTEM DESIGN PRESSURE.
17. WHERE REQUIRED, CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.

LANDSCAPE DETAIL — IRRIGATION CONSTRUCTION NOTES — NOT TO SCALE — DETAIL NO. IR1 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



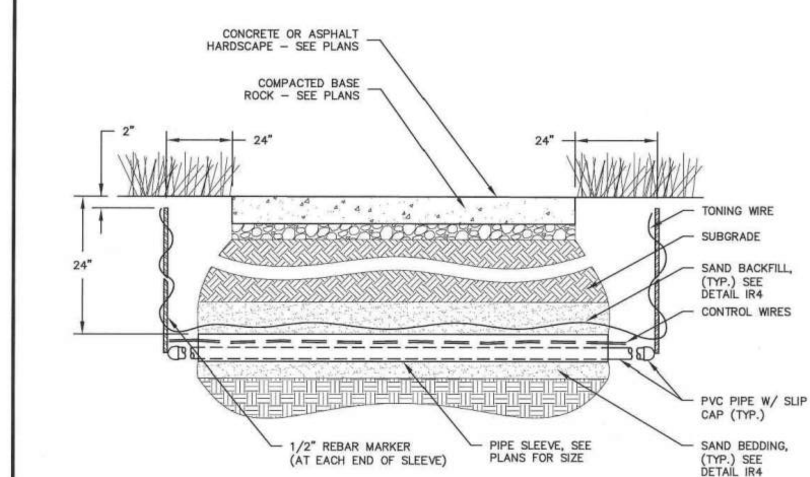
NOTES:
1. IRRIGATION CONTROLLER SHALL BE A RAINBIRD ESP-LXME SERIES PROGRAMMABLE CONTROLLER, OR APPROVED EQUAL.
2. INTERIOR INSTALLATIONS DO NOT REQUIRE AN ENCLOSURE WHEN MOUNTED WITHIN THE UTILITY ROOM OF A RESTROOM OR OTHER FACILITY WHERE THE PUBLIC HAS NO ACCESS.
3. FOR EXTERIOR WALL MOUNTED APPLICATIONS SEE DETAIL IR3.

LANDSCAPE DETAIL — IRRIGATION CONTROLLER – INDOOR MOUNT — NOT TO SCALE — DETAIL NO. IR2 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



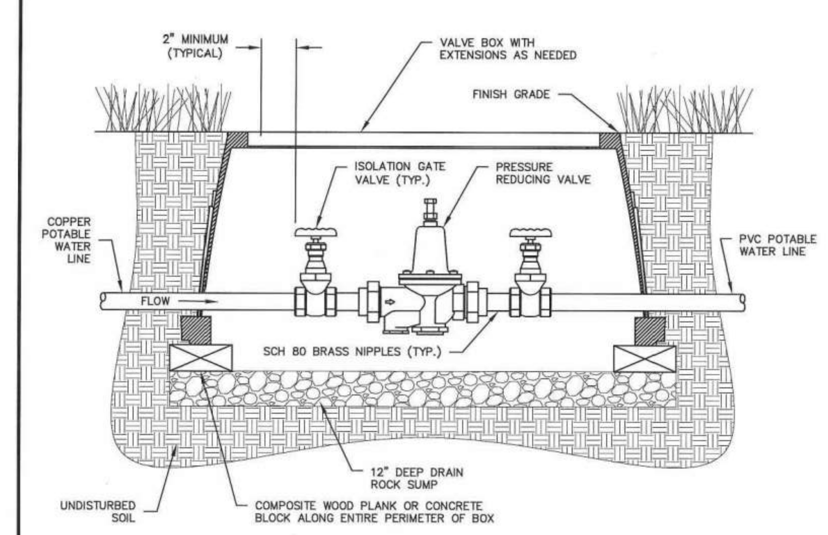
NOTES:
1. ALL TONING WIRE SHALL BE 14 GAUGE YELLOW HDPE INSULATED COPPER CLAD STEEL. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.
2. PROVIDE A 48 INCH COIL OF TONING WIRE IN EACH VALVE BOX.

LANDSCAPE DETAIL — IRRIGATION TRENCH — NOT TO SCALE — DETAIL NO. IR4 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED IRRIGATION POLYMER VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. PROVIDE TONING WIRE ALONG ALL PIPE SLEEVING.
3. ALL TONING WIRE SHALL BE 14 GAUGE YELLOW HDPE INSULATED COPPER CLAD STEEL. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.

LANDSCAPE DETAIL — IRRIGATION PIPE SLEEVE — NOT TO SCALE — DETAIL NO. IR5 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



NOTES:
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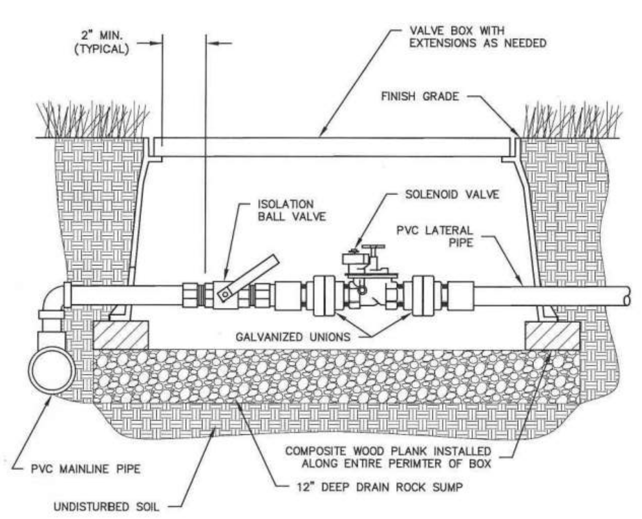
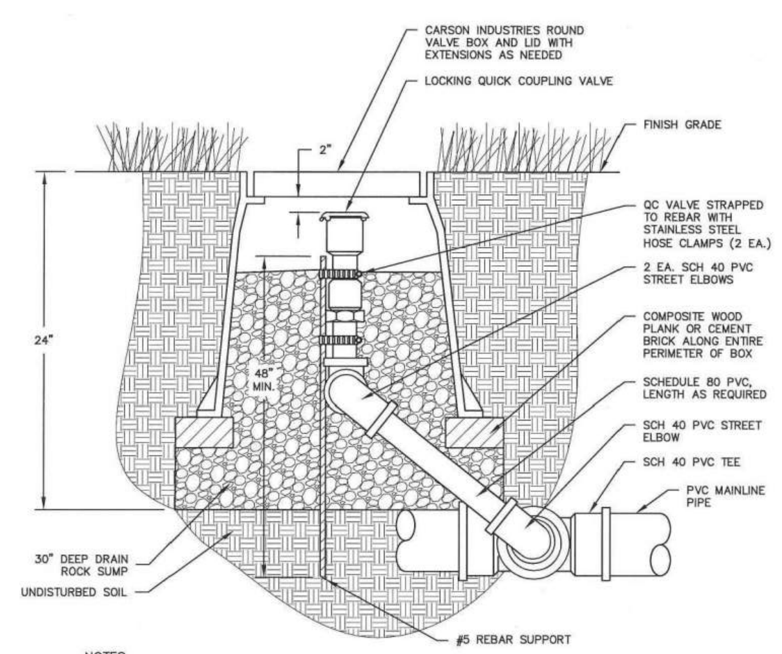
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. PRESSURE REDUCING VALVE SHALL BE A WATTS M/N 25AUB-Z3 WITH DOUBLE UNION END CONNECTIONS, OR APPROVED EQUAL.
4. FOR APPLICATIONS WHERE DRINKING FOUNTAINS ARE SUPPLIED, ALL COMPONENTS SHALL BE SUITABLE FOR POTABLE WATER.

LANDSCAPE DETAIL — IRRIGATION PRESSURE REGULATOR — NOT TO SCALE — DETAIL NO. IR6 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



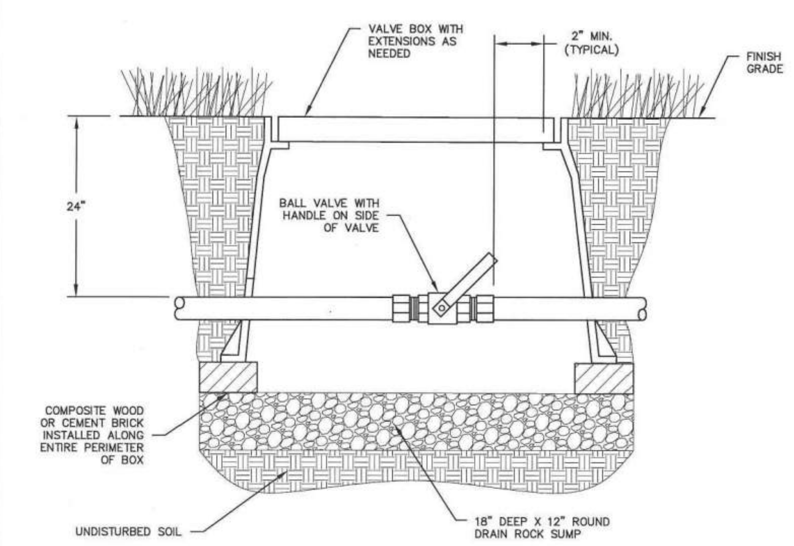
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.

LANDSCAPE DETAIL — IRRIGATION SOLENOID VALVE — NOT TO SCALE — DETAIL NO. IR7 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



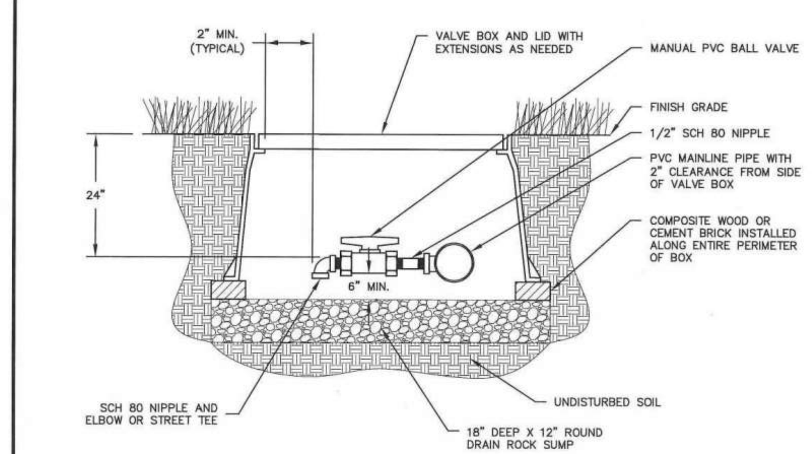
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. SWING JOINT SIZE SHALL BE SAME SIZE AS VALVE BOTTOM INLET.

LANDSCAPE DETAIL — IRRIGATION QUICK COUPLING VALVE — NOT TO SCALE — DETAIL NO. IR9 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



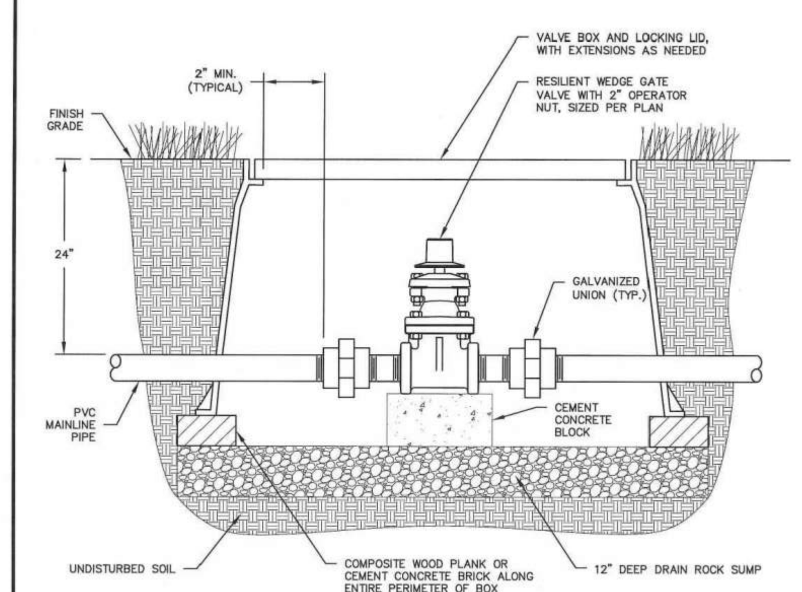
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.

LANDSCAPE DETAIL — IRRIGATION ISOLATION BALL VALVE — NOT TO SCALE — DETAIL NO. IR10 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. CONTRACTOR RESPONSIBLE FOR LOCATING DRAIN VALVE AT LOWEST POINT OF MAINLINE TO ENSURE POSITIVE DRAINAGE.
4. ALLOW FOR 1" CLEARANCE FROM HOLE IN BOX TO TOP OF PIPE.

LANDSCAPE DETAIL — IRRIGATION MANUAL DRAIN VALVE — NOT TO SCALE — DETAIL NO. IR11 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



NOTES:
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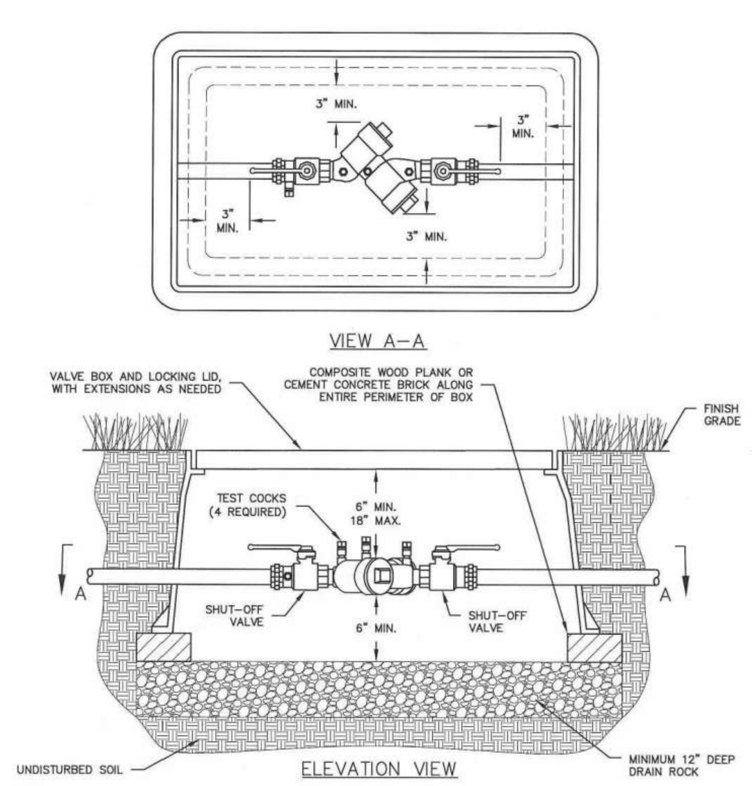
LANDSCAPE DETAIL — IRRIGATION MANUAL GATE VALVE — NOT TO SCALE — DETAIL NO. IR12 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



NOTES:
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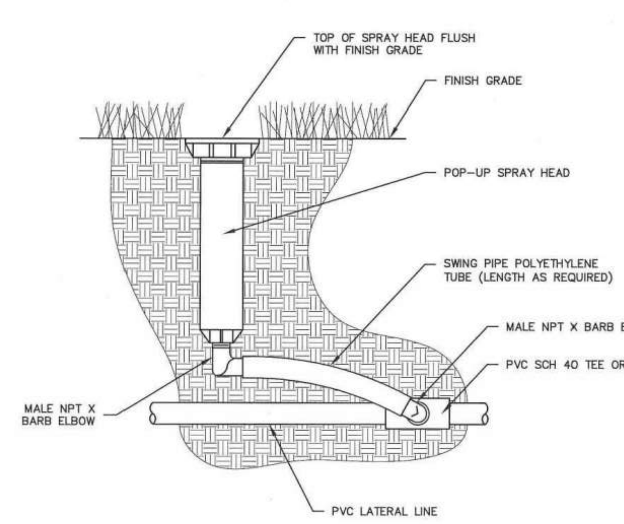
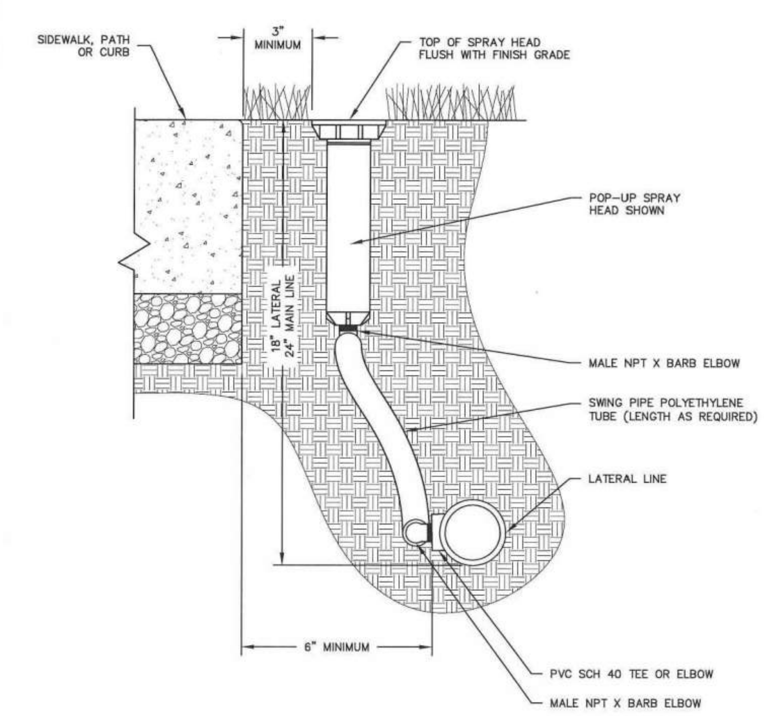
2. APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH GROUND. TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
3. DESIGNED FOR BACK SIPHONING AND BACK PRESSURE.
4. THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
5. THE DCVA MAY BE INSTALLED ABOVE OR BELOW THE GROUND PROVIDED ALL CLEARANCES ARE MET.
6. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING. MUST BE ACCESSIBLE AND PROTECTED FROM FREEZING CONDITIONS.
7. THE DOUBLE CHECK VALVE BACKFLOW PREVENTER ASSEMBLY SHALL BE ASSE LISTED 1015 APPROVED AND INCLUDE FULL PORT BALL VALVES WITH RESILIENT SEATS AND UNION CONNECTIONS.
8. A PLUMBING PERMIT IS REQUIRED. PLEASE CONTACT THE CITY OF CAMAS BUILDING DEPARTMENT.
9. MUST BE TESTED AFTER INSTALLATION BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THE CITY OF CAMAS WATER DEPARTMENT.

LANDSCAPE DETAIL — IRRIGATION DOUBLE CHECK VALVE ASSY. — NOT TO SCALE — DETAIL NO. IR13 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



NOTES:
1. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
2. SWING PIPE SHALL BE POLYEHTYLENE AND SIZE SHALL NOT BE LESS THAN HEAD INLET SIZE.
3. POP-UP SPRAY HEADS SHALL BE RAIN BIRD 1800 OR APPROVED EQUAL, SUBMITTAL REQUIRED.
4. WHEN SPRAY HEADS ARE LOCATED ALONG SIDEWALK OR CURBING THE HEADS SHALL BE MINIMUM 3" FROM HARDSCAPE AND PIPES MINIMUM 6" FROM HARDSCAPE.

LANDSCAPE DETAIL — IRRIGATION POP-UP SPRAY HEAD — NOT TO SCALE — DETAIL NO. IR15 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



NOTES:
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2. SWING PIPE SHALL BE POLYEHTYLENE AND SIZE SHALL NOT BE LESS THAN HEAD INLET SIZE.
3. WHEN SPRAY HEADS ARE LOCATED ALONG SIDEWALK OR CURBING THE HEADS SHALL BE MINIMUM 3" FROM HARDSCAPE AND PIPES MINIMUM 6" FROM HARDSCAPE.

LANDSCAPE DETAIL — IRRIGATION HEAD PLACEMENT ALONG HARDSCAPE — NOT TO SCALE — DETAIL NO. IR16 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG

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13TH STREET GAS STATIOIN

20101 NE 13th Street
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DRAWN: Camas
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REVISIONS:

SHEET NAME: PRELIMINARY IRRIGATION DETAILS

SHEET #: ID

SHEET 8 OF 8

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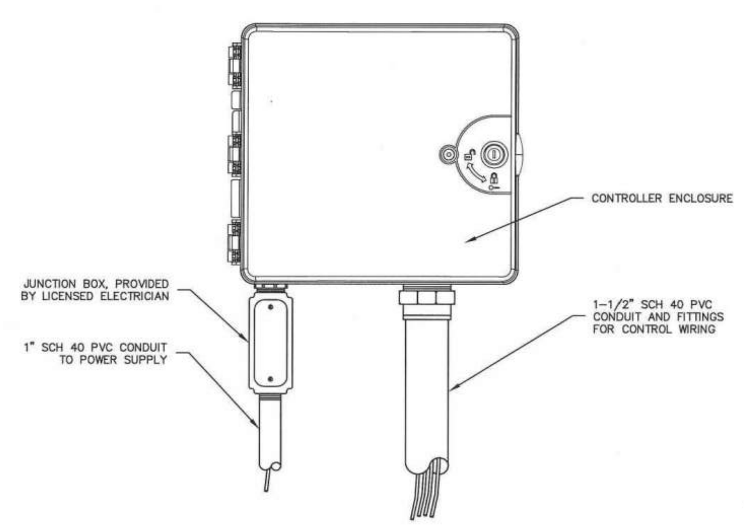
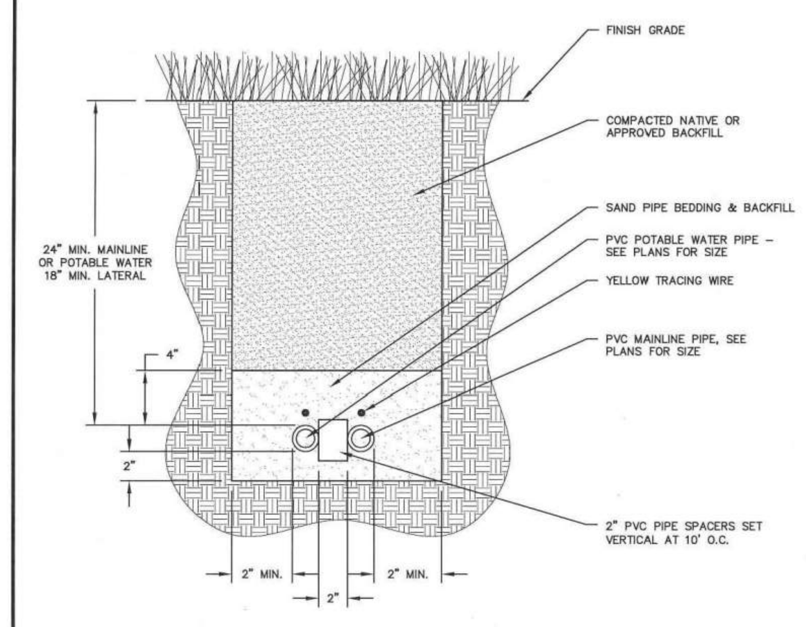
8. CONTRACTOR TO PROGRAM AUTOMATIC CONTROLLER TO ALLOW FOR THE EQUIVALENT OF 1" OF WATER PER WEEK.
9. ALL PIPES SHALL BE TRENCHED. PROVIDE POSITIVE DRAINAGE OF MAINLINE. PLACE MANUAL DRAIN AT LOW POINTS IN MAINLINE. IDENTIFY LOCATIONS ON AS-BUILTS.
10. USE 45° ELBOWS INSTEAD OF 90° ELBOWS ON ALL MAINLINES 2-1/2" AND LARGER. INSTALL CONCRETE THRUST BLOCKS AT ALL MAINLINE CHANGES IN DIRECTION. POUR MINIMUM OF 1 CUBIC FOOT OF CONCRETE ON UNDISTURBED SOIL. WRAP PIPE IN PLASTIC PRIOR TO COVERING WITH CONCRETE.
11. CONTRACTOR TO INSTALL CONTROLLER, CPU ELECTRICAL, PHONE AND ACCESSORIES AS REQUIRED. CONTRACTOR TO FURNISH CONTROL WIRES FROM VALVES TO CONTROLLER. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING 110 VOLT SERVICE FROM BUILDING TO EXISTING JUNCTION BOX IN CONTROLLER HOUSING AND CONNECT CONTROLLER SERVICE.
12. ALL TONING WIRE, WHERE REQUIRED, SHALL BE 14 GAUGE COPPER CLAD STEEL WITH HDPE DIRECT BURY INSULATION. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.
13. ALL DIRECT BURY CONTROL WIRING AND CABLING SHALL HAVE SPLICE CONNECTIONS SEALED WITH 3M DBY OR RAIN BIRD DB SERIES WIRE CONNECTORS IN A SPLICE BOX.
14. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS.
15. WATER METER SHALL BE INSTALLED BY THE CITY. CONTRACTOR RESPONSIBLE FOR CONNECTIONS DOWNSTREAM OF WATER METER.
16. CONTRACTOR TO VERIFY WATER PRESSURE TO ENSURE THAT PRESSURE MATCHES THE SYSTEM DESIGN PRESSURE.
17. WHERE REQUIRED, CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION CONSTRUCTION NOTES — NOT TO SCALE — DETAIL NO. IR1 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



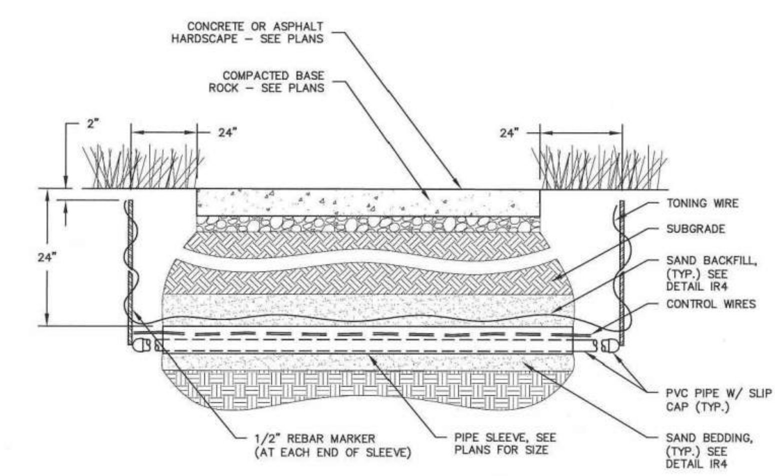
NOTES:
1. IRRIGATION CONTROLLER SHALL BE A RAINBIRD ESP-LXME SERIES PROGRAMMABLE CONTROLLER, OR APPROVED EQUAL.
2. INTERIOR INSTALLATIONS DO NOT REQUIRE AN ENCLOSURE WHEN MOUNTED WITHIN THE UTILITY ROOM OF A RESTROOM OR OTHER FACILITY WHERE THE PUBLIC HAS NO ACCESS.
3. FOR EXTERIOR WALL MOUNTED APPLICATIONS SEE DETAIL IR3.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION CONTROLLER – INDOOR MOUNT — NOT TO SCALE — DETAIL NO. IR2 — REVISION: 2 — DATE: 6/19/2019



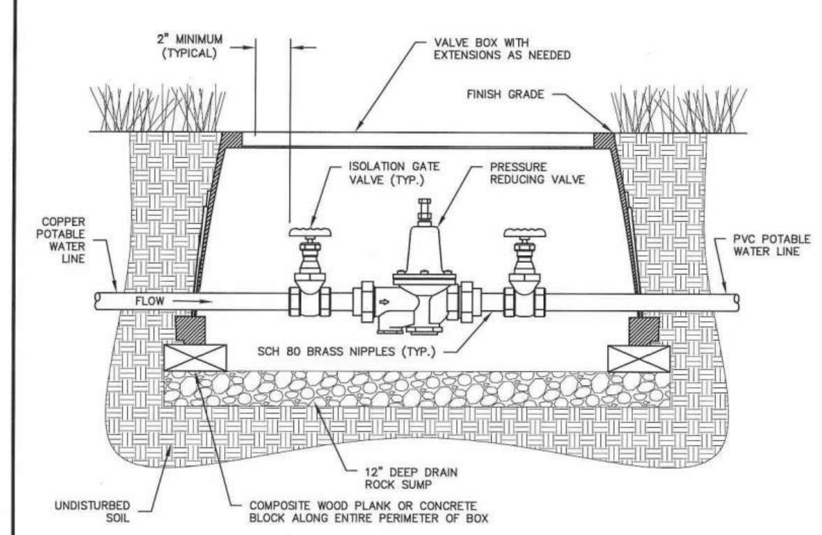
NOTES:
1. ALL TONING WIRE SHALL BE 14 GAUGE YELLOW HDPE INSULATED COPPER CLAD STEEL. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.
2. PROVIDE A 48 INCH COIL OF TONING WIRE IN EACH VALVE BOX.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION TRENCH — NOT TO SCALE — DETAIL NO. IR4 — REVISION: 2 — DATE: 6/19/2019



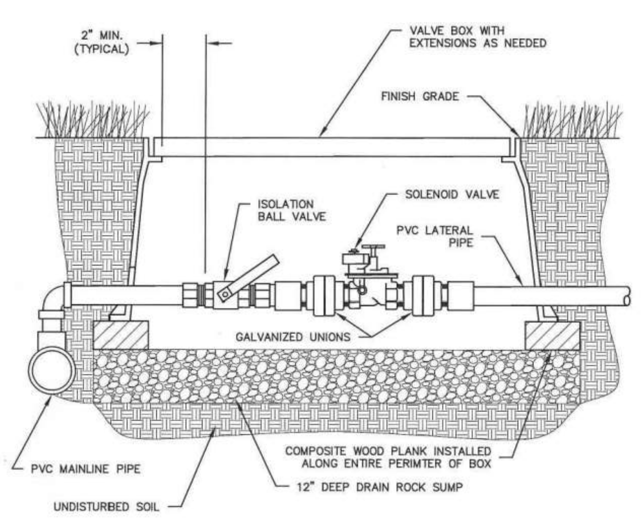
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED IRRIGATION POLYMER VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. PROVIDE TONING WIRE ALONG ALL PIPE SLEEVING.
3. ALL TONING WIRE SHALL BE 14 GAUGE YELLOW HDPE INSULATED COPPER CLAD STEEL. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION PIPE SLEEVE — NOT TO SCALE — DETAIL NO. IR5 — REVISION: 2 — DATE: 6/19/2019



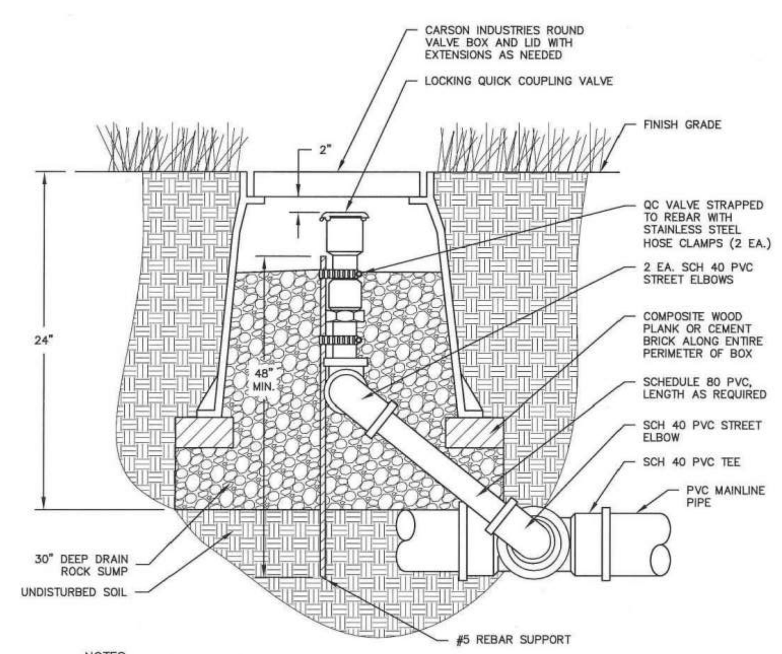
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. PRESSURE REDUCING VALVE SHALL BE A WATTS M/N 25AUB-Z3 WITH DOUBLE UNION END CONNECTIONS, OR APPROVED EQUAL.
4. FOR APPLICATIONS WHERE DRINKING FOUNTAINS ARE SUPPLIED, ALL COMPONENTS SHALL BE SUITABLE FOR POTABLE WATER.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION PRESSURE REGULATOR — NOT TO SCALE — DETAIL NO. IR6 — REVISION: 2 — DATE: 6/19/2019



NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION SOLENOID VALVE — NOT TO SCALE — DETAIL NO. IR7 — REVISION: 2 — DATE: 6/19/2019



NOTES:
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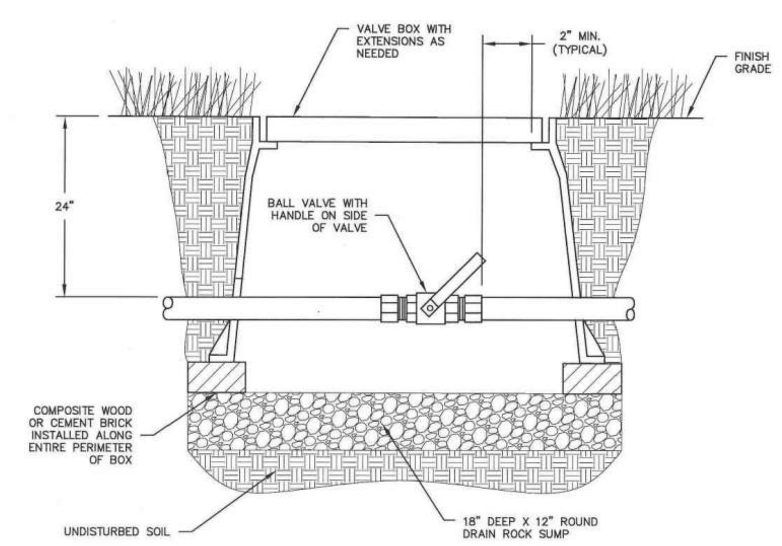
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. SWING JOINT SIZE SHALL BE SAME SIZE AS VALVE BOTTOM INLET.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION QUICK COUPLING VALVE — NOT TO SCALE — DETAIL NO. IR9 — REVISION: 2 — DATE: 6/19/2019



NOTES:
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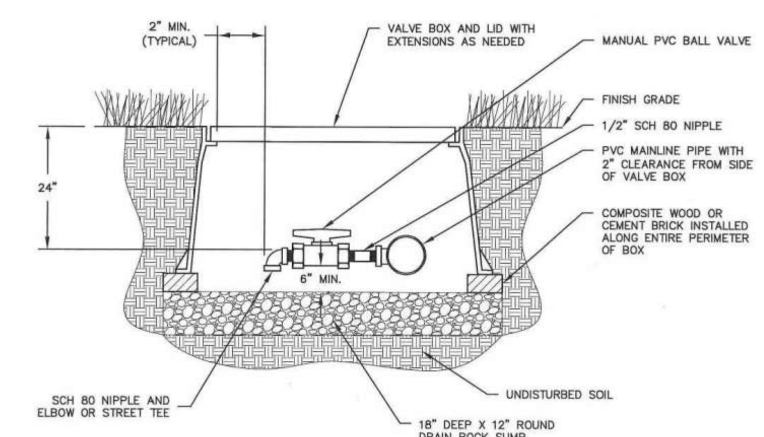
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION ISOLATION BALL VALVE — NOT TO SCALE — DETAIL NO. IR10 — REVISION: 2 — DATE: 6/19/2019



NOTES:
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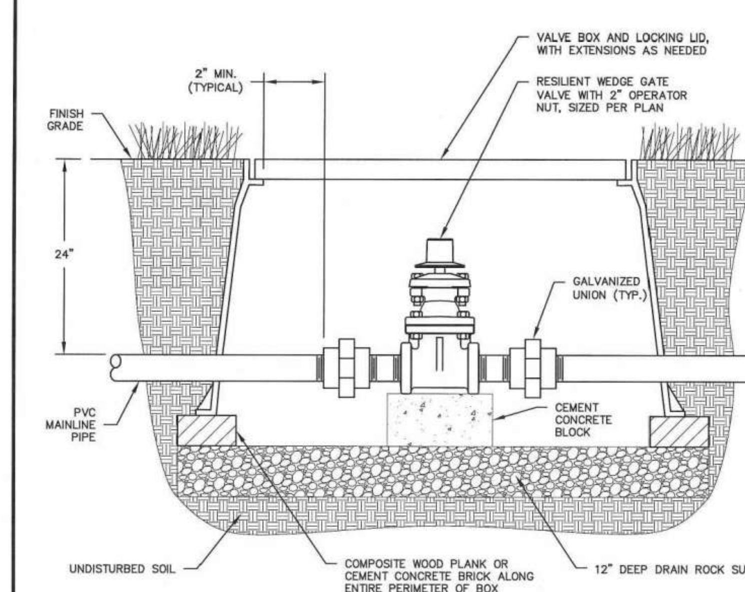
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. CONTRACTOR RESPONSIBLE FOR LOCATING DRAIN VALVE AT LOWEST POINT OF MAINLINE TO ENSURE POSITIVE DRAINAGE.
4. ALLOW FOR 1" CLEARANCE FROM HOLE IN BOX TO TOP OF PIPE.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION MANUAL DRAIN VALVE — NOT TO SCALE — DETAIL NO. IR11 — REVISION: 2 — DATE: 6/19/2019



NOTES:
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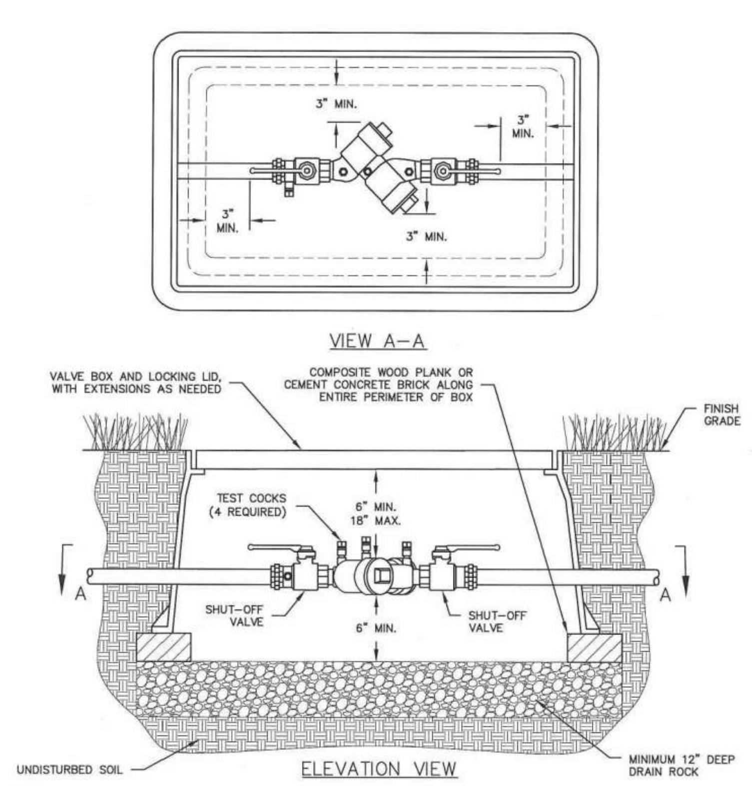
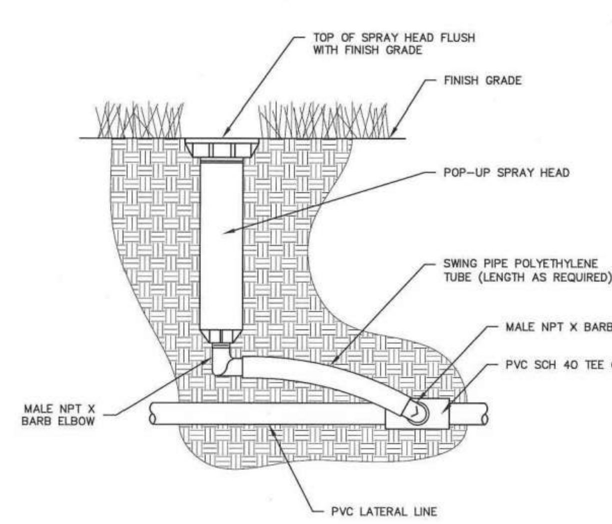
City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION MANUAL GATE VALVE — NOT TO SCALE — DETAIL NO. IR12 — REVISION: 2 — DATE: 6/19/2019



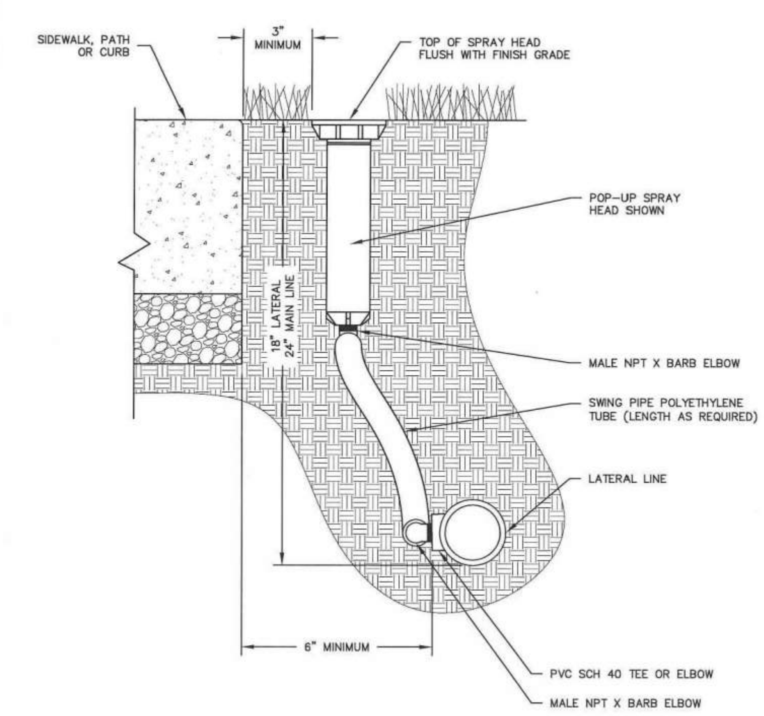
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH GROUND. TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
3. DESIGNED FOR BACK SIPHONING AND BACK PRESSURE.
4. THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
5. THE DCVA MAY BE INSTALLED ABOVE OR BELOW THE GROUND PROVIDED ALL CLEARANCES ARE MET.
6. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING. MUST BE ACCESSIBLE AND PROTECTED FROM FREEZING CONDITIONS.
7. THE DOUBLE CHECK VALVE BACKFLOW PREVENTER ASSEMBLY SHALL BE ASSE LISTED 1015 APPROVED AND INCLUDE FULL PORT BALL VALVES WITH RESILIENT SEATS AND UNION CONNECTIONS.
8. A PLUMBING PERMIT IS REQUIRED. PLEASE CONTACT THE CITY OF CAMAS BUILDING DEPARTMENT.
9. MUST BE TESTED AFTER INSTALLATION BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THE CITY OF CAMAS WATER DEPARTMENT.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION DOUBLE CHECK VALVE ASSY. — NOT TO SCALE — DETAIL NO. IR13 — REVISION: 2 — DATE: 6/19/2019



NOTES:
1. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
2. SWING PIPE SHALL BE POLYEHTYLENE AND SIZE SHALL NOT BE LESS THAN HEAD INLET SIZE.
3. POP-UP SPRAY HEADS SHALL BE RAIN BIRD 1800 OR APPROVED EQUAL, SUBMITTAL REQUIRED.
4. WHEN SPRAY HEADS ARE LOCATED ALONG SIDEWALK OR CURBING THE HEADS SHALL BE MINIMUM 3" FROM HARDSCAPE AND PIPES MINIMUM 6" FROM HARDSCAPE.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION POP-UP SPRAY HEAD — NOT TO SCALE — DETAIL NO. IR15 — REVISION: 2 — DATE: 6/19/2019



NOTES:
1. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
2. SWING PIPE SHALL BE POLYEHTYLENE AND SIZE SHALL NOT BE LESS THAN HEAD INLET SIZE.
3. WHEN SPRAY HEADS ARE LOCATED ALONG SIDEWALK OR CURBING THE HEADS SHALL BE MINIMUM 3" FROM HARDSCAPE AND PIPES MINIMUM 6" FROM HARDSCAPE.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION HEAD PLACEMENT ALONG HARDSCAPE — NOT TO SCALE — DETAIL NO. IR16 — REVISION: 2 — DATE: 6/19/2019

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PRELIMINARY
NOT FOR CONSTRUCTION
SUBJECT TO APPROVAL

13TH STREET GAS STATIOIN

20101 NE 13th Street
Camas, Washington

DRAWN: Camas	CHECKED: CB
SCALE: AS SHOWN	DATE: 9.15.23
JOB #: 23-1837	
ISSUED FOR: PLR	
REVISIONS: 1, 2, 3, 4, 5, 6	

SHEET NAME:
PRELIMINARY IRRIGATION DETAILS

SHEET #: ID

SHEET 8 OF 8

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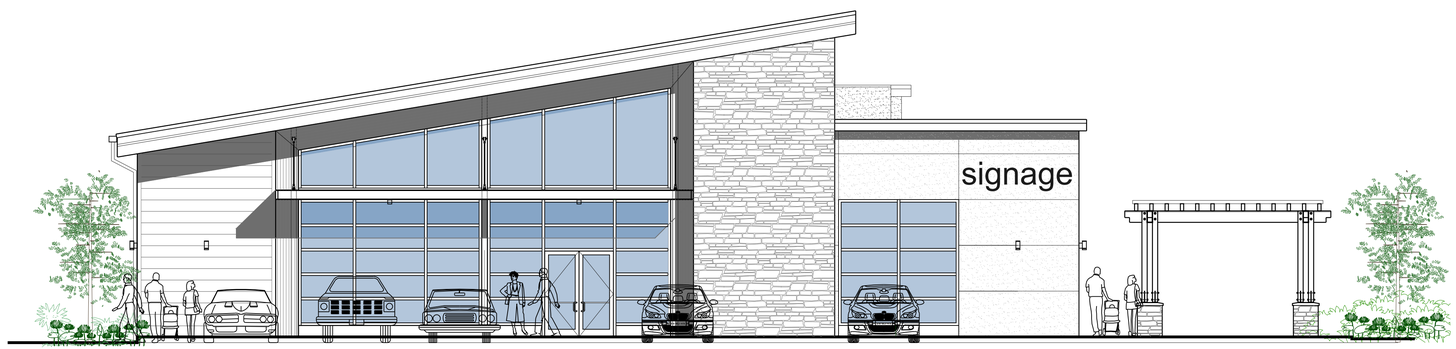
13th Street Site Plan



LEGEND OF SYMBOLS

NORTH ARROW

DETAIL NUMBER
X
AX.X
SHEET NUMBER
DETAIL TAG

DETAIL NUMBER
X
AX.X
SHEET NUMBER
SECTION/ELEVATION TAG

INDICATE REVISED AREA
1
REVISION
REVISION NUMBER

ROOM NAME
ROOM
XXX
ROOM NUMBER
ROOM TAG

XX WALL TYPE TAG

XX KEY NOTE TAG

ID DOOR SCHEDULE KEY

W WINDOW SCHEDULE KEY

X GRID DESIGNATION

X/XXX.X INTERIOR ELEVATION

ABBREVIATIONS

#	POUND OR NUMBER	EXIST'G	EXISTING	P.C.C.	PRE-CAST CONCRETE
&	AND	E.J.	EXPANSION JOINT	P-LAM	PLASTIC LAMINATED
@	AT	EXT	EXTERIOR	PLUMB	PLUMBING
ACT	ACOUSTIC CEILING TILE	FD	FLOOR DRAIN	PLYWD	PLYWOOD
A.F.F.	ABOVE FINISHED FLOOR	FEC	FIRE EXTINGUISHER CABINET	P.T.	PRESSURE TREATED
ALUM	ALUMINUM	F.F.L.	FINISH FLOOR LINE	PNT	PAINT/PAINTED
ANOD	ANODIZE	FIXT	FIXTURE	PVC	POLYVINYL CHLORIDE
BSMT	BASEMENT	FLR	FLOOR	RBR	RUBBER
BYND	BEYOND	F.O.	FACE OF	RCP	REFLECTED CEILING PLAN
BOT	BOTTOM	FRP	FIBER GLASS REINFORCED PLASTIC	RD.	ROOF DRAIN
C.I.P.	CAST IN PLACE			REQ'D	REQUIRED
CHNL	CHANNEL	FND	FOUNDATION	RM	ROOM
C.J.	CONTROL JOINT	GA	GAUGE	SIM	SIMILAR
CLG	CEILING	GALV	GALVANIZED	SPEC	SPECIFICATION OR SPECIFIED
CLR	CLEAR	GWB	GYPSUM BOARD	SPKLR	SPRINKLER
CMU	CONCRETE MASONRY UNIT	H.C.	HOLLOW CORE	SSTL	STAINLESS STEEL
COL	COLUMN	HT.	HEIGHT	S.T.C.	SOUND TRANSMISSION CONTROL
COMPR	COMPRESSIBLE	H.M.	HOLLOW METAL	STL	STEEL
CONC	CONCRETE	HR.	HOUR	STRUCT'L	STRUCTURAL
CONT	CONTINUOUS	HVAC	HEATING VENTILATING AND AIR CONDITIONING	TBD	TO BE DETERMINE
CPT	CARPET			T&G	TONGUE AND GROOVE
CT	CERAMIC TILE	INSUL	INSULATED OR INSULATION	TELE	TELEPHONE
DBL	DOUBLE	INT	INTERIOR	T.O.	TOP OF
DEMO	DEMOLISH	LO	LOW	T.O.B.	TOP OF BEAM
DIA	DIAMETER	MAX.	MAXIMUM	T.O.C.	TOP OF CONCRETE
DIM	DIMENSION	MEL	MELAMINE	T.O.F.	TOP OF FLOOR
DN	DOWN	M.O.	MASONRY OPENING	T.O.P	TOP OF PLATE
DR	DOOR	MECH	MECHANICAL	T.O.R	TOP OF ROOF
DWG	DRAWING	MEMBR	MEMBRANE	T.O.S.	TOP OD STEEL
EA	EACH	MIN	MINIMUM	TP	TOILET PAPER DISPENSER
EIFS	EXTERIOR INSULATION & FINISH SYSTEM	MRGWB	MOISTURE RESISTANT GYPSUM WALL BOARD	T/D	TELEPHONE DATA
				TYP	TYPICAL
EL	ELEVATION	MTL	METAL	O.U.N.	UNLESS OTHERWISE NOTED
ELEC	ELECTRICAL	N.I.C.	NOT IN CONTRACT	U/S	UNDERSIDE
ELEV	ELEVATOR	NO NOM	NUMBER NOMINAL	V.I.F.	VERIFIED IN FIELD
EPDM	ETHYLENE PROPYLENE DIENE M-CLASS ROOFING	O.C.	ON CENTER	V.P.	VISION PANEL
		O.H.	OPPOSITE HAND	W/	WITH
EQ	EQUAL	O/	OVER	WD	WOOD

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VANCOUVER, WA.
98663
(360) 696-4722

11895 REGISTERED ARCHITECT
RYAN C. WILSON
STATE OF WASHINGTON

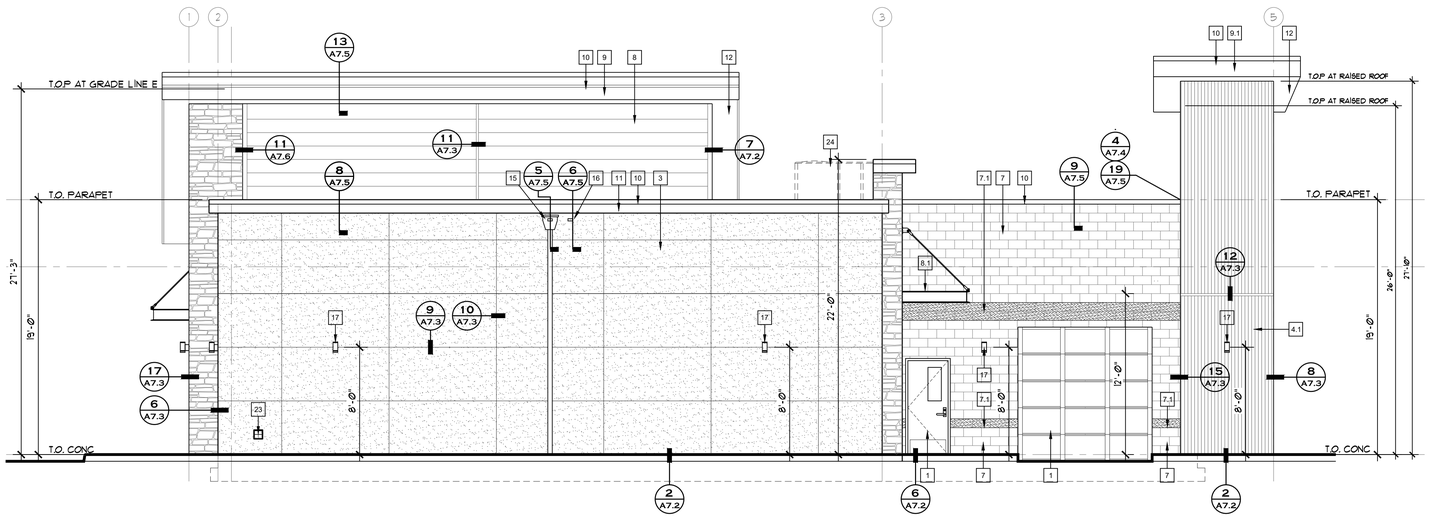
13th Street Site Plan

DATE	SCALE
05-10-23	
JOB NO. 222	DRAWN BY RGM

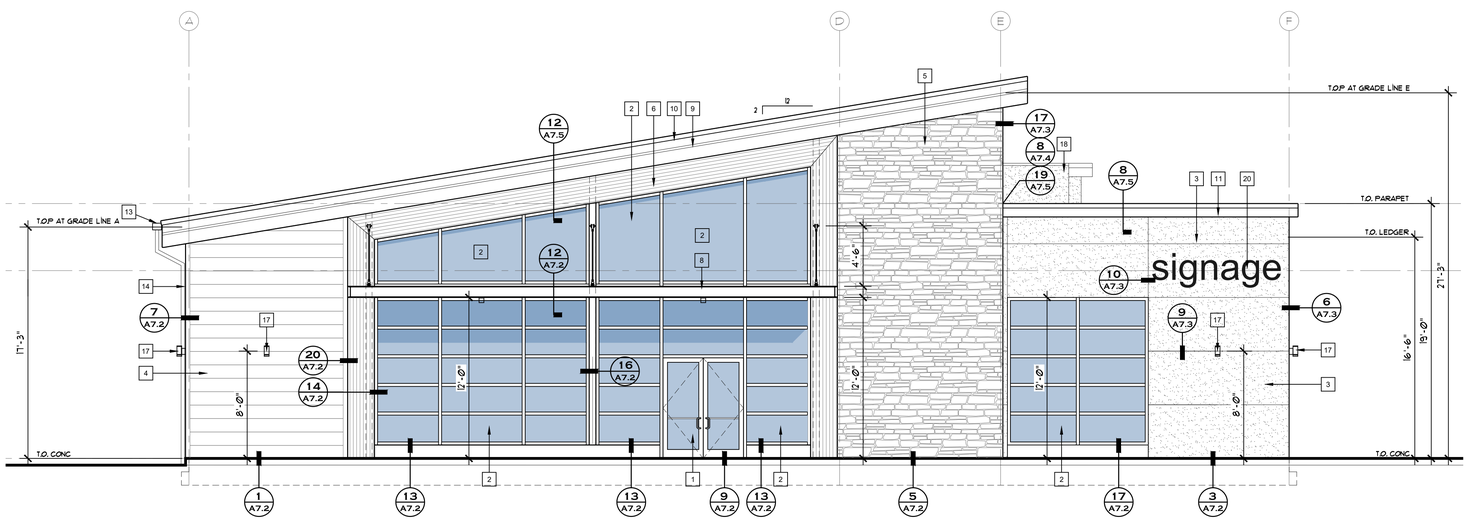
REVISIONS:
1
2
3
4
5
6
7
8
9
10

C

PROJECT TEAM
SHEET INDEX
LEGEND
ABBREVIATIONS



2 SOUTH ELEVATION
SCALE: 3/16" = 1'-0"



1 EAST ELEVATION
SCALE: 3/16" = 1'-0"

KEY NOTES

1. STORE FRONT SEE SCHEDULE
2. DOOR SEE SCHEDULE
3. FIBER CEMENT PANEL
4. METAL PANEL TYPE 1 SEE DETAIL 4/A7.5
4.1. METAL PANEL TYPE 2 SEE DETAIL 4/A7.5
5. VENEER STONE
6. COMPOSITE WOOD SIDING
7. CMU TYPE 1
7.1. CMU TYPE 2
8. METAL CANOPY TYPE 1
8.1. METAL CANOPY TYPE 2
9. METAL FASCIA TYPE 1
9.1. METAL FASCIA TYPE 2
10. METAL CAPPING
11. METAL CORNICE
12. COMPOSITE WOOD
13. METAL GUTER
14. DOWNSPOUT
15. CONDUCTOR SEE DETAIL 1/A7.6
16. OVERFLOW SEE DETAIL 5/A7.5, 15/A7.5
17. LIGHTING FIXTURE TYPE 1
18. RAISED PARAPET BEYOND
19. METAL ROOFING
20. SIGNAGE TYPE 1 (MINI MART)
21. SIGNAGE TYPE 2 (CARWASH)
22. SIGNAGE TYPE 3 (CARWASH)
23. HOSE BIB WITH 8 1/2"X8 1/4" STAINLESS STEEL HOSE BOX SEE DETAIL 3/A7.4
24. HVAC SEE MECH PLAN

GENERAL NOTES

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VANCOUVER, WA.
98663
(360) 696-4722

11895 REGISTERED ARCHITECT
RYAN C. WILSON
STATE OF WASHINGTON

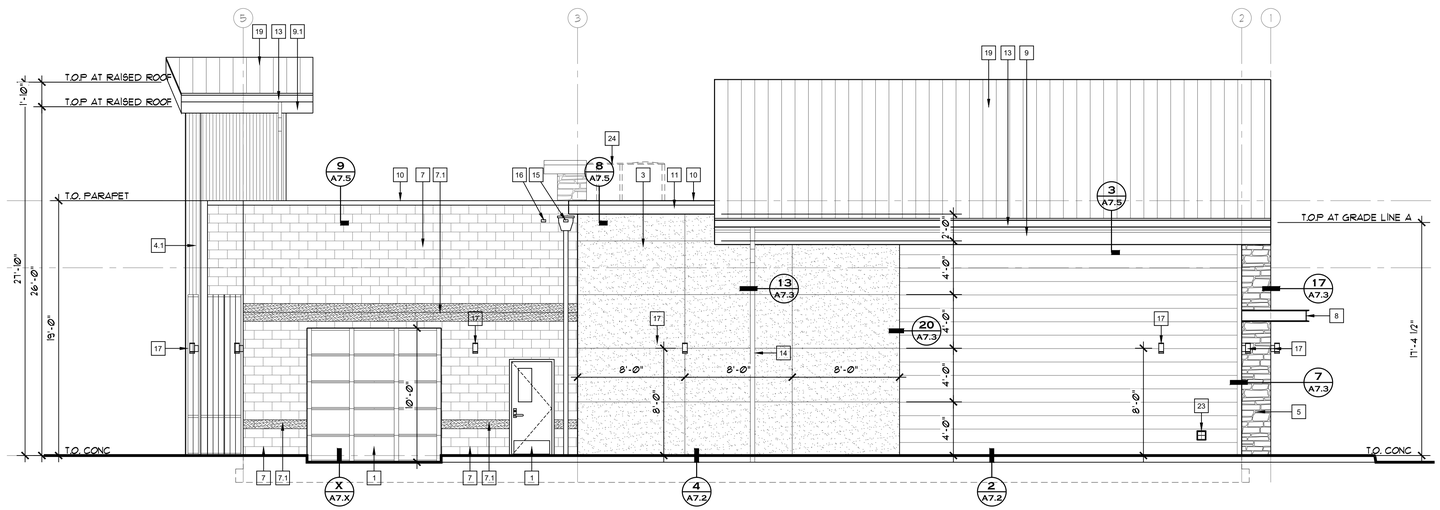
13th Street Site Plan

DATE	SCALE
05-10-23	
JOB NO. 222	DRAWN BY RGM

REVISIONS:
1
2
3
4
5
6
7
8
9
10

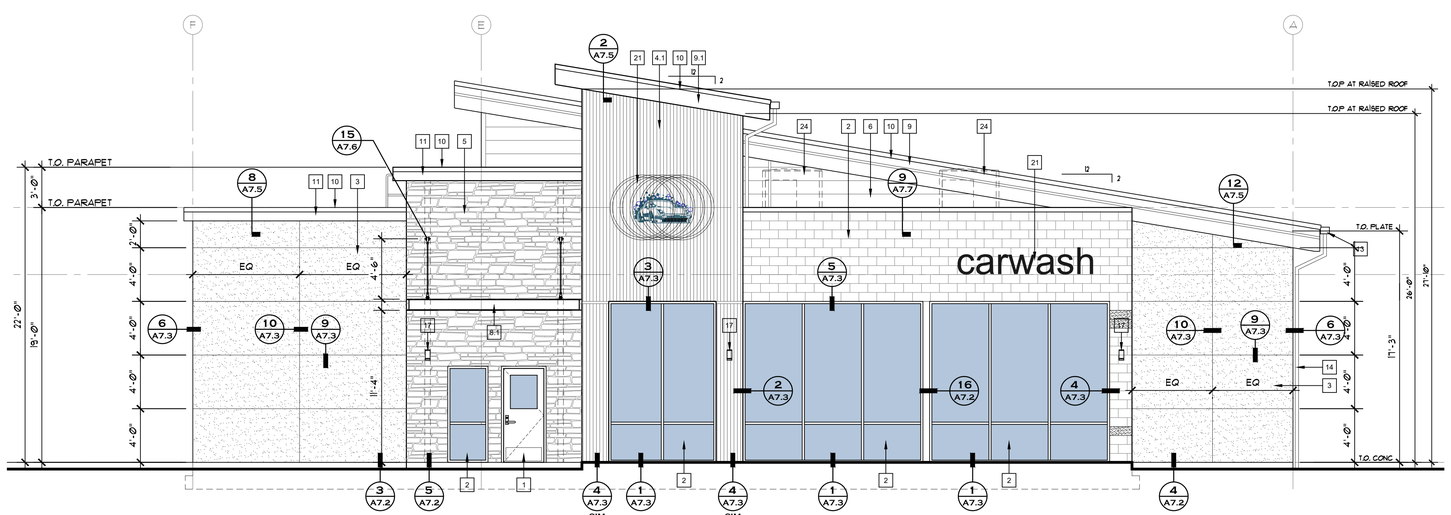
A2.1

BUILDING ELEVATIONS & KEY NOTES



2 NORTH ELEVATION

SCALE: 3/16" = 1'-0"



1 WEST ELEVATION

SCALE: 3/16" = 1'-0"

KEY NOTES

1. STORE FRONT SEE SCHEDULE
2. DOOR SEE SCHEDULE
3. FIBER CEMENT PANEL
4. METAL PANEL TYPE 1 SEE DETAIL 4/A7.5
4.1. METAL PANEL TYPE 2 SEE DETAIL 4/A7.5
5. VENEER STONE
6. COMPOSITE WOOD SIDING
7. CMU TYPE 1
7.1. CMU TYPE 2
8. METAL CANOPY TYPE 1
8.1. METAL CANOPY TYPE 2
9. METAL FASCIA TYPE 1
9.1. METAL FASCIA TYPE 2
10. METAL CAPPING
11. METAL CORNICE
12. COMPOSITE WOOD
13. METAL GUTER
14. DOWNSPOUT
15. CONDUCTOR SEE DETAIL 1/A7.6
16. OVERFLOW SEE DETAIL 5/A7.5, 15/A7.5
17. LIGHTING FIXTURE TYPE 1
18. RAISED PARAPET BEYOND
19. METAL ROOFING
20. SIGNAGE TYPE 1 (MINI MART)
21. SIGNAGE TYPE 2 (CARWASH)
22. SIGNAGE TYPE 3 (CARWASH)
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24. HVAC SEE MECH PLAN

GENERAL NOTES

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RYAN C. WILSON
STATE OF WASHINGTON

13th Street Site Plan

DATE	SCALE
05-10-23	
JOB NO. 222	DRAWN BY RGM

REVISIONS:
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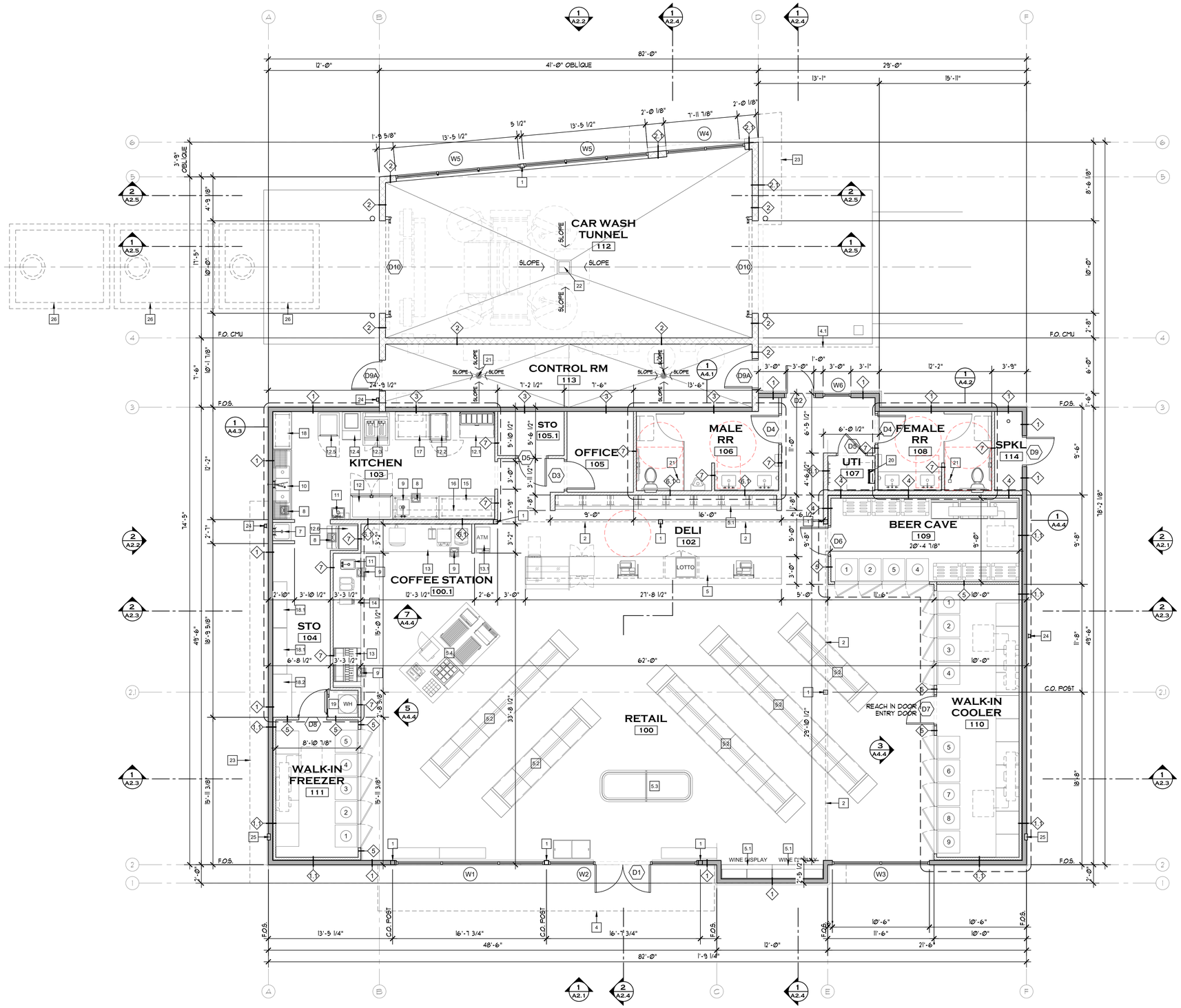
A2.2

BUILDING ELEVATIONS & KEY NOTES



FLOOR PLAN

SCALE: 3/16 = 1'-0"

KEY NOTES

1	STEEL POST PER STRUCT'L
2	BEAM PER STRUCT'L
3	ELECTRIC PANEL SEE ELECT'L DRAWING
4	CANOPY TYPE 1
4.1	CANOPY TYPE 2
5	CABINET COUNTER WITH POS, LOTTO AND DISPLAY DELI
5.1	DISPLAY CABINET
5.2	GONDOLA
5.3	GRAB AND GO
5.4	HOT CASE FOOD STATION
6	NOT USED
7	MOP SINK
8	FLOOR SINK
9	PREP SINK
10	3 COMPARTMENT SINK
11	HANDWASH SINK
11.1	DROP-IN SINK
12	56" FREEZER
12.1	PIZZA PREPARATION REFRIGERATOR
12.2	MULTI-COOK OVEN
12.3	VENTLESS FRYER
12.4	BREAD AND BATTER STATION
12.5	REACH-IN REFRIGERATOR
12.6	ICE MAKER, CUBE-STYLE
13	SODA ICE & BEVERAGE DISPENSER
13.1	ATM MACHINE
14	DRINKING FOUNTAIN BAR STATION
15	30X60 WORKING TABLE
16	SHELVING WALL MOUNTED
17	36X44 WORKING TABLE
18	24X60 WORKING TABLE
18.1	WIRE SHELVING
18.2	BAG IN BOX SYRUP TANK RACK
19	WATER HEATER
20	ROOF HATCH WITH FIXED LADDER
21	FLOOR DRAIN
22	FLOOR DRAIN (CARWASH TUNNEL)
23	ROOF LINE
24	DOWNSPOUT
25	8 1/2"X8 1/4" STAINLESS STEEL HOSE BIBB SEE DETAIL 3/A7.4
26	UNDERGROUND TANK

GENERAL NOTES

1. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE.
2. ALL DENOTED DIMENSIONS ARE TO BE USED. PLANS SHALL NOT BE SCALED.
3. EXTERIOR WALLS ARE 2"X6 STUD, INT SHEAR WALLS ARE 2X6 @ 16" OC. UNLESS NOTED OTHERWISE, SEE STRUCTURAL.
4. SEE PLUMBING DRAWINGS FOR DIMENSIONS TO PLUMBING FIXTURES.
5. LOCATION OF (N) KNOX BOX. VERIFY EXACT LOCATION WITH FIRE MARSHALL PRIOR TO INSTALLING.
6. ELECTRICAL PLAN SEE ELECTRICAL DWG'S.
7. MECHANICAL PLAN SEE MECHANICAL DWG'S.
8. WALL ASSEMBLY SEE DWG A7.1
9. DOOR SCHEDULE SEE DWG A8.1
10. WINDOW SCHEDULE SEE DWG A9.1
11. EQUIPMENT SCHEDULE SEE DWG A3.4
12. FINISH SCHEDULE SEE DWG A10.1

WILSON
ARCHITECTS, PLLC
404 E 15TH ST. #7
VANCOUVER, WA.
98663
(360) 696-4722

11895 REGISTERED ARCHITECT RYAN C. WILSON STATE OF WASHINGTON

13th Street Site Plan

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JOB NO. 222	DRAWN BY RGM

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A3.1

FLOOR PLAN. KEY NOTES

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

November 30, 2023

Travis Johnson
pm@plsengineering.com

Taz Khan
tkhanusa@gmail.com

RE: Application Review for 20101 NE 13th Street – Planning Cases SPRV23-06, ARCH23-07, CA23-08, DR23-09 and SEPA23-12

Dear Travis,

Thank you for your application submittal for the 13th Street Gas Station. I am the case planner assigned to this project. The purpose of this letter is to inform you that the application submitted on November 9, 2023, has been deemed incomplete and there are items that need to be addressed before we move forward with the review process.

Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete. As a reminder, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite applicable code requirements shall not constitute a waiver by the City of any standard or requirement.

The items necessary for completeness are as follows:

ENGINEERING

The items noted below were submitted with the initial application and require revisions and/or resubmittals as noted below.

CMC 18.18.040.D:

- The civil plans were submitted at a scale of 1" = 20' instead of the required scale of 1" = 50'.

CMC 18.18.040.E:

- A circulation plan was not submitted. It stated in the narrative that drive aisles are wide enough, but a plan sheet showing the circulation of fuel delivery trucks and deliveries to the market is required.
- The TIA traffic impact analysis has been sent to the City of Vancouver for review and comments.

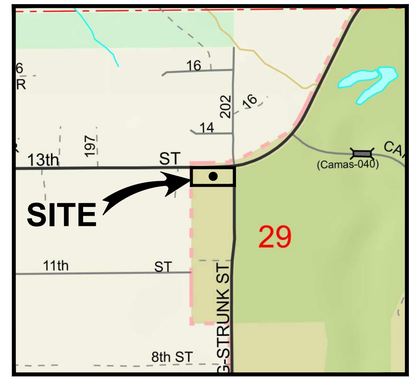
CMC 18.18.040.F:

- A preliminary TIR was submitted however, the report refers to a 35-lot subdivision project in Section A.1, first paragraph. Revise and resubmit the PTIR.
- The preliminary stormwater plans are included on the preliminary utility plans.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,

Yvette Sennewald, Senior Planner



VICINITY MAP
NOT TO SCALE

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	

Scale 1" = 20'
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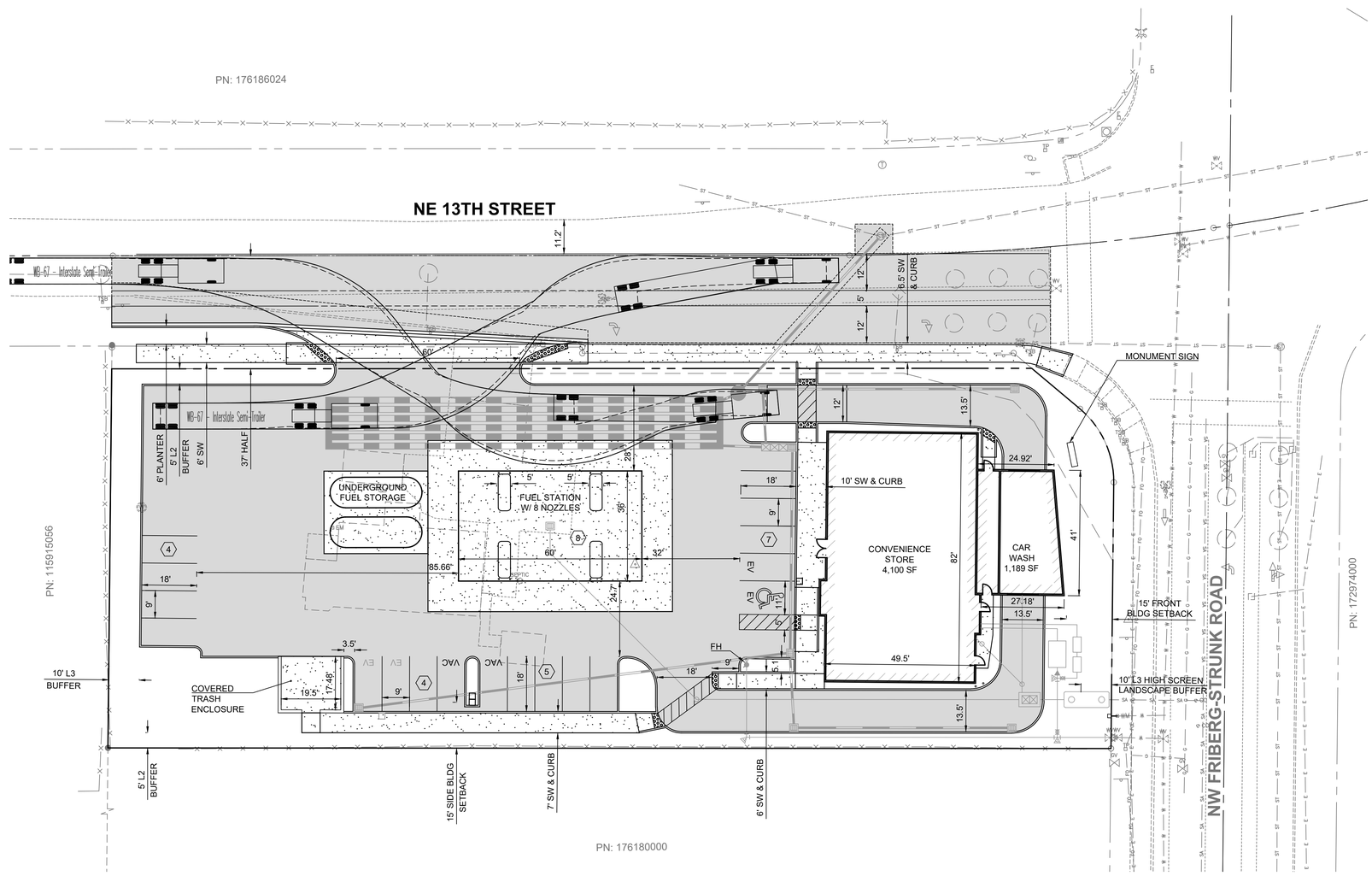

GENERAL NOTES

APPLICANT:
Taz Kahn
3993 NW Currawong Court
Camas, WA 98607
TKahnusa@gmail.com

OWNER:
Pak USA Camas LLC
20107 NE 13th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 176148-000
20101 NE 13TH ST
Camas, WA 98607

CIRCULATION DISCUSSION:
This plan shows that a WB-67 truck can enter and exit the site for deliveries. Note that the turning path does not impact access to the gas pumps. This is the largest possible design vehicle. Since it can access the site, smaller delivery vehicles can as well.

PLS ENGINEERING

Preliminary Circulation Plan For:

13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	
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SCOTT W. GILLILAND
STATE OF WASHINGTON
42773
REGISTERED PROFESSIONAL ENGINEER
11/09/23

Project No. 3632	
SCALE:	H: 1" = 20' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

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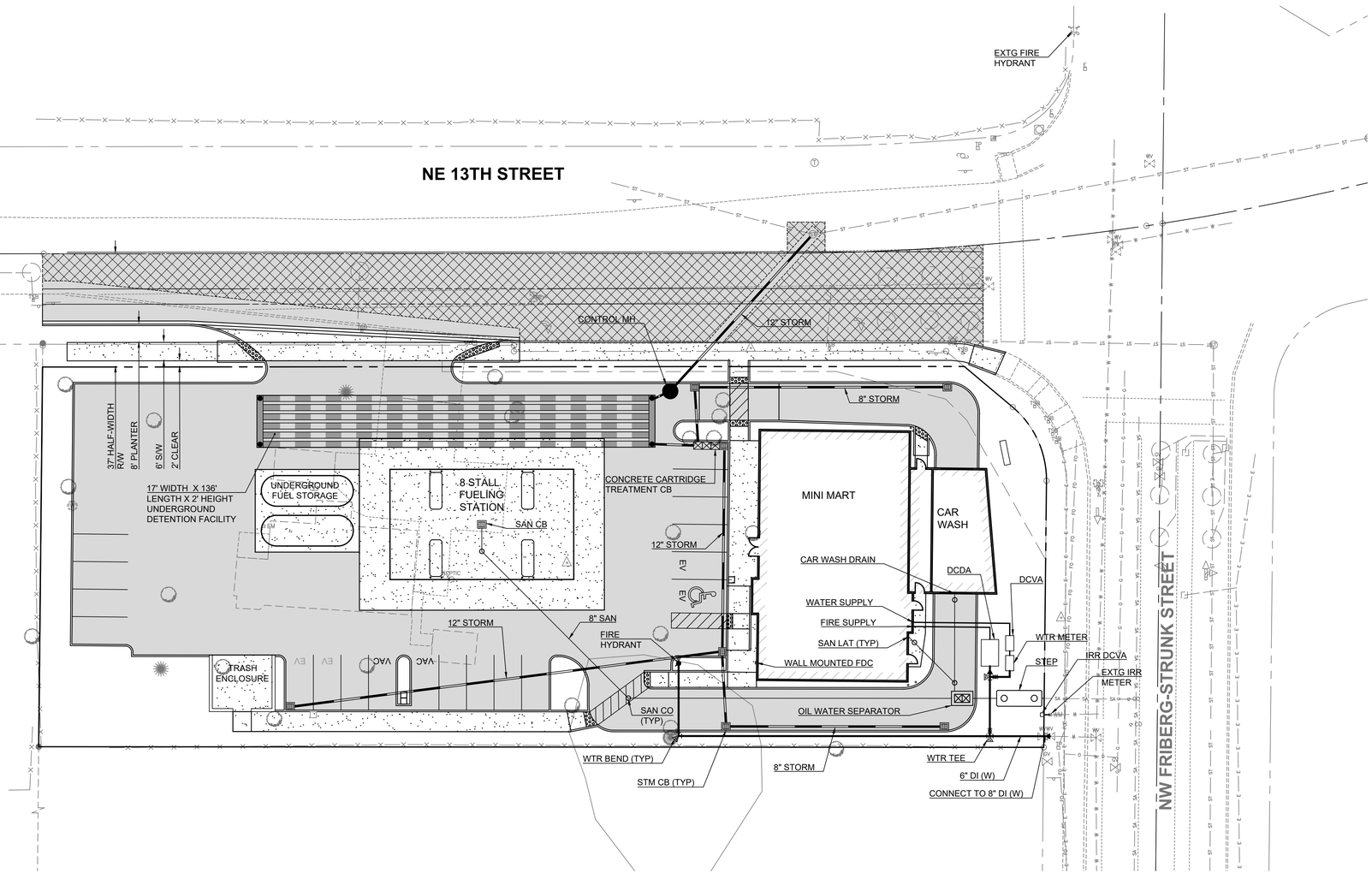

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Grind and Overlay	

Scale 1" = 20'

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N

PLS ENGINEERING

Preliminary Stormwater Plan For: 13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

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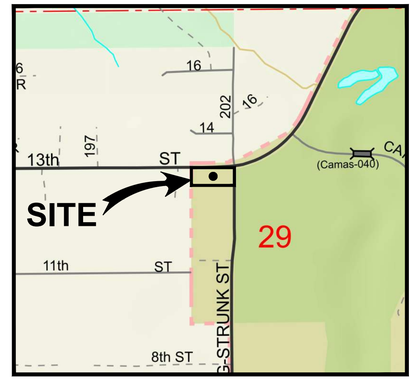
SCOTT W. GILLILAND — STATE OF WASHINGTON — 42773 — REGISTERED PROFESSIONAL ENGINEER — 11/22/23

Project No. 3632	
SCALE:	H: 1" = 20' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

1 / 1

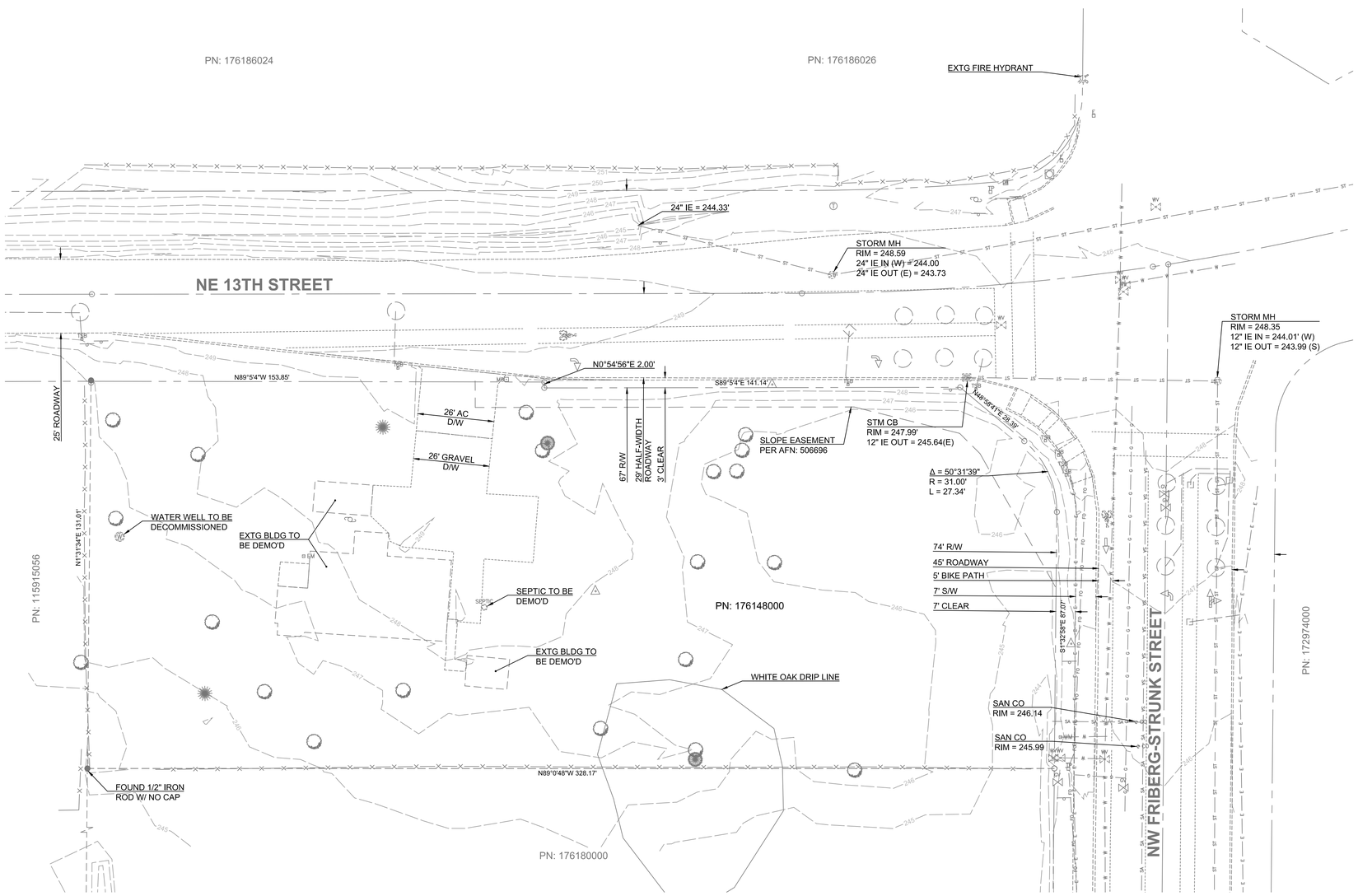
13th Street Site Plan

Located in the NW ¼ of Section 29, T2N, R3E, W.M.
City of Camas, Washington



VICINITY MAP
NOT TO SCALE

Sheet Index	
1.	Existing Conditions Plan
2.	Preliminary Site Plan
3.	Preliminary Utility Plan
4.	Preliminary Grading Plan
5.	Existing Tree Survey TP
6.	Preliminary Landscape Plan L1
7.	Final Landscape Details PD
8.	Preliminary Irrigation Details ID



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CIVIL ENGINEER:
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Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 176148-000
20101 NE 13TH ST
Camas, WA 98607

HORIZONTAL DATUM:
NAD 83 (2011) Washington State plane coordinate system, south zone, us survey feet. Based on real time kinematic corrections from the Washington State reference network.

VERTICALL DATUM:
NGVD 1929(47) based on real time kinematic corrections from the Washington State reference network.

Scale 1" = 20'
20 10 0 20

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ENGINEERING
PLS

Existing Conditions Plan For:
13th Street Site Plan
A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions
1 2 3 4 5 6

SCOTT W. GILLILAND
STATE OF WASHINGTON
42773
REGISTERED PROFESSIONAL ENGINEER
8/31/23

Project No. 3632	
SCALE:	H: 1" = 20' V: N/A
DESIGNED BY:	SWG
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REVIEWED BY:	TGJ

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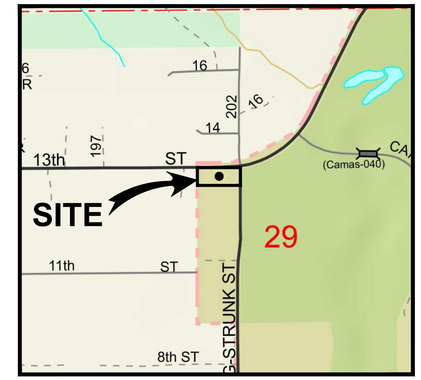

VICINITY MAP
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Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	

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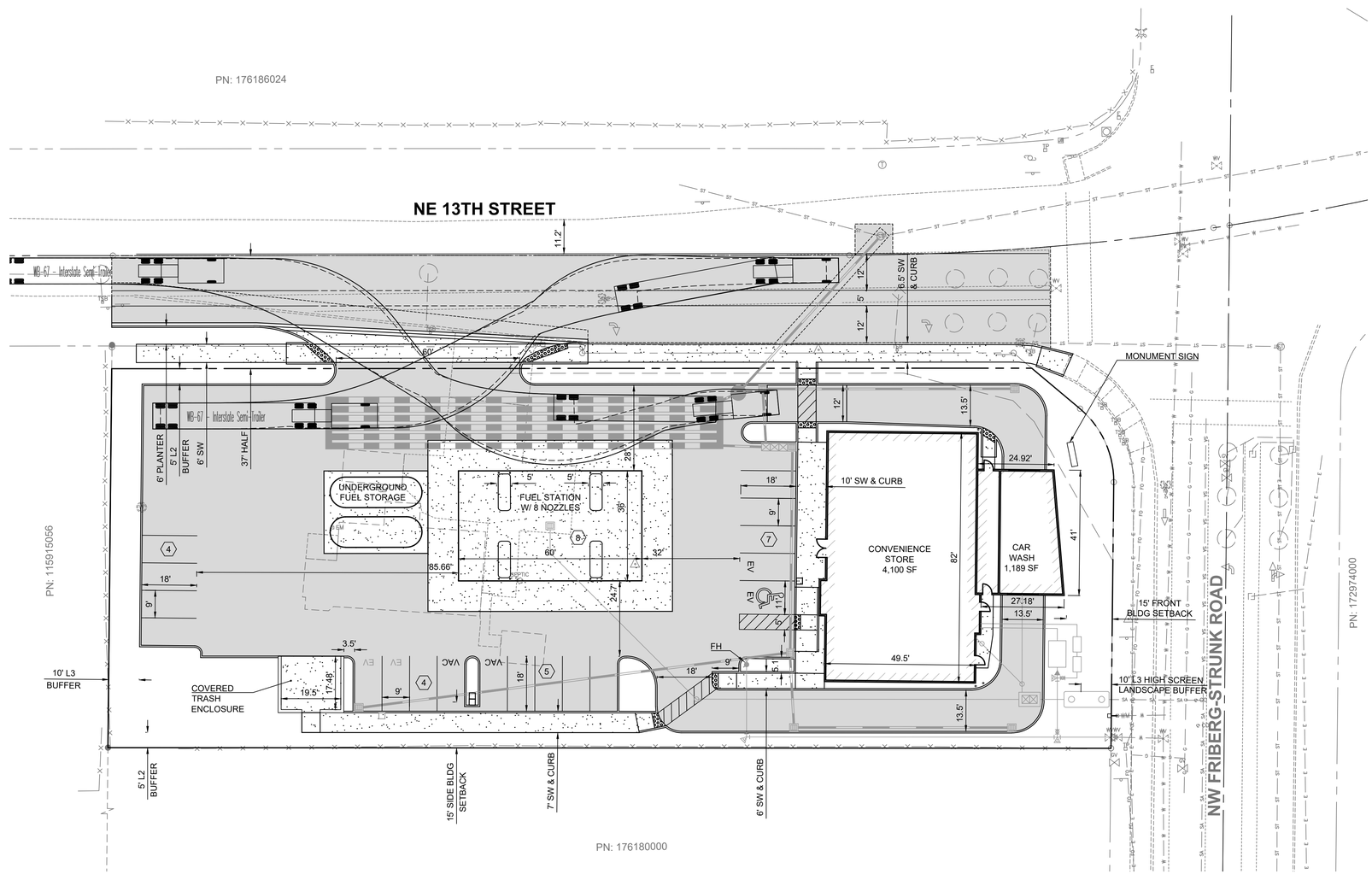

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PLS ENGINEERING

Preliminary Circulation Plan For:

13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

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11/09/23

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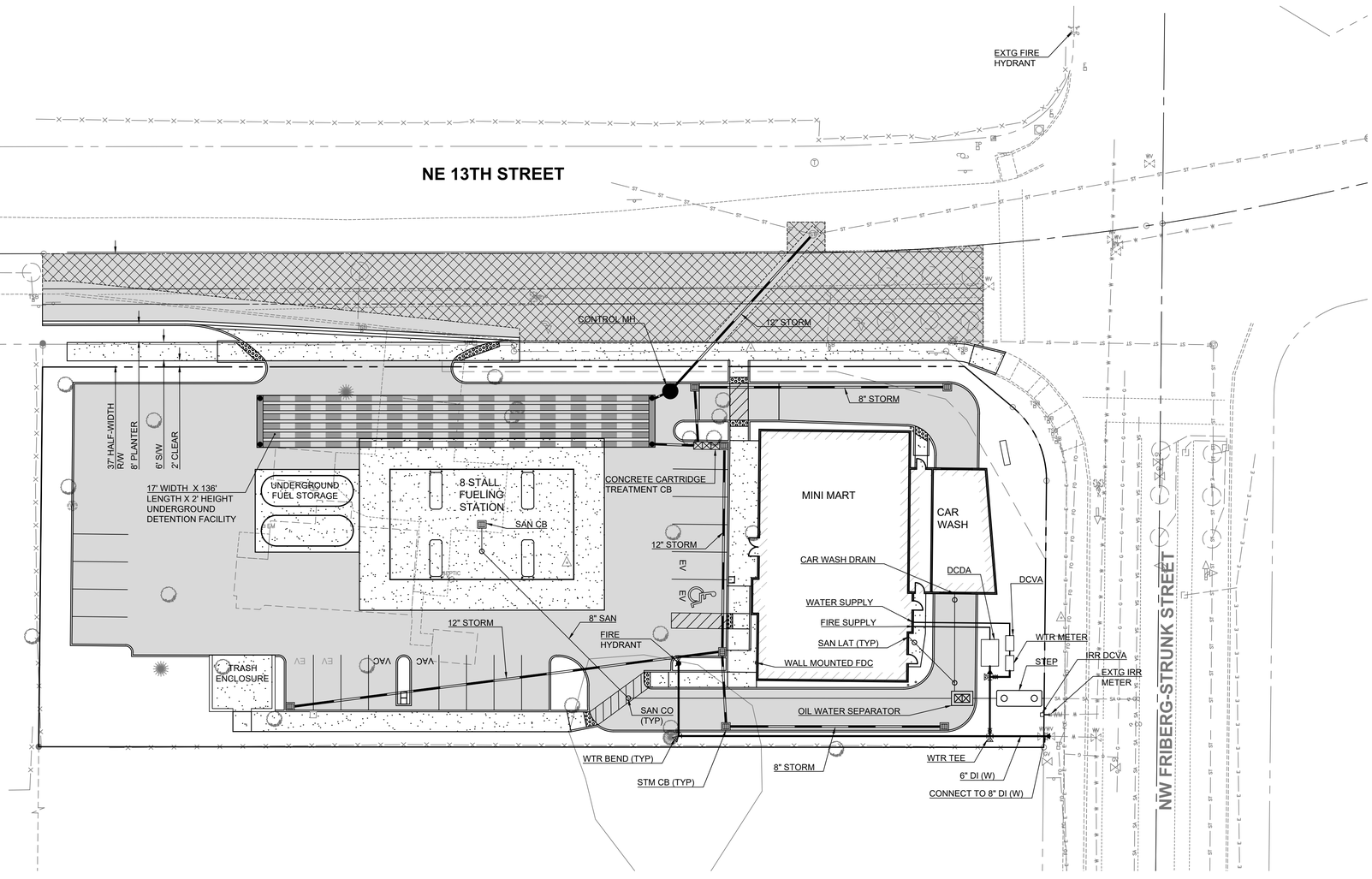

Legend	
Proposed Asphalt Concrete	
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Proposed Grind and Overlay	

Scale 1" = 20'

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PLS ENGINEERING

Preliminary Stormwater Plan For:

13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

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SCOTT W. GILLILAND
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42773
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11/22/23

Project No. 3632	
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DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

1

1

13th Street Site Plan

Located in the NW ¼ of Section 29, T2N, R3E, W.M.
City of Camas, Washington

PARCEL STATISTICS		
ZONE: Business Park BP		
Gross Site Area	42,208 SQ FT	0.97 AC
Critical Areas	0 SQ FT	0 AC
	REQUIRED	PROPOSED
Density	N/A	N/A
Maximum Lot Coverage	50%	20%
Setbacks		
North	15'	15'
South	15'	15'
East	15'	15'
West	50'	50'
Maximum Building Height	None	28'
Total Parking Spaces *	20	20
Standard Parking Spaces	70% Min of Total	20
Compact Spaces (C)	30% Max of Total	0
Gas Fill-up Stalls *	1 Per Nozzle (8)	8
ADA Spaces (ADA)	1 Per 25 of Total (1)	1
Spaces with Electric Vehicle Charging Infrastructure (E)	10% Now (2) + 10% Future (2)	2 Now + 2 Future

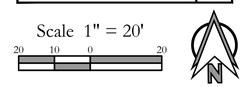
*Note: The Gas stalls are not actually parking stalls and do not count towards the required ADA and EV calculations.

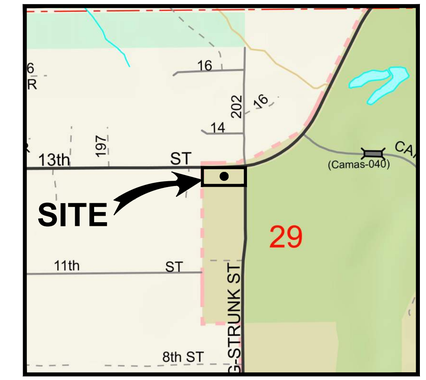
REQUIRED PARKING CALCULATIONS:

4100 sf c-store @ 1/250 sf	= 17
8 nozzle gas station @ 1/nozzle	= 8
1 stall carwash w/ 2 employees @ 2/stall+1/2 employees	= 3
Total	= 28
Excluding Gas Fill-up Stalls	= 20

Legend
Proposed Asphalt Concrete
Proposed Cement Concrete
Proposed Grind and Overlay

Scale 1" = 20'





VICINITY MAP
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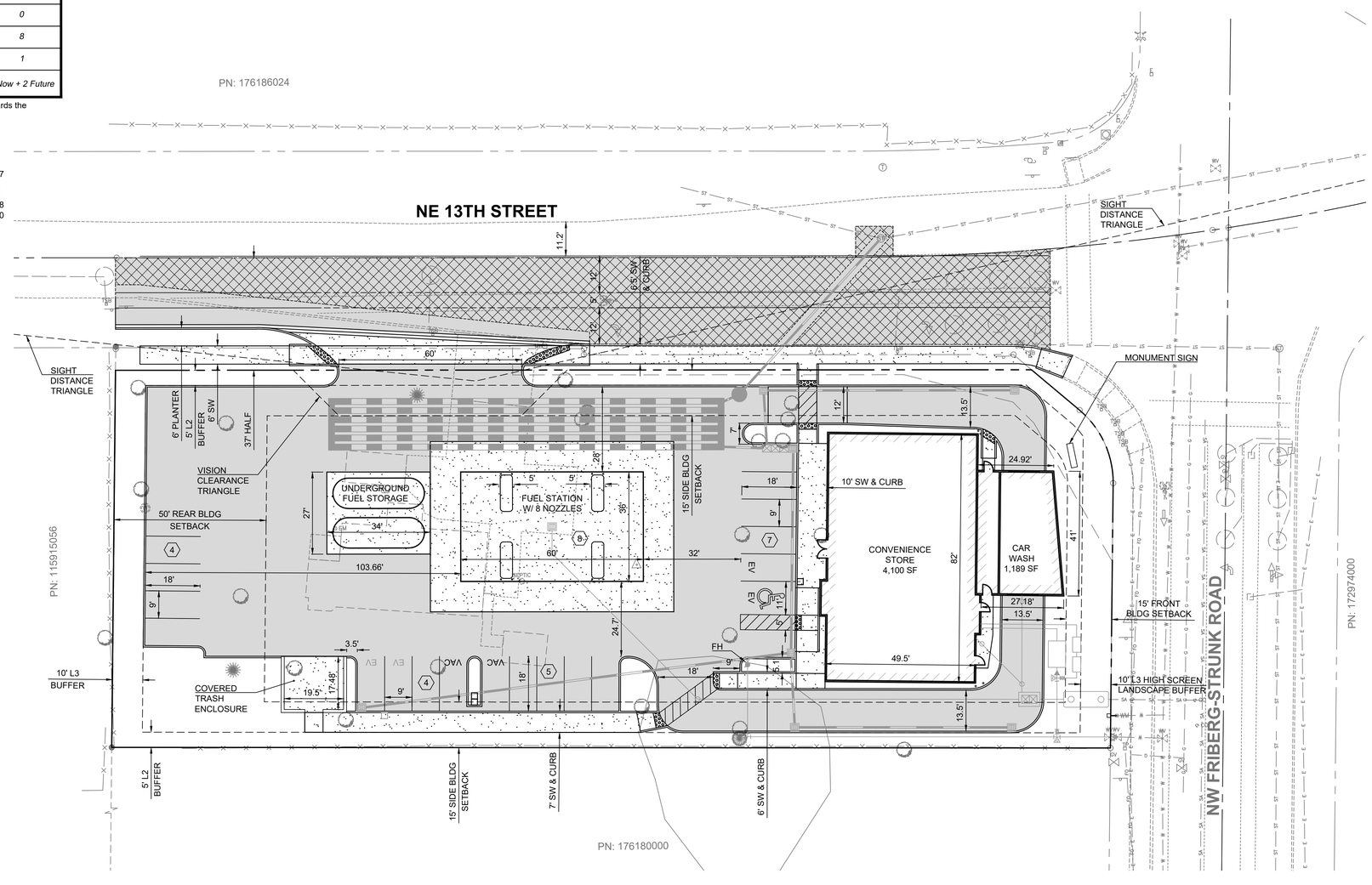

GENERAL NOTES

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PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 176148-000
20101 NE 13TH ST
Camas, WA 98607

SITE STATISTICS:
Existing Site Area: 42,257 SF (0.97 Acre)
ROW Dedication: 1,832 SF (0.04 Acre)
Developed Site: 42,257 SF (0.93 Acre)

PLS ENGINEERING
Preliminary Site Plan For:
13th Street Site Plan
A Subdivision Located In The City Of Camas, Washington
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Revisions
1 2 3 4 5 6

SCOTT W. GILLILAND STATE OF WASHINGTON 42773 REGISTERED PROFESSIONAL ENGINEER 11/09/23

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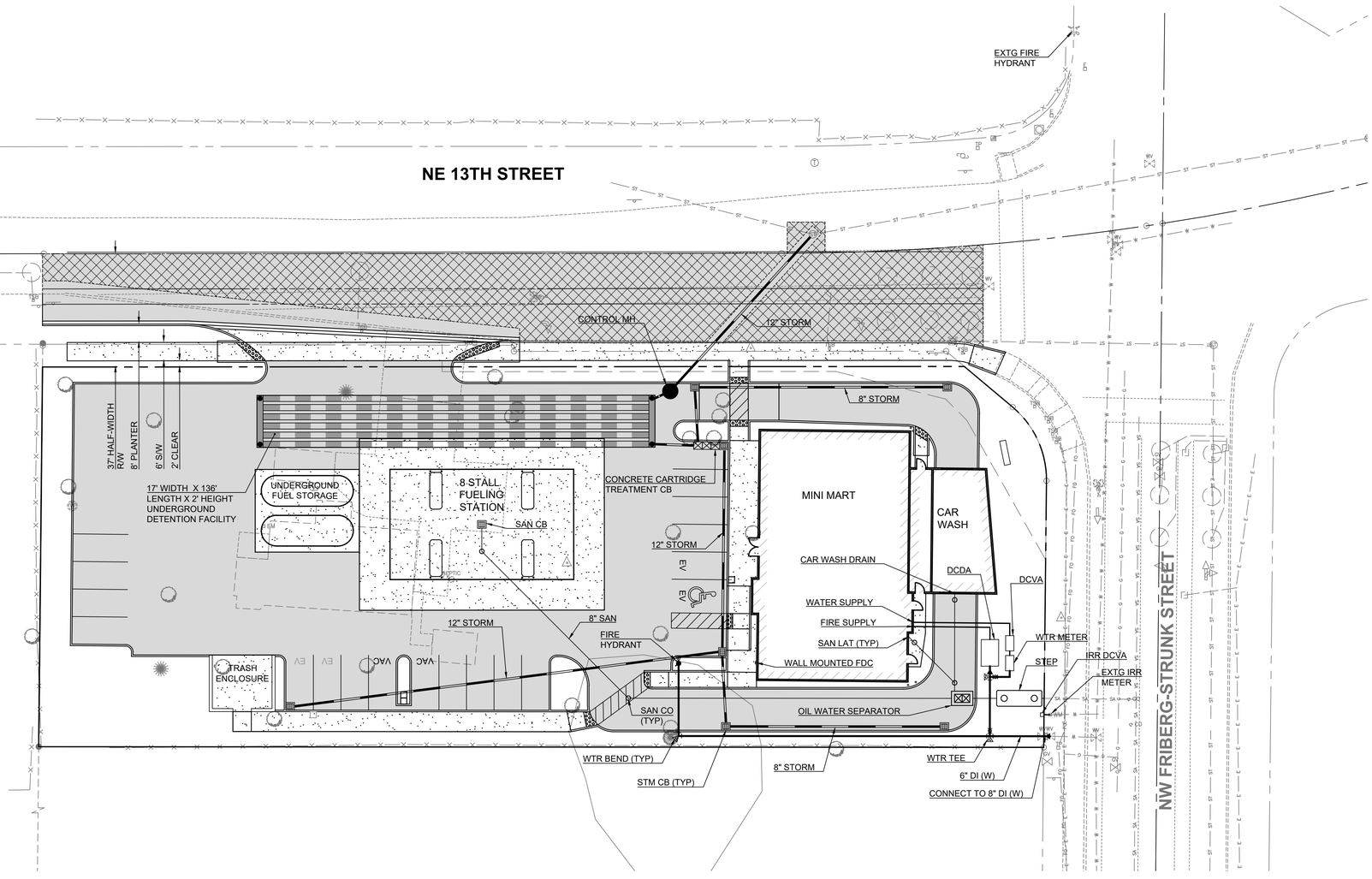

Legend	
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Proposed Grind and Overlay	

Scale 1" = 20'

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PLS ENGINEERING

Preliminary Utility Plan For:

13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

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42773
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11/22/23

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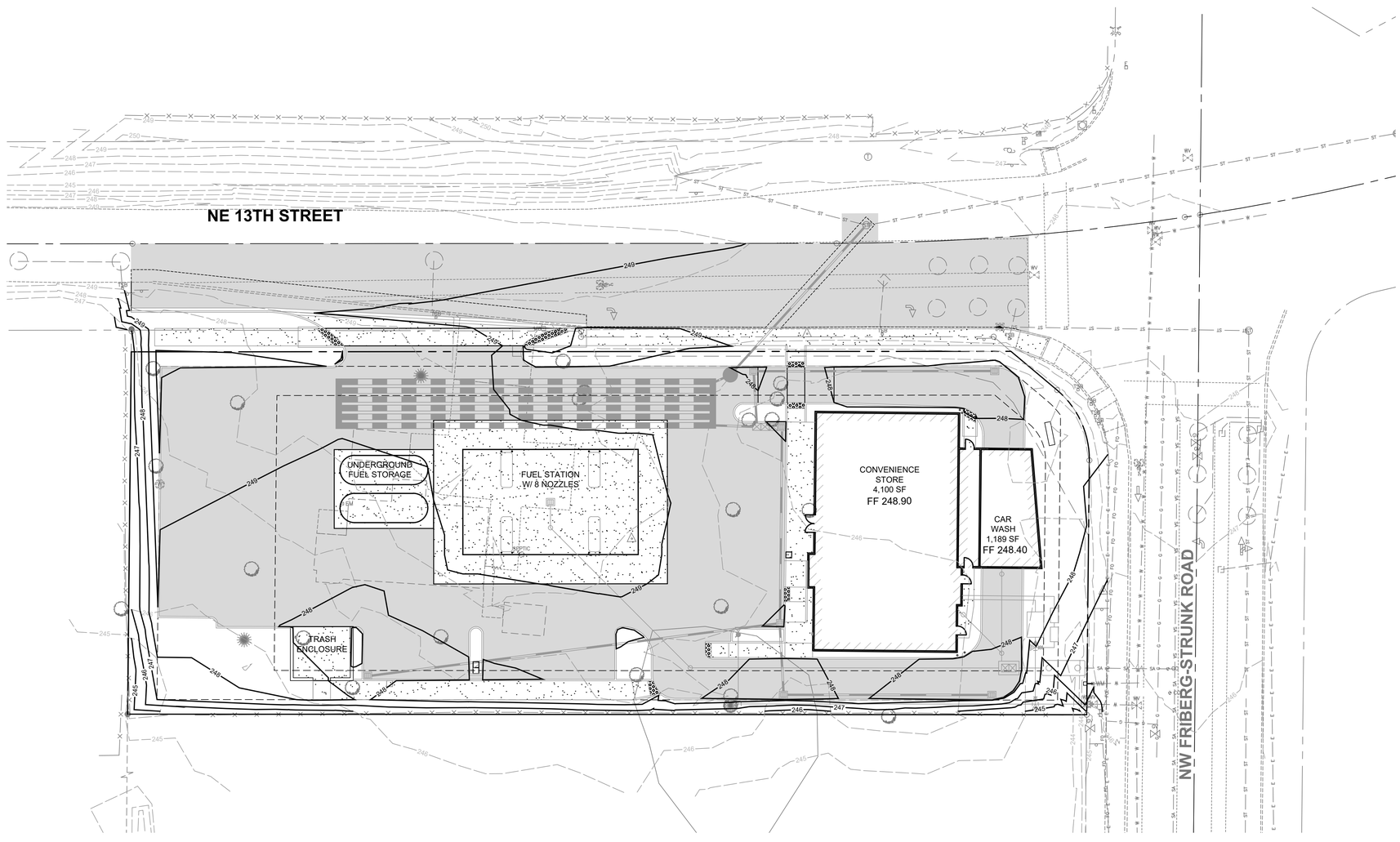

UNADJUSTED VOLUMES	
CUT	620 CY
FILL	1,730 CY

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Grind and Overlay	

Scale 1" = 20'

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PLS ENGINEERING

Preliminary Grading Plan For:

13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

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SCOTT W. GILLILAND — STATE OF WASHINGTON — 42773 — REGISTERED PROFESSIONAL ENGINEER — 11/22/23

Project No. 3632	
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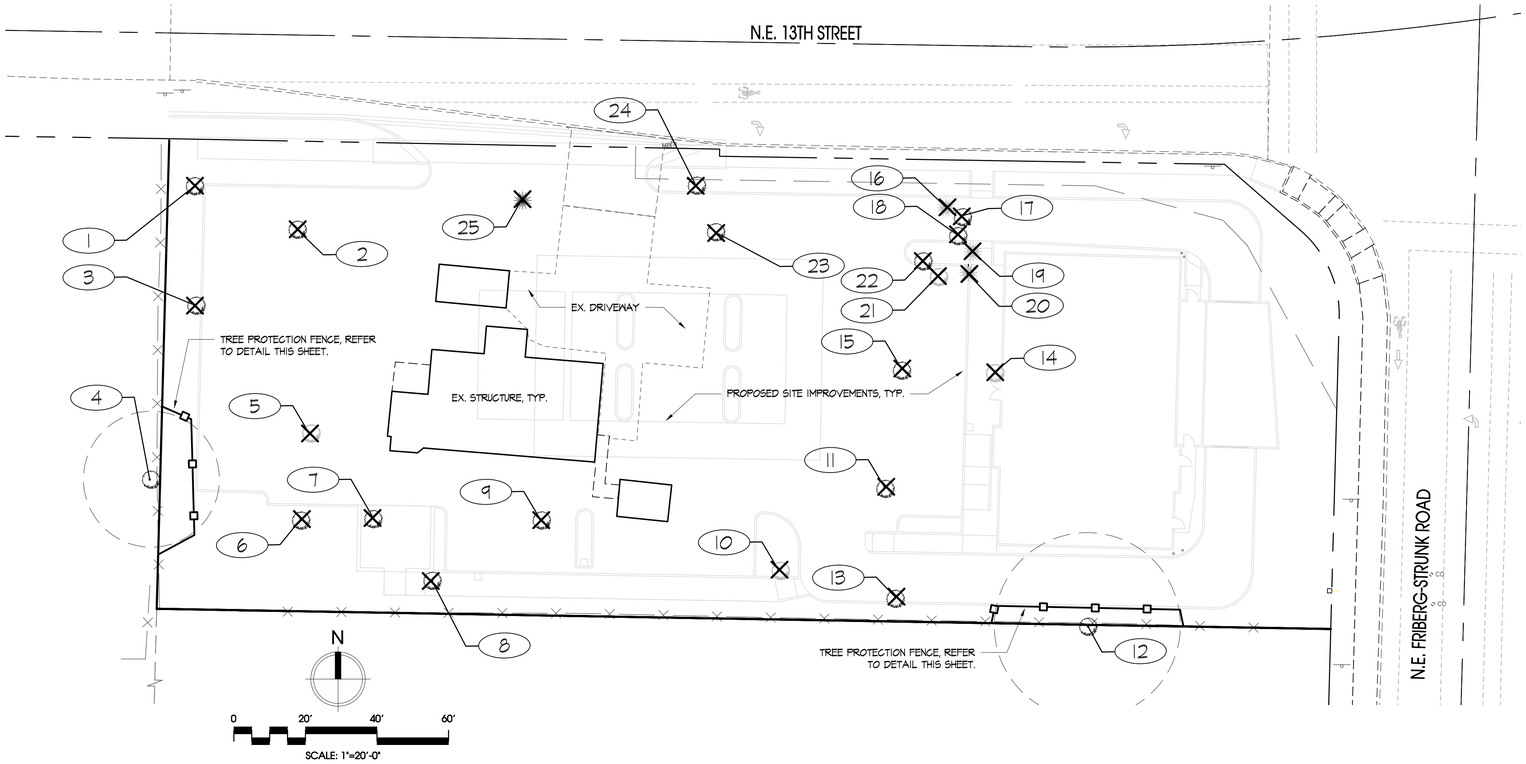


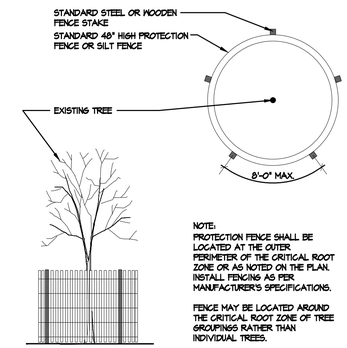
Tree Data					
Tree No.	Species	DBH	RPZ	Tree Condition	Condition Notes
1	Prunus spp. (Plum)	12"	12'	poor	Diseases or Conks, Visible Decay
2	Malus spp. (Apple)	19"	19'	fair	Diseases or Conks, Leaning
3	Malus spp. (Apple)	13"	13'	fair	Dieback 30% - 60%
4	Robinia pseudoacacia (Black Locust)	19"	19'	fair	Heavy Leaning (>60%)
5	Acer palmatum (Japanese maple)	9"	9'	poor	Dieback 30% - 60%, Visible Decay
6	Thuja plicata (Western Redcedar)	18"	18'	good	
7	Malus spp. (Apple)	18"	18'	poor	Branch Failures, Biotic Damage (Pests/Fungus), Dieback 60%-90%, Diseases or Conks, Visible Decay
8	Acer palmatum (Japanese maple)	12"	12'	good	
9	Malus spp. (Apple)	17"	17'	fair	Biotic Damage (Pests/Fungus), Dieback 30% - 60%, Leaning
10	Malus spp. (Apple)	11"	11'	poor	Included Bark, Dieback 30% - 60%, Leaning
11	Acer saccharum (Sugar Maple)	22"	22'	good	Dieback 30% - 60%
12	Aesculus californica (California Buckeye)	26"	26'	fair	Branch Failures, Dieback 30% - 60%, Leaning
13	Quercus garryana (OR White Oak)	43"	43'	fair	Leaning
14	Aesculus californica (California Buckeye)	10"	10'	fair	Dieback 30% - 60%
15	Robinia pseudoacacia (Black Locust)	25"	25'	fair	Branch Failures, Dieback 30% - 60%, Leaning
16	Picea pungens (Blue Spruce)	6"	6'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
17	Acer saccharum (Sugar Maple)	18"	18'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
18	Acer saccharum (Sugar Maple)	19"	19'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
19	Picea pungens (Blue Spruce)	7"	7'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
20	Thuja occidentalis (Aborvitae)	6"	6'	poor	Branch Failures, Branches Suppressed, Co-dominant, Dieback 30% - 60%, Visible Decay
21	Malus spp. (Apple)	6"	6'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
22	Acer saccharum (Sugar Maple)	20"	20'	poor	Branch Failures, Branches Suppressed, Dieback 30% - 60%, Visible Decay
23	Acer palmatum (Japanese maple)	15"	15'	good	
24	Robinia pseudoacacia (Black Locust)	33"	33'	poor	Branch Failures, Dieback 30% - 60%, Leaning, Visible Decay
25	Thuja plicata (Western Redcedar)	44"	44'	fair	Leaning, Visible Decay

CERTIFIED ARBORIST ISA

Robert Phipps,
PN-8751A

SITE STATISTICS	
.93± AC	SITE AREA
19	TREE UNITS REQUIRED (20 / ACRE)
0	TREE UNITS RETAINED

SYMBOL LEGEND	
SYMBOL	DESCRIPTION
	EXISTING SIGNIFICANT DECIDUOUS TREE (12" CAL. OR GREATER) EXISTING SIGNIFICANT EVERGREEN TREE (8" CAL. OR GREATER)
	EXISTING DECIDUOUS (LESS THAN 12" CAL.) EXISTING EVERGREEN TREE (LESS THAN 8" CAL.)
	EXISTING SIGNIFICANT TREES TO BE REMOVED
	ROOT PROTECTION ZONE AREA (RPZ)
	TREE PROTECTION FENCE LOCATION (4' CHAIN LINK, ORANGE PVC FENCE OR SILT FENCE) (ALSO DENOTES AREA WHERE NO IMPACTS TO THE ROOT PROTECTION ZONE SHALL OCCUR). SEE DETAIL THIS SHEET.



NOTE:
PROTECTION FENCE SHALL BE LOCATED AT THE OUTER PERIMETER OF THE CRITICAL ROOT ZONE OR AS NOTED ON THE PLAN. INSTALL FENCING AS PER MANUFACTURER'S SPECIFICATIONS.

FENCE MAY BE LOCATED AROUND THE CRITICAL ROOT ZONE OF TREE GROUPINGS RATHER THAN INDIVIDUAL TREES.

A Tree Protection Fencing Detail
Not To Scale — SECTION / PLAN VIEW

TREE PROTECTION TIME LINE & NARRATIVE

EXISTING ON-SITE AND OFF-SITE TREE LOCATIONS AND SIZES HAVE BEEN OBTAINED VIA SURVEY INFORMATION AND SITE OBSERVATIONS.

NO EXISTING TREES WITHIN THE PROJECT BOUNDARIES ARE PROPOSED TO BE RETAINED.

TREE PROTECTION FENCING SHALL BE PLACED AS SHOWN TO PROTECT THE OFF-SITE TREE NEAR THE S.E. CORNER OF THE SITE.

TREE PROTECTION / EROSION CONTROL FENCING SHALL BE ESTABLISHED PRIOR TO EXCAVATION. IT IS RECOMMENDED TO BE INSTALLED AT THE SAME TIME EROSION CONTROL MEASURES ARE INSTALLED. WHERE TREE FENCE AND EROSION CONTROL FENCE ARE LOCATED AT THE SAME LOCATION, EROSION FENCE THEN SERVES AS TREE PROTECTION FENCE. SEE DETAIL THIS SHEET.

TREES DETERMINED TO BE A SAFETY HAZARD AT THE TIME OF CONSTRUCTION MAY BE REMOVED. THE SITE WILL MAINTAIN A MINIMUM TREE UNIT COUNT OF 20 TREES PER ACRE IN ACCORDANCE WITH CITY OF CAMAS MUNICIPAL CODE CC 18.13.051.

TREE PROTECTION NOTES

1) NO PERSON MAY CONDUCT ANY OF THE FOLLOWING ACTIVITIES WITHIN THE DRIP LINE OF THE TREES DESIGNATED TO REMAIN INCLUDING, BUT NOT LIMITED TO: PARKING EQUIPMENT, FUELING, SERVICING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIAL AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT AND LOCATING BURN HOLES.
2) DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO THE TREES DESIGNATED FOR PROTECTION.
3) THE CONTRACTOR SHALL FOLLOW THE GRADING PLAN PROVIDED BY THE PROJECT CIVIL ENGINEER. GRADING ACTIVITIES SHALL BE CONDUCTED IN A MANNER TO MINIMIZE THE IMPACTS TO THE TREES MARKED FOR PRESERVATION.
4) THE EXCAVATOR SHALL KEEP A SHARP PAIR OF LOPPERS AND A SHARP 12" PRUNING SAW ACCESSIBLE ON-SITE DURING GRADING OPERATIONS. ANY ROOTS LARGER THAN ½" SHALL BE PRUNED TO THE FACE OF THE CUT (USING A SHARP PAIR OF LOPPERS OR A SHARP 12" PRUNING SAW) AND SHALL NOT BE TORN FROM THE GROUND BY MECHANICAL EXCAVATION.
5) SPECIAL CARE SHALL BE EXERCISED IN WORKING NEAR THE TREES TO BE RETAINED. THIS INCLUDES HAND EXCAVATING THE ROOTS AT THE EDGE OF THE EXCAVATION AND CUTTING ROOTS WITH A LOPPER OR PRUNING SAW. PRUNING THE ROOTS AT THE EDGE OF EXCAVATION WILL MINIMIZE BREAKAGE OF HEALTHY ROOTS BEYOND THE EDGE OF THE PROPOSED EXCAVATION.
6) EXCEPT FOR THE PROPOSED IMPROVEMENTS SHOWN WITHIN THE DRIP LINES OF THE TREES NOTED TO BE RETAINED THE GRADE SHALL NOT BE ELEVATED OR REDUCED FROM EXISTING GRADE.
7) IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREE'S DRIP LINE, IT SHALL BE PERMANENTLY STABILIZED.
8) THE TREES NOTED TO RETAINED SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. CLEARING OPERATIONS SHALL BE CONDUCTED SO AS TO EXPOSE THE SMALLEST PRACTICAL AREA OF SOIL TO EROSION FOR THE LEAST POSSIBLE TIME. REFER TO THE PROJECT'S EROSION CONTROL PLAN FOR MORE INFORMATION.
9) THE PROJECT SHALL NOT INSTALL AN IMPERVIOUS SURFACE OTHER THAN THOSE SPECIFICALLY SHOWN ON THE PLANS WITHIN THE DRIP LINE OF THE TREES TO BE RETAINED.
10) UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE DRIP LINE OF THE TREES TO BE RETAINED.
11) ONGOING TREE MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE LAND OWNER. TREES SHALL BE MAINTAINED IN ACCORDANCE WITH ANSI AMERICAN NATIONAL STANDARDS INSTITUTE'S AS WELL AS OTHER APPLICABLE FEDERAL, STATE AND LOCAL STANDARDS PERTAINING TO TREE CARE OPERATIONS.

- ANSI Z133 ARBORICULTURAL OPERATIONS: SAFETY REQUIREMENTS
- ANSI A300 PART 1 PRUNING

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PBS ENGINEERING + ENVIRONMENTAL SURVEYING PBSUSA.COM

13TH STREET GAS STATIOIN

20101 NE 13th Street
Camas, Washington

DRAWN: CB/RP	CHECKED: CB
SCALE: 1" = 20'-0"	DATE: 11.03.23
JOB #: 23-1887	
ISSUED FOR: PLR	

REVISIONS:
1
2
3
4
5
6

SHEET NAME:
EXISTING TREE SURVEY

SHEET #:
TP

SHEET 5 OF 8

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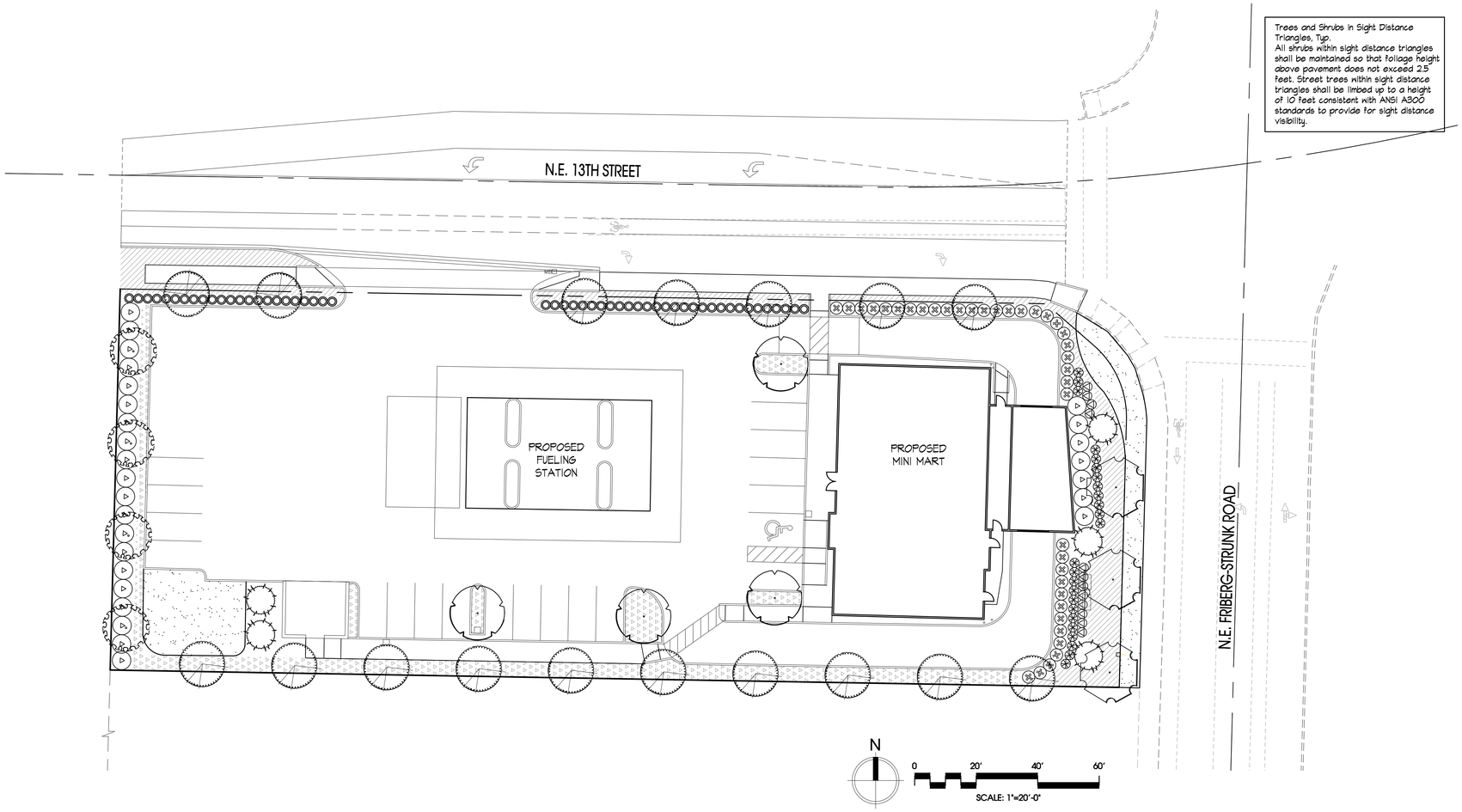

Trees and Shrubs in Sight Distance Triangles, Typ.
All shrubs within sight distance triangles shall be maintained so that foliage height above pavement does not exceed 2.5 feet. Street trees within sight distance triangles shall be limbed up to a height of 10 feet consistent with ANSI A300 standards to provide for sight distance visibility.

TREE LEGEND

SYMBOL	BOTANICAL / COMMON NAME	SIZE	QUANTITY	TREE UNITS
TREES				
	ACER RUBRUM 'ARMSTRONG' ARMSTRONG MAPLE	2" cal. min.	17	17
	CARPINUS BETULUS 'FASTIGIATA' PYRAMIDAL EUROPEAN HORNBEAM	2" cal. min.	4	4
	LIRIODENDRON TULIPERA 'JFS-OZ' EMERALD CITY TULIP TREE	2" cal. min.	3	3
	THUJA PLICATA 'HOGAN' WESTERN RED CEDAR	6' HT min.	5	5
	TILIA CORDATA 'CORZAM' CORINTHIAN LINDEN	2" cal. min.	4	4
			TOTAL TREE UNITS	33
SHRUBS				
	LIGUSTRUM JAPONICUM 'TEXANUM' WAX PRIVET	5 GAL.	38	
	MAHONIA REPENS CREEPING OREGON GRAPE	2 GAL.	12	
	MYRICA CALIFORNICA PACIFIC WAX MYRTLE	5 GAL.	27	
	PRUNUS LAUROCERASUS 'OTTO LUYKEN' OTTO LUYKEN'S LAUREL	5 GAL.	52	
	VIBURNUM DAVIDII DAVID VIBURNUM	2 GAL.	24	
GROUNDCOVER				
	ARCTOSTAPHYLOS UVA URSI 'MASS.' MASSACHUSETTS KINICKINNICK	1 GAL.	30" O.C.	
	RUBUS CALYCINOIDES CREEPING RASPBERRY	1 GAL.	30" O.C.	
	LAWN (SEED OR SOD) PER OWNER			

TREE UNIT SUMMARY

SITE AREA	.93± AC
REQUIRED TREE UNITS / ACRE	20
TOTAL REQUIRED TREE UNITS	19
EXISTING TREE UNITS RETAINED	0
TREE UNITS PROPOSED TO PLANT	33
TREE UNITS PROVIDED	33

PLANTING NOTES

1. ALL BOUNDARIES, EASEMENTS, UTILITIES AND LEGAL ENCUMBRANCES TO BE CONFIRMED WITH OWNER PRIOR TO BEGINNING WORK. PROPERTY LINES AND SURVEY INFORMATION PROVIDED BY **PLS ENGINEERING**
2. IN NO WAY IS THIS PLAN TO BE INTERPRETED TO EXCEED THE LEGAL BOUNDARIES OF THE OWNER'S REAL PROPERTY.
3. THE LANDSCAPE DESIGNER ASSUMES NO RESPONSIBILITY FOR THE LOCATION OF BOUNDARIES, UTILITIES AND WETLANDS.
4. THIS PLAN SHALL BE INSTALLED TO MEET ALL APPLICABLE CITY, COUNTY, STATE AND FEDERAL CODES.
5. THIS PLAN SHALL BE CONSIDERED PRELIMINARY UNTIL APPROVED BY ALL GOVERNING AGENCIES. IMPLEMENTATION OF THIS PLAN SHALL NOT PROCEED UNTIL ISSUANCE OF ALL RELATED PERMITS.
6. PLANT QUANTITIES ARE FOR INFORMATION ONLY. IN CASE OF ANY DISCREPANCY, THE PLAN SHALL GOVERN.
7. ALL WORK IS TO BE PERFORMED BY LICENSED CONTRACTORS AND EXPERIENCED WORKERS.
8. THE CONTRACTOR IS TO VERIFY THE LOCATION OF EXISTING UNDERGROUND UTILITIES AND STRUCTURES PRIOR TO PERFORMING ANY EXCAVATION. CONTRACTOR SHALL REPAIR ANY DAMAGE TO UTILITIES CAUSED BY THE CONTRACTOR'S WORK, AT NO ADDITIONAL COST TO THE OWNER. CONTACT ALL UTILITY PROVIDERS SERVING THE SITE AREA 48 HOURS PRIOR TO ANY EXCAVATION.
9. ALL PLANT MATERIALS SHALL MATCH SPECIFICATIONS PER SPECIES AND SHALL COMPLY WITH ANSI Z60.1 'STANDARD FOR NURSERY STOCK'.
10. THE CONTRACTOR SHALL ADHERE TO THE WASHINGTON ASSOCIATION OF NURSERYMEN'S GUIDELINES FOR PLANTING PRACTICES.
11. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING ELEMENTS ON AND OFF SITE, RESULTING FROM THE CONTRACTOR'S WORK.
12. THE CONTRACTOR IS RESPONSIBLE FOR THE VIABILITY OF ALL PLANT MATERIAL FOR 2 YEARS AFTER COMPLETION OF PLANTING. DISEASED, DYING, OR DEAD PLANT MATERIAL SHALL BE REPLACED BY THE CONTRACTOR DURING THE TWO YEAR PERIOD AND MAINTAINED FOR AN ADDITIONAL 2 YEAR PERIOD.
13. IMMEDIATELY UPON BID AWARD, CONTRACTOR SHALL SECURE THE PLANT MATERIALS AS SPECIFIED FROM AVAILABLE SOURCES. IN THE EVENT THAT PLANT MATERIALS ARE NOT AVAILABLE, CONTACT LANDSCAPE ARCHITECT FOR APPROVED SUBSTITUTIONS. NO SUBSTITUTION FOR PLANT MATERIAL WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.
14. TOP DRESS ALL SHRUB AND GROUND COVER AREAS (NOT LAWN) WITH 3" OF FIR BARK MULCH. SUBMIT SAMPLE TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION.
15. TREE LOCATIONS MAY BE ADJUSTED IN THE FIELD TO SUIT SITE REQUIREMENTS AS DIRECTED BY THE LANDSCAPE ARCHITECT.
16. THE CONTRACTOR SHALL ENSURE THAT ALL EXCAVATED PLANTING PITS HAVE POSITIVE DRAINAGE. PLANT PITS FULLY FLOODED WITH WATER SHALL DRAIN WITHIN (12) HOURS OF FILLING.
17. FINISH GRADE SHALL BE SET TO ALLOW POSITIVE DRAINAGE
18. ROTOTILL 2" OF COMPOST INTO ALL PLANTED AREAS.
19. INCORPORATE PEAT INTO THE ROOT ZONE OF RHODODENDRONS, AZALEAS AND OTHER ACID LOVING PLANTS.
20. INCORPORATE 10-20-20 FERTILIZER INTO THE ROOT ZONE OF ALL NEW PLANTINGS.
21. RONSTAR, OR APPROVED EQUAL, PREEMERGENT HERBICIDE TO BE APPLIED TO ALL PLANTED AREAS PER MANUFACTURERS INSTRUCTIONS.
22. EXISTING VEGETATION TO BE SPRAYED WITH ROUNDUP, OR APPROVED EQUAL, PER MANUFACTURERS INSTRUCTIONS. SUFFICIENT TIME SHALL BE GIVEN TO ALLOW EXISTING MATERIAL TO DIE. REMOVE EXISTING 2T.
23. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
24. CROWN LAWN AREAS AND GRADE TO PROVIDE POSITIVE DRAINAGE.
25. ROLL LAWN AREA TO INSURE PROPER COMPACTION TO MINIMIZE SETTLING.
26. AMEND SOIL IN LAWN AREAS WITH 80 LBS. OF DOLOMITE LIME AND 40 LBS. OF 10-20-20 SLOW RELEASE FERTILIZER OR EQUIVALENT. PROVIDE A 3" LAYER OF SANDY LOAM TOPSOIL FOR LAWN AND BED AREA.
27. SEED LAWN AREAS WITH GRASS SEED MANUFACTURER'S RECOMMENDATIONS. COVER SEED WITH FINE MULCH APPLIED WITH ROLLER OR HYDROSEED.
28. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
29. PLANT MATERIAL SHALL BE PLANTED W/ ROOT CROWN 1" ABOVE FINISHED GRADE TO ALLOW POSITIVE DRAINAGE AWAY FROM CROWN.
29. STAKE ALL TREES OVER 6 FT. IN HEIGHT PER DETAILS ON THIS SHEET.
30. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
31. ALL PLANTING SHALL BE HAND WATERED OR IRRIGATED BY AN AUTOMATIC UNDERGROUND SPRINKLER SYSTEM.
32. ALL PLANT MATERIALS FURNISHED ARE TO BE HEALTHY, UNIFORMLY BRANCHED AND WITH WELL DEVELOPED FIBROUS ROOT SYSTEMS.
33. ALL PLANT MATERIALS FURNISHED ARE TO BE FREE FROM DEAD OR BROKEN BRANCHES, LICHENS, SCARS, BROKEN BARK OR WOUNDS. ALL PLANT MATERIALS WILL BE INSECT, WEED, AND DISEASE FREE ACCORDING TO THE REQUIREMENTS OF THE **WASHINGTON** STATE DEPARTMENT OF AGRICULTURE FOR NURSERY PLANT MATERIALS SOLD FOR WHOLESALE OR RETAIL. ALL PRUNING WOUNDS MUST BE WELL HEALED WITH NO EVIDENCE OF DECAY.
34. FIELD CONFIRM ALL SITE CONDITIONS, AREAS AND SIZES PRIOR TO BIDDING & CONSTRUCTION. DO NOT SCALE FROM PLANS.

IRRIGATION NOTE

ALL LANDSCAPE AREAS SHALL BE HAND WATERED OR IRRIGATED WITH AN AUTOMATIC DRIP AND/OR SPRAY IRRIGATION SYSTEM. REFER TO CIVIL ENGINEERING PLANS FOR WATER SOURCE.

REFER TO SHEET PD FOR LANDSCAPE DETAILS AND NOTES
REFER TO SHEET ID FOR IRRIGATION DETAILS AND NOTES.

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STATE OF WASHINGTON
CHRISTOPHER A. BAUMAN
LICENSED LANDSCAPE ARCHITECT
EXP.

PRELIMINARY
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13TH STREET GAS STATIOIN

20101 NE 13th Street
Camas, Washington

DRAWN: CB	CHECKED: CB
SCALE: 1" = 20'-0"	DATE: 11.08.23
JOB #: 23-1837	
ISSUED FOR: PLR	
REVISIONS:	
1	
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SHEET NAME:	

SHEET #:

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SHEET 6 OF 8

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LANDSCAPING GENERAL NOTES:

1. DEVELOPER SHALL SUBMIT A LANDSCAPE PLAN SHOWING PLANT TYPE, LOCATION, AND QUANTITY OF PLANTS, THAT IS DESIGNED BY A QUALIFIED LANDSCAPE DESIGNER.
2. SHOW THE LOCATION OF SIDEWALK, LIGHT POLES, MAIL BOXES, DRIVEWAYS, FIRE HYDRANTS, INTERSECTIONS, AND ANY OTHER APPURTENANCE THAT MAY INFLUENCE THE PLACEMENT OF PLANTS.
3. LANDSCAPING SHALL BE SELECTED AND LOCATED TO DETER SOUND, FILTER AIR CONTAMINANTS, CURTAIL EROSION, MINIMIZE STORM WATER RUN-OFF, CONTRIBUTE TO LIVING PRIVACY, REDUCE THE VISUAL IMPACTS OF BUILDINGS/EQUIPMENT AND PAVED AREAS, SCREEN, REDUCE GLARE, AND EMPHASIZE OR SEPARATE OUTDOOR SPACES OF DIFFERENT USES OR CHARACTER.
4. LANDSCAPING SHALL BE DESIGNED TO BE HARMONIOUS WITH THE LOCAL SETTING AND WITH NEIGHBORING DEVELOPMENTS.
5. PLANTS AND TREES SHALL COMPLEMENT OR SUPPLEMENT SURROUNDING NATURAL VEGETATION.
6. PLANTS AND TREES CHOSEN SHALL BE IN SCALE WITH THE STRUCTURES AND EQUIPMENT DEVELOPMENT, KEEPING IN MIND THE MATURE SIZE OF PLANTINGS.
7. MINIMUM LANDSCAPING AS A PERCENT OF GROSS SITE AREA SHALL BE 15%.
8. DEVELOPER SHALL PROVIDE AN IRRIGATION PLAN.
   - 8.1 APPROPRIATE IRRIGATION SYSTEMS SHALL BE INSTALLED WHERE NEEDED TO ASSURE LANDSCAPING SUCCESS.
   - 8.2 DESIGN OF LANDSCAPING THAT INCLUDES XERISCAPE PRINCIPLES IS ENCOURAGED TO REDUCE LONG-TERM MAINTENANCE DEMANDS AND TO CONSERVE WATER.
   - 8.3 XERISCAPE IS DEFINED AS LANDSCAPE DESIGN, WHICH WOULD INCORPORATE PLANT MATERIALS THAT REQUIRE LITTLE OR NO IRRIGATION AND RELY ON NATURAL MOISTURE AND RAINFALL FOR SURVIVAL ONCE ESTABLISHED.
9. LANDSCAPE SHALL BE DESIGNED WITH MAINTENANCE IN MIND:
   - 9.1 DEVELOPER SHALL PROVIDE A MAINTENANCE PLAN DESCRIBING FUNDING, RESPONSIBILITY, AND FREQUENCY OF MAINTENANCE.
   - 9.2 PLANTS AND TREES THAT MINIMIZE UPKEEP AND MAINTENANCE SHALL BE SELECTED.
   - 9.3 TREES, AS THEY GROW, SHALL BE PRUNED TO THEIR NATURAL FORM TO PROVIDE AT LEAST 10 FEET OF CLEARANCE ABOVE SIDEWALKS AND 12 FEET ABOVE STREET ROADWAY SURFACES.
   - 9.4 SHRUBS SHALL BE MAINTAINED TO A MAXIMUM HEIGHT OF 42 INCHES FROM TOP OF CURB TO TOP OF PLANT. ENSURE THAT SHRUBS ARE TRIMMED BACK FROM FACE OF CURB.
10. WHERE THERE ARE OVERHEAD UTILITY LINES, TREE SPECIES THAT WILL NOT INTERFERE WITH THOSE LINES SHALL BE CHOSEN. DEVELOPER IS TO VERIFY WITH UTILITY ON SPECIES SELECTION.
11. TREES SHALL NOT BE PLANTED WITHIN 2 FEET OF ANY PERMANENT HARD SURFACE PAVING OR WALKWAY.
12. PARKING AND LOADING AREAS SHALL BE SCREENED FROM HORIZONTAL VIEW WITH THE USE OF DENSE LANDSCAPING, MOUNDS OR BERMS.
13. PERIMETER AND SECURITY FENCING SHALL BE CONSTRUCTED TO MINIMIZE VISUAL IMPACT. WALLS OR FENCES SEPARATING ADJOINING PARCELS MAY BE LOCATED AT THE PROPERTY LINE. SECURITY FENCING SHALL BLEND INTO AND BE COMPATIBLE WITH LANDSCAPING AND SURROUNDING ENVIRONMENT. FENCING SHALL HAVE EARTH TONE COLORS OF BROWN, TAN GRAY, OR GREEN, WALLS SHALL BE CONSTRUCTED OF MATERIALS COMPATIBLE WITH THE BUILDING ACRHITECTURE, LANDSCAPING, AND SURROUNDING ENVIRONMENT.
14. SITE AND BUILDING LIGHTING SHALL BE DESIGNED TO MINIMIZE GLARE OR OBJECTIONABLE EFFECTS TO THE ADJACENT PROPERTIES. SITE LIGHTING POLES SHALL NOT EXCEED 20 FEET IN HEIGHT AND SHALL DIRECT THE LIGHT DOWNWARD. LIGHTING SOURCES VIEWED FROM ABOVE OR BELOW ON ADJACENT PROPERTY SHALL BE SHIELDED. BUILDING LIGHTING IS TO BE CONCEALED AND INDIRECT. SITE LIGHTING IS TO BE DESIGNED TO PROVIDE UNIFORM DISTRIBUTION AND THE LIGHT LEVELS SHALL BE ADEQUATE FOR REASONABLE SECURITY AND SAFETY ON THE PREMISES.
15. EARTH BERMS MAY BE USED TO PROVIDE VARIATION IN THE GROUND PLANE AND FOR SCREENING INTERIOR PROTIONS OF THE SITE. CARE MUST BE TAKEN IN THEIR DESIGN TO AVOID CREATING AN ARTIFICIAL APPEARING LANDSCAPE. THE BERMED AREAS SHALL BE AS LONG, AS GRADUAL, AND AS GRACEFUL AS SPACE WILL ALLOW, AND SHOULD HAVE A MINIMUM HEIGHT ABOVE SURROUNDING GRADE OF THREE FEET. MAXIMUM SLOPES FOR BERMED AREAS SHALL BE 3:1 FOR TURF AREAS AND 2:1 FOR GROUNDCOVER AREAS.

LANDSCAPING W/IN R.O.W. NOTES:

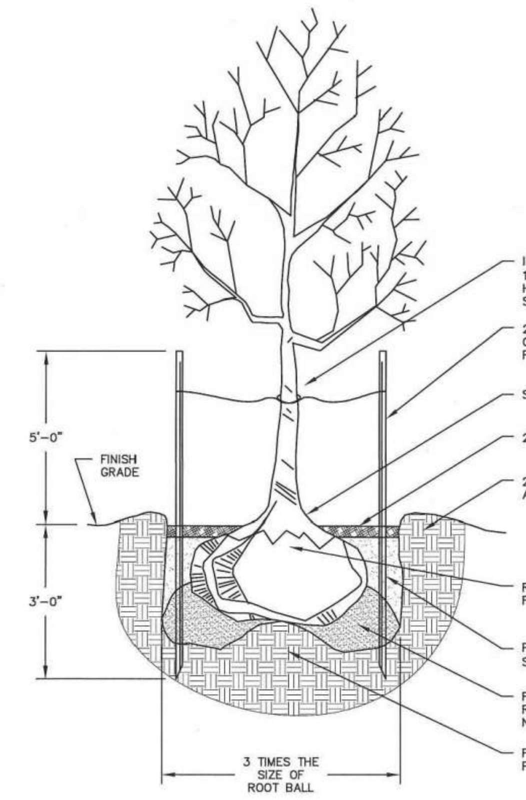
1. TREES SHALL NOT BE PLANTED CLOSER THAN 25 FEET FROM THE CURB LINE OF THE INTERSECTIONS OF STREETS OR ALLEYS, AND NOT CLOSER THAN 10 FEET FROM DRIVEWAYS, FIRE HYDRANTS, OR UTILITY POLES.
2. STREET TREES SHALL NOT BE PLANTED CLOSER THAN 20 FEET TO LIGHT STANDARDS. EXCEPT FOR PUBLIC SAFETY, NO NEW LIGHT STANDARD SHOULD BE POSITIONED CLOSER THAN 10 FEET TO ANY EXISTING STREET TREE, AND PREFERABLY SUCH LOCATIONS WILL BE AT LEAST 20 FEED DISTANCE.
3. TREES SHALL NOT BE PLANTED CLOSER THAN 2-1/2 FEET FROM THE FACE OF THE CURB EXCEPT AT INTERSECTIONS, WHERE IT SHOULD BE 25 FEET FROM THE CURB IN A CURB RETURN AREA..
4. EXISTING TREES MAY BE USED AS STREET TREES IF THERE WILL BE NO DAMAGE FROM THE DEVELOPMENT WHICH WILL KILL OR WEAKEN THE TREE.
5. VISION CLEARANCE HAZARDS SHALL BE AVOIDED AND VISION CLEARANCE STANDARDS SHALL BE ADHERED TO.

City of Camas WASHINGTON | LANDSCAPE DETAIL | LANDSCAPING NOTES | NOT TO SCALE | DETAIL NO. LS1 | DETAIL APPROVED BY | DATE 5-17-19 | REVISION: 3 | DATE: 5/17/2019 | ST-PLANTING.DWG

PLANTING NOTES:

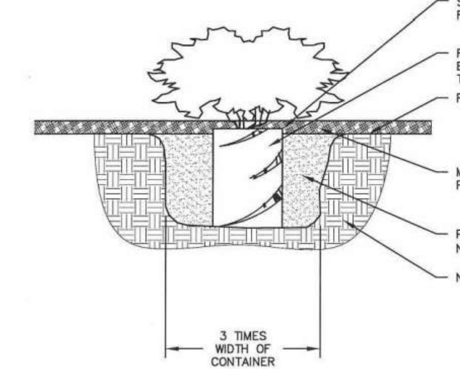
1. ALL PLANTING TO BE OF NURSERY STOCK GRADE NO. 1 OR BETTER AND MUST BE APPROVED PRIOR TO PLANTING.
2. ALL PLANTING HOLES SHALL BE EXCAVATED THREE TIMES THE DIAMETER OF THE TREE ROOT BALL OR ROOT SYSTEM.
3. DECIDUOUS TREES SHALL HAVE STRAIGHT TRUNKS, BE FULL BRANCHED, HAVE A MINIMUM CALIPER OF 2 INCHES AND BE ADEQUATELY STAKED FOR PLANTING. CALIPER OF TREES SHALL BE LARGER WHEN REQUIRED BY OTHER CITY STANDARDS OR PLANS.
4. EVERGREEN TREES SHALL BE A MINIMUM OF THREE FEET IN HEIGHT, FULLY BRANCHED AND ADEQUATELY STAKED FOR PLANTING.
5. DECIDUOUS TREES SHALL BE A MINIMUM 2" CALIPER UNLESS APPROVED BY THE CITY.
6. POTTED OR B&B PLANTS SHALL BE A MINIMUM SIZE OF 3 GALLONS UNLESS APPROVED BY THE CITY..
7. SHRUBS SHALL BE PLANTED ACCORDING TO RECOGNIZED LANDSCAPE STANDARD PRACTICE FOR MAINTENANCE, APPEARANCE, HEALTH OF THE PLANTS, AND OVERALL AESTHETICS.
8. PLANT UPRIGHT AND FACE TO GIVE BEST APPEARANCE OR RELATIONSHIP TO OTHER PLANTS AND STRUCTURES.
   - 8.1. LOOSEN AND REMOVE TWINE BINDING AND BURLAP FROM AROUND THE TOP OF EACH ROOT BALL.
   - 8.2. SET TREES AN INCH ABOVE FINISH GRADE.
   - 8.3. STAKE OR GUY TREES IMMEDIATELY AFTER PLANTING (SEE DETAIL PL3, PL4, & PL5)
   - 8.4. REMOVE STAKES OR GUY WIRES ONE YEAR AFTER INSTALLATION.
9. PLACE AND COMPACT BACKFILL SOIL MIXTURE CAREFULLY TO AVOID INJURY TO ROOTS, AND TO FILL ALL VOIDS. BACKFILL MIX SHALL CONSIST OF 1/4 APPROVED HUMUS MATERIAL TO 3/4 TOPSOIL, PLUS SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED PRIOR TO PLANTING TREES).
10. WHEN HOLE IS NEARLY FILLED, COMPLETELY SOAK AND ALLOW WATER TO DRAIN AWAY. FILL HOLE TO FINISH GRADE. PROVIDE 2 INCH HIGH BERM WATER RING AT THE BASE OF EACH TREE. REMOVE BERM AT THE END OF CONTRACT MAINTENANCE PERIOD.
11. GROUND COVER, SHALL BE PLANTED ACCORDING TO RECOGNIZED LANDSCAPE STANDARD PRACTICE FOR MAINTENANCE, APPEARANCE, OVERALL AESTHETICS, AND HEALTH OF THE PLANTS.
12. TREES, AS THEY GROW, SHALL BE PRUNED TO THEIR NATURAL FORM TO PROVIDE AT LEAST 10 FEET OF CLEARANCE ABOVE SIDEWALKS AND 14 FEET ABOVE STREET ROADWAY SURFACES.
13. TREE MAINTENANCE – IN ORDER TO INSURE ESTABLISHMENT, SURVIVAL AND GROWTH, TREES SHALL BE MULCHED WITH 4" DEEP COMPOST AND WATERED AS NECESSARY DURING THE FIRST TWO GROWING SEASONS. PRUNING TO BE AS FOLLOWS:
   - 13.1. YEAR 1 – ONLY DEAD, BROKEN, OR CROSSING BRANCHES SHALL BE PRUNED.
   - 13.2. YEAR 2 – A CLASS 1 PRUNE, PURSUANT TO NATIONAL ARBORIST ASSOCIATION STANDARDS, SHALL BE PERFORMED. THE PURPOSE OF THIS PRUNING IS TO ESTABLISH PROPER SCAFFOLD BRANCHING, RAISE THE CROWN FOR ROAD/SIDEWALK CLEARANCE, AND REMOVE ANY DEAD, DYING OR CROSSING BRANCHES.
   - 13.3. YEAR 3 – A CLASS 1 PRUNE, PURSUANT TO NATIONAL ARBORIST ASSOCIATION STANDARDS, SHALL BE PERFORMED. THE PURPOSE OF THIS PRUNING IS TO CONTINUE TO ESTABLISH THE PROPER SCAFFOLD BRANCHING, CONTINUE TO RAISE THE CROSSING FOR ROAD/SIDEWALK CLEARANCE, AND TO REMOVE ANY DEAD, DYING, OR CROSSING BRANCHES.
14. DEFNITIONS:
   - 14.1. BALLED AND BURLAPPED (B&B) – TREES AND SHRUBS WITH A LARGE BALL OF SOIL AROUND THE ROOTS WRAPPED IN BURLAP.
   - 14.2. BARE-ROOT – OFFERED BY NURSERIES IN WINTER AND EARLY SPRING WITH ALL THE SOIL REMOVED FROM THEIR ROOTS.
   - 14.3. CALIPER – THE DIAMETER OF THE TRUNK MEASURED AT 4-FEET FROM THE GROUND.
   - 14.4. GROUND COVER – LIVING MATERIAL THAT DOES NOT INCLUDE BARK CHIPS OR OTHER MULCH.

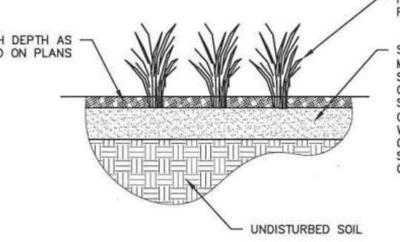
City of Camas WASHINGTON | LANDSCAPE DETAIL | PLANTING NOTES | NOT TO SCALE | DETAIL NO. LS2 | DETAIL APPROVED BY | DATE 5-17-19 | REVISION: 3 | DATE: 5/17/2019 | ST-PLANTING.DWG



NOTES:
1. A ROOT BARRIER SHOULD BE INSTALLED AT THE EDGE OF PAVEMENT OR 4 FEET WIDE AND 6 FEET WIDE RECTANGLE AROUND THE TREE. SEE DETAILS PL7, PL8 & PL9
2. BACKFILL MIX SHALL CONSIST OF THE FOLLOWING: 0.75 PART TOPSOIL, 0.25 PART APPROVED HUMUS MATERIAL, SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED BEFORE PLANTING TREES).

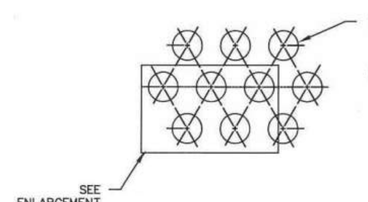
City of Camas WASHINGTON | LANDSCAPE DETAIL | DECIDUOUS BALLED/BURLAP TREE PLANTING | NOT TO SCALE | DETAIL NO. LS4 | DETAIL APPROVED BY | DATE 5-17-19 | REVISION: 2 | DATE: 5/17/2019 | ST-PLANTING.DWG





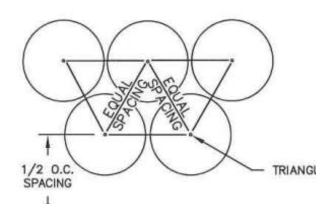
NOTES:
1. SCARIFY BOTTOM AND SIDES OF HOLE PRIOR TO PLANTING.
2. KEEP PLANTS MOIST AND SHADED UNTIL PLANTING.
3. BACKFILL MIX SHALL CONSIST OF THE FOLLOWING: 0.75 PART TOPSOIL, 0.25 PART APPROVED HUMUS MATERIAL, SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED BEFORE PLANTING).

City of Camas WASHINGTON | LANDSCAPE DETAIL | SHRUB CONTAINER PLANTING | NOT TO SCALE | DETAIL NO. LS5 | DETAIL APPROVED BY | DATE 5-17-19 | REVISION: 2 | DATE: 5/17/2019 | ST-PLANTING.DWG



1. ALL GROUNDCOVER SHALL BE PLANTED AT EQUAL TRIANGULAR SPACING OR ON CENTER SPACING AS SPECIFIED ON PLANTING PLAN.
2. LOCATE GROUNDCOVER ONE HALF OF SPECIFIED SPACING DISTANCE FROM ANY CURB, SIDEWALK, OR OTHER HARD SURFACE, UNLESS OTHERWISE SPECIFIED.

GROUNDCOVER PLANTING DETAIL



ENLARGEMENT DETAIL:
TRIANGULAR SPACING

City of Camas WASHINGTON | LANDSCAPE DETAIL | GROUNDCOVER PLANTING DETAIL | NOT TO SCALE | DETAIL NO. LS7 | DETAIL APPROVED BY | DATE 5-17-19 | REVISION: 3 | DATE: 5/17/2019 | ST-PLANTING.DWG

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STATE OF WASHINGTON – LICENSED LANDSCAPE ARCHITECT

PRELIMINARY
NOT FOR CONSTRUCTION
SUBJECT TO APPROVAL

13TH STREET GAS STATIOIN

20101 NE 13th Street
Camas, Washington

DRAWN: HA/CB	CHECKED: CB
SCALE: AS SHOWN	DATE: 11.03.23
JOB #: 23-1837	
ISSUED FOR: PLR	
REVISIONS:	

SHEET NAME:
FINAL LANDSCAPE DETAILS

SHEET #:
PD
SHEET 7 OF 8

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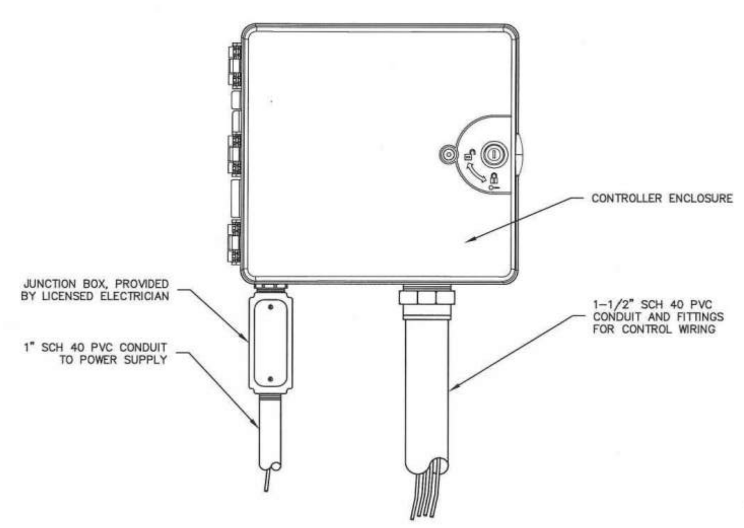
IRRIGATION CONSTRUCTION NOTES:

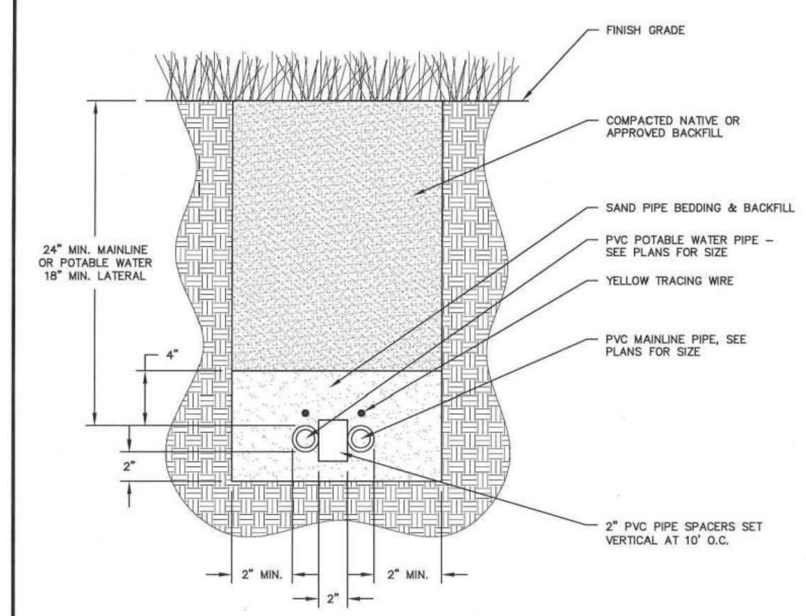
1. THE CONTRACTOR SHALL INSPECT THE SITE AND VERIFY CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION.
2. IRRIGATION PLANS ARE SCHEMATIC REPRESENTATIONS ONLY. PLACE LINES IN A COMMON TRENCH WHENEVER POSSIBLE. FIELD ADJUST LINES TO AVOID CONFLICT WITH UTILITIES.
3. IRRIGATION IS COORDINATED WITH THE PLANTING PLAN AND SITE IMPROVEMENTS AND IS DESIGNED WITH TRIANGULAR SPACING GIVING HEAD TO HEAD COVERAGE. COORDINATE IRRIGATION HEAD LAYOUT WITH NEW PLANT MATERIALS, LOCATE SPRAY HEADS 30" FROM BASE OF TREE. DO NOT ALTER HEAD LOCATION, PIPE LAYOUT, OR VALVE LOCATION WITHOUT WRITTEN APPROVAL FROM THE CITY ENGINEER. NOTIFY THE CITY ENGINEER IF DISCREPANCIES OCCUR BETWEEN THE PLANS AND FIELD CONDITIONS.
4. ALL COMPONENTS OF IRRIGATION SYSTEM SHALL BE INSTALLED AND PROPERLY ADJUSTED TO PROVIDE ADEQUATE COVERAGE AND MINIMIZATION OF OVER SPRAY ONTO WALKS, BUILDINGS, PARKING AREAS, ETC.
5. ALL PIPE SIZES INDICATED ARE MINIMUMS. CONTRACTOR MAY NOT DECREASE PIPE SIZE. LARGER PIPE SIZES MAY BE USED AT NO ADDITIONAL COST TO OWNER. IRRIGATION LATERALS ARE SIZED BEGINNING AT THE AUTOMATIC VALVE AND CONTINUING IN DIRECTION OF FLOW. REDUCTIONS IN PIPE SIZE ARE LABELED BEGINNING DOWNSTREAM OF NEAREST FITTING. ALL LATERALS NOT SIZED ARE MINIMUM 3/4".
6. INSTALL ALL IRRIGATION PIPE AND CONTROL WIRES IN MINIMUM 4" PVC SLEEVE BELOW ALL PAVED SURFACES UNLESS OTHERWISE INDICATED ON THE PLANS. INSTALL SLEEVES PRIOR TO PLACEMENT OF PAVEMENTS AND PAVEMENT SUB-BASE. SEE PIPE SLEEVING DETAIL FOR FURTHER REQUIREMENTS.
7. COORDINATE IRRIGATION POINTS OF CONNECTION AND LOCATION OF AUTOMATIC CONTROL VALVES WITH THE ENGINEER. COORDINATE ALL WORK WITH OTHER TRADES, I.E. ELECTRICAL, MASONRY, ETC.
8. CONTRACTOR TO PROGRAM AUTOMATIC CONTROLLER TO ALLOW FOR THE EQUIVALENT OF 1" OF WATER PER WEEK.
9. ALL PIPES SHALL BE TRENCHED. PROVIDE POSITIVE DRAINAGE OF MAINLINE. PLACE MANUAL DRAIN AT LOW POINTS IN MAINLINE. IDENTIFY LOCATIONS ON AS-BUILTS.
10. USE 45° ELBOWS INSTEAD OF 90° ELBOWS ON ALL MAINLINES 2-1/2" AND LARGER. INSTALL CONCRETE THRUST BLOCKS AT ALL MAINLINE CHANGES IN DIRECTION. POUR MINIMUM OF 1 CUBIC FOOT OF CONCRETE ON UNDISTURBED SOIL. WRAP PIPE IN PLASTIC PRIOR TO COVERING WITH CONCRETE.
11. CONTRACTOR TO INSTALL CONTROLLER, CPU ELECTRICAL, PHONE AND ACCESSORIES AS REQUIRED. CONTRACTOR TO FURNISH CONTROL WIRES FROM VALVES TO CONTROLLER. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING 110 VOLT SERVICE FROM BUILDING TO EXISTING JUNCTION BOX IN CONTROLLER HOUSING AND CONNECT CONTROLLER SERVICE.
12. ALL TONING WIRE, WHERE REQUIRED, SHALL BE 14 GAUGE COPPER CLAD STEEL WITH HDPE DIRECT BURY INSULATION. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.
13. ALL DIRECT BURY CONTROL WIRING AND CABLING SHALL HAVE SPLICE CONNECTIONS SEALED WITH 3M DBY OR RAIN BIRD DB SERIES WIRE CONNECTORS IN A SPLICE BOX.
14. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS.
15. WATER METER SHALL BE INSTALLED BY THE CITY. CONTRACTOR RESPONSIBLE FOR CONNECTIONS DOWNSTREAM OF WATER METER.
16. CONTRACTOR TO VERIFY WATER PRESSURE TO ENSURE THAT PRESSURE MATCHES THE SYSTEM DESIGN PRESSURE.
17. WHERE REQUIRED, CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION CONSTRUCTION NOTES — NOT TO SCALE — DETAIL NO. IR1 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



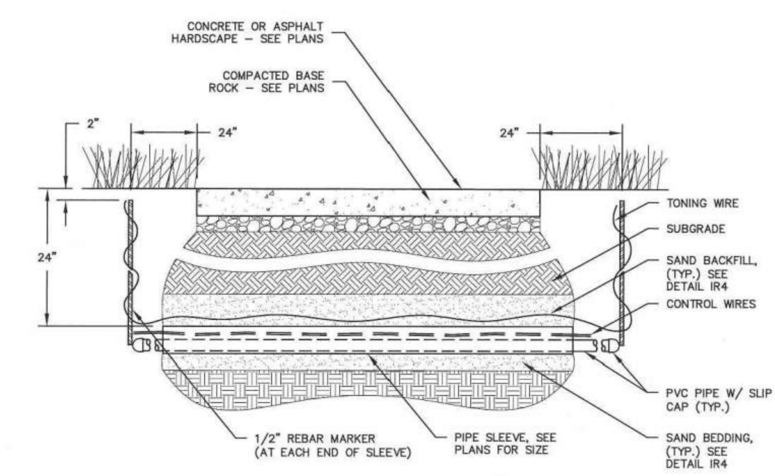
NOTES:
1. IRRIGATION CONTROLLER SHALL BE A RAINBIRD ESP-LXME SERIES PROGRAMMABLE CONTROLLER, OR APPROVED EQUAL.
2. INTERIOR INSTALLATIONS DO NOT REQUIRE AN ENCLOSURE WHEN MOUNTED WITHIN THE UTILITY ROOM OF A RESTROOM OR OTHER FACILITY WHERE THE PUBLIC HAS NO ACCESS.
3. FOR EXTERIOR WALL MOUNTED APPLICATIONS SEE DETAIL IR3.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION CONTROLLER – INDOOR MOUNT — NOT TO SCALE — DETAIL NO. IR2 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



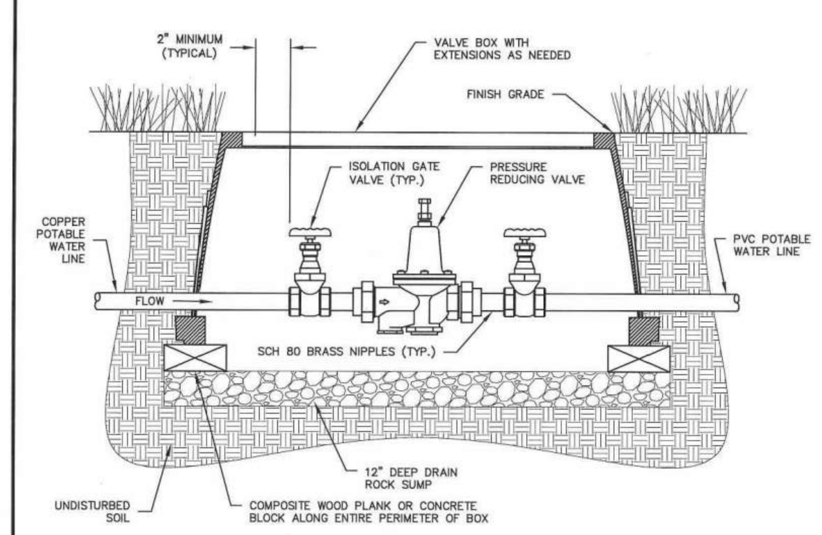
NOTES:
1. ALL TONING WIRE SHALL BE 14 GAUGE YELLOW HDPE INSULATED COPPER CLAD STEEL. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.
2. PROVIDE A 48 INCH COIL OF TONING WIRE IN EACH VALVE BOX.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION TRENCH — NOT TO SCALE — DETAIL NO. IR4 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



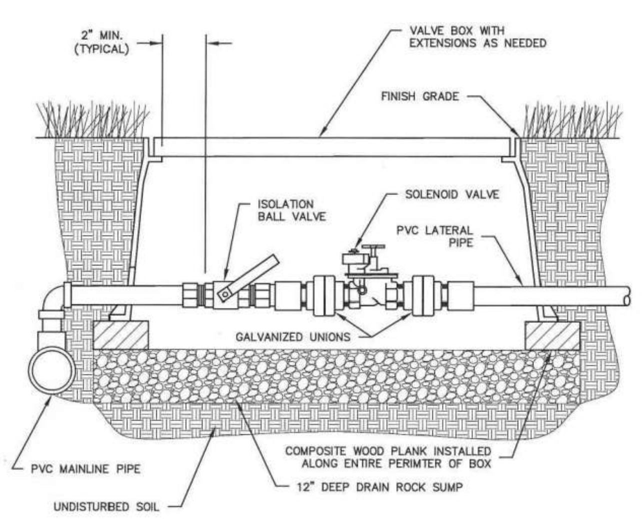
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED IRRIGATION POLYMER VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. PROVIDE TONING WIRE ALONG ALL PIPE SLEEVING.
3. ALL TONING WIRE SHALL BE 14 GAUGE YELLOW HDPE INSULATED COPPER CLAD STEEL. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION PIPE SLEEVE — NOT TO SCALE — DETAIL NO. IR5 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



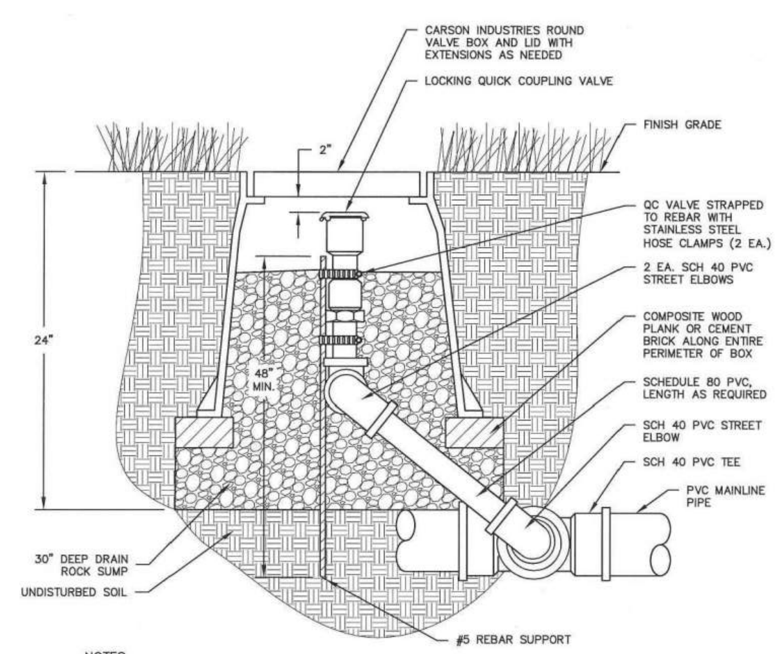
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. PRESSURE REDUCING VALVE SHALL BE A WATTS M/N 25AUB-Z3 WITH DOUBLE UNION END CONNECTIONS, OR APPROVED EQUAL.
4. FOR APPLICATIONS WHERE DRINKING FOUNTAINS ARE SUPPLIED, ALL COMPONENTS SHALL BE SUITABLE FOR POTABLE WATER.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION PRESSURE REGULATOR — NOT TO SCALE — DETAIL NO. IR6 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



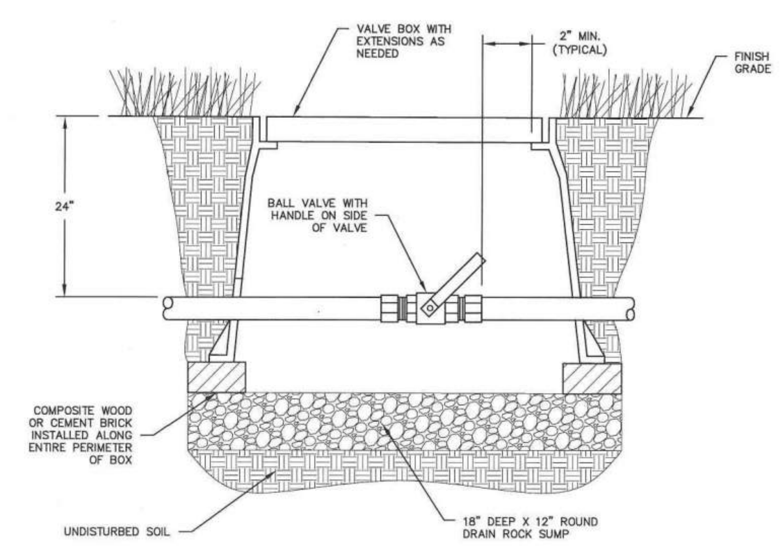
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION SOLENOID VALVE — NOT TO SCALE — DETAIL NO. IR7 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



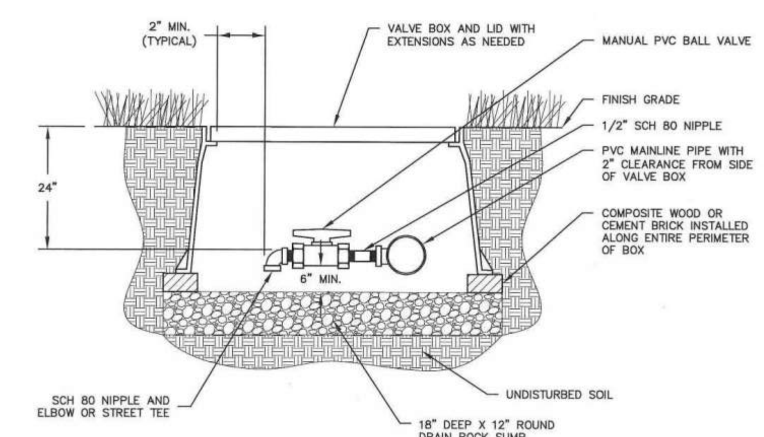
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. SWING JOINT SIZE SHALL BE SAME SIZE AS VALVE BOTTOM INLET.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION QUICK COUPLING VALVE — NOT TO SCALE — DETAIL NO. IR9 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



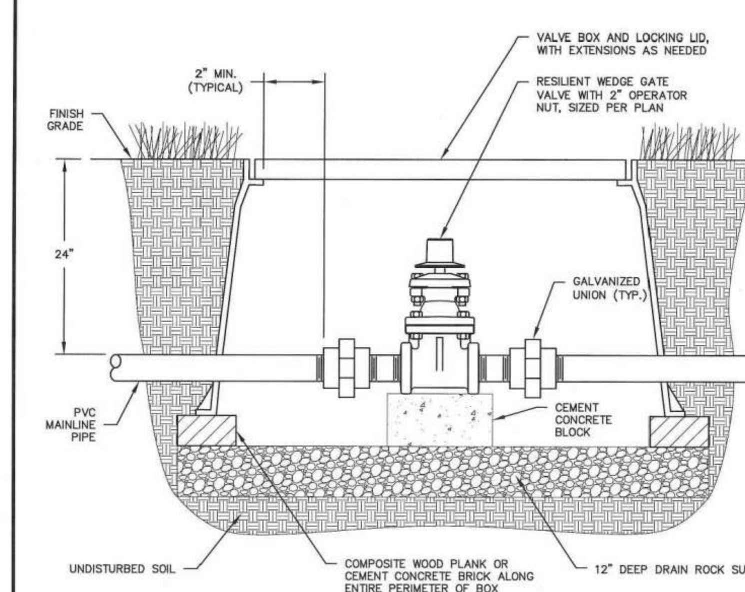
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION ISOLATION BALL VALVE — NOT TO SCALE — DETAIL NO. IR10 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



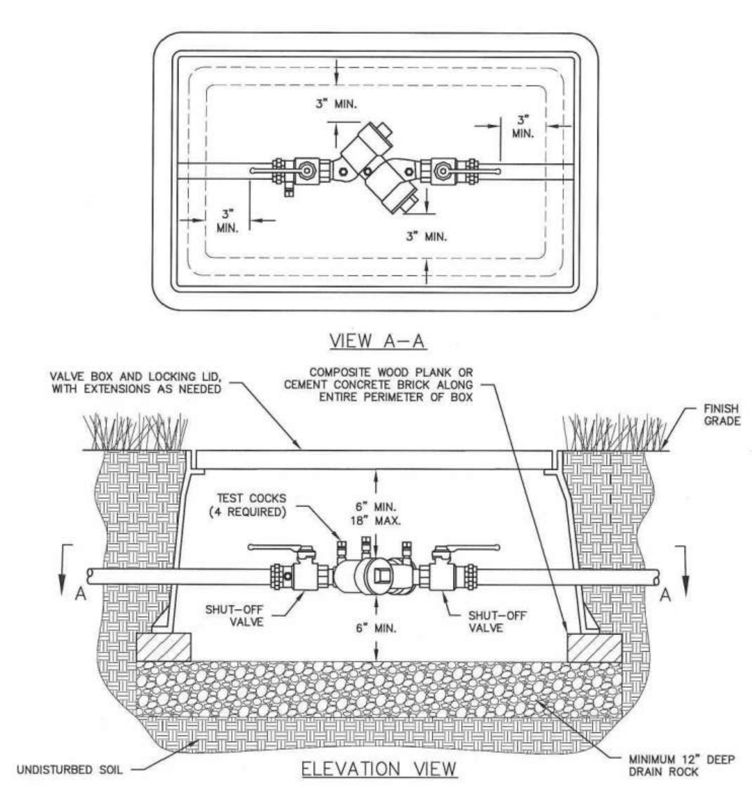
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. CONTRACTOR RESPONSIBLE FOR LOCATING DRAIN VALVE AT LOWEST POINT OF MAINLINE TO ENSURE POSITIVE DRAINAGE.
4. ALLOW FOR 1" CLEARANCE FROM HOLE IN BOX TO TOP OF PIPE.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION MANUAL DRAIN VALVE — NOT TO SCALE — DETAIL NO. IR11 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



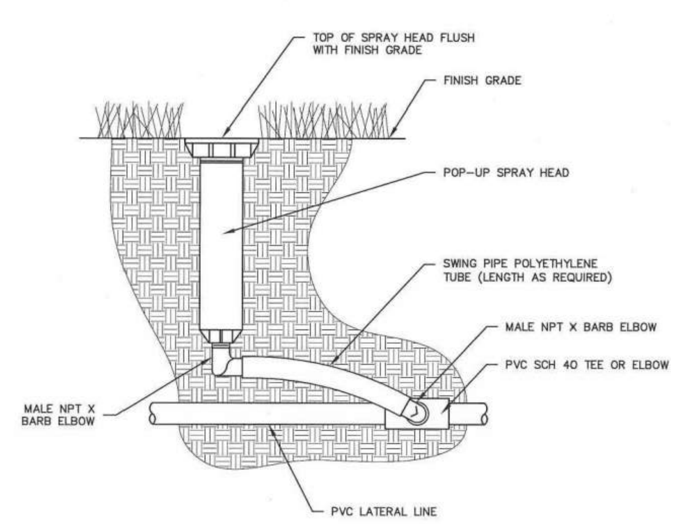
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION MANUAL GATE VALVE — NOT TO SCALE — DETAIL NO. IR12 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



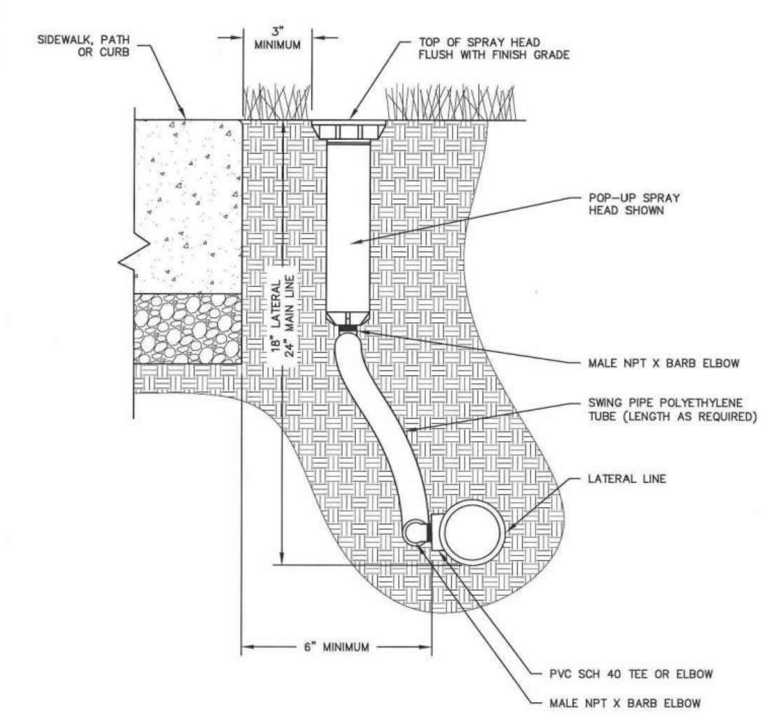
NOTES:
1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH GROUND. TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
3. DESIGNED FOR BACK SIPHONING AND BACK PRESSURE.
4. THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
5. THE DCVA MAY BE INSTALLED ABOVE OR BELOW THE GROUND PROVIDED ALL CLEARANCES ARE MET.
6. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING. MUST BE ACCESSIBLE AND PROTECTED FROM FREEZING CONDITIONS.
7. THE DOUBLE CHECK VALVE BACKFLOW PREVENTER ASSEMBLY SHALL BE ASSE LISTED 1015 APPROVED AND INCLUDE FULL PORT BALL VALVES WITH RESILIENT SEATS AND UNION CONNECTIONS.
8. A PLUMBING PERMIT IS REQUIRED. PLEASE CONTACT THE CITY OF CAMAS BUILDING DEPARTMENT.
9. MUST BE TESTED AFTER INSTALLATION BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THE CITY OF CAMAS WATER DEPARTMENT.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION DOUBLE CHECK VALVE ASSY. — NOT TO SCALE — DETAIL NO. IR13 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



NOTES:
1. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
2. SWING PIPE SHALL BE POLYEHTYLENE AND SIZE SHALL NOT BE LESS THAN HEAD INLET SIZE.
3. POP-UP SPRAY HEADS SHALL BE RAIN BIRD 1800 OR APPROVED EQUAL, SUBMITTAL REQUIRED.
4. WHEN SPRAY HEADS ARE LOCATED ALONG SIDEWALK OR CURBING THE HEADS SHALL BE MINIMUM 3" FROM HARDSCAPE AND PIPES MINIMUM 6" FROM HARDSCAPE.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION POP-UP SPRAY HEAD — NOT TO SCALE — DETAIL NO. IR15 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG



NOTES:
1. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
2. SWING PIPE SHALL BE POLYEHTYLENE AND SIZE SHALL NOT BE LESS THAN HEAD INLET SIZE.
3. WHEN SPRAY HEADS ARE LOCATED ALONG SIDEWALK OR CURBING THE HEADS SHALL BE MINIMUM 3" FROM HARDSCAPE AND PIPES MINIMUM 6" FROM HARDSCAPE.

City of Camas WASHINGTON — LANDSCAPE DETAIL — IRRIGATION HEAD PLACEMENT ALONG HARDSCAPE — NOT TO SCALE — DETAIL NO. IR16 — DETAIL APPROVED BY / DATE 6-19-19 — REVISION: 2 — DATE: 6/19/2019 — ST-IRRIGATION.DWG

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Camas, Washington

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SCALE: AS SHOWN	DATE: 11.03.23
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ISSUED FOR: PLR	
REVISIONS:	

SHEET NAME:
PRELIMINARY IRRIGATION DETAILS

SHEET #: ID

SHEET 8 OF 8

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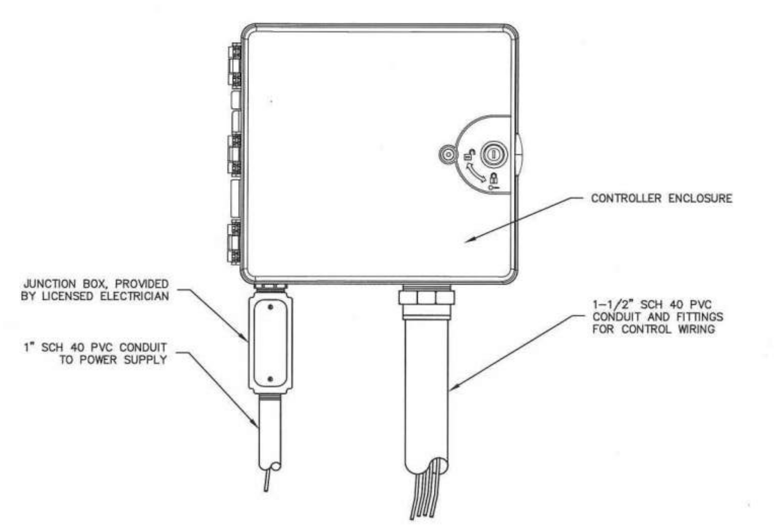
IRRIGATION CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL INSPECT THE SITE AND VERIFY CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION.
2. IRRIGATION PLANS ARE SCHEMATIC REPRESENTATIONS ONLY. PLACE LINES IN A COMMON TRENCH WHENEVER POSSIBLE. FIELD ADJUST LINES TO AVOID CONFLICT WITH UTILITIES.
3. IRRIGATION IS COORDINATED WITH THE PLANTING PLAN AND SITE IMPROVEMENTS AND IS DESIGNED WITH TRIANGULAR SPACING GIVING HEAD TO HEAD COVERAGE. COORDINATE IRRIGATION HEAD LAYOUT WITH NEW PLANT MATERIALS, LOCATE SPRAY HEADS 30" FROM BASE OF TREE. DO NOT ALTER HEAD LOCATION, PIPE LAYOUT, OR VALVE LOCATION WITHOUT WRITTEN APPROVAL FROM THE CITY ENGINEER. NOTIFY THE CITY ENGINEER IF DISCREPANCIES OCCUR BETWEEN THE PLANS AND FIELD CONDITIONS.
4. ALL COMPONENTS OF IRRIGATION SYSTEM SHALL BE INSTALLED AND PROPERLY ADJUSTED TO PROVIDE ADEQUATE COVERAGE AND MINIMIZATION OF OVER SPRAY ONTO WALKS, BUILDINGS, PARKING AREAS, ETC.
5. ALL PIPE SIZES INDICATED ARE MINIMUMS. CONTRACTOR MAY NOT DECREASE PIPE SIZE. LARGER PIPE SIZES MAY BE USED AT NO ADDITIONAL COST TO OWNER. IRRIGATION LATERALS ARE SIZED BEGINNING AT THE AUTOMATIC VALVE AND CONTINUING IN DIRECTION OF FLOW. REDUCTIONS IN PIPE SIZE ARE LABELED BEGINNING DOWNSTREAM OF NEAREST FITTING. ALL LATERALS NOT SIZED ARE MINIMUM 3/4".
6. INSTALL ALL IRRIGATION PIPE AND CONTROL WIRES IN MINIMUM 4" PVC SLEEVE BELOW ALL PAVED SURFACES UNLESS OTHERWISE INDICATED ON THE PLANS. INSTALL SLEEVES PRIOR TO PLACEMENT OF PAVEMENTS AND PAVEMENT SUB-BASE. SEE PIPE SLEEVING DETAIL FOR FURTHER REQUIREMENTS.
7. COORDINATE IRRIGATION POINTS OF CONNECTION AND LOCATION OF AUTOMATIC CONTROL VALVES WITH THE ENGINEER. COORDINATE ALL WORK WITH OTHER TRADES, I.E. ELECTRICAL, MASONRY, ETC.
8. CONTRACTOR TO PROGRAM AUTOMATIC CONTROLLER TO ALLOW FOR THE EQUIVALENT OF 1" OF WATER PER WEEK.
9. ALL PIPES SHALL BE TRENCHED. PROVIDE POSITIVE DRAINAGE OF MAINLINE. PLACE MANUAL DRAIN AT LOW POINTS IN MAINLINE. IDENTIFY LOCATIONS ON AS-BUILTS.
10. USE 45° ELBOWS INSTEAD OF 90° ELBOWS ON ALL MAINLINES 2-1/2" AND LARGER. INSTALL CONCRETE THRUST BLOCKS AT ALL MAINLINE CHANGES IN DIRECTION. POUR MINIMUM OF 1 CUBIC FOOT OF CONCRETE ON UNDISTURBED SOIL. WRAP PIPE IN PLASTIC PRIOR TO COVERING WITH CONCRETE.
11. CONTRACTOR TO INSTALL CONTROLLER, CPU ELECTRICAL, PHONE AND ACCESSORIES AS REQUIRED. CONTRACTOR TO FURNISH CONTROL WIRES FROM VALVES TO CONTROLLER. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING 110 VOLT SERVICE FROM BUILDING TO EXISTING JUNCTION BOX IN CONTROLLER HOUSING AND CONNECT CONTROLLER SERVICE.
12. ALL TONING WIRE, WHERE REQUIRED, SHALL BE 14 GAUGE COPPER CLAD STEEL WITH HDPE DIRECT BURY INSULATION. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.
13. ALL DIRECT BURY CONTROL WIRING AND CABLING SHALL HAVE SPLICE CONNECTIONS SEALED WITH 3M DBY OR RAIN BIRD DB SERIES WIRE CONNECTORS IN A SPLICE BOX.
14. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS.
15. WATER METER SHALL BE INSTALLED BY THE CITY. CONTRACTOR RESPONSIBLE FOR CONNECTIONS DOWNSTREAM OF WATER METER.
16. CONTRACTOR TO VERIFY WATER PRESSURE TO ENSURE THAT PRESSURE MATCHES THE SYSTEM DESIGN PRESSURE.
17. WHERE REQUIRED, CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.

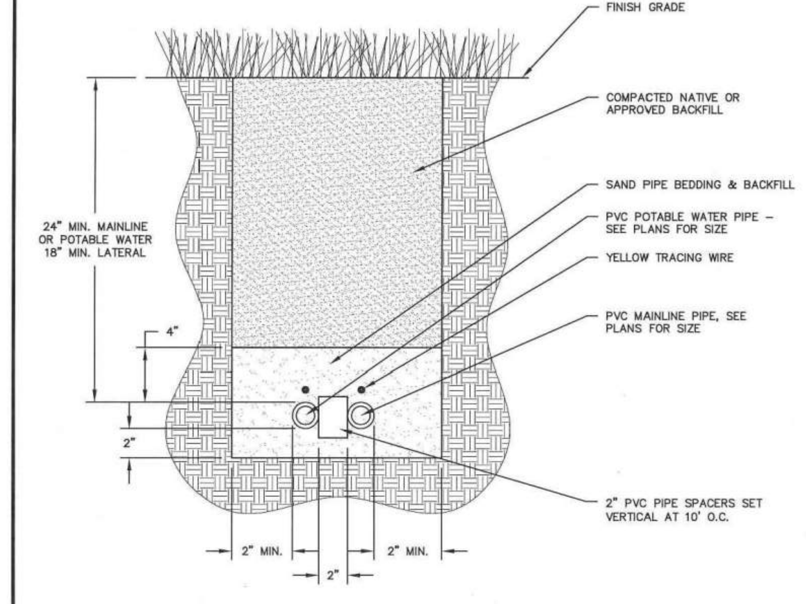
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION CONSTRUCTION NOTES | NOT TO SCALE | DETAIL NO. IR1 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. IRRIGATION CONTROLLER SHALL BE A RAINBIRD ESP-LXME SERIES PROGRAMMABLE CONTROLLER, OR APPROVED EQUAL.
2. INTERIOR INSTALLATIONS DO NOT REQUIRE AN ENCLOSURE WHEN MOUNTED WITHIN THE UTILITY ROOM OF A RESTROOM OR OTHER FACILITY WHERE THE PUBLIC HAS NO ACCESS.
3. FOR EXTERIOR WALL MOUNTED APPLICATIONS SEE DETAIL IR3.

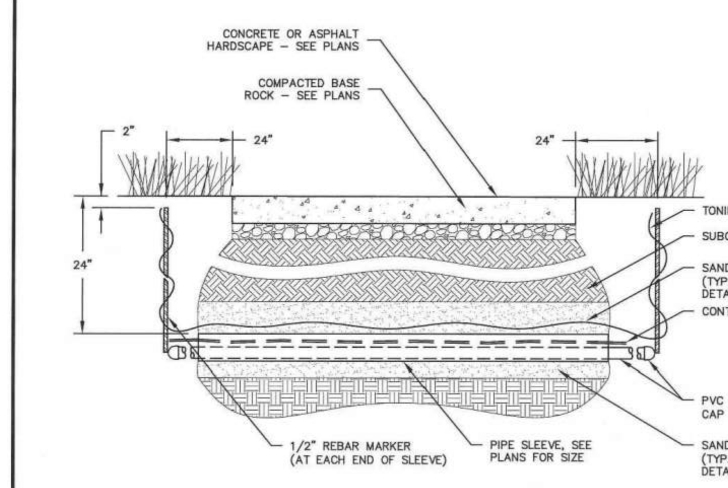
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION CONTROLLER – INDOOR MOUNT | NOT TO SCALE | DETAIL NO. IR2 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. ALL TONING WIRE SHALL BE 14 GAUGE YELLOW HDPE INSULATED COPPER CLAD STEEL. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.
2. PROVIDE A 48 INCH COIL OF TONING WIRE IN EACH VALVE BOX.

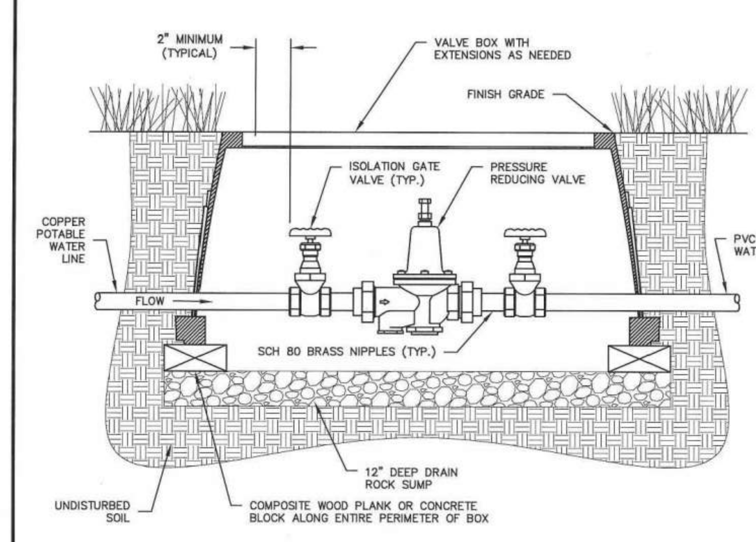
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION TRENCH | NOT TO SCALE | DETAIL NO. IR4 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED IRRIGATION POLYMER VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. PROVIDE TONING WIRE ALONG ALL PIPE SLEEVING.
3. ALL TONING WIRE SHALL BE 14 GAUGE YELLOW HDPE INSULATED COPPER CLAD STEEL. SEAL SPLICE CONNECTIONS WITH 3M DBY OR KING GEL CAPS.

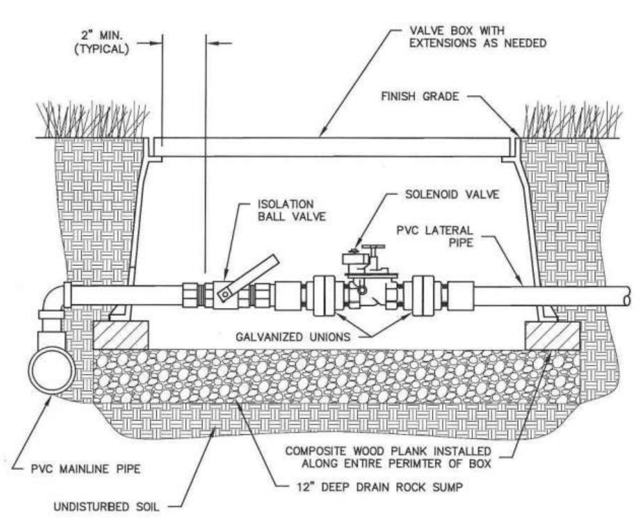
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION PIPE SLEEVE | NOT TO SCALE | DETAIL NO. IR5 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. PRESSURE REDUCING VALVE SHALL BE A WATTS M/N 25AUB-Z3 WITH DOUBLE UNION END CONNECTIONS, OR APPROVED EQUAL.
4. FOR APPLICATIONS WHERE DRINKING FOUNTAINS ARE SUPPLIED, ALL COMPONENTS SHALL BE SUITABLE FOR POTABLE WATER.

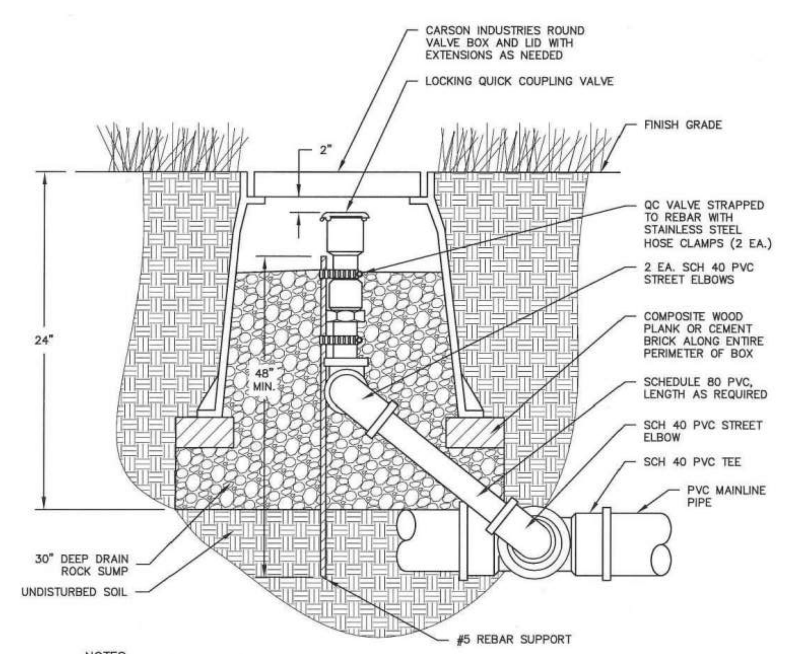
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION PRESSURE REGULATOR | NOT TO SCALE | DETAIL NO. IR6 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.

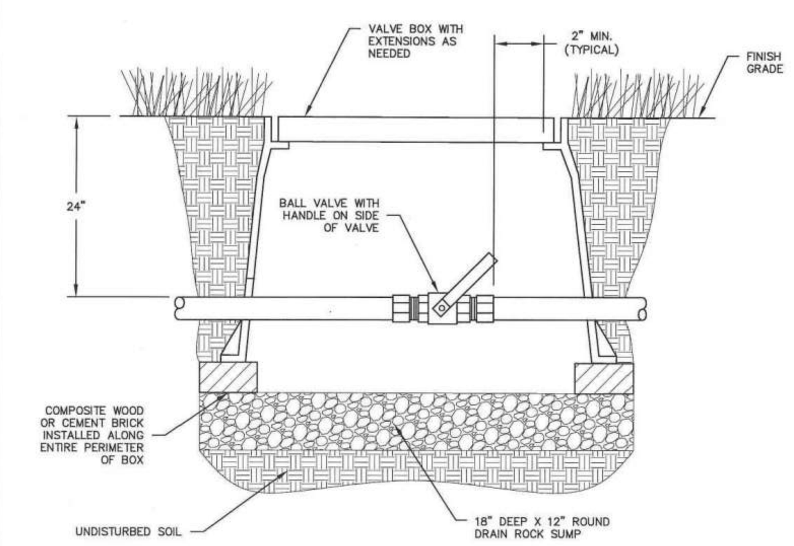
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION SOLENOID VALVE | NOT TO SCALE | DETAIL NO. IR7 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. SWING JOINT SIZE SHALL BE SAME SIZE AS VALVE BOTTOM INLET.

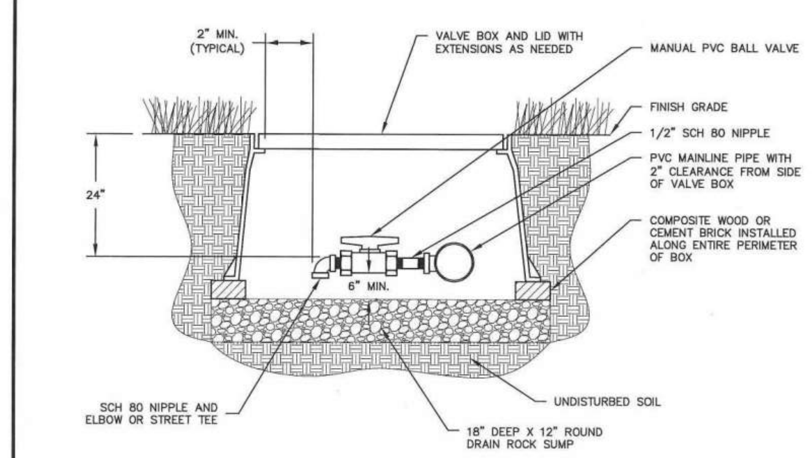
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION QUICK COUPLING VALVE | NOT TO SCALE | DETAIL NO. IR9 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.

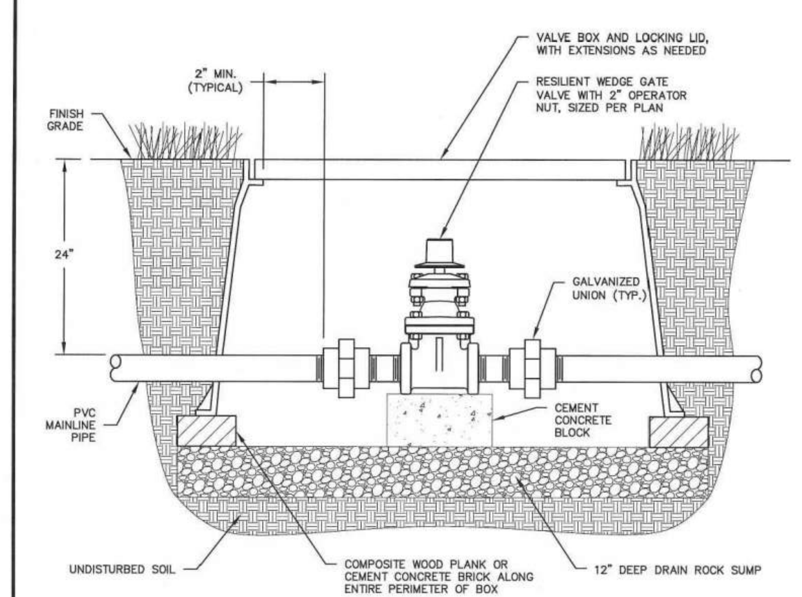
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION ISOLATION BALL VALVE | NOT TO SCALE | DETAIL NO. IR10 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
3. CONTRACTOR RESPONSIBLE FOR LOCATING DRAIN VALVE AT LOWEST POINT OF MAINLINE TO ENSURE POSITIVE DRAINAGE.
4. ALLOW FOR 1" CLEARANCE FROM HOLE IN BOX TO TOP OF PIPE.

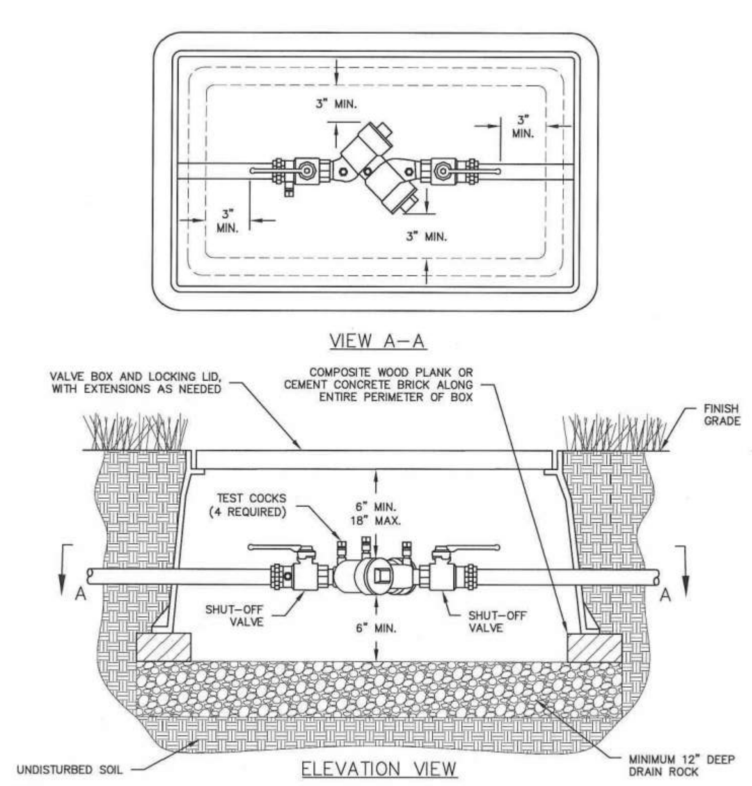
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION MANUAL DRAIN VALVE | NOT TO SCALE | DETAIL NO. IR11 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.

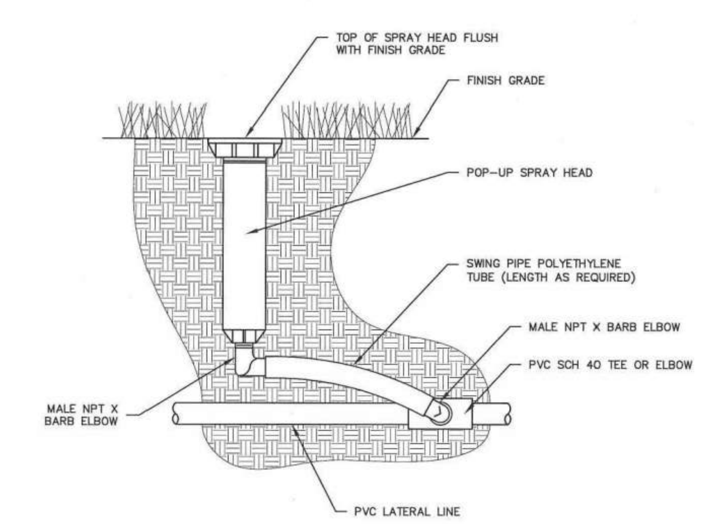
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION MANUAL GATE VALVE | NOT TO SCALE | DETAIL NO. IR12 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED POLYMER IRRIGATION VALVE BOX LARGE ENOUGH TO CONTAIN THE SPECIFIED COMPONENTS. VALVE BOXES SHALL BE RAINBIRD VB SERIES, CARSON, OR APPROVED EQUIVALENT.
2. APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH GROUND. TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
3. DESIGNED FOR BACK SIPHONING AND BACK PRESSURE.
4. THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
5. THE DCVA MAY BE INSTALLED ABOVE OR BELOW THE GROUND PROVIDED ALL CLEARANCES ARE MET.
6. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING. MUST BE ACCESSIBLE AND PROTECTED FROM FREEZING CONDITIONS.
7. THE DOUBLE CHECK VALVE BACKFLOW PREVENTER ASSEMBLY SHALL BE ASSE LISTED 1015 APPROVED AND INCLUDE FULL PORT BALL VALVES WITH RESILIENT SEATS AND UNION CONNECTIONS.
8. A PLUMBING PERMIT IS REQUIRED. PLEASE CONTACT THE CITY OF CAMAS BUILDING DEPARTMENT.
9. MUST BE TESTED AFTER INSTALLATION BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THE CITY OF CAMAS WATER DEPARTMENT.

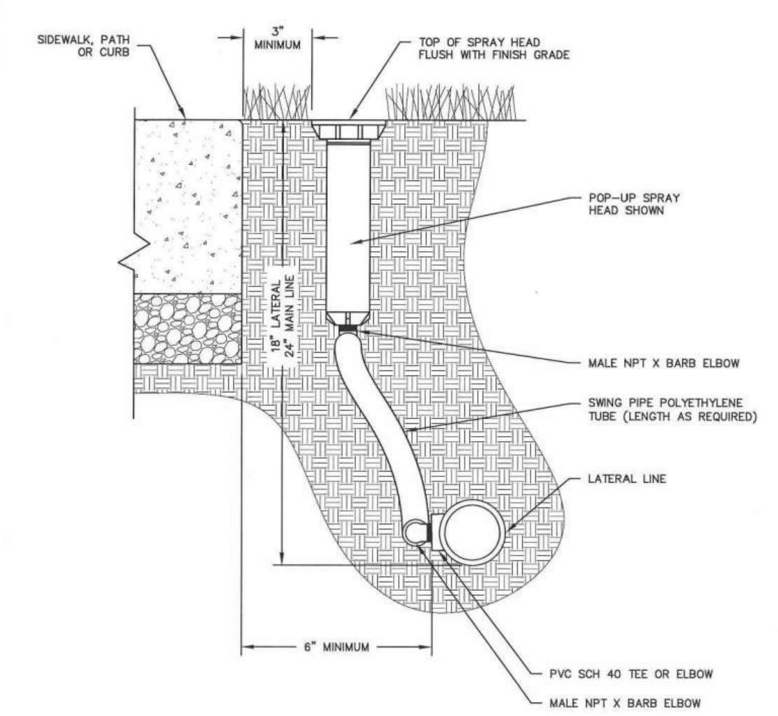
City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION DOUBLE CHECK VALVE ASSY. | NOT TO SCALE | DETAIL NO. IR13 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
2. SWING PIPE SHALL BE POLYEHTYLENE AND SIZE SHALL NOT BE LESS THAN HEAD INLET SIZE.
3. POP-UP SPRAY HEADS SHALL BE RAIN BIRD 1800 OR APPROVED EQUAL, SUBMITTAL REQUIRED.
4. WHEN SPRAY HEADS ARE LOCATED ALONG SIDEWALK OR CURBING THE HEADS SHALL BE MINIMUM 3" FROM HARDSCAPE AND PIPES MINIMUM 6" FROM HARDSCAPE.

City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION POP-UP SPRAY HEAD | NOT TO SCALE | DETAIL NO. IR15 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG



NOTES:

1. ALL THREADED FITTINGS SHALL BE WRAPPED WITH TEFLON TAPE.
2. SWING PIPE SHALL BE POLYEHTYLENE AND SIZE SHALL NOT BE LESS THAN HEAD INLET SIZE.
3. WHEN SPRAY HEADS ARE LOCATED ALONG SIDEWALK OR CURBING THE HEADS SHALL BE MINIMUM 3" FROM HARDSCAPE AND PIPES MINIMUM 6" FROM HARDSCAPE.

City of Camas WASHINGTON | LANDSCAPE DETAIL | IRRIGATION HEAD PLACEMENT ALONG HARDSCAPE | NOT TO SCALE | DETAIL NO. IR16 | DETAIL APPROVED BY / DATE | REVISION: 2 | DATE: 6/19/2019 | ST-IRRIGATION.DWG

Planning Solutions, Inc
Creating Solutions to Complex Issues
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Suite 275
VANCOUVER, WA 9866
VOICE: 360-750-9000 FAX: 360-713-61
www.planningsolutionsinc.co

PRELIMINARY
NOT FOR CONSTRUCTION
SUBJECT TO APPROVAL

STATE OF WASHINGTON
CHRISTOPHER A. BAUMAN
LICENSED LANDSCAPE ARCHITECT

13TH STREET GAS STATIOIN

20101 NE 13th Street
Camas, Washington

DRAWN: Camas	CHECKED: CB
SCALE: AS SHOWN	DATE: 9.15.23
JOB #: 23-1837	
ISSUED FOR: PLR	
REVISIONS:	
1	
2	
3	
4	
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6	

SHEET NAME:

PRELIMINARY IRRIGATION DETAILS

SHEET #: ID

SHEET 8 OF 8

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PRELIMINARY TECHNICAL INFORMATION REPORT

NE 13th Street Site Plan

City of Camas, Washington

Prepared by:
PLS Engineering
Consulting Engineers and Planners
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

Prepared for:
Taz Khan
3993 NW Currawong Court
Camas, WA 98607

Prepared: November of 2023

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Technical Appendices:

Appendix A: Maps

- **Vicinity Map**
- **Soils Map**
- **Critical Areas Map**
- **Basin Maps**

Appendix B: Design Calculations & Modeling

Appendix C: Geotechnical Report

Appendix D: Operations and Maintenance Manual

Appendix E: Construction Stormwater Pollution Prevention Plan (SWPPP)

Appendix F: Environmental Documentation

CERTIFICATE OF ENGINEER

NE 13th Street Gas Station Site Plan

Technical Information Report

The technical information and data contained in this report was prepared under the direction and supervision of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

This document was prepared by:

Scott W. Gilliland, PE

Section A – Project Overview

Section A.1 – Site Information

This project will comply with current City of Camas Standards for Stormwater and Erosion Control per CMC Title 14. The Final Grading / Erosion Control / Drainage Plans have been prepared by the project civil engineer, PLS Engineering, Inc. The site will be served by public sewer and water provided by the City of Camas. This project proposes construction of a gas station along with associated structures, access, paved areas, sewer, water, and storm drain connections. Access to the site is from NE 13th Street.

The physical address of the site is currently 20101 NE 13th Street, but the postal office may change that prior to the completion of this project. The parcel serial number is 176148000. The property is located in the Northwest quarter of Section 29, T2N, R3E of the Willamette Meridian. The property is bordered by NE 13th Street on the north side, 1 acre single family lots to the West, NW Friburg-Strunk Street to the East, and Business Park to the South. The cumulative property area contains a total of 42,257 square feet (0.97 acres), with 1,832 square feet (.04 acres) of right of way dedication, resulting in 40,425 square feet (0.93 acres) of developed area. This technical information report will address the stormwater runoff associated with the construction which will take place.

The topography of the site is set below the bordering roadways by approximately 2' and slightly sloped from the high point at the NW corner of the site towards the SW and SE corners of the site. Elevations range from approximately 249' to 244'. Slopes are generally between 1% and 7%, while the slopes at the edge of the Northern and Eastern boundary roads are around 33%. The site contains a 1,600 square-foot house and a 150 square-foot shop. These structures are planned to be removed. The remainder of the site is filled with grass, landscaping, and a variety of trees. There are potential wetlands mapped on Clark County Maps South of the site. There is a White Oak located on the South edge of the site. Otherwise, there are no known water courses, areas prone to flooding, floodplains, shoreline areas, water bodies, unstable slopes, landslide hazard areas, habitat, critical areas, or historic sites located on the site. Site drainage follows the slope of the land going from the NW corner to the SE/SW corners. There are also some isolated low points on site. The site runoff currently flows to the South, but that is clearly not the historical flow from the site. It appears that when NE 13th Street, and NW Friburg-Strunk Street were created, they were raised above the property and effectively dammed off the site. Historically, the flow from this site traveled to the NE towards Lacamas Creek.

Site runoff from PGIS surfaces will be routed to a to a cartridge vault for treatment. The treated runoff and any other runoff not routed to the vault will flow to an underground detention system. The detention system was modeled using WWHM software to discharge flows in compliance with the SWMMWW. The detention system discharges to an existing MH in NE 13th Street where it will be routed to a roadside ditch located on the North side of NE Goodwin road where it will eventually reach Lacamas creek, returning the site flows to their historical flow path.

Existing frontage on NE 13th Street is currently flowing in two different directions. The North side of the street is routed to the East where it eventually flows into Lacamas Creek. The South side of the street is routed to the South where it is treated and discharged as part of a City road project. The discharge appears to flow to a Wetland located East of NW Friberg-Strunk Street. The site discharge

historically followed the flow path of the North side of the road and is being discharged to that storm system. Consequently, this project has two TDA's. Runoff from the South side of 13th is identified as TDA 1, and will only include the existing and proposed frontage improvements along 13th. TDA 2 will include the roadway improvements on the North side of 13th, as well as the site improvements.

Section B – Minimum Requirements

Section B.2 – Determination of Applicable Minimum Requirements

After site development, disturbed impervious surfaces will cover approximately 49,280 square feet, resulting in more than 5,000 square foot of hard surface area. Consequently, this site must meet all nine Minimum Requirements of the stormwater manual. The site area and the North side of 13th will discharge to TDA 2, and the frontage improvements on the South side of 13th will discharge to TDA 1. The minimum requirements for the TDA's will be different. The areas for each TDA are summarized below. The stormwater system is designed to comply with all City requirements for stormwater treatment and quantity control. The treatment regulations require treatment of 91% of the total runoff volume from pollution generating impervious surfaces while the quantity control regulations require that post-development discharges shall match pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

Total Site Area:

Existing hard surface	12,106 ft^2
New hard surface	35,442 ft^2
Replaced hard	7,566 ft^2
Native vegetation converted to lawn or landscaping	9,829 ft^2
Native vegetation converted to pasture	0 ft^2
Total land-disturbing activity	1.21 acre
Pollution-generating hard surface	30,977 ft^2
Pollution-generating pervious surface	0 ft^2
New Pollution-generating hard surface	23,634 f t^2
Total pollution-generating surfaces	31,200 ft^2
Total non-pollution-generating surfaces	20,078 ft^2

TDA 1:

Existing hard surface	7,566 ft^2
New hard surface	3,091 ft^2
Replaced hard	7,566 ft^2
Native vegetation converted to lawn or landscaping	895 ft^2
Native vegetation converted to pasture	0 ft^2
Total land-disturbing activity	0.26 acre
Pollution-generating hard surface	8,875 ft^2
Pollution-generating pervious surface	0 ft^2
New Pollution-generating hard surface	1,532 f t^2
Total pollution-generating surfaces	9,098 ft^2
Total non-pollution-generating surfaces	895 ft^2

TDA 2:

Existing hard surface	4,540 ft^2
New hard surface	32,351 ft^2
Replaced hard	0 ft^2
Native vegetation converted to lawn or landscaping	8,934 ft^2
Native vegetation converted to pasture	0 ft^2
Total land-disturbing activity	0.95 acre
Pollution-generating hard surface	22,102 ft^2
Pollution-generating pervious surface	0 ft^2
New Pollution-generating hard surface	22,102 ft^2
Total pollution-generating surfaces	22,102 ft^2
Total non-pollution-generating surfaces	19,183 ft^2

MR #1) Preparation of Stormwater Site Plans
All Stormwater System designs meet City of Camas Requirements for conveyance, quality control and quantity. See final construction documents for more details.

MR #2) Construction Stormwater Pollution Prevention
A Stormwater Pollution Prevention Plan is being included with this report and will be onsite for the duration of the project's construction.

MR #3) Source Control of Pollution
See Section D

MR #4) Preservation of Natural Drainage Systems and Outfalls
The historic flow path from the site was to the NE. The South side of 13th was artificially routed to away from the historic flow path and to the South. This flow path will remain unchanged. The North side of 13th is currently following the historic flow path to the NE and will remain unchanged. The site runoff was dammed off by the roadways located North and East of the site, and its historic flow path was changed to the South. This project will restore the site to its historic flow path. This will maintain and preserve the natural drainage systems.

MR #5) Onsite Stormwater Management
See Section E

MR #6) Runoff Treatment
See Section F

MR #7) Flow Control
See Section G

MR #8) Wetland Protection

Clark County maps show the potential for a Wetland located South of the site. See Appendix F for documentation showing that there are not any wetlands on the site.

MR #9) Operations and Maintenance
See Appendix D

Section C – Soils Evaluation

The soils are mapped by the NRCS as Wind River gravelly loam (WrB) for the majority of the site, and Cove silty clay loam (CwA) at the SW corner and Eastern edge of the site.

Earth Engineering Inc. investigated the site on August 4, 2023, and provided a Geotechnical report for the site on August 31, 2023. The geotechnical investigation identified the subsurface soils on site as hard silty clay soils. Consequently, the site was modeled assuming soil type SG4. The geotechnical report has been included in Appendix C and a soil map is included in Appendix A.

Section D – Source Control

The pollution risks involved with this project mainly include the sediment accumulation involved with construction. The Stormwater Pollution Prevention Plan is a document that notes our certain Best Management Practice's (BMP's) that will help prevent sediment laden water from leaving the site during construction. The Erosion Control Plan located in the final construction drawings will provide protection measures involved with minimizing the chance that sediment from the site could enter downstream waterways. The SWPPP is provided in Appendix E.

After construction is complete, this site will be a Gas Station, with special source control measures required. The following Source Control BMPs should be implemented after construction to meet the MR# 3 requirements:

- **BMP S409: BMP's for Fueling at Dedicated Stations**.
- **BMP S412: BMP's for Loading and Unloading Areas of Liquid or Solid Materials**.
- **BMP S426: BMP's for Spills of Oil and Hazardous Substances**.
- **BMP S455: BMP's for Spill Prevention and Cleanup**.

Section E – On-site Stormwater Management BMPs

Minimum Requirement 5 requires the applicant to employ On-site Stormwater Management BMPs in accordance with the following project thresholds, standards, and lists to infiltrate, disperse, and retain stormwater runoff on-site to the maximum extent feasible without causing flooding or erosion impacts. Based on section I-2.5.1 of the Western Washington Stormwater Manual the development is within the UGA on a parcel that is less than 5 acres therefore Low Impact Development Performance Standards and BMP T5.13; or List #2 will apply (applicant option). Due to negligible infiltration rates, this project will apply List #2. If certain BMP's are infeasible; infeasibility criteria per the 2019 Stormwater Management Manual for Western Washington are also noted.

List #2:
Lawn and Landscape areas:
BMP T5.13 Post-Construction Soil Quality and Depth:
This requirement will be met during final design and shown on final construction drawings.

Roofs:
BMPT5.30A or T5.30B Full Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

BMPT5.14A or BMPT5.14B Rain Gardens and Bioretention:
The soil permeability factor above groundwater is less than 0.3 inches per. Because the site soils don't accommodate infiltration, this is not a feasible infiltration BMP as part of Minimum requirement #5.

BMPT5.10C Downspout Dispersion Systems:
There is insufficient space to meet the required dispersion lengths and setbacks from the structures and the property lines.

BMP T5.10D Perforated Stub-out Connections
There is insufficient space to meet the required setback of 10' away from the structures and property lines, and infiltration rates are less than 0.3 inches per hour.

Other Hard Surfaces:
BMPT5.30A or T5.30B Full Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

BMPT5.15 Permeable Pavement:
Permeable pavement is insufficient due to soil infiltration above the groundwater table being less than 0.3 in/hr.

BMPT5.14A or BMPT5.14B Rain Gardens and Bioretention:
The soil permeability factor above groundwater is less than 0.3 inches per hour. Because the site soils don't accommodate infiltration, this is not a feasible infiltration BMP as part of Minimum requirement #5.

BMPT5.12 Sheet Flow Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

None of the List 2 requirements can be met by this project. Consequently, site stormwater runoff from this project will be treated and detained prior to discharge as described in Sections F and G of this report.

The following BMPs will be implemented to meet the MR# 5 requirements:

- **BMP T5.13: Post-Construction Soil Quality and Depth** for lawn and landscaped areas.
- **BMP D.2: Detention Tanks** for runoff from the site.
- **BMP V10.0: Manufactured Treatment Devices** for runoff from the site.
- **BMP T11.11: Coalescing Plate (CP) Separator** for treatment of fuel station spills, mini-mart grease, and car wash oils.

Section F – Runoff Treatment Analysis and Design

Treatment for the site will be accomplished with Contech treatment cartridges. Preliminary stormwater analysis with a WWHM model (see appendix B) identifies the water quality storm event for the site as 0.1213. This volume includes roof, landscape, and frontage runoff, which will not all be treated as part of the final design. The Contech sizing table below identifies treatment flow rates for different cartridges. For example, the 18" ZPG cartridges will each treat 0.028 cfs. Based on this preliminary analysis, there will be 5 or less 18" cartridges needed to treat the stormwater runoff from the site. Due to elevation issues it might be necessary to use low drop cartridges which would result in 7 or less ZPG cartridges. This site is very tight vertically, so the preliminary rim elevations and pipe IE's were sent to Contech who verified that their treatment cartridges will operate properly under the proposed backwater conditions.

Table 1-Contech Sizing Chart

	$2\ GPM/ft^2$			$1\ GPM/ft^2$			$1.67\ GPM/ft^2$		
StormFilter	Flow (GPM)	Flow (CFS)	Color	Flow (GPM)	Flow (CFS)	Color	Flow (GPM)	Flow (CFS)	Color
LowDrop	10	0.022	Gray (GRY)	5.00	0.011	Blue (BLU)	8.35	0.019	Yellow (YLW)
18"	15	0.033	Black (BLK)	7.50	0.017	Blue (BLU)	12.53	0.028	Red (RED)
27"	22.5	0.05	Gold (GLD)	11.50	0.025	Pink (PNK)	18.79	0.042	White (WHT)

Section G - Flow Control Analysis and Design

The stormwater quantity control system for this site has been designed based on the current stormwater quantity control requirements of the City of Camas. The quantity control standards require that stormwater discharges shall match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

The runoff from this site will be detained in an underground detention facility. The preliminary design assumes 6 x 136' 24" CMP pipes placed in gravel. The gravel has a porosity of 0.40. Underground storage was modelled in WWHM using a trench. In order to properly model the 24" CMP in the underground storage, the porosity for the rock was calculated and averaged out to be 0.7326. The WWHM model shows that it passed and meets the discharge requirements of the SWMMWW.

See Appendix B for calculations.

Section H – Wetland Protection

There are not any wetlands on the site. See appendix F.

Section I – Other Permits

The project will be required to obtain preliminary site plan approval, final site plan approval, construction drawing approval, an NPDES construction stormwater permit, and building permit approval prior to construction.

Section J – Conveyance Systems Analysis and Design

Conveyance will be provided with the Final TIR.

Section K – Special Reports and Studies

A Geotechnical Report for the site is included in Appendix C. A Critical Areas report and a Mitigation plan are included in Appendix F. No other special studies are anticipated to be needed.

Section L –Operations and Maintenance Manual

The stormwater facility located on-site will be maintained by the site owner. An Operations and Maintenance Manual is included as Appendix D of this report.

SEPARATOR SHEET

APPENDIX A

Maps

Vicinity Map

Legend

- Taxlots
- All Roads
  - Interstate
  - State Route
  - Arterial
  - Forest Arterial
  - Minor Collector
  - Forest Collector
  - Private or Other

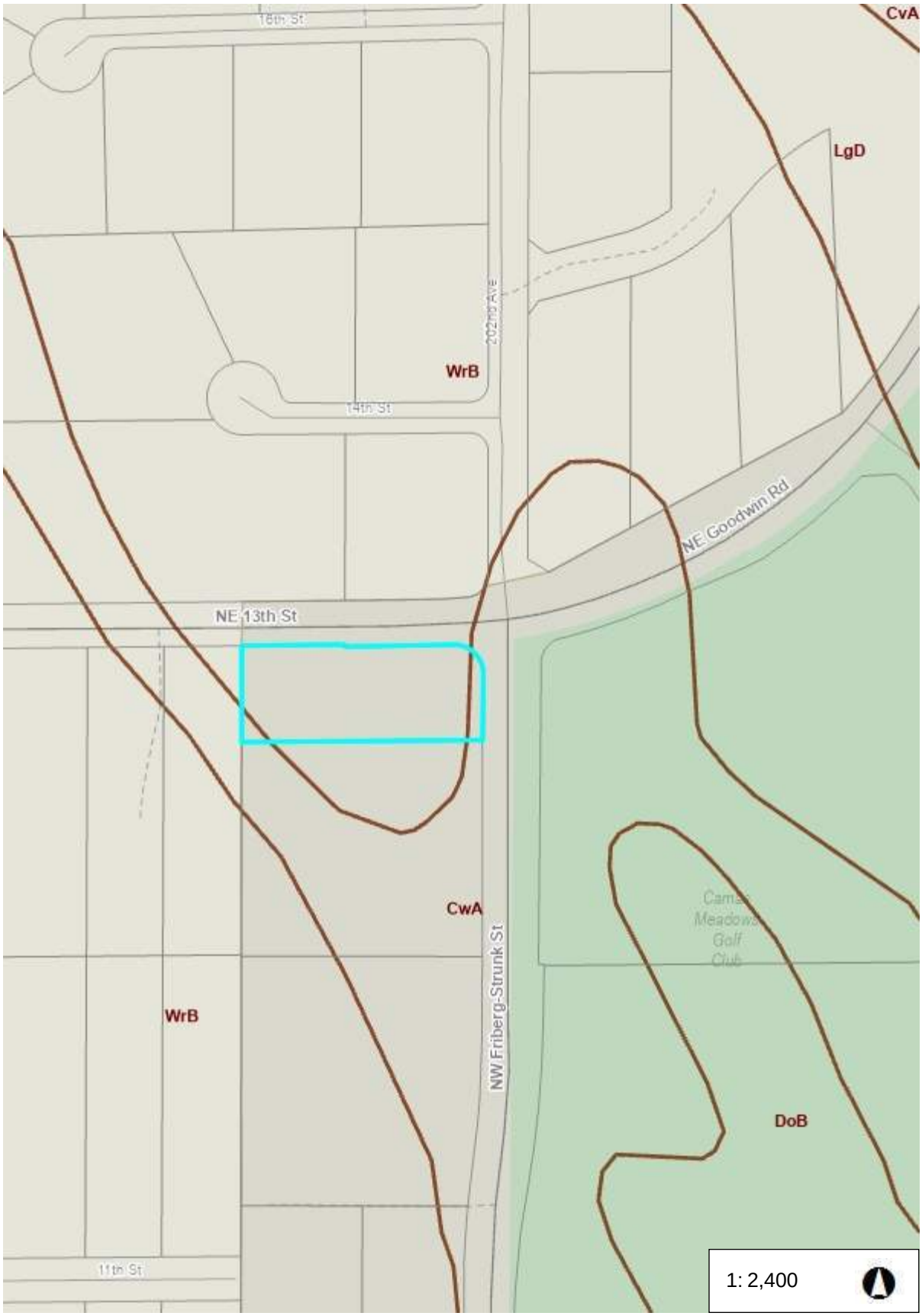
Notes:

1,000.0 0 500.00 1,000.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. The lot (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.

Soils Map



Legend

- Taxlots
- Soil Type

Notes:

400.0 0 200.00 400.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

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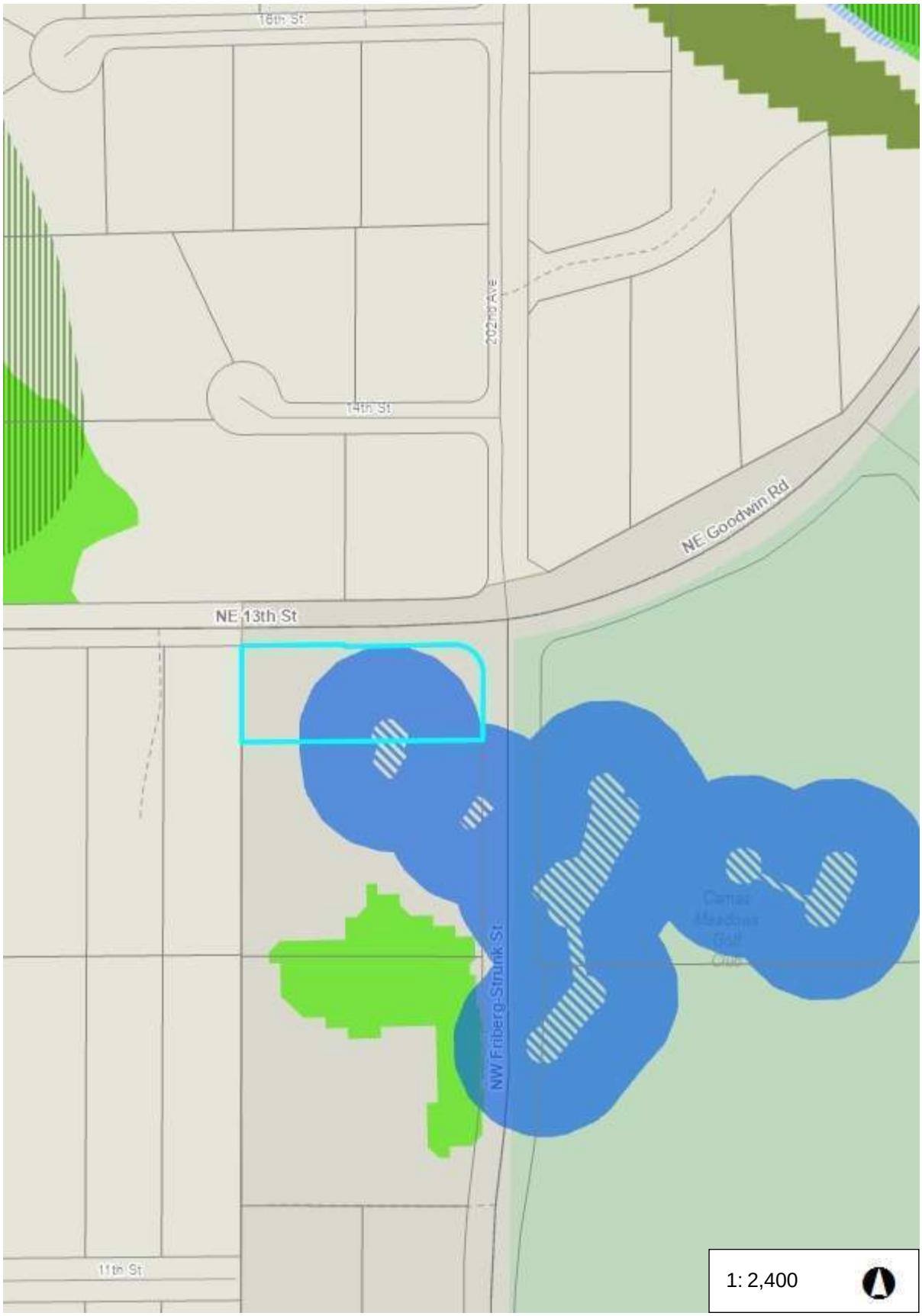
Critical Areas Map



Legend

- Taxlots
- Species
  - Species Area
  - Adjacent to Species Area
- Habitat
  - Habitat Area
  - Adjacent to Habitat Area
- Riparian Habitat
- Severe Erosion Hazard Areas
- Steep Slopes and Landslide H
  - Areas of Historic or Active Landslid
  - Areas of Potential Instability
  - Areas of Older Landslide Debris
  - Slopes > 15%
  - Slopes > 25%
- Potential Wetlands Presence
- Flood Zone Designation
  - Floodway
  - Floodway Fringe
  - 500 Year Flood Area
  - Area Not Studied
- Shoreline Designations
  - Aquatic
  - Natural
  - Urban Conservancy
  - Medium Intensity
  - High Intensity
  - Rural Conservancy Residential
  - Rural Conservancy Resource Land
- Critical Aquifer Recharge Area

Notes:

400.0 0 200.00 400.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

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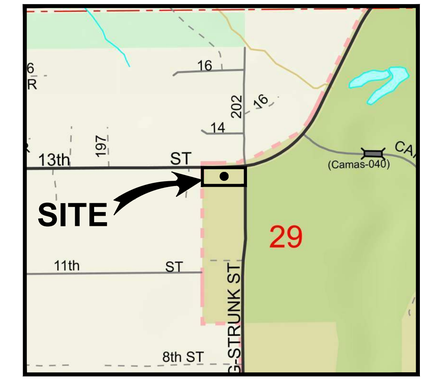
13th Street Site Plan

Located in the NW ¼ of Section 29, T2N, R3E, W.M.
City of Camas, Washington

Sheet Index

1. Predevelopment Basin Map
2. Postdevelopment Basin Map



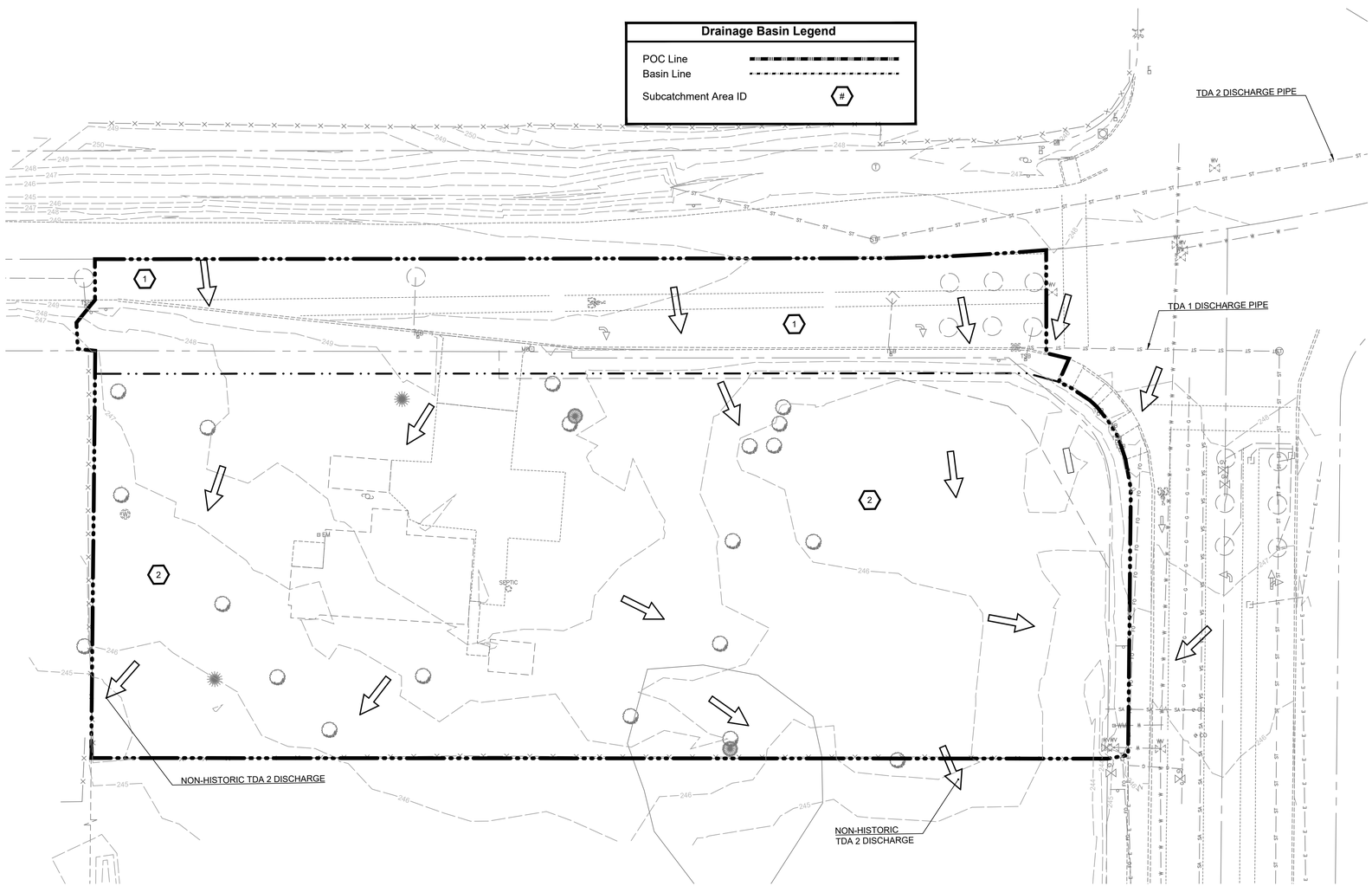
VICINITY MAP
NOT TO SCALE

Extg TDA Totals	sqft	acre	
TDA 1 Area	11,551.38	0.2652	1
Frontage Road	7,565.86	0.1737	
Frontage Landscape	3,985.52	0.0915	
TDA 2 Area	41,285.00	0.9478	2
Site Driveway	2,449.31	0.0562	
Site Sidewalk	154.38	0.0035	
Site Roof	1,936.36	0.0445	
Site Landscape	36,744.94	0.8435	
Existing Site Area Modeled as Forested	41,285.00	0.9478	

Scale 1" = 20'
20 10 0 20

Drainage Basin Legend

POC Line
Basin Line
Subcatchment Area ID #



GENERAL NOTES

APPLICANT:
Taz Kahn
3993 NW Currawong Court
Camas, WA 98607
TKahnusa@gmail.com

OWNER:
Pak USA Camas LLC
20107 NE 13th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 176148-000
20101 NE 13TH ST
Camas, WA 98607

SITE STATISTICS:
Existing Site Area: 42,257 SF (0.97 Acre)
ROW Dedication: 1,832 SF (0.04 Acre)
Developed Site: 42,257 SF (0.93 Acre)

PLS ENGINEERING

Predevelopment Basin Map For:
13th Street Site Plan
A Subdivision Located In The City Of Camas, Washington
Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions
1 2 3 4 5 6

Project No. 3632	
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

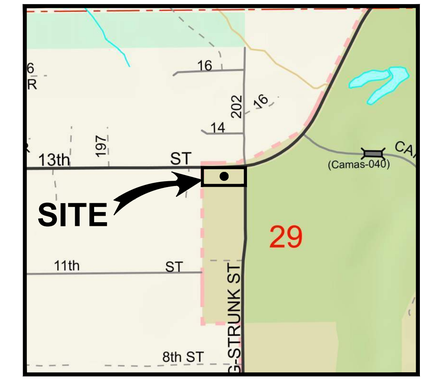
1 / 2

13th Street Site Plan

Located in the NW ¼ of Section 29, T2N, R3E, W.M.
City of Camas, Washington

Sheet Index

1. Predevelopment Basin Map
2. Postdevelopment Basin Map



VICINITY MAP
NOT TO SCALE

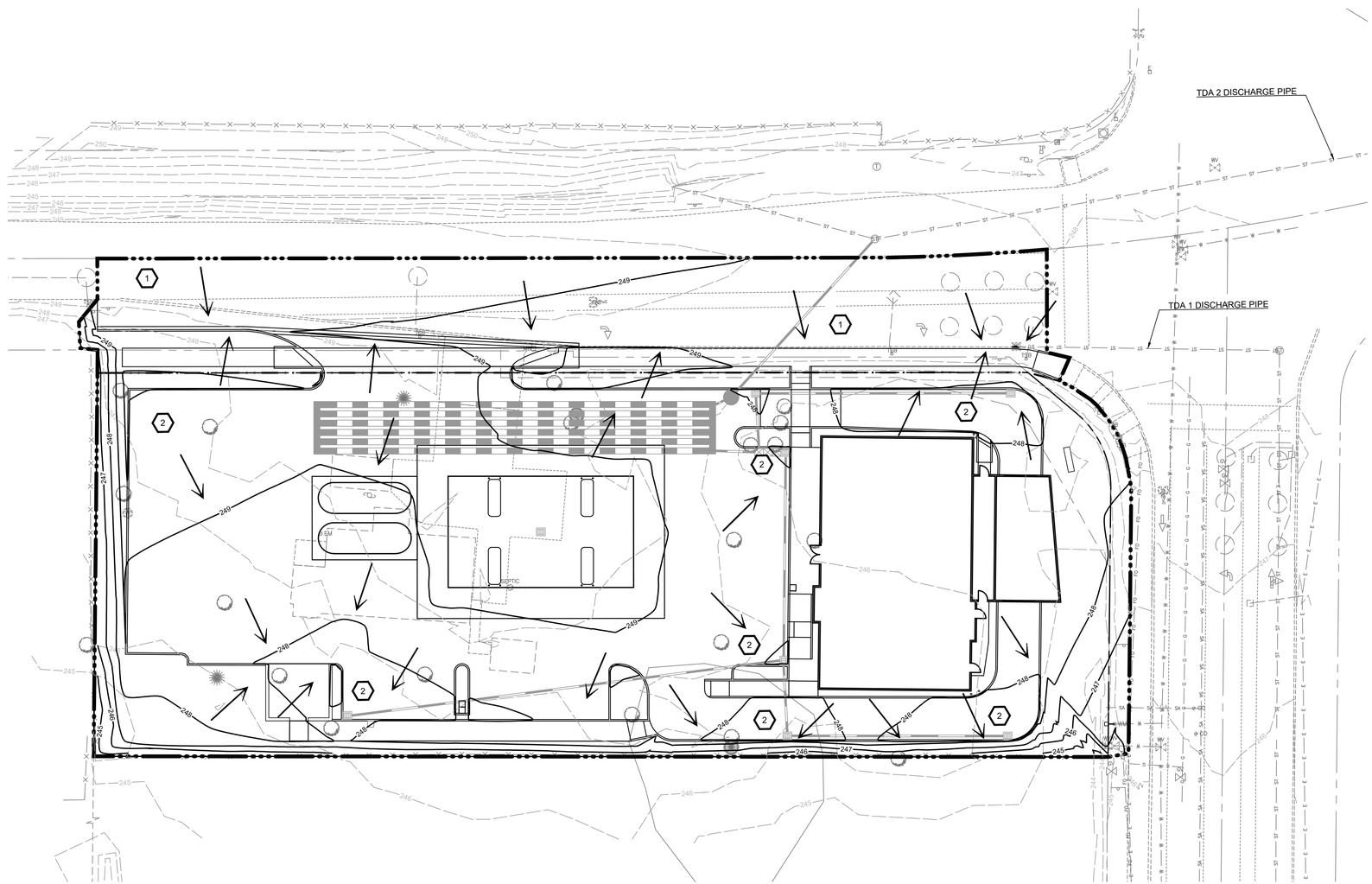
Basin Areas (sqft)						
Basin	Road	SW	Roof	Field	Landscape	Total
1 TDA 1 Basin 1 Frontage	9,097.51	1,559.09	-	-	894.78	11,551.38
2 TDA 2 Basin 3 Site	22,101.84	2,490.08	7,759.05	-	8,934.03	41,285.00
Total	31,199.36	4,049.16	7,759.05	-	9,828.81	52,836.38

Basin Areas (acre)						
	Road	SW	Roof	Field	Landscape	Total
1 TDA 1 Basin 1 Frontage	0.2089	0.0358	-	-	0.0205	0.2652
2 TDA 2 Basin 3 Site	0.5074	0.0572	0.1781	-	0.2051	0.9478
	-	-	-	-	-	-
Total	0.7162	0.0930	0.1781	-	0.2256	1.2130

Scale 1" = 20'
20 10 0 20

Drainage Basin Legend

POC Line
Basin Line
Subcatchment Area ID #



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SITE ADDRESS:
Parcel # 176148-000
20101 NE 13TH ST
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SITE STATISTICS:
Existing Site Area: 42,257 SF (0.97 Acre)
ROW Dedication: 1,832 SF (0.04 Acre)
Developed Site: 42,257 SF (0.93 Acre)

PLS ENGINEERING

Post-Development Basin Map For:

13th Street Site Plan

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions
1 2 3 4 5 6

Project No. 3632	
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

2
2

SEPARATOR SHEET

APPENDIX B

Design Calculations and Modeling

Proposed TDA Totals		
	sqft	acre
Total Development	**52,836.38**	**1.2130**
Road	31,199.36	0.7162
Sidewalk	4,049.16	0.0930
Roof	7,759.05	0.1781
Landscape	9,828.81	0.2256
Impervious Area	43,007.57	0.9873
Pervious Area	9,828.81	0.2256
Pollution Generating Impervious Surface Area (PGIS)	31,199.36	0.7162
TDA 1	**11,551.38**	**0.2652**
Road	9,097.51	0.2089
Sidewalk	1,559.09	0.0358
Landscape	894.78	0.0205
TDA 1 New Impervious	3,090.74	0.0710
TDA 1 Replaced Impervious	7,565.86	0.1737
TDA 1 New PGIS	1,531.66	0.0352
TDA 1 Replaced PGIS	7,565.86	0.1737
TDA 2	**41,285.00**	**0.9478**
Road	22,101.84	0.5074
Sidewalk	2,490.08	0.0572
Roof	7,759.05	0.1781
Landscape	8,934.03	0.2051
TDA 2 New Impervious	32,350.97	0.7427
TDA 2 Replaced Impervious	-	-
TDA 2 New PGIS	22,101.84	0.5074
TDA 2 Replaced PGIS	-	-

Extg TDA Totals		
	sqft	acre
TDA 1 Area	11,551.38	0.2652
Frontage Road	7,565.86	0.1737
Frontage Landscape	3,985.52	0.0915
TDA 2 Area	41,285.00	0.9478
Site Driveway	2,449.31	0.0562
Site Sidewalk	154.38	0.0035
Site Roof	1,936.36	0.0445
Site Landscape	36,744.94	0.8435
Existing Site Area Modeled as Forested	41,285.00	0.9478

Basin Areas (sqft)						
Basin	**Road**	**SW**	**Roof**	**Field**	**Landscape**	**Total**
TDA 1 Basin 1 Frontage	9,097.51	1,559.09	-	-	894.78	11,551.38
TDA 2 Basin 3 Site	22,101.84	2,490.08	7,759.05	-	8,934.03	41,285.00
Total	31,199.36	4,049.16	7,759.05	-	9,828.81	52,836.38

Basin Areas (acre)						
	Road	**SW**	**Roof**	**Field**	**Landscape**	**Total**
TDA 1 Basin 1 Frontage	0.2089	0.0358	-	-	0.0205	0.2652
TDA 2 Basin 3 Site	0.5074	0.0572	0.1781	-	0.2051	0.9478
	-	-	-	-	-	-
Total	0.7162	0.0930	0.1781	-	0.2256	1.2130

WWHM Basin Treatment Flow Analysis (cfs)						
	WQ	**2-yr**	**10-yr**	**25-yr**	**50-yr**	**100-yr**
Total Site Treatment	0.1213	0.568841	0.844412	0.987932	1.097315	1.208959

Underground Storage Calculations		
17' Wide x 2' Tall is	34.0000	SF
6x24" CMP is	18.8496	SF
Rock Storage @ 40% Porocity	6.0602	SF
Total Storage	24.9097	SF
Porocity Tweaked to match	**73.26%**	
Facility Length	130.0000	LF
Total Facility Volume	4,420.0000	CF
Facility Storage	3,238.2654	CF

SEPARATOR SHEET

WWHM2012

PROJECT REPORT

General Model Information

WWHM2012 Project Name: 13thPrelimStormAnalysis

Site Name:	13th Gas Station
Site Address:	
City:	
Report Date:	11/3/2023
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.300
Version Date:	2023/01/27
Version:	4.2.19

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

TDA 2 EXTG

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Flat	0.9478
Pervious Total	0.9478
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.9478

Mitigated Land Use

TDA 2 Basin 3 Site

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Flat	0.2051
Pervious Total	0.2051
Impervious Land Use	acre
ROADS FLAT	0.5074
ROOF TOPS FLAT	0.1781
SIDEWALKS FLAT	0.0572
Impervious Total	0.7427
Basin Total	0.9478

Routing Elements

Predeveloped Routing

Mitigated Routing

Underground Detention

Bottom Length:	136.00 ft.
Bottom Width:	17.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	2
Pour Space of material for first layer:	0.7326
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0

Discharge Structure

Riser Height:	2 ft.
Riser Diameter:	10 in.
Notch Type:	Rectangular
Notch Width:	0.270 ft.
Notch Height:	0.400 ft.
Orifice 1 Diameter:	1.900 in. Elevation:0 ft.

Element Flows To:

Outlet 1 Outlet 2

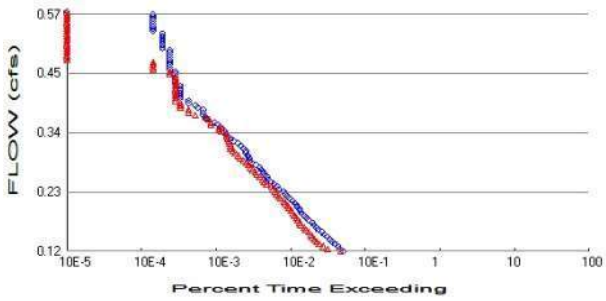
Gravel Trench Bed Hydraulic Table

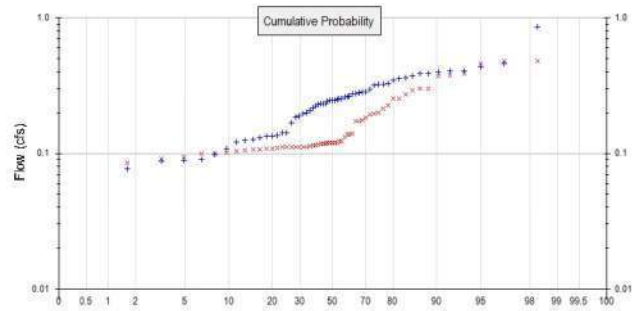
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.053	0.000	0.000	0.000
0.0222	0.053	0.000	0.014	0.000
0.0444	0.053	0.001	0.020	0.000
0.0667	0.053	0.002	0.025	0.000
0.0889	0.053	0.003	0.029	0.000
0.1111	0.053	0.004	0.032	0.000
0.1333	0.053	0.005	0.035	0.000
0.1556	0.053	0.006	0.038	0.000
0.1778	0.053	0.006	0.041	0.000
0.2000	0.053	0.007	0.043	0.000
0.2222	0.053	0.008	0.046	0.000
0.2444	0.053	0.009	0.048	0.000
0.2667	0.053	0.010	0.050	0.000
0.2889	0.053	0.011	0.052	0.000
0.3111	0.053	0.012	0.054	0.000
0.3333	0.053	0.013	0.056	0.000
0.3556	0.053	0.013	0.058	0.000
0.3778	0.053	0.014	0.060	0.000
0.4000	0.053	0.015	0.062	0.000
0.4222	0.053	0.016	0.063	0.000
0.4444	0.053	0.017	0.065	0.000
0.4667	0.053	0.018	0.066	0.000
0.4889	0.053	0.019	0.068	0.000
0.5111	0.053	0.019	0.070	0.000
0.5333	0.053	0.020	0.071	0.000
0.5556	0.053	0.021	0.073	0.000
0.5778	0.053	0.022	0.074	0.000
0.6000	0.053	0.023	0.075	0.000
0.6222	0.053	0.024	0.077	0.000

0.6444	0.053	0.025	0.078	0.000
0.6667	0.053	0.025	0.080	0.000
0.6889	0.053	0.026	0.081	0.000
0.7111	0.053	0.027	0.082	0.000
0.7333	0.053	0.028	0.083	0.000
0.7556	0.053	0.029	0.085	0.000
0.7778	0.053	0.030	0.086	0.000
0.8000	0.053	0.031	0.087	0.000
0.8222	0.053	0.032	0.088	0.000
0.8444	0.053	0.032	0.090	0.000
0.8667	0.053	0.033	0.091	0.000
0.8889	0.053	0.034	0.092	0.000
0.9111	0.053	0.035	0.093	0.000
0.9333	0.053	0.036	0.094	0.000
0.9556	0.053	0.037	0.095	0.000
0.9778	0.053	0.038	0.096	0.000
1.0000	0.053	0.038	0.098	0.000
1.0222	0.053	0.039	0.099	0.000
1.0444	0.053	0.040	0.100	0.000
1.0667	0.053	0.041	0.101	0.000
1.0889	0.053	0.042	0.102	0.000
1.1111	0.053	0.043	0.103	0.000
1.1333	0.053	0.044	0.104	0.000
1.1556	0.053	0.044	0.105	0.000
1.1778	0.053	0.045	0.106	0.000
1.2000	0.053	0.046	0.107	0.000
1.2222	0.053	0.047	0.108	0.000
1.2444	0.053	0.048	0.109	0.000
1.2667	0.053	0.049	0.110	0.000
1.2889	0.053	0.050	0.111	0.000
1.3111	0.053	0.051	0.112	0.000
1.3333	0.053	0.051	0.113	0.000
1.3556	0.053	0.052	0.114	0.000
1.3778	0.053	0.053	0.115	0.000
1.4000	0.053	0.054	0.115	0.000
1.4222	0.053	0.055	0.116	0.000
1.4444	0.053	0.056	0.117	0.000
1.4667	0.053	0.057	0.118	0.000
1.4889	0.053	0.057	0.119	0.000
1.5111	0.053	0.058	0.120	0.000
1.5333	0.053	0.059	0.121	0.000
1.5556	0.053	0.060	0.122	0.000
1.5778	0.053	0.061	0.123	0.000
1.6000	0.053	0.062	0.123	0.000
1.6222	0.053	0.063	0.127	0.000
1.6444	0.053	0.063	0.134	0.000
1.6667	0.053	0.064	0.141	0.000
1.6889	0.053	0.065	0.151	0.000
1.7111	0.053	0.066	0.161	0.000
1.7333	0.053	0.067	0.172	0.000
1.7556	0.053	0.068	0.185	0.000
1.7778	0.053	0.069	0.198	0.000
1.8000	0.053	0.070	0.211	0.000
1.8222	0.053	0.070	0.226	0.000
1.8444	0.053	0.071	0.241	0.000
1.8667	0.053	0.072	0.257	0.000
1.8889	0.053	0.073	0.274	0.000
1.9111	0.053	0.074	0.291	0.000

1.9333	0.053	0.075	0.309	0.000
1.9556	0.053	0.076	0.327	0.000
1.9778	0.053	0.076	0.346	0.000
2.0000	0.053	0.077	0.366	0.000

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.9478
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.2051
Total Impervious Area: 0.7427

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.237792
5 year	0.372265
10 year	0.445639
25 year	0.520497
50 year	0.565063
100 year	0.601747

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.143408
5 year	0.220762
10 year	0.285903
25 year	0.386617
50 year	0.47677
100 year	0.581482

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.186	0.173
1950	0.243	0.118
1951	0.322	0.120
1952	0.189	0.184
1953	0.254	0.109
1954	0.354	0.113
1955	0.197	0.109
1956	0.387	0.374
1957	0.294	0.118
1958	0.218	0.302

1959	0.127	0.091
1960	0.125	0.123
1961	0.349	0.196
1962	0.234	0.111
1963	0.260	0.119
1964	0.248	0.112
1965	0.222	0.175
1966	0.284	0.118
1967	0.248	0.116
1968	0.324	0.119
1969	0.264	0.461
1970	0.862	0.476
1971	0.136	0.100
1972	0.232	0.111
1973	0.231	0.133
1974	0.364	0.388
1975	0.198	0.109
1976	0.285	0.123
1977	0.008	0.094
1978	0.406	0.254
1979	0.275	0.215
1980	0.168	0.104
1981	0.386	0.293
1982	0.260	0.274
1983	0.432	0.172
1984	0.141	0.107
1985	0.109	0.138
1986	0.134	0.114
1987	0.234	0.137
1988	0.090	0.106
1989	0.098	0.105
1990	0.089	0.100
1991	0.253	0.111
1992	0.278	0.099
1993	0.327	0.255
1994	0.250	0.193
1995	0.207	0.299
1996	0.397	0.477
1997	0.459	0.376
1998	0.371	0.120
1999	0.278	0.198
2000	0.134	0.085
2001	0.077	0.082
2002	0.405	0.114
2003	0.319	0.139
2004	0.087	0.112
2005	0.131	0.111
2006	0.245	0.111
2007	0.121	0.228
2008	0.142	0.120

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.8622	0.4771
2	0.4595	0.4763
3	0.4322	0.4607
4	0.4060	0.3879

5	0.4054	0.3757
6	0.3967	0.3738
7	0.3870	0.3017
8	0.3860	0.2990
9	0.3714	0.2929
10	0.3637	0.2735
11	0.3544	0.2551
12	0.3485	0.2545
13	0.3270	0.2277
14	0.3237	0.2153
15	0.3216	0.1982
16	0.3187	0.1964
17	0.2943	0.1925
18	0.2848	0.1841
19	0.2841	0.1745
20	0.2782	0.1725
21	0.2776	0.1716
22	0.2748	0.1394
23	0.2638	0.1383
24	0.2598	0.1370
25	0.2598	0.1327
26	0.2543	0.1230
27	0.2529	0.1228
28	0.2500	0.1202
29	0.2480	0.1200
30	0.2476	0.1196
31	0.2446	0.1193
32	0.2435	0.1189
33	0.2343	0.1184
34	0.2338	0.1176
35	0.2319	0.1175
36	0.2309	0.1161
37	0.2223	0.1142
38	0.2183	0.1140
39	0.2075	0.1130
40	0.1982	0.1121
41	0.1973	0.1121
42	0.1885	0.1113
43	0.1857	0.1110
44	0.1681	0.1108
45	0.1421	0.1107
46	0.1410	0.1106
47	0.1364	0.1090
48	0.1344	0.1086
49	0.1343	0.1086
50	0.1308	0.1073
51	0.1269	0.1065
52	0.1254	0.1052
53	0.1211	0.1038
54	0.1087	0.1003
55	0.0983	0.0999
56	0.0905	0.0990
57	0.0892	0.0936
58	0.0875	0.0913
59	0.0775	0.0851
60	0.0078	0.0822

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1189	1055	983	93	Pass
0.1234	965	655	67	Pass
0.1279	904	571	63	Pass
0.1324	818	507	61	Pass
0.1369	757	463	61	Pass
0.1414	699	434	62	Pass
0.1459	647	404	62	Pass
0.1504	587	388	66	Pass
0.1549	549	364	66	Pass
0.1595	490	333	67	Pass
0.1640	458	319	69	Pass
0.1685	429	291	67	Pass
0.1730	410	278	67	Pass
0.1775	367	263	71	Pass
0.1820	342	250	73	Pass
0.1865	317	236	74	Pass
0.1910	298	222	74	Pass
0.1955	281	213	75	Pass
0.2000	265	199	75	Pass
0.2045	254	192	75	Pass
0.2090	238	180	75	Pass
0.2135	225	169	75	Pass
0.2180	201	153	76	Pass
0.2226	187	146	78	Pass
0.2271	175	135	77	Pass
0.2316	169	129	76	Pass
0.2361	145	122	84	Pass
0.2406	139	115	82	Pass
0.2451	126	100	79	Pass
0.2496	114	92	80	Pass
0.2541	104	89	85	Pass
0.2586	101	80	79	Pass
0.2631	95	74	77	Pass
0.2676	90	71	78	Pass
0.2721	85	66	77	Pass
0.2766	81	61	75	Pass
0.2811	71	57	80	Pass
0.2856	62	53	85	Pass
0.2902	59	49	83	Pass
0.2947	58	44	75	Pass
0.2992	56	42	75	Pass
0.3037	53	38	71	Pass
0.3082	52	35	67	Pass
0.3127	49	33	67	Pass
0.3172	45	33	73	Pass
0.3217	41	32	78	Pass
0.3262	36	31	86	Pass
0.3307	33	30	90	Pass
0.3352	30	29	96	Pass
0.3397	28	29	103	Pass
0.3442	27	25	92	Pass
0.3487	25	23	92	Pass
0.3532	24	23	95	Pass

0.3578	22	18	81	Pass
0.3623	20	18	90	Pass
0.3668	16	17	106	Pass
0.3713	15	15	100	Pass
0.3758	14	11	78	Pass
0.3803	14	9	64	Pass
0.3848	14	9	64	Pass
0.3893	12	7	58	Pass
0.3938	11	7	63	Pass
0.3983	9	7	77	Pass
0.4028	9	6	66	Pass
0.4073	7	6	85	Pass
0.4118	7	6	85	Pass
0.4163	7	6	85	Pass
0.4208	7	6	85	Pass
0.4254	7	6	85	Pass
0.4299	7	6	85	Pass
0.4344	6	6	100	Pass
0.4389	6	6	100	Pass
0.4434	6	6	100	Pass
0.4479	6	6	100	Pass
0.4524	6	5	83	Pass
0.4569	6	5	83	Pass
0.4614	5	3	60	Pass
0.4659	5	3	60	Pass
0.4704	5	3	60	Pass
0.4749	5	3	60	Pass
0.4794	5	0	0	Pass
0.4839	5	0	0	Pass
0.4884	5	0	0	Pass
0.4930	5	0	0	Pass
0.4975	5	0	0	Pass
0.5020	4	0	0	Pass
0.5065	4	0	0	Pass
0.5110	4	0	0	Pass
0.5155	4	0	0	Pass
0.5200	4	0	0	Pass
0.5245	4	0	0	Pass
0.5290	4	0	0	Pass
0.5335	3	0	0	Pass
0.5380	3	0	0	Pass
0.5425	3	0	0	Pass
0.5470	3	0	0	Pass
0.5515	3	0	0	Pass
0.5560	3	0	0	Pass
0.5606	3	0	0	Pass
0.5651	3	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Underground Detention POC	☐	154.69			☐	0.00			
Total Volume Infiltrated		154.69	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

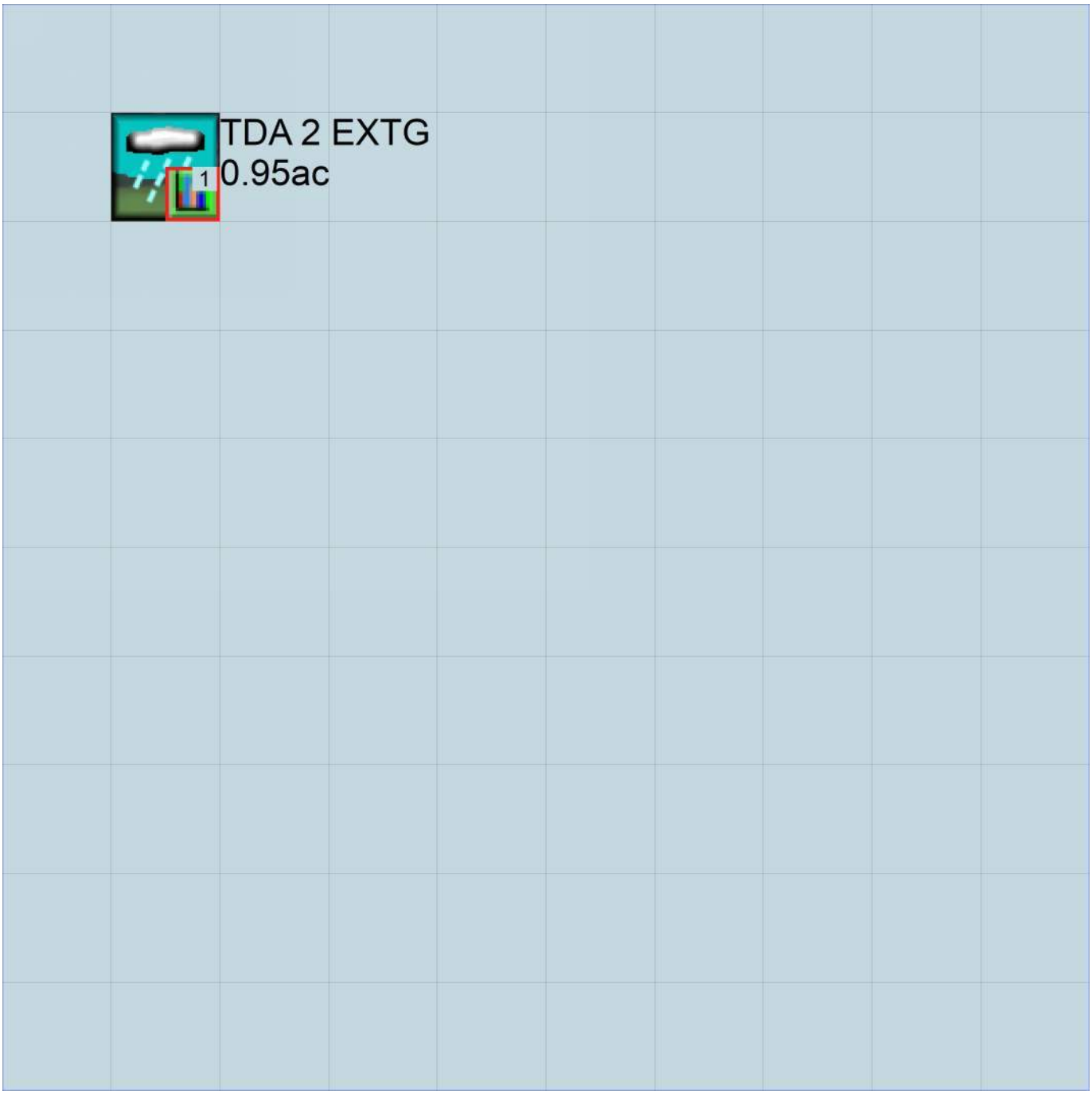
No PERLND changes have been made.

IMPLND Changes

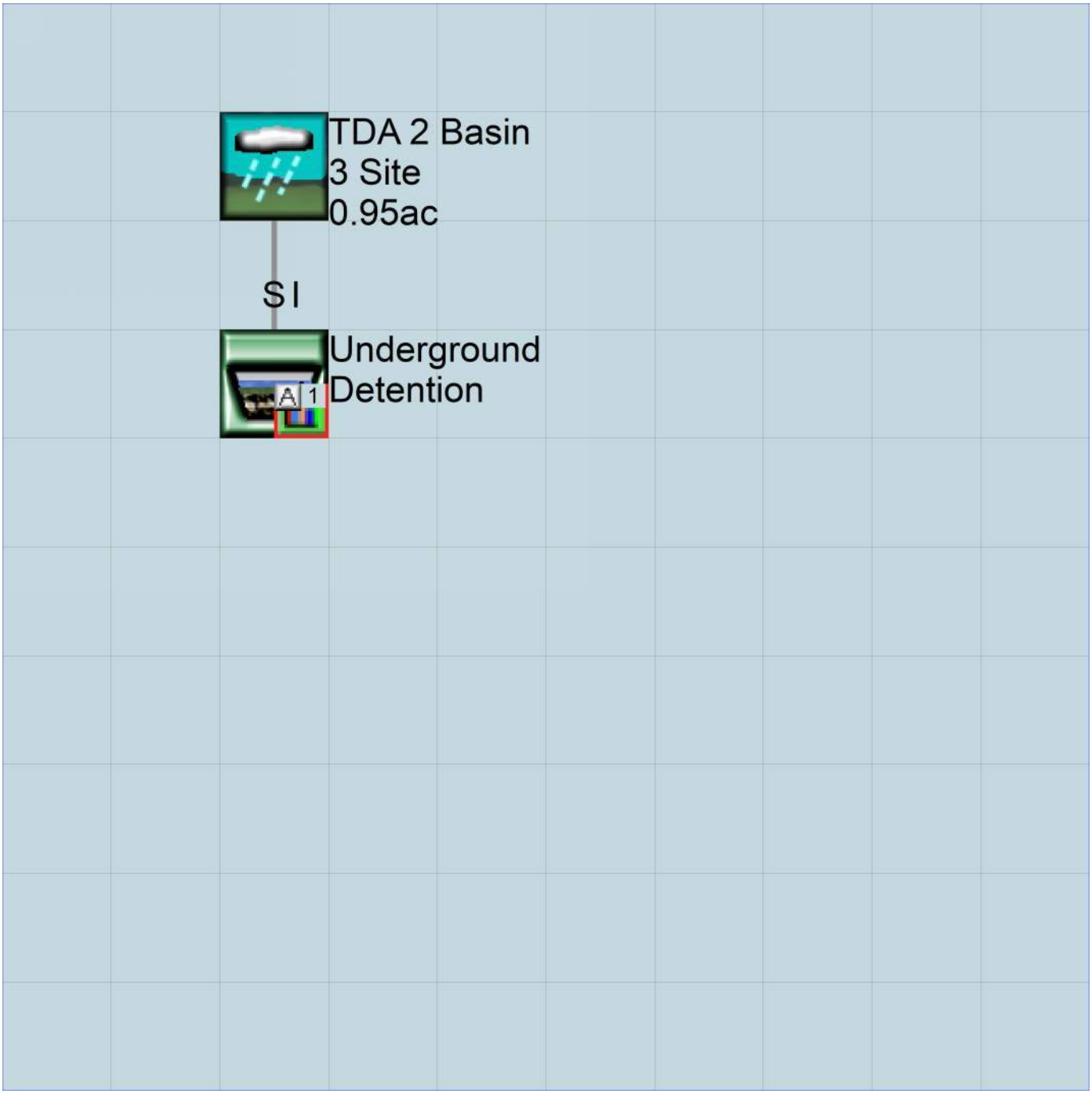
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                               ***
WDM        26   13thPrelimStormAnalysis.wdm
MESSU      25   Pre13thPrelimStormAnalysis.MES
           27   Pre13thPrelimStormAnalysis.L61
           28   Pre13thPrelimStormAnalysis.L62
           30   POC13thPrelimStormAnalysis1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      28
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        TDA 2 EXTG                 MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                           in  out           ***
   28     SG4, Forest, Flat       1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   28         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   28         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   28         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   28              0         6      0.04       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   28              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   28            0.2       0.4      0.35         2       0.4       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   28              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                       in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
TDA 2 EXTG***
PERLND  28                      0.9478     COPY   501     12
PERLND  28                      0.9478     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                        in  out                               ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                       ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                               ***
WDM        26   13thPrelimStormAnalysis.wdm
MESSU      25   Mit13thPrelimStormAnalysis.MES
           27   Mit13thPrelimStormAnalysis.L61
           28   Mit13thPrelimStormAnalysis.L62
           30   POC13thPrelimStormAnalysis1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      34
      IMPLND       1
      IMPLND       4
      IMPLND       8
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Underground Detention       MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                           in  out           ***
   34     SG4, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   34         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
```

```
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   34         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   34         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   34             0         6      0.02       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   34             0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                  ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   34           0.1       0.2      0.25         2       0.4      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   34             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                       in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    4    1    9
    4         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    8         0    0    0    0    0
```

```
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
TDA 2 Basin 3 Site***
PERLND  34                      0.2051     RCHRES   1      2
PERLND  34                      0.2051     RCHRES   1      3
IMPLND   1                      0.5074     RCHRES   1      5
IMPLND   4                      0.1781     RCHRES   1      5
IMPLND   8                      0.0572     RCHRES   1      5

******Routing******
PERLND  34                      0.2051     COPY     1     12
IMPLND   1                      0.5074     COPY     1     15
IMPLND   4                      0.1781     COPY     1     15
IMPLND   8                      0.0572     COPY     1     15
PERLND  34                      0.2051     COPY     1     13
RCHRES   1                           1     COPY   501     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<-----------------><---> User T-series  Engl Metr LKFG           ***
                                          in  out                           ***
    1     Underground Dete-016    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
```

```
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                        ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1               1      0.03       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                           ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   92    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.053076  0.000000  0.000000
  0.022222  0.053076  0.000864  0.014604
  0.044444  0.053076  0.001728  0.020653
  0.066667  0.053076  0.002592  0.025294
  0.088889  0.053076  0.003456  0.029207
  0.111111  0.053076  0.004320  0.032655
  0.133333  0.053076  0.005184  0.035771
  0.155556  0.053076  0.006049  0.038637
  0.177778  0.053076  0.006913  0.041305
  0.200000  0.053076  0.007777  0.043811
  0.222222  0.053076  0.008641  0.046181
  0.244444  0.053076  0.009505  0.048435
  0.266667  0.053076  0.010369  0.050588
  0.288889  0.053076  0.011233  0.052654
  0.311111  0.053076  0.012097  0.054642
  0.333333  0.053076  0.012961  0.056559
  0.355556  0.053076  0.013825  0.058414
  0.377778  0.053076  0.014689  0.060212
  0.400000  0.053076  0.015553  0.061958
  0.422222  0.053076  0.016418  0.063656
  0.444444  0.053076  0.017282  0.065309
  0.466667  0.053076  0.018146  0.066922
  0.488889  0.053076  0.019010  0.068497
  0.511111  0.053076  0.019874  0.070036
  0.533333  0.053076  0.020738  0.071543
  0.555556  0.053076  0.021602  0.073018
  0.577778  0.053076  0.022466  0.074464
  0.600000  0.053076  0.023330  0.075882
  0.622222  0.053076  0.024194  0.077275
  0.644444  0.053076  0.025058  0.078643
  0.666667  0.053076  0.025922  0.079987
  0.688889  0.053076  0.026787  0.081309
```

```
  0.711111  0.053076  0.027651  0.082610
  0.733333  0.053076  0.028515  0.083891
  0.755556  0.053076  0.029379  0.085153
  0.777778  0.053076  0.030243  0.086396
  0.800000  0.053076  0.031107  0.087622
  0.822222  0.053076  0.031971  0.088830
  0.844444  0.053076  0.032835  0.090023
  0.866667  0.053076  0.033699  0.091199
  0.888889  0.053076  0.034563  0.092361
  0.911111  0.053076  0.035427  0.093509
  0.933333  0.053076  0.036291  0.094642
  0.955556  0.053076  0.037155  0.095762
  0.977778  0.053076  0.038020  0.096869
  1.000000  0.053076  0.038884  0.097964
  1.022222  0.053076  0.039748  0.099046
  1.044444  0.053076  0.040612  0.100117
  1.066667  0.053076  0.041476  0.101177
  1.088889  0.053076  0.042340  0.102225
  1.111111  0.053076  0.043204  0.103263
  1.133333  0.053076  0.044068  0.104291
  1.155556  0.053076  0.044932  0.105308
  1.177778  0.053076  0.045796  0.106316
  1.200000  0.053076  0.046660  0.107314
  1.222222  0.053076  0.047524  0.108303
  1.244444  0.053076  0.048389  0.109283
  1.266667  0.053076  0.049253  0.110255
  1.288889  0.053076  0.050117  0.111218
  1.311111  0.053076  0.050981  0.112172
  1.333333  0.053076  0.051845  0.113119
  1.355556  0.053076  0.052709  0.114058
  1.377778  0.053076  0.053573  0.114989
  1.400000  0.053076  0.054437  0.115912
  1.422222  0.053076  0.055301  0.116829
  1.444444  0.053076  0.056165  0.117738
  1.466667  0.053076  0.057029  0.118640
  1.488889  0.053076  0.057893  0.119536
  1.511111  0.053076  0.058757  0.120424
  1.533333  0.053076  0.059622  0.121307
  1.555556  0.053076  0.060486  0.122182
  1.577778  0.053076  0.061350  0.123052
  1.600000  0.053076  0.062214  0.123916
  1.622222  0.053076  0.063078  0.127752
  1.644444  0.053076  0.063942  0.134049
  1.666667  0.053076  0.064806  0.141947
  1.688889  0.053076  0.065670  0.151139
  1.711111  0.053076  0.066534  0.161446
  1.733333  0.053076  0.067398  0.172749
  1.755556  0.053076  0.068262  0.184961
  1.777778  0.053076  0.069126  0.198013
  1.800000  0.053076  0.069991  0.211850
  1.822222  0.053076  0.070855  0.226428
  1.844444  0.053076  0.071719  0.241707
  1.866667  0.053076  0.072583  0.257656
  1.888889  0.053076  0.073447  0.274245
  1.911111  0.053076  0.074311  0.291448
  1.933333  0.053076  0.075175  0.309245
  1.955556  0.053076  0.076039  0.327614
  1.977778  0.053076  0.076903  0.346537
  2.000000  0.053076  0.077767  0.365998
  2.022222  0.053076  0.078947  0.396049
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP
```

```
END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1969/ 9/17 21:30

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3387.5     3438.9     3471.8
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1969/ 9/17 21:30

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -7.584E+03    1.6401  1.6401E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1969/ 9/17 21:45

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3616.7
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1969/ 9/17 21:45

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -2.061E+04    4.4577  4.4577E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1969/ 9/17 22: 0

RCHRES:     1
```

```
The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3482.2
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1969/ 9/17 22: 0

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -8.521E+03    1.8427  1.8427E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1970/ 1/22 17: 0

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3565.4
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1970/ 1/22 17: 0

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -1.600E+04    3.4612  3.4611E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1970/ 1/22 17:15

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3586.9
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1970/ 1/22 17:15

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -1.794E+04    3.8796  3.8796E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1970/ 1/22 17:30

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3469.4
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1970/ 1/22 17:30

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -7.362E+03    1.5922  1.5922E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1995/11/11  6:15

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3511.1
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1995/11/11  6:15

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
```

```
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -1.112E+04    2.4041     2.4041       2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1995/11/11  6:30

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3387.5     3438.9     3643.9
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1995/11/11  6:30

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -2.307E+04    4.9884  4.9884E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1995/11/11  6:45

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 3.3875E+03 3438.9     3511.3
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1995/11/11  6:45

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 4624.0     -1.113E+04    2.4071  2.4071E+00      2
```

Disclaimer

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SEPARATOR SHEET

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	13thPrelimTreatmentAnalysis
Site Name:	13th Gas Station
Site Address:	
City:	
Report Date:	8/22/2023
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.300
Version Date:	2018/10/10
Version:	4.2.16

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

TDA 2 Treatment

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Flat	0.2916
Pervious Total	0.2916
Impervious Land Use	acre
ROADS FLAT	0.6565
ROOF TOPS FLAT	0.1781
SIDEWALKS FLAT	0.0572
Impervious Total	0.8918
Basin Total	1.1834

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

TDA 2 Treatment

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Flat	0.2916
Pervious Total	0.2916
Impervious Land Use	acre
ROADS FLAT	0.6565
ROOF TOPS FLAT	0.1781
SIDEWALKS FLAT	0.0572
Impervious Total	0.8918
Basin Total	1.1834

Element Flows To:

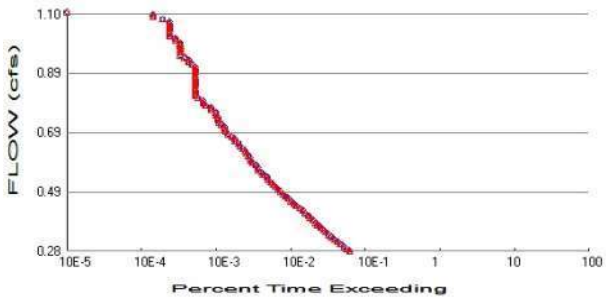
Surface	Interflow	Groundwater

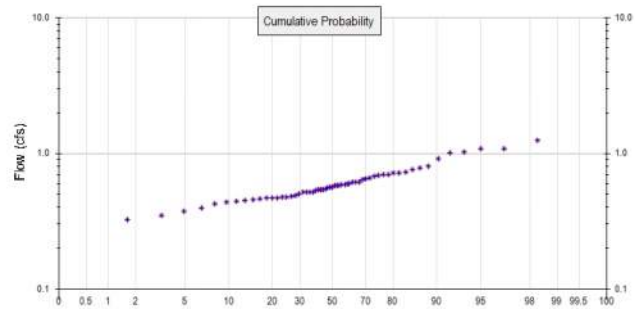
Routing Elements

Predeveloped Routing

Mitigated Routing

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.2916
Total Impervious Area: 0.8918

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.2916
Total Impervious Area: 0.8918

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.568841
5 year	0.733272
10 year	0.844412
25 year	0.987932
50 year	1.097315
100 year	1.208959

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.568841
5 year	0.733272
10 year	0.844412
25 year	0.987932
50 year	1.097315
100 year	1.208959

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.762	0.762
1950	0.501	0.501
1951	0.537	0.537
1952	0.561	0.561
1953	0.520	0.520
1954	0.718	0.718
1955	0.437	0.437
1956	0.588	0.588
1957	0.612	0.612
1958	0.685	0.685

1959	0.460	0.460
1960	0.455	0.455
1961	0.560	0.560
1962	0.491	0.491
1963	0.592	0.592
1964	0.452	0.452
1965	0.467	0.467
1966	0.541	0.541
1967	0.558	0.558
1968	1.082	1.082
1969	0.918	0.918
1970	1.244	1.244
1971	0.483	0.483
1972	0.655	0.655
1973	0.534	0.534
1974	0.549	0.549
1975	0.395	0.395
1976	0.467	0.467
1977	0.289	0.289
1978	0.681	0.681
1979	0.779	0.779
1980	0.425	0.425
1981	0.644	0.644
1982	0.647	0.647
1983	0.724	0.724
1984	0.374	0.374
1985	0.470	0.470
1986	0.712	0.712
1987	0.444	0.444
1988	0.542	0.542
1989	0.611	0.611
1990	0.579	0.579
1991	0.610	0.610
1992	0.579	0.579
1993	0.693	0.693
1994	0.478	0.478
1995	0.589	0.589
1996	0.805	0.805
1997	1.019	1.019
1998	1.075	1.075
1999	0.477	0.477
2000	0.345	0.345
2001	0.323	0.323
2002	0.693	0.693
2003	0.518	0.518
2004	0.520	0.520
2005	0.596	0.596
2006	0.580	0.580
2007	0.514	0.514
2008	1.001	1.001

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	1.2439	1.2439
2	1.0816	1.0816
3	1.0749	1.0749
4	1.0186	1.0186

5	1.0011	1.0011
6	0.9178	0.9178
7	0.8045	0.8045
8	0.7793	0.7793
9	0.7619	0.7619
10	0.7241	0.7241
11	0.7179	0.7179
12	0.7124	0.7124
13	0.6935	0.6935
14	0.6927	0.6927
15	0.6851	0.6851
16	0.6812	0.6812
17	0.6545	0.6545
18	0.6466	0.6466
19	0.6442	0.6442
20	0.6123	0.6123
21	0.6111	0.6111
22	0.6101	0.6101
23	0.5959	0.5959
24	0.5924	0.5924
25	0.5892	0.5892
26	0.5876	0.5876
27	0.5797	0.5797
28	0.5787	0.5787
29	0.5786	0.5786
30	0.5607	0.5607
31	0.5604	0.5604
32	0.5581	0.5581
33	0.5492	0.5492
34	0.5415	0.5415
35	0.5414	0.5414
36	0.5374	0.5374
37	0.5337	0.5337
38	0.5201	0.5201
39	0.5200	0.5200
40	0.5184	0.5184
41	0.5144	0.5144
42	0.5005	0.5005
43	0.4907	0.4907
44	0.4833	0.4833
45	0.4781	0.4781
46	0.4771	0.4771
47	0.4696	0.4696
48	0.4669	0.4669
49	0.4667	0.4667
50	0.4597	0.4597
51	0.4553	0.4553
52	0.4517	0.4517
53	0.4439	0.4439
54	0.4367	0.4367
55	0.4251	0.4251
56	0.3951	0.3951
57	0.3742	0.3742
58	0.3454	0.3454
59	0.3232	0.3232
60	0.2887	0.2887

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.2844	1293	1293	100	Pass
0.2926	1194	1194	100	Pass
0.3008	1088	1088	100	Pass
0.3091	977	977	100	Pass
0.3173	891	891	100	Pass
0.3255	805	805	100	Pass
0.3337	738	738	100	Pass
0.3419	682	682	100	Pass
0.3501	612	612	100	Pass
0.3583	573	573	100	Pass
0.3665	528	528	100	Pass
0.3747	489	489	100	Pass
0.3830	456	456	100	Pass
0.3912	414	414	100	Pass
0.3994	379	379	100	Pass
0.4076	360	360	100	Pass
0.4158	330	330	100	Pass
0.4240	304	304	100	Pass
0.4322	276	276	100	Pass
0.4404	248	248	100	Pass
0.4486	231	231	100	Pass
0.4569	214	214	100	Pass
0.4651	193	193	100	Pass
0.4733	179	179	100	Pass
0.4815	165	165	100	Pass
0.4897	154	154	100	Pass
0.4979	143	143	100	Pass
0.5061	130	130	100	Pass
0.5143	121	121	100	Pass
0.5225	114	114	100	Pass
0.5308	106	106	100	Pass
0.5390	101	101	100	Pass
0.5472	90	90	100	Pass
0.5554	86	86	100	Pass
0.5636	77	77	100	Pass
0.5718	76	76	100	Pass
0.5800	71	71	100	Pass
0.5882	64	64	100	Pass
0.5964	61	61	100	Pass
0.6047	60	60	100	Pass
0.6129	57	57	100	Pass
0.6211	53	53	100	Pass
0.6293	51	51	100	Pass
0.6375	48	48	100	Pass
0.6457	44	44	100	Pass
0.6539	42	42	100	Pass
0.6621	38	38	100	Pass
0.6703	37	37	100	Pass
0.6786	34	34	100	Pass
0.6868	30	30	100	Pass
0.6950	28	28	100	Pass
0.7032	27	27	100	Pass
0.7114	27	27	100	Pass

0.7196	25	25	100	Pass
0.7278	23	23	100	Pass
0.7360	22	22	100	Pass
0.7442	22	22	100	Pass
0.7525	21	21	100	Pass
0.7607	21	21	100	Pass
0.7689	18	18	100	Pass
0.7771	18	18	100	Pass
0.7853	15	15	100	Pass
0.7935	14	14	100	Pass
0.8017	14	14	100	Pass
0.8099	12	12	100	Pass
0.8181	11	11	100	Pass
0.8264	11	11	100	Pass
0.8346	11	11	100	Pass
0.8428	11	11	100	Pass
0.8510	11	11	100	Pass
0.8592	11	11	100	Pass
0.8674	11	11	100	Pass
0.8756	11	11	100	Pass
0.8838	11	11	100	Pass
0.8920	11	11	100	Pass
0.9002	11	11	100	Pass
0.9085	11	11	100	Pass
0.9167	11	11	100	Pass
0.9249	10	10	100	Pass
0.9331	9	9	100	Pass
0.9413	9	9	100	Pass
0.9495	8	8	100	Pass
0.9577	7	7	100	Pass
0.9659	7	7	100	Pass
0.9741	7	7	100	Pass
0.9824	7	7	100	Pass
0.9906	7	7	100	Pass
0.9988	7	7	100	Pass
1.0070	6	6	100	Pass
1.0152	6	6	100	Pass
1.0234	5	5	100	Pass
1.0316	5	5	100	Pass
1.0398	5	5	100	Pass
1.0480	5	5	100	Pass
1.0563	5	5	100	Pass
1.0645	5	5	100	Pass
1.0727	5	5	100	Pass
1.0809	4	4	100	Pass
1.0891	3	3	100	Pass
1.0973	3	3	100	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.1553 acre-feet
On-line facility target flow:	0.2195 cfs.
Adjusted for 15 min:	0.2195 cfs.
Off-line facility target flow:	0.1213 cfs.
Adjusted for 15 min:	0.1213 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

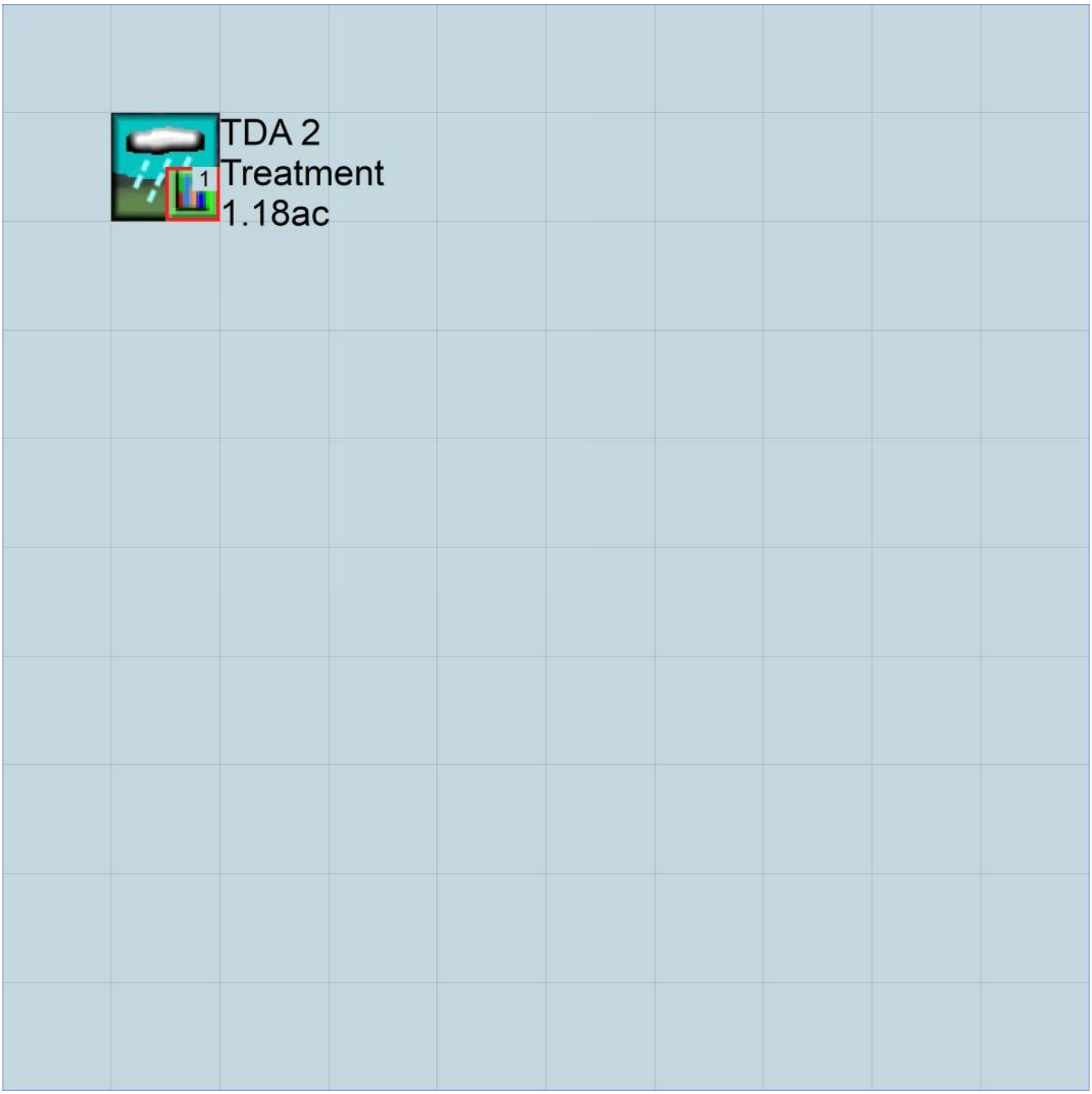
No PERLND changes have been made.

IMPLND Changes

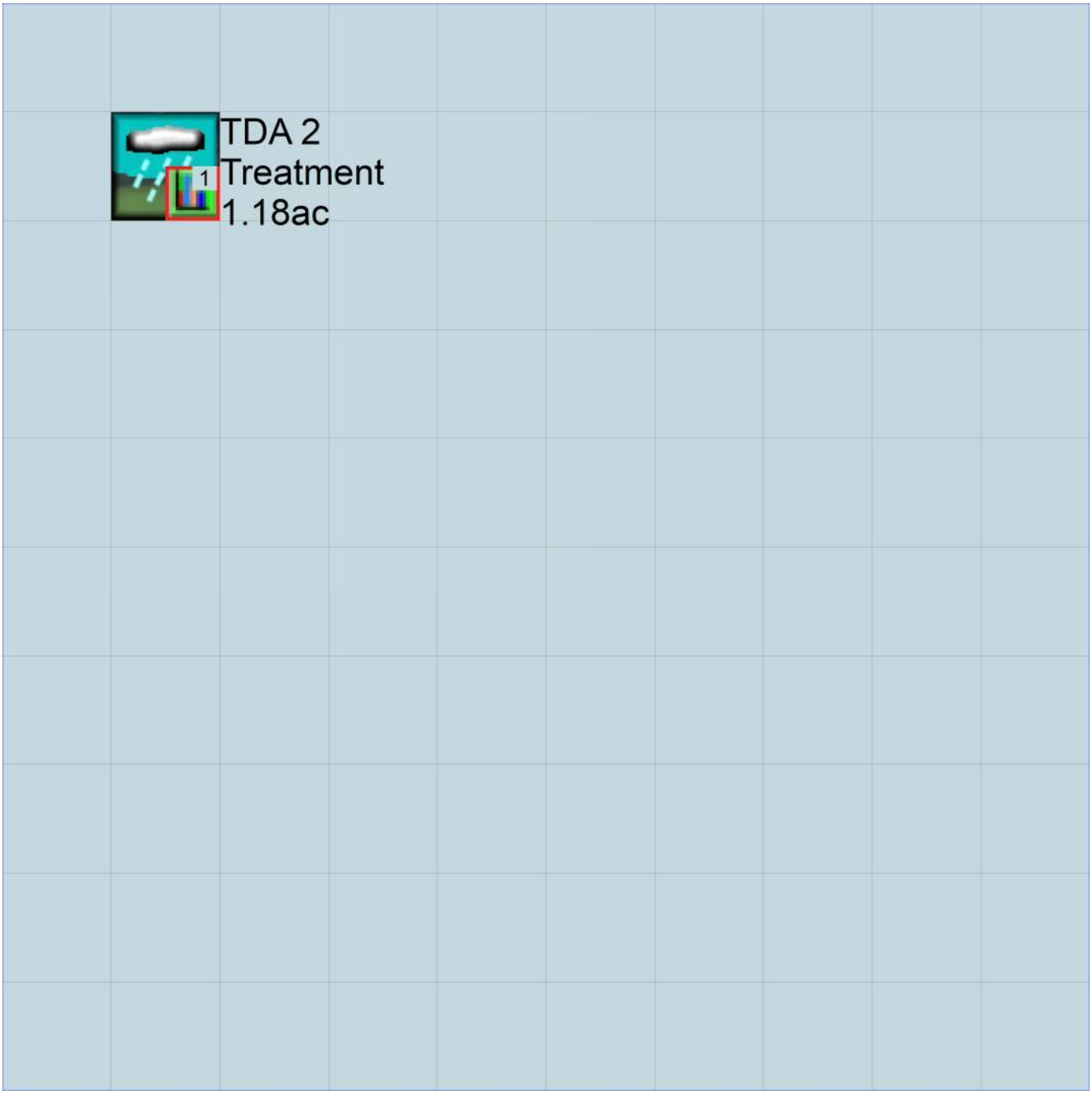
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                               ***
WDM        26   13thPrelimTreatmentAnalysis.wdm
MESSU      25   Pre13thPrelimTreatmentAnalysis.MES
           27   Pre13thPrelimTreatmentAnalysis.L61
           28   Pre13thPrelimTreatmentAnalysis.L62
           30   POC13thPrelimTreatmentAnalysis1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      34
      IMPLND       1
      IMPLND       4
      IMPLND       8
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        TDA 2 Treatment             MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                           in  out           ***
   34     SG4, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   34         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
  34         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
  34         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
  34             0         6      0.02       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
  34             0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
  34           0.1       0.2      0.25         2       0.4      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
  34             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out            ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    8         0    0    0    0    0
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
TDA 2 Treatment***
PERLND  34                      0.2916     COPY   501     12
PERLND  34                      0.2916     COPY   501     13
IMPLND   1                      0.6565     COPY   501     15
IMPLND   4                      0.1781     COPY   501     15
IMPLND   8                      0.0572     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<-----------------><---> User T-series  Engl Metr LKFG            ***
                                        in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                               ***
WDM        26   13thPrelimTreatmentAnalysis.wdm
MESSU      25   Mit13thPrelimTreatmentAnalysis.MES
           27   Mit13thPrelimTreatmentAnalysis.L61
           28   Mit13thPrelimTreatmentAnalysis.L62
           30   POC13thPrelimTreatmentAnalysis1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      34
      IMPLND       1
      IMPLND       4
      IMPLND       8
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        TDA 2 Treatment             MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                           in  out           ***
   34     SG4, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   34         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
   34         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   34         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   34             0         6      0.02       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   34             0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   34           0.1       0.2      0.25         2       0.4      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   34             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out            ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    8         0    0    0    0    0
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
TDA 2 Treatment***
PERLND  34                      0.2916     COPY   501     12
PERLND  34                      0.2916     COPY   501     13
IMPLND   1                      0.6565     COPY   501     15
IMPLND   4                      0.1781     COPY   501     15
IMPLND   8                      0.0572     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<-----------------><---> User T-series  Engl Metr LKFG            ***
                                        in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><-------><-------><-------><-------><-------><------->             ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

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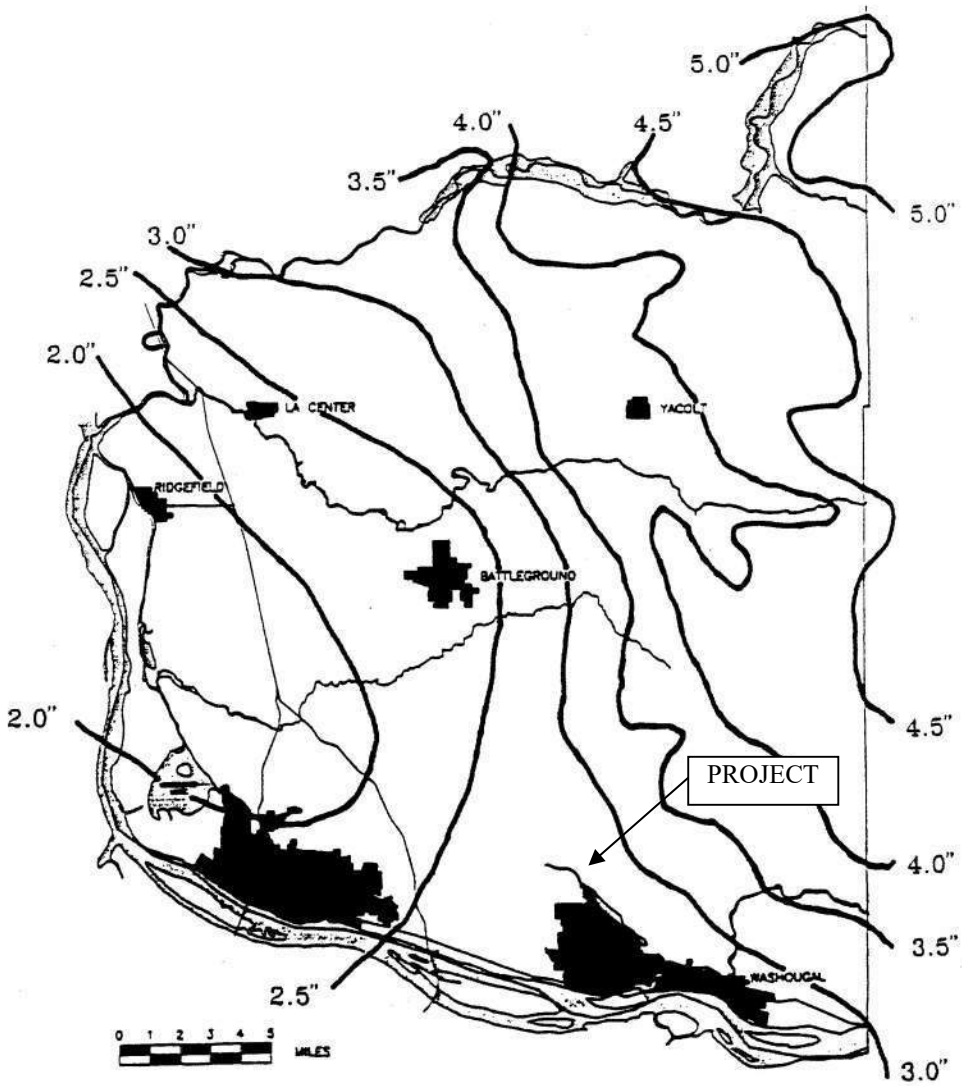
SEPARATOR SHEET

PLS ENGINEERING

Exhibit C

Isopluvial Maps for Design Storms in Clark County

2-Year, 24-Hour Isopluvials



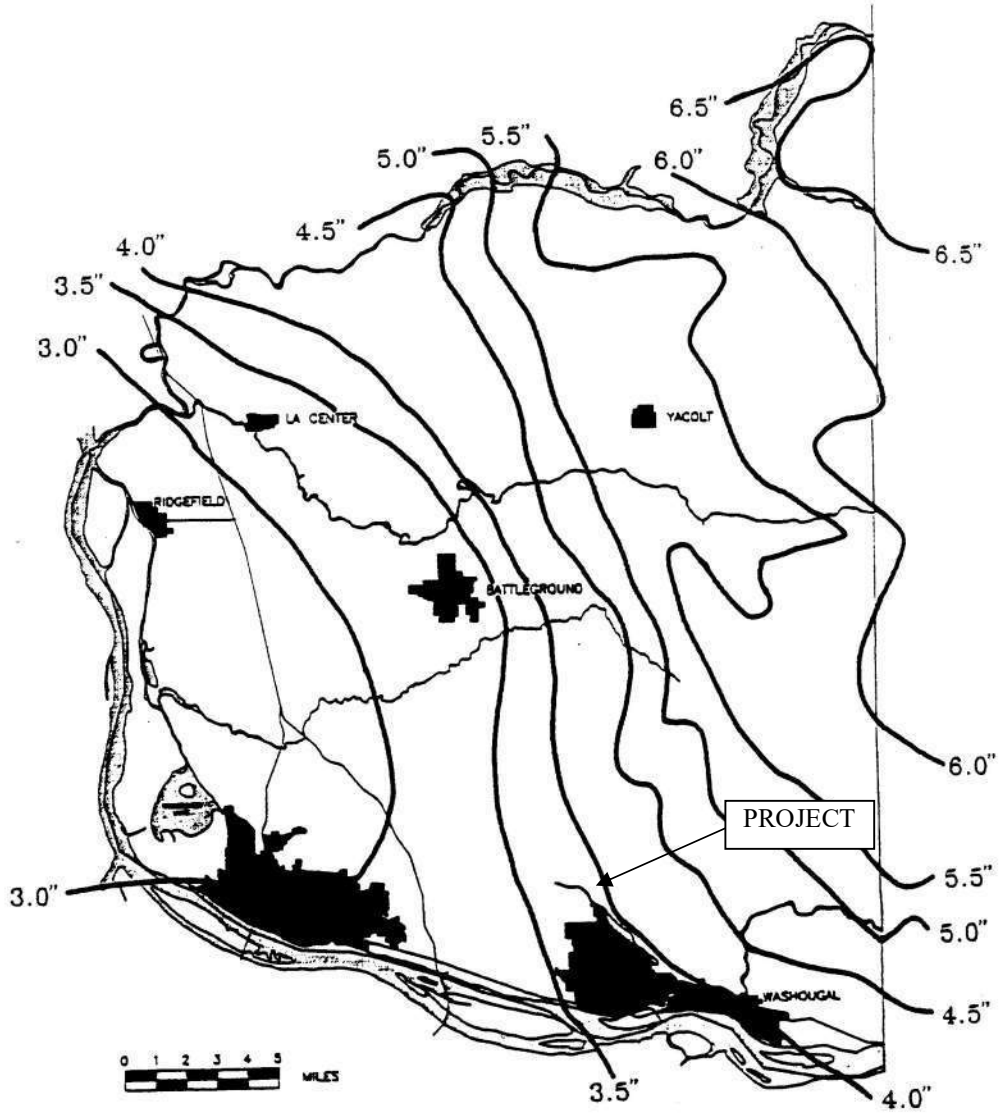
Page 1

P=2.9"

PLS ENGINEERING

Exhibit C
Isopluvial Maps for Design Storms in Clark County

10-Year, 24-Hour Isopluvials



Page 2

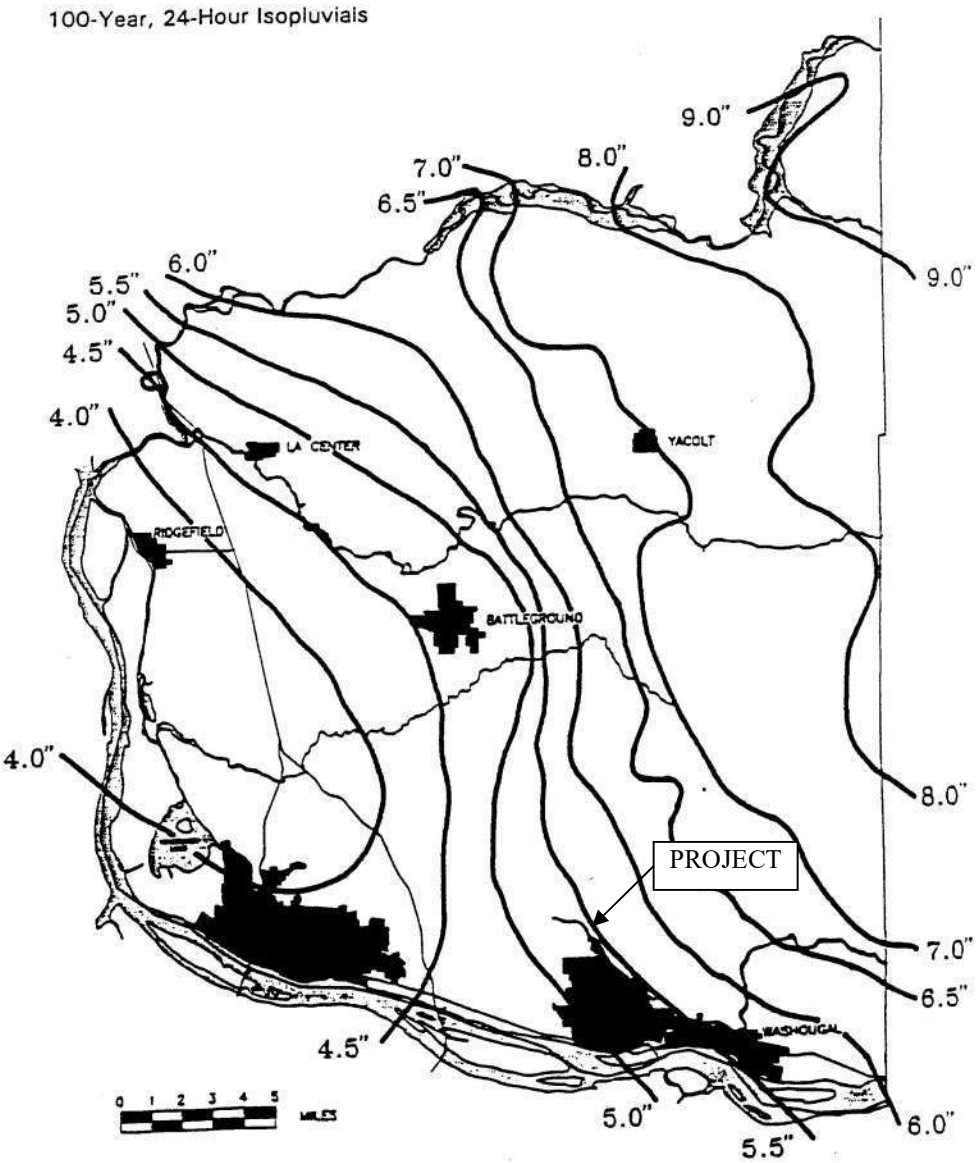
P=4.0"

PLS ENGINEERING

Exhibit C

Isopluvial Maps for Design Storms in Clark County

100-Year, 24-Hour Isopluvials



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SEPARATOR SHEET

WASHINGTON STATE DEPARTMENT OF ECOLOGY

April 2017

GENERAL USE LEVEL DESIGNATION FOR BASIC (TSS) TREATMENT

For

CONTECH Engineered Solutions
Stormwater Management StormFilter®
With ZPG Media at 1 gpm/sq ft media surface area

Ecology's Decision:

Based on the CONTECH Engineered Solutions' (CONTECH) application submissions, Ecology hereby issues a General Use Level Designation (GULD) for the Stormwater Management StormFilter® (StormFilter):

1. **As a basic stormwater treatment practice for total suspended solids (TSS) removal,**
   - **Using ZPG™ media (zeolite/perlite/granular activated carbon), with the size distribution described below,**
   - **Sized at a hydraulic loading rate of 1 gpm/ft^2 of media surface area, per Table 1, and**
   - **Internal bypassing needs to be consistent with the design guidelines in CONTECH's current product design manual.**

Table 1. StormFilter Design Flow Rates per Cartridge

Effective Cartridge Height (inches)	12	18	27
Cartridge Flow Rate (gpm/cartridge)	5	7.5	11.3

2. **Ecology approves StormFilter systems containing ZPG™ media for treatment at the hydraulic loading rates shown in Table 1, and sized based on the water quality design flow rate for an off-line system when using an external bypass vault or a treatment vault with an internal bypass. Contech designs their StormFilter systems to maintain treatment of the water quality design flow while routing excess flows around the treatment chamber during periods of peak bypass. The water quality design flow rates are calculated using the following procedures:**
   - **Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.**

- **Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.**
- **Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.**

3. **This designation has no expiration date, but Ecology may amend or revoke it.**

<u>Ecology's Conditions of Use</u>:

The StormFilter with ZPG media shall comply with the following conditions:

1. **Design, install, operate, and maintain the StormFilter with ZPG media in accordance with applicable Contech Engineered Solutions manuals, documents, and the Ecology Decision.**

2. **Install StormFilter systems to bypass flows exceeding the water quality treatment rate. Additionally, high flows will not re-suspend captured sediments. Design StormFilter systems in accordance with the performance goals in Ecology's most recent Stormwater Manual and CONTECH's *Product Design Manual Version 4.1 (April 2006)*, or most current version, unless otherwise specified.**

3. **Owners must follow the design, pretreatment, land use application, and maintenance criteria in CONTECH's Design Manual.**

4. **Pretreatment of TSS and oil and grease may be necessary, and designers shall provide pre-treatment in accordance with the most current versions of the CONTECH's *Product Design Manual (April 2006)* or the applicable Ecology Stormwater Manual. Design pre-treatment using the performance criteria and pretreatment practices provided on Ecology's "Evaluation of Emerging Stormwater Treatment Technologies" website.**

5. **Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of manufactured filter treatment device.**

   - **Typically, CONTECH designs StormFilter systems for a target filter media replacement interval of 12 months. Maintenance includes removing accumulated sediment from the vault, and replacing spent cartridges with recharged cartridges.**

- **Indications of the need for maintenance include effluent flow decreasing to below the design flow rate, as indicated by the scumline above the shoulder of the cartridge.**
- **Owners/operators must inspect StormFilter with ZPG media for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.**
- **Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.**
- **When inspections are performed, the following findings typically serve as maintenance triggers:**
  - **Accumulated vault sediment depths exceed an average of 2 inches, or**
  - **Accumulated sediment depths on the tops of the cartridges exceed an average of 0.5 inches, or**
  - **Standing water remains in the vault between rain events, or**
  - **Bypass occurs during storms smaller than the design storm.**
- **Note: If excessive floatables (trash and debris) are present, perform a minor maintenance consisting of gross solids removal, not cartridge replacement.**

6. **CONTECH shall maintain readily available reports listed under "Application Documents" (above) as public, as well as the documentation submitted with its previous conditional use designation application. CONTECH shall provide links to this information from its corporate website, and make this information available upon request, at no cost and in a timely manner.**

7. **ZPG™ media used shall conform with the following specifications:**

- **Each cartridge contains a total of approximately 2.6 cubic feet of media. The ZPG™ cartridge consists of an outer layer of perlite that is approximately 1.3 cubic feet in volume and an inner layer, consisting of a mixture of 90% zeolite and 10% granular activated carbon, which is approximately 1.3 cubic feet in volume.**

- **Perlite Media: Perlite media shall be made of natural siliceous volcanic rock free of any debris or foreign matter. The expanded perlite shall**

have a bulk density ranging from 6.5 to 8.5 lbs per cubic foot and particle sizes ranging from 0.09" (#8 mesh) to 0.38" (3/8" mesh).

- **Zeolite Media: Zeolite media shall be made of naturally occurring clinoptilolite. The zeolite media shall have a bulk density ranging from 44 to 50 lbs per cubic foot and particle sizes ranging from 0.13" (#6 mesh) to 0.19" (#4 mesh). Additionally, the cation exchange capacity (CEC) of zeolite shall range from approximately 1.0 to 2.2 meq/g.**

- **Granular Activated Carbon: Granular activated carbon (GAC) shall be made of lignite coal that has been steam-activated. The GAC media shall have a bulk density ranging from 28 to 31 lbs per cubic foot and particle sizes ranging from a 0.09" (#8 mesh) to 0.19" (#4 mesh).**

<u>Approved Alternate Configurations</u>

Peak Diversion StormFilter

1. The Peak Diversion StormFilter allows for off-line bypass within the StormFilter structure. Design capture flows and peak flows enter the inlet bay which contains an internal weir. The internal weir allows design flows to enter the cartridge bay through a transfer hole located at the bottom of the inlet bay while the unit routs higher flows around the cartridge bay.
2. To select the size of the Peak Diversion StormFilter unit, the designer must determine the number of cartridges required and size of the standard StormFilter using the site-specific water quality design flow and the **StormFilter Design Flow Rates per Cartridge** as described above.
3. New owners may not install the Peak Diversion StormFilter at an elevation or in a location where backwatering may occur.

Applicant: Contech Engineered Solutions

Applicant's Address: 11835 NE Glenn Widing Dr.
Portland, OR 97220

Application Documents:

The applicant's master report, titled, "The Stormwater Management StormFilter Basic Treatment Application for General Use Level Designation in Washington", Stormwater Management, Inc., November 1, 2004, includes the following reports:

- (Public) *Evaluation of the Stormwater Management StormFilter Treatment System: Data Validation Report and Summary of the Technical Evaluation Engineering Report (TEER) by Stormwater Management Inc.*, October 29, 2004 Ecology's technology assessment protocol requires the applicant to hire an independent consultant to complete the following work:

1. Complete the data validation report.
2. Prepare a TEER summary, including a testing summary and conclusions compared with the supplier's performance claims.
3. Provide a recommendation of the appropriate technology use level.
4. Work with Ecology to post recommend relevant information on Ecology's website.
5. Provide additional testing recommendations, if needed."
6. This report, authored by Dr. Gary Minton, Ph. D., P.E., Resource Planning Associates, satisfies the Ecology requirement.

- (Public) "Performance of the Stormwater Management StormFilter Relative to the Washington State Department of Ecology Performance Goals for Basic Treatment," is a summary of StormFilter performance that strictly adheres to the criteria listed in the Guidance for Evaluating Emerging Stormwater Treatment Technologies, Technology Assessment Protocol – Ecology (TAPE).
- "Heritage Marketplace Field Evaluation: Stormwater Management StormFilter with ZPG™ Media," is a report showing all of the information collected at Site A as stated in the SMI Quality Assurance Project Plan (QAPP). This document contains detailed information regarding each storm event collected at this site, and it provided a detailed overview of the data and project.
- "Lake Stevens Field Evaluation: Stormwater Management StormFilter with ZPG™ Media," is a report that corresponds to Site E as stated in the SMI QAPP. This document contains detailed information regarding each storm collected at this site, and includes a detailed overview of the data and project.
- (Public) "Evaluation of the Stormwater Management StormFilter for the removal of SIL-CO-SIL 106, a standardized silica product: ZPG™ at 7.5 GPM" is a report that describes laboratory testing at full design flow.
- "Factors Other Than Treatment Performance."
- "State of Washington Installations."
- "Peak Diversion StormFilter" is a technical document demonstrating the Peak Diversion StormFilter system complies with the Stormwater Management Manual for Western Washington Volume V Section 4.5.1.

Above-listed documents noted as "public" are available by contacting CONTECH.

Applicant's Use Level Request:

That Ecology grant a General Use Level Designation for Basic Treatment for the StormFilter using ZPG™ media (zeolite/perlite/granular activated carbon) at a hydraulic loading rate of 1 gpm/ft^2 of media surface area in accordance with Ecology's 2011 *Technical Guidance Manual for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE).*

Applicant's Performance Claim:

The combined data from the two field sites reported in the TER (Heritage Marketplace and Lake Stevens) indicate that the performance of a StormFilter system configured for inline bypass with ZPG™ media and a hydraulic loading rate of 1 gpm/ft^2 of media surface area meets Ecology performance goals for Basic Treatment.

Ecology's Recommendations:

Based on the weight of the evidence and using its best professional judgment, Ecology finds that:

- StormFilter, using ZPG™ media and operating at a hydraulic loading rate of no more than 1 gpm/ft^2 of media surface area, is expected to provide effective stormwater treatment achieving Ecology's Basic Treatment (TSS removal) performance goals. Contech demonstrated this is through field and laboratory testing performed in accordance with the approved protocol. StormFilter is deemed satisfactory with respect to factors other than treatment performance (e.g., maintenance; see the protocol's Appendix B for complete list).

Findings of Fact:

- Influent TSS concentrations and particle size distributions were generally within the range of what Ecology considers "typical" for western Washington (silt-to-silt loam).
- Contech sampled thirty-two (32) storm events at two sites for storms from April 2003 to March 2004, of which Contech deemed twenty-two (22) as "qualified" and were therefore included in the data analysis set.
- Statistical analysis of these 22 storm events verifies the data set's adequacy.
- Analyzing all 22 qualifying events, the average influent and effluent concentrations and aggregate pollutant load reduction are 114 mg/L, 25 mg/L, and 82%, respectively.
- Analyzing all 22 qualifying events based on the *estimated average* flow rate during the event (versus the *measured peak* flow rate), and more heavily weighting those events near the design rate (versus events either far above or well below the design rate) does not significantly affect the reported results.
- For the 7 qualifying events with influent TSS concentrations greater than 100 mg/L, the average influent and effluent concentrations and aggregate pollutant load reduction are 241 mg/L, 34 mg/L, and 89%, respectively. If we exclude the 2 of 7 events that exceed the maximum 300 mg/L specified in Ecology's guidelines, the average influent and effluent concentrations and aggregate pollutant load reduction are 158 mg/L, 35 mg/L, and 78%, respectively.
- For the 15 qualifying events with influent TSS concentrations less than 100 mg/L, the average influent and effluent concentrations and aggregate pollutant load reduction are 55 mg/L, 20 mg/L, and 61%, respectively. If the 6 of 15 events that fall below the minimum 33 mg/L TSS specified in Ecology's guidelines are excluded, the average

influent and effluent concentrations and aggregate pollutant load reduction are 78 mg/L, 26 mg/L, and 67%, respectively.

- For the 8 qualifying events with peak discharge exceeding design flow (ranging from 120 to 257% of the design rate), results ranged from 52% to 96% TSS removal, with an average of 72%.
- Due to the characteristics of the hydrographs, the field results generally reflect flows below (ranging between 20 and 60 percent of) the tested facilities' design rate. During these sub-design flow rate periods, some of the cartridges operate at or near their *individual* full design flow rate (generally between 4 and 7.5 GPM for an 18" cartridge effective height) because their float valves have opened. Float valves remain closed on the remaining cartridges, which operate at their base "trickle" rate of 1 to 1.5 GPM.
- Laboratory testing using U.S. Silica's Sil-Co-Sil 106 fine silica product showed an average 87% TSS removal for testing at 7.5 GPM per cartridge (100% design flow rate).
- Other relevant testing at I-5 Lake Union, Greenville Yards (New Jersey), and Ski Run Marina (Lake Tahoe) facilities shows consistent TSS removals in the 75 to 85% range. *Note that the evaluators operated the I-5 Lake Union at 50%, 100%, and 125% of design flow*.
- SMI's application included a satisfactory "Factors other than treatment performance" discussion.

Note: Ecology's 80% TSS removal goal applies to 100 mg/l and greater influent TSS. Below 100 mg/L influent TSS, the goal is 20 mg/L effluent TSS.

Technology Description:

The Stormwater Management StormFilter® (StormFilter), a flow-through stormwater filtration system, improves the quality of stormwater runoff from the urban environment by removing pollutants. The StormFilter can treat runoff from a wide variety of sites including, but not limited to: retail and commercial development, residential streets, urban roadways, freeways, and industrial sites such as shipyards, foundries, etc.

Operation:

The StormFilter is typically comprised of a vault that houses rechargeable, media-filled, filter cartridges. Various media may be used, but this designation covers only the zeolite-perlite-granulated activated carbon (ZPG™) medium. Stormwater from storm drains percolates through these media-filled cartridges, which trap particulates and may remove pollutants such as dissolved metals, nutrients, and hydrocarbons. During the filtering process, the StormFilter system also removes surface scum and floating oil and grease. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharged to an open channel drainage way.

This document includes a bypass schematic for flow rates exceeding the water quality design flow rate on page 8.

StormFilter Configurations:

Contech offers the StormFilter in multiple configurations: precast, high flow, catch basin, curb inlet, linear, volume, corrugated metal pipe, drywell, and CON/Span form. Most configurations use pre-manufactured units to ease the design and installation process. Systems may be either uncovered or covered underground units.

The typical precast StormFilter unit is composed of three sections: the energy dissipater, the filtration bay, and the outlet sump. As Stormwater enters the inlet of the StormFilter vault through the inlet pipe, piping directs stormwater through the energy dissipater into the filtration bay where treatment will take place. Once in the filtration bay, the stormwater ponds and percolates horizontally through the media contained in the StormFilter cartridges. After passing through the media, the treated water in each cartridge collects in the cartridge's center tube from where piping directs it into the outlet sump by a High Flow Conduit under-drain manifold. The treated water in the outlet sump discharges through the single outlet pipe to a collection pipe or to an open channel drainage way. In some applications where you anticipate heavy grit loads, pretreatment by settling may be necessary.

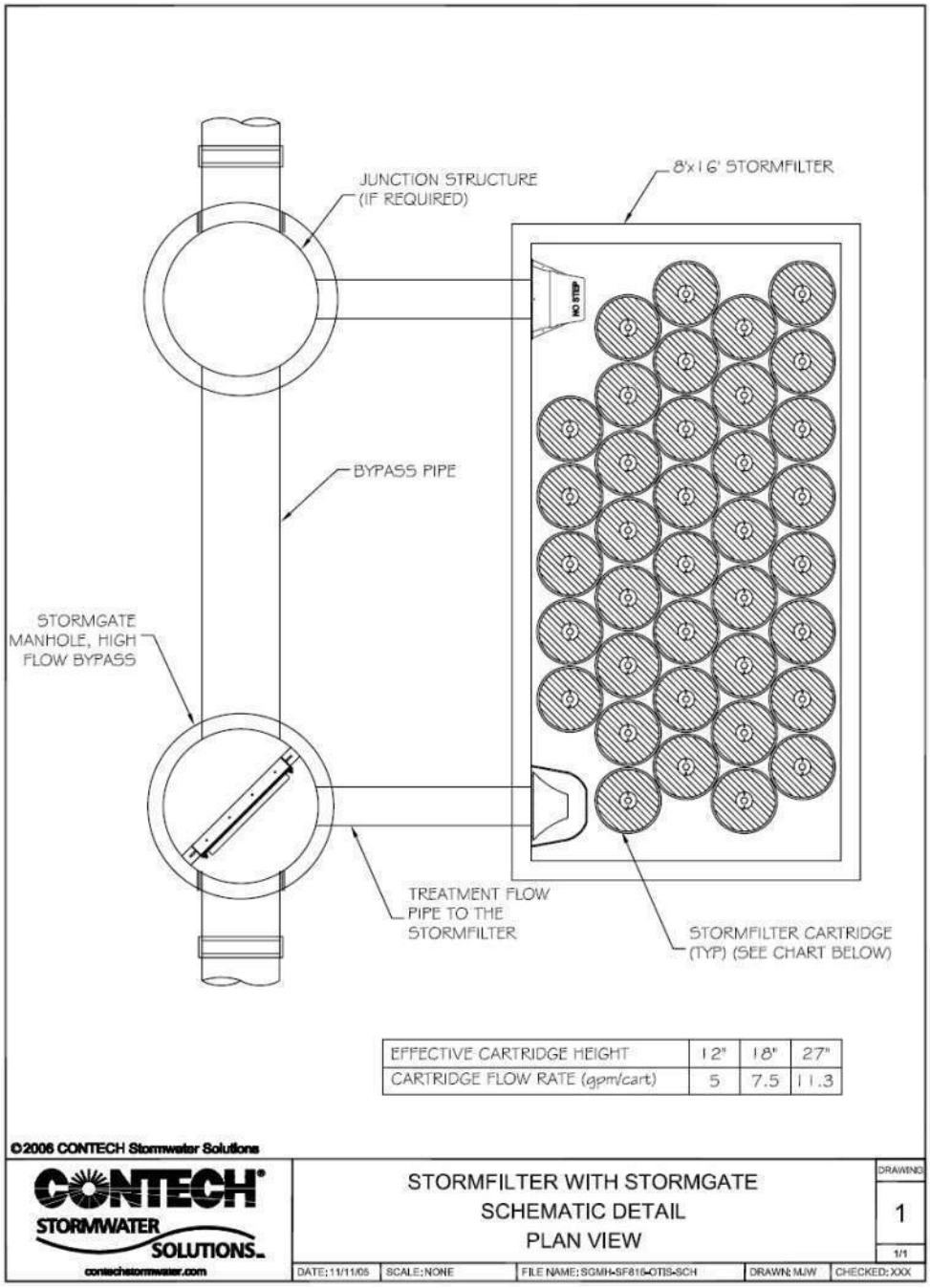

Figure 1. Stormwater Management StormFilter Configuration with Bypass

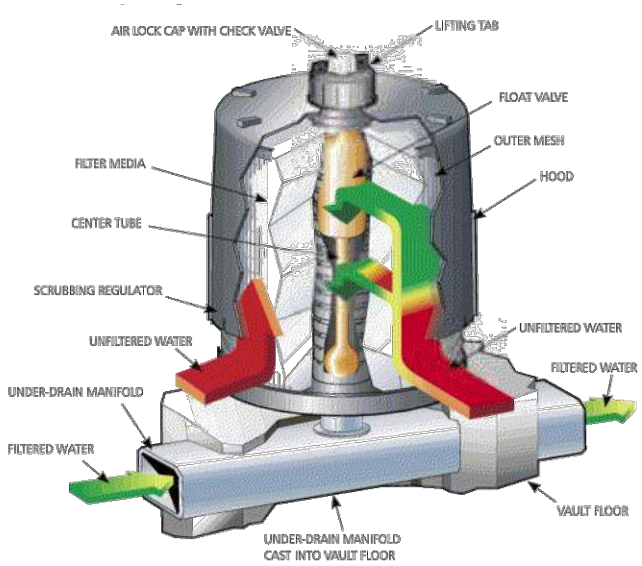

Figure 2. The StormFilter Cartridge

Cartridge Operation:

As the water level in the filtration bay begins to rise, stormwater enters the StormFilter cartridge. Stormwater in the cartridge percolates horizontally through the filter media and passes into the cartridge's center tube, where the float in the cartridge is in a closed (downward) position. As the water level in the filtration bay continues to rise, more water passes through the filter media and into the cartridge's center tube. Water displaces the air in the cartridge and it purges from beneath the filter hood through the one-way check valve located in the cap. Once water fills the center tube there is enough buoyant force on the float to open the float valve and allow the treated water to flow into the under-drain manifold. As the treated water drains, it tries to pull in air behind it. This causes the check valve to close, initiating a siphon that draws polluted water throughout the full surface area and volume of the filter. Thus, water filters through the entire filter cartridge throughout the duration of the storm, regardless of the water surface elevation in the filtration bay. This continues until the water surface elevation drops to the elevation of the scrubbing regulators. At this point, the siphon begins to break and air quickly flows beneath the hood through the scrubbing regulators, causing energetic bubbling between the inner surface of the hood and the outer surface of the filter. This bubbling agitates and cleans the surface of the filter, releasing accumulated sediments on the surface, flushing them from beneath the hood, and allowing them to settle to the vault floor.

Adjustable cartridge flow rate:

Inherent to the design of the StormFilter is the ability to control the individual cartridge flow rate with an orifice-control disc placed at the base of the cartridge. Depending on the treatment requirements and on the pollutant characteristics of the influent stream as

specified in the CONTECH *Product Design Manual*, operators may adjust the flow rate through the filter cartridges. By decreasing the flow rate through the filter cartridges, the influent contact time with the media is increased and the water velocity through the system is decreased, thus increasing both the level of treatment and the solids removal efficiencies of the filters, respectively (de Ridder, 2002).

Recommended research and development:

Ecology encourages CONTECH to pursue continuous improvements to the StormFilter. To that end, CONTECH recommends the following actions:

- Determine, through laboratory testing, the relationship between accumulated solids and flow rate through the cartridge containing the ZPG™ media. **Completed 11/05.**
- Determine the system's capabilities to meet Ecology's enhanced, phosphorus, and oil treatment goals.
- Develop easy-to-implement methods of determining that a StormFilter facility requires maintenance (cleaning and filter replacement).

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Ecology web link: http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html

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Revision History

Date	**Revision**
Jan 2005	Original Use Level Designation
Dec 2007	Revision
May 2012	Maintenance requirements updated
November 2012	Design Storm and Maintenance requirements updated
January 2013	Updated format to match Ecology standard format
September 2014	Added Peak Diversion StormFilter Alternate Configuration
November 2016	Revised Contech contact information
April 2017	Revised sizing language to note sizing based on Off-line calculations

SEPARATOR SHEET

APPENDIX C

Geotechnical Report

GEOTECHNICAL ENGINEERING STUDY

13th Street Gas Station
NE 13th Street & NW Friberg-Strunk Street
Camas, Clark County, Washington
Tax Lot No. (176148000)

Prepared for:
Taz Khan
701 Columbia Street #109
Vancouver, WA 98660

Prepared By:

Donald J. Bruno, CEG
Engineering Geologist

9/31/23

State of Washington
Engineering Geologist
2177
Licensed Geologist

DONALD J. BRUNO

Project No. G26-0723

{August 2023}

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Earth Engineering, Inc.
Geotechnical & Environmental Consultants

Taz Khan
701 Columbia Street #109
Vancouver, Washington 98660

August 31st 2023
G26-0723

Subject: **Geotechnical Engineering Study**
13th Street Gas Station, C-Store & Car Wash
NE 13th Street & NW Friberg-Strunk Street
Camas, Clark County, Washington
(Tax Lot No. 176148000)

Hello Taz,

We are pleased to submit our engineering report for the subject property located in Camas, Washington. This report presents the results of our field exploration, selective laboratory tests, field testing and engineering analyses.

Based on the results of this study, it is our opinion that construction of the proposed commercial structures is feasible from a geotechnical standpoint, provided recommendations presented in this report are included in the project design.

We appreciate the opportunity to have been of service to you and look forward to working with you in the future. Should you have any questions about the content of this report, or if we can be of further assistance, please call.

Respectfully Submitted,
Earth Engineering Inc.,

Donald J. Bruno, CEG
Engineering Geologist

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{G26-0723}

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Exhibit 33 APPEAL24-1001

INTRODUCTION

General

This report presents the results of the geotechnical engineering study completed by Earth Engineering, Inc. for the proposed gas station, convenience store and drive thru car wash located in Camas, Washington. The general location of the site is shown on the *Vicinity Map, Figure 1.* At the time our study was performed, the site and our exploratory locations are approximately as shown on the *Site Plan, Figure 2.*

The purpose of this study was to explore subsurface conditions at the site and based on the conditions encountered provide geotechnical recommendations for the proposed construction. In addition this report includes infiltration testing for stormwater design and a seismic hazard evaluation.

Project Description

Based on the information that was provided to us by the project civil engineer (PLS), it is our understanding the site will be developed with a one story convenience store building that will provide four thousand one-hundred (4100) square feet of floor space, a one thousand one-hundred and eighty nine (1189) square foot drive thru car wash, a fuel pumping island, trash enclosure and an asphalt paved access driveway with vehicle parking spaces. Construction will also include the installation of a stormwater system and subsurface utilities.

Due to the relatively flat topography, it is anticipated that earthwork cuts and fills will be less than two feet to achieve the desired design grade. The convenience store and car wash structures will be constructed with a metal or wood frame and slab on grade floors.

Structural design loads were not available at the time this report was written. However, based on our experience with similar projects, we anticipate that wall and column loads will be approximately seven hundred and fifty (750) to one thousand five hundred (1500) pounds per lineal foot (maximum dead plus live loads). Slab on grade loads will most likely range from one hundred (100) to one hundred and fifty (150) pounds per square foot (psf).

If any of the above information is incorrect or changes, we should be consulted to review the recommendations contained in this report. In any case, it is recommended that Earth Engineering, Inc. perform a general review of the final design for the proposed construction.

SITE CONDITIONS

Surface

The rectangular shaped property encompasses approximately one acre. An existing single family residence was located at the central west area of the property. The adjacent properties to the south and west are moderately to heavily vegetated with single family homes on acreage.
NE 13th Street borders the north side and NW Friberg-Strunk Street.

Exhibit 33 APPEAL24-1001

The property is relatively level and slopes gently downward from the north to the south and southeast with an overall elevation change of approximately five feet and a gradient that is less than two percent (2%). The property has been landscaped with a manicured lawn as well as a variety of trees and flowering bushes.

Subsurface & Soil Classification

For this study, the site was explored by excavating two test pits at the approximate locations shown on the *Site Plan, Figure 2*. Infiltration testing was performed in both test pits. All soil was classified following the Unified Soil Classification System (USCS). A USCS Legend is included as Plate A1. A description of the field exploration methods is included in Appendix A.

In general, in our test pits we encountered very stiff to hard soil consisting of Silt (ML) and lean Clay (CL) to the maximum exploration depth of ten and one half (10.5) feet below the existing ground surface. Please refer to the test pit logs, Plates A-2 thru A-3, for a more detailed description of the conditions encountered.

Groundwater

During the time of our field exploration (August 2023) groundwater was not encountered in any of our test pits. It is important to note that groundwater conditions are not static; fluctuations may be expected in the level and seepage flow depending on the season, amount of, surface water runoff, and other factors. Generally, groundwater levels are higher and the seepage rate is greater in the wetter winter months (typically October through May).

General Regional Geology

General information about geologic conditions and soil in the vicinity of the site was obtained by reviewing the Geologic Map of Washington-Southwest Quadrant, Washington Division of Geology and Earth Resources, (Geologic Map GM-34, 1987). This map provides general information about geologic units in the Camas, Clark County, Washington area.

Our review of existing geological information indicates that soils in the vicinity of the subject site were formed from alluvial deposits during the Quaternary Period. Outburst flood deposits from glacial Lake Missoula deposited these sedimentary soils. The native material encountered in our test pits consists predominantly of Silt.

LABORATORY TESTING

Laboratory tests were conducted on representative soil samples to verify or modify the field soil classification of the units encountered, and to evaluate the general physical properties as well as the engineering characteristics of the soils encountered. The following provides information about the testing procedures performed on representative soil samples and the general condition of subsurface soil conditions encountered:

Exhibit 33 APPEAL24-1001

- *Moisture Content (ASTM-D2216-92)* tests were performed on representative samples. The native Silt has a moisture content that ranges from thirteen to forty three percent (13-43 %). The native lean clay has a moisture content of thirty eight percent (38%)

- In-Situ Soil Density (ASTM-D4564-93) utilizing the sleeve method was performed on representative samples to determine the wet and dry density of native soil. The in-situ density provides a relative indication of soil support characteristics. The average wet density of the native silt is one hundred and ten (110) pounds per cubic foot (pcf). The average dry density of this soil is ninety six (96) pcf.

Laboratory testing confirms that subsurface soil consists predominantly of Silt and lean Clay. These types of soil are sensitive to changes in moisture content. Moisture sensitive soils are discussed in more detail in the *Site Preparation and Grading* section of this report.

The results of laboratory tests performed on specific samples are provided at the appropriate sample depth on the individual test pit logs. However, it is important to note that some variation of subsurface conditions may exist. Our geotechnical recommendations are based on our interpretation of these test results.

SEISMIC HAZARD EVALUATION

The following provides a seismic hazard evaluation for the proposed commercial building and fuel island. Our evaluation is based on subsurface conditions encountered at the site during the time of our geotechnical study and a review of applicable geologic maps (Washington State Department of Natural Resources, Geologic Map of Washington-Southwest Quadrant, 1987) and the International Building Code (IBC-2018) guidelines.

In general, supportive soil at the subject site consists of very stiff to hard Silt. The geologic map indicates that no known active faults are located within one-mile of the subject site. Soils encountered at the site are classified as a type "D" soil in accordance with "Seismic Design Categories" (IBC 2018, Section 1803.5.12).

Liquefaction:

Structures are subject to damage from earthquakes due to direct and indirect action. Shaking represents direct action. Indirect action is represented by foundation failures and is typified by liquefaction. Liquefaction occurs when soil loses all shear strength for short periods of time during an earthquake. Ground shaking of sufficient duration results in the loss of grain to grain contact as well as a rapid increase in pore water pressure. This causes the soil to assume physical properties of a fluid.

To have potential for liquefaction a soil must be loose, cohesion-less (generally sands and silts), below the groundwater table, and must be subjected to sufficient magnitude and duration of ground shaking. The effects of liquefaction may be large total settlement and/or large differential settlement for structures with foundations in or above the liquefied soil. Based on the very stiff to hard soil conditions encountered and the absence of a near surface groundwater table, it is not likely that soil liquefaction would occur at the subject site during a seismic event.

DISCUSSION AND RECOMMENDATIONS

General

Based on the results of our study, it is our opinion the commercial project can be developed as planned provided the geotechnical recommendations contained in this report are incorporated into the final design. The proposed buildings (convenience store & car wash) as well as the fuel island canopy can be supported on conventional shallow spread footings bearing either entirely on competent native soil or compacted structural fill. Supporting the proposed buildings on homogeneous material will significantly decrease the potential for differential settlement across the foundation area.

This report has been prepared for specific application to this project only and in a manner consistent with that level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area for the exclusive use of Taz Khan and their representatives. This report, in its entirety, should be included in the project documents for information to the contractor. No warranty, expressed or implied, is made.

Site Preparation and Grading

The site shall be stripped and cleared of all vegetation, organic matter and any other deleterious material. Stripped material should not be mixed with any soils to be used as fill. Stripped soil could potentially be used for topsoil at landscape areas after removing vegetation and screening out organic matter.

Building and Driveway Areas:

After clearing and grading, the exposed sub-grade at building and pavement areas should be compacted to a dense non-yielding condition with suitable compaction equipment. This phase of earthwork compaction shall be performed prior to the placement of structural fill, at the bottom of all foundation excavations, interior and exterior concrete slabs, as well as the driveway-parking areas, before the placement of base rock.

Structural Fill:

Structural fill is defined as any soil placed under buildings or any other load bearing-areas. Structural fill placed under footings and slab on grade should be placed in thin horizontal lifts not exceeding eight inches and compacted to a minimum ninety-five percent (95%) of its maximum dry density (Modified Proctor ASTM D1557). The fill material should be placed within two to three percent of the optimum moisture content.

Fill under pavements should also be placed in lifts approximately eight inches in thickness, and compacted to a minimum of ninety percent (92%) of its maximum dry density (Modified Proctor ASTM D1598), except for the top twelve (12) inches which should be compacted to ninety-five percent (95%) of the maximum dry density.

Exhibit 33 APPEAL24-1001

We recommend that structural fill consist of a well graded granular material having a maximum size of two inches and no more than five percent (5%) fines passing the #200 sieve, based on the ¾ inch fraction. It is recommended that any structural fill planned for onsite use, be submitted for approval prior to import.

The placement and compaction of structural fill should be observed by a representative from our office to verify that fill has been placed and compacted in accordance with the approved project plans and specifications.

It should be noted that the depth of excavation to competent soil at foundation footings and floor slab areas could be greater or less than anticipated depending on conditions encountered. Our test pits provide general information about subsurface soil and groundwater conditions.

Wet Weather Construction & Moisture Sensitive Soils:

Field observations and laboratory testing indicates that soil encountered at the site consists of moisture sensitive Silt and lean Clay. As such in an exposed condition moisture sensitive soil can become disturbed during normal construction activity, especially when in a wet or saturated condition. Once disturbed, in a wet condition, these soils will be unsuitable for support of foundations, floor slabs and pavements.

Therefore, where soil is exposed and will support new construction, care must be taken not to disturb their condition. If disturbed soil conditions develop, the affected soil must be removed and replaced with structural fill. The depth of removal will be dependent on the depth of disturbance developed during construction. Covering the excavated area with plastic and refraining from excavation activities during rainfall will minimize the disturbance and decrease the potential degradation of supportive soils.

Earthwork grading and foundation construction will be difficult during the wet winter and spring seasons. Based on this condition we suggest that grading and foundation construction be completed during the drier summer and fall seasons.

Foundations

Based on the encountered subsurface soil conditions, preliminary building design criteria, and assuming compliance with the preceding *Site Preparation and Grading* section, the proposed building may be supported on conventional shallow spread footings bearing entirely on six inches of compacted granular structural fill.

Individual spread footings or continuous wall footings providing support for the proposed commercial building and pump island canopy may be designed for a maximum allowable bearing value of two -thousand (2000) pounds per square foot (psf).

Footings for a one level structure should be at least twelve (12) inches in width. Footings for a two-level structure should be a minimum of fifteen (15) inches in width. In either case, all footings should extend to a depth of at least eighteen (18) inches below the lowest adjacent finished sub grade for lateral support and frost heave considerations.

These basic allowable bearing values are for dead plus live loads and may be increased one-third for combined dead, live, wind, and seismic forces. It is estimated that total and differential footing settlements for the relatively light building will be approximately one-half and one-quarter inches, respectively.

Lateral loads can be resisted by friction between the foundation and the supporting sub grade or by passive earth pressure acting on the buried portions of the foundation. For the latter, the foundations must be poured "neat" against the existing soil or back filled with a compacted fill meeting the requirements of structural fill.

- Passive Pressure = 300 pcf equivalent fluid weight
- Coefficient of Friction = 0.40

We recommend that all footing excavations be observed by a representative of Earth Engineering, Inc. prior to placing forms or rebar, to verify that sub grade support conditions are as anticipated in this report, and/or provide modifications in the design as required.

Slab on Grade

The sub-grade for all concrete floor slab areas should be compacted to a dense non-yielding condition prior to the placement of base rock. It is important to note that the existing sub-grade soil may become too wet to re-compact due to weather conditions. If supportive soils become saturated it may be necessary to remove the unsuitable material and replace it with imported granular structural fill.

Interior floor slabs should be provided with a minimum of six inches of compacted granular structural fill after compacting the sub-grade. In areas where moisture is undesirable, a vapor barrier such as a 8-mil plastic membrane should be placed beneath the slab.

Temporary Excavations

The following information is provided solely as a service to our client. Under no circumstances should this information be interpreted to mean that Earth Engineering Inc. is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

In no case should excavation slopes be greater than the limits specified in local, state and federal safety regulations. Based on the information obtained from our field exploration and laboratory testing, the site soils expected to be encountered in excavations, very stiff to hard Silt would be classified as a Type "A" soil by OSHA guidelines.

Therefore, temporary excavations and cuts greater than four feet in height, should be sloped at an inclination no steeper than 3/4H:1V (horizontal:vertical) for type "A" soils. If slopes of this inclination, or flatter, cannot be constructed or if excavations greater than ten feet in depth are required, temporary shoring will be necessary.

Exhibit 33 APPEAL24-1001

Infiltration Testing

During August of 2023, infiltration testing was performed at two locations at four and one half and six feet below the existing ground surface. The approximate location of the infiltration tests are shown on the *Site Plan, Figure 2.*

Infiltration testing was conducted in general accordance with standard engineering practices The Encased Falling Head Test consists of driving a fifteen (15) inch long, six-inch diameter pipe six inches into the exposed ground surface at the bottom of the test pit. The pipe is filled with water as the soil around the bottom and below the pipe is saturated for several hours. The pipe is filled again, and the amount of time required for the water to fall, per inch, for six inches, is recorded. This step is performed a minimum of three times. The test results are averaged and calculated in inches per hour.

Testing yielded infiltration rates that ranged from 0.1 to 0.25 inches per hour. Based on these infiltration rates and the very stiff to hard soil conditions encountered, it is our opinion on-site soil is not conducive to infiltration. Alternative methods will need to be employed for stormwater control.

Site Drainage

The site should be graded so that surface water is directed off the site. Water should not be allowed to stand in any area where buildings or slabs are to be constructed. Loose surfaces should be sealed at the end of each workday by compacting the surface to reduce the potential for moisture infiltration into the soils. Final site grades should allow for drainage away from the building foundation. The ground should be sloped at a gradient of three percent for a distance of at least ten feet away from the buildings.

We recommend that a footing drain be installed around the perimeter of the building just below the invert of the footing with a gradient sufficient to initiate flow. Under no circumstances should the roof down spouts be connected to the footing drain system. We suggest that clean outs be installed at several accessible locations to allow for the periodic maintenance of the footing drain system. Details for the footing drain have been included on *Figure 3, Typical Footing Drain Detail.*

Utility Support and Back Fill

Based on the conditions encountered, the soil to be exposed by utility trenches should provide adequate support for utilities. Utility trench backfill is a concern in reducing the potential for settlement along utility alignments, particularly in pavement areas. It is also important that each section of utility line be adequately supported in the bedding material. The back fill material should be hand tamped to ensure support is provided around the pipe haunches.

Fill should be carefully placed and hand tamped to about twelve inches above the crown of the pipe before any compaction equipment is used. The remainder of the trench back fill should be placed in lifts having a loose thickness of ten inches.

Exhibit 33 APPEAL24-1001

A typical trench backfill section and compaction requirements for load supporting and non-load supporting areas is presented on *Figure 4, Utility Trench Backfill Detail.* Trench back fill may consist of imported granular fill provided the material is approved, placed and compacted near the optimum moisture content.

Imported granular material or on-site soil to be used as backfill should be submitted to our laboratory at least one week prior to construction so that we can provide a laboratory proctor for field density testing. If native soil is planned for use as backfill, additional testing may be required to determine the suitability of the material.

Pavements

The durability of pavements is related in part to the condition of the underlying sub grade. To provide a properly prepared sub grade for pavements, we recommend the sub grade be treated and prepared as described in the *Site Preparation and Grading* section of this report.

It is possible that some localized areas of soft, wet or unstable sub grade may still exist after this process. Before placement of any base rock, the sub grade should be compacted with suitable compaction equipment. Yielding areas that are identified should be excavated to firm material and replaced with compacted one and one quarter inch-minus clean-crushed rock. The following pavement sections are recommended for the proposed pavement areas:

- Entrance Driveway & Truck Turnaround - Four inches of Asphalt Concrete (AC) over ten inches of compacted Crushed Rock Base (CRB), over a geo-grid consisting of Tensar BX 1200 or equivalent.

- Parking Stalls for Automobiles - Three inches of Asphalt Concrete (AC) over eight inches of compacted Crushed Rock Base (CRB) material.

The geo-grid should be placed directly on the sub grade surface of the driveway prior to placement of base rock. Appropriate geo-textiles have been designed to increase the strength of the sub grade and extend pavement life.

Asphaltic Cement (AC) and Crushed Rock Base (CRB) materials should conform to WSDOT specifications. All base rock should be compacted to at least ninety-five percent (95 %) of the ASTM D1557-91 laboratory test standard.

We recommend that a minimum of eight inches of compacted CRB be placed below all exterior slabs. Exterior concrete slabs that are subject to vehicle traffic loads should be at five inches in thickness. It is also suggested that nominal reinforcement such as "6x6-10/10" welded wire mesh be installed, near midpoint, in new exterior concrete slabs and paving.

Exhibit 33 APPEAL24-1001

Additional Services & Earthwork Monitoring

Earth Engineering, Inc. will be available to provide consultation services related to review of the final design to verify that the recommendations within our purview have been properly interpreted and implemented in the approved construction plans and specifications. A representative from our office will be available to attend a pre-construction meeting to discuss and/or clarify all geotechnical issues related to the proposed project.

In addition, it is suggested that our office be retained to provide geotechnical services during construction to observe compliance with the design concepts and project specifications and to allow design changes in the event subsurface conditions differ from those anticipated. Our construction services would include monitoring and documenting the following:

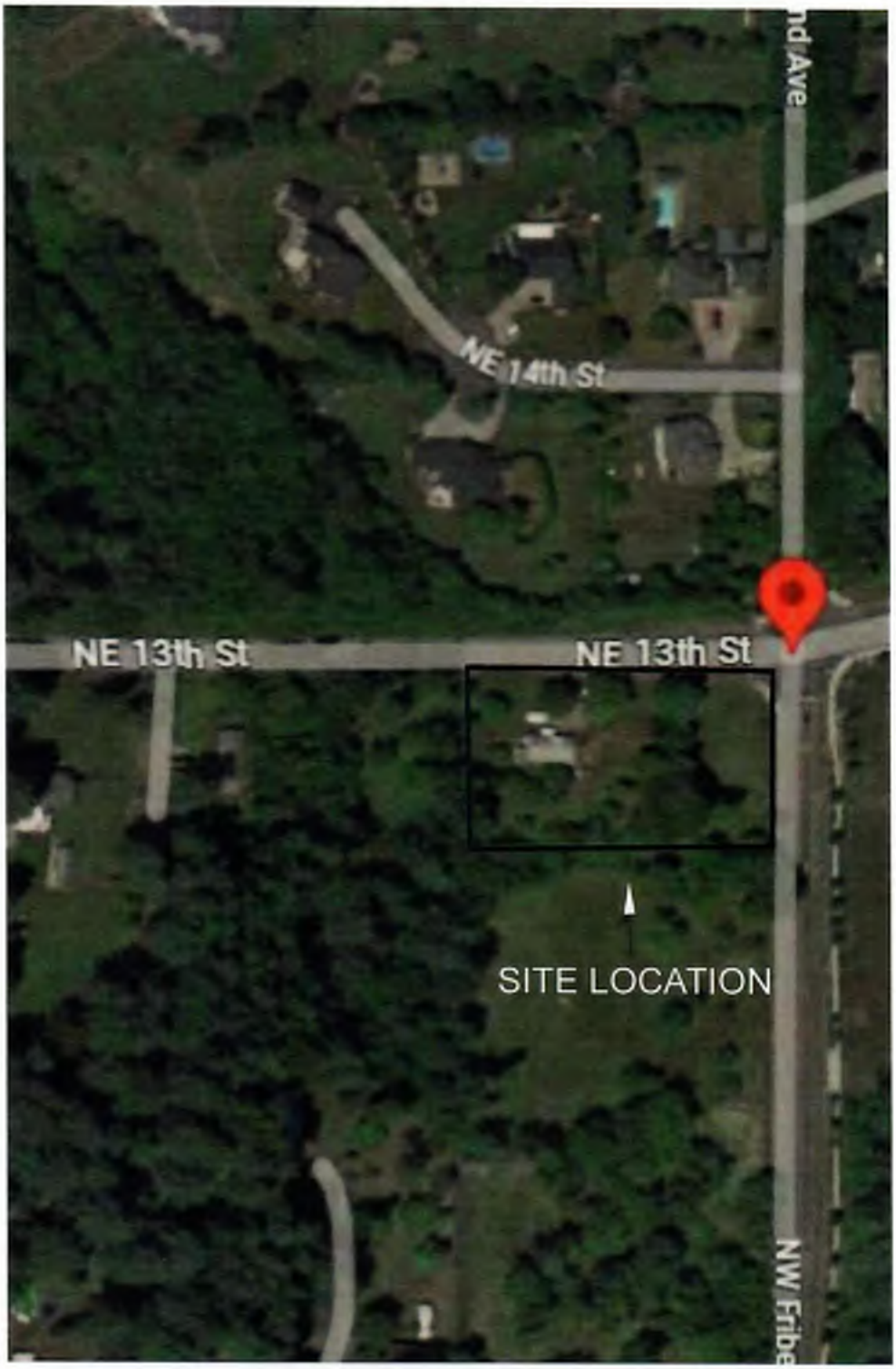
- Verify that site has been adequately stripped of organic materials.
- Observe the condition of exposed bearing soils at the building areas.
- Laboratory proctor tests for structural fill materials.
- Observe compaction and provide density testing of structural fill.
- Observe compaction and provide density testing of utility trench backfill.
- Provide footing inspection at the building & canopy footings to verify soil bearing capacity.
- Verify the installation of all building and site drainage elements.
- Provide density testing of the asphalt driveway and parking areas.

LIMITATIONS

Our recommendations and conclusions are based on the site materials observed, selective laboratory testing, engineering analyses, the design information provided to Earth Engineering, Inc. and our experience as well as engineering judgment. The conclusions and recommendations are professional opinions derived in a manner consistent with that level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area. No warranty is expressed or implied.

The recommendations submitted in this report are based upon the data obtained from the test pits. Soil and groundwater conditions may vary from those encountered. The nature and extent of variations may not become evident until construction. If variations do appear, Earth Engineering, Inc. should be requested to reevaluate the recommendations contained in this report and to modify or verify them in writing prior to proceeding with the proposed construction.

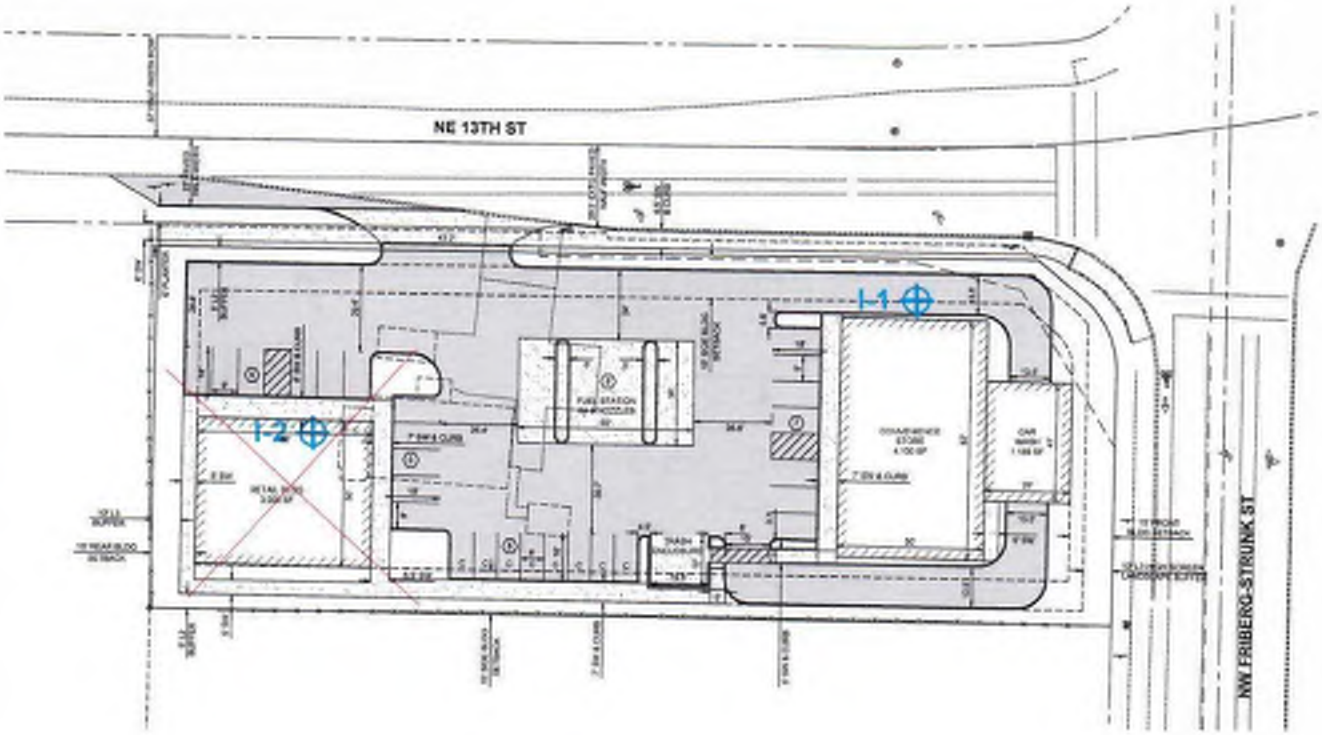
VICINITY MAP



Earth Engineering
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	TAZ KHAN	DRAWN:	EG
PROJECT: 13TH STREET GAS STATION NE 13TH ST & NW FRIBERG-STRUNK ST CAMAS, WA		DATE:	09/2023
		FIGURE:	1
		PRO. #:	G26-072

SITE PLAN

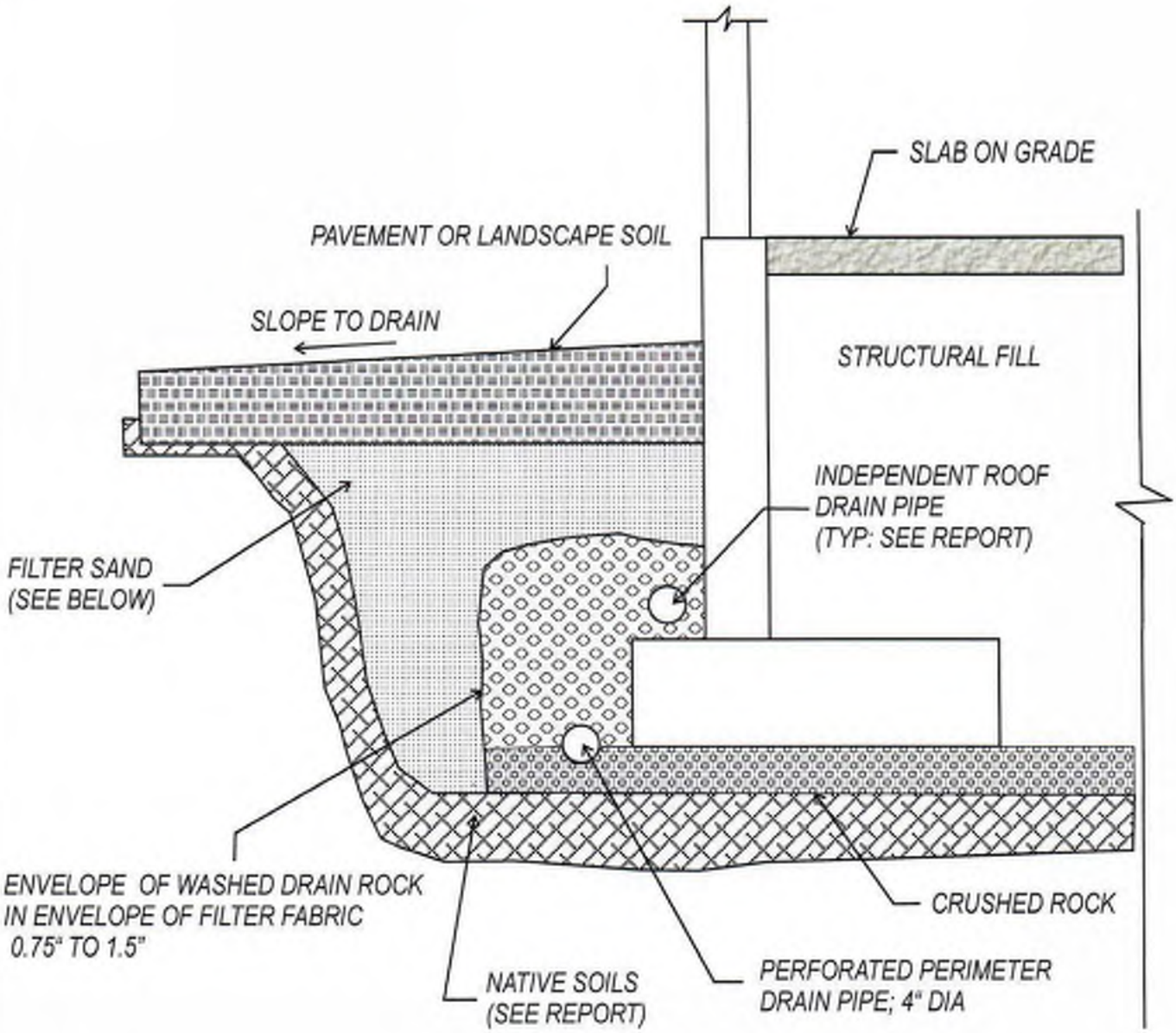


LEGEND

I-1 ⊕ Approximate Infiltration Test Location

NTS

Earth Engineering GEOTECHNICAL & ENVIRONMENTAL SERVICES	CLIENT: TAZ KHAN	DRAWN:	EG
	PROJECT: 13TH STREET GAS STATION NE 13TH ST & NW FRIBERG -STRUNK ST CAMAS, WA	DATE:	09/2023
		FIGURE:	2
		PRO. #:	G26-072



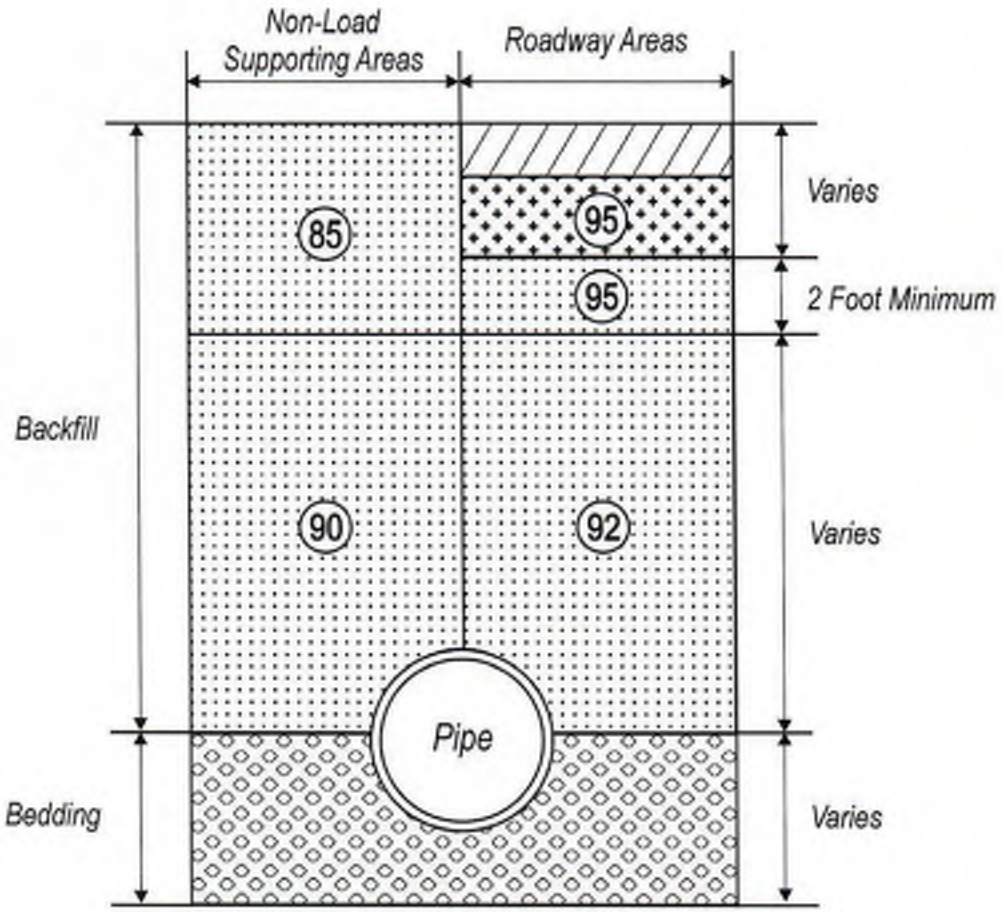
NOTES:

1. FILTER SAND - FINE AGGREGATE FOR PORTLAND CEMENT; SECTION 9=03.1(2)
2. PERFORATED OR SLOTTED RIGID PVC PIPE WITH A POSITIVE DRAINAGE GRADIENT
3. FILTER FABRIC OPTIONAL IF FILTER SAND USED

TYPICAL FOOTING DRAIN DETAIL

Not to Scale

Earth Engineering, Inc. GEOTECHNICAL & ENVIRONMENTAL SERVICES	CLIENT: 13TH STREET GAS STATION	DRAWN:	DB
	PROJECT: COMMERCIAL BUILDING NE 13TH ST. & NW FRIBERG-STRUCK ST. VANCOUVER, WA	DATE:	07/2023
		FIGURE:	3
		PRO. #:	G26-0723



LEGEND

Asphalt or Concrete Pavement

Roadway Base Material or Base Rock

Backfill: Compacted on-site soil or imported select fill material as described in the site preparation of the general Earthwork Section of the attached report text.

92 — Minimum percentage of maximum Laboratory Dry Density as determined by ASTM Test method D1557 (Modified Proctor),unless otherwise specified in the attached report text.

Bedding Material: Material type depends on type of pipe and laying conditions. Bedding should conform to the manufacturer's recommendations for the type of pipe selected.

UTILITY TRENCH BACKFILL DETAIL

Not to Scale

Earth Engineering, Inc. GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS	CLIENT: 13TH ST. GAS STATION	DRAWN:	DB
	PROJECT: COMMERCIAL BUILDING NE 13TH ST. & NW FRIBERG-STRUNK CAMAS, WA	DATE:	07/2023
		FIGURE:	4
		PRO. #:	G26-0723

APPENDIX A

(FIELD EXPLORATION)

FIELD EXPLORATION

Our field exploration was performed on August 4th 2023. Subsurface conditions at the site were explored by excavating two test pits. The test pits were excavated to a maximum depth of ten and one half (10.5) feet below the existing ground surface. The test pits were excavated using a track-hoe.

The test pits were located by pacing from property features. The locations are shown on the Site Plan, Figure 2. Field exploration was monitored by an Earth Engineering, Inc. representative, who classified the soils that we encountered and maintained a log of each test pit, obtained representative samples, and observed pertinent site features. Representative soil samples were placed in closed containers and returned to the laboratory for further examination and testing.

All samples were identified using the Standard Classification of Soils for Engineering Purposes (ASTM D2487-93) in accordance with the Unified Soil Classification System (USCS), which is presented on Plate A-1. The test pit log and boring logs are presented in Appendix A. The final log represents our interpretations of the field logs and the results of the laboratory tests on field samples.

UNIFIED SOIL CLASSIFICATION SYSTEM
LEGEND

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTION
Coarse Grained Soils	Gravel and Gravelly Soils	Clean Gravels (little or no fines)		GW / gw	Well-Graded Gravels, Gravel-Sand Mixtures Little or no Fines
	More Than 50% Coarse Fraction Retained on No 4 Sieve			GP / gp	Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
		Gravels with Fines (appreciable amount of fines)		GM / gm	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC / gc	Clayey Gravels, Gravel-Sand-Clay Mixtures
More Than 50% Material Larger Than No 200 Sieve Size	Sand and Sandy Soils	Clean Sand (little or no fines)		SW / sw	Well-graded Sands, Gravelly Sands Little or no Fines
	More Than 50% Coarse Fraction Passing No 4 Sieve			SP / sp	Poorly-Graded Sands, Gravelly Sands Little or no Fines
		Sands with Fines (appreciable amount of fines)		SM / sm	Silty Sands, Sand-Silt Mixtures
				SC / sc	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils	Silts and Clays	Liquid Limit Less than 50		ML / ml	Inorganic Silts and Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands; Clayey Silts w/ slight Plasticity
				CL / cl	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean
				OL / ol	Organic Silts and Organic Silty Clays of Low Plasticity
More Than 50% Material Smaller Than No 200 Sieve Size	Silts and Clays	Liquid Limit Greater than 50		MH / mh	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soils
				CH / ch	Inorganic Clays of High Plasticity, Fat Clays
				OH / oh	Organic Clays of Medium to High Plasticity, Organic Silts
Highly Organic Soils				PT / pt	Peat, Humus, Swamp Soils with High Organic Contents

Topsoil		Humus and Duff Layer
Fill		Highly Variable Constituents

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CLIENT:	13TH STREET GAS STATION	DRAWN:	DB
PROJECT:	COMMERCIAL BUILDING NE13TH ST. & NW FRIBERG-STRUNK ST. CAMAS, WA	DATE:	07/2023
		PLATE:	A1
		PRO. #:	G26-0723

LOG OF TEST PIT I-1
(Northeast)

ELEVATION: +/- 239 feet
EXPLORATORY EQUIPMENT: TRACK HOE
DATE: 08/04/2023

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
		6" Topsoil						
1	•			Light Brown			14	-
2								
3								
4								
5	•	- Field infiltration rate of 0.25 inches per hour **Silt (ML)** **trace sand**			Damp to Wet	Very Stiff to Hard	18	-
6								
7								
8								
9				Grey Brown				
10	•	(Native)					26	-

Bottom of test pit at 10.5 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	TAZ KHAN	DRAWN:	DB
PROJECT:	13TH ST GAS STATION NE 13TH ST & NW FRIBERG-STRUNK ST CAMAS, WA	DATE:	09/2023
		PLATE:	A-2
		PRO. #:	G26-0723

LOG OF TEST PIT I-2

(Central West)

ELEVATION: **+/- 240 feet**
EXPLORATORY EQUIPMENT: **TRACK HOE**
DATE: **08/04/2023**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1		8" Topsoil						
2	•			Light Brown to Dark Brown	Damp to Sat	Very Stiff to Hard	13	-
3		**Silt (ML)**						
4								
5								
6	•	- Field infiltration rate of 0.1 inches per hour					43	
7		(Native)						
8								
9		**lean Clay (CL)**		Light Brown Grey	Sat	Very Stiff to Hard		
10	•						38	-

Bottom of test pit at 10.0 feet below existing ground surface.
No groundwater encountered.

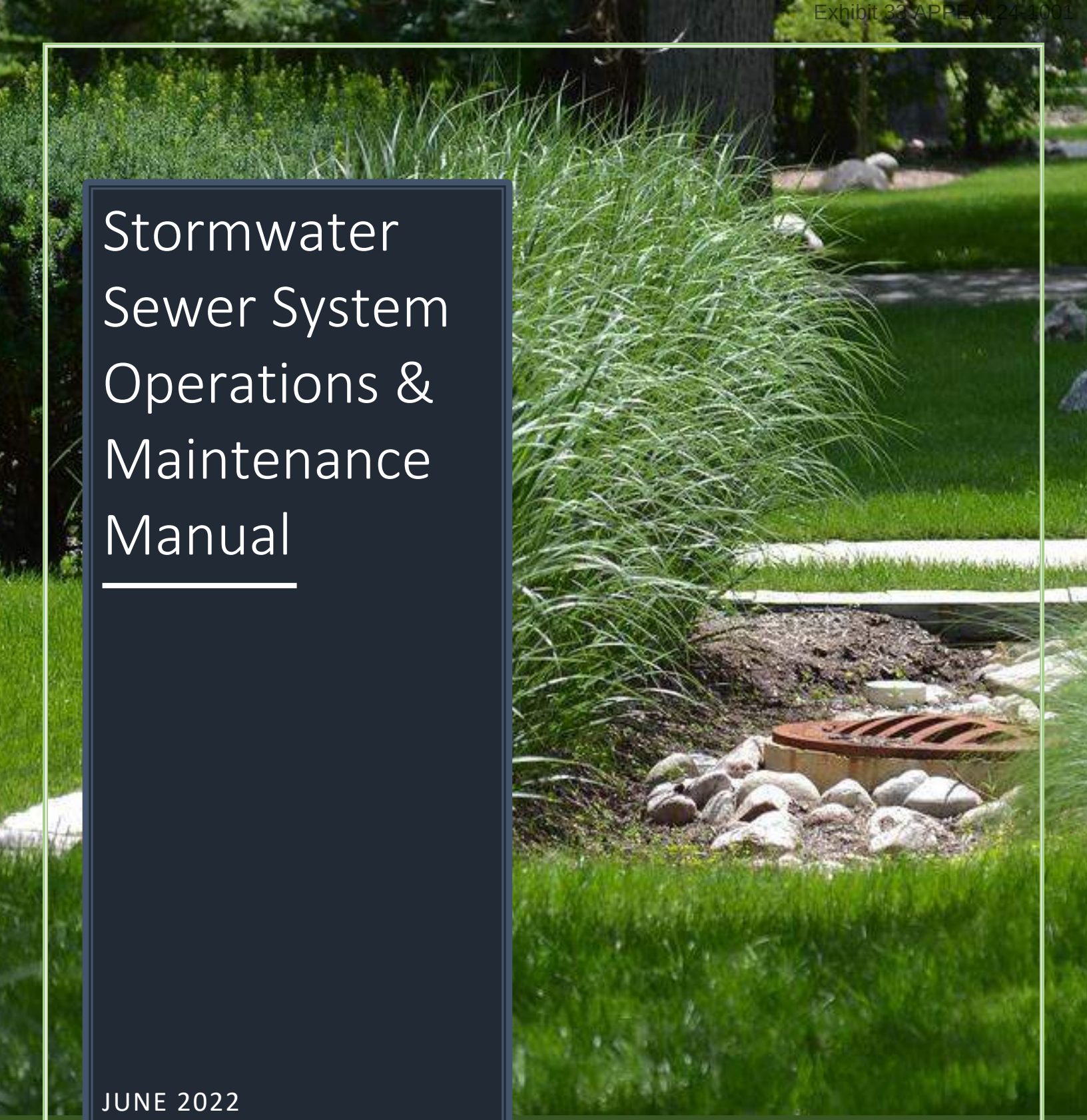
Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	TAZ KHAN	DRAWN:	DB
PROJECT:	13TH ST GAS STATION NE 13TH ST & NW FRIBERG-STRUNK ST CAMAS, WA	DATE:	09/2023
		PLATE:	A-3
		PRO. #:	G26-0723

SEPARATOR SHEET

APPENDIX D

Operations and Maintenance Manual



Stormwater Sewer System Operations & Maintenance Manual

JUNE 2022

City of Camas
Stormwater Division | Public Works

City of Camas WASHINGTON

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Introduction

Background

All public and privately owned, roads, parking lots, residential developments, commercial or industrial developments, or school facilities have various components that make up a storm system. These components consist of conveyance pipes, catch basins, manholes, roadside ditches, stormwater facilities (such as bioswales, detention ponds, wet ponds, treatment filters, etc.), landscaping and any other structure that collects, conveys, controls, and/or treats stormwater. Regardless of the component, all storm systems eventually discharge into 'waters of the state' which are streams, rivers, lakes, and wetlands.

Under the Federal Clean Water Act (FCWA) and in compliance with the Department of Ecology's NPDES Phase II Permit, 'waters of the state' are to be protected from contamination. This in turn protects threatened and endangered species under the Federal Endangered Species Act (FESA).

One way to protect 'waters of the state' is to provide the proper maintenance of all storm system components. It is the responsibility of the City of Camas (City) to ensure that all components of the public storm system be properly maintained and operated. The City is responsible for those components that are located within the City's right-of-way, such as the conveyance pipes, manholes, catch basins, roadside ditches, and stormwater facilities. A large part of the stormwater facilities in the City are privately owned and maintained by the property owners. These property owners include, but are not limited to, Homeowners Associations (HOAs), school district, businesses, and commercial/industrial site owners.

Purpose

This manual is intended to help, both public and private stormwater facility maintenance operators, meet the requirements of City Municipal Code 14.02.090 for proper maintenance and operation of the various storm system components. Proper maintenance will help to assure that:

- Stormwater facilities operate as they were designed;
- Storm systems are cleaned of the pollutants that they trap, such as sediment and oils, so that storm systems are not overwhelmed and become pollutant sources;
- Pollutant sources are removed, or minimized, prior to entering the storm system.

Along with keeping a site from flooding, properly maintained storm system can help reduce surface water and groundwater pollution. Most sites have some type of stormwater control component designed to limit the environmental and flooding damage caused by stormwater runoff. These components require more labor intensive maintenance than a system of pipes and catch basins.

Manual Layout

This manual is broken out into various best management practice (BMP) maintenance components. For each BMP maintenance component, this manual will:

- Briefly describe the component type, e.g. facility or activity.
- Describes potential maintenance issues and/or problems.
- Describes conditions when maintenance is required.
- Minimum performance standards and suggested maintenance methods.

Additional information may be found in other manuals, such as the Washington Department of Ecology's *Stormwater Management Manual for Western Washington (SWMMWW), Vols. V*, and Ecology's LID manual.

Inspection of a stormwater facility will determine if conditions require a maintenance action. The maintenance standard is not the required condition at all times. Exceeding a condition, between inspections and/or maintenance, does not automatically constitute a violation of these standards. The inspection and maintenance schedules should be adjusted to minimize the length of time that a facility is in a condition that requires maintenance.

Emergent Treatment Technologies

Some stormwater treatment facilities are designed and installed with emerging technologies that are not standard at the time of their installation. If not found in this manual, a treatment facility may be an emerging technology approved by Washington Department of Ecology; the maintenance standards can be found at Emerging Stormwater Treatment Technologies.

Mosquito Control

Mosquitoes are annoying and sometimes pose a serious risk to public health. They can transmit diseases such as West Nile Virus and equine encephalitis. Above-ground stormwater facilities should be designed to allow water to flow through or infiltrate in less than 48 hours. Presence of mosquitos in a stormwater facility may indicate a clogged outlet, compromised infiltration capacity, or other defect that should trigger inspection and may require maintenance.

If mosquitos are identified during a stormwater facility maintenance or inspection and are a concern, a request to the Clark County Mosquito Control District for service or information regarding mosquito control can be made online at Mosquito Control District or at the 24-hour request line, 360-397-8430.

Material Disposal and Spills

The disposal of waste, e.g. sediment or standing water, from the maintenance of the stormwater facilities and storm system components shall be conducted in accordance with federal, state, and local regulations, including the Solid Waste Handling Standards chapter 173-350 WAC, Minimum Functional Standards for Solid

Waste Handling chapter 173-304 WAC and Appendix IV-B: Management of Street Waste Solids and Liquids of the SWMMWW. Dangerous waste must be handled following, Dangerous Waste Regulations chapter 173-303 WAC. Vegetation to be recycled and disposed of at local receptacle locations.

For major spills, coordinate removal/cleanup with the City at 360-817-1563 and notify Department of Ecology at 360-407-6300.

Vegetated Facilities

Biofiltration Swale

Biofiltration swales use grass or other dense vegetation to filter sediment and oily materials out of stormwater. Usually, they look like flat-bottomed channels with grass growing in them. As water passes through the vegetation, pollutants are removed through the effects of filtration, infiltration and settling.

See SWMMWW Appendix V-A, Table V-A.8 for biofiltration swale maintenance standards. If available, reference record drawings for seed mix and groundcover replacements, or see SWMMWW BMP T9.10, Tables V-7.3 and V-7.4. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.

Wet Biofiltration Swale

A wet biofiltration swale is a variation of basic biofiltration swale for use where the centerline slope is slight, groundwater table are high, or a continuous low base flow is likely to result in wet soil conditions for long periods of time. Where continuously wet soil exceeds about 2 weeks, typically grasses will die. Thus, vegetation specifically adapted to wet soil conditions is needed. Different vegetation requires modification of several of the design and maintenance requirements from the basic biofiltration swale.

See SWMMWW Appendix V-A, Table V-A.9 for wet biofiltration swale maintenance standards. If available, reference record drawings for seed mix and groundcover replacements, or see SWMMWW BMP T9.20, Table V-7.5. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.

Filter Strip

Filter strips are linear strips of grass that remove sediment and oils from stormwater by filtering it. Stormwater is treated as it sheet flows across the filter strip. Usually, filter strips are placed along the edge of linear paved areas, such as parking lots and roads. Where designed filter strips are installed; road shoulders should only be graded to maintain level flow off the road.

See SWMMWW Appendix V-A, Table V-A.10 for filter strip maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP T9.10, Table V-7.3.

Detention Pond

Detention pond facilities are designed to hold and slowly release stormwater by use of a pond with a specially designed control structure. Styles vary greatly from well-manicured to natural appearing. Generally, native vegetation is preferred for reduced maintenance and enhance wildlife habitat. Some facilities are designed to appear as natural water bodies or are in a park-like setting.

See SWMMWW Appendix V-A, Table V-A.1 for detention pond maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP D.1, Table V-12.3. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.

Wet Pond

A wet pond is an open basin that retains a permanent pool of water year-round or only during the wet season. The volume of the wet pond allows sediment and other pollutants to settle out of the runoff. Wetland vegetation is typically planted within the wet pond to provide additional treatment through nutrient removal. Detention quantity control can be provided with additional temporary storage volume above the permanent pool elevation.

See SWMMWW Appendix V-A, Table V-A.11 for wet pond maintenance standards. If available, reference record drawings for seed mix and plants replacement, or see SWMMWW BMP D.1, Table V-12.3 for seed mix and BMP T10.10, Table V-8.1 for plants. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.

Infiltration Facility

Infiltration facilities dispose of water by holding it in an area where it can soak into the ground. These are open facilities that may either drain rapidly and have grass bases or have perpetual ponds where water levels rise and fall with stormwater flows. Infiltration facilities may be designed to handle all of the runoff from an area or they may overflow and bypass larger storms.

Since the facility is designed to pass water into the ground, generally after passing through a sediment trap/manhole, anything that can cause the base to clog will reduce the performance and is a large concern. Generally, infiltration basins are managed like detention ponds, but with greater emphasis on maintaining the capacity to infiltrate stormwater.

See SWMMWW Appendix V-A, Table V-A.2 for infiltration facility maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP D.1, Table V-12.3. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.

Rain Garden

Rain gardens are non-engineered, shallow, landscaped depressions with compost-amended soils and adapted plants. The depression temporarily stores stormwater runoff from adjacent areas. Some or all the influent stormwater passes through the amended soil profile and into the underlying native soil. Stormwater that exceeds the storage capacity is designed to overflow to an adjacent drainage system.

If available, reference record drawings for plant replacements, or see Rain Garden Handbook for Western Washington, Appendix A for recommendation on rain garden plants. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.

Rain Garden			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Evidence of trash and debris	Remove trash and debris
Side slopes	Erosion	Persistent soil erosion on slopes	Replenish mulch areas throughout rain garden - on the sides and bottom of the rain garden and around the perimeter (and on berm if applicable).
Bottom area	Sediment	Visible sediment that reduces drainage rate	Remove sediment accumulation
		Sediment deposited from water entering the rain garden	Remove sediment, determine the source, and stabilize area
	Leaves	Matted accumulation of leaves reducing drainage rate	Remove leaves
Ponded water	Ponding	Ponded water remains for more than 3 days after the end of a storm	Remove sediment, leaf litter and/or debris accumulation
Pipe inlet/outlet	Pipe	Water is backing up in pipe	Clear pipes of sediment and debris with snake and/or flush with water
		Damaged or cracked drain pipes	Repair or seal cracks, or replace as needed
Inlet rock pad	Erosion	Rock or cobble is removed, missing and flow is eroding soil.	Replace rock and reestablish pad
Weeds	Weeds	Weeds are present	Remove weeds and apply mulch after weeding
Vegetation	Dying Vegetation	Dying, dead or unhealthy plants	Remove diseased plants or plant parts and dispose, then replace
	Sight Distance	Vegetation reduces sight distances and sidewalk	Keep sidewalks and sight distances on roadways clear
	Blockage	Vegetation is crowding inlets and outlets	Remove vegetation crowding inlets and outlets
	Poor Vegetation Growth	Yellowing, poor growth, poor flowering, spotting or curled leaves, weak roofs, or stems	Test soil to identify specific nutrient deficiencies.
			Do not use synthetic fertilizers
			Consider selecting different plant for soil conditions
Mulch	Bare Soil	Bare spots are present or mulch depth less than 2 inches	Supplement mulch with hand tools to a depth of 2 to 3 inches, keep mulch away from woody stems.

Bioretention

Bioretention facilities are engineered facilities that store and treat stormwater by filtering it through a specified soil profile. Water that enters the facility ponds in an earthen depression or other basin (e.g., concrete planter) before it infiltrates into the underlaying bioretention soil. Stormwater that exceeds the surface storage capacity overflow to an adjacent drainage system. Treated water is either infiltrated into the underlying native soil or collected by an underdrain and discharged. An underdrain system can be comprised of perforated or slotted pipe, wrapped in an aggregate blanket.

See SWMMWW Appendix V-A, Table V-A.21 for bioretention maintenance standards. If available, reference record drawings for plant replacements, or see LID Technical Guidance Manual for Puget Sound, Appendix 1 for plant recommendations. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.

Conveyance Ditch

Ditches are often manmade open-channels that convey stormwater runoff. These ditches are maintained to prevent localized flooding.

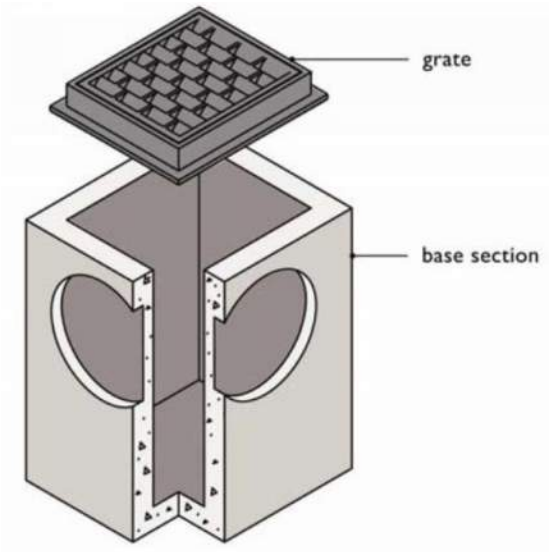
Conveyance Ditch			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Sediment	Sediment exceeds 20% of ditch depth or affects the historic or designed hydraulic capacity.	Remove sediment deposits. When finished, ditch should be level from side to side and drain freely in intended direction.
	Standing Water	Excessive standing water in ditch between storms due to ditch not draining freely	If possible, repair cause of poor drainage. This may include but is not limited to the following activities: remove sediment or trash blockages, improve grade of ditch.
	Eroded or Unstable Side Slopes	When grass is sparse, bare or eroded, patches occur in more than 20% of the ditch	Determine why grass growth is poor and correct that condition. Replant with plugs of grass at eight-inch intervals or reseed. If cause is excessive moisture replace grass with wetland plantings.
	Vegetation	Grass is excessively tall (greater than 15 inches). Nuisance weeds and other vegetation start to take over ditch.	Mow vegetation and/or remove nuisance vegetation so that flow is not impeded. Grass should be mowed to a height of 3 to 4 inches.
	Bare Soil	Poor vegetation coverage.	Reseed poor vegetation areas. Reference "Low Grow" seed mix, see SWMMWW BMP C120 Table II-3.4
	Inlet/Outlet Pipes or Culverts	Inlet/outlet area clogged with sediment and/or debris	Remove material so that there is no clogging or blockage in the inlet and outlet area
	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from ditch.
	Erosion/Scouring	Eroded or scoured ditch bottom	Permanently stabilize ditch bottom

Stormwater Structures

Catch Basin

A catch basin is an underground concrete structure with a slotted grate that collects stormwater runoff and route it through the underground pipes. Catch basins typically provide a sump below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. Some catch basins are fitted with a spill control device such as an inverted elbow on the outlet pipe to control grease or oils. The most common tool for cleaning catch basins is a vactor truck which is used to remove sediment and debris from the sump. The sediment and oils if not removed from the catch basins have the potential to pollute downstream waterbodies. Unless you have Occupational Safety and Health Administration (OSHA) approved confined space training and equipment, never enter a catch basin. There is a considerable risk of poisonous gas and injury.

See SWMMWW Appendix V-A, Table V-A.5 for catch basin maintenance standards.



Field/Ditch Inlet

An inlet is a concrete, plastic or steel structure fitted with a slotted grate to collect stormwater runoff and route through underground pipes. A field inlet has a flat grate, and a ditch inlet has an angled grate. These inlets typically provide a sump below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. Some of these inlets are fitted with a spill control device such as an inverted elbow on the outlet pipe to control grease or oils. The most common tool for cleaning out the inlet is a vactor truck which is used to remove sediment and debris from the sump. The sediment and oils if not removed from the inlet has the potential to pollute downstream water bodies. Unless you have OSHA approved confined space training and equipment, never enter an inlet. There is a considerable risk of poisonous gas and injury.

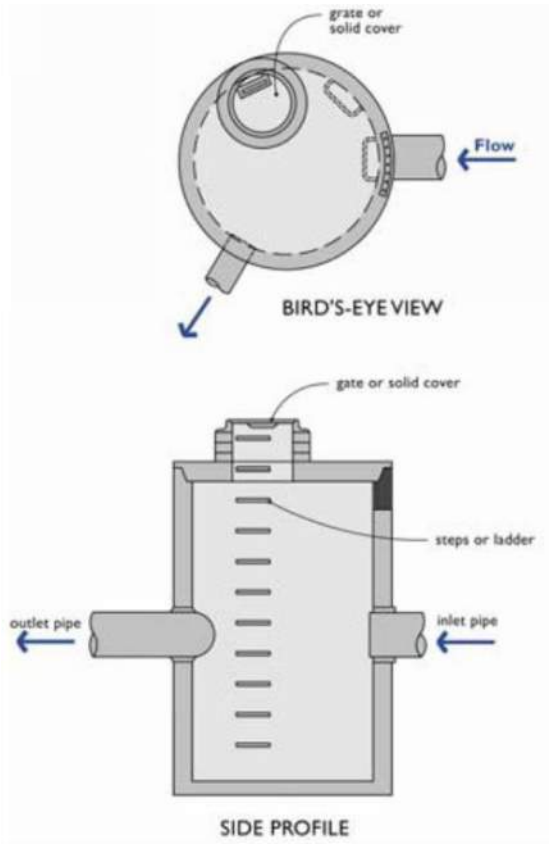
Field Inlet

Ditch Inlet

Field Inlet/Ditch Inlet			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash & Debris	Trash or debris blocking inletting capacity by more than 10%.	Remove trash or debris blocking grate opening.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	Remove dead animals or vegetation present within the field/ditch inlet.
	Sediment	Sediment has accumulated to within six inches of the invert of the lowest pipe	Remove sediment
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch.	Repair top slab to be free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Make adjustments so that frame is sitting flush on the riser rings or top slab and is firmly attached.
	Fractures or Cracks in Field Inlet Walls/Bottom	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Regrout pipe and secure at field inlet wall.
	Settlement/ Misalignment	If failure of field inlet has created a safety, function, or design problem.	Replace or repair field inlet to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the inlet opening.	Remove vegetation blockage from basin opening.
	Contamination and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
Metal Grates	Grate Not in Place	Grate is missing or only partially in place. Any open field inlet requires maintenance.	Replace missing grate, cover field inlet
	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Repair grate opening
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Replace missing grate or repair broken member(s)

Manhole

Manholes are large cylindrical underground structures usually set at storm sewer pipe connections. Manholes are used in storm sewer system at any change in direction, slope, pipe material or pipe size. Some manholes have sumps and fitted with stormwater flow control structures such as orifices or weirs. Unless you have OSHA approved confined space training and equipment, never enter a manhole. There is a considerable risk of poisonous gas and injury.

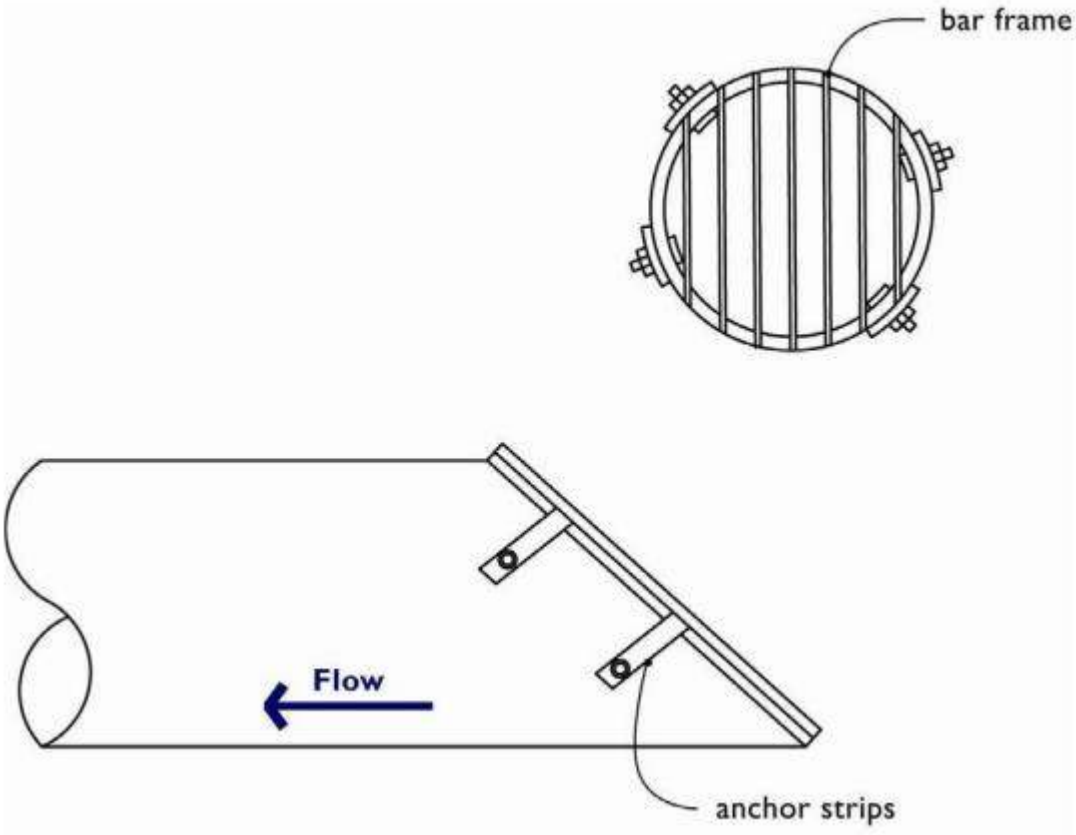


Manhole			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Trash or debris has accumulated to within six inches of the invert of the lowest pipe.	Remove all trash or debris from manhole.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Remove trash or debris from inlet and outlet pipes.
	Sediment	Sediment has accumulated to within six inches of the invert of the lowest pipe.	Remove all sediment from manhole
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch.	Repair top slab to be free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Make adjustments so that frame is sitting flush on the riser rings or top slab and is firmly attached.
	Fractures or Cracks in Manhole Walls/Bottom	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering manhole through cracks.	Regrout pipe and secure at manhole wall.
	Settlement/ Misalignment	If failure of manhole has created a safety, function, or design problem.	Replace or repair manhole to design standards.
Cover	Cover Not in Place	Cover is missing or only partially in place. Any open manhole requires maintenance.	Replace missing cover, cover manhole.
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Repair opening mechanism
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure.	Make adjustments so that one maintenance person can remove the manhole cover.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Repair or replace ladder to meet design standards and allow maintenance person safe access.
Control Structure/Flow Restrictor	See Control Structure/Flow Restrictor		

Debris Barrier

Debris barriers and trash racks are barred covers to pipe openings. They prevent large objects from entering pipes and keeps pets and people out of the pipes as well.

See SWMMWW Appendix V-A, Table V-A.6 for debris barrier maintenance standards.



Profile View

Sediment Trap

A sediment trap is a concrete structure typically fitted with slotted grate or multiple slotted grates. The concrete structure provides a storage volume (sump) below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. A sediment trap can be a fully enclosed concrete structure (above or below ground) with a sump, inlet pipe(s) and outlet pipe.

Sediment Trap			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Trash and debris which is located immediately in front of the sediment trap opening or is blocking the inlet capacity of the basin by more than 10%	Remove trash and debris
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	Remove dead animals or vegetation present within the sediment trap.
	Sediment (non-enclosed structure)	Sediment depth exceeds 2 inches.	Remove sediment
	Sediment (enclosed structure)	Sediment depth within 6 inches from lowest invert	Remove sediment
	Fractures or Cracks in Sediment Trap	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering sediment trap through cracks.	Regrout pipe and secure at sediment trap wall.
	Settlement/ Misalignment	If failure of sediment trap has created a safety, function, or design problem.	Replace or repair sediment trap to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the sediment trap opening	Remove vegetation
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Remove contaminants and/or pollutants. (Coordinate removal/cleanup with local water quality response agency)
Slotted Grate	Trash and Debris	Trash and debris that is blocking more than 20% of the grate surface inlet capacity	Remove trash and debris from grate
	Damaged or Missing Grate	Grate missing or broken member(s) of the grate	Replace or repair grate to design standards.
Cover (enclosed structure)	Cover Not in Place	Cover is missing or only partially in place.	Replace missing cover
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure or latch broken	Make adjustments so that one maintenance person can remove the cover and/or repair broken latch.

Energy Dissipater

Energy dissipaters are critical for preventing erosion at storm drain outfalls. There are a variety of designs, including wire gabion baskets, rock splash pads, trenches, and specially designed pools or manholes. They are installed on or near the inlet or outlet to a closed pipe system to prevent erosion at these locations.

See SWMMWW Appendix V-A, Table V-A.7 for energy dissipater maintenance standards.

Discharge Point

Stormwater facility discharge points may convey drainage from the stormwater facility into open channels, ditches, ponds, wetlands, streams, or lakes. Stormwater facility discharge points need to be assessed to make sure stormwater is not causing any negative impacts to these drainage areas.

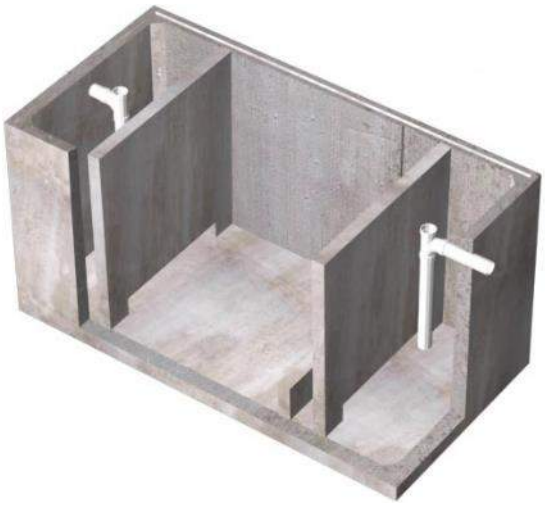
Discharge Point			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Monitoring	Contaminants and Pollution	Any evidence of oil, gasoline, sewage, contaminants, or other pollutants	Identify and remove source. The effluent discharge should be clear and free of odor. Notify City at (360) 817-1567.
	Ditch or Stream Banks Eroding	Erosion, scouring, or head cuts in ditch or stream banks downstream of facility discharge point due to flow channelization or higher flows.	Stabilize ditch or stream banks. Report to City for engineer evaluation.
General	Missing or Moved Rock	Only one layer of rock exists above native soil in an area five square feet or larger, or any exposure of native soil	Replace or repair rock pad to design standards
	Erosion	Soil erosion in or adjacent to rock pad	Replace or repair rock pad to design standards
	Sediment	Sediment blocking 20% of the pipe diameter	Remove sediment
	Obstructions	Roots or debris enters pipe or deforms pipe, reducing flow	Remove roots from pipe by mechanical methods; do not use root-dissolving chemicals in storm sewer pipes. If necessary, remove vegetation over the line.
	Pipe Rusted or Deteriorated	Any part of the piping that is crushed or deformed excessively or any other failure to the piping	Repair or replace pipe
Energy Dissipater	See Energy Dissipater		

Oil/Water Separators

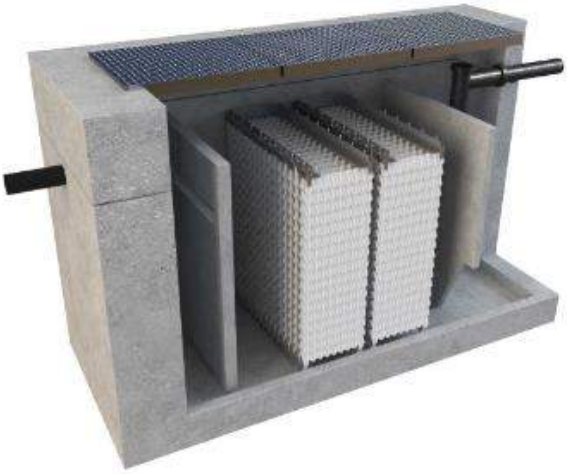
An oil/water separator is an underground vault that treats stormwater by mechanically separating oil from water. The oil rises to the surface and floats on the water and sediment settles to the bottom. Oil/water separators are typically utilized in locations where high oil concentrations in the stormwater runoff are anticipated (e.g., service and fuel stations). Oil/water separators are most commonly used as the first pretreatment facility in a series of stormwater management facilities.

These facilities have special problems for maintenance and should be serviced by contractors. The main issues are working in confined spaces and properly handling any sludge and oil cleaned from vaults or oil/water separators. Manufacturer's recommendations for maintenance should be followed at a minimum.

See SWMMWW Appendix V-A, Table V-A.16 for baffle oil/water separator maintenance standards and Table V-A.17 for coalescing plate oil/water separator maintenance standards.



Baffle Oil/Water Separator

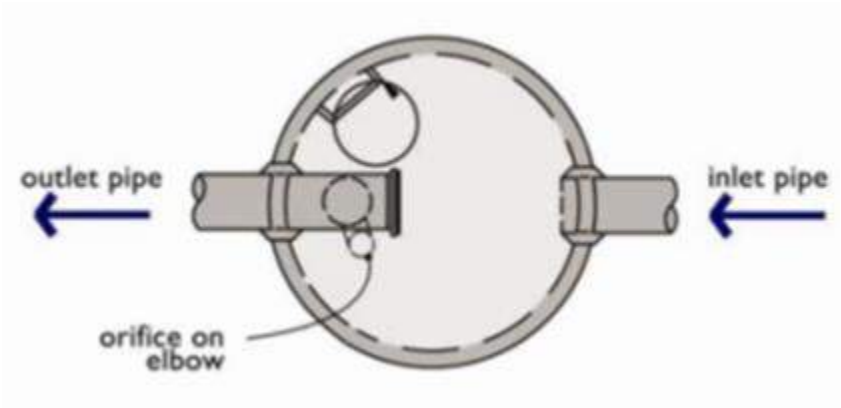


Coalescing Plate Oil/Water Separator

Flow Control Structures/Flow Restrictors

Flow control structures and flow restrictors direct or restrict flow in or out of facility components. Outflow controls on detention facilities are a common example where flow control structures slowly release stormwater at a specific rate. The flow is regulated by a combination of orifices (holes with specifically sized diameters) and weirs (plates with rectangular or 'V' shaped notch). Lack of maintenance of the control structure can result in the plugging of an orifice. If these flow controls are damaged, plugged, bypassed, or not working properly, the facility could overtop or release water too quickly.

See SWMMWW Appendix V-A, Table V-A.4 for control structure/flow restrictor maintenance standards.



Plan View

Storm Sewer Pipe

Storm sewer pipes convey stormwater. Storm pipes are constructed of many different types of materials and are sometimes perforated to allow groundwater to be collected by the storm system. Storm pipes are cleaned to remove sediment or blockages when problems are identified. Storm pipes must be clear of obstructions and breaks to prevent localized flooding.

Storm Sewer Pipe			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Obstructions, Including Roots	Obstruction exists in pipe, reducing flow capacity	Remove obstruction. Use mechanical methods. Do not put root-dissolving chemicals in storm sewer pipes. If necessary, remove the vegetation over the line.
	Pipe Dented or Broken	Inlet/outlet pipe damaged or broken	Repair or replace pipe
	Pipe rusted or deteriorated	Any part of the piping that is crushed or deformed excessively or any other failure to the piping	Repair or replace pipe
	Sediment and Debris	Sediment or debris depth is greater than 15% of the pipe diameter	Clean pipe. Evaluate source of sediment upstream of the pipe and stabilize if possible.
	Broken Trash Screen	Trash screen is broken or missing parts	Repair or replace trash screen
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.

Closed Detention System

A closed detention system functions similarly to a detention pond but with the storage volume provided by an underground structure. The structure is typically constructed of large diameter pipe, plastic chamber structure or a concrete vault. These systems are typically utilized for sites that do not have space available for an above-ground system and are more commonly associated with commercial sites.

Underground detention systems are enclosed spaces where harmful chemicals and vapors can accumulate. Therefore, the maintenance of these facilities should be conducted by an individual trained and certified to work in hazardous confined spaces.

See SWMMWW Appendix V-A, Table V-A.3 for closed detention maintenance standards.

Drywell

Drywells are perforated, open-bottomed manholes used to infiltrate stormwater into the ground. While not the intended use, drywells trap sediment and some of the oil pollutants in stormwater runoff. Drywells are more likely to fill with oily sediment in areas that lack swales or other treatment facilities. Fine oil sediment can clog drywells and lead to localized street flooding. Also, pollutants discharged into drywells can migrate into groundwater. Drywells were often installed in closed topographic depressions, areas with will-drained soils, or areas having inadequate storm sewers. Often, drywells contain groundwater.

Drywell			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Does not Dissipate Stormwater	Does not dissipate stormwater	Replace or repair
	Opening Clogged	Openings are clogged, reducing capacity	Clear openings or convert existing drywell to a sediment trap and install a new drywell or drainage trench. To convert to a sediment trap: grout holes, cover base with concrete, and add piping. Alterations to any storm facility cannot be done without approval from the City of Camas.
	Standing Water	Standing water indicates the drywell is into the groundwater table	Rebuild drywell to prevent stormwater from going directly into groundwater
	Trash and Debris	Trash or debris blocking any inlet or outlet pipe	Remove trash and debris
	Sediment	Sediment in drywell exceeds 60 percent of the depth below the lowest pipe	Remove sediment
	Structure Damage	Structure unsound	Replace or repair drywell to design standards.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
Cover	Cover Not in Place	Cover is missing or only partially in place.	Replace missing cover
	Cover Difficult to Remove	One maintenance person cannot remove cover after applying normal lifting pressure.	Make adjustments so that one maintenance person can remove the drywell cover.

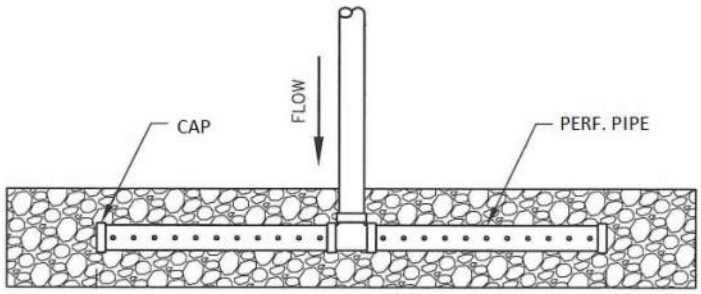
Pond Leveler System

The pond leveler system consists of an intake cage and outlet pipe. This system is used to bypass beaver dams. The pond leveler system creates a permanent leak through the beaver dam that the beavers cannot stop.

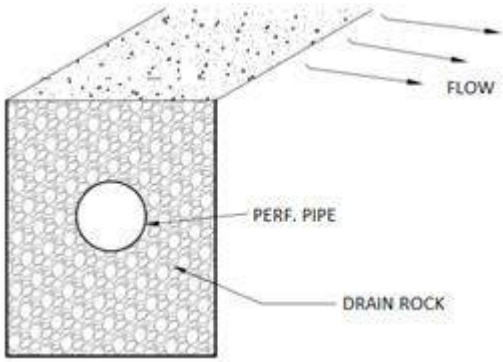
Pond Leveler			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Intake Cage	Debris and sediment	Debris and sediment build up around cage	Remove debris and sediment build up around cage. Recommended tools: potato rake and a narrow, stiff shop broom.
	Structure	Broken cage, resulting in holes larger than 6" diameter.	Repair hole with similar cage material, attach with hog rings.
	Obstruction to inflow pipe	Debris obstructing pipe flow inside intake cage	Remove obstruction
Outflow Pipe	Obstruction	Debris obstructing outflow	Remove obstruction

Dispersion Trench

Dispersion trench are grave-filled trenches, which serve to spread runoff over vegetated pervious areas. This BMP reduce peak flows, provide some infiltration, and water quality benefits.



Plan View



Cross Section

Dispersion Trench			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from site.
	Poisonous Vegetation and noxious weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations.	Remove noxious weeds. Compliance with State or local eradication policies required. Apply requirements of adopted IPM policies for the use of herbicides.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
	Rodent Holes	Any evidence of rodent holes.	Fill holes.
Perforated Pipe	Sediment and/or obstruction	Sediment and/or obstruction impeding the flow, causing backup	Remove sediment and/or obstruction

Special Facilities

Manufactured Media Filter

Manufacture media filters are passive, flow-through, stormwater treatment systems. They are comprised of manholes or vaults that house media-filled filter cartridges. Stormwater passes through a filtering medium, which traps particulates and/or absorb pollutants such as dissolved metals and hydrocarbons. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharge to a pond or open channel drainage way.

The filter media can be housed in cartridge filters enclosed in concrete vaults or catch basins. Structures will have vault doors or manhole lids for maintenance access. Various types of filter media are available from different manufactures. Determine the type of filter media used and consult manufacturer for maintenance recommendations.

See SWMMWW Appendix V-A, Table V-A.15 for manufactured media filters maintenance standards.

Manufactured Media Filter – Additional Maintenance Standards			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Below Ground Vault or Manhole	Sediment Accumulation in Vault (no first chamber)	Sediment depth exceeds 4-inches on vault floor.	Remove sediment from vault floor. May require replacing media cartridges, consult manufacturer.

Permeable Pavement

Permeable pavement is a paving system which allows rainfall to percolate through the surface into the underlying soil or an aggregate bed, where stormwater is stored and infiltrated to underlying subgrade, or removed by an overflow drainage system.

See SWMMWW Appendix V-A, Table V-A.22 for permeable pavement maintenance standards.

Modular Wetland

Modular wetlands linear is a biofiltration system that utilizes horizontal flow which allows for a smaller footprint, higher treatment capacity and design versatility. This system can be utilized downstream of storage for additional volume control and treatment. The modular wetland is contained in an underground vault that has different chambers containing media. Some modular wetlands can have plants growing out of it, but it is not required for the system to function. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharge to a pond or open channel drainage way.

Modular Wetland			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Missing or damaged components	Missing or damaged internal components or cartridges	Replace missing or repair damaged internal components or cartridges
Inlet or Outlet	Obstruction	Obstruction to inlet or outlet that impedes flow	Remove obstruction
Pretreatment Chamber	Floatables	Excessive accumulation of floatables, in which the length and width of the chamber is fully impacted more than 18"	Remove floatables
	Sediment	Excessive accumulation of sediment, more than 6"in depth	Remove sediment
Filter Cartridges	Sediment	Excessive accumulation of sediment on media, more than 85% clogged (blackish color)	Replace media
Vegetation (if applicable)	Overgrown	Overgrown vegetation	Trim/prune vegetation in accordance with landscaping and safety needs
Structure	Cracks in structure	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through cracks	Repair cracks in vault

Tree Box Filter

Tree box filter is a stormwater treatment system incorporating high performance biofiltration media to remove pollutants from stormwater runoff.

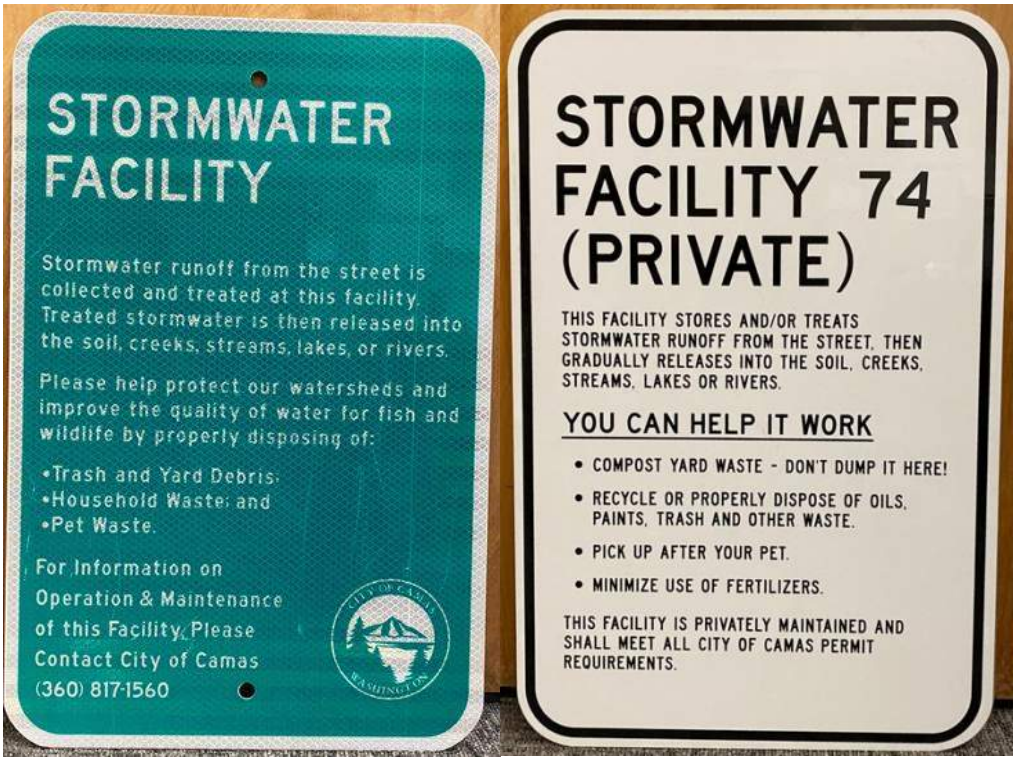
Tree Box Filter			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Inlet	Excessive sediment or trash accumulation	Accumulated sediments or trash impair free flow of water into system	Remove sediment and/or trash
Mulch cover	Trash and debris	Excessive trash and/or debris accumulation	Remove trash and/or debris.
	Standing water	Ponding of water over mulch due to excessive fine sediment accumulation or spill of petroleum oils	Remove mulch and replace, contact manufacturer for advice
Vegetation	Plant not growing or in poor condition	Soil/mulch too wet, evidence of spill, incorrect plant selection, pest infestation, vandalism to plants	Plants should be healthy and pest free, contact manufacturer for advice
	Plant growth excessive	Plants should be appropriate to the species and location	Trim/prune plants in accordance with landscaping and safety needs
Structure	Cracks in structure	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through cracks	Repair cracks in vault

Miscellaneous Items

Fences, Gates and Water Quality Signs

Fences are installed around the perimeter of stormwater facilities as a means of protecting the public, as they restrict entrance to the facility. Gates are installed to allow for maintenance access. Gates will be secured, typically with a double lock system (daisy chain) that allows access to the City and to the property owner's maintenance crew.

Water Quality Signs are installed on the fences, or on sign poles, within public view as a means of educating the public as to the presence of a stormwater facility. These signs also have a number located in the upper right hand corner that is cross referenced, at the City, to an address and maintenance responsibility. The publicly owned storm facility signs are green and the privately owned storm facility signs are white.



Public Storm Sign (Green) **Private Storm Sign (White)**

Fence, Gate and Water Quality Sign			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Gate or Fence Allows Unauthorized Entry	Openings in fence, missing gate, openings beneath fence allowing unauthorized access	Repaired gate and/or fence to prevent unauthorized access
	Locking Mechanism	Mechanism cannot be opened by one maintenance person with proper tools	Repair/replace lock
		No lock on gate, allows unauthorized entry	Add lock
	Damaged Parts	Posts out of plumb more than six inches	Plumb post
		Top rails of plump more than six inches	Repair top rails so that it is free of bends greater than 1 inch
	Erosion	Erosion has resulted in an opening under a fence that allows entry by people or pets	Replace soil under fence so that no opening exceeds 4 inches in height
	Sign	Sign is leaning more than 8 inches off vertical	Reset sign to plumb
		Sign is missing or 20% of surface is unreadable	Replace sign

Access Roads and Easements

Many stormwater facilities have access roads to bring in heavy equipment for facility maintenance. These roads are typically gravel and should be maintained for inspection access and ease of equipment entry. All facilities should allow access for the inspection process. The easement area should be adequately or otherwise stabilized. Bare soil areas will generate higher levels of stormwater runoff and increase erosion and sedimentation in stormwater facilities.

Access Road and Easements			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Erosion	Soils are bare or eroded	Seed or use other stabilization BMP
	Road Surface	Conditions of road surface may lead to erosion of the facility or limit access	Repair road
	Erosion of Ground Surface	Noticeable rills are seen in landscaped areas	Identify causes of erosion and implement BMPs to slow down/spread out the water. Fill, contour, and seed eroded areas. If needed, re-grade affected areas.
	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from site.
	Poisonous Vegetation and Noxious Weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations.	Remove noxious weeds. Compliance with State or local eradication policies required. Apply requirements of adopted IPM policies for the use of herbicides.
	Tree Growth and Hazard Trees	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If dead, diseased, or dying trees are identified.	Remove hazardous tree that impede with maintenance access and activities. Remove trees that are damaging the pipe system and/or blocking drain inlet. Remove dead, diseased, or dying trees. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood).
	Weeds (Non-poisonous)	Weeds growing in more than 20% of the landscaped area (tree and shrubs only).	Remove weeds
	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Destroy or remove insects from site. Apply insecticides in compliance with adopted IPM policies.

Pavement Sweeping

Pavement sweeping is performed as a means of removing sand, dirt, and litter from streets and curb gutters. Sweeping also reduces dust during dry weather. Pavement sweeping plays a large part in stormwater maintenance because it limits the amount of sediment washed into the municipal storm sewer system. The water quality procedure for street sweeping focuses on sediment removal and disposal. Reducing the amount of sediment washed into catch basins, curb inlets, detention facilities, drywells, and other facilities can save money because sweeping is generally cheaper that removing sediment from facilities. Sweeping also helps protect facilities from clogging with sediment.

Typically, the City sweeps the downtown area once a week and the whole city about three times per year. Most of the downtown area does not have water quality treatment. Pavement sweeping is the main source for pollution control.

Repair/Replacement Activities

Minor Culvert Repair (Not in a Stream)

This activity is for the replacement or repair of culverts and inlets. It applies only to structures that are in ditches that are specifically for storm drainage. These are ditches that do not carry water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, consult with the Washington Department of Fish and Wildlife and the City of Camas Public Works Department.

Major Culvert Repair (at a Stream Crossing)

This activity is the replacement or repair of culverts and inlets bridging a stream or ditch with flowing water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, consult the Washington Department of Fish and Wildlife and the City of Camas Public Works Department.

These projects must meet all regulatory requirements such as State Environmental Policy Act (SEPA), Shoreline Permit, Hydraulic Project Approval (HPA) and Flood Plain.

Vegetation Management

The City recognizes the special importance of the rivers, streams, wetlands, ponds, and stormwater control and treatment facilities. The sensitive nature of such habitat, their plant and animal communities, and their direct link with other waterways require that we establish specific policies to ensure their health. All landscape management decisions for controlling unwanted vegetation, diseases, and pests should follow the Integrated Pest Management (IPM) principles and decision-making rationale.

Integrated Pest Management (IPM) Principles

1. Correctly identify the pest problem and understand their life cycle. Refer to online resources such as Washington State Noxious Weed Control Board and Washington Invasive Species Council.
2. Every landscape has a population of some pest insects, weeds, and diseases. Once the pest has been identified and studied, determine if low levels of the pest are tolerable. Small numbers of certain pests may not be harmful. If this is the case, simply continue to monitor the pest population.
3. If pest exceed tolerance thresholds, choose a safe and effective control method.
    a. Cultural methods of vegetation and pest control are preferred and are first employed. Cultural control changes the pest's environment: landscape fabric, mulch, soil amendments, altering the irrigation method of duration, crop rotation, crop covers, etc.
    b. Mechanical means of vegetation and pest control are next in line of preference and are utilized where feasible. Mechanical means consist of digging, hand-pulling, mowing, tilling, trapping, etc.
    c. Biological methods of vegetation and pest control are considered before chemical means, where they are feasible. Biological control uses natural enemies: beneficial insects, managed grazing, bird boxes and perches, etc.
    d. Chemical methods are used only when no other feasible methods exist. Chemical control is the use of pesticides to remove vegetation and pests.
4. Observe and record the results of the control treatment. Evaluate the effectiveness. If necessary, modify maintenance practices to support a healthy landscape and prevent recurrence of the pest.

A licensed pesticide applicator is required for performing any chemical application in stormwater facilities. Applicators must be licensed in Washington State with an aquatic endorsement (WAC 16-228-1545). Applicator must submit a copy of their license to the City prior to starting work. Aquatic pesticide products are recommended. No chemical application shall be applied directly in the water. Do not apply pesticide when it is raining. Check the weather and ensure there are multiple dry days before and after application. Do not apply pesticide on windy days to prevent drift movement of pesticide from target areas.

For vegetated areas outside of stormwater facilities, Washington State pesticide application laws and rules are followed, Chapter 17.21 RCW and Chapter 16-228 WAC.

Plants and Groundcover

Use plants that will thrive in the growing conditions of each facility. Growing conditions are affected by moisture, soil conditions, and light. Plants native to western Washington are preferred. Recommended plants, seed mixes and groundcover list for biofiltration swales, bioretention systems, rain gardens, and other facility types are given in the respective BMP maintenance sections. It is best to reference the stormwater facility record drawings for vegetation replacements, if available. Fertilization of vegetated stormwater facilities should be avoided.

The City has adopted a list of approved plants for use in development projects, and to assist homeowners in choosing appropriate plantings. The list also has prohibited undesirable plants. Only plants approved for use on the City of Camas Plant Materials are allowed within the City's right-of-way.

Mulches and other ground coverings are useful during the installation and restoration of landscapes as well as their ongoing maintenance. Mulches meet a variety of needs. They suppress weeds, help to retain moisture around plants, reduce possible erosion and provide visual enhancement. Possible risk impacts to consider when using mulch are inadvertent introduction of non-native plants or migration of mulch material into waterways.

Possible scenarios where trees should be removed and/or trimmed in a stormwater facility (always check if the stormwater facility has a liner before tree removal):

- Trees that pose a risk to a stormwater structure due to root growth should be removed.
- Trees that are growing on spillways that would impede drainage should be removed.
- Hazardous trees should be removed.
- Trees/shrubs that hinder accessibility to access roads should be trimmed or removed.

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SEPARATOR SHEET

APPENDIX E

Stormwater Pollution Prevention Plan

Stormwater Pollution Prevention Plan

For
NE 13th Street Site Plan

Prepared For
Taz Kahn
3993 NW Currawong Court
Camas, WA 98607

Owner	Developer	Operator/Contractor
Taz Kahn 3993 NW Currawong Court Camas, WA 98607	Same as Owner	Unknown

Project Site Location
20101 NE 13th Street
Camas, WA 98607
Parcel #176148-000

SWPPP Prepared By
PLS Engineering, Inc.
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519

SWPPP Preparation Date
August 2023

Approximate Project Construction Dates
March 2024

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Appendix A Site plans

- Vicinity map (with all discharge points)
- Site plan with TESC measures

Appendix B Construction BMPs

- Possibly reference in BMPs, but likely it will be a consolidated list so that the applicant can photocopy from the list from the SWMMWW.

Appendix C Alternative Construction BMP list

- List of BMPs not selected, but can be referenced if needed in each of the 12 elements

Appendix D General Permit

Appendix E Site Log and Inspection Forms

Appendix F Engineering Calculations

1.0 Introduction

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the Monte Verde construction project in Camas, Washington. The site is located on Parcel 173184000. Current address for the site is 22205 NE 28th Street, Camas, WA 98607 and the existing site is approximately 8.61 acres. Current proposed development associated with this SWPPP includes the construction of 34 single family lots along with the associated infrastructure. The stormwater plan associated with this project provides for stormwater management of all runoff from the site using two private infiltration trenches, and one stormwater detention facility. Stormwater runoff from the pollution generating surfaces will be treated by a ConTech media cartridge before being infiltrated.

Construction activities will include excavation, grading, construction of paving and sidewalk to serve the site, construction of an infiltration trench to mitigate for impacts to stormwater runoff from the new paving, and installation of utilities to serve the site including sanitary sewer, storm sewer, potable water, electrical, phone, and cable TV. The purpose of this SWPPP is to describe the proposed construction activities and all temporary and permanent erosion and sediment control (TESC) measures, pollution prevention measures, inspection/monitoring activities, and recordkeeping that will be implemented during the proposed construction project. The objectives of the SWPPP are to:

1. Implement Best Management Practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. Prevent violations of surface water quality, ground water quality, or sediment management standards.

3. Prevent, during the construction phase, adverse water quality impacts including impacts on beneficial uses of the receiving water by controlling peak flow rates and volumes of stormwater runoff at the Permittee's outfalls and downstream of the outfalls.

This SWPPP was prepared using the Ecology SWPPP Template downloaded from the Ecology website. This SWPPP was prepared based on the requirements set forth in the Construction Stormwater General Permit and the *Stormwater Management Manual for Western Washington* (SWMMWW). The report is divided into seven main sections with several appendices that include stormwater related reference materials. The topics presented in the each of the main sections are:

- Section 1 – INTRODUCTION. This section provides a summary description of the project, and the organization of the SWPPP document.

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- Section 2 – SITE DESCRIPTION. This section provides a detailed description of the existing site conditions, proposed construction activities, and calculated stormwater flow rates for existing conditions and post–construction conditions.

- Section 3 – CONSTRUCTION BMPs. This section provides a detailed description of the BMPs to be implemented based on the 12 required elements of the SWPPP (SWMMEW 2004).

- Section 4 – CONSTRUCTION PHASING AND BMP IMPLEMENTATION. This section provides a description of the timing of the BMP implementation in relation to the project schedule.

- Section 5 – POLLUTION PREVENTION TEAM. This section identifies the appropriate contact names (emergency and non-emergency), monitoring personnel, and the onsite temporary erosion and sedimentation control inspector

- Section 6 – INSPECTION AND MONITORING. This section provides a description of the inspection and monitoring requirements such as the parameters of concern to be monitored, sample locations, sample frequencies, and sampling methods for all stormwater discharge locations from the site.

- Section 7 – RECORDKEEPING. This section describes the requirements for documentation of the BMP implementation, site inspections, monitoring results, and changes to the implementation of certain BMPs due to site factors experienced during construction.

Supporting documentation and standard forms are provided in the following Appendices:

Appendix A – Site plans
Appendix B – Construction BMPs
Appendix C – Alternative Construction BMP list
Appendix D – General Permit
Appendix E – Site Log and Inspection Forms
Appendix F – Engineering Calculations

2.0 Site Description

2.1 Existing Conditions

Current Addresses for the site is 20101 NE 13th Street, Camas, WA 98607. The site is approximately 0.97 acres. The property's topography is moderately sloped from a high point at the NW corner of the site to low areas along at the South boundary of the site. The site has an existing house will be removed. The remaining area consists of grass, and trees, and landscaping.

The soils are mapped by the NRCS as Wind River gravelly loam (WrB) for the majority of the site, and Cove silty clay loam (CwA) at the SW corner and Eastern edge of the site.

2.2 Proposed Construction Activities

The project proposes to develop a gas station with a mini-mart and car wash on a single lot. Construction activities will include excavation, grading, construction of paving and sidewalk to serve the site, construction of stormwater facilities to mitigate for impacts to stormwater runoff from the new paving, and installation of utilities to serve the site including sanitary sewer, storm sewer, potable water, electrical, phone, and cable TV.

Temporary erosion and sediment control facilities will be installed prior to site construction to handle construction-phase stormwater runoff. The schedule and phasing of BMPs during construction is provided in Section 4.0.

Stormwater runoff has been calculated using Western Washington Hydrology Model (WWHM). The stormwater facilities were designed to treat and detain the runoff generated by the site prior to discharge.

After the site has been graded and all new utilities are installed, the building construction will commence. Trees will also be planted in the landscape areas noted in the Landscape Plan. Temporary seeding will occur over the lots to establish vegetative cover until such time as individual buildings are developed and permanent landscaping occurs.

3.0 Construction Stormwater BMPs

3.1 The 13 BMP Elements

3.1.1 Element #1 – Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Trees that are to be preserved, as well as all sensitive areas and their buffers, shall be clearly delineated, both in the field and on the plans. In general, natural vegetation and native topsoil shall be retained in an undisturbed state to the maximum extent possible. The BMPs relevant to marking the clearing limits that will be applied for this project include:

- Preserving Native Vegetation (BMP C101)
- Silt Fence (BMP C233)

Alternate BMPs for marking clearing limits are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.2 Element #2 – Establish Construction Access

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads, and wheel washing, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters. All wash wastewater shall be controlled on site. The specific BMPs related to establishing construction access that will be used on this project include:

- Stabilized Construction Entrance (BMP C105)

Alternate construction access BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.3 Element #3 – Control Flow Rates

In order to protect the properties and waterways downstream of the project site, stormwater discharges from the site will be controlled. The specific BMPs for flow control that shall be used on this project include:

- Downspout Full Infiltration - Infiltration Trenches (BMP T5.10B).
- Infiltration Trenches (BMP R5.11).

Alternate flow control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, the project must comply with Minimum Requirement 7 (Ecology 2005).

In general, discharge rates of stormwater from the site will be controlled where increases in impervious area or soil compaction during construction could lead to downstream erosion, or where necessary to meet local agency stormwater discharge requirements (e.g. discharge to combined sewer systems).

3.1.4 Element #4 – Install Sediment Controls

All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site or prior to being discharged to an infiltration facility. The specific BMPs to be used for controlling sediment on this project include:

- Silt Fence (BMP C233)
- Storm Drain Inlet Protection (BMP C220)

Silt fencing and storm drain inlet protection will be adequate for sediment control during summer months. Alternate sediment control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

In addition, sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers, as needed, to minimize tracking of sediments on vehicle tires away from the site and to minimize washoff of sediments from adjacent streets in runoff.

Whenever possible, sediment laden water shall be discharged into onsite, relatively level, vegetated areas (BMP C240 paragraph 5, page 4-102).

In some cases, sediment discharge in concentrated runoff can be controlled using permanent stormwater BMPs (e.g., infiltration swales, ponds, trenches). Sediment loads can limit the effectiveness of some permanent stormwater BMPs, such as those used for infiltration or biofiltration; however, those BMPs designed to remove solids by settling (wet ponds or detention ponds) can be used during the construction phase. When permanent stormwater BMPs will be used to control sediment discharge during construction, the structure will be protected from excessive sedimentation with adequate erosion and sediment control BMPs. Any accumulated sediment shall be removed after construction is complete and the permanent stormwater BMP will be restabilized with vegetation per applicable design requirements once the remainder of the site has been stabilized.

The following BMPs will be implemented as end-of-pipe sediment controls as required to meet permitted turbidity limits in the site discharge(s). Prior to the implementation of these technologies, sediment sources and erosion control and soil stabilization BMP efforts will be maximized to reduce the need for end-of-pipe sedimentation controls.

- Construction Stormwater Filtration (BMP C251)
- Construction Stormwater Chemical Treatment (BMP C 250) (implemented only with prior written approval from Ecology).

3.1.5 Element #5 – Stabilize Soils

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. The specific BMPs for soil stabilization that shall be used on this project include:

- Temporary and Permanent Seeding (BMP C120)
- Mulching (BMP C121)
- Nets and Blankets (BMP C122)
- Plastic Covering (BMP C123)
- Topsoiling (BMP C125)
- Surface Roughening (BMP C130)
- Dust Control (BMP C140)
- Early application of gravel base on areas to be paved

Alternate soil stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, no soils shall remain exposed and unworked for more than 7 days during the dry season (May 1 to September 30) and 2 days during the wet season (October 1 to April 30). Regardless of the time of year, all soils shall be stabilized at the end of the shift before a holiday or weekend if needed based on weather forecasts.

In general, cut and fill slopes will be stabilized as soon as possible and soil stockpiles will be temporarily covered with plastic sheeting. All stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

3.1.6 Element #6 – Protect Slopes

All cut and fill slopes will be designed, constructed, and protected in a manner that minimizes erosion. The following specific BMPs will be used to protect slopes for this project:

- Temporary and Permanent Seeding (BMP C120)

Alternate slope protection BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.7 Element #7 – Protect Drain Inlets

All storm drain inlets and culverts made operable during construction or inlets near the site that could potentially receive surface runoff from the construction site shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep street wash water separate from entering storm drains until treatment can be provided. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets and culverts that could potentially be impacted by sediment-laden runoff on and near the project site. The following inlet protection measures will be applied on this project:

Drop Inlet Protection

- Block and Gravel Drop Inlet Protection
- Gravel and Wire Drop Inlet Protection
- Catch Basin Filter

If the BMP options listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D), or if no BMPs are listed above but deemed necessary during construction, the Certified Erosion and Sediment Control Lead shall implement one or more of the alternative BMP inlet protection options listed in Appendix C.

3.1.8 Element #8 – Stabilize Channels and Outlets

Where site runoff is to be conveyed in channels or discharged to a stream or some other natural drainage point, efforts will be taken to prevent downstream erosion. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

- Outlet Protection (BMP C209)

Alternate channel and outlet stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, all temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the expected peak 10-minute velocity of flow from a Type 1A, 10-year, 24-hour recurrence interval storm for the developed condition. Alternatively, the 10-year, 1-hour peak flow rate indicated by an approved continuous runoff simulation model, increased by a factor of 1.6, shall be used. Stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent streambanks, slopes, and downstream reaches shall be provided at the outlets of all conveyance systems.

3.1.9 Element #9 – Control Pollutants

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well organized, and free of debris. If required, BMPs to be implemented to control specific sources of pollutants are discussed below.

Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.
- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

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Chemical storage:

- Any chemicals stored in the construction areas will conform to the appropriate source control BMPs listed in Volume IV of the Ecology stormwater manual. In Western WA, all chemicals shall have cover, containment, and protection provided on site, per BMPC153 for Material Delivery, Storage and Containment in SWMMWW 2005
- Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application procedures and rates shall be followed.

Excavation and tunneling spoils dewatering waste:

- Dewatering BMPs and BMPs specific to the excavation and tunneling (including handling of contaminated soils) are discussed under Element 10.

Demolition:

- Dust released from demolished sidewalks, buildings, or structures will be controlled using Dust Control measures (BMP C140).
- Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection (BMP C220 as described above for Element 7).
- Process water and slurry resulting from sawcutting and surfacing operations will be prevented from entering the waters of the State by implementing Sawcutting and Surfacing Pollution Prevention measures (BMP C152).

Concrete and grout:

- Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures (BMP C151).

Sanitary wastewater:

- Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.
- Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system or to the sanitary sewer as part of Wheel Wash implementation (BMP C106).

Solid Waste:

- Solid waste will be stored in secure, clearly marked containers.

Other:

- Other BMPs will be administered as necessary to address any additional pollutant sources on site.

The facility does not require a Spill Prevention, Control, and Countermeasure (SPCC) Plan under the Federal regulations of the Clean Water Act (CWA).

3.1.10 Element #10 – Control Dewatering

3.1.13 Element #13 – Protect Low Impact Development BMPs

- Protect all bioretention and rain garden BMP's from sedimentation through installation and maintenance of erosion control BMP's on portions of the site that drain into them. Restore the BMP's to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden bioretention/ rain garden soils, and replacing the removed soils with soils meeting the design specification.
- Prevent compacting bioretention and rain garden BMP's by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction by construction equipment.
- Control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff into permeable pavements or base materials.
- Pavements fouled with sediments or no longer passing an initial infiltration test must be cleaned using procedures from Book 4 of the manufacturer's procedures.
- Keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils

3.2 Site Specific BMPs

Site specific BMPs are shown on the TESC Plan Sheets and Details in Appendix A. These site-specific plan sheets will be updated annually.

3.3 Additional Advanced BMPs

- The following BMPs are advanced and are only recommended if construction activities are complex enough to warrant them; or if the site has the potential for significant impacts to water quality. The following BMPs are directed at "end-of-pipe" treatment for sedimentation issues related to turbid runoff from construction sites. Effective BMPs are most often the simple BMPs and focus on the minimization of erosion before sedimentation is an issue. The following BMPs will most likely be implemented only after other BMP options are exhausted, or if the construction activity is large and off-site sedimentation or turbid runoff occurs or is inevitable.
- For BMP 250, written pre-approval, through Ecology is required (see SWMMWW 2005):
- BMP C250: Construction Stormwater Chemical Treatment
- BMP C251: Construction Stormwater Filtration.

4.0 Construction Phasing and BMP Implementation

The BMP implementation schedule will be driven by the construction schedule. The following provides a sequential list of the proposed construction schedule milestones and the corresponding BMP implementation schedule. The list contains key milestones such as wet season construction.

The BMP implementation schedule listed below is keyed to proposed phases of the construction project and reflects differences in BMP installations and inspections that relate to wet season construction. The project site is located west of the Cascade Mountain Crest. As such, the dry season is considered to be from May 1 to September 30 and the wet season is considered to be from October 1 to April 30.

- Estimate of Construction start date: 3/01/24
- Estimate of Construction finish date: 9/30/27
- Mobilize equipment on site: 3/01/24
- Mobilize and store all ESC and soil stabilization products: 3/01/24
- Install ESC measures: 3/01/24
- Install stabilized construction entrance: 3/01/24
- Begin clearing and grubbing: 3/01/24
- Demolish existing structures: 3/01/24
- Begin site grading 3/01/24
- Site grading ends 3/30/24
- Excavate and install new utilities and services: 4/01/24
- Excavation for building foundations 3/06/24
- Begin building construction: 3/06/24
- Complete utility construction 3/06/24
- Begin implementing soil stabilization and sediment control BMPs throughout the site in preparation for wet season: 3/06/24
- Wet Season starts: 10/01/24
- Site inspections and monitoring conducted weekly and for applicable rain events as detailed in Section 6 of this SWPPP: 3/01/24
- Implement Element #12 BMPs and manage site to minimize soil disturbance during the wet season: 3/01/24
- Complete road paving 5/30/24
- Building construction complete: 9/06/25
- Dry Season starts: 5/01/24

5.0 Pollution Prevention Team

5.1 Roles and Responsibilities

The pollution prevention team consists of personnel responsible for implementation of the SWPPP, including the following:

- Certified Erosion and Sediment Control Lead (CESCL) – primary contractor contact, responsible for site inspections (BMPs, visual monitoring, sampling, etc.); to be called upon in case of failure of any ESC measures.
- Resident Engineer – For projects with engineered structures only (sediment ponds/traps, sand filters, etc.): site representative for the owner that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's site supervisor or representative
- Emergency Ecology Contact – individual to be contacted at Ecology in case of emergency.
- Emergency Owner Contact – individual that is the site owner or representative of the site owner to be contacted in the case of an emergency.
- Non-Emergency Ecology Contact – individual that is the site owner or representative of the site owner than can be contacted if required.
- Monitoring Personnel – personnel responsible for conducting water quality monitoring; for most sites this person is also the Certified Erosion and Sediment Control Lead.

5.2 Team Members

Names and contact information for those identified as members of the pollution prevention team are provided in the following table.

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	Unknown	
Resident Engineer	Travis Johnson	(360)944-6519
Emergency Ecology Contact	Unknown	
Emergency Owner Contact	Unknown	
Non-Emergency Ecology Contact	Unknown	
Monitoring Personnel	Unknown	

Exhibit 33 APPEAL24-1001

6.0 Site Inspections and Monitoring

Monitoring includes visual inspection, monitoring for water quality parameters of concern, and documentation of the inspection and monitoring findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book. This SWPPP may function as the site log book if desired, or the forms may be separated and included in a separate site log book. However, if separated, the site log book but must be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

6.1 Site Inspection

All BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. The inspector will be a Certified Erosion and Sediment Control Lead (CESCL) per BMP C160. The name and contact information for the CESCL is provided in Section 5 of this SWPPP.

Site inspection will occur in all areas disturbed by construction activities and at all stormwater discharge points. Stormwater will be examined for the presence of suspended sediment, turbidity, discoloration, and oily sheen. The site inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair or replace any of the BMPs to improve the quality of stormwater discharges. All maintenance and repairs will be documented in the site log book or forms provided in this document. All new BMPs or design changes will be documented in the SWPPP as soon as possible.

6.1.1 Site Inspection Frequency

Site inspections will be conducted at least once a week and within 24 hours following any discharge from the site. For sites with temporary stabilization measures, the site inspection frequency can be reduced to once every month.

6.1.2 Site Inspection Documentation

The site inspector will record each site inspection using the site log inspection forms provided in Appendix E. The site inspection log forms may be separated from this SWPPP document, but will be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

6.2 Stormwater Quality Monitoring

The construction site will comply with the requirements set forth in the 2015 Construction Stormwater General Permit (revised 2017) seen in Appendix D. A Certified Erosion and Sediment Control Lead shall be on-site or on-call at all times.

The following text describes the monitoring for the proposed development.

6.2.1 Turbidity Sampling

The receiving water body, Lacamas Creek Watershed, is impaired for turbidity. Mandatory BMPs (Best Management Practices) and erosion control practices put in place by the permit will appropriately minimize the turbidity of the stormwater discharge. Monitoring requirements for the proposed project will include weekly turbidity sampling to monitor site discharges for water quality compliance as required by the NPDES Construction Stormwater General Permit, provided that site discharges occur. It should be noted that the site is designed such that all site runoff will be infiltrated so it is likely that discharges will be rare or may not occur at all. Sampling will be conducted at all discharge points at least once per calendar week.

Turbidity sampling during construction will be completed weekly in order to confirm that erosion control measures are meeting the water quality standards for turbidity (Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharge, but has not excluded these discharges, compliance with special Conditions S4 (monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL (S8.E.1.c)). Special Conditions S4 establishes that the key benchmark values that require action are 25 NTU for turbidity (equivalent to 32 cm transparency) and 250 NTU for turbidity (equivalent to 6 cm transparency). If the 25 NTU benchmark for turbidity (equivalent to 32 cm transparency) is exceeded, the following steps will be conducted:

1. Ensure all BMPs specified in this SWPPP are installed and functioning as intended.
2. Assess whether additional BMPs should be implemented, and document revisions to the SWPPP as necessary.
3. Sample discharge location daily until the analysis results are less than 25 NTU (turbidity) or greater than 32 cm (transparency).

If the turbidity is greater than 25 NTU (or transparency is less than 32 cm) but less than 250 NTU (transparency greater than 6 cm) for more than 3 days, additional treatment BMPs will be implemented within 24 hours of the third consecutive sample that exceeded the benchmark value. Additional treatment BMPs to be considered will include, but are not limited to, off-site treatment, infiltration, filtration and chemical treatment.

If the 250 NTU benchmark for turbidity (or less than 6 cm transparency) is exceeded at any time, the following steps will be conducted:

1. Notify Ecology by phone within 24 hours of analysis (see Section 5.0 of this SWPPP for contact information).
2. Continue daily sampling until the turbidity is less than 25 NTU (or transparency is greater than 32 cm).

3. Initiate additional treatment BMPs such as off-site treatment, infiltration, filtration and chemical treatment within 24 hours of the first 250 NTU exceedance.
4. Implement additional treatment BMPs as soon as possible, but within 7 days of the first 250 NTU exceedance.
5. Describe inspection results and remedial actions taken in the site log book and in monthly discharge monitoring reports as described in Section 7.0 of this SWPPP.

In the event that Turbidity results are greater than 25 NTUs, or the site is determined to be out of compliance with surface water quality standards for turbidity, the following BMPs should be established, re-established or implemented as determined necessary by the Certified Erosion and Sediment Control lead (CESCL) in order to bring the site back into compliance:

BMP C105: Stabilized Construction Entrance / Exit (repair construction entrance as necessary)

BMP C106: Wheel Wash (repair wheel wash as necessary)

BMP C120: Temporary and permanent Seeding

BMP C124: Sodding

BMP C140: Dust Control

BMP C209: Outlet Protection

BMP C220: Storm Drain Inlet Protection (add more inlet protection, as necessary

BMP C233: Silt Fence (add more silt fencing as necessary)

7.0 Reporting and Recordkeeping

7.1 Recordkeeping

7.1.1 Site Log Book

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book.

7.1.2 Records Retention

Records of all monitoring information (site log book, inspection reports/checklists, etc.), this Stormwater Pollution Prevention Plan, and any other documentation of compliance with permit requirements will be retained during the life of the construction project and for a minimum of three years following the termination of permit coverage in accordance with permit condition S5.C.

7.1.3 Access to Plans and Records

The SWPPP, General Permit, Notice of Authorization letter, and Site Log Book will be retained on site or within reasonable access to the site and will be made immediately available upon request to Ecology or the local jurisdiction. A copy of this SWPPP will be provided to Ecology within 14 days of receipt of a written request for the SWPPP from Ecology. Any other information requested by Ecology will be submitted within a reasonable time. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with permit condition S5.G.

7.1.4 Updating the SWPPP

In accordance with Conditions S3, S4.B, and S9.B.3 of the General Permit, this SWPPP will be modified if the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site or there has been a change in design, construction, operation, or maintenance at the site that has a significant effect on the discharge, or potential for discharge, of pollutants to the waters of the State. The SWPPP will be modified within seven days of determination based on inspection(s) that additional or modified BMPs are necessary to correct problems identified, and an updated timeline for BMP implementation will be prepared.

7.2 Reporting

7.2.1 Discharge Monitoring Reports

Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period, the Permittee shall submit the form as required, with the words "No discharge" entered in the place of monitoring results. The DMR due date is 15 days following the end of each month.

Water quality sampling results will be submitted to Ecology monthly on Discharge Monitoring Report (DMR) forms in accordance with permit condition S5.B. If there was no discharge during a given monitoring period, the form will be submitted with the words "no discharge" entered in place of the monitoring results. If a benchmark was exceeded, a brief summary of inspection results and remedial actions taken will be included. If sampling could not be performed during a monitoring period, a DMR will be submitted with an explanation of why sampling could not be performed.

7.2.2 Notification of Noncompliance

If any of the terms and conditions of the permit are not met, and it causes a threat to human health or the environment, the following steps will be taken in accordance with permit section S5.F:

1. Ecology will be immediately notified of the failure to comply.
2. Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Any time turbidity sampling indicates turbidity is 250 nephelometric turbidity units (NTU) or greater or water transparency is 6 centimeters or less, the Ecology regional office will be notified by phone within 24 hours of analysis as required by permit condition S5.A (see Section 5.0 of this SWPPP for contact information).

In accordance with permit condition S2.A, a complete application form will be submitted to Ecology and the appropriate local jurisdiction (if applicable) to be covered by the General Permit.

Appendix A – Site Plans

See Plans.

Appendix B – Construction BMPs

Stabilized Construction Entrance (BMP C105)

Silt Fence (BMP C233)

Storm Drain Inlet Protection (BMP C220)

Infiltration Trench (BMP T7.20)

Temporary and Permanent Seeding (BMP C120)

Mulching (BMP C121)

Nets and Blankets (BMP C122)

Plastic Covering (BMP C123)

Topsoiling (BMP C125)

Dust Control (BMP C140)

Early application of gravel base on areas to be paved

Outlet Protection (BMP C209)

Appendix C – Alternative BMPs

The following includes a list of possible alternative BMPs for each of the 12 elements not described in the main SWPPP text. This list can be referenced in the event a BMP for a specific element is not functioning as designed and an alternative BMP needs to be implemented.

Element #1 - Mark Clearing Limits
High Visibility Plastic or Metal Fence (BMP C103)
Stake and Wire Fence (BMP C104)
Element #2 - Establish Construction Access
Wheel Wash (BMP C106)
Water Bars (BMP C203)
Element #3 - Control Flow Rates
Wattles (BMP C235)

Element #4 - Install Sediment Controls
Straw Bale Barrier (BMP C230)
Gravel Filter Berm (BMP C232)
Straw Wattles (BMP C235)
Portable Water Storage Tanks (Baker Tanks)
Construction Stormwater Chemical Treatment (BMP C250)
Construction Stormwater Filtration (BMP C251)

Element #5 - Stabilize Soils
Polyacrylamide (BMP C126)

Element #6 - Protect Slopes
Straw Wattles (BMP C235)
Surface Roughening (BMP C240)

Element #8 - Stabilize Channels and Outlets
Level Spreader (BMP C206)
Check Dams (BMP C207)

Element #9 – Control Pollutants
Concrete Handling (BMP C151)
Construction Stormwater Chemical Treatment (BMP C250)
Construction Stormwater Filtration (BMP C251)

Element #10 - Control Dewatering
Vegetated Filtration (BMP C236)
Additional Advanced BMPs to Control Dewatering:

Appendix D – General Permit

Appendix E – Site Inspection Forms (and Site Log)

The results of each inspection shall be summarized in an inspection report or checklist that is entered into or attached to the site log book. It is suggested that the inspection report or checklist be included in this appendix to keep monitoring and inspection information in one document, but this is optional. However, it is mandatory that this SWPPP and the site inspection forms be kept onsite at all times during construction, and that inspections be performed and documented as outlined below.

At a minimum, each inspection report or checklist shall include:

a. Inspection date/times

b. Weather information: general conditions during inspection, approximate amount of precipitation since the last inspection, and approximate amount of precipitation within the last 24 hours.

c. A summary or list of all BMPs that have been implemented, including observations of all erosion/sediment control structures or practices.

d. The following shall be noted:

   i. locations of BMPs inspected,

   ii. locations of BMPs that need maintenance,

   iii. the reason maintenance is needed,

   iv. locations of BMPs that failed to operate as designed or intended, and

   v. locations where additional or different BMPs are needed, and the reason(s) why

e. A description of stormwater discharged from the site. The presence of suspended sediment, turbid water, discoloration, and/or oil sheen shall be noted, as applicable.

f. A description of any water quality monitoring performed during inspection, and the results of that monitoring.

g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.

h. A statement that, in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the SWPPP and the NPDES permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation.

i. Name, title, and signature of person conducting the site inspection; and the following statement: "I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief".

When the site inspection indicates that the site is not in compliance with any terms and conditions of the NPDES permit, the Permittee shall take immediate action(s) to: stop, contain, and clean up the unauthorized discharges, or otherwise stop the noncompliance; correct the problem(s); implement appropriate Best Management Practices (BMPs), and/or conduct maintenance of existing BMPs; and achieve compliance with all applicable standards and permit conditions. In addition, if the noncompliance causes a threat to human health or the environment, the Permittee shall comply with the Noncompliance Notification requirements in Special Condition S5.F of the permit.

Site Inspection Form

General Information			
Project Name:			
Inspector Name:		**Title:** **CESCL # :**	
Date:		**Time:**	
Inspection Type:	☐ After a rain event ☐ Weekly ☐ Turbidity/transparency benchmark exceedance ☐ Other		
Weather			
Precipitation	Since last inspection	In last 24 hours	
Description of General Site Conditions:			

Inspection of BMPs							
Element 1: Mark Clearing Limits							
BMP:							
Location	Inspected		Functioning				Problem/Corrective Action
		Y	N	Y	N	NIP	
BMP:							
Location	Inspected		Functioning				Problem/Corrective Action
		Y	N	Y	N	NIP	
Element 2: Establish Construction Access							
BMP:							
Location	Inspected		Functioning				Problem/Corrective Action
		Y	N	Y	N	NIP	
BMP:							
Location	Inspected		Functioning				Problem/Corrective Action
		Y	N	Y	N	NIP	

Element 3: Control Flow Rates

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 4: Install Sediment Controls

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 5: Stabilize Soils

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 6: Protect Slopes

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 7: Protect Drain Inlets

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 8: Stabilize Channels and Outlets

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 9: Control Pollutants						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
Element 10: Control Dewatering						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Stormwater Discharges From the Site		
	Observed?	Problem/Corrective Action

	Y	N
Location		
Turbidity		
Discoloration		
Sheen		
Location		
Turbidity		
Discoloration		
Sheen		

Water Quality Monitoring		
Was any water quality monitoring conducted?	☐ Yes	☐ No
If water quality monitoring was conducted, record results here:		
If water quality monitoring indicated turbidity 250 NTU or greater; or transparency 6 cm or less, was Ecology notified by phone within 24 hrs?	☐ Yes	☐ No
If Ecology was notified, indicate the date, time, contact name and phone number below:		
Date:		
Time:		
Contact Name:		
Phone #:		
General Comments and Notes		
Include BMP repairs, maintenance, or installations made as a result of the inspection.		
Were Photos Taken?	☐ Yes	☐ No
If photos taken, describe photos below:		

SEPARATOR SHEET

APPENDIX F

Environmental Documentation

CRITICAL AREAS REPORT

October 2, 2023

13th Street Gas Station

Camas, WA

Prepared for

PAK USA Camas, LLC
c/o Taz Khan
3993 NW Currawong Court
Camas, WA 98607
(512) 779-4999

Prepared by

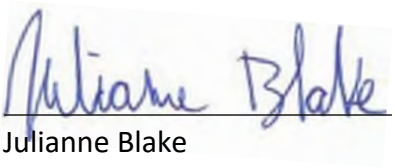
Ecological Land Services

1157 3rd Avenue, Suite 220A • Longview, WA 98632

(360) 578-1371 • Project Number 3934.01

SIGNATURE PAGE

The information in this report was compiled and prepared under the supervision and direction of the undersigned.



Julianne Blake
Biologist III

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INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by PAK USA Camas, LLC to complete a critical areas assessment for wetlands and fish and wildlife habitat conservation areas, for the purpose of future development. The site is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). Field work was conducted on August 29, 2023. This report summarizes the findings of the site visit in accordance with *Camas Municipal Code (CMC) Title 16 Environment* (2023).

SITE DESCRIPTION

The 0.97-acre site consists of Clark County Tax Parcel 176148000 and is accessed by a paved driveway off NE 13th Street. The site is zoned as Business Park (BP) and currently contains a single-family mobile home, shed, carport, and paved driveway. The site is bordered to the north by NE 13th Street, to the east by NW Friberg-Strunk Street, to the south by undeveloped land and commercial development in progress, and to the west by undeveloped land and a single-family residence (Figure 2).

Vegetation onsite consists primarily of regularly mowed grasses, ornamental shrubs, and coniferous and deciduous trees. Topography onsite is generally flat with NE 13th Street and NW Friberg-Strunk Street roughly two feet higher in elevation than the site. One Oregon white oak (*Quercus garryana,* FACU) was identified onsite along the southern property boundary.

METHODOLOGY

The property was evaluated for the presence of wetlands using the Routine Determination Method according to the U.S. Army Corps of Engineers' 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual* (Environmental Laboratory 1987)*; Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010). The Routine Determination Method and defining wetland criteria are discussed further in Appendix A. Wetlands are regulated as "Waters of the United States" by the U.S. Army Corps of Engineers (Corps) and as "Waters of the State" by the Washington Department of Ecology (Ecology), and locally by The City of Camas (City).

ELS biologists evaluated the property on August 29, 2023, to determine the presence or absence of critical areas including streams, wetlands, and priority habitats. One Oregon white oak (oak) was identified onsite, and no wetlands, streams, or other priority habitats were identified. Vegetation, soil, and hydrology data were collected from one test plot (TP) to determine whether wetlands were present onsite. No wetlands were present onsite. TP-1 was taken in the southwest corner of the site in an area with mapped hydric soils. The oak dripline and test plot location were mapped using a hand-held Global Positioning System (GPS) unit capable of sub-meter accuracy under ideal conditions.

VEGETATION

General vegetation consists primarily of regularly mowed grass and ornamental trees and shrubs (Photoplates 1 and 2). One Oregon white oak was observed along the southern site boundary. The plant indicator status following the plant scientific name is defined by the *National Wetland Plant List Indicator Rating Definitions* (Corps 2012) and can be found in Appendix A.

Dominant vegetation consisted of domestic apple trees (*Malus* spp., assumed FAC), Japanese maple (*Acer palmatum*, UPL), rhododendron (*Rhododendron* spp., assumed FACU), Oregon white oak, osoberry (*Oemleria cerasiformis*, FACU), mowed English hawthorn saplings (*Crataegus monogyna*, FAC), swordfern (*Polystichum munitum*, FACU), and fescue grass (*Festuca* spp., assumed FAC). The wetland determination data form contains vegetation information at TP-1 and is in Appendix B.

SOILS

The Natural Resources Conservation Service (NRCS) designates soils onsite as cove silty clay loam, thin solum, 0 to 3 percent slopes (CwA), and Wind River gravelly loam, 0 to 8 percent slopes (WrB) (Figure 3, NRCS 2023B). Of the two soil types found onsite, cove silty clay loam, thin solum, 0 to 3 percent slopes is designated as hydric.

According to soil profile descriptions developed by NRCS, cove silty clay loam, thin solum, is characterized as a poorly drained soil, forming on floodplains, with a depth to water table of 0 to 12 inches below ground surface (BGS). A typical soil profile includes silty clay loam from 0 to 14 inches, clay from 14-21 inches, and silt loam from 21 to 60 inches BGS. Wind River gravelly loam is categorized as a somewhat excessively drained soil with a typical soil profile of gravelly loam from 0 to 4 inches, coarse sandy loam from 4 to 24 inches, and loamy coarse sand from 24 to 60 inches BGS. Wind River gravelly loam forms on floodplains from alluvium parent material and has an average depth to water table of more than 80 inches.

Evaluated soils were characterized as loamy with a value of 4, and a chroma of 3, with no observations of redoximorphic concentrations and meeting no hydric soil indicators. Mapped hydric soils do not necessarily mean that an area is or is not a wetland—hydrology, hydrophytic wetland vegetation, and hydric soils must all be present to classify an area as a wetland. The test plot data form is in Appendix B.

HYDROLOGY

No evidence of wetland hydrology was observed at TP-1 or onsite.

PRECIPITATION

Precipitation data was gathered from the NOAA Regional Climate Centers *Clark County, Washington, WETS Station: Battle Ground*, which is located closest to the site. No rainfall occurred the day of the site visit or in the two weeks prior. Rainfall in June, July, and August was below exceedance levels and approximately 94 percent of August rainfall occurred prior to the site visit. Furthermore, review of the USACE Antecedent Precipitation Tool (APT) indicates rainfall

in the two months preceding the August 29th site visit was drier than normal with a score of 6. A copy of the APT data is provided in Appendix C. Table 1 summarizes the precipitation data.

Table 1. Precipitation Summary

Precipitation (inches)								
Date of Visit	Two Weeks Prior	3 Months Prior		30%	70%	DAREM[1]		
		30 Days Ending	Observed			Value	Weight	Total
8/29/23	8/15/23 – 8/28/23	8/29/23	0.05	0.25	0.99	1	3	3
0.0	0.0	7/30/23	0.0	0.24	0.82	1	2	2
		6/30/23	0.83	1.48	2.80	1	1	1
Rainfall 3 months prior was: **drier than normal** (sum 6-9), normal (sum 10-14), wetter than normal (sum 15-18).[1]								6
Year to Date Average Rainfall[2,3]: 50.06								
Year to Date Actual Rainfall[3]: 45.32								

[1] Direct Antecedent Rainfall Evaluation Methods (Sumner et al 2009)
[2] Includes 94% of August Rainfall
[3] Based on a water year, October 2022 – August 2023

Critical Area Inventories

National Wetlands Inventory

The National Wetlands Inventory (NWI) map does not indicate any wetlands onsite (Figure 4, USFWS 1988). ELS agrees with the NWI mapping, as no wetlands were identified onsite.

Clark County Critical Area Inventory

The Clark County Critical Area Inventory (CCCAI) map does not indicate any wetlands onsite but does indicate potential wetlands presence on the property to the south. Hydric soils are mapped along the eastern site boundary and the southwestern corner, and a habitat area is mapped over the majority of the eastern portion of the site (Figure 5). ELS partially agrees with the CCAI as no wetlands were identified onsite and one oak was observed in the vicinity of the mapped habitat area. The potential wetlands mapped to the south of the site are located in the footprint of a commercial development that has received permit approval. However, ELS does not agree with the extent of the mapped habitat area as only one oak was identified onsite and no other critical habitats were identified.

Washington Department of Natural Resources Stream Type

The Washington Department of Natural Resources (WDNR) Stream Type Map does not depict any streams onsite (Figure 6, WDNR 2023). ELS agrees with the WDNR mapping as no streams were observed onsite.

Priority Habitats and Species

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) maps indicate oak woodland and caves or cave-rich areas on the southern boundary of the site

and within 300 feet of the site to the southwest (Figure 7, WDFW 2023). ELS confirmed the presence of a single oak along the southern site boundary, but no oak woodlands or caves were observed onsite.

Critical area inventory maps are typically used to gather general information about a region and due to the large scale necessary for regional mapping, are limited in accuracy for localized analyses.

Critical Areas Summary

Priority Habitats

Oregon White Oak

Oregon white oaks are considered a priority habitat and are regulated by the Washington Department of Fish and Wildlife (WDFW) and locally by the City of Camas. According to WDFW's Management Recommendations for Washington's priority habitats: Oregon white oak woodlands (Larsen and Morgan, 1998), in urban or urbanizing areas west of the Cascades, priority oak habitat is defined as single oaks, stands of pure oak, or oak/conifer associations, one acre or greater in size. WDFW may also consider individual Oregon white oak trees a priority habitat when found to be particularly valuable to wildlife [i.e., contains many cavities, has a large diameter at breast height (DBH), is used by priority species, or has a large canopy]. The site is within the City of Camas. WDFW recommendation is that in urban and urbanizing areas, single trees should be maintained if they are deemed important to species highly associated with Oregon white oak. Oaks and their associated floras comprise distinct woodland ecosystems with various plant communities providing valuable habitat that contributes to wildlife diversity; oak woodlands provide a mix of feeding, resting, and breeding habitat for many wildlife species (Larsen and Morgan 1998).

The WDFW Priority Habitats and Species online mapping tool depicts oak woodlands within the vicinity of the observed oak along the southern site boundary. One oak tree measuring approximately 52 inches DBH was mapped along the southern site boundary during site reconnaissance (Figure 2). The oak has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. The oak location was mapped using a GPS system capable of submeter accuracy in ideal conditions. According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

Table 2: Oak Summary

Canopy Area	Diameter at Breast Height	Number of Trunks	Noteworthy Habitat Features
0.08 acres	52 inches	1	• Canopy is interconnected with adjacent trees, but not other oaks • Two large cavities

LIMITATIONS

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

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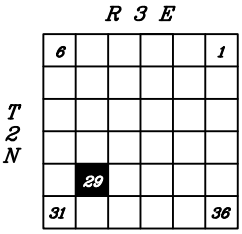
FIGURES AND PHOTOPLATES

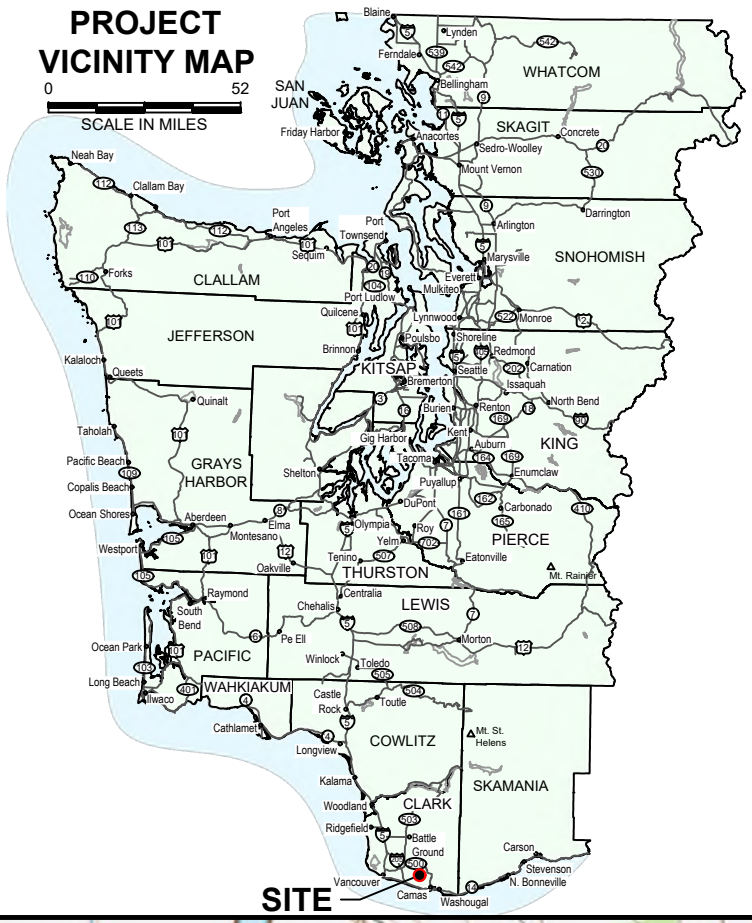
WASHINGTON

45.6321° Latitude
-122.4664° Longitude

LOCATION MAP



PROJECT VICINITY MAP



NOTE:
Quadrangle topographic map from USGS.

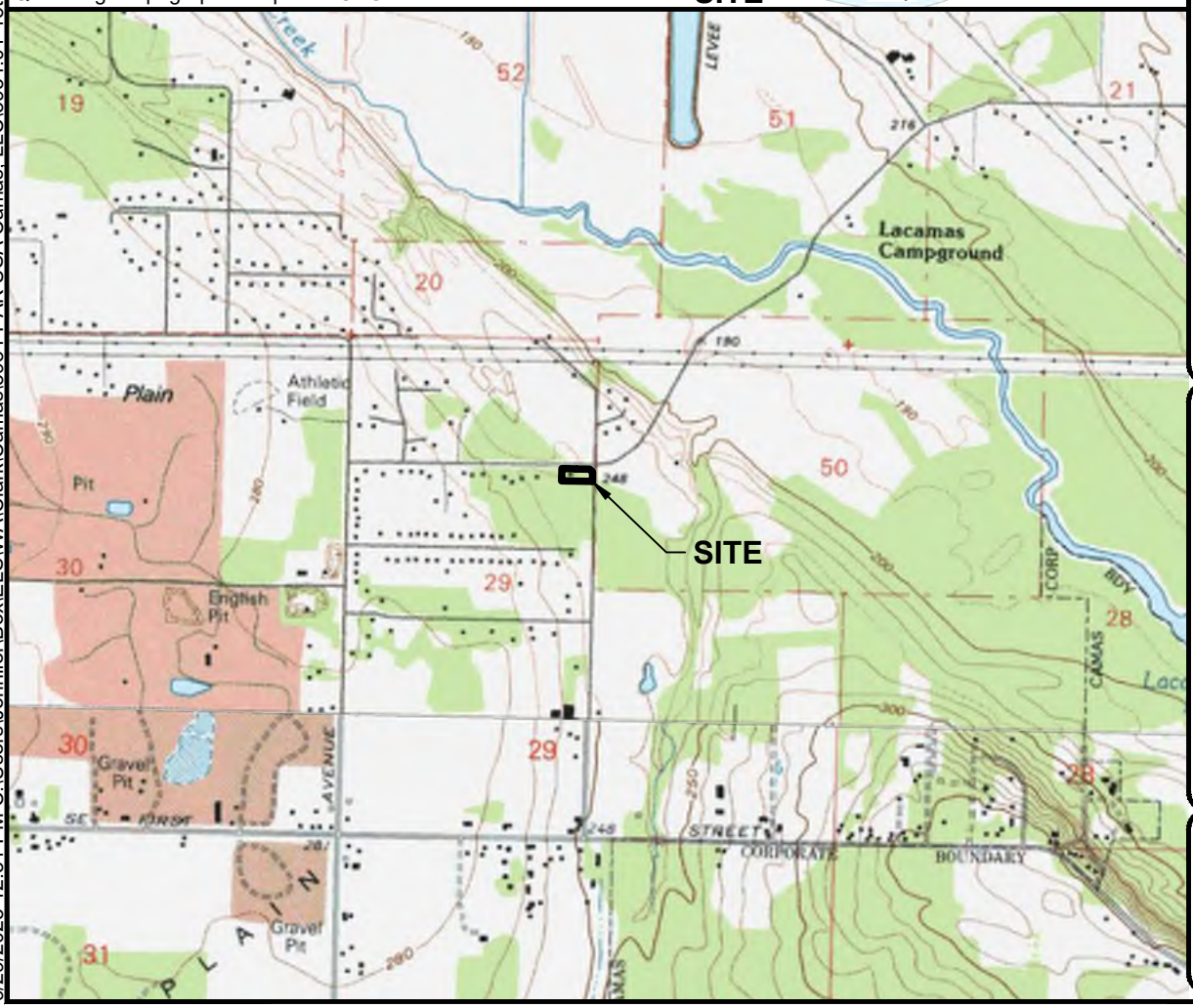


Figure 1
VICINITY MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

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Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com
Ecological Land Services

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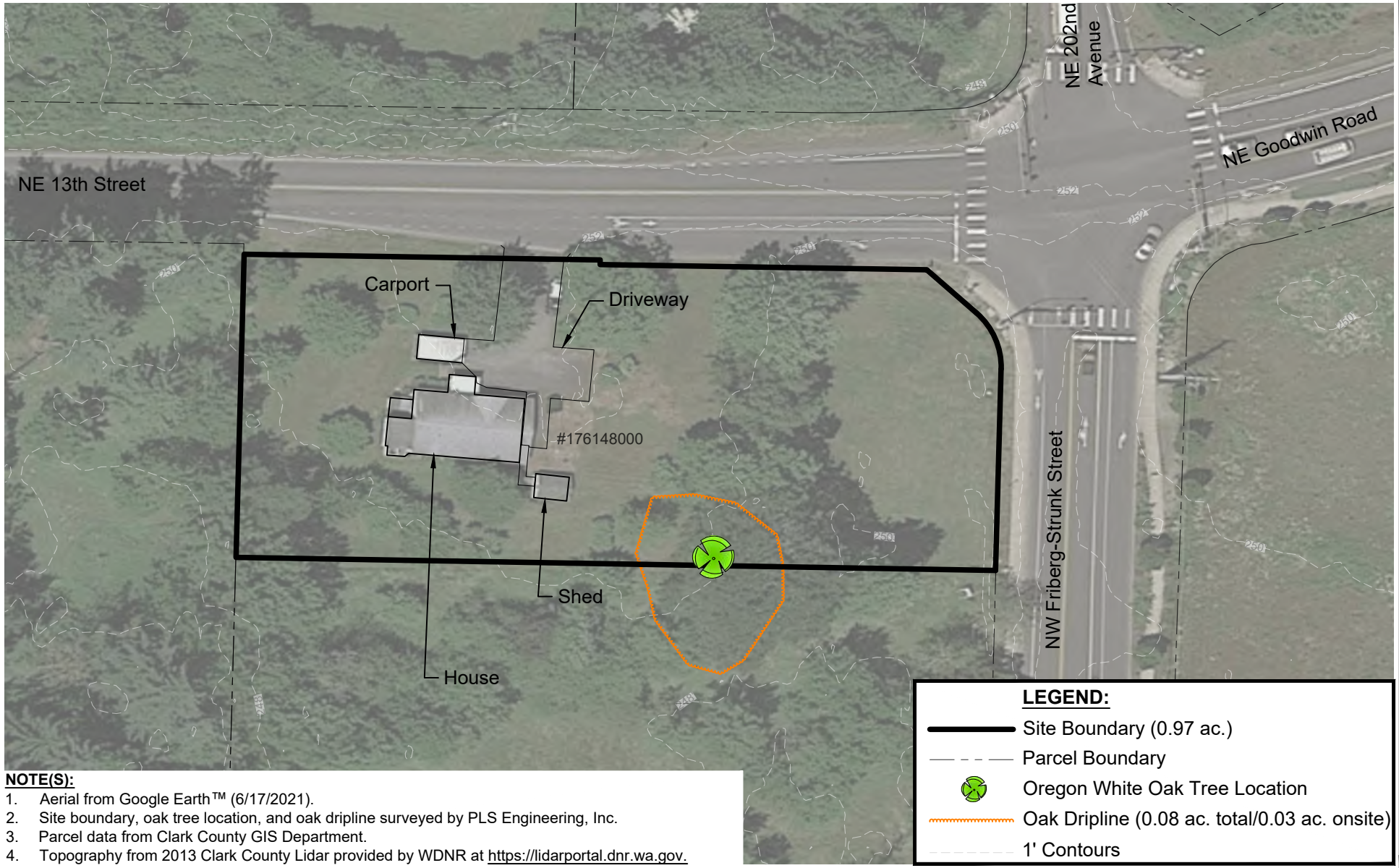

NOTE(S):

1. Aerial from Google Earth™ (6/17/2021).
2. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
3. Parcel data from Clark County GIS Department.
4. Topography from 2013 Clark County Lidar provided by WDNR at https://lidarportal.dnr.wa.gov.

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Figure 2
EXISTING CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

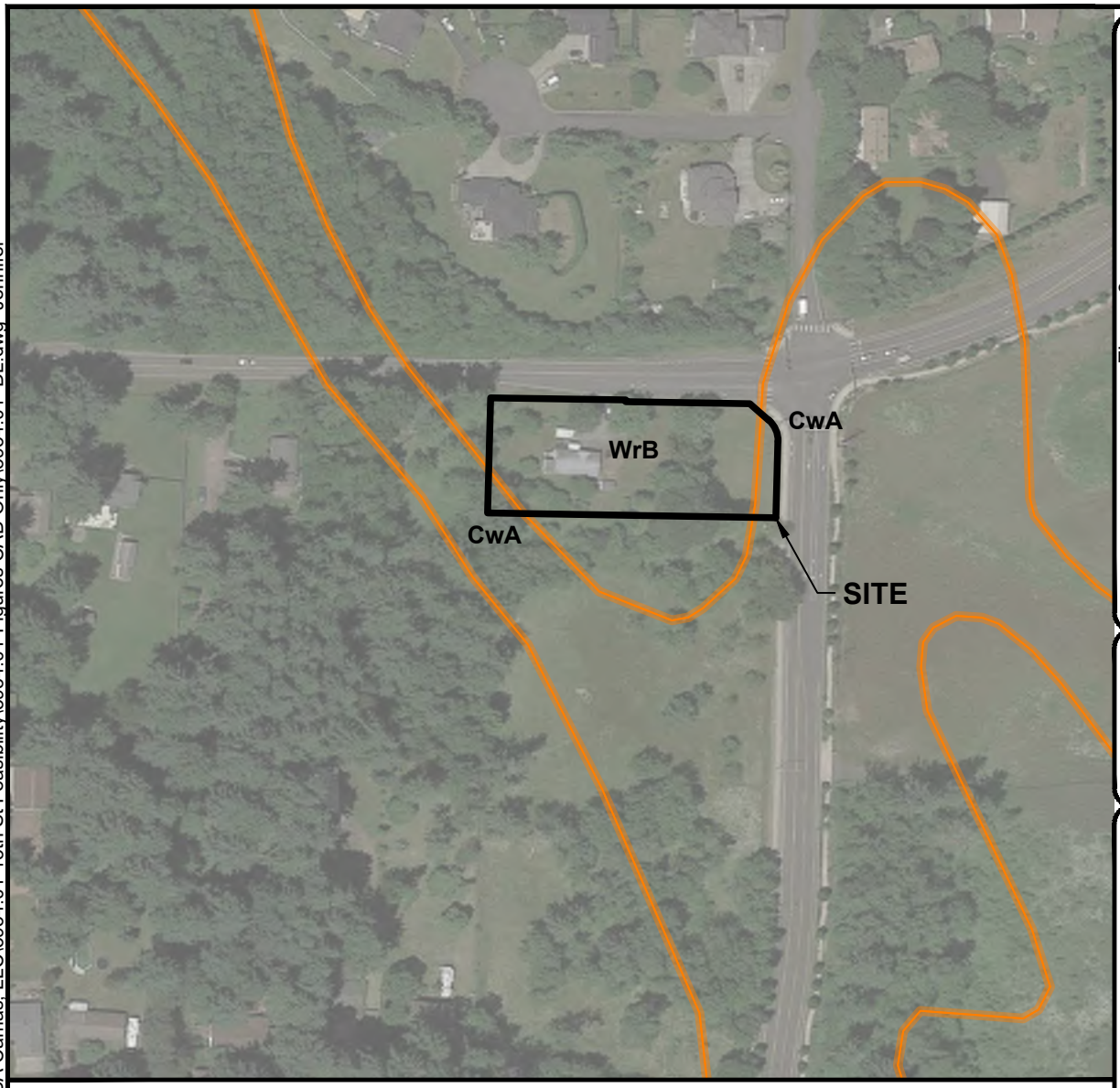

Figure 3
NRCS SOIL SURVEY
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
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LEGEND:

Site Boundary
NRCS Soil Boundary
CwA Cove silty clay loam, thin solum, 0 to 3 percent slopes. **Hydric.**
WrB Wind River gravelly loam, 0 to 8 percent slopes. Not hydric.

NOTE(S):
1. Map provided on-line by NRCS at web address: *http://websoilsurvey.nrcs.usda.gov/app/*

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No mapped wetlands indicated onsite by US Fish & Wildlife Service.

LEGEND:

Site Boundary

Wetlands

Riverine

NOTE(S):

1. Map provided on-line by US Fish & Wildlife Service at web address: *https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper*

Figure 4
USFWS NATIONAL WETLANDS INVENTORY
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
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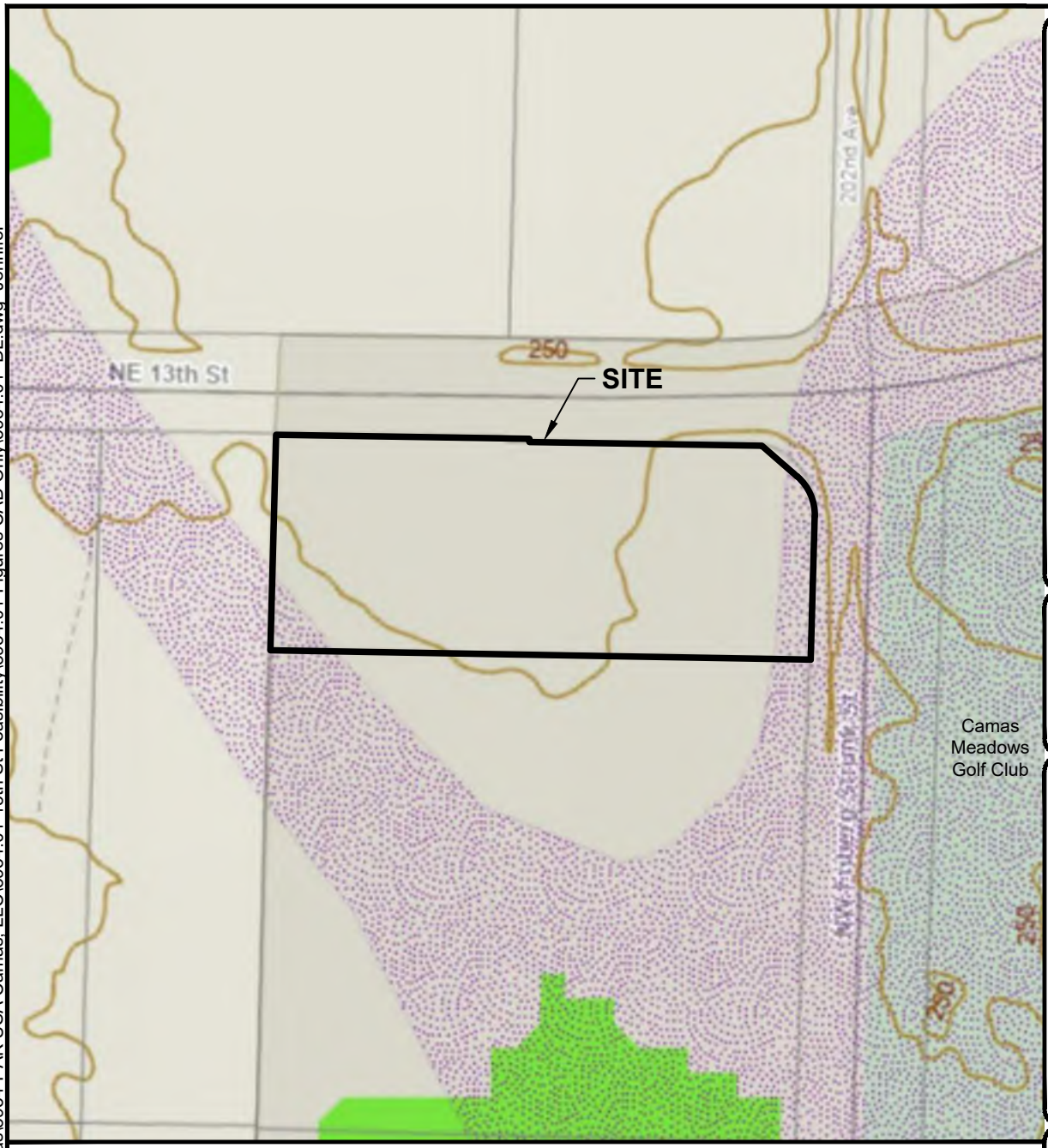

Figure 5
CLARK COUNTY CRITICAL AREAS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
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LEGEND:

Site Boundary

Slopes and Geologic Hazards Group
Contour Lines
Contour Lines - 10 ft

Soils and Wetlands Inventory
Hydric Soils
Potential Wetlands Presence
Permitted Wetland

NOTE(S):
1. Map provided on-line by Clark County at web address: *https://gis.clark.wa.gov/mapsonline/index.cfm?site=Environmental*

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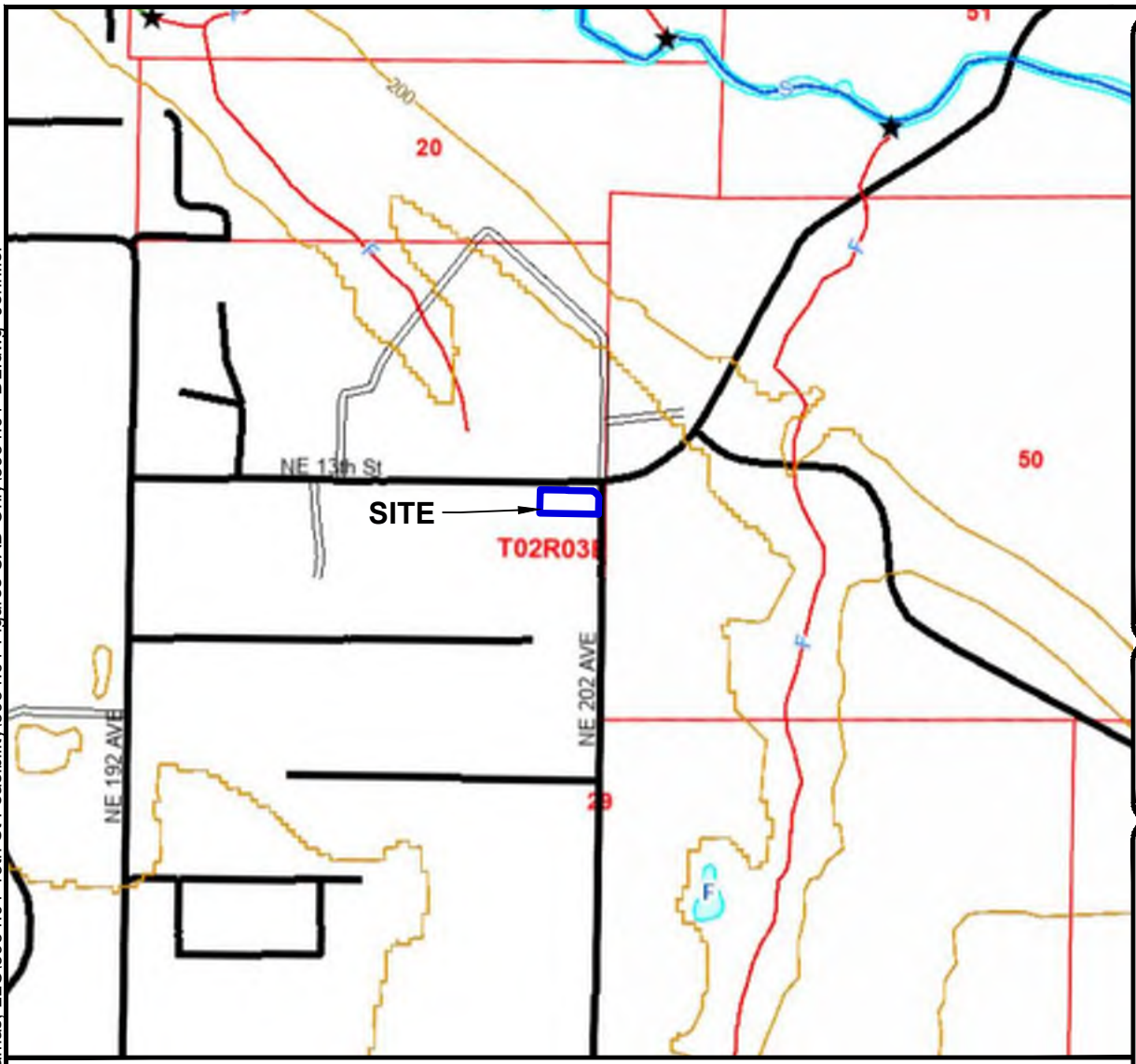

No mapped streams indicated onsite by the Washington State Department of Natural Resources (DNR).

LEGEND:

Site Boundary

40-foot Contours
- 40 ft. Contours

Water Courses (FP)
- Type S
- Type F
- Type N, Np, Ns
- U, unknown
- X, non-typed per WAC 222-16

WRIA Boundaries
- WRIA Boundaries

DNR Roads
- Paved Road
- Unpaved Road/Surface Unknown

Unpaved Road/Surface Unknown
- Water Type Breaks (FP)

NOTE: Map provided on-line by Washington State Department of Natural Resources at web address: *http://fortress.wa.gov/dnr/app1/Fpars/viewer.htm*

Figure 6
WDNR STREAM TYPE MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
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Figure 7
WDFW PRIORITY HABITAT AND SPECIES
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
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LEGEND:

Site Boundary
Parcel Boundary
Oak Woodland - Habitat Feature

By Township
Caves or Cave-rich Areas

NOTE: Map provided on-line by Washington State Department of Fish & Wildlife at web address: *http://apps.wdfw.wa.gov/phsontheweb/*

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Photo 1 was taken facing east and shows general conditions onsite.

Photo 2 was taken facing west and shows general conditions onsite. The oak is visible on the left.

Photo 3 shows the onsite Oregon white oak.

Ecological Land Services

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DATE: 08.29.2023
DWN: JB
PRJ. MGR: JB
PROJ.#: 3934.01

Photoplate 1
13th Street Gas Station
Camas, WA
Section 29, Township 2N, Range 3E, W.M.

Photo 4 was taken facing north at TP-1 and shows general conditions onsite.

Photo 5 was taken facing west.

Photo 6 was taken facing west at TP-1.

Photo 7 was taken facing east at TP-1 and shows general conditions onsite.

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DATE: 08.29.2023
DWN: JB
PRJ. MGR: JB
PROJ.#: 3934.01

Photoplate 2
13th Street Gas Station
Camas, WA
Section 29, Township 2N, Range 3E, W.M.

APPENDIX A

ROUTINE DETERMINATION METHOD AND PLANT INDICATOR RATING DEFINITIONS

Routine Determination Method

The Routine Determination Method is defined according to the U.S. Army Corps of Engineers' 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual* (Environmental Laboratory 1987)*; Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010). The Routine Determination Method examines three parameters – vegetation, soils, and hydrology – to determine if wetlands exist in a given area. Hydrology is critical in determining what is a wetland, but if often difficult to assess because hydrologic conditions can change periodically (hourly, daily, or seasonally). Consequently, it is necessary to determine if hydrophytic vegetation and hydric soils are present, which would indicate that water is present for a long enough duration to support a wetland plant community. By definition, wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Vegetation Indicator Status

The indicator status, following the scientific names of plant species, indicates the likelihood of the species to be found in wetlands according to the *National Wetland Plant List Indicator Rating Definitions* (Corps 2012). Listed from most likely to least likely to be found in wetlands, the indicator status categories are:

- **OBL** (obligate wetland) - occur almost always under natural conditions in wetlands.
- **FACW** (facultative wetland) - usually occur in wetlands, but occasionally found in non-wetlands.
- **FAC** (facultative) - equally likely to occur in wetlands or non-wetlands.
- **FACU** (facultative upland) - usually occur in non-wetlands, but occasionally found in wetlands.
- **UPL** (obligate upland) - occur almost always under natural conditions in non-wetlands.
- **NI** (no indicator) - insufficient data to assign to an indicator category.

APPENDIX B

WETLAND DETERMINATION DATA FORM

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 13th Street Gas Station City/County: Camas/Clark Sampling Date: 08/29/2023
Applicant/Owner: PAK USA Camas, LLC State: WA Sampling Point: TP-1
Investigator(s): J. Blake Section, Township, Range: S29, T2N, R3E
Landform (hillslope, terrace, etc.): Floodplains Local relief: (concave, convex, none): Convex Slope (%): 0-3%
Subregion (LRR): LRRA MLRA2 Lat: 45.6318544 Long: -122.4669931 Datum: NAD83
Soil Map Unit Name: Cove silty clay loam, thin solum, 0 to 3 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes☐ No☒ (If no, explain Remarks.)
Are Vegetation☐, Soil☐, or Hydrology☐ significantly disturbed? Are "Normal Circumstances" present? Yes☒ No☐
Are Vegetation☐, Soil☐, or Hydrology☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** **Yes☐ No☒**
Hydric Soils Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks: TP-1 is located in the southwest corner of the site in an area with mapped hydric soils. TP-1 does not meet all three wetland indicators and is therefore in uplands. Hydrologic conditions were not typical for this time of year, as antecedent rainfall was determined to be drier than normal for the two months prior to the site visit.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Malus* spp.*	20%	yes	FAC
2. *Fraxinus latifolia*	20%	yes	FACW
3. *Robinia pseudoacacia*	20%	yes	FACU
4. *Crataegus monogyna*	15%	yes	FAC
50% = 38 20% = 15	75%	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
50% = ___ 20% = ___	%	=Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *Festuca* spp*	93%	yes	FAC
2. *Iris* spp.*	5%	no	FACW
3. *Rubus ursinus*	2%	no	FACU
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
50% = 50 20% = 20	100%	=Total Cover	
Woody Vine Stratum (Plot size: 15 ft radius)			
1. *Rubus armeniacus*	5%	yes	FAC
2.	%		
50% = 3 20% = 1	5%	=Total Cover	

% Bare Ground in Herb Stratum 0%

Dominance Test Worksheet

Number of Dominant Species That Are OBL, FACW, or FAC:	5	(A)
Total Number of Dominant Species Across All Strata:	6	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	83	(A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x 1=	
FACW species		x 2=	
FAC species		x 3=	
FACU species		x 4=	
UPL species		x 5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A=_____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 – Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes☒ No☐**

Remarks: *Festuca* spp.* and *Malus* spp.* indicator statuses assumed FAC. *Iris* spp.* indicator status assumed FACW.

SOIL

Sampling Point: TP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/3	100%		%			Loam	
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosal (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Minerals (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and Wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: Hardpan
Depth (inches): 6

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (min. of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (Inches): _____
Water Table Present?	Yes ☐	No ☒	Depth (Inches): _____
Saturation Present? (Includes Capillary fringe)	Yes ☐	No ☒	Depth (Inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

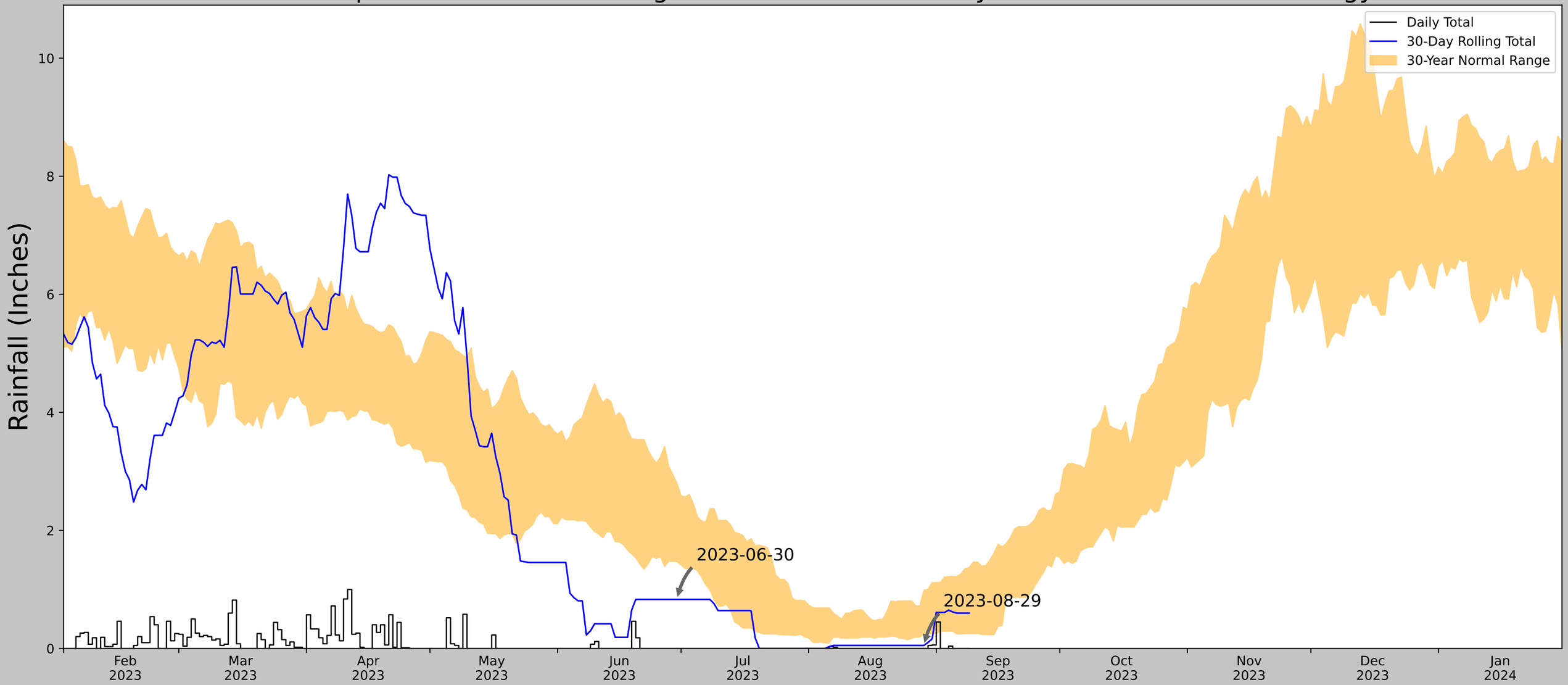
Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrologic conditions were not typical for this time of year, as antecedent rainfall was determined to be drier than normal for the two months prior to the site visit.

APPENDIX C

PRECIPITATION INFORMATION

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	45.632018, -122.467297
Observation Date	2023-08-29
Elevation (ft)	253.44
Drought Index (PDSI)	Severe drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-29	0.253543	0.986221	0.051181	Dry	1	3	3
2023-07-30	0.24252	0.814961	0.0	Dry	1	2	2
2023-06-30	1.475197	2.795276	0.830709	Dry	1	1	1
Result							Drier than Normal - 6

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
BATTLE GROUND	45.7717, -122.5286	284.121	10.094	30.681	4.852	11318	69
BATTLE GROUND 0.8 N	45.794, -122.5443	316.929	1.716	32.808	0.828	0	1
BATTLE GROUND 1.2 NE	45.7958, -122.5275	361.877	1.666	77.756	0.879	0	20
VANCOUVER 4 NNE	45.6775, -122.6514	220.144	8.8	63.977	4.523	4	[illegible]
MERWIN DAM	45.955, -122.5625	224.081	12.769	60.04	6.513	31	0

SEPARATOR SHEET

OAK BANK USE PLAN

October 2, 2023

13th Street Gas Station
Camas, WA

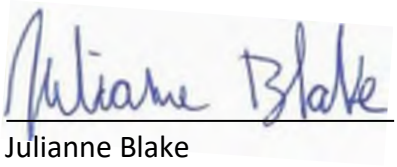
Prepared for

PAK USA Camas, LLC
c/o Taz Khan
3993 NW Currawong Court
Camas, WA 98607
(512) 779-4999

Prepared by
Ecological Land Services
1157 3rd Avenue, Suite 220A • Longview, WA 98632
(360) 578-1371 • Project Number 3934.01

SIGNATURE PAGE

The information in this report was compiled and prepared under the supervision and direction of the undersigned.



Julianne Blake
Biologist III

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INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by PAK USA Camas, LLC to prepare this Oak Bank Use Plan to address Oregon white oak (oak) impacts resulting from the construction of a fuel station, convenience store, and associated parking lot. The site is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). Field work was conducted on August 29, 2023. The project will remove one existing oak (*Quercus garryana*) and impact 0.08 acres (3,456 square feet) of oak canopy. Canopy impacts will be offset by purchasing 0.238 credits from Terrace Oak Bank (Bank). This Bank Use Plan was prepared according to the *Camas Municipal Code (CMC) Title 16 Environment* (2023) and Washington Department of Fish and Wildlife's (WDFW) *Management recommendations for Washington's priority habitats: Oregon white oak woodlands (1998)*.

RESPONSIBLE PARTIES

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MITIGATION BANK
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BIOLOGICAL CONSULTANT
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Julianne Blake – Biologist III
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Project Description

The project area is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). The project consists of constructing a fuel station, convenience store, and associated parking lot. The parking lot will contain electric vehicle charging stations and vacuum pumps as well as pedestrian crossing areas (Figure 3). The existing oak will be removed as part of the project, removing 0.08 acres (3,546 square feet) of oak canopy. Canopy impacts will be mitigated by purchasing 0.238 credits from Terrace Oak Bank. Construction is anticipated to start upon receipt of all necessary permits.

Best management practices (BMPs) that will be completed prior to construction include designating staging and stockpile areas outside of critical areas and associated buffers, establishing a standard construction entrance, and installing silt fencing to prevent sedimentation. When site preparation is complete, construction will occur. A water truck will be available to prevent dust blowing during construction, if needed. Equipment used may include haul trucks, bulldozers, excavators, pavers, and hand tools. Upon completion of construction activities, disturbed areas that will not be paved will be seeded with a native grass seed mix.

Existing Conditions

Existing and Surrounding Land Uses

The 0.97-acre site consists of Clark County Tax Parcel 176148000 and is accessed by a paved driveway off NE 13th Street. The site is zoned as Business Park (BP) and currently contains a single-family mobile home, shed, carport, and paved driveway. The site is bordered to the north by NE 13th Street, to the east by NW Friberg-Strunk Street, to the south by undeveloped land and commercial development in progress, and to the west by undeveloped land and a single-family residence (Figure 2).

Existing Critical Areas

A site visit was completed by ELS in August 2023 following the appropriate technical manuals: *The Routine Determination Method according to the Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010). During the field visit, no wetlands were identified onsite (ELS 2023).

The WDFW Priority Habitats and Species online mapping tool depicts oak woodlands within the vicinity of the observed oak along the southern site boundary. One oak measuring approximately 52 inches diameter at breast height (DBH) was mapped along the southern site boundary during site reconnaissance (Figure 2). The oak has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. The oak location was mapped using a GPS system capable of submeter accuracy in ideal conditions. According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

Table 1. Oak Summary

Total Canopy Area	DBH	Number of Trunks	Noteworthy Habitat Features
0.08 acres 3,456 square feet	52 inches	1	• Canopy is interconnected with adjacent trees, but not other oaks • Two large cavities

Avoidance and Minimization

The preferred mitigation sequencing of first avoidance, then minimization, and finally compensation for unavoidable impacts was taken into consideration during the design process of this project; however, due to the single oak tree being located in an area of the site needed for a required driveway, avoiding Oregon white oak impacts altogether is not feasible. The Oregon white oak proposed for removal is the only oak tree onsite.

Unavoidable Oregon White Oak Impacts

Removal of the oak will result in the loss of 0.08 acres (3,456 square feet) of Oregon white oak priority habitat as measured by the oak canopy coverage (drip line). The following table summarizes proposed oak impacts.

Table 2. Oak Impact Summary

Identifier	DBH	Canopy Coverage	Total Impact
Oregon White Oak (Single Mature Tree)	52 inches	0.08 acres 3,456 square feet	0.08 acres 3,456 square feet

Impacted Priority Habitat Functions

ELS assessed the functions provided by the oak during a site visit on August 29, 2023. The functional assessment is based on Washington Department of Fish and Wildlife's (WDFW) *Management Recommendations for Washington's Priority Habitats, Oregon White Oak Woodlands* (Guidance) (Larsen and Morgan 1998).

Habitat Functions

Oak woodlands are considered "priority habitat and species" by WDFW and are protected locally by the City of Camas Municipal Code (*CMC*). According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

In urban or urbanizing areas west of the Cascades, WDFW defines priority oak habitat as single oaks, or stands of pure oak, or oak/conifer associations, 1 acre or greater in size. WDFW may also consider individual Oregon white oak trees a priority habitat when found to be particularly valuable to wildlife (i.e., contains many cavities, has a large DBH, is used by priority species, or has a large canopy) (Larsen and Morgan 1998). The project site is within the City of Camas (City). WDFW recommendation is that in urban and urbanizing areas, single trees should be maintained

if they are deemed important to species highly associated with Oregon white oak. Oaks and their associated flora comprise distinct woodland ecosystems with various plant communities providing valuable habitat that contributes to wildlife diversity. Oak woodlands provide a mix of feeding, resting, and breeding habitat for many wildlife species (Larsen and Morgan 1998).

The oak proposed for removal has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. Due to the placement of the oak within the City boundaries and lack of habitat connectivity, larger animals or those not adapted to urban conditions are not likely to be present. Therefore, removing the oak would likely result in habitat loss and a food source only for birds and small mammals that are well adapted to urban conditions.

Oregon White Oak Mitigation Selection Rationale

The Oregon white oak proposed for removal is located in the service area for the Terrace Oak Bank (Bank). The oak tree is approximately 4 miles southeast of the Bank, in the Lacamas Creek Watershed which is in the southeastern portion of the service area (Figure 4). The proposed oak removal will be mitigated by purchasing credits from the Bank at ratios specified in the Terrace Oak Bank's Mitigation Banking Instrument (MBI).

Rationale for selecting this mitigation bank is as follows:

- The oak onsite does not provide habitat for other priority species that should be replaced onsite. Habitat functions will be impacted for species common to urban areas, which can be fully replaced at the Bank.

- The habitat functions lost from the proposed oak removal correspond directly with the habitat creation purpose, goals, and objectives at the Bank which identifies 13.93 acres of existing Oregon white oak woodland WDFW Priority Habitat that will be restored to pre-agricultural conditions through creation, enhancement, and preservation. Creation and enhancement will be accomplished through planting oak saplings and/or native understory plantings, removing of Douglas-fir, and establishing a conservation easement over the entire 13.93 acres.

The 2008 *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule* (Corps) recommends purchasing mitigation bank credits for ecological considerations (lower risk of failure and lower temporal loss of resources and services) and to avoid the maintenance and contingency issues and outright failures that often accompany permittee-responsible mitigation sites. Use of the Terrace Oak Bank substantially lowers the risk of failure and temporal loss of resource functions and services over newly established, permittee-responsible mitigation sites and offsite mitigation is anticipated to be more meaningful and beneficial to the watershed's habitat functions.

Functions Provided at Oak Bank

The general goal of the Bank is to restore the approximately 13.93 acres to a state similar to its pre-agricultural condition through creation, enhancement, and preservation of an existing Oregon white oak woodland. All functions related to oak habitat are expected to increase as a result of design implementation. The primary ecological goals of the Bank are as follows:

- Removal of all existing impervious surfaces, including buildings, large equipment, gravel and paved areas, and debris, followed by replanting oak saplings and native understory species.
- Removal of invasive species in creation, enhancement, and preservation areas, primarily English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus armeniacus*).
- Removal of Douglas-fir (*Pseudotsuga menziesii*) overstory as recommended by WDFW to reduce competition and further degradation of the Oregon white oak woodland from shading.
- Replanting of both creation and enhancement areas with oak saplings and and native understory species to augment and expand existing Oregon white oak habitat.
- Preserve the Bank through a conservation easement.

Wildlife Habitat

The proposed development site plan will provide diverse habitat for a variety of large and small mammals, songbirds, waterfowl, amphibians, and insects by improving the condition of the existing Oregon White Oak habitat through creation and enhancement that includes replanting of oaks and native understory, removing invasive species, non-native debris, and impervious surfaces, and eliminating Douglas-fir encroachment.

Anticipated Functional Lift

The creation, enhancement, and Douglas-fir stand release activities proposed in the Bank will provide a variety of benefits lifting overall habitat functions. Invasive species eradication and installing oak trees and native understory in open areas will increase the site's potential to provide habitat by providing improved and increased diversity of plant species, structure, and interspersion of habitat. Removing Douglas-fir competition will allow the existing oaks to increase branching and smaller oak trees to become better established. The changes will increase acorn production, provide additional food for wildlife, and support a greater diversity of wildlife species as will removing impervious surfaces and debris. All functions impacted by removing an oak tree at the project site will be fully mitigated at the Bank.

Proposed Mitigation Credits

As stated in the MBI (October 28th, 2020), the local jurisdiction with regulatory authority will determine both how impacts are measured[1] and the mitigation ratios required. The mitigation

[1] i.e., square foot of canopy area/root zone, DBH, etc.

credits required for impacts to Oregon white oak will be determined by using the local jurisdiction's mitigation ratio (6:1) and multiplying this ratio by a "risk reduction factor" of 0.5. Impacts to high functioning Oregon White Oak Priority Habitat stands will be determined by the regulatory agencies on a case-by-case basis. Table 3 summarizes the impact type, mitigation ratio, and total credits proposed for compensation.

Table 3. Credits for Oak Impacts at Terrace Oak Bank

Impact Type	Impact Amount	Mitigation Ratio	Risk Reduction Multiplier	Mitigation Area Required	Proposed Credit Purchase
Canopy loss	0.08 acres (3,456 sq. ft.)	6:1	0.5	0.238 acres (10,368 sq. ft.)	0.238 credits

Credit Purchase or Transfer Timing

Following permit issuance, PAK USA Camas, LLC, as the applicant, will enter into a Buy/Sell Agreement with Terrace Oak Bank, for purchase of mitigation credits (in the quantity specified in Table 3) that would appropriately mitigate for the proposed project impacts. The actual purchase of credits will occur upon permit issuance. Prior to impacting the project oak, the applicant will submit proof of transfer of mitigation credits to project managers for the City of Camas. Proof of the mitigation transfer will be provided in the form of a notification letter to the approving agencies. Upon service of this notification, the mitigation requirement to purchase 0.238 mitigation credits will be fully satisfied.

Confirmation of Mitigation Credit Availability

Proof of the current number of available mitigation credits at the Terrace Oak Bank site will be confirmed by the approving agency, City of Camas and through the advising members of the Oak Bank Review Team.

Chair:
Brent Davis, Wetland and Habitat Review Program Manager
Clark County Community Development
P.O. Box 9810
Vancouver, WA 98666-9810
(360) 397-2375 ext. 4152
brent.davis@clark.wa.gov

Advisory Members:
Dave Howe, Area Habitat Biologist
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Washington Department of Natural Resources
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Vancouver, WA 98685
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LIMITATIONS

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

REFERENCES

City of Camas. 2023. *Camas Municipal Code (CMC) Title 16 Environment.* Camas, Washington. July 31, 2023.

Ecological Land Services, Inc. (ELS). 2023. *Critical Areas Report for 13th Street Gas Station, Camas, Washington*. September 26, 2023.

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Larsen, E. M., and J. T. Morgan. 1998. *Management recommendations for Washington's priority habitats: Oregon white oak woodlands*. Washington Department of Fish and Wildlife, Olympia. 37pp.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1. U.S. Army Corps of Engineer Waterways Experiment Station. Vicksburg, Mississippi.

Interagency Review Team for Washington State. February 19, 2009. *Using Credits from Wetland Mitigation Banks: Guidance to Applicants on Submittal Contents for Bank Use Plans*. Online http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/pdf/mitig_ plan_guidance.pdf. Accessed August 2023.

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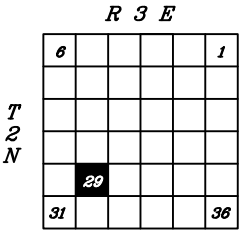
U.S. Army Corps of Engineers (Corps). 2010. *Final Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-13. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.

FIGURES

WASHINGTON

45.6321° Latitude
-122.4664° Longitude

LOCATION MAP



PROJECT VICINITY MAP

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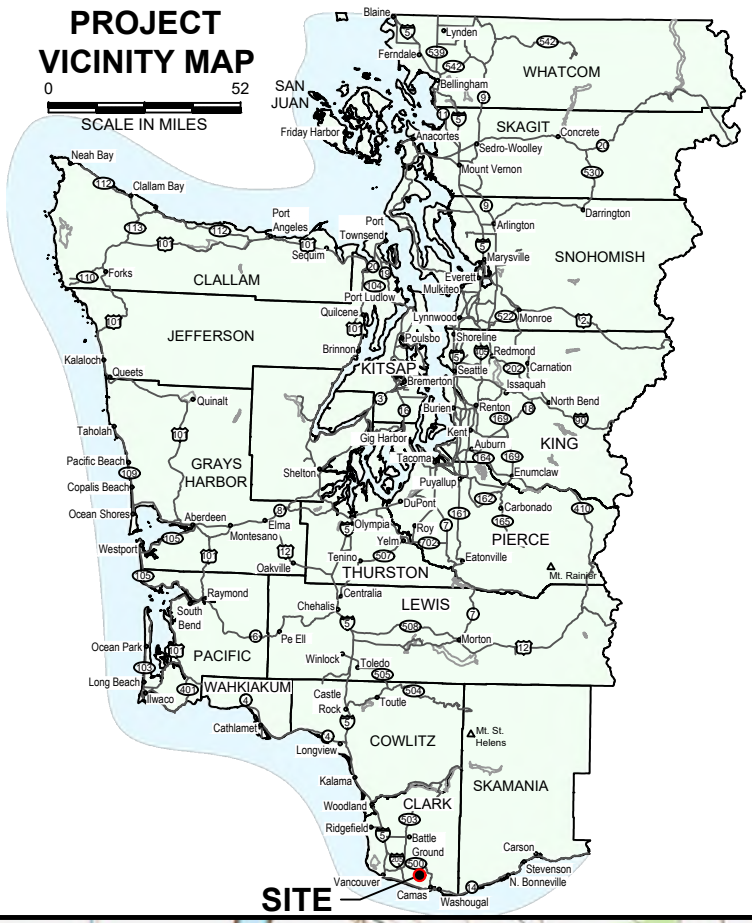

NOTE:
Quadrangle topographic map from USGS.

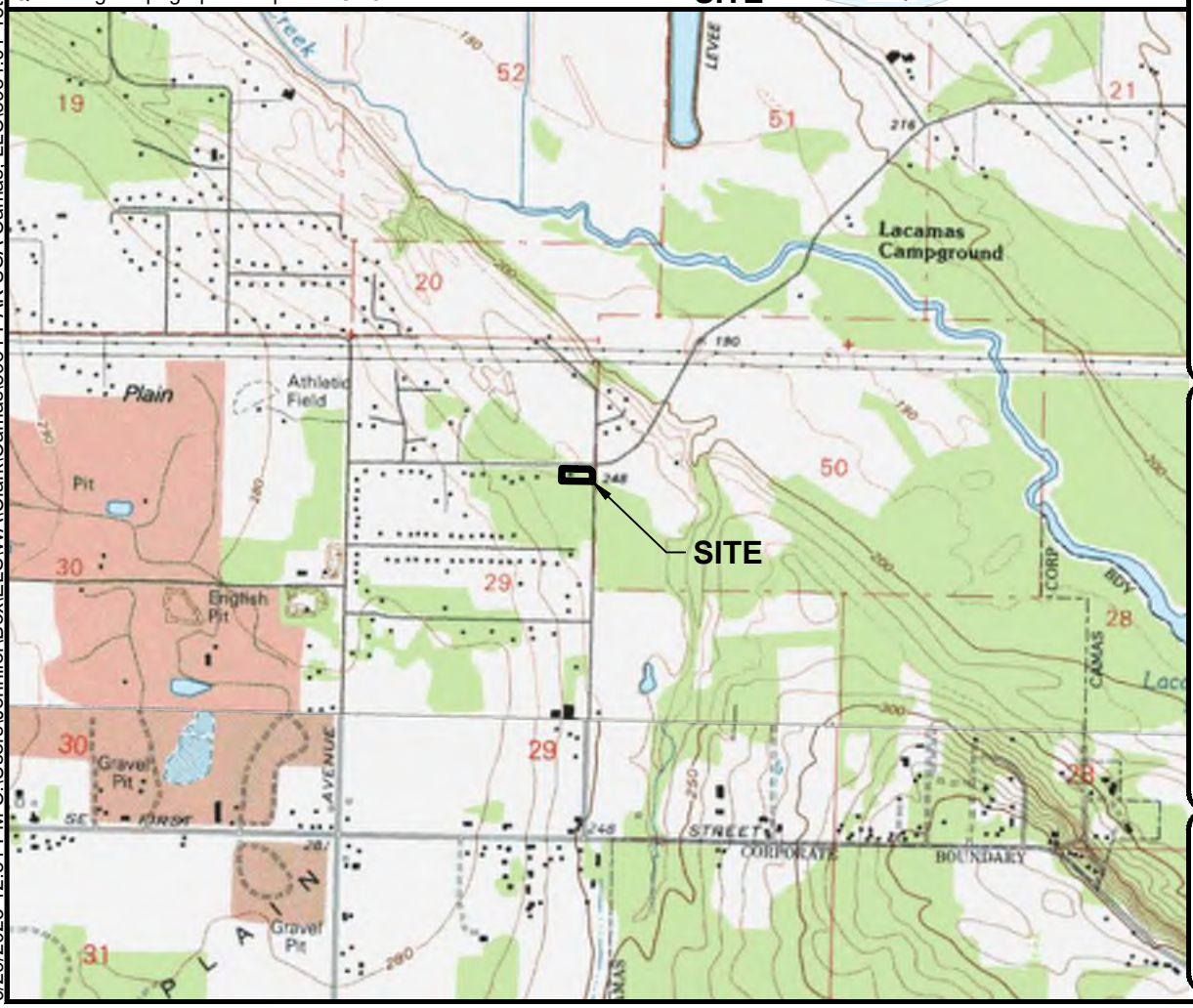

Figure 1
VICINITY MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

1157 3rd Ave., Suite 220A
Longview, WA 98632
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Ecological Land Services

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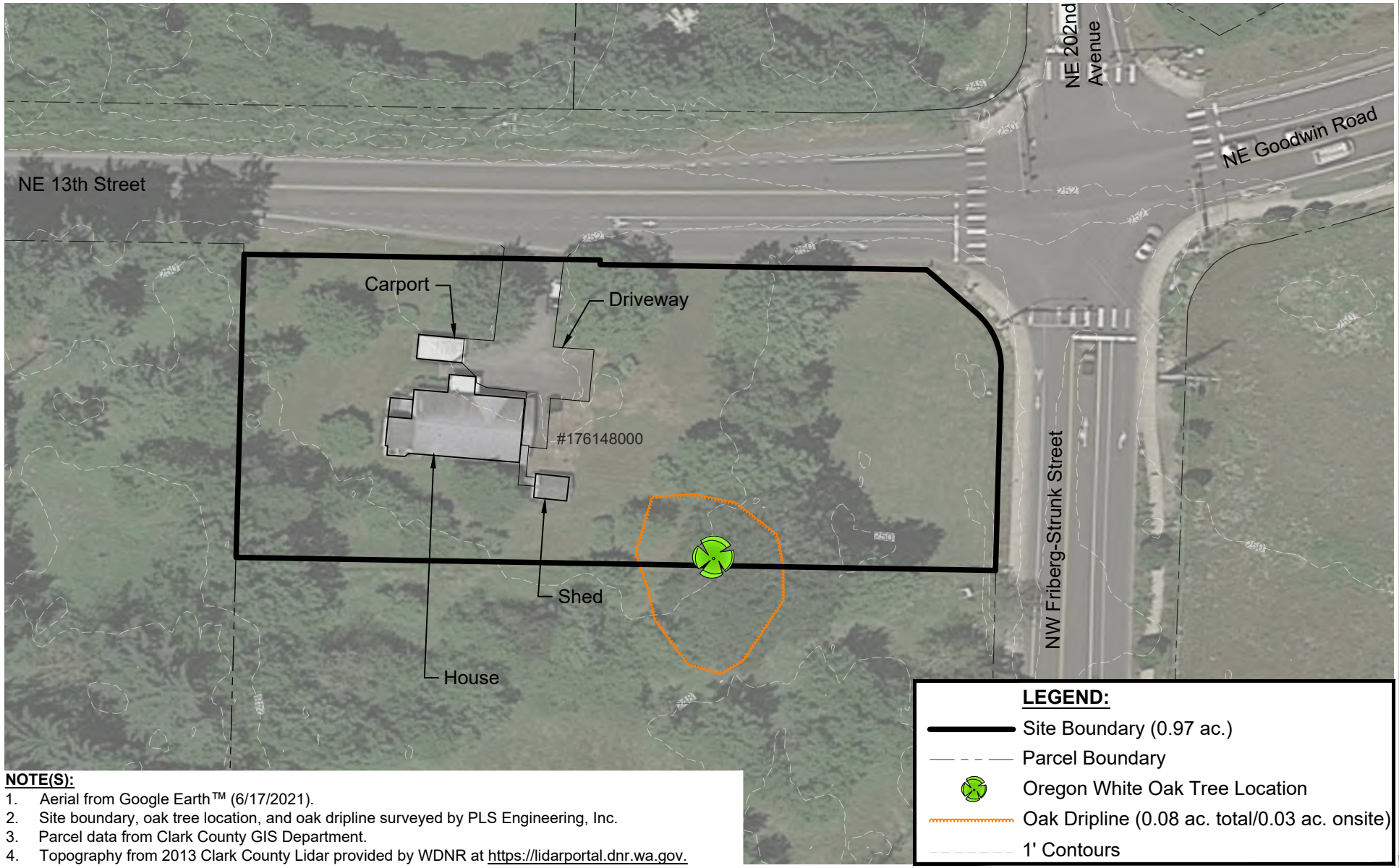

NOTE(S):

1. Aerial from Google Earth™ (6/17/2021).
2. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
3. Parcel data from Clark County GIS Department.
4. Topography from 2013 Clark County Lidar provided by WDNR at https://lidarportal.dnr.wa.gov.

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DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 2
EXISTING CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

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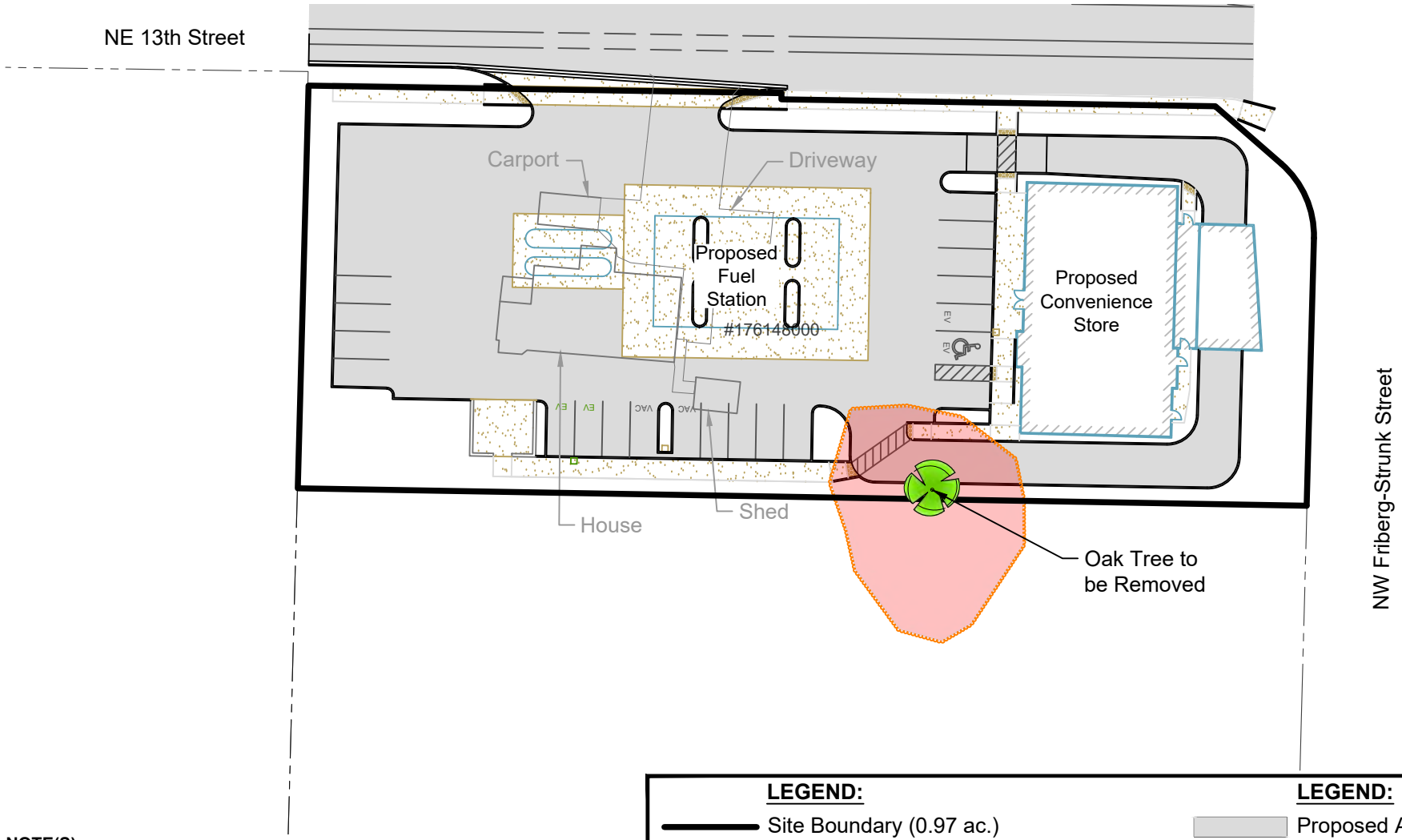

NOTE(S):

1. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
2. Parcel, ditch, and culvert data from Clark County GIS Department.
3. Site plan by PLS Engineering.

LEGEND:

- Site Boundary (0.97 ac.)
- Parcel Boundary
- Oregon White Oak Tree Location
- Oak Dripline (0.08 ac. total/0.03 ac. onsite)

LEGEND:

- Proposed Asphalt
- Proposed Concrete
- Oak Dripline Impact (3,546 sq. ft./0.08 ac.)

N W E S

0 50 100
SCALE IN FEET

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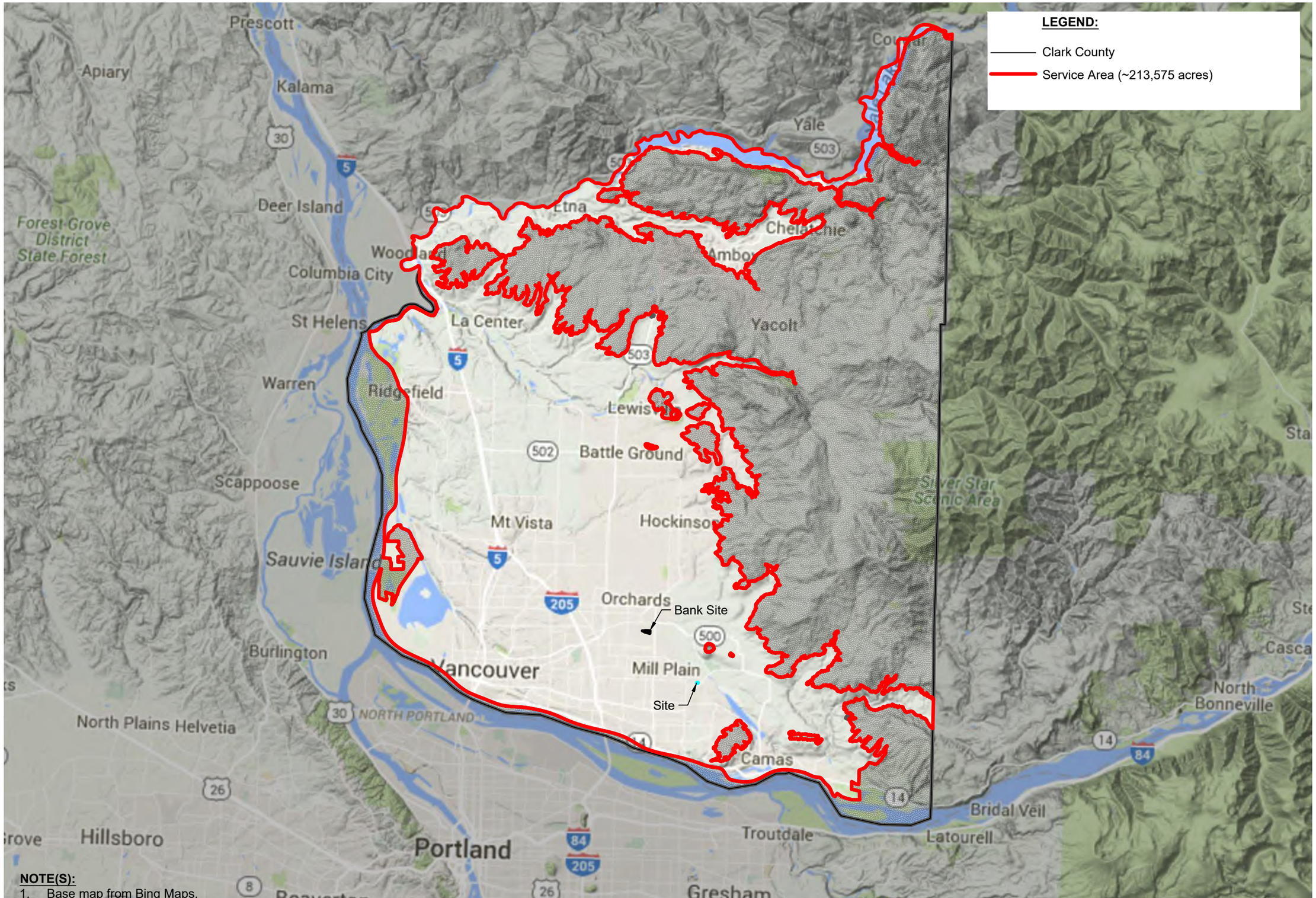
DATE: 9/29/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 3
PROPOSED CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.



NOTE(S):
1. Base map from Bing Maps.

Figure 4
TERRACE OAK BANK SERVICE AREA
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/26/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

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0 4 8
SCALE IN MILES

N W E S

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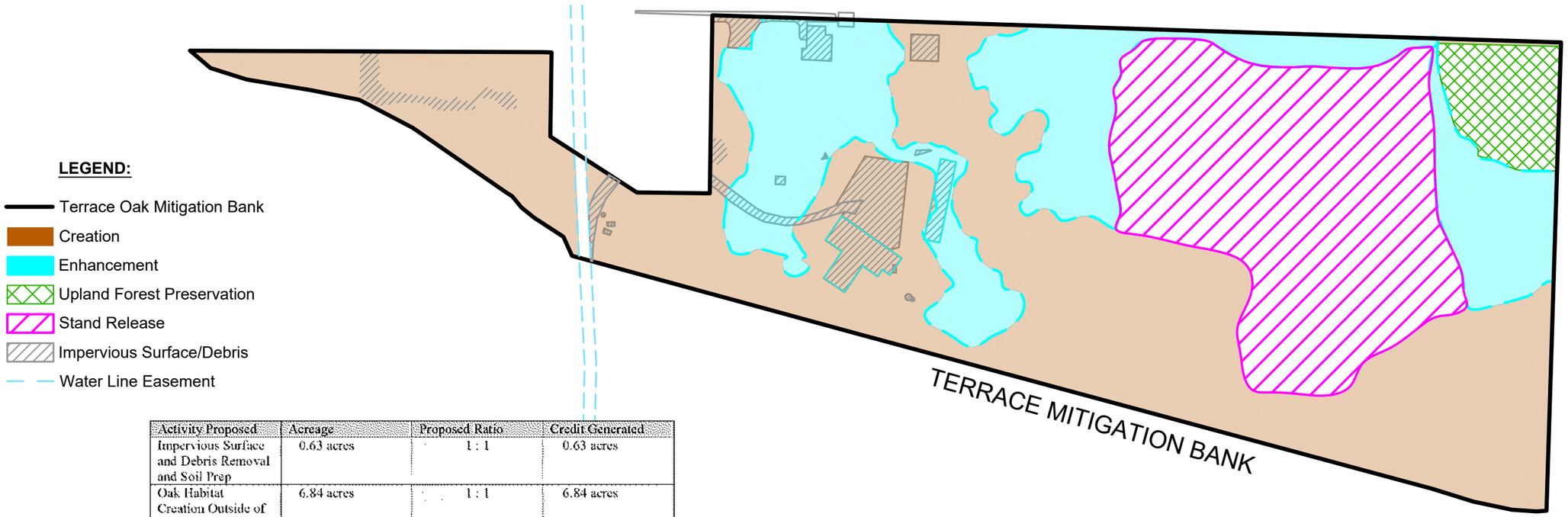

Activity Proposed	Acreage	Proposed Ratio	Credit Generated
Impervious Surface and Debris Removal and Soil Prep	0.63 acres	1 : 1	0.63 acres
Oak Habitat Creation Outside of Existing Oak Stand	6.84 acres	1 : 1	6.84 acres
Douglas Fir Stand Release	3.34 acres	0.4 : 1	8.35 acres
Enhancement of Existing Oak Stand	3.20 acres	0.4 : 1	8.00 acres
Upland Forest Preservation	0.50 acres	0.5 : 1	1.00 acres
Totals	14.51 acres[1]		24.82 acres

[1] Total acreage includes areas of activity overlap and does not include 0.05 acres of water line easement, so is not reflective of the 13.93 acres represented in the legal survey of Oak Bank area.

Table 2. Oak Mitigation Bank Activity Descriptions.

Activity Proposed	Type of Activity/Area
Impervious Surface and Debris Removal and Soil Prep	• Includes: • Buildings, driveways, gravel pads or any other impervious area to be removed (regardless of whether oak tree canopy already covers the area) • Removal of debris piles throughout the site • Loosening of soils following impervious/debris removal
Oak Habitat Creation Outside of Existing Oak Stand	• Includes open areas of all types not currently covered by oak canopy • Areas to be replanted with oak suplings and native understory
Douglas Fir Stand Release	• Includes area of dense fir canopy within existing oak stand • Douglas fir over-story to be removed through harvest or tree girdling/snag creation
Enhancement of Existing Oak Stand	• Includes areas of existing oak canopy • Enhancement areas will have non-natives removed and understory planted with native shrubs typically associated with oak woodlands
Upland Forest Preservation	• Includes areas of deciduous forest adjacent to oak canopy, providing upland forest habitat • Area will be preserved through administration of a conservation easement

Figure 5
TERRACE OAK BANK SITE DESIGN
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 9/26/23
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com
Ecological Land Services

0 150 300
SCALE IN FEET

N W E S

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

December 19, 2023

Travis Johnson
pm@plsengineering.com
Taz Khan
tkhanusa@gmail.com

RE: Completness Review for 20101 NE 13th Street – Planning Cases SPRV23-06, ARCH23-07, CA23-08, DR23-09 and SEPA23-12

Dear Travis,

Thank you for your recent resubmittal. Upon review of the additional information received on December 4, 2023, your project can be deemed **technically complete**. However, comments from Engineering include items that will need to be addressed during the review process. Please see below for more information.

CMC 18.18.040.E:

- A circulation plan was submitted on December 1, 2023.
    - However, the circulation plan should include circulation for the fuel delivery trucks and deliveries through the site, e.g., from the entrance through to the east or west and around to the south and exiting the site.
- The TIA traffic impact analysis has been sent to City of Vancouver (COV) for review and comments.
    - Staff will provide comments from COV when comments are received.
    - Staff will provide comments after a thorough review is completed.

CMC 18.18.040.F:

- The PTIR was resubmitted with the correction to the narrative on December 1, 2023.
    - Staff will provide any additional comments after a thorough review is completed.
- The preliminary stormwater plans were submitted on December 1, 2023.

Staff will begin reviewing the complete application and will contact you if we have comments and/or questions. A final decision should be issued within 120 -days, provided that all comments from Engineering noted above have been addressed and satisfied.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,

Yvette Sennewald, Senior Planner

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

Date Published: February 22, 2024

To Whom It May Concern:

Please find enclosed a Determination of Non-Significance (DNS) for the **13th Street Gas Station (SEPA23-12)** that was issued pursuant to the State Environmental Policy Act (SEPA) Rules, Chapter 197-11, Washington Administrative Code. The enclosed review comments reflect evaluation of the environmental checklist by the lead agency as required by WAC 197-11-330(1)(a)(i).

The following materials were submitted with the initial application:

- Application Form and Fees
- Applicant's narrative
- Archaeological Predetermination*
- Critical Areas Report
- Geotechnical Study
- Project Plans
- Public Health Review Letter
- SEPA checklist
- Stormwater Drainage Report

All application materials are available for review upon request from the Community Development Department. *Archaeological information is exempt from public disclosure, consistent with RCW 42.56.300.

Written comments may be submitted on this determination within fourteen (14) days of its issuance, after which the DNS will be reconsidered in light of the comments received.

Please address all correspondence to:

City of Camas, SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607
communitydevelopment@cityofcamas.us

Distribution:

Applicant
Bureau of Indian Affairs
C-Tran
Camas School District
Camas Building Official, Bob Cunningham
Camas Communications Director, Bryan Rachal
Camas Community Development Director, Phil Bourquin
Camas Engineering Department Managers and Staff
Camas Fire Department, Randy Miller
Camas Finance Director, Cathy Huber Nickerson
Camas Interim Mayor and City Council Members
Camas Parks and Recreation, Trang Lam
Camas Planning Manager and Staff
Camas Police Chief, Mitch Lackey
Camas Public Works Director, Steve Wall
Camas Public Library, Connie Urquhart
Camas-Washougal Post Record
Chinook Indian Nation
Cultural Resource Program, Cowlitz Indian Tribe
Cultural Resource Program, Yakama Indian Nation
Clark County Department of Environmental Services
Clark County Department of Transportation
Clark County Natural Resources Council
Clark Public Utilities
Department of Ecology
Department of Fish and Wildlife, Region 5
Department of Natural Resources, SEPA Center
Southwest Clean Air Agency
US Army Corps of Engineers
Vancouver- Clark Parks & Recreation
Washington Office of Archaeology & Historic Preservation
Washington State Department of Transportation
Washington State Parks and Recreation Commission, Environmental Program
Property Owners within 300 feet *(mailed the SEPA Determination & map)*

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SEPA23-12 13th Street Gas Station

APPLICANT: PLS Engineering, Travis Johnson
604 W Evergreen Boulevard
Vancouver, WA 98660

REQUEST: To construct a gas station, car wash, and convenience store on the subject 0.97-acre site currently developed with a single-family residence, in the BP – Business Park Zone.

LOCATION: 20101 NE 13TH STREET, CAMAS, WA 98607
PARCEL NUMBER 176148000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE NW ¼ OF SECTION 29, TOWNSHIP 2 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: **MARCH 7, 2024, AT 5:00 P.M.**

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on February 22, 2024 Legal Publication #886200
Mailed to property owners within 300-feet on February 21, 2024
Posted on bulletin boards at Camas City Hall, Camas Library and the City of Camas website at: http://www.cityofcamas.us

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **February 22, 2024,** and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **March 7, 2024**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

Responsible Official: Robert Maul (360) 817-1568

Robert Maul, Planning Manager and Responsible Official	**February 22, 2024** **Date of publication**

N

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]

13th Street Site Plan

2. Name of applicant: [help]

Taz Khan

3. Address and phone number of applicant and contact person: [help]

3993 NW Currawong Court
Camas, WA 98607

4. Date checklist prepared: [help]

August 23, 2023

5. Agency requesting checklist: [help]

City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]

Development is expected to start at the time of final construction drawing approval, likely in early 2024. No phasing is proposed.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

No, not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

SEPA Checklist, Archaeological Predetermination, Geotechnical Report, Critical Areas Report

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

No, there are no known government approvals pending related to this property.

10. List any government approvals or permits that will be needed for your proposal, if known.

- *Preliminary Type II Site Plan*
- *Public notification and staff report publications*
- *Final engineering plan review and approval*
- *Final Site Plan Approval*
- *SEPA*
- *SWWPPP*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The applicant proposes to construct a 4,100 sf convenience store with gas pumps and a drive through car wash. The site is zoned BP, Business Park, and is 0.97 acres in size.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

The site is located at 20101 NE 13th Street, Camas, WA 98607, in the NW ¼ of Section 29, Township 2 North, Range 3 East of the Willamette Meridian. The site is comprised of tax lot 176148000. See the proposed development plans for a preliminary site plan, grading plan, vicinity map and topographical data.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

5% per Clark County GIS data

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

This site has the following soils onsite per Clark County GIS data:

WrB – Wind River Gravelly Loam, 0-8% slopes
CvA – Cove Silty Loam, 0-3% slopes

It is unknown if these soils are classified as agricultural or if the site contains prime farmland.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate area.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

There will be grading for the construction of drive aisles, the installation of utilities, and the preparation of the site for the future convenience store, car wash and gas pumps. Surplus material may be required to be hauled from the site to an approved dump site or offsite fill may be required. Quantities and source are unknown at this time.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Standard erosion control measures will be followed during grading construction on the site. A final erosion control plan will be reviewed and approved by City of Camas.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 80%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Proposed measures to reduce and control erosion include providing an erosion control plan for review and approval prior to starting construction on the site and following the conditions of the approved grading and erosion control plan during all phases of construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal commercial/retail uses as well as possible vapor from the gas tanks.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are no known off-site sources of emissions or odor that may affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Dust from construction can be mitigated by sprinkling the site with water during construction as needed. Stage 2 vapor recovery systems will be included in the gas storage tanks and delivery systems.

3. Water [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

There is a wetland to the south of the site that has permits to be filled for the proposed

Lacamas Tech Business Park. There are no other surface water bodies or wetlands within the immediate vicinity of the site.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

No, there is no work that will take place within 200' of any water bodies.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

Not applicable – there are no wetlands onsite.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

The proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, the site does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No, there will be no discharge of waste material to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No ground water will be withdrawn with this proposal. Stormwater from pollution generating surfaces will be treated prior to being routed to an existing roadside ditch.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

No waste material is proposed to be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

The main source of runoff is from stormwater. There will be runoff from impervious roof area, drive aisles, parking areas, and landscaped areas. Onsite catch basins will connect

to a pipe network that leads to an underground detention facility that will discharge to an existing roadside ditch.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

Not anticipated.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

Use of approved erosion control measures during all phases of development.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

x deciduous tree: alder, **maple**, aspen, **other: Oregon white oak, ash, cottonwood, cherry**
x evergreen tree: **fir**, cedar, pine, other
x shrubs
x grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
x other types of vegetation: **blackberry**

b. What kind and amount of vegetation will be removed or altered? [help]

Site vegetation will be stripped for site preparation. Trees beyond the property line are proposed to be retained.

c. List threatened and endangered species known to be on or near the site. [help]

There is 1 priority habitat Oregon white oak onsite.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Landscaping will be provided onsite in accordance with City of Camas requirements. One Oregon white oak will be removed and mitigated at a 6:1 ratio.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

None known.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:
birds: hawk, heron, eagle, **songbirds, other:** mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Small mammals, such as mice, voles, and rabbits are located on and near the site. This site is also in an area where larger mammals, such as raccoons, opossum, and mammals indigenous to the Clark County area are sometimes located.

b. List any threatened and endangered species known to be on or near the site. [help]

There are no known threatened or endangered species on or near the site.

c. Is the site part of a migration route? If so, explain. help]

This site is part of the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

The site will provide landscaped buffers and street trees.

e. List any invasive animal species known to be on or near the site. [help]

None known

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

The site will be served primarily by electricity.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

The convenience store and car wash will have energy efficient windows and will comply with state building codes which includes conservation measures.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk

of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

The gas station will store and dispense gasoline and diesel, which are flammable and could spill.

1) Describe any known or possible contamination at the site from present or past uses. [help]

Utilizing the "What's in My Neighborhood" section of DOE's database shows that there are no cleanup sites or known hazards within 0.5 miles of the site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

There are no known existing hazardous chemicals/conditions that may affect the development.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

The site proposes a gas station; gas and diesel will be stored and used on the site after development.

4) Describe special emergency services that might be required. [help]

No special emergency services outside those normally expected in a commercial/business area are anticipated to be required in association with this proposal.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

Emergency shut-off switches will be located inside of the convenience store and outside at the gas pumps. Underground storage and pipes will be double-containment construction with rupture protection. Underground tanks also include monitoring of the inner walls for leaks. Overfill protection, gravity return of undispensed product, breakaway valves and stage 2 vapor recovery systems are also included in the storage tanks and delivery systems.

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)? [help]

Light traffic noise from surrounding areas/roads along with typical home and business use noises. None of these will affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site. [help]

Short term noises would include construction noises which would occur during approved hours as mandated by City of Camas and Washington State. Long term noises could include slight increase in traffic noise and vehicle noise at the site.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Construction on the site will take place during normal working hours as allowed by the City.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed site has an existing single-family residence and two outbuildings. To the south is a developing business park. West of the site is a single family residence. To the east of the site across NW Friberg-Strunk Street is land owned by Camas Meadows Golf Club. To the north across NE 13th Street are single family homes.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

It is unknown whether the site has been used as working farmlands or forest lands. There are not currently any agricultural or forest uses associated with the site.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No, the proposal will not be affected by, nor will it affect, any surrounding working farm or forest land business.

c. Describe any structures on the site. [help]

Single family residences and two outbuildings.

d. Will any structures be demolished? If so, what? [help]

All structures will be demolished.

e. What is the current zoning classification of the site? [help]

BP – Business Park

f. What is the current comprehensive plan designation of the site? [help]

IND - Industrial

g. If applicable, what is the current shoreline master program designation of the site? [help]

The site does not lie within the shoreline master program.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

There is an Oregon white oak on site.

i. Approximately how many people would reside or work in the completed project? [help]

It is currently planned that approximately 2 people will work at this site at the time of full buildout.

j. Approximately how many people would the completed project displace? [help]

The removal of one single-family residence has the potential to displace up to 3 people.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

There are no measures proposed to avoid or reduce displacement impacts.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

By complying with the zoning designation, the comprehensive plan, and the City of Camas Development Code, the proposal will be compatible with the existing and projected land uses.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

No impacts are expected to agricultural or forest lands, therefore no measures are proposed.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

Not applicable, no homes are proposed.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

One existing residence will be eliminated. The income level housing type is unknown.

c. Proposed measures to reduce or control housing impacts, if any: [help]

The applicant will pay all impact fees associated with the development at the time of building permit.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

All new construction will meet City of Camas building codes for commercial/business development. Exterior building materials will include composite wood siding, fiber cement panels, CMU, metal roofing and accents, and veneer stone. The tallest structure will not exceed 28'.

b. What views in the immediate vicinity would be altered or obstructed? [help]

The site will change from a large-lot single family residence to a commercial/retail development with a convenience store, gas station and drive-through car wash.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The site will be landscaped as required by the City of Camas. The main roadway frontages will be landscaped with trees per the City of Camas roadway standards.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

When the site is built out external illumination will be provided for the canopy/fueling area and for perimeter lot lighting and parking areas.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No, light or glare from the finished project will not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are existing off-site sources of light from adjacent homes and roads, but they will not affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Shielding of lights and streetlights will reduce light and glare impacts offsite.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Camas Meadows Golf Club is adjacent to the east. The Harmony Sports Complex is approximately ½ mile to the west.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

There will be no recreational uses displaced with this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

No impacts are proposed, therefore no measures to reduce or control impacts on recreation are proposed.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

There are no structures recommended for listing in national, state or local preservation registers per the Archaeological Predetermination.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

Archaeological Services, LLC (ASCC) performed an onsite field investigation on August 17, 2023. No mention of landmarks, features or other evidence of Indian use or occupation are mentioned. Several artifacts were found including pink glass fragments suspected to be Depression Glass, a coin bank dated to 1926-1930, and a metal bolt. Based on these items, along with the former structures that appear on site in historic photos, ASCC is recording the debris scatter as a historic-area archaeological site and recommends a Cultural Resource Survey Report prior to any ground disturbing activity.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The report utilized surface surveys and excavation of test pits, as well as reviewing historical maps and records on file at the Washington State Department of Archaeology and Historic Preservation.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

Based on the findings of the Archaeological Predetermination, a Cultural Resources Study is recommended prior to ground disturbing activity. If during the course of construction any artifacts are discovered, all work will cease, and proper notification shall be given to City of Camas and DAHP.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

NE 13th Street and NW Friberg-Strunk Street abut the site to the north and west. A new driveway off of NE 13th Street will provide access to the site.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

C-tran does not operate in close proximity to the site. The nearest stop is 1.6 miles SE of the site along SE 192nd Avenue at Mill Plain Blvd.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

20 parking spaces, plus 8 gas fill-up spaces, will be provided with this development. The project will eliminate approximately 2-4 parking spaces with the removal of the existing home.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Frontage improvements are proposed to bring NE 13th Street up to half-width roadway standards. NW Friberg-Strunk Street is currently built out to standard.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help].

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

It is anticipated that 2,281 new trips per day would be generated by the project. It is expected that 60 trips will occur in the AM peak hour (7:00 – 9:00 AM) and 81 trips will occur in the PM peak hour (4:00 – 6:00).

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

Not anticipated

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The applicant will pay transportation impact fees.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes. The completion of this development will increase the need for public services in the area.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

This project will pay impact fees for traffic at the time of building permit.

16. Utilities [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

- *Electricity: Clark Public Utilities*
- *Water: City of Camas*
- *Telephone: Century Link, Comcast*
- *Sanitary Sewer: City of Camas*
- *Natural Gas: NW Natural*

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

DocuSigned by:

Signature: _____
FF97DED7F6DB4EF...

Name of signee Faz Khan

Position and Agency/Organization Managing Member Pak USA Camas, LLC

Date Submitted: 10/9/2023

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

March 6, 2024

Robert Maul, Planning Manager
City of Camas
Community Development Department
616 Northeast Fourth Avenue
Camas, WA 98607

Dear Robert Maul:

Thank you for the opportunity to comment on the determination of nonsignificance for the 13th Street Gas Station Project (SEPA23-12) 20101 Northeast 13th Street as proposed by Travis Johnson. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

HAZARDOUS WASTE & TOXICS REDUCTION: Garret Peck (564) 669-0836

The applicant proposes to demolish an existing structure(s). In addition to any required asbestos abatement procedures, the applicant should ensure that any other potentially dangerous or hazardous materials present, such as PCB-containing lamp ballasts, fluorescent lamps, and wall thermostats containing mercury, are removed prior to demolition. It is important that these materials and wastes are removed and appropriately managed prior to demolition. It is equally important that demolition debris is also safely managed, especially if it contains painted wood or concrete, treated wood, or other possibly dangerous materials.

Please review the "Dangerous Waste Rules for Demolition, Construction, and Renovation Wastes," posted at Ecology's website, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Dangerous-waste-guidance/Common-dangerous-waste/Construction-and-demolition . The applicant may also contact Rob Rieck of Ecology's Hazardous Waste and Toxics Reduction Program at (360) 407-6751 for more information about safely handling dangerous wastes and demolition debris.

SHORELANDS & ENVIRONMENTAL ASSISTANCE: Meghan Tait, (360) 210-2783

Thank you for providing the Department of Ecology the opportunity to review and comment on the proposed 13th Street Gas Station.
The wetland delineation was conducted in August, typically a dry time of the year for the region. Per the Corps of Engineers WMVC regional supplement to the wetland delineation manual, additional field investigation is necessary to determine whether a wetland is present. One or more site visits should be scheduled to coincide with the normal wet portion of the growing season, the period of the year when the presence or absence of wetland hydrology indicators is most likely to reflect the true wetland/non-wetland status of the site.

The City of Camas Critical Areas Ordinance states that all wetlands and recommended buffer zones within 300 feet of the project area shall be addressed in the critical area report (16.53.030(B)(2)). Wetlands and buffers on surrounding parcels have not been evaluated and included in the Critical Areas Report dated October 2, 2023 prepared by Ecological Land Services for this project. There are mapped wetlands and hydric soils on the parcel to the west and south of the project area.

For technical assistance or questions, please contact Wetland Specialist, Meghan Tait, at meghan.tait@ecy.wa.gov or 360-210-2783.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(JKT:2024000789)

cc: Garret Peck, HWTR
Meghan Tait, SEA

SWCAA
Southwest Clean Air Agency

11815 NE 99th Street, Suite 1294
Vancouver, WA 98682
(360) 574-3058
www.swcleanair.gov

March 4, 2024

City of Camas, SEPA Official
Community Development Department
616 NE Fourth Ave
Camas WA 98607

RE: 13th Street Gas Station; SEPA23-12; SEPA 202400789

Dear SEPA Official:

The Southwest Clean Air Agency (SWCAA) has learned that your agency has issued/will issue a SEPA Determination for the above project. Please be advised that SWCAA administers/enforces a number of regulations that may apply to the proposed project. The applicability of these regulations depends on the exact nature of the project in question. The following sections provide brief summaries of the requirements for the general types of activity that may be affected by this project.

Demolition / Asbestos [SWCAA 476]:

- Prior to **demolition or renovation** of a structure, a thorough asbestos inspection must be conducted by an AHERA-certified inspector in order to determine the presence of asbestos containing material (ACM) in all affected structure(s) or area(s).
  A copy of the AHERA asbestos inspection report must be posted for viewing at the project site.

Asbestos Containing Material PRESENT

If the asbestos inspection reveals ACM to be present in the affected structure(s) or area(s) –

Required documents/reports: (for each structure)

- **Notification of Demolition**
- **Notice of Intent to Remove Asbestos**
- **AHERA asbestos inspection report**

There is a 10-calendar day waiting period from the time the notices are submitted before asbestos removal or structure demolition may begin.

All asbestos must be completely removed from the affected structure(s) or area(s) prior to structure demolition taking place.

ACM must be removed by certified personnel in full accordance with the Southwest Clean Air Agency's Regulations SWCAA 476 (Standards for Asbestos Control) and with 40 CFR Part 61 Subpart M (National Emission Standards for Asbestos).

Asbestos Containing Material NOT PRESENT

If the asbestos inspection does not reveal ACM to be present in the affected structure(s) or area(s)…

…and the structure is to be demolished –
Required documents/reports:

- **Notification of Demolition**
- **AHERA asbestos inspection report**

There is a 10-calendar day waiting period from the time the notification is submitted before the demolition may begin.

…and the project involves only renovation and that renovation does not involve the removal of load bearing walls –
Required documents/reports:
none

Construction Dust [SWCAA 400: General Regulations for Air Pollution Sources]:

- Construction and earthmoving activities have the potential to generate excessive dust emissions if reasonable control measures are not implemented. SWCAA Regulation 400-040(2) requires that "no person shall cause or permit the emission of particulate matter from any stationary source to be deposited beyond the property under direct control of the owner or operator of the stationary source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited". Furthermore,

Exhibit 37 APPEAL24-1001

SWCAA Regulation 400-040(8)(a) requires that "the owner or operator of any source of fugitive dust shall take reasonable precautions to prevent fugitive dust from becoming airborne and shall maintain and operate the source to minimize emissions".

- Common control measures to mitigate the emission of dust from construction and earthmoving activities include: application of water before and during earthmoving operations, application of water to disturbed surface areas (including access roads and staging areas) after earthmoving operations, application of chemical dust control products and/or surfactants, limiting access to open/disturbed areas, reducing equipment/vehicle speeds, establishing vegetative cover on inactive areas and ceasing operations altogether during high wind events.
- Violations of SWCAA Regulation 400-040 may result in civil penalties being assessed against the project operator and/or property owner.

Registration, Notification and Permitting of Air Pollution Sources [SWCAA 400-072, 100, 109, 110]

- SWCAA's General Regulations regulate the installation and/or modification of any building, structure, or facility that emits or may emit an air contaminant. An air contaminant is defined as "…dust, fume, mist, smoke, other particulate matter, vapor, gas, odorous substance, or any combination thereof". Project proponents for any proposed installation or modification that creates a new or increased source of air contaminants may be required to register with the agency and submit a notification or permit application in accordance with SWCAA Regulations 400-072, 100 and 109. If an Air Discharge Permit (ADP) or Small Unit Notification (SUN) is required, the application must be approved and an ADP/SUN issued before commencing construction, in accordance with SWCAA 400-110. If the proposed project includes any new or modified air pollutant sources, the proponent should consult with SWCAA to determine if these requirements are applicable.
- The proposed project (a new gasoline dispensing facility) will likely require an ADP from this Agency. Contact an Agency permitting engineer at 360-574-3058 to discuss your project, equipment requirements and the likely need to obtain an ADP before dispensing gasoline in the Agency's jurisdiction.

The proponent of this project may contact SWCAA at 360-574-3058 for more information regarding the agency's requirements. Notification forms, permit applications, air quality regulations and other information are available on the internet at **http://www.swcleanair.gov**.

Sincerely,

Duane Van Johnson
Air Quality Specialist II

Outlook

RE: SEPA23-12: Proposed 13th Street Gas Station

From Smith, Amaia A (DFW) <Amaia.Smith@dfw.wa.gov>
Date Wed 2/28/2024 4:43 PM
To Yvette Sennewald <YSennewald@cityofcamas.us>

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Hi Yvette,

WDFW recently published a guidance document, Best management practices for mitigating impacts to Oregon white oak priority habitat, that describes the significance of Oregon white oaks and identifies best management practices (BMPs) for avoiding, minimizing, and mitigating impacts to this important habitat and is considered best available science. The actions identified in this guidance document can be implemented under the existing critical areas ordinance is the new standard for evaluating projects that involve Oregon white oak.

This SEPA notice identifies a priority Oregon white oak on site and states it will be removed for this project. WDFW wants to ensure that the project proponent explored design alternatives that avoid and minimize impacts to the Oregon white oak, as required by CMC 16.51.170 – Mitigation sequencing. If impacts to the Oregon white oak cannot be avoided and is subsequently removed for this project, WDFW recommends updating the mitigation to align with our newly published guidance document. A 6:1 mitigation ratio, as proposed, will result is a net-loss of ecological function due to the life history of Oregon white oaks. Furthermore, we recommend that the proponent explores on-site and off-site options prior to purchasing oak credits from a mitigation bank.

Please reach out if there are any questions about our updated guidance document. Additionally, the project proponent can contact me directly if there are questions about our new guidance document.

Thank you,
Amaia

Amaia Smith
(she/her)
Assistant Regional Habitat Program Manager
WDFW - Region 5

5525 S 11th St Ridgefield, WA 98642
amaia.smith@dfw.wa.gov
360-839-3508

From: Yvette Sennewald <YSennewald@cityofcamas.us>
Sent: Wednesday, February 28, 2024 3:30 PM
To: Smith, Amaia A (DFW) <Amaia.Smith@dfw.wa.gov>
Subject: SEPA23-12: Proposed 13th Street Gas Station

External Email

Hi Amaia,

Just wanted to let you know that I received your phone message regarding the updates for the Oregon White Oak mitigation plan. I look forward to receiving your email with comments and mitigation plan updates.

Thank you,
Yvette

Yvette Sennewald, Senior Planner
Community Development – Planning
Office: (360) 817-1568
Direct: (360) 817-7269
www.cityofcamas.us | ysennewald@cityofcamas.us

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Outlook

_RE: City of Camas preparing to permit gas station on high risk land (SPRV23-06)

From Brent Davis <Brent.Davis@clark.wa.gov>
Date Tue 2/20/2024 7:56 AM
To Karin Nosrati, DC <bforback@gmail.com>
Cc Tait, Meghan (ECY) <mtai461@ECY.WA.GOV>; Community Development Email <communitydevelopment@cityofcamas.us>

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Karin,

Clark County has no jurisdiction over critical areas or land use for projects within the City of Camas. Our critical areas ordinance does regulate "indirect" impacts to wetlands that could theoretically occur from development on adjacent properties, however our wetland buffers and the related standards do not apply outside our jurisdiction (e.g. the unincorporated portions of the County). Furthermore, a review of our wetland inventory mapping and aerial photography do not suggest that there are wetland indicators on the properties immediately to the west of the proposed development.

I have copied Meghan Tait, who is the Wetland and Shoreline Specialist at Ecology assigned to our area. Ecology is an "Agency with Expertise" in matters pertaining to wetlands and water quality under the State Environmental Policy Act (SEPA). If Camas has initiated the SEPA process on this project Meghan and/or her colleagues have likely reviewed the plans and technical documents and are providing comments to the City.

Sincerely,

Brent Davis
Land Use, Wetland, and Habitat Review Manager
Shoreline Administrator
COMMUNITY DEVELOPMENT

ePlan – saving trees and parking fees! Visit clark.wa.gov/ePlan to learn more.

From: Karin Nosrati, DC <bforback@gmail.com>
Sent: Sunday, February 18, 2024 6:51 PM
To: Brent Davis <Brent.Davis@clark.wa.gov>; david.howe@dfw.wa.gov; carlo.abbruzzese@dnr.wa.gov
Cc: Barbara Wegner <oakbarb@lmi.net>; Randy Nosrati <randynos1@gmail.com>
Subject: City of Camas preparing to permit gas station on high risk land

EXTERNAL: This email originated from outside of Clark County. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Sirs:

The City of Camas is preparing to permit the construction of a gas station, convenience store and car wash at 20101 NE 13th Street, near our residential neighborhoods.

We are a group of neighbors who live just north of the signal light on the north-end of Friberg/Strunk Road and NE 13th Street, in Clark County, outside the Camas city limits. This project also affects the neighbors along NE 13th Street. The developer is Kevin Deford and PAK USA CAMAS, LLC. (The original owner, Mr. Warren Townsend, who has lived here for many decades currently still lives there.) The permit might receive approval as early as the middle of April 2024.

The developer commissioned a Critical Areas report in the summer of 2023, which is attached to this email. We are concerned that the wetlands in the area immediately adjacent to the property were not taken into consideration. We also suspect that the report is skewed as the data was collected during a hot summer. Hydric soils are present per the GIS maps, but negated in the Wetland Determination Data Form. The pollutants would run-off to these wetlands.

Secondly, all the homes to the west of the proposed development draw their drinking water through wells which draw from an aquifer below. The pollutants will jeopardize drinking water supply.

This location is truly on the outer margin of where the City of Camas abuts Clark County, and this proposal is not taking the community into consideration.

Could you please read the reports and weigh in on the concerns that this is a high risk land? We appreciate any opinions, resources or contacts you could provide. Lastly, could you help identify one of the trees in the picture, to make certain that there is only one oak tree at risk?

Thank you,

Karin Nosrati
20107 NE 14th Street
Camas, WA 98607
360-254-1585

Outlook

Re: Proposed Development on 13th street

From Carlo Abbruzzese <puffbird10@gmail.com>
Date Fri 3/8/2024 2:22 PM
To Robert Maul <RMaul@cityofcamas.us>
Cc Community Development Email <communitydevelopment@cityofcamas.us>; Yvette Sennewald <YSennewald@cityofcamas.us>

1 attachments (3 KB)
image002.jpg;

You are welcome. Wish I had oregon time to look into it and write a more detailed letter.
This is a comment letter from me. DNR doesn't usually comment on projects like this.

Carlo

On Thu, Mar 7, 2024, 11:21 AM Robert Maul <RMaul@cityofcamas.us> wrote:

> Thank you for your comment, Carlo.
>
> To clarify for the record, is this an official comment from DNR, or your personal comment? Thanks.
>
> Regards,
>
> Robert

City of Camas
Robert Maul
Planning Manager

Desk 360-817-7255

www.cityofcamas.us rmaul@cityofcamas.us

From: Community Development Email <communitydevelopment@cityofcamas.us>
Sent: Thursday, March 7, 2024 10:55 AM
To: Yvette Sennewald <YSennewald@cityofcamas.us>
Cc: Robert Maul <RMaul@cityofcamas.us>
Subject: FW: Proposed Development on 13th street

Carey Certo

Administrative Support Assistant

Community Development

Office: 360-817-1568

www.cityofcamas.us | ccerto@cityofcamas.us

The permit center is closed daily 12-1pm

From: Carlo Abbruzzese <puffbird10@gmail.com>
Sent: Thursday, March 7, 2024 10:05 AM
To: Community Development Email <communitydevelopment@cityofcamas.us>
Subject: Proposed Development on 13th street

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Carlo Abbruzzese

Washington Department of Natural Resources

901 Bond Road

Castle Rock, WA 98611

Attn: City of Camas, SEPA Official

Community Development Department

616 NE Fourth Avenue

Camas, Washington 98607

Please confirm receipt.

To whom it may concern,

I manage the Lacamas Prairie Natural Area which lies about a ½ mile to the NE of the proposed gas station, car wash and convenience store proposed to be located at the corner of 13th street and Friberg-Strunk street. Lacamas Prairie Natural Area protects the only example of Willamette Valley Prairie in the state and habitat for 8 rare plant species, one rare animal species (slender-billed nuthatch) and rare Oregon white oak/ Oregon ash forest . It is also provides critical winter waterfowl habitat.

I have serious concerns about this proposal due to the potential of fuel tank leaks, fuel spills, and toxic runoff from the carwash leaving the site and harming the sensitive and rare wetland and oak forest downslope. Lacamas Lake, where people fish and swim could also be permanently harmed by this development.

I would hope the City of Camas would want to protect this site, which contains one of the best and biggest populations of camas lily in Clark County, by requiring the developer to choosing a more environmentally friendly development.

In summary, I do not believe the SEPA document adequately considers the risk this development poses to the preserve. There rare habitats and species are irreplaceable resources.

Sincerely,

Carlo Abbruzzese

Natural Areas Manager

Washington Department of Natural Resources

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To: Camas City Council members

Regarding : Proposed Project at Friberg and 13th Street in Camas.

March 6th, 2024

Respectfully submitted,

My name is Brittany Bozarth, I live at 19821 NE 13th St, Camas WA for the last 11 years and am located .1 miles from the proposed gas station.

I have many concerns in regards to the SEPA report and the approval of this project that have not fully been considered and vetted against the city and state codes you have committed to enforce.

Traffic Study

- The traffic study was not conducted during peak hours for this road. You conducted this study in the middle of summer when school was not in session. You also only indicated traffic from the high school, many of us on this road have students at the elementary school and travel down 13th to access 192nd. The elementary should be included in the traffic numbers, you can only right turn out of Illahee elementary on 1st St. Forcing you to Friberg to then access 13th St, up to 192nd. The high school and local elementary school release and start at almost the same time. The high school and elementary school start at 8:40 and 8:35, and end at 3:18 pm respectively. The peak hours in the PM are NOT 4-6 PM, these hours are 2:45-4:00PM when in which parents and teens are departing school. The traffic backs up from the light at 192nd and NE 13th St. to Friberg daily, making it impossible to even leave my driveway.

Sidewalk

- There is no safe way to access this proposed development. The separation from lane of travel is less than six inches. You are now going to have more pedestrians walking this road (I see teenagers *daily* walking this road already to access the school). Adding a convenience store gives them more reason to take this route where there is **NO** safe access. Will you put a sidewalk in when a pedestrian is killed?
- The county and the city share this strip of road, both should be held accountable and liable to provide safe access and the business should be required to assist in that development.
- They should be required to pay a hefty TIF to facilitate the improvements of the road.

Driveway

- My driveway has immediate access to 13th St. I was denied the ability to provide safe exit and entrance to my home by generating a u-shaped driveway and now there will be even more traffic. You are asking for an accident.
- It is difficult for me to exit my driveway now due to traffic, an increase in trips daily will only exacerbate the issue.

Buses/Kids

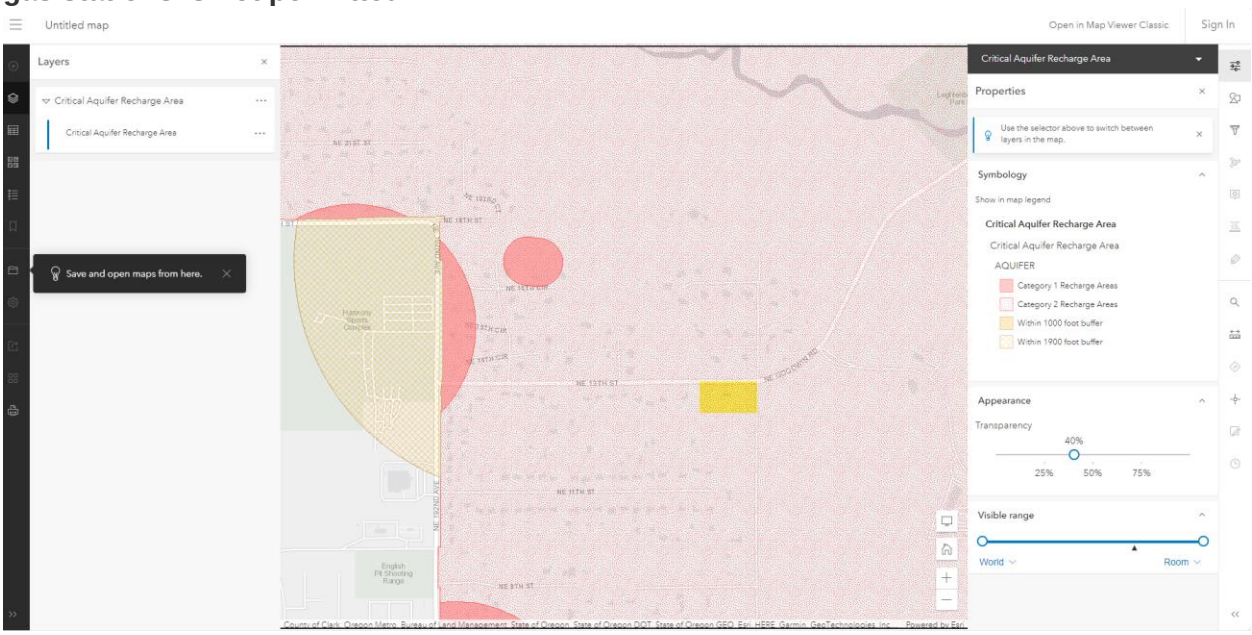
- The buses for the schools travel this route daily to pick up students. There are many school bus stops on 13th St. alone. This is a safety issue, you have young elementary school children waiting to get on a bus, and now you are going to encourage further traffic down the road.
- I have had two cars in my ditch, right where my children have to wait for a bus. The lane of travel is too small to have large (or small) tanker trucks traveling this route. You are risking the lives of our youth.
- The cars traveling west on 13th come off a 45mph road and do not slow down. They blow through the school bus stop sign weekly, ignoring the safety of our students.

Accidents and Lane of Travel

- My mailbox resides on 13th St., exactly where my children are required to wait for a bus. This mailbox has been hit and demolished four times in the last six years. June 20 2018, July 8th 2020, March 31, 2021 and July 6th 2021.
- There is no shoulder, and when you send these large tanker trucks down the road, there is zero room for error and they have been known to cross the white line and damage property.
- The garbage service requires our cans are set at the end of our driveway. My driveway has a steep slope from 13th St and they have to be placed right at the white line to avoid them running back down the driveway. They get knocked over and spilled just from the speed of travel and wind gust created from these large vehicles traveling by.
- To reiterate the accidents unreported on the road typically involve cars in the ditch and are not reported due to single party involvement and they want to avoid a ticket. The one car was abandoned, and I reported it to police on or around Sept 14th, 2020.

Well Water/Run Off

- All the homes on NE 13th St rely on the stability and safety of our well water. The code states that petroleum storage areas must be one hundred feet from the well. The property immediately next to the proposed gas station (20005 NE 13th St) is closer than 100ft to the storage tanks.
- Additionally this area is a CARA (Critical aquifer recharge areas) and the code states in **16.55.080 - Uses prohibited from critical aquifer recharge areas. That a fuel and/or gas stations is not permitted.**



- The run off from spills and other accidents will lead to the stormwater that feeds Lacamas Creek. The very lake your voters are trying to save.

Site Challenges and Risk Assessments

- The developer should not be given *any* exceptions to the code. If an entrance/exit cannot be within 250 yards of an intersection, this property cannot accommodate this gas station. This will create an unsafe road and intersection at NE 13th St. and Friberg being so close to the traffic light.
- The site plan does not accommodate the code for corner lot vison clearance 18.17.030 - Corner lot vision clearance area.
- Those travelling west on 13th St. when proceeding through the intersection at Friberg will not have the appropriate sight distance to see the fuel trucks entering the *oncoming* lane of traffic and will cause collisions. A car verses a tanker truck, we know who wins that war. These cars are traveling at a rate of speed of 45mph and will be expect to stop on a dime. WSDOT sight distance regulations

Thank you for your careful consideration,

Brittany Bozarth

Outlook

Case Number SEP23-12 13th street gas station

From stacy brickert <pinkangel6968@gmail.com>
Date Wed 2/28/2024 12:59 PM
To Community Development Email <communitydevelopment@cityofcamas.us>; Lance Thomas Brickert <lancethomasbrickert@gmail.com>

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Hello. I am writing to express my concerns and objections to the convenience store and car wash proposal at 20101 NE 13th Street in Camas.

We currently have a multitude of unresolved environmental issues surrounding the adjacent wetlands and Lacamas Lake itself. This is a single-family residential area. We are not looking for a change in zoning to allow commercial business in our neighborhood. 13th street is not designed to handle the current amount of traffic that flows on a daily basis. As Green Mountain continues to grow the traffic is becoming a bigger and bigger problem for those of us that live on 13th street. Getting out of my own driveway can be nearly impossible. Having strangers using my driveway as a turnaround. inviting unwanted crime via vandalism and theft is already a problem. Opening up a full-blown gas station will invite more activity and homeless individuals to the area and continue to degrade the quality of life that we moved to Camas to enjoy. Please consider an area that is already zoned commercial and is away from our natural resources and beautiful wetlands. We support small local business but in the proper place. A single family neighborhood is not a good fit.

Thank you for your consideration,

Stacy Brickert
19809 NE 13th St Camas Washington 98607
503-314-6816

Outlook

Rethink Gas Station on NE 13th St

From collinsclark@gmail.com <collinsclark@gmail.com>
Date Tue 3/5/2024 9:52 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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To the City of Camas Community Development Department,

I am aware of the proposal to build a gas station and convenience store at the intersection of NE 13th Street and Friberg/Strunk Road. I live nearby and am very familiar with the intersection. I also have reviewed many of the publicly available documents relating to the proposal. I urge you to reconsider the proposal.

Although the lot in question is zoned for business uses, a gas station is not good fit for that particular lot.

- It is too small to accommodate a gas station and comply with applicable environmental and building laws.
- It is too close to an already busy and dangerous intersection.
- The residential areas surrounding the gas station do not have sidewalks, and pedestrians walking to the convenience store will be at significant risk.
- The gas station presents significant environmental risks to neighboring wetlands.

The gas storage tanks are proposed to be less than 100 feet from the private drinking water well on the property immediately to the west. This is contrary to state law. Furthermore, the property owners with wells within ¼ of a mile of the gas station will all be required to pay for independent inspections of their wells as part of the appraisal process when selling their homes. (*FHA Single Housing Policy Handbook for Appraiser and Property Requirements*.) It is not right to impose these increased costs on the existing residential homeowners.

The environmental review looking for evidence was flawed in that the key issue is the impact on and presence of wetlands, but the review in question involved taking a single soil sample in August, the peak of a record dry summer. The lot in question frequently has standing water, but not in August.

Further, the environmental study ignores wetland areas in very close proximity. The lot immediately to the west has standing water much of the year, immediately along the proposed gas station. To lots immediately to the north (across NE 13th) have wetland areas as well. These wetland areas are all much closer than what is permitted for a gas station under applicable law.

In addition, the very sensitive Lacamas Creek and Heritage Trail area is less than ¾ of a mile to east of the lot, downhill. That is also home to the largest camas lily field in Camas. Leaks, accidents, airborne particulates, runoff, and ground water seepage are all potentially significant dangers. The city of Camas should not sacrifice one of the last natural vestiges of its name-sake for a gas station.

The proposed plans depend on the city granting variances or deviations from the city's standard building and zoning laws. These deviations or variances should not be granted. The single planned entrance and exit is half the distance to a busy and dangerous intersection than permitted by law. The parking spaces do not comply with the 50 foot setback requirement imposed by law. There is no good reason or the city

to grant exceptions (deviations) from its law to permit the gas station to be built as proposed. The lot is simply too small for all that is planned.

The gas station plans do not provide enough room for large vehicles, including gasoline refueling trucks, to safely access the station to refill the tanks. The circulation plans will require these large trucks to block all of NE 13th Street when entering and exiting the property. This will be especially dangerous for westbound traffic on NE14th Street, which has significantly limited visibility when approaching the intersection, given the curve and slope of the street there.

Only one entrance and exit from the gas station is going to increase congestion at an already strained intersection, which is only going to get much worse with the increased development in Fern Prairie, and the very large industrial warehouse being built immediately across the street from the proposed gas station. Eastbound traffic on 13th Street will interfere with and block the entrance and exit to the gas station. Westbound traffic on 13th Street will be blocked by anyone waiting to turn left into the gas station, which will then interfere with the entire intersection.

The intersection in question is high traffic, and less than ¾ of a mile from the high school. It is extremely busy, especially during peak hours when school is in session. The traffic study, however, was conducted when school was not in session. It makes a mockery of the traffic study.

The intersection in question, and all of NE 13th Street is far more dangerous than the city must realize. Many accidents occur there, not all of which are reported. Those that are reported are split between jurisdictions (the city of Camas and the county). All of this is expected to be worse with the continuously increasing traffic due to development in Fern Prairie and the new warehouse across the street from the gas station.

NE 13th Street does not have sidewalks or bike lanes. If the convenience store goes in, it will attract pedestrian traffic from the many residences along NE 13th Street. Children in particular will ride their bikes and walk to the convenience store, as nothing similar is within walking distance. This is a very dangerous recipe. No businesses attracting pedestrian or bicycle traffic should be built on NE 13th Street unless the proper access infrastructure is also built.

Gas stations and convenience stores have long hours and are brightly lit. The bright lights will cause light pollution for the surrounding residential neighborhood.

The gas station and convenience store, especially with the addition of a car wash and self service vacuum will be very loud. It will disrupt, late into the night, the residential neighbors. The self-service vacuum is planned to be less than 100 feet from the closest residence.

Gas stations are known to be centers of crime. A recent article published by the convenience store industry notes that “c-stores and gas stations combined were the site of 13.8% of robberies [in 2022]. According to the FBI, 4.5% of all reported violent crime in 2022 took place at a gas station or convenience store.” Convenience Store Operators Grapple with Rising Crime, Danielle Romano, Feb. 12, 2024 (available at: https://csnews.com/convenience-store-operators-grapple-rising-crime). This should not be placed in a residential area, or in a business are directly bordering residential neighborhoods.

Given all of these concerns and additional concerns that others are likely to raise, the city should not approve the proposed permits. Instead, the city should either decline the application or carefully work through all of these various issues.

The property in question could be the location of many different and profitable businesses, but it simply is not the right location for a gas station, convenience store, and car wash. It is too much to fit on that lot, and the traffic, environmental, and safety implications will be negative.

Sincerely,
Collins Clark
20001 NE 16th St
Camas, WA 98607

Outlook

Comments: THE PROPOSED 13TH STREET/FRIBERG-STRUNK GAS STATION

From SHANNON CONNELL <gsconnell@comcast.net>
Date Thu 3/7/2024 9:17 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Camas Community Development

I am writing in opposition to the proposed 13th St./Friberg-Strunk Gas Station. Reviewing the proposal revealed several significant concerns that will result in long term issues for this location.

1.) Wetland impact: The wetland evaluation was performed in August. On was most likely the driest day of the year. This does not reflect the remainder of the year. My property is several hundred feet north of the proposed site. Between my neighbor and myself we collectively have 4 acres of wetlands that spend a majority of the year with standing water on them. These wetlands drain directly into Lacamas creek and lake. I highly doubt this type of establishment will not effect this watershed in a neutral way. Once built it will effectively injure surrounding wetlands. The analysis only looked at the exact lot in the proposal. This is shortsighted and not reflective of the environmental impact this site will have. It calls into question the evaluation process used here.

2.) Traffic congestion: 13th is turning into the main artery for all the development The City of Camas has approved over the last couple of years. It is the primary conduit to the retail core of 192nd. Not even considering school traffic the increase of traffic going west bound on 13th will become a congestion point as customers attempt to turn left into the gas station. There was a divergence from standards to allow the driveway entrance to be with in 500 ft of the intersection. This will cause back up of traffic into the intersection on a regular basis. This will become a significant hazard as drivers come westbound at a high speed up a hill with a curve. Visibility is poor already and this intersection has had numerous accidents (including my daughter totaling her car a few years ago when traffic was much less). Adding a business with a single entrance (also a variance) is a set up for a failed intersection in the future. This is especially true if the growth forecasted north of the lake occurs. There currently is no other route to the major retail core of 192nd Ave. This is a complete and avoidable setup for future issues. The area is zoned business park and that is what belongs in this parcel not a retail store with a requirement for high traffic to be successful.

I feel this project is being forced on this property. It is not designed well and ignores its serious flaws. At a minimum the environmental evaluation should be done during the primary weather this area experiences (like now). I do not have a well but know of several wells in the area that could be affected. Capping off a well doesn't keep the well a hundred feet away safe. The traffic congestion will 100% be an issue for safety. It is already a dangerous intersection and the road under developed with no proposed upgrade in the future planned. The City of Camas

does not control this road but is considering a project that will impact it significantly. The City of Camas has annexed and approved thousands of homes that will use this road daily and will create a failed intersection with no way to fix it. This is all avoidable by rejecting this proposal and approve for appropriate use.

Respectfully,

Greg & Shannon Connell
20002 NE 14th St.
Camas, WA

360-281-6952
gsconnell@comcast.net

Outlook

Request from the Community Development Dashboard for Information on the Oak Tree Station Project & 13th St Gas Station Project

From Nicole M Daltoso <Nicole.Daltoso@evergreenps.org>
Date Tue 2/20/2024 2:03 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Good Afternoon,

I have some questions regarding the aforementioned projects.

Oak Tree Station Project – I see that a decision was issued on the project, but am not entirely sure how to review the decision. Who can I discuss the status of the project and how can I review the design plans? I started with Evergreen almost a year ago and this particular project has been a topic of discussion, but also just have no clue the overall progress of it.

13th St. Gas Station Project – This one just came into my purview following a couple of community members reaching out to the school district with their concerns. Their concerns are related to the environment, increased traffic, and effect it'll have on students (i.e. cross country runners who will have to traverse a busy driveway, and access to alcohol). I know that their concerns are all addressed by various laws and regulations. However, I'm curious if they've voiced their concerns with the City of Camas yet.

I'm happy to receive information via email or if a phone call would be easier, please contact me at the number in the signature.

Thank you,

Nicole Daltoso, MPH, ASP
Sr. Director of Capital Facilities
P: (360) 604-4081
Evergreen Public Schools

Outlook

Gas station at the corner of ne 13th st and Freiburg rd...

From Susan Davis <susanmachelledavis@gmail.com>
Date Wed 3/6/2024 4:06 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Council committee members...

I have lived at 19705 ne 13th st since the age of 13...I am now 60...I can appreciate some growth in our community but not this. Please don't bring this into a residential neighborhood. There are many places to get gas and wash your car within a 2 mile radius...I feel this is catering to all of the union high school students who will enevitably spend a large fortune there...how convient for them, but what about us? The car traffic, foot traffic, and crime will only increase...let's keep this residential area just that...for residents...

All of us have wells and septic systems in this area...I am very concerned about the possibility of ground contamination coming from this project... especially from the gasoline....Would you want that in your back yard? A small leak from underground, not detected for years could be disastrous...

Thank you for your time!

Outlook

Strong Objection to the proposed gas station at the corner of NE 13th and Friberg Road

From Jeff Goertzen <jeffkgoertzen@gmail.com>
Date Thu 3/7/2024 7:47 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

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To whom it may concern,

I am writing to express my strong objection to the proposed gas station at the corner of NE 13th and Friberg-Strunk Road. My wife and I live on just under 3.5 acres directly acrossed the street to the North of the proposed gas station at 20009 NE 14th Street. Almost 1/2 of our property is classified by the county as wetlands. It is harmful to place a gas station in this close proximity to a wetlands. I take exception to the placement of a gas station this close to the wetlands and to the fact that these wetlands were not mentioned or acknowledged in the approved SEPA report. The approved SEPA report is erroneous via omission.

I also take exception to the omission in the SEPA report of the mention of deer. There are numerous deer that can be found grazing on occasion on the proposed gas station property and they also utilize that property as part a route between the Camas Meadows area and the extensive wetlands to the North of 13th, including the wetlands on our property and vast habitat beyond to the North.

I take a general exception to this location being used for a gas station because it doesn't make sense for the local community for the following reasons:

Ours and our neighbors homes on 14th street are closer than the recommended buffer distance between existing residential homes and new gas stations. Locating a gas station this close to a residence has been documented to have negative impacts on the health and property values of existing neighbors within the buffer zone.

Generally speaking, gas stations as a business model are in decline and that trend will continue with legislations requiring further adoption of electric vehicles. When this business fails, what is left is a blight in the community that requires extensive environmental remediation costs to restore the property to some useful purpose. These remediation costs will result in decreased property values or inordinate remediation costs preventing the redevelopment of this property for a suitable use.

This intersection at 13th and Friberg-Strunk cannot safely handle the traffic consequences of the hundreds of additional trips generated by instances of pulling in and out of this establishment onto 13th street so near the intersection that will occur every day. This intersection already faces challenges with limited sight distance and reduced speed transition from traffic coming up Goodwin

from the east, along with challenges stemming from new and inexperienced drivers heading to nearby Union High School. The existing signalization is inadequate with the level of competence of teen drivers who are often confused with who has the right of way on left hand turns requiring yielding to oncoming traffic and not yielding to pedestrians on right hand turns. Additionally, there are sporadic deer crossings. This will just add to the existing problems.

Additionally, 13th Street does not have a turn lane to accommodate people pulling out and turning left out of the proposed gas station. How would this be dealt with safely? Will the exit be right turn only? Otherwise, people get impatient waiting for a break in both directions of traffic to make a left hand turn and take chances….and cause wrecks. Especially new and inexperienced drivers. How would a fuel truck ever pull out without totally disrupting traffic in this already sensitive area of inexperienced drivers, low sight distance, and speed zone transition? A gas station is a bad fit for this location.

Thank you for considering these facts.

Regards,

Jeff Goertzen, PE

Outlook

Gas station on 13th St

From KELI GOERTZEN <jkgoertzen@comcast.net>
Date Mon 3/4/2024 6:47 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Dear City of Camas Council Members,

We have lived at 20009 NE 14th St, directly across from the proposed gas station, since 2012. During this time traffic has increased, pedestrian crossing at that corner has become extremely hazardous. We were surprised by the enormous warehouse that is going up. We understood the development of the business park. We can not understand putting a gas station and convenience store at this intersection. Our property contains wetlands backing up to 13th St. We have not ever had the option of building near this part of our own property, why can the applicant build so close to these vulnerable wetlands and all the wildlife they contain? We have deer in our yard almost every day, we regularly see a coyote, an owl and all kinds of birds, frogs, snakes, rabbits and squirrels. The fumes from the gas station, the noise and the runoff that will inevitably end up here will change the habitat these animals have come to rely on. Trying to cross from our property back to the open space on Friberg will mean the deer have to walk through the gas station or through the hazardous intersection. High school students (and all drivers) will be at increased risk of hitting one of these deer.

In addition to these concerns I can't understand the need for another gas station in 2024. The world is increasingly moving towards using electric vehicles. We already have plenty of options for gas nearby. Eventually this will just be an empty eyesore sitting on the edge of this residential area. It will have changed the landscape irreversibly. No one else will want to redevelop it as it will require removing the gas tanks. The wildlife and residents world's will have been changed for no good reason.

Please do not permit this unnecessary gas station, car wash and convenience store.

Sincerely,
Keli Goertzen

Outlook

13th Street Gas Station/Convenience Store/Car Wash

From Pamela Goldfain <gopammyanne@gmail.com>
Date Thu 2/29/2024 9:25 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

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I live on Livingston Mountain and regularly travel through 13th Street and 202nd/Friberg-Strunk intersection. I am writing to protest the development of a gas station complex at that location.

1) Traffic congestion: With the addition of Union High School and housing at the former Green Meadows site, the traffic volume at this intersection is very high. Adding a gas station complex will make traffic control even worse. Just traveling this road at the times Union High School starts and stops, as well as when "rush hour" occurs, will show this intersection, as well as 192nd and 13th, is already severely burdened. Backups can occur all the way to Ingel Road, as well as Costco. Roadway modification at 13th/192nd will not eliminate this problem.

2) Wildlife impact: With development under construction at that intersection, coupled with additional proposed construction impact, the wildlife area will be severely impacted. Wetlands nearby, as well as Lacamas Trailhead on Goodwin Road and Camas Meadows, host many birds and water animals. Light pollution from added development will impact their health. Recent alarming research regarding light pollution harm to wildlife is imperative to consider. Light and noise pollution will adversely impact single family homes in this area.The walls of the warehouse under construction opposite this proposed site will bounce light and noise right back on those homes, compounding the issue.

3) Camas city awards: Recent coverage of Camas city's near win of a national award is evidence of careful planning thus far. Camas is more than its downtown. Protect rural areas from sprawl, noise, and light pollution by denying this request for development.

Pamela Goldfain
28304 NE 66th Street
Camas, WA 98607
360-433--7744

Outlook

Proposed 13th street/Friberg-Strunk Gas Station Convenience Store Carwash

From Norma Harrison <retiredbabe@msn.com>
Date Thu 3/7/2024 3:13 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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I just became aware of this proposed development last night from my neighbors on 13th street. We live on 20002 N.E. 11 Street which would make this station almost behind our house. I am really concerned that we did not receive any notice about this proposal since it will affect us and our property.

We have several concerns:

We have a well that is our drinking water source and all water uses.

Lighting is another concern. If the lights are on all night, they will have our backyard lit up.
Will there be a wall to reduce the noise and block the lights?

Additional noise and lots of traffic is a real issue.

We are especially concerned about the effect it will have on our property values.

I hope these concerns will be considered before it is approved.

Thanks,
Norma Harrison

Outlook

13th St. Gas Station

From Cyndy Harvey <claharvey@aol.com>
Date Mon 3/4/2024 3:44 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Re: Case # SEPA23-12
WAC 197-11 340

I would like to add my opposition to the development of a gas station/store on 13th Street.
I don't have new reasons but I'm agreeing with many of the reasons already put forward:

The project is too near wetlands with the possibility of pollution to the air and water.
We need to protect the beautiful open spaces that are still left in Camas.
The additional traffic and already busy intersection are a safety issue for car and student travelers.

Thank you for your consideration,

Cyndy Harvey
9641 N. Alder St.
Camas, WA

Outlook

Gas station

From Jen Haslam <jenhaslam7@gmail.com>
Date Sat 3/2/2024 8:17 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

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As if it wasn't enough that the city of Camas approved the hideous monstrosities going up on the corner of 13th and Goodwin, now a gas station/car wash as well?
I beg the city of Camas to reconsider due to multiple factors including the traffic and environmental considerations. All water in that area leads to the Lacamas watershed which already had issues resulting in water quality in the lake.
And why can't new developments have deeper set backs with landscape design to not only make them more visually appealing but environmentally friendly as well?

Jen Haslam

Outlook

Public Comment - 19503 NE 14th Cir.

From Emily <emilysnhubbard@gmail.com>
Date Sun 3/3/2024 9:02 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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March
3, 2024

Community
Development
616
NE 4th Avenue
Camas,
WA 98607

To
Whom it May Concern,

My
name is Emilys Hubbard and my family and I reside at the residential address of 19503 NE 14th Cir. Camas WA 98607. I am writing to express my concerns for the proposed development of a gas station, carwash, and convenience store on 13th Street/Friberg-Strunk.
My property line boarders 13th street and the new addition to the area will directly impact the quality of my residence.

Our
family's biggest concern is the amount of increased traffic on 13th street. The intersection between 13th and 192nd is a highly congested intersection during rush hour. The addition of a gas station, car wash, and convenient store will increase the flow of
traffic to an already overburdened street. I have had to wait an additional 10-15 mins trying to turn onto 13th street from 192nd due to games being held at harmony sports complex. The left hand turn lane onto 13th street from 192nd regularly gets backed up
from the hours of 5-6pm. We should be solving these issues first before added additional traffic to 13th street.

I have been constantly fighting off liter since we've moved to this residence. There is a constant flow of trash from 13th street that ends up on my property. We will be building a fence to prevent the influx of trash to continue but the volume will only increase with the introduction of a convent store.

There is already a gas station at Costco on 192nd about a mile away from the proposed area. We do not need two gas stations surrounding a residential area and so close to protected wetlands. The noise level and fumes will not be healthy for the local wild life in the area.

Thank you for your time,
Emilys Hubbard

Resident of
19503 NE 14th Cir.
Camas WA 98607

Outlook

Proposed gas station - 13th Street

From Terry Jones <tljones54@gmail.com>
Date Fri 3/1/2024 2:31 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Please accept my comment that I support the proposed new gas station on the SWC of 13th Street and Frieberg Strunk. I live at 2 Creeks Condominiums on 75th Ave in Camas approximately 1 mile to the northeast of the subject site. Currently the Costco gas station on 192nd is the ONLY gas station within 4 miles of my house, and all the other many new houses on the Goodwin Rd corridor heading north. Those concerned with pollution coming from this location haven't considered the cost and pollution that comes from hundreds of cars each week that currently have to drive the many extra mileage to get gas. I support a new gas station at this location.
Terry L. Jones
4022 NW 75thAve
Camas,WA

Outlook

THE PROPOSED 13Th street/FRIBERG-STRUNK GAS STATION~CONVENIENCE STORE~CARWASH

From Nicole Long <longswayhome@gmail.com>
Date Wed 3/6/2024 12:46 PM
To Community Development Email <communitydevelopment@cityofcamas.us>
Cc Karin Nosrati, DC <bforback@gmail.com>

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Dear Sir or Madam,
I am writing to you in regard to the SEPA report submitted by the developers of the above referenced property. As a very concerned citizen and long term homeowner (27 years) on NE 13Th ST., and most certainly a party to be potentially negatively impacted, I would like to request your consideration in halting this proposed development.
I have numerous concerns regarding probable significant adverse impacts, the most critical ones that have a high likelihood of negative impact and eventual harm to our family as well as our property value include but are not limited to the following:

+**AIR POLLUTION**
Hazardous chemicals including benzene, ethyl benzene can pose a toxic risk to the environment as well as neighbors per the Community and Environmental Defense Services. Any gas station with diesel and gas storage tanks should be required to have installed tank vent pipes emission control.
+**WATER POLLUTION**
The proposed gas station and car wash will present risk of hazardous and toxic chemicals entering our neighborhood private wells. Our wells are used for our family drinking as well as home gardens to feed our children. The response by the developers on the SEPA Checklist to install storage tanks in line with our wells all the way down 13th ST is very scary. I submit that these safety measures can and do fail. Simply noting that the underground tanks will be safe is just not enough when it's your own family's drinking water that you are discussing.
+**HISTORIC and CULTURAL PRESERVATION**
Per the SEPA report, the archeological services recommend a CULTURAL RESOURCE SURVEY REPORT. As a neighbor and community member, I would ask that the questions left unanswered be given more weight at this time.

I very much appreciate your time and attention to my concerns and would ask that you consider them as those of your fellow neighbors.

Nicole Long

Outlook

-gas station

From ERNEST LUCIER <lucier1796@comcast.net>
Date Wed 2/28/2024 7:25 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Good Morning

Putting a service station on Mr. Townsend's former property is liken to placing a horse killing operation down town Camas. 20005 NE 13th Street. Land Owner

Camas governing bodies continue to do stupid things.

Outlook

Gas station near Union HS

From Jodie <jodielmarion@gmail.com>
Date Wed 2/28/2024 12:47 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Hello.

I am writing to make comment about the plan to put a gas station near the wetland near Union High School.

My comment is “please don’t” for the following reasons:

1. If not a wetland, it is pretty darn close to one. Why take the chance?

2. This area is populated with lots of inexperienced drivers (Union)—why invite more and more complex traffic nearby?

3. There’s plenty of gas nearby—Costco and THREE of them on 1st and 164th. And, we should be working towards less fossil fuel consumption, not encourage more of it.

The decision to put a gas station there flies in the face of the ethos that Washington—the Evergreen state—embodies. Would you please add my comment to the public body of comment? Hopefully the de ion-makers in Camas will listen.

Thank you for your time.

Jodie Marion

Outlook

Proposed Gas Station/Convenience Store at 13 and Friberg/Strunk

From Daniel Moffat <dmoffat@accessvalueservices.com>
Date Wed 3/6/2024 4:52 PM
To Community Development Email <communitydevelopment@cityofcamas.us>
Cc Tim Hein <THein@cityofcamas.us>; Jane Moffat <janemoffat90@hotmail.com>

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City of Camas,

We currently live in a house in Fern Prairie one mile outside the city limits of Camas. We cannot vote in Camas elections but we pay assessments for Camas schools and we also own a house in Lacamas Shores. We moved to Camas in 1991 and our three kids are all proud Papermakers.

We have seen many changes in Camas over the years. Most of these changes have been well handled by the City of Camas and Camas is the better for it.

We oppose the addition of a gas station/convenience store on the corner of 13th and Friberg-Strunk. This neighborhood area is semi-rural in character and it is close to Camas Meadows and the termination of the Lacamas Lake Heritage trail. Less than ¼ mile away are the beautiful Camas flower meadows. This area is also less than one mile from Green Mountain park.

This neighborhood is part of the Lacamas Creek water shed and chemical residue from development here will flow into sensitive Lacamas Creek at a time when we are trying to clean up Lacamas Lake.

The proposed location is also close to Union HS. Such commercial developments sometimes attract unsavory characters. It will surely worsen an

already bad traffic situation at this corner with the addition of more pedestrians.

There is no practical need for yet another gas station/convenience store here. There is a Costco gas station 5 minutes away as part of the existing large commercial area on 192cd avenue and Mill Plain. There is an existing gas station and convenience store at the Fern Prairie Market 6 minutes up SR 500.

We do not need this development except as another example of suburban sprawl can blight Camas. There will be plenty of commercial development in the Camas North Shore expansion.

Thank you for listening,

Dan and Jane Moffat
831-334-6912

Outlook

NE13th gas station SEPA response

From Jeannette Murphy <jenspearin@hotmail.com>
Date Thu 3/7/2024 4:02 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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City of Camas community development team,

I am concerned with the SEPA report for the proposed gas station on NE 13th and Friberg/Strunk. I feel the report is not accurate with concerns to traffic, noise and wetlands.

It seems like there needs to be improvements on 13th street to handle the traffic for this. The proposed entrance and exit to the gas station is too close to the busy intersection. With Green Mountain building even more homes, it will even become more dangerous. This growth has changed since the traffic report was done. The school traffic is so heavy right before and after school and I'm not sure this was taken into account in the report.

I am concerned with the noise from the car wash and outdoor vacuums. The report claims there is no significant noise concerns but I feel that needs to be proven.

I believe there are wetlands on that property that were not mentioned in the report.

I did not realize that a high traffic convenience store could be built in a business park zoning so close to a neighborhood and school. It seems like a stretch in zoning. I am concerned with alcohol and tobacco sales close to my home and schools.

Thank you,
Jeannette Murphy
Morning Meadow Estates home owners

20007 NE 16th St
Camas, WA
360-608-7751
Jenspearin@hotmail.com

Get Outlook for iOS

Outlook

New Proposed Camas Gas Station

From Jessica Niles <jniles325@gmail.com>
Date Sun 3/3/2024 5:04 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Hello,

I am a concerned citizen whose values and opinions align with those expressed by Ms. Wagner. We have moved beyond a time when there is any justification for new gas stations. Our world is no longer approaching a critical juncture on climate change; we're there. Concerns have been expressed quite vehemently by generations from the current Gen Alpha all the way back to before my group of Millennials were young people. We can not continue to act as if nothing is wrong. We must take actions aligned with science.

If a "fuel station" of some kind is unavoidable, it should be focused on fast, efficient, electric vehicle charging. There is no justification that can warrant continued interaction with fossil fuels.

Do the right thing.

Best regards,
Jessica Niles

Outlook

Personal Concerns Regarding Proposed Gas Station Development

From Arianna Nosrati <ariannanos13@gmail.com>
Date Thu 3/7/2024 4:49 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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To Whom It May Concern,

My name is Arianna Nosrati, and I am a senior undergraduate student at Washington State University pursuing a major in Biological Sciences and a minor in Chemistry. My family and I have resided in unincorporated Clark County for twenty years, with our property standing on the northwest corner of Friberg-Strunk street and Goodwin road.

It has come to my attention over the last several weeks that a deal has been made to convert the plot of land on the southwest side of this intersection into a gas station, convenience store, and car wash. This news was very alarming to hear, as I am very familiar with the environmental impacts gas station vapors and occasional spills have on the surrounding land. The intersection is at the top of a hilly road which slopes down on Goodwin road east towards Ingle road. Drivers familiar with Goodwin road can recall the large untouched wetlands and grasses that can be seen on the left and right side, which connect towards the northern end of Lacamas Lake's trailhead. Lacamas Lake is a prehistoric remain of the well-known Columbia River, which has suffered over-enrichment over the past several years due to fertilizer pollution runoff from nearby homes. This land requires protection and isolation from harmful toxicity which gas stations are incapable of fully preventing, especially due to the topography of the land. Lacamas lake and surrounding bodies of water require protection from additional feasible harmful toxicity. According to the U.S. Fish and Wildlife Service, this region is home to over 300 species of birds, coyotes, the black bear, various fish, deer, and numerous plant species. Over time, this area has seen an increase in deforestation and noise/light pollution, however there hasn't been any major toxicity exposure to the soils and water reserves. We are educating our students in elementary science courses to identify constraints such as this one to make children more aware of the environment through field trips and experiments. The allowance of this project contradicts the information we are educating. What is a situation like this one showing our future generations? I believe that introducing a likely source of chemicals, such as petroleum, to this environment would drastically impact the environmental structure the land currently holds which in the long term could result in species extinction.

As mentioned above, my residence is directly on the northwest corner of this intersection. My bedroom and dining room both face the south direction, and I have a great concern with an increase in noise pollution on the road due to the placement of these facilities. Being a full time student and part-time

employee, home is the place I seek rest and comfort on my longest days. I would hate to have a hard time falling asleep at night because of the traffic which these facilities would experience. In addition, the intersection already experiences a high volume of drivers due to Union High School less than a half a mile south on Friberg-Strunk street. A gas station and convenience store would attract an additional cohort of drivers to the area, causing an unimaginable amount of congestion right by a neighborhood of families with young children, students, and hard-working citizens.

The environment and the residents who were here first as tax payers require their voices to be heard. The development of a gas station, convenience store, and car wash are unacceptable in this region of the city boundaries, and should be relocated to an area where these concerns wouldn't exist. It is our right as individuals in the beautiful Pacific Northwest to proudly represent and preserve our untouched environments to maintain what we call our home.

Thank you for your consideration,
Arianna Nosrati
360-954-6750

Outlook

Walking to School Past Gas Station

From Mar Nos <mformar2@gmail.com>
Date Thu 3/7/2024 3:08 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Hi,

I am a student at Union High School. Because our home is so close to Union there is no school bus. Students from our neighborhood often walk to and from school. If you allow a gas station to be built, we will have to walk past a gas station on the way to school.

My sister used to work at the Nothing Bundt Place on 164th Avenue, next to the 7-11 gas station and convenience store. It is so bad with the type of people who hang out there, that it takes 2 people to go together to take out the trash, because it is not safe.

How can the kids from my neighborhood get to school safely once this gas station is built?

Marlise Nosrati

Outlook

NE 13th St Gas Station - Traffic Analysis Report

From Randy Nosrati <randynos1@gmail.com>
Date Tue 3/5/2024 2:53 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Dear Sir / Madam,

The traffic study presented by Mr Charbenou presents the following questions and serious concerns.
- Study did not actually account for traffic during the school year rather a simulation based on number of students
- Report identifies at least 2 left turn into the proposed development during AM & PM rush hours but negates the need for a left turn lane
- Report refers to posted speed limit (35 m/h) rather than actual traffic speed throughout the day (majority of the traffic is > 40 m/h and many at >50 m'/h traveling westbound on 13th)
- Report claims 500 feet of visibility to the intersection from both directions, the westbound road curves almost 90 degrees, how was the visibility for westbound traffic determined?
- Report claims 0.6 accidents per year based on staff from WSDOT, what is classified as an accident? We live here and have seen and experienced more accidents than 0.6 / year. There are multiple car accidents per year just from the Union high drivers, not including others.
- Report acknowledges traffic increase of at least 2% per year and continuing to increase and the necessity to widen the 13th st road by 2035. How is the city of Camas planning to widen the road? Where is the real state / land coming from? Once the area is incorporated, it must accommodate for pedestrian sidewalk and wider road?

Lastly and most importantly, we have experienced traffic increase year over year and don't need reports to confirm it. We know for the fact that the majority of the vehicles drive faster than speed limit, in some instances 55-60 m/h. We have observed, helped victims of accidents in the intersection more than 2 times per year, we had one car drive through the fence into our backyard.

We are seriously concerned about higher risk of traffic accidents introduced due to attracting vehicles to the gas station, dangerous left turn into the gas station, unprepared left turns into the gas station, stopping at left turn for oncoming traffic to move into the gas station, while vehicles are driving up the hill westbound coming around the corner at above speed limit endangering safety of our family. I don't want to have a vehicle to drive through my backyard over my children when we are enjoying an afternoon outdoors or simply doing a bit of yard work. Aside from risk of damage to our property, our life and safety is at risk.

We are requesting the City of Camas to take the increased traffic accidents, people's safety and our family's safety into serious consideration. There is no price for the safety and health of children and residents in our neighborhood.

Thank you,

Randy Nosrati
(360) 954-6757

Outlook

SEP A23-12 13th Street Gas Station

From Lisa Ogden <lisaogden.11@gmail.com>
Date Wed 3/6/2024 7:03 PM
To Community Development Email <communitydevelopment@cityofcamas.us>
Cc Mike Ogden <mogden@westernconstruction.com>; Karin Nosrati <bforback@gmail.com>

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To whom it may concern,

I am a resident of Morning Meadows neighborhood directly across from this proposed development. My address is 19916 NE 16th St.. Please review my comments regarding the SEPA report for this project.

In response to question:

2.a Additional air pollution is of concern to the families living adjacent to this proposed use. We will already see a huge increase in diesel truck traffic from the warehouse on the SE corner of this intersection. Approving this proposed use will greatly exacerbate the problem.

7.b.2:
Long term traffic noise being described as “slight increase” is NOT an accurate assessment given the anticipated addition of 2281 vehicles per day, per applicants response to question 14. Not to mention the after hours refueling semi trucks with back up alarms and air brakes. This is being proposed directly adjacent to and across the street from long established private residences.

11.d.
Applicants addresses light shields to minimize impacts offsite. We have residences adjacent to the property on 2 sides and would expect the jurisdiction to reject monument signage and any form of projected or neon signage. Back light signage would be far less obtrusive to the adjacent homes.

Business hours should also be restricted to neighborhood standards, 6 am til 10 pm.

14.
The distance from the one proposed entry/exit to the intersection of 13th/Friberg/Strunk is LESS than the arterial required 300’. This entrance location with no left turn lane will cause traffic to back up into the intersection creating additional traffic hazards at an already dangerous location. Patrons attempting to exit westbound on 13th would also create hazards this close to the intersection. The responsible solution would be to require a second entry/exit on Friburg/Strunk and require both to be right turn in and right turn out ONLY.

The validity of the current traffic study is questionable as it was done with no consideration for the new warehouse traffic at the SE corner of this intersection and was done off school hours, failing to account for Union HS traffic located less than 1 mile south of this site.

The current proposal does nothing to mitigate noise/light/air pollution nor does it address the complete lack of pedestrian sidewalks along 13th street. If allowed to proceed, this business will draw pedestrian traffic on 13th, an arterial with little shoulder and steep ditches. At a minimum, for public safety, the City and County should require ADA sidewalks be added to both sides of 13th street from Freiburg/Struck to 192nd Ave.

The applicants own fuel delivery plan requires 18 wheel vehicles to enter the oncoming traffic lane in order to both enter and exit the site. Per applicants plan these trucks will be in the head on lane, while exiting, to within 50’ of the

intersection creating an intolerable risk to public safety. The speed of vehicles traveling west on Goodwin/13th approaching this intersection of often far in excess of posted speed limits.

The SEPA report consists of findings taken late August at the end of one of the driest summers on record. Were samples taken at this time of year, the result would be far different as August is historically the only month where this site does not contain standing water and saturated soils.

The residence location directly north of this proposed use has an existing water well. The underground fuel storage tanks proposes for this use are closer to this existing well than code would allow a new well to be permitted adjacent to existing fuel tanks, how can this be allowed without severe impact and potential contamination to a pre existing well/home?

Sincerely,

Lisa Ogden

Outlook

Fwd: SEP A23-12 13th Street Gas Station

From Mike Ogden <mogden@westernconstruction.com>
Date Thu 3/7/2024 6:32 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

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>
> To whom it may concern,
>
> I am a resident of Morning Meadows neighborhood directly across from this proposed development. My address is 19916 NE 16th St.. Please review my comments regarding the SEPA report for this project.
>
> In response to question:
>
> 2.a Additional air pollution is of concern to the families living adjacent to this proposed use. We will already see a huge increase in diesel truck traffic from the warehouse on the SE corner of this intersection. Approving this proposed use will greatly exacerbate the problem.
>
> 7.b.2:
> Long term traffic noise being described as “slight increase” is NOT an accurate assessment given the anticipated addition of 2281 vehicles per day, per applicants response to question 14. Not to mention the after hours refueling semi trucks with back up alarms and air brakes. This is being proposed directly adjacent to and across the street from long established private residences.
>
> 11.d.
> Applicants addresses light shields to minimize impacts offsite. We have residences adjacent to the property on 2 sides and would expect the jurisdiction to reject monument signage and any form of projected or neon signage. Back light signage would be far less obtrusive to the adjacent homes.
>
> Business hours should also be restricted to neighborhood standards, 6 am til 10 pm.
>
> 14.
> The distance from the one proposed entry/exit to the intersection of 13th/Friberg/Strunk is LESS than the arterial required 300’. This entrance location with no left turn lane will cause traffic to back up into the intersection creating additional traffic hazards at an already dangerous location. Patrons attempting to exit westbound on 13th would also create hazards this close to the intersection. The responsible solution would be to require a second entry/exit on Friburg/Strunk and require both to be right turn in and right turn out ONLY.
>
> The validity of the current traffic study is questionable as it was done with no consideration for the new warehouse traffic at the SE corner of this intersection and was done off school hours, failing to account for Union HS traffic located less than 1 mile south of this site.
>
> The current proposal does nothing to mitigate noise/light/air pollution nor does it address the complete lack of pedestrian sidewalks along 13th street. If allowed to proceed, this business will draw pedestrian traffic on 13th, an arterial with little shoulder and steep ditches. At a minimum, for public safety, the City and County should require ADA sidewalks be added to both sides of 13th street from Freiburg/Struck to 192nd Ave.
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> The applicants own fuel delivery plan requires 18 wheel vehicles to enter the oncoming traffic lane in order to both enter and exit the site. Per applicants plan these trucks will be in the head on lane, while exiting, to within 50’ of the intersection creating an intolerable risk to public safety. The speed of vehicles traveling west on Goodwin/13th approaching this intersection of often far in excess of posted speed limits.

>
> The SEPA report consists of findings taken late August at the end of one of the driest summers on record. Were samples taken at this time of year, the result would be far different as August is historically the only month where this site does not contain standing water and saturated soils.
>
> The residence location directly north of this proposed use has an existing water well. The underground fuel storage tanks proposes for this use are closer to this existing well than code would allow a new well to be permitted adjacent to existing fuel tanks, how can this be allowed without severe impact and potential contamination to a pre existing well/home?
>
>
> Sincerely,
>
>
Mike Ogden
Project Manager
Mogden@westernconstruction.com
Cell: 360.798.4713

Sent from my iPhone
>
>
>
>
[Western]
Western Construction Services, Inc.<http://www.westernconstruction.com>
2300 East 3rd Loop, Suite 110
Vancouver, WA 98661
Office: 360-699-5317
Fax: 360-694-7818
WA LIC WESTECS 162R8 OR CCB 63717 AK LIC 28375

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Outlook

Two Issues

From gail and oz pawellek-osmun <gailandoz@hotmail.com>
Date Thu 2/29/2024 1:36 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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I am opposed to locating a car oriented facility at 13th St.

Can someone explain why a new cell tower is needed . The equipment on top of the Theater generates income for the city and has a higher elevation than the proposed new tower.

Richard Osmun

Outlook

Proposed Gas Station/Car Wash at corner of 13th & Friberg-Strunk - Public Comments on SEPA

From heidihparker@gmail.com <heidihparker@gmail.com>
Date Thu 3/7/2024 1:40 PM
To Community Development Email <communitydevelopment@cityofcamas.us>
Cc eric.hahn@cityofvancouver.us <eric.hahn@cityofvancouver.us>

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Dear City of Camas & Mr. Hahn –

I have reviewed the SEPA checklist submitted for the captioned gas station and have the following concerns about #14 Transportation:

1. The applicant should conduct a traffic study when Union High School is in session instead of relying on models. The intersection at 13th & Friberg-Strunk is packed with high school student drivers and buses twice a day nine months out of the year. Whatever model Charbonneau used isn't accurate. I've lived in the Morning Meadows subdivision since 2008 and I've almost been hit countless times by teens in that intersection. And now we have a warehouse at that corner, which will add large truck traffic to an already dangerous intersection. I trust that truck traffic wasn't factored into Charbonneau's study.

2. The report concludes that a westbound turn lane on NE 13th isn't warranted. For me, that one statement calls into question the credibility of the entire report. First, no one driving west on 13th is going 35 mph unless they had to stop at the 13th/Friberg-Strunk light. Second, when high schoolers are streaming through that intersection after school more than one car will want to stop at the convenience store for a Red Bull. There will likely be several cars of kids who want to stop and they will back up the entire intersection because the proposed entrance to the convenience store is going to be just 200 feet from the intersection, which leads to my 3rd concern.

3. Why would the City of Camas be so willing to approve a commercial entrance that doesn't even come close to the 600 foot minimum? What are the requirements for obtaining a deviation? Why is the City prioritizing access for gas tanker trucks over the safety of hundreds of high school kids who drive through that intersection 9 months a year? Is the City legally obligated to grant a major deviation?

I understand that the character of this area is evolving. I know how hard it is to strike a balance between emerging commercial zones that abut residential zones. But the balance is possible.

I was once a zoning attorney in Virginia and mostly represented developers. I know there's an art to downplaying the impact of a development on nearby residential areas. That's why I'm not terribly convinced by the traffic report. I also know that it's hard to stop developers. But I grew to respect and admire the planning departments and governing boards that made my clients either propose a better project or jump through expensive hoops to preserve the beauty and safety of adjacent areas. I hope both Camas and Vancouver will do the same with this developer.

Respectfully,
Heidi Parker

20103 NE 16th Street
360-907-8963

Outlook

Comments re SEPA for facility at the intersection of 13th Street & Friberg Road

From Kristin Price <19813mkp@gmail.com>
Date Thu 3/7/2024 7:03 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

1 attachments (55 KB)
cross-walkpdf.pdf;

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Comments are included bothin text and in an attached pdf file.

Thank you for receiving comments regarding the SEPA document for a proposed construction of a gas station / carwash / convenience store at the intersection of 13th Street and Friberg Road. Review of the SEPA document raises multiple concerns. I strongly urge additional time for review of this proposal within the community, including additional studies and further consideration of environmental impacts.

What is the demonstrated need for this facility in the community?
How does construction of a new gas station fit in with statewide environmental initiatives in terms of encouraging clean energy? (Washington State Department of Ecology, Climate Commitment Act) Do any benefits outweigh the risks associated with the construction of a gas station adjacent to a residential area and a high school with outdoor recreation facilities?

Have environmental impacts been adequately addressed?
EARTH - Clarification of soil content is needed to address the impact on the drainage field. Note that this land would currently support extension of a green space use, wetland habitat area, park use or agricultural use (nursery). Erosion control measures are not detailed, it appears that the project would interfere with existing drainage systems.

There is existing vegetation on the property, now landscaped for residential use. There is a beautiful Priority I Oregon White Oak tree on-site. This tree and other landscaping should be incorporated into the design of any commercial space on the property.

AIR
The proposal acknowledges: "Long-term emissions will be produced by automobile traffic and normal commercial/retail uses as well as possible vapor from the gas tanks."
The proposal does not provide adequate solutions to reduce or control these impacts.

Research indicates that Stage 2 vapor recovery systems in the gas storage tanks and delivery systems are not sufficient to mitigate the impact of air pollution from a facility. Wind patterns (high E/NE winds) will result in noxious vapors being carried to residential areas immediately north and west of the proposed facility.

There is a risk for igniting a wildfire - a particular concern given the recent history of local wildfires during hot, dry summer periods and nearby wooded areas. The proposed project would add to hazardous levels of AQI noted in the last two years in our community. Accordingly, health consequences are present for residents living nearby, including children and elderly residents.

The dispersion of toxic materials would threaten the viability of small organic agricultural plots (home gardens) in this area.

WATER
The proposal acknowledges: "Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters."

Note the need for critical review of SWWPPP (Stormwater Pollution Protection Plan)
The proposed project threatens water supplies for nearby residences that have existing well systems. The proposed project would impact the supply of groundwater, with the potential of increasing pollution to Lacamas Lake, downhill from the proposed facility.
The project should include steps for decommissioning of the underground fuel storage tanks and restoration of the property after use.

The proposed project creates a dangerous intersection. This project would impact residents of the area, families of Union High School, and drivers traveling on 13th Street, 1st Street, 192nd Street and Friberg Road. Winter months and ice accumulations on 13th Street have contributed to multiple vehicle crashes along this route. The proposal does not address concerns related to maintaining road safety, including obstruction of line of sight for drivers and management of known seasonal hazards. The project would inevitably result in an increased number of crashes at or near this intersection.

Modifications to roadway and the intersection will be necessitated by the facility. The proposed project suggests entry that is unacceptably close to an active intersection. There is no provision for safe egress from the facility in the event of an emergency. The proposed traffic flow does not provide safe exit from the facility for traffic heading west on 13th Street. The proposed project would disrupt both east-bound and west-bound traffic on13th Street and Friberg Road.

There is a critical need for an updated transportation study. The current study is inadequate and contains inaccurate estimates. The transportation study does not address traffic volume during late afternoon (school dismissal) hours. The proposed project does not adequately plan for traffic flow, including the delivery of fuel. Plans do not address queuing of vehicles within the property, particularly during refueling operations.

There are markedly increased safety risks for both drivers and pedestrians. The operation would interfere with school bus arrival and departure, as well as special event traffic. The project interferes with safe recreational use for bicyclists and runners. This is a route that has been established for safe transit on a well-known bicycle route. The project proposal does not provide for safe transit for pedestrians (students walking to school). Upgrading sidewalk access around the facility and across

13th Street should be required.

Hours of operation for the service station/convenience store should be limited to 9:00 pm due to the proximity to adjacent residential areas. A retaining wall is needed at the rear to limit intrusions to adjacent residential areas, given the risk of increased crime.

Outlook

Proposed Gas Station at NE 13th Street/NW Friberg-Strunk Street

From Elisabeth Rickard <elisabeth.rickard@gmail.com>
Date Thu 3/7/2024 10:21 AM
To Community Development Email <communitydevelopment@cityofcamas.us>
Cc Administration Email <administration@cityofcamas.us>

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Dear City of Camas Community Development Team,

I would like to strongly disagree with the assessment that a new gas station/convenience store/car wash on the corner of NE 13th Street and NW Friberg-Strunk Street will not have a significant negative impact on the surrounding area/residents. Below are my concerns.

According to the CARA map published on the City of Camas website, this proposed location is within one mile of two different Critical Aquifer Recharge Areas; the first is located at approximately NE 197th and NE 16th Street, the second Critical Aquifer Recharge Areas is approximately at NE Goodwin and NW Alexander Lane (at LaCamas Creek) is just downhill from the proposed site.

What assurance do we have that the catch basins for this business will be able to hold, process and filter spilt gasoline, dripping oil from idling engines, runoff car wash chemicals and stormwater effectively before being released into an open ditch that is up hill from, and will feed into the CARA located at NE Goodwin and NW Alexander Lane? What ongoing independent or state testing of groundwater will be done to ensure this business is properly disposing of its runoff water?

There are numerous hazardous vapor compounds released from fueling and underground gasoline storage tank vents. One of which is Benzene. According to the World Health Organization Guidelines for Indoor Air Quality, "there is no safe level of Benzene." According to a 2019 ScienceDirect study, emissions from gasoline storage tanks constitute a health risk up to 524 ft away, in all directions. The risk of cancer linked to Benzene has caused the California Air Resource Board to recommend that schools, daycares and other sensitive land uses (i.e. homes) should not be within 300 ft of gasoline storage tanks. What measures have been outlined to protect neighbors within 300 ft? And do these measures meet the highest industry standards of reducing air born pollutants from reaching homes nearby?

The additional chemicals from the car wash make this site even more hazardous. According to a recent University of Washington study, car washes that use cleaning agents containing hydrofluoric acid should train staff in proper handling. The study sites over 48 Labor & Industry claims, and even one death due to exposure. The study also states that even in small amounts, hydrofluoric acid is "insidiously toxic". What measures will be taken to protect workers and the public at large from chemical exposure at this car wash by the business and by the City of Camas?

There is also a risk of having a car wash next to a gas station. The risk of gasoline and other chemicals accidentally mixing should be considered. If the ethanol from gasoline were to mix with the hydrofluoric acid from commercial car wash mixtures, it would result in ethyl chloride. According to the National Institute for Occupational Safety and Health (NIOSH), ethyl chloride has an Immediately Dangerous to Life or Health air concentration value (IDLH) of 3.8%. Ethyl chloride is also extremely flammable in both liquid and gas form and is considered a federal air pollutant. What measures will be taken to prevent the accidental mixing of gasoline and other chemicals? How will the business, the Vancouver and Camas Fire Departments, and the City of Camas, respond when HazMat accidents and spills do happen?

A gas station on NE 13th St and NW Friberg-Strunk, will put extreme and permanent undue financial burdens on homeowners nearby. Homes directly in this area are on well water. When a home with a well is going up for sale, and that home that is located within one-quarter mile of a gas station, the homeowner must obtain an independent inspection of the well system as part of the appraisal process (as stated in the FHA Single Housing Policy Handbook for Appraiser and Property Requirements). Moreover, according to the property development and data research company, Locate Alpha, homes located near gas stations sell for 30-50% less than homes located one mile or more away. So, in addition to needing special inspections of well water systems, this gas station will directly affect property values. What measures will be taken to offset these financial burdens for nearby neighbors by the business, and by the City of Camas?

As stated in the SEPA Checklist for this proposed gas station, it is estimated to generate 2,281 new vehicular trips per day. What market research has been done to support these numbers? If this site does not get the daily business on the high end of these estimates, what assurance do we have this building won't be boarded up and a blight on the neighborhood in a few years?

If this business does generate the very high estimate of over 2,000 trips per day, what measures have been outlined by the business and by the City of Camas, that the 13th Street and NW Friberg-Strunk intersection and roads can support that much traffic? Has the business proposed additional traffic signals to handle the numerous left turns that drivers will seek to make onto 13th Street? Or does the business propose that over 2,000 drivers make a right hand turn and use NW Friberg-Strunk instead? And if so, has the business reached out to, and gotten the approval of the Evergreen School District? Union High School will be at a higher risk of traffic incidents with over 2,000 more vehicles driving past each day. Has the business expressed to the Camas Police Department that everyday there will be delivery trucks using multiple lanes of traffic (gas tankers, general merchandise, food, alcohol, cleaning supplies, LTL freight, etc.)? How does the business intend to keep trucks entering, and backing up from oncoming traffic not an interference with a very busy intersection, a blind uphill curve from west-bound traffic on Goodwin Road, and the normal traffic of new high school aged drivers?

Busy convenience stores come with many risks. According to FBI 2020 Crime Data, convenience stores account for 3% of all violent crime in the US. Additionally, convenience stores make up 10% of robbery locations, while gas stations make up 5%. What measures is the business taking to curb the threat of crime at this location? Will the business employ armed security guards? Does the business intend to use cameras inside and outside of the building? Does this business have a crime prevention plan involving the Camas Police Department and the Vancouver Police Department?

As stated in the SEPA Checklist for this proposed gas station, this site is part of the Pacific Flyway for migratory waterfowl. Light pollution affects millions of birds every year. With a new tall commercial warehouse next door, the light pollution from the lights of this gas station could attract and confuse waterfowl. As waterfowl migration happens primarily at night, what measures will the business take to ensure canopy lights and outdoor building lights will be off after sunset? Has the business sought the help and consultation of the Department of Wildlife? With fewer and fewer areas for birds to safely land, how will the gas station balance building on 80% of the land and the needs of the birds on the Pacific Flyway?

Thank you for taking my questions about this proposed gas station/convenience store/car wash on the corner of NE 13th Street and NW Friberg-Strunk Street. I look forward to your timely responses.

Lastly, as a resident of Camas for most of my life, I will end this email with my opinion; Camas needs more green spaces, not gas stations. This land should be protected and used for good, not for the profit of big oil at the cost of our neighborhood and the environment. I grew up here. My bus stop was at this intersection, and it pains me to see the development that has happened here already. It's certainly not lost to me that businesses and cities must grow, and that land has been getting repurposed for generations, but what are you planning to leave untouched for my generation? For the generations below me? Let's keep Camas greener than its neighbors, let's keep our wildlife safe and let's protect the water we all rely on.

Sincerely,

Elisabeth R. Rickard

Outlook

SEPA23-12 Comments

From joanier@comcast.net <joanier@comcast.net>
Date Thu 3/7/2024 4:43 PM
To Community Development Email <communitydevelopment@cityofcamas.us>
Cc JOAN RICKARD <joanier@comcast.net>; rickdr@comcast.net <rickdr@comcast.net>

1 attachments (22 KB)
SEPA23-12_letter_030724.docx;

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Richard and Joan Rickard
1417 NE 202nd Ave.
Camas, WA 98607

March 7, 2024

Robert Maul,
City Of Camas SEPA Official
Community Development Department
616 NE 4th Ave.
Camas, WA 68607

Re: SEPA23-12 13th Street Gas Station

Dear Robert Maul,

We are responding to the City of Camas February 22, 2024, letter concerning SEPA23-12 Determination of Non-Significance. We strongly disagree with the Camas Community Development Department recommendation of the **SEPA23-12 13th Street Gas Station Determination of Non-Significance**. We believe that this project will have a negative effect on the environment and our neighborhood. We live in Katie's Hill just north of 13th St, our property is less than 200' of the proposed gas station. We have lived here since 1990.

If this proposed project goes forward the air quality will be affected by the gas vapors escaping from the underground storage tanks when they are being filled and vapor leaks from the underground storage tanks venting systems, and gas vapor leaks from the pumps when customers fill their cars gas tank. These vapor compounds which include benzene, toluene, ethyl benzene, and xylene are a serious health risk and can travel more than 500' in all directions. Benzene is one of the more

hazardous vapor compounds. Adverse health effects of benzene include nausea, cancer, anemia, increased susceptibility to infections, and low birth weight. According to the World Health Organization Guidelines for Indoor Air Quality there is no safe level for benzene. The California Air Resource Board recommends that schools, daycares, and other sensitive land uses should not be within 300' of gasoline storage tanks. Also, affecting the air quality will be the exhaust fumes from the increase in traffic and the cars and trucks waiting, idling at the gas station.

The water quality will be affected by this project. The aquifer and wetlands need to be protected. Several homes on both sides of 13th St. rely on private household drinking water wells. Some of these wells are less than 500' from the proposed gas storage tanks. The FHA single Housing Policy Handbook for Appraisers and Property Requirements states that if you have a drinking water well that is within ¼ mile of a gas station, when you sell your home, you will need to obtain an independent inspection of your well as part of the appraisal process.

The SEPA Checklist, b. Water Runoff states that "Stormwater from pollution generating surfaces will be treated prior to being routed to an existing roadside ditch."

How well will the catch basin filter system work on all the everyday surface runoff of gas, oil spills, car wash detergent (Hydrofluoric acid, waxes/petroleum products), and grimy wastewater? And most important, can the catch basin filter system handle any major spills or the increased volume when it rains heavily? How clean will this supposedly "treated runoff" be before its diverted to the roadside ditch that flows down the hill to Lacamas Creek and into Lacamas Lake.

The gas station will create loud noises from many sources such as the car wash and vacuums, customers' loud music and voices, idling cars, motorcycles, trucks, horns, the backup warning beeps from the delivery trucks and the fuel tanker trucks. The surrounding area is a quiet residential neighborhood. The gas station will disturb and interfere with the peace and comfort of those living in the neighborhood.

The lighting from the monument sign would create light pollution outside of the perimeter of the project. The LED bright lighting of the interior of the convenience store will project onto the concrete surfaces and reflect to neighboring properties and the LED lighting from the gas pump overhangs will reflect off the concrete surfaces. Vehicles entering and exiting the gas station would shine their headlights into neighboring homes, this will especially be worse in winter with the prolonged daytime darkness. The area is immersed in darkness, except at the intersection. Light pollution can negatively affect many parts of our environment, including migratory birds, pollinators, plants, animals, and people. As stated in the SEPA Checklist for this proposed gas station, this site is part of the Pacific Flyway for migratory waterfowl. Light pollution disrupts the migrations of birds, especially waterfowl that migrate primarily at night. This project would significantly change the night sky.

Traffic safety is a major concern. The 13th St. /Strunk-Friberg intersection is already dangerous with school buses and scores of inexperienced high school drivers passing though it twice a day during the school year. The soon-to-be-completed warehouse east of the proposed gas station will introduce large truck traffic to the intersection.

The proposed gas station will have only one entrance / exit fronting 13th St. and that entrance is only a couple hundred feet from the intersection of 13th St and Friberg-Strunk.

During the morning most of the traffic is headed eastbound on 13th St. and then turns right at Friberg-Strunk to go to Union High. The right-hand turn lane is in front of the gas station entrance, the cars turning right onto Friberg will block the entrance to the gas station. Customers entering or leaving the gas station will have to wait for a break in traffic, likely causing congestion. In the afternoon when school is out most of the northbound Friberg/Strunk traffic turns left onto 13th Street. Westbound traffic on 13th St. will be blocked while cars wait to turn into the gas station, and that will cause congestion. The westbound vehicles on Goodwin Rd / 13th St. come up the hill and around the curve at a speed of 40+ mph. When the traffic signal is green (or yellow) those vehicles generally do not slow down before the 13th St/Friberg intersection, so there may not be enough time to stop if there is a vehicle stopped in the travel lane waiting to turn left into the gas station. Large tanker trucks and delivery trucks will stop traffic as they attempt to maneuver into and out of the gas station.
The traffic situation is already bad with all the current traffic from the surrounding area, the high school, and the large trucks from the soon to be warehouse and then to add another 2200 vehicle trips per day to the 13th St. gas station would just compound the problem.
For the entrance/exit of the gas station to be safer for both vehicles and pedestrians, 13th St should be widened to add a left turn lane. Sidewalks should be installed on both sides of 13th St. from Friberg-Strunk down to 192nd Ave.

In summary we think this project is incompatible with our neighborhood community. The proposed gas station does not consider that it is surrounded by quiet residences and would project its collective problems onto the neighborhood.

Due to the environmental concerns and the traffic issues this is not the best location for a gas station, car wash and convenience store. A gas station is not needed at this location. Within 3 miles there are at least 6 gas stations / convenience stores and car washes, most are open 24 hours. Gas consumption is declining. The high school students are within easy walking distance to a convenience store near their school.

We ask you to carefully consider the environmental, traffic safety, and quality of life issues for the neighborhood and not approve this project. Thank you.

Sincerely,

Richard and Joan Rickard

Outlook

Gas Station Convenience Stire Goodwin/13th St

From karenrigley021@gmail.com <karenrigley021@gmail.com>
Date Thu 3/7/2024 4:13 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

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I grew up in this area. It has always felt very safe. I walk frequently and with the traffic flow in the last couple of years it has become very dangerous to cross from 202nd and Goodwin. I always have to cautiously walk WHEN THE SIGNAL indicates WALK. I always have to point at the walk sign when drivers are turning onto 13th from Goodwin, well this day I pointed and the person came to a screeching stop, which he should have stopped in the first place, as he made his abrupt stop the guy behind him rear ended him. I am sure this won't be the last incident. I am fearful someone is going to get hit! They need to reduce building in this area it is NOT SAFE and is not good for the community! Save our area so we can be safe!
Karen Rigley/Schnell
Sent from my iPhone

Outlook

Gas station / Car wash / Convenience Store Corner @ NE 13th St and Friberg-Strunk St.

From markgayles@aol.com <markgayles@aol.com>
Date Wed 3/6/2024 5:20 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Good Afternoon,

We would like to voice our comments and concerns about the proposed gas station/convenience store/carwash development going in on the corner of NE 13 St and NW Friberg-Strunk St.

We live on NE 197th Ave, which is a short cul-de-sac about .2 of a mile from the proposed development. We have concerns about the traffic and noise that this development will cause. From the corner of where this proposed development is going there are no continuous sidewalks going west on NE 13th St to NE 192nd Ave. I've twice reached out to the city of Camas and Clark Co voicing my concern about the increased traffic and the many large trucks, and the problems they pose to people/students walking or riding a bike on NE 13th St. There is now a very large warehouse being built on the east side of the proposed intersection that is going to only draw more traffic and large trucks.

Looking at the traffic study done for the proposed development it does not seem to take into account for any increase in traffic due the already under construction new commercial warehouse and the two new commercial buildings on NW Friberg-Strunk St. NE 13th St doesn't have a center turn lane, and a long section of it, approaching from the west of the intersection where the proposed gas station is, doesn't have a shoulder on either side of it. Twice a day, nine months of the year there are hundreds of students driving to and from Union high school which many are using that intersection and heading west on NE 13th St. Reading through the SEPA study it doesn't seem to take into account any realistic numbers of the fore mentioned traffic. Looking at the proposal it looks like its going to only have one entrance/exit off NE 13th St. Is that entrance far enough from the intersection of NE 13th Street and NW Friberg-Strunk St? With no center turn lane to turn into the gas station from the east it won't take very many cars to back up to, and into, the intersection? We've lived here for 25 years and have seen a number of accidents at that intersection and on NE 13th St and can't imagine the increase with the proposed development.

All the houses on our street are on wells. We are also concerned about what a gas station and it's runoff will do to the local ground water. All the homeowners on our street, and I believe that most the homes in our area, including the ones next to the gas station are on wells. We find it troubling that the city can allow a gas station that close to where we are getting our drinking water. I know car washes do their best to recycle the wash water but having been through car

washes myself I know that the cars do not come out completely dry and that water does end up outside and on the surrounding area. I'm not opposed to gas stations or car washes, I just think that next to and over an area's aquifer is not the right place. Here is some information that I found :

As the environmental risks associated with gas stations—particularly the risk of gasoline leaked from underground storage tank (UST) systems—have become increasingly clear, vast improvements have been made in the design, construction, and operation of UST systems. Unfortunately, federal and state regulators and UST system designers and installers have ***not*** *succeeded in engineering all of the groundwater contamination risk out of these systems. A study by the U.S. Geological Survey, which randomly sampled 225 water supply wells in Rockingham County in 2003, detected the gasoline additive MtBE in 40 percent of public wells, and found a correlation between MtBE concentration and proximity to USTs.*

There are designated wetlands that run behind all the houses on our street, NE 197th Ave, and up to NE 13th street from the north and then again is designated wetlands across NE 13th St on the south side, and it looks there are some designated wetlands on or near the proposed gas station lot now. What does the developer have to take into account for those? If I'm reading it right it looks like the SEPA checklist was done in August. The ground in this area is considerably different from October to June with all the rain we get. I would think that any soil sampling or ground testing ought to be done during this time, when there's a more realist representation that would yield more realist results.

The only noises they mentioned in the SEPA report are increased traffic and vehicle noise, it looks like they are proposing outdoor vacuums as part of the car wash. These vacuums are very strong and noisy and would think that they should be listed and considered in the report also.

Why is there not going to be an Environmental Impact study done? And why is the City of Camas allowing the gas station parking spot spacing and setback deviations from its own CDSM?

We love the this area and have seen tremendous change over the past 25 years. We are not against commercial development and people should be able to use their property as they see fit. But we don't think that the applicant has meet the requirements that the City, County, State and Fed's have in place to protect the surrounding landowners property, our drinking water, the environment or the safety of it's citizens.

We appreciate you listening and look forward to hearing more later, thanks.

Mark and Gayle Scott
1415 NE 197th Ave
Camas, WA 98607
360-600-2792

Outlook

13th St/202nd Ave. GasStation

From WILLIAM SMALL <rgwtsmall@comcast.net>
Date Tue 3/5/2024 12:20 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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The corner of 13th St and 202nd (Friberg-Strunk) is not the place for a gas station. There is gas available "right around the corner" at Costco. 13th and F/S are both only two lane roads (13th is very narrow).

When a car waits to turn left into the station, it will back up traffic into and beyond the intersection, possibly blocking emergency vehicles in and out of our neighborhood which is on the north side of 13th and accessed east and west from 202nd, an extension of F/S.

Traffic at this intersection has increased significantly even since the SEPA report was generated, due to development to the east (i.e. Green Mountain and as far as Livingston Mountain).

There will be big trucks coming and going from the huge warehouse on the SE corner of the intersection probably all night long. Personal cars (teens) and buses to and from the nearby high school as well as the elementary and middle schools use this intersection.

There are at least six water wells along 13th , very close to the proposed station. If an accidental spill or leakage occurs causing contamination, could the City of Camas and the person or persons approving the station be liable in a law suit? Since eighty per cent of the gas station area is hard surface, where is the assurance that our water and the wetlands down the hill will not be contaminated?

The noise and lighting created by the station will not be appreciated by neighbors and wildlife alike! Statistics show that an operation like this will attract crime and surely a lot of litter.

Joe Turner said of the Prune Hill gas station that environmental and traffic concerns were "unfortunate and frightening". But, the gas station was approved. What kind of a city do you want? Surely, NOT one of the "Best Small Cities" !!!

Ruth Small
20217 N.E. 16th St.
Camas, WA 98607

Outlook

proposed gas station at 13th St. and Friberg/Strunk (F/S)

From WILLIAM SMALL <rgwtsmall@comcast.net>
Date Thu 3/7/2024 3:09 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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I see many mistakes and omissions in the SEPA report for the proposed gas station, store, and car wash project.The report claims the property to the east (across F/S) belongs to Camas Meadows Golf course. There is currently a GIANT warehouse under construction.

The air pollution, noise, and traffic congestion from the warehouse semi trucks at this already very busy intersection will cause major problems when adding the gas station.

The single entrance/exit to the station is so close to the intersection, traffic will be backed up blocking the intersection.

The fuel holding tanks are very close to the adjacent neighbor's well. There are wells along the north side of 13th and Goodwin Road that would be contaminated by a spill or leakage.

The SEPA wetlands test took place in August and was 6" deep. Obviously, that should have been done at a wetter time of year. The whole area has spongy lawns after rains. There are scattered wetlands around and through the neighborhood.

NEIGHBORHOOD. This is NOT the proper project for this small lot.

William T. Small
20217 N.E. 16th St.
Camas, Wa 98607

Outlook

Purposed Gas Station on 13th & Friberg-Strunk ATT: Carey Secto

From Ken Waltos <ken.waltos@outlook.com>
Date Mon 3/4/2024 11:33 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Hi Carey

we are homeowners very close to the purposed gas station on 13th & Friberg-Strunk.

20106 NE 14th Street, Camas Wa.

We are opposed to this station being located there for the following reasons.

1. Our son in law is a Vancouver police officer and noted that gas station/convivence stores have a higher rate of crime then other types of businesses.
2. we have bedrooms on the second floor of my house, and we believe that the station will adversely create light pollution, impacting sleep.
3. We believe that the SEPA report does not reflect an accurate assessment of the water report due to several factors. A) it was done in August, when the water table is lower. in the winter months there are wetlands and surface water adjacent to the purposed sight. B) There was no mention of the Clark county storm water facility across the street. C)There are also privately owned drinking wells located adjacent and nearby the purposed sight.
4. We have a concern that the additional noise from the carwash and the vacuums will be a constant nuisance and may exceed what is allowed in a residential setting.
5. We believe the purposed entrance is too close to the intersection and will cause an already busy intersection to back up more especially during peak times, when school is starting or ending. The purposed gas tanker truck delivery route will add an additional back up.
6. When school is in session that intersection is used by many inexperienced drivers which has led to many near misses. The SEPA that was filled states that only 60-80 added trips would be added during peak hours out of 2,281 for the day. I do not believe that would be accurate. I believe many of the additional trips will be generated during the already congested school starting time and or during sports-related events.
7. The noise from that intersection has been magnified from the addition of the large warehouse that was built right on the adjacent corner. The addition of the gas station will only make that worse as opposed to some other types of business.

Thank you for considering my concerns and objection to the purposed gas station.

Ken and Lisa Waltos.

Outlook

Fwd: SEPA Comments- Gas Station (SEPA23-12)

From Russell Wegner <russwegner@mac.com>
Date Wed 3/6/2024 5:49 PM
To Community Development Email <communitydevelopment@cityofcamas.us>
Cc CARLO (DNR) ABBRUZZESE <puffbird10@gmail.com>

1 attachments (12 MB)
Wetland.2.pdf;

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Russell & Barbara Wegner

19910 NE 16th St.

Camas, WA 98607

Attn: City of Camas, SEPA Official

Community Development Department

616 NE Fourth Avenue

Camas, Washington 98607

Please confirm receipt.

SEPA Comments: We feel the SEPA is flawed and the project should not move forward

Please see the following:

The SEPA does not address many important issues:

1. **Water Flow and Runoff** (including storm water as well as the method of collection and disposal This is not mentioned in the SEPA) Where will this water flow?
2. **Project Violaton of Camas Municipal Code 16.55.080** - States "Uses prohibited from critical acquifer recharge areas Item F, Fuel and/ or Gas Stations."

Surface spills during the rainy season will mix with storm water which would then be discharged with drainage leads to Lacamas Creek/Lacamas Lake, and Lacamas Prairie as well as towards the west and it's wetland/standing water and aquifers.

Approximately 18 wells are adjacent to this gas station project. Wetlands and aquifer adjacent to property which are 17 feet from project property line are also affected

(see photos 2/11/24).

The SEPA does not address the protection and impact on the acquifers, Lacamas Creek, Lacamas Lake, Lacamas Prairie, Wetlands (17 ft from property line, see attached photo) and the wells. Clearly 14.04 of Municipal Code has not been addressed as part of the SEPA. Mitigation issues of developer neighboring projects is also not cited.

14.04.020 Applicability The SEPA and overall project needs to be reviewed with Camas 14.04 in mind

The provisions of this chapter shall apply to all new and existing development, public and private. The provisions of this chapter shall also apply to the maintenance responsibility of existing stormwater facilities.

1. Meeting the requirements of this chapter is the joint and severable responsibility of the owner(s) of the site and the person(s) responsible for maintenance on both new and existing facilities.
2. The responsible city official is authorized to enforce the provisions of this chapter.
3. The city recognizes that the implementation of successful pollution control practices is most likely through a pollution prevention education effort for institution sites, commercial sites, industrial sites and the general public. The city will endeavor to provide education and technical assistance within the constraints of available resources to show individuals how to implement pollution control practices.

For the purpose of this chapter the following shall apply:

"AKART" — All known, available, and reasonable methods of prevention, control, and Treatment. See also the State Water Pollution Control Act, sections 90.48.010 RCW and 90.48.520 RCW.

"Best management practices (BMPs)" — Those physical, structural and managerial practices, and prohibitions of practices, that, when used singly or in combination, control stormwater runoff peak flow rates and volumes and prevent or reduce pollution of surface water or groundwater.

Special Note: Carwashes commonly use hydrofluoric acid and this has not been addressed. The review of 14.04 needs to occur by City of Camas.

14.04.060 Prohibited discharges.

No person shall throw, drain, or otherwise discharge, cause or allow others under its control to throw, drain, or otherwise discharge into the municipal storm drain system and/or surface and ground waters, and materials other than stormwater.

A. Examples of prohibited discharges include, but are not limited to, the following:

1. Trash or debris.
2. Construction materials.
3. Petroleum products, including but not limited to, oil, gasoline, grease, fuel oil, and heating oil.
4. Antifreeze and other automotive products.
5. Metals in either particulate or dissolved form.
6. Flammable or explosive materials.
7. Radioactive material.
8. Batteries.
9. **Acids,** alkalis, or bases.
10. Paints, stains, resins, lacquers, or varnishes.
11. **Degreasers and/or solvents.**
12. Drain cleaners.
13. Pesticides, herbicides, or fertilizers.
14. **Steam cleaning wastes.**
15. **Soaps, detergents, or ammonia.**
16. Swimming pool or spa filter backwash.

17. **Chlorine, bromine, or other disinfectants.**
18. **Heated water.**
19. Domestic animal wastes.
20. Sewage.
21. Recreational vehicle waste.
22. Animal carcasses.
23. Food wastes.
24. Bark and other fibrous materials.
25. Lawn clippings, leaves, or branches.
26. Silt, sediment, concrete, cement or gravel.
27. Dyes.
28. **Chemicals not normally found in uncontaminated water.**
29. **Any other process-associated discharge except as otherwise allowed in this section.**
30. **Any hazardous material or waste not listed above.**

- Posting of a maintenance assurance pursuant to subsection J of this section.

4. Duration. Wetland permit preliminary approval shall be valid for a period of three years from the date of issuance or termination of administrative appeals or court challenges, whichever occurs later, unless:
   a. A longer period is specified in the permit; or
   b. The applicant demonstrates good cause to the responsible official's satisfaction for an extension not to exceed an additional one year.

I. Wetland Permit—Final Approval.

1. Issuance. The responsible official shall issue final approval of the wetland permit authorizing commencement of the activity permitted thereby upon:
   a. Submittal and approval of a final mitigation plan pursuant to subsection (E)(3) of this section;
   b. Installation and approval of field markings as required by Section 16.53.040(C)(2);
   c. The recording of a conservation covenant as required by Section 16.53.040(C)(3) and included on the plat, short plat, or site plan as required by Section 16.53.040(C)(4);

d. The posting of a performance assurance as required by subsection (H)(3) of this section.

Property owner at 20005 NE 13th Street experienced new sewage and drainage problems - A recent sewage backup from new Camas Sewers created a pollution issue in front of residence home on 202nd and 14th. Camas took no action to protect the pollutants into the storm water pond. Camas needs to be proactive in planning process to prevent future problems as required by involved and work with county and Dept of Ecology on this, yet it was ignored. Camas must take proactive and active with SEPA as defined in 14.4.

In order to meet the Federal Clean Water Act and DOE's requirements to protect the environment, the city has adopted regulations for identifying what is allowed and what is prohibited for discharging into waters of the state. Camas needs to ensure this is followed.

The Geotechnical Study is inaccurate. Multiple tests at multiple dates/ seasons would provide the required information to understand the soil, water, and site issues. Adjacent Wetlands are not identified. Aquifers and nearby wells on 13th street (multiple) are also not sited in the report. The aquifer and wetlands are approximately 17 feet away from the property line. Please see attached photos.

The elevation that the gas station would be is such that any runoff and drainage from the pollutants from the property would directly impact the following: Wells, Acquifers,Wetlands, Lacamas Prairie, Lacamas Creek and Lacamas Lake.

Air Quality

Regarding air quality, the SEPA does not address

a. The proposal will affect current land uses on nearby or adjacent properties.

Other Camas Code Issues that need to be addressed with SEPA

- Surrounded by quiet residential properties
- It will disturb and interfere with the peace, comfort and repose of owners or possessors of neighboring and nearby real property

- Section 18.01.020 of the Camas Municipal code A. (attachment F) states
- The purposes of this title are: to implement the comprehensive plan for the city; to encourage the most appropriate use of land; to conserve and stabilize the value of property; to aid in rendering of fire and police protection; to provide adequate open space for light and air; to lessen the congestion on streets; to give an orderly growth to the city; to prevent undue concentration of population; to improve the city's appearance; to facilitate adequate provisions for community utilities and facilities such as water, sewerage, and electrical distribution system, transportation, schools, parks, and other public requirements; and in general to promote public health, safety and general welfare.
- Since the public health, safety and general welfare is superior to the interests and pecuniary gains of the individual, this title may limit the use of property and prevent its most profitable gain. If some reasonable use of property is allowed by this title and the effect is not confiscatory, the city is exercising a proper use of police power.
- (Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)
- The externalities from this project will destabilize property values of all neighbors, which **Per Camas Municipal code 9.20.020 - Public consumption.** Except as permitted by RCW Chapter 66, no person shall open the package containing liquor or consume liquor in a public place within the limits of the city. This is problematic because the customers of the development may then move to our neighborhoods located across the street in Clark County to consume their purchases, here.
- The FHA Single Family Housing Policy Handbook for Appraiser and Property Requirements for Title II Forward and Reverse Mortgages states …that properties within one quarter mile of a gas station will need to conduct an independent inspection of their wells ('for the appraisal'). This requirement is an additional burden as result of a gas station next to all the homes on NE 13th Street and in Morning Meadows Estates and Katie's Hill neighborhoods with drinking water wells (more than 27 homes).

Air Issues

a. Emissions

- **Vacuums from car wash operation/customers vacuuming releasing particles.**
- **Vapor leaks of gasoline during customer filling and tanker truck filling of underground storage tank (UST)**
- **Exhaust fumes from cars waiting, idling, from trucks idling, even more from diesel powered engines on cars and trucks, exhaust fumes from tanker trucks**
- **Exhaust fumes and odors from 100's of additional trips of cars and trucks to the site**

Traffic Impact

The Traffic Impact study and does not reflect environmental impacts and does not address seasonal issues, school traffic issues, sidewalks, as well as other construction modifications and environmental impacts for necessary infrastructure modifications and impacts. For example, Traffic Impact Study did not capture Union High School release times which is a high traffic time and dangerous time due to bumper to bumper congestion and inexperienced drivers. The impacts of vendor services to and from the gas station and car wash are also not addressed in the Traffic Impact Study, particularly fuel trucks.

The impact of this type of development and special requirements from Dept of Ecology and City of Camas are also not identified.

Environmental Noise Issues

-
  - Horns if there is congestion, which is likely given how the entry/exit is designed
  - Tanker truck delivery process
  - Customers' loud voices
  - Regarding, Section 9.32.050 Public disturbance noises. of the Camas Municipal Code, 4. The creation of frequent, repetitive or continuous

sounds in connection with the starting, operation, repair, rebuilding or testing of any motor vehicle, motorcycle, off-road vehicle, or internal combustion engine so as to unreasonably disturb or interfere with the peace, comfort and repose of owners or possessors of neighboring or nearby real property, provided, however, that this subsection shall not apply to the operation of lawn mowers, garden tools, chain saws or other power equipment used for building repair or grounds maintenance between the hours of 7 a.m. and 10 p.m.

I see these problems coming from this project:

- car wash: swooshing, blowing, loud noises
- customers: music, especially in warmer months
- idling cars
- motor cycle and diesel truck engine noises
- starting of motor vehicles
- braking noise from motor vehicles

Animals observed on site- not addressed in SEPA

The project would disrupt the habitat for the following:

Deer

Eagles

Owls

Squirrels

Hawks

Coyotes

Raccoons

Lacamas Prairie Issues

The gas station project will impact this sacred area which includes the largest Camas Lily Field in the County (Camas is named for) Please see below from DNR.

Department of Natural Resources Lacamas Prairie NAP/NRCA

Natural Areas Category Evaluation Criteria Responses RCO Project #20-1334

Introduction: This project aims to protect priority wet prairie and Oregon white oak plant communities that contain Bradshaw's lomatium, listed as Endangered under the federal Endangered Species Act, seven other rare plants and one bird of conservation concern. Funding for this project is vital to prevent development of these private parcels, which are located just east of Vancouver, in Clark County, one of the most rapidly developing counties in the state.

1. Ecological and Biological Characteristics

Bigger Picture- Located within the Puget Trough/Willamette Valley ecoregion, **this site represents the best and only known remnant of the Willamette Valley wet prairie ecosystem in Washington, including one of only 20 remaining sites and the largest of four known population centers for Bradshaw's lomatium, a globally rare and federally endangered plant species. The prairie remnant occurs in a native valley landscape mosaic with Oregon white oak woodland and Oregon ash wetland forest. Conservation targets at the site include the following elements that have been identified as priorities for protection in The State of Washington Natural Heritage Plan (2018)**:

Oregon white oak/Oregon ash / snowberry forest--Priority 1
Priority 2 Willamette Valley wetprairie--Priority 1
Bradshaw's lomatium--Priority 1
Slender-billed Nuthatch--Priority 1
Tall beardtongue—Priority 1
Hall's aster--Priority 2
Oregon coyote-thistle--
Dense sedge--Priority 3
Nuttall's quillwort--Priority 3
Small-flowered trillium--Priority 3
Calif. compass plant--Priority 3

This site was approved by the Commissioner of Public Lands in 2007 as a combined natural area preserve (NAP) and natural resources conservation area (NRCA). The sensitive prairie, rare plants and oak forest will be protected within a core NAP, while important watershed lands, waterfowl habitat, and oak/ash forest remnants are found within the NRCA portion.

The prairie and oak communities on this site have been identified by Partners in Flight and the American Bird Conservancy as a priority Bird Conservation Area (BCA). This site is also supported by the Draft Lacamas Meadows Site Conservation Plan written by the Washington Field Office of The Nature Conservancy in 1999. Restoration and management of this site are recognized as an important component of the U.S. Fish and Wildlife Service Bradshaw's lomatium (*Lomatium bradshawii)* Recovery Plan and the U.S. Fish and WildlifeService Willamette Basin Recovery Plan. The Natural Heritage Advisory Council has approved the site as a Natural Area in 2006.

Uniqueness and Significance- This occurrence of Willamette Valley wet prairie is the last remaining example of its size and quality in Washington. Formerly extending over more than 1 million acres in the Willamette and Columbia Valleys, this native prairie type is now extremely rare, with less than 1% (2000 acres) remaining in fewer than 20 locations. Most of this lowland oak forest and prairie was lost in the early 1900s to agriculture and land development.

This site is part of a larger native landscape of lowland wet prairie, oak forest and ash riparian forest. Other protected lands within this lowland landscape include: Oregon ash riparian forest in Camp Curry (protected by a conservation easement held by the Columbia Land Trust), Lacamas Lake County Park, and a native prairie remnant on the Camas Meadows Conservation Agreement tracts. Adjacent private lands also have examples of the wet prairie and oak forest.

Species or Communities- The Oregon white oak – Oregon ash / snowberry forest at Lacamas Prairie is one of six high-quality examples out of less than 20 occurrences in the state. Most other sites are either smaller, more fragmented, or infested with exotic plants.

The population of Bradshaw's lomatium is the only known occurrence of this species in Washington and is believed to be the largest population of this species in the world. There are only 12 other known populations of this species throughout its range. It also is the only occurrence of the species within Recovery Area 5, as described in the USFWS Recovery Plan (1993) and Plan Amendment (1999) for Bradshaw's lomatium.

In 2014 a population of tall beardtongue was discovered at the site. This species was first recorded in 1934 and had not been seen since until it was rediscovered in Oregon in 2008. In Washington, this species is only known from Lacamas Prairie NA which has the largest known population in the world. There are only four other extant populations which are found southeast of Portland.

Thank you for your attention to this very important matter.

Sincerely,

Russell and Barbara Wegner

Russell Wegner
19910 NE 16th St.
Camas, WA 98607

360-314-4500 Land
415-716-4373 mobile

russwegner@mac.com

Outlook

SEPA23-12 13TH Street Gas Station

From Judy Wilson <uno-gram@msn.com>
Date Thu 3/7/2024 3:52 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Dear Robert Maul,

I purchased my home @ 20008 NE 11 Street Camas WA 98607 50 years ago .
My Home is on the property line for the proposed Gas Station, and the current Business Park zoned, Tech Center on Strunk RD..

The Proposed Gas Station SEPA23-12 13TH Street would have a huge negative impact on our environment in which we live .

I have already witnessed the large impact of the "Business Park Zoned construction that is next to proposed Gas Station.
It's awful. The Owls, Deer, Bal Eagles and more are being pushed out of their habitat. We have increased traffic, pollution, crime, loss privacy.

In my opinion ,The Gas Station could have a negative effect on the value of our homes, the quality of our water, and the wildlife that inhabits surrounding area.

If we sell our home, we have to have a special inspection because of Gas Station . What about our well water and landscaping ?
What about Privacy Wall ???

This is in our back yard. Would you like to build a "business Park zoned anything in your back yard?
Really, the current building next-door is ridiculous .
Trucks in and out, horns honking, reverse beepers beeping , loaders banging ,diesel fumes all day.
I walk in my back yard and look directly at it every day .We need a Privacy wall please.

No Gas Station Please!

Thank You, Judith Ann Wilson and family.

Outlook

Proposed 13thSt/Friberg-Strunk Gas station and Car Wash

From Tim Woodring <timjwoodring@gmail.com>
Date Thu 3/7/2024 3:47 AM
To Community Development Email <communitydevelopment@cityofcamas.us>

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To Whom it may Concern,

As a concerned citizen of Unincorporated Clark County I am concerned about this proposal in that I live within 1/4 mile of the proposed development. I am a resident of 11th st and my property will be affected by this business in that I have a well that supplies my home with water, and one other concern.
Besides those two issues I am concerned that the first I am hearing of this proposed development was by a flyer placed at my front door (March 6th). Until then I have heard nothing about this matter. In that it impacts my property both legally and subjectively, I wonder why I have not heard of this.Understanding I have not investigated the matter fully, in that I have not had the time to do so. First and foremost I consider my family's health (later explained) and secondly I am led to believe I am monetarily impacted by this development in that when I sell my property I am subject to a mandatory, by law, a water well inspection prior to sale. I am currently preparing to sell my property within the next two years. I feel this will impact me in two ways, first in that the inspection will cost me money, and secondly that this inspection, and probably by legal land sale disclosure, will reveal to a potential buyer that they are well within a "pollution zone" that will affect the sale price of the home now and in the future.
The "flyer" placed on my door also referenced a State Environmental Policy Act (SEPA) study that may not have been conducted properly. Again I apologize given the time frame I have not been able to validate these claims, The flyer claims the study was done during the dry season and may not be accurate. I give cause to this belief in that my neighbor and I have an easement together on our properties, My half of the easement is projected to be a traffic through way, and theirs is for stormwater run-off. Currently my part of the eastment has not been "claimed" by Clark County, however my neighbors has, and is currently a stormwater drainage ditch.
That being said, not being an expert, it does give me cause to think a lot of water is exchanged within the 1/4 mile area surrounding the proposed gas station/car wash that I live within. I am foremost concerned with the health of my family, and secondly with the impacts of the value of my property now and in the future.
My Second concern is noise. When I moved here long ago we loved it for the silence as one of the benefits of the area, There was no Walmart, no Costco or any of the other businesses or schools along 192nd Ave, I accept development happening, part of the world turning. I also believe in reason. The potential noise from the car wash, and its vacuums may be unreasonable, understanding the property is surrounded by residential properties on the majority of sides. At the very least I would have wanted

somebody from the City of Camas to make a 1/4 mile circle on a GIS or Google map to find out those affected and notify them. At the very least I would have been happy with a guy showing up at my door asking if he could hear a shop-vac from 900 ft away.
Concluding, As an affected resident, I would like more time to hear more about any proposed mitigations. Whether they be environmental or financial this, if approved, will affect me either way. I am sure you can confirm my location via Clark County GIS.
I may be reached at this email for any questions.

Thank you

Tim Woodring

Outlook

Gas station near 13th

From Steven Zimmerman <szimmer753@icloud.com>
Date Thu 2/29/2024 4:24 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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As a resident of Camas for over 60 years I am totally in favor of a small business gas station near Union High School.
The negative impact pointed out by the newspaper is largely in “theory “ stage—not facts that have empirical evidence proving any long term negative impact.
Steve Zimmerman
360 921-1177
Sent from my iPhone

PROJECT NARRATIVE
For

13TH SITE PLAN

A PRELIMINARY TYPE II APPLICATION

Submitted to
CITY OF CAMAS

FOR
TAZ KHAN
3993 NW Currawong Court
Camas, WA 98607

October 2023
Revised August 2024

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General Information

Applicant/Owner:

Taz Khan
3993 NW Currawong Court
Camas, WA 98607
512-779-4999
tkhanusa@gmail.com

Owner:

Pak USA Camas LLC
20101 NE 13th Street
Camas, WA 98607

Project Contacts:

PLS Engineering
Travis Johnson, PE
604 W Evergreen Boulevard
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

Location:	NW ¼ of Section 29, T2N, R3E, WM
Address:	20101 NE 13th Street, Camas, WA 98607
Project Size:	0.97 acres/42,257 SF
Zoning:	BP – Business Park
Overlay:	None
Comprehensive Plan:	IND
Current Use:	Vacant
Parcel Number:	176148000
School District:	Evergreen
Water District:	Camas
Sewer District:	Camas
Fire District:	Camas
Park District:	N/A
Clark County Reference:	PA22-32
Transportation Impact Fee:	Camas

Project Description

The 13th Street Site Plan project proposes to construct a 4,100 sf convenience store with drive-thru car wash and gas pumps on parcel 176148000. The convenience store will have small general retail sales including food items, cold beverages and potentially some on-site prepared foods.

The site is located on the southwest corner of the intersection at NE 13th Street and NW Friberg-Strunk Street. A single-family home is currently on site that will be removed. Parcels to the north across NE 13th Street, as well as directly to the west, are single-family residential uses under Clark County jurisdiction. South of the site is a developing business park approved as Lacamas Tech Business Park. East of the site across NW Friberg-Strunk Street is Camas Meadows Golf Club.

The site is relatively flat with vegetation consisting primarily of grass with scattered trees.

Transportation and Utilities:
NE 13th Street is an existing Minor Arterial that abuts the site to the north and provides access to the site. Frontage improvements are proposed to bring the street up to half-width standards including a 37' half-width ROW and 23' half-width paved section with 6' planter strip and 6' detached sidewalks.

NW Friberg-Strunk Street is a fully improved 3 lane arterial that does not require frontage improvements per the Pre-Application Conference Report.

There are no transit routes or stops within 1/4 mile of the development site.

A traffic study has been provided that shows the projected trip generations for the development. No offsite mitigation is required based on the study.

Stormwater will be collected and treated onsite before being routed to an onsite underground stormwater detention facility. From there it will be discharged to an existing conveyance system. A stormwater report has been provided to show compliance with the City stormwater regulations.

The site will be served by public water and sewer services.

Critical Areas:
Ecological Land Services (ELS) assessed the site for critical areas and has provided a Critical Areas Report. ELS concludes that there is one Oregon white oak on the south portion of the property, but no oak woodlands or caves as mapped by WDFW. There is a wetland to the south of the site that has permits to be filled for the proposed Lacamas Tech Business Park. There is an offsite wetland that has been identified to the west on adjacent property with buffers that extend onto the subject site.

The parcel is within a high and moderate - high archaeological predictive area, therefore an Archaeological Predetermination has been prepared for the site and submitted with this application.

Proposal & Code Compliance Discussion

Title 16 – Environment

16.01 - SEPA

The State Environmental Policy Act (SEPA) procedures require documentation of critical areas as well as discussion on earth, air, water, plants and animals, energy and natural resources, environmental health, noise, land and shoreline uses, aesthetics, recreation, historic and cultural preservation, transportation, and public services and utilities. A SEPA application is required and has been included with this application. A revised SEPA was submitted on July 15, 2024 that included revised environmental data further discussed below.

16.31 – Archaeological Resource Preservation

The site is located in an area of high probability for the presence of archaeological artifacts. An Archaeological Predetermination Survey Report is required for this project. Archaeological Services, LLC (ASCC) performed an onsite field investigation on August 17, 2023. Several artifacts were found including pink glass fragments suspected to be Depression Glass, a coin bank dated to 1926-1930, and a metal bolt. Based on these items, along with the former structures that appear on site in historic photos, ASCC is recording the debris scatter as a historic-area archaeological site and recommends a Cultural Resource Survey Report prior to any ground disturbing activity.

16.51 – Critical Areas - 16.53 Wetlands - 16.61 Fish and Wildlife Habitat

WDFW has mapped the site as having oak woodland and being within a cave rich area. No wetlands are mapped onsite however potential wetlands are mapped by Clark County GIS on the property to the south. A Critical Areas Report has been prepared by Ecological Land Services (ELS) for the the site and concludes that there is one Oregon white oak on the south portion of the property, but no oak woodlands or caves as mapped by WDFW. The potential wetland to the south is located within the footprint of a proposed building and that application has received permits to fill the wetland.

A revised Critical Areas Report (CAR) prepared by ELS and dated May 2, 2024 was submitted to the City of Camas along with other supporting documents that address comments received during the 1st Notice of Application. The revised CAR includes findings from an April 2024 site visit that include a wetland to the southwest of the site with a buffer that extends on to the subject parcel.

Along with a revised CAR, ELS issued a revised Oak Mitigation Plan (dated May 17, 2024) as well as a Wetland Buffer Mitigation Plan (dated May 16, 2024). The oak tree mitigation plan proposes to purchase credits with the Terrace Oak Bank. The wetland buffer mitigation plan proposes to purchase credits with the Terrace Mitigation Bank.

Title 17 – Land Development

17.19.040 – Infrastructure Standards

NE 13th Street is an existing minor arterial that abuts the site to the north. Access to the site will be via a new entrance/exit from NE 13th Street. Half width improvements are proposed as part of this project. Some improvements at the intersection of NW Friberg-Strunk Street were previously completed. Frontage improvements for this development will begin at the west curb return and continue west along the site frontage. Additional right-of-way will be dedicated to provide a 37' half-width right-of-way with a 52' full-width right-of-way. The 23'paved roadway half width that tapers out to 28.5'at the intersection with NW Friberg-Strunk Street. It includes a 6' detached sidewalk and an 8' planter strip.

NW Friberg-Strunk is an existing 3-lane arterial that is fully improved. No frontage improvements are required or proposed. No access is proposed via NW Friberg-Strunk Street.

Circulation:

No circulation to adjacent parcels is proposed. The site fronts on NE 13th Street and NW Friberg-Strunk Street, therefore no further circulation to the north or east is required. The parcel to the west is zoned residential and falls under Clark County jurisdiction. Any circulation to the west would not be compatible with this proposed use. The parcels to the south are currently developing as a business park and do not require circulation to and through the subject parcel.

Turnarounds:

The proposed drive aisles that will serve the site vary in width from 24' to 32' wide and can be utilized as a loop road for fire turnaround.

Pedestrian/Bicycle Circulation:

All sidewalks, driveway aprons, and pedestrian crossings will comply with the American with Disabilities Act.

Access Spacing:

Required access spacing along an arterial is 660' minimum and 1,000' maximum. The westernmost property line is approximately 367' west of the intersection with NW Friberg-Strunk Street, therefore it is not possible to meet minimum access spacing based on the existing conditions of the site. A deviation request has been submitted with this application to grant relief from this standard. The access to the site has been located as far west as possible, while allowing for a street taper on NE 13th Street and providing space on site for gas tanker trucks to maneuver to exit the site.

Traffic Study:

A Traffic Study has been prepared for this project by Charbonneau Engineering and is included with this application. The following is a summary of the study:

- Intersection sight distance at the access point exceeds the minimum standard (390 feet) as over 500 feet of sightline is available in both directions on NE 13th Street. For safety reasons the sightlines must be maintained and potential obstructions due to street grade,

buildings, parking, signing, fencing, landscaping, above ground utilities, or other objects shall not be permitted.

- The capacity analysis has determined that only one intersection will fail. The signalized intersection at NE 13th Street and NE 192nd Avenue will operate at LOS `F` during the PM peak hour in the year 2026 background and total traffic scenarios. The failing condition is attributed to the growth and in-process traffic. The City has recognized and documented in the TSP that long range future improvements will be necessary on NE 13th Street (Goodwin Road) to accommodate heavier traffic. A year 2035 improvement is listed in Table 6 within the TSP that proposes street widening which should mitigate the issue. Specifically, the current study finds that adding a separate left turn lane on the westbound approach will mitigate the failing condition to acceptable LOS `D`. However, no mitigation is proposed in conjunction with the gas station & market development as the failure is due to the background traffic conditions.

- A left turn lane warrant was assessed for the westbound to southbound movement from NE 13th Street for traffic entering the site. The AM & PM peak hours were evaluated for the year 2026 total traffic scenario. The turn lane is not warranted in the PM peak hour. The warrant curve (Exhibit 1310-7a in the appendix) indicates that a left turn is marginally met based on a 40 MPH travel speed. However, the travel speed on NE 13th Street is 35 MPH which if plotted indicates the warrant would not be met. It is also noted that the queuing analysis for the westbound left turn movement has confirmed that up to one vehicle may queue to make a left turn resulting in a LOS `A` condition. Considering these factors adding a westbound left turn lane on NE 13th Street is not proposed in conjunction with the development.
- Based on the findings of the traffic analysis no off-site improvements to the transportation system are recommended.
- The City of Vancouver's intersections that are identified for future improvements are detailed in the traffic study in Table 4. The table includes the number of peak hour site trips that will impact the locations, cost per trip, and the proportionate share fee equating to $153,050.
- The development at full build out will create an additional 2,281 new trips, with 60 net AM peak hour trips and 81 net PM peak hour trips.

Sewer and Water

The site will be served by the City of Camas for public sewer service. There is an existing 4" pressure sewer main located in the west half of NE Friberg-Strunk Street. A 4" pressure sewer lateral was stubbed to the site from NE Friberg-Strunk Street. A private STEP sewer system is required for this site.

City of Camas will provide public water service. There in an existing 12" water main located in NE Friberg-Strunk Street with an existing 8" water main to the site at the SE corner of the site. The development will extend the existing 8" water main to serve the site.

Stormwater and Erosion Control
Stormwater runoff from pollution generating surfaces is proposed to be treated using filter cartridges and then routed to an underground detention facility. Infiltration was deemed infeasible by the geotechnical engineer, so discharge from the site will be routed to an existing drainage ditch on the north side of the site.

A preliminary stormwater plan has been submitted with this application. The preliminary technical information report (TIR) has also been submitted with this application which better explains the stormwater system and how it meets the applicable code.

Garbage and Recycling:
The location of onsite garbage and recycling receptacles is shown on the preliminary site plan.

Impact Fees:
This development will pay impact fees for traffic and fire.

System Development Charges:
Water and sewer system development charges will be paid by this development.

Fire:
Fire apparatus access is provided onsite with the proposed drive aisles. Permits for underground storage tanks, fuel dispensing, sprinkler system and fire alarm system will be required. One new fire hydrant is proposed onsite.

Title 18 - Zoning

18.05 – Zoning Districts
The site is designated as being within the BP (Business Park) zoning district, a commercial district.

18.07 – Use Authorization
The applicant proposes a gas/fuel station with mini market, which is a permitted uses in the BP zone. Development in this zone is noted as needing to comply with Design Review under CMC 18.19.

18.09 – Density and Dimensions
Density standards are not applicable for this zone/use. The following standards apply to this development:

Table 1 – Density and Dimensions for Commercial and Industrial Zones		
	BP	**Proposed**
Maximum density (dwelling units/net acre)	n/a	n/a

Minimum lot area (square feet)	½ acre	0.97 acres
Minimum lot width (feet)	100	131’
Minimum lot depth (feet)	100	328’
Maximum building lot coverage	50%	20%
Maximum building height (feet)	None	28’
Minimum front yard	15’	15’
Minimum side yard	15’	15’
Minimum rear yard	50’	50’

The development will comply with the above standards.

18.11 – Parking

CMC 18.11.130 requires that gas stations with mini markets provide 1 parking space per nozzle plus 1 space per 250 sf of gross floor area. Car wash uses require 2 spaces per stall and 1 space per 2 employees. The following parking calculations demonstrate what is required for this site:

4,100 sf mini market @ 1/250 sf	= 17 spaces
8 nozzle gas station @ 1/nozzle	= 8 spaces
1 stall carwash w/2 employees @ 2/stall + ½ employees	= 3 spaces
Total	= 28 spaces
Excluding gas fill-up stalls	= 20 spaces

This development proposes a total of 20 parking spaces, all standard size, plus 8 gas fill-up stalls. Of the 20 standard spaces 1 will be ADA compliant, 2 will have electric vehicle charging infrastructure at the time of development and 2 are designated as future electric vehicle charging spaces.

The design of the site limits any vehicle from having to back out into public right-of-way.

18.13 – Landscaping

A Tree Survey has been submitted with this application providing an inventory of existing trees. A Landscape, Tree and Vegetation Plan has been submitted with this application showing proposed landscaping, and all onsite trees proposed to be retained or removed.

A 20-unit/acre tree density per net acre has been incorporated into the site plan. The tree density is met by providing street trees, and plantings withing the proposed tract areas. The proposed and adjacent uses are residential or open space, so specific landscape buffers are not required.

Landscape buffers have been provided as follows:

North: 5’ - L2
West: 10’ – L3
South: 5’ – L2
East: 10’ – L3

The pre-application conference report states that the drive-thru car wash should be screened to a 10'- L3 buffer standard. This would require a 10' – L3 buffer along the east as well as a portion of the north property line. This is not a code requirement, rather a design review recommendation from previous projects. It is not possible to provide the 10' buffer due to the constraints of the parcel. The lot is narrow; after right-of-way dedication the remaining lot width is approximately 124'. A 10' – L3 buffer is provided along NW Friberg-Strunk Street, as the lot is quite deep and there is room for the additional buffer. Along NE 13th Street a 5' – L2 buffer has been shown. It should be noted that the drive-thru for the car wash will generate significantly less traffic than a drive-thru for fast food. In addition, the car wash will generate fewer trips than the traffic utilizing the site for the gas station or the mini mart. From a trip generation/screening standpoint it does not seem that additional screening is necessary for this type of a drive-thru. A deviation request is not submitted for this item because the project does meet written code. The applicant hopes that the City will work with us to find a compromise.

Street trees will be provided along NE 13th Street. NW Friberg-Strunk Street is already built to the required standards with street trees; no street trees along NW Friberg-Strunk Street are proposed.

18.15 – Signs

No signs are proposed with this project at this time.

18.17 – Supplemental Development Standards

This lot is a corner lot, therefore a vision clearance area of 15' x 15' is required.

18.19 – Design Review

Per CMC 18.19.020 Design Review is required for new developments in commercial zones. The applicant has designed the site to provide:

- Parking areas placed towards the interior of the site and screened with landscaping.
- The drive-thru is screened heavily with landscape.
- The design of the site has kept development away from the existing home to the west.
- The proposed building is designed to be built right on the setback line in order to define the streetscape. Blank walls have been avoided.
- Outdoor lighting will be directed so as not to impact adjacent properties and streets.

18.18 – Site Plan Review

This proposal is subject to a Type II Site Plan Review. All applicable content has been submitted for a complete application. The following criteria must be addressed in order for the site plan to be approved:

- *Compatibility with the City's comprehensive plan*

Response: This project encourages economic development in an area designated as Business Park, which is considered Employment Land.

- *Compliance with all applicable design and development standards*

Response: As evidenced in this narrative, and associated plans, the proposed development complies with all applicable codes and development standards.

- *Availability and accessibility of adequate public services*

Response: Public water and sewer are available adjacent to the site in public right-of-way. Garbage and recycling services are available in the area. Emergency services such as fire, medical and police also are available in the area. This development will not impact schools or parks.

- *Adequate provisions are made for other public and private services and utilities, parks, and trails*

Response: This development will pay impact fees for traffic and fire, as well as system development charges for water and sewer. This development will not impact schools or parks as it is commercial in nature. There are no trails in the vicinity of the site to connect to. Garbage and recycling service will be paid for by the owner of the site.

- *Adequate provisions are made for maintenance of public utilities*

Response: Provisions have been made to provide for the maintenance of public utilities by paying impact fees and system development charges.

- *All relevant statutory codes, regulations, ordinance, and compliance with the same*

Response: This narrative and the associated plans and reports address all relevant statutory codes, regulations, ordinance and demonstrate compliance with the applicable codes.

18.55 – Administration and Procedures

This project is subject to a Type II process for Site Plan Review. The application will be subject to the development approval and application timelines of this chapter.

A preapplication meeting is required per CMC 18.55.060. A preapplication conference was held on July 28th, 2022 and a land use application was not submitted within 180 days. The applicant met City staff to review changes made to the layout. Emails with Yvette Sennewold confirm that this meeting acted as a 2nd pre-application conference and no further conference or waiver would be required.

The project received Technically Complete status on December 19, 2023 and Notice of Application was issued. Based on a number of comments the applicant placed the project on hold in order to provide additional environmental information. A revised SEPA with supporting documentation was submitted on July 15, 2024.

The applicant has submitted the required documents and information as required CMC 18.55.110.

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:
Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]

   13th Street Site Plan

2. Name of applicant: [help]

Taz Khan

3. Address and phone number of applicant and contact person: [help]

3993 NW Currawong Court
Camas, WA 98607

4. Date checklist prepared: [help]

August 23, 2023
Revised May 2, 2024

5. Agency requesting checklist: [help]

City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]

Development is expected to start at the time of final construction drawing approval, likely in early 2024. No phasing is proposed.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

No, not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

SEPA Checklist, Archaeological Predetermination, Geotechnical Report, Critical Areas Report, Oak Mitigation Plan and Wetland Buffer Mitigation Plan

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

No, there are no known government approvals pending related to this property.

10. List any government approvals or permits that will be needed for your proposal, if known.

- *Preliminary Type II Site Plan*
- *Public notification and staff report publications*
- *Final engineering plan review and approval*
- *Final Site Plan Approval*
- *SEPA*
- *SWWPPP*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The applicant proposes to construct a 4,100 sf convenience store with gas pumps and a drive through car wash. The site is zoned BP, Business Park, and is 0.97 acres in size.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

The site is located at 20101 NE 13th Street, Camas, WA 98607, in the NW ¼ of Section 29, Township 2 North, Range 3 East of the Willamette Meridian. The site is comprised of tax lot 176148000. See the proposed development plans for a preliminary site plan, grading plan, vicinity map and topographical data.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

5% per Clark County GIS data

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

This site has the following soils onsite per Clark County GIS data:

WrB – Wind River Gravelly Loam, 0-8% slopes
CvA – Cove Silty Loam, 0-3% slopes

It is unknown if these soils are classified as agricultural or if the site contains prime farmland.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate area.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

There will be grading for the construction of drive aisles, the installation of utilities, and the preparation of the site for the future convenience store, car wash and gas pumps. Surplus material may be required to be hauled from the site to an approved dump site or offsite fill may be required. Quantities and source are unknown at this time.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Standard erosion control measures will be followed during grading construction on the site. A final erosion control plan will be reviewed and approved by City of Camas.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 80%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Proposed measures to reduce and control erosion include providing an erosion control plan for review and approval prior to starting construction on the site and following the conditions of the approved grading and erosion control plan during all phases of construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal commercial/retail uses as well as possible vapor from the gas tanks.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are no known off-site sources of emissions or odor that may affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Dust from construction can be mitigated by sprinkling the site with water during construction as needed. Stage 2 vapor recovery systems will be included in the gas storage tanks and

delivery systems.

3. Water [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

There is a wetland to the south of the site that has permits to be filled for the proposed Lacamas Tech Business Park. There is an offsite wetland that has been identified to the west on adjacent property.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

Yes, work will take place within 200' of the offsite wetland to the west. No wetland impacts are proposed however a portion of the wetland buffer will be impacted. Approximately 0.16 acres of wetland buffer will be impacted by a paved parking area.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

No fill or dredge material is proposed to be placed in or removed from the offsite wetland.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

The proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, the site does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No, there will be no discharge of waste material to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No ground water will be withdrawn with this proposal. Stormwater from pollution generating surfaces will be treated prior to being routed to an existing roadside ditch. Runoff around gas pumps will go through an oil/water separator before being discharged to the storm sewer.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if

any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

No waste material is proposed to be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

The main source of runoff is from stormwater. There will be runoff from impervious roof area, drive aisles, parking areas, and landscaped areas. Onsite catch basins will connect to a pipe network that leads to an underground detention facility that will discharge to an existing roadside ditch. Runoff around gas pumps will go through an oil/water separator before being discharged to the storm sewer.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

Not anticipated.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

Use of approved erosion control measures during all phases of development. Runoff around gas pumps will go through an oil/water separator before being discharged to the storm sewer. Wetland buffer impacts are proposed to be mitigated offsite by purchasing 0.08 mitigation credits through the Terrace Mitigation Bank LLC. The Wetland Buffer Bank Use Plan, prepared by Ecological Land Services (ELS) and dated May 16, 2024, provides further details.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

x deciduous tree: alder, **maple**, aspen, **other: Oregon white oak, ash, cottonwood, cherry**
x evergreen tree: **fir**, cedar, pine, other
x shrubs
x grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other

x other types of vegetation: **blackberry**

b. What kind and amount of vegetation will be removed or altered? [help]

Site vegetation will be stripped for site preparation. Trees beyond the property line are proposed to be retained.

c. List threatened and endangered species known to be on or near the site. [help]

There is 1 priority habitat Oregon white oak onsite.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Landscaping will be provided onsite in accordance with City of Camas requirements. One Oregon white oak will be removed and mitigated offsite at the Terrace Mitigation Bank. Approximately 0.238 credits are proposed to be purchased for mitigation. The revised Oak Bank Use Plan, prepared by ELS and dated May 17, 2024, provides further details.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

None known.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:

birds: hawk, heron, eagle, **songbirds, other:** mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Small mammals, such as mice, voles, and rabbits are located on and near the site. This site is also in an area where larger mammals, such as raccoons, opossum, and mammals indigenous to the Clark County area are sometimes located.

b. List any threatened and endangered species known to be on or near the site. [help]

There are no known threatened or endangered species on or near the site.

c. Is the site part of a migration route? If so, explain. help]

This site is part of the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

The site will provide landscaped buffers and street trees.

e. List any invasive animal species known to be on or near the site. [help]

None known

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

The site will be served primarily by electricity.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

The convenience store and car wash will have energy efficient windows and will comply with state building codes which include conservation measures.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

The gas station will store and dispense gasoline and diesel, which are flammable and could spill.

1) Describe any known or possible contamination at the site from present or past uses. [help]

Utilizing the "What's in My Neighborhood" section of DOE's database shows that there are no cleanup sites or known hazards within 0.5 miles of the site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

There are no known existing hazardous chemicals/conditions that may affect the development.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

The site proposes a gas station; gas and diesel will be stored and used on the site after development.

4) Describe special emergency services that might be required. [help]

No special emergency services outside those normally expected in a

commercial/business area are anticipated to be required in association with this proposal.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

Emergency shut-off switches will be located inside of the convenience store and outside at the gas pumps. Underground storage and pipes will be double-containment construction with rupture protection. Underground tanks also include monitoring of the inner walls for leaks. Overfill protection, gravity return of undispensed product, breakaway valves and stage 2 vapor recovery systems are also included in the storage tanks and delivery systems.

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)? [help]

Light traffic noise from surrounding areas/roads along with typical home and business use noises. None of these will affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site. [help]

Short term noises would include construction noises which would occur during approved hours as mandated by City of Camas and Washington State. Long term noises could include slight increase in traffic noise and vehicle noise at the site.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Construction on the site will take place during normal working hours as allowed by the City.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed site has an existing single-family residence and two outbuildings. To the south is a developing business park. West of the site is a single-family residence. To the east of the site across NW Friberg-Strunk Street is land owned by Camas Meadows Golf Club. To the north across NE 13th Street are single family homes.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

It is unknown whether the site has been used as working farmlands or forest lands. There are not currently any agricultural or forest uses associated with the site.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No, the proposal will not be affected by, nor will it affect, any surrounding working farm or forest land business.

c. Describe any structures on the site. [help]

Single family residences and two outbuildings.

d. Will any structures be demolished? If so, what? [help]

All structures will be demolished.

e. What is the current zoning classification of the site? [help]

BP – Business Park

f. What is the current comprehensive plan designation of the site? [help]

IND - Industrial

g. If applicable, what is the current shoreline master program designation of the site? [help]

The site does not lie within the shoreline master program.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

There is one Oregon white oak on site.

i. Approximately how many people would reside or work in the completed project? [help]

It is currently planned that approximately 2-4 people will work at this site at the time of full buildout.

j. Approximately how many people would the completed project displace? [help]

The removal of one single-family residence has the potential to displace up to 3 people.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

There are no measures proposed to avoid or reduce displacement impacts.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

By complying with the zoning designation, the comprehensive plan, and the City of Camas Development Code, the proposal will be compatible with the existing and projected land uses.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

No impacts are expected to agricultural or forest lands, therefore no measures are proposed.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

Not applicable, no homes are proposed.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

One existing residence will be eliminated. The income level housing type is unknown.

c. Proposed measures to reduce or control housing impacts, if any: [help]

The applicant will pay all impact fees associated with the development at the time of building permit.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

All new construction will meet City of Camas building codes for commercial/business development. Exterior building materials will include composite wood siding, fiber cement panels, CMU, metal roofing and accents, and veneer stone. The tallest structure will not exceed 28'.

b. What views in the immediate vicinity would be altered or obstructed? [help]

The site will change from a large-lot single family residence to a commercial/retail development with a convenience store, gas station and drive-through car wash. No views will be obstructed though they will be altered as the site develops.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The site will be landscaped as required by the City of Camas. The main roadway frontages will be landscaped with trees per the City of Camas roadway standards.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

When the site is built out external illumination will be provided for the canopy/fueling area and for perimeter lot lighting and parking areas.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No, light or glare from the finished project will not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are existing off-site sources of light from adjacent homes and roads, but they will not affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Lights and streetlights will be shielded to reduce light and glare.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Camas Meadows Golf Club is adjacent to the east. The Harmony Sports Complex is approximately ½ mile to the west.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

There will be no recreational uses displaced with this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

No impacts are proposed, therefore no measures to reduce or control impacts on recreation are proposed.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

There are no structures recommended for listing in national, state or local preservation registers per the Archaeological Predetermination.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

Archaeological Services, LLC (ASCC) performed an onsite field investigation on August 17, 2023. No mention of landmarks, features or other evidence of Indian use or occupation are mentioned. Several artifacts were found including pink glass fragments suspected to be Depression Glass, a coin bank dated to 1926-1930, and a metal bolt. Based on these items, along with the former structures that appear on site in historic photos, ASCC is recording the debris scatter as a historic-area archaeological site and recommends a Cultural Resource Survey Report prior to any ground disturbing activity.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and

historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The report utilized surface surveys and excavation of test pits, as well as reviewing historical maps and records on file at the Washington State Department of Archaeology and Historic Preservation.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

Based on the findings of the Archaeological Predetermination, a Cultural Resources Study is recommended prior to ground disturbing activity. If during the course of construction any artifacts are discovered, all work will cease, and proper notification shall be given to City of Camas and DAHP.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

NE 13th Street and NW Friberg-Strunk Street abut the site to the north and west. A new driveway off of NE 13th Street will provide access to the site.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

C-tran does not operate in close proximity to the site. The nearest stop is 1.6 miles SE of the site along SE 192nd Avenue at Mill Plain Blvd.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

20 parking spaces, plus 8 gas fill-up spaces, will be provided with this development. The project will eliminate approximately 2-4 parking spaces with the removal of the existing home.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Frontage improvements are proposed to bring NE 13th Street up to half-width roadway standards. NW Friberg-Strunk Street is currently built out to standard.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help].

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would

be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

A Traffic Analysis Report and Traffic Memo-"Response to City Traffic Comments" have been prepared by Charbonneau Engineering, LLC for the site and are included with this application. The Traffic Analysis estimated that 2,281 new trips per day would be generated by the project. It is expected that 60 trips will occur in the AM peak hour (7:00 – 9:00 AM) and 81 trips will occur in the PM peak hour (4:00 – 6:00). Note that fueling tank trucks will be limited to filling tanks onsite during the hours of 7 pm and 7 am to avoid impacting peak hour traffic.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

Not anticipated

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The applicant will pay transportation impact fees. A west bound left turn lane on NE 13th Street is proposed that will improve safety at the site access.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes. The completion of this development will increase the need for public services in the area.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

This project will pay impact fees for traffic at the time of building permit.

16. Utilities [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

- *Electricity: Clark Public Utilities*
- *Water: City of Camas*
- *Telephone: Century Link, Comcast*
- *Sanitary Sewer: City of Camas*
- *Natural Gas: NW Natural*

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

DocuSigned by:

Signature: _____
EF97DED7F6DD4E...

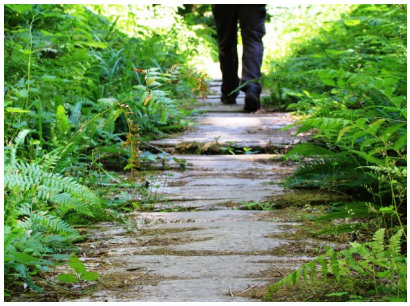
Name of signee Faz Khan

Position and Agency/Organization Managing Member Pak USA Camas, LLC

Date Submitted: 7/9/2024

CRITICAL AREAS REPORT - REVISED

May 2, 2024



13th Street Gas Station

Camas, WA

Prepared for

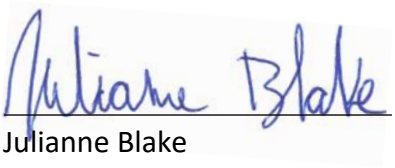
PAK USA Camas, LLC
c/o Taz Khan
3993 NW Currawong Court
Camas, WA 98607
(512) 779-4999

Prepared by

Ecological Land Services
1157 3rd Avenue, Suite 220A • Longview, WA 98632
(360) 578-1371 • Project Number 3934.01

SIGNATURE PAGE

The information in this report was compiled and prepared under the supervision and direction of the undersigned.



Julianne Blake
Biologist III

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Appendix A – Routine Determination Method and Plant Indicator Rating Definitions
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INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by PAK USA Camas, LLC (PAK) to complete a critical areas assessment for wetlands and fish and wildlife habitat conservation areas, for the purpose of future development. The site is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). This report summarizes the findings of the site visit in accordance with *Camas Municipal Code (CMC) Title 16 Environment* (2023).

PROJECT HISTORY

PLS Engineering (PLS) applied for permit approval for site development on behalf of PAK with the City of Camas (City) in December 2023 (DAHP Project Tracking # 2023-12-08397). The *Critical Areas Report for 13th Street Gas Station* completed by ELS in October 2023 identified a single Oregon white oak tree (*Quercus garryana,* FACU) onsite. No other critical areas were identified during the August 29, 2023 site visit. A State Environmental Policy Act (SEPA) Determination of Non-Significance (DNS) was issued by the City on February 22, 2024. The Department of Ecology (Ecology) responded to the SEPA DNS on March 6, 2024 requesting an additional site visit be completed during the normal wet portion of the growing season to reevaluate the property for the presence of wetlands. An additional site visit was completed by ELS on April 2, 2024. Although the site visit confirmed no wetlands or additional critical areas were located onsite, surface water was observed offsite to the west that was not present during the initial August 2023 site visit. This revised critical areas report documents the findings of the August 29, 2023 and April 2, 2024 site visits.

SITE DESCRIPTION

The 0.97-acre site consists of Clark County Tax Parcel 176148000 and is accessed by a paved driveway off NE 13th Street. The site is zoned as Business Park (BP) and currently contains a single-family mobile home, shed, carport, and paved driveway. The site is bordered to the north by NE 13th Street, to the east by NW Friberg-Strunk Street, to the south by undeveloped land and commercial development in progress, and to the west by undeveloped land and a single-family residence (Figure 2).

Vegetation onsite consists primarily of regularly mowed grasses, ornamental shrubs, and coniferous and deciduous trees. Topography onsite is generally flat with NE 13th Street and NW Friberg-Strunk Street roughly two feet higher in elevation than the site. One Oregon white oak was identified onsite along the southern property boundary.

METHODOLOGY

The property was evaluated for the presence of wetlands using the Routine Determination Method according to the U.S. Army Corps of Engineers' 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual* (Environmental Laboratory 1987)*; Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010). The Routine Determination Method and defining wetland criteria are discussed further in Appendix

A. Wetlands are regulated as "Waters of the United States" by the U.S. Army Corps of Engineers (Corps) and as "Waters of the State" by the Washington Department of Ecology (Ecology), and locally by The City of Camas (City).

ELS biologists evaluated the property on August 29, 2023 and April 2, 2024 to determine the presence or absence of critical areas including streams, wetlands, and priority habitats. One Oregon white oak (oak) was identified onsite during the August 2023 site visit, and no wetlands, streams, or other priority habitats were identified onsite. Vegetation, soil, and hydrology data were collected from one test plot (TP-1) during the August 2023 visit in an area with mapped hydric soils. Although no wetlands were present onsite, one wetland (Wetland A) was observed offsite to the southwest during the April 2024 site visit. As such, data was collected from another test plot (TP-2) in the southwest corner of the site, in the vicinity of Wetland A, to determine if the wetland boundaries extend onsite. Offsite boundaries for Wetland A were estimated by visual observations and aerial photos; therefore, Wetland A boundaries are approximate. The oak dripline and test plot locations were mapped using a hand-held Global Positioning System (GPS) unit capable of sub-meter accuracy under ideal conditions.

VEGETATION

General vegetation consists primarily of regularly mowed grass and ornamental trees and shrubs (Photoplates 1 and 2). One Oregon white oak was observed along the southern site boundary. The plant indicator status following the plant scientific name is defined by the *National Wetland Plant List Indicator Rating Definitions* (Corps 2012) and can be found in Appendix A.

WETLANDS

Wetland A is located offsite. As such, wetland vegetation observations were limited to what could be observed from within site boundaries and are therefore generalized. Dominant wetland vegetation consisted of Oregon ash (*Fraxinus latifolia*, FACW) and reed canarygrass (*Phalaris arundinacea*, FACW), as well as other woody and herbaceous species.

UPLANDS

Dominant upland vegetation consisted of domestic apple trees (*Malus* spp., assumed FAC), Japanese maple (*Acer palmatum*, UPL), rhododendron (*Rhododendron* spp., assumed FAC), Oregon white oak, osoberry (*Oemleria cerasiformis*, FACU), mowed English hawthorn saplings (*Crataegus monogyna*, FAC), swordfern (*Polystichum munitum*, FACU), and fescue grass (*Festuca* spp., assumed FAC). The wetland determination data forms contain vegetation information at TP-1 and TP-2 and can be found in Appendix B.

SOILS

The Natural Resources Conservation Service (NRCS) designates soils onsite as cove silty clay loam, thin solum, 0 to 3 percent slopes (CwA), and Wind River gravelly loam, 0 to 8 percent slopes (WrB) (Figure 3, NRCS 2024B). Of the two soil types found onsite, cove silty clay loam, thin solum, 0 to 3 percent slopes is designated as hydric.

According to soil profile descriptions developed by NRCS, cove silty clay loam, thin solum, is characterized as a poorly drained soil, forming on floodplains, with a depth to water table of 0 to 12 inches below ground surface (BGS). A typical soil profile includes silty clay loam from 0 to 14 inches, clay from 14-21 inches, and silt loam from 21 to 60 inches BGS. Wind River gravelly loam is categorized as a somewhat excessively drained soil with a typical soil profile of gravelly loam from 0 to 4 inches, coarse sandy loam from 4 to 24 inches, and loamy coarse sand from 24 to 60 inches BGS. Wind River gravelly loam forms on floodplains from alluvium parent material and has an average depth to water table of more than 80 inches.

Evaluated soils were characterized as loamy with a value of 4, and a chroma of 3, with no observations of redoximorphic concentrations and meeting no hydric soil indicators. Mapped hydric soils do not necessarily mean that an area is or is not a wetland—hydrology, hydrophytic wetland vegetation, and hydric soils must all be present to classify an area as a wetland. The test plot data forms are in Appendix B.

Hydrology

Wetland A (Offsite)

Wetland A is an emergent depressional wetland located just offsite to the west and outlets to Ditch 1. As it was outside of the site boundaries, an approximate boundary was mapped using aerial imagery and topography, and hydrology determinations are approximate. Wetland hydrology likely comes from a seasonally high groundwater table, runoff, and precipitation. Wetland A likely has two hydroperiods, seasonally flooded and saturated only. The wetland rating form is in Appendix D. Surface water was not observed at the time of the August 2023 site visit but was observed at the April 2024 visit.

Ditch 1 (Offsite)

One ditch is located just offsite to the west, along NE 13th Street, and is the outlet for Wetland A. Ditch 1 flows west for approximately 250 feet, where it flows through a culvert to the north under NE 13th Street, and discharges into an unnamed, Type F (fish-bearing) stream. Ditch 1 receives road runoff and outflow from Wetland A.

Precipitation

Precipitation data was gathered from the NOAA Regional Climate Centers *Clark County, Washington, WETS Station: Battle Ground*, which is located closest to the site.

August 2023 Site Visit

No rainfall occurred the day of the site visit or in the two weeks prior. Rainfall in June, July, and August 2023 was below exceedance levels and approximately 94 percent of August rainfall occurred prior to the site visit. Furthermore, review of the USACE Antecedent Precipitation Tool (APT) indicates rainfall in the two months preceding the August 29th site visit was drier than normal with a score of 6. A copy of the APT data is provided in Appendix C. Table 1 summarizes the precipitation data.

Table 1. Precipitation Summary – August 29, 2023

Precipitation (inches)								
Date of Visit	Two Weeks Prior	3 Months Prior		30%	70%	DAREM[1]		
		30 Days Ending	Observed			Value	Weight	Total
8/29/23	8/15/23 – 8/28/23	8/29/23	0.05	0.25	0.99	1	3	3
0.0	0.0	7/30/23	0.0	0.24	0.82	1	2	2
		6/30/23	0.83	1.48	2.80	1	1	1
Rainfall 3 months prior was: **drier than normal** (sum 6-9), normal (sum 10-14), wetter than normal (sum 15-18).[1]								6
Year to Date Average Rainfall[2,3]: 50.06								
Year to Date Actual Rainfall[3]: 45.32								

[1] Direct Antecedent Rainfall Evaluation Methods (Sumner et al 2009)
[2] Includes 94% of August Rainfall
[3] Based on a water year, October 2022 – August 2023

April 2024 Site Visit

No rainfall occurred the day of the site visit and 1.82 inches occurred the two weeks prior. Rainfall in February and March was above exceedance levels while rainfall in April was below exceedance levels. Approximately 7 percent of April rainfall occurred prior to the site visit. Furthermore, review of the APT indicates rainfall in the two months preceding the April 2nd site visit was normal with a score of 12. A copy of the APT data is provided in Appendix C. Table 2 summarizes the precipitation data.

Table 2. Precipitation Summary – April 2, 2024

Precipitation (inches)								
Date of Visit	Two Weeks Prior	3 Months Prior		30%	70%	DAREM[1]		
		30 Days Ending	Observed			Value	Weight	Total
4/2/24	3/19/24 – 4/1/24	4/2/24	2.46	3.17	4.86	1	3	3
0.0	1.82	3/3/24	5.63	2.71	5.08	3	2	6
		2/2/24	8.93	4.26	7.11	3	1	3
Rainfall 3 months prior was: drier than normal (sum 6-9), **normal** (sum 10-14), wetter than normal (sum 15-18).[1]								12
Year to Date Average Rainfall[2,3]: 39.50								
Year to Date Actual Rainfall[3]: 43.69								

[1] Direct Antecedent Rainfall Evaluation Methods (Sumner et al 2009)
[2] Includes 7% of April Rainfall
[3] Based on a water year, October 2023 – April 2024

Critical Area Inventories

National Wetlands Inventory

The National Wetlands Inventory (NWI) map does not indicate any wetlands onsite or in the vicinity of the site (Figure 4, USFWS 1988). ELS partially agrees with the NWI mapping as no wetlands were identified onsite, but Wetland A was identified offsite to the west which was not shown by the NWI.

Clark County Critical Area Inventory

The Clark County Critical Area Inventory (CAI) map does not indicate any wetlands onsite or in the location of Wetland A but does indicate potential wetlands presence on the property to the south. Hydric soils are mapped along the eastern site boundary and the southwestern corner, and a habitat area is mapped over the majority of the eastern portion of the site (Figure 5). ELS partially agrees with the CAI as no wetlands were identified onsite and one oak was observed in the vicinity of the mapped habitat area. However, ELS does not agree with the extent of the mapped habitat area as only one oak was identified onsite and no other critical habitats were identified. The potential wetlands mapped to the south of the site are located in the footprint of a commercial development that has received permit approval.

Washington Department of Natural Resources Stream Type

The Washington Department of Natural Resources (WDNR) Stream Type Map does not depict any streams onsite (Figure 6, WDNR 2024). ELS agrees with the WDNR mapping as no streams were observed onsite.

Priority Habitats and Species

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) maps indicate oak woodland and caves or cave-rich areas on the southern boundary of the site and within 300 feet of the site to the southwest (Figure 7, WDFW 2024). ELS confirmed the presence of a single oak along the southern site boundary, but no oak woodlands or caves were observed onsite.

Critical area inventory maps are typically used to gather general information about a region and due to the large scale necessary for regional mapping, are limited in accuracy for localized analyses.

Critical Areas Summary

Offsite Wetland

Wetland A is a Category III, depressional, forested and emergent wetland totaling approximately 0.57 acres offsite to the west, and outlets to Ditch 1. Offsite boundaries for Wetland A were estimated by visual observations of changes in vegetation, the presence of surface water, and aerial photos; therefore, Wetland A boundaries are approximate. Vegetation in Wetland A is dominated by deciduous trees and herbaceous vegetation. Wetland hydrology likely comes from a seasonally high groundwater table, runoff, and precipitation. Hydroperiods include seasonally flooded and saturated only. According to the *Washington State Wetland Rating System for*

Western Washington: 2014 Update (Rating System), Wetland A is a Category III wetland scoring 7 points for water quality functions, 7 points for hydrologic functions, and 4 points for habitat functions, for a total of 18 points.

Wetland Buffers and Functional Isolation

The designated buffer width for a Category III wetland with a high land use intensity and a habitat score of 4 is 80 feet, as listed in *CMC Table 16.53.040-1* (Table 3).

According to *CMC 16.53.040(B)(4)(b)*, functionally isolated buffer areas are areas that are separated from a wetland and do not protect the wetland from adverse impacts. When impervious surfaces from previous development, such as pre-existing roads, structures, or vertical separation completely functionally isolate the wetland, the wetland buffer shall extend from the wetland boundary to the impervious surfaces. Wetland A's onsite buffer is functionally isolated on the east side by the existing mobile home.

Table 3. Wetland Summary

Wetland						
Name	**Size**	**Hydrogeomorphic Classification[1]**	**Cowardin Class[2]/ Hydroperiod**	**Habitat Score[3]**	**Category[3]**	**Buffer Width[4]**
A	Approximately 0.57 acres	Depressional	Emergent, Forested/ Saturated Only	4	III	80 ft.

[1]*NRCS 2008*
[2]*FGDC 2013*
[3]*Hruby 2014*
[4]*CMC Table 16.53.040-1*

Priority Habitats

Oregon White Oak

Oregon white oaks are considered a priority habitat and are regulated by the Washington Department of Fish and Wildlife (WDFW) and locally by the City of Camas. According to WDFW's Management Recommendations for Washington's priority habitats: Oregon white oak woodlands (Larsen and Morgan, 1998), in urban or urbanizing areas west of the Cascades, priority oak habitat is defined as single oaks, stands of pure oak, or oak/conifer associations, one acre or greater in size. WDFW may also consider individual Oregon white oak trees a priority habitat when found to be particularly valuable to wildlife [i.e., contains many cavities, has a large diameter at breast height (DBH), is used by priority species, or has a large canopy]. The site is within the City of Camas. WDFW recommendation is that in urban and urbanizing areas, single trees should be maintained if they are deemed important to species highly associated with Oregon white oak. Oaks and their associated floras comprise distinct woodland ecosystems with various plant communities providing valuable habitat that contributes to wildlife diversity; oak woodlands provide a mix of feeding, resting, and breeding habitat for many wildlife species (Larsen and Morgan 1998).

The WDFW Priority Habitats and Species online mapping tool depicts oak woodlands within the vicinity of the observed oak along the southern site boundary. One oak tree measuring approximately 52 inches DBH was mapped along the southern site boundary during site reconnaissance (Table 4, Figure 2). The oak has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. The oak location was mapped using a GPS system capable of submeter accuracy in ideal conditions. According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

Table 4. Oak Summary

Canopy Area	Diameter at Breast Height	Number of Trunks	Noteworthy Habitat Features
0.08 acres	52 inches	1	• Canopy is interconnected with adjacent trees, but not other oaks • Two large cavities

LIMITATIONS

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

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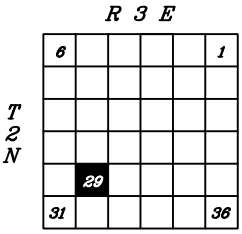
FIGURES AND PHOTOPLATES

WASHINGTON

45.6321° Latitude
-122.4664° Longitude

LOCATION MAP



PROJECT VICINITY MAP

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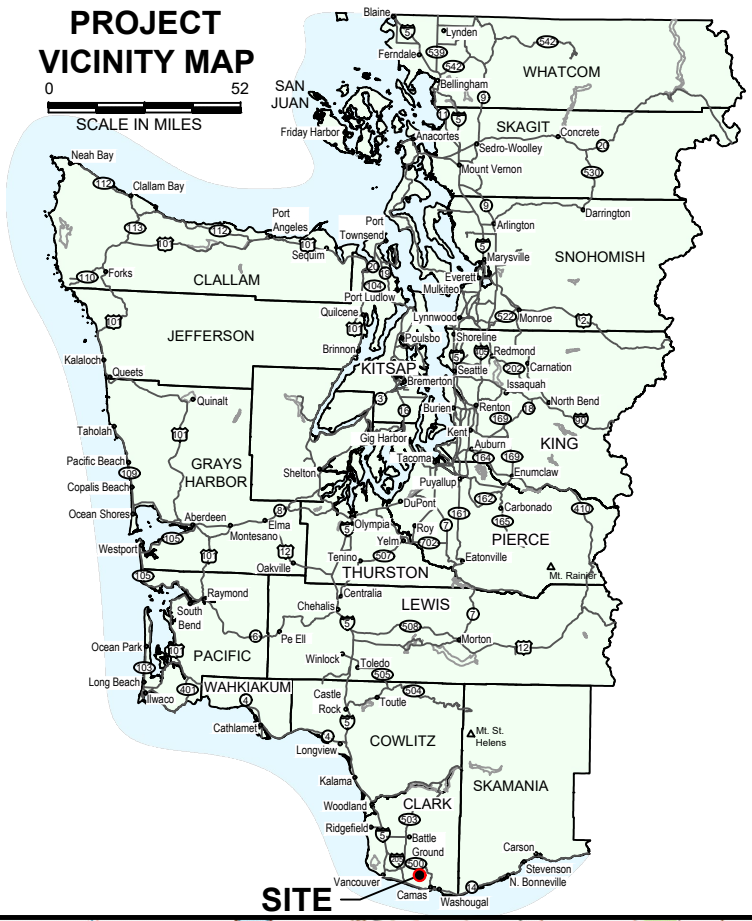
SCALE IN MILES



NOTE:
Quadrangle topographic map from USGS.

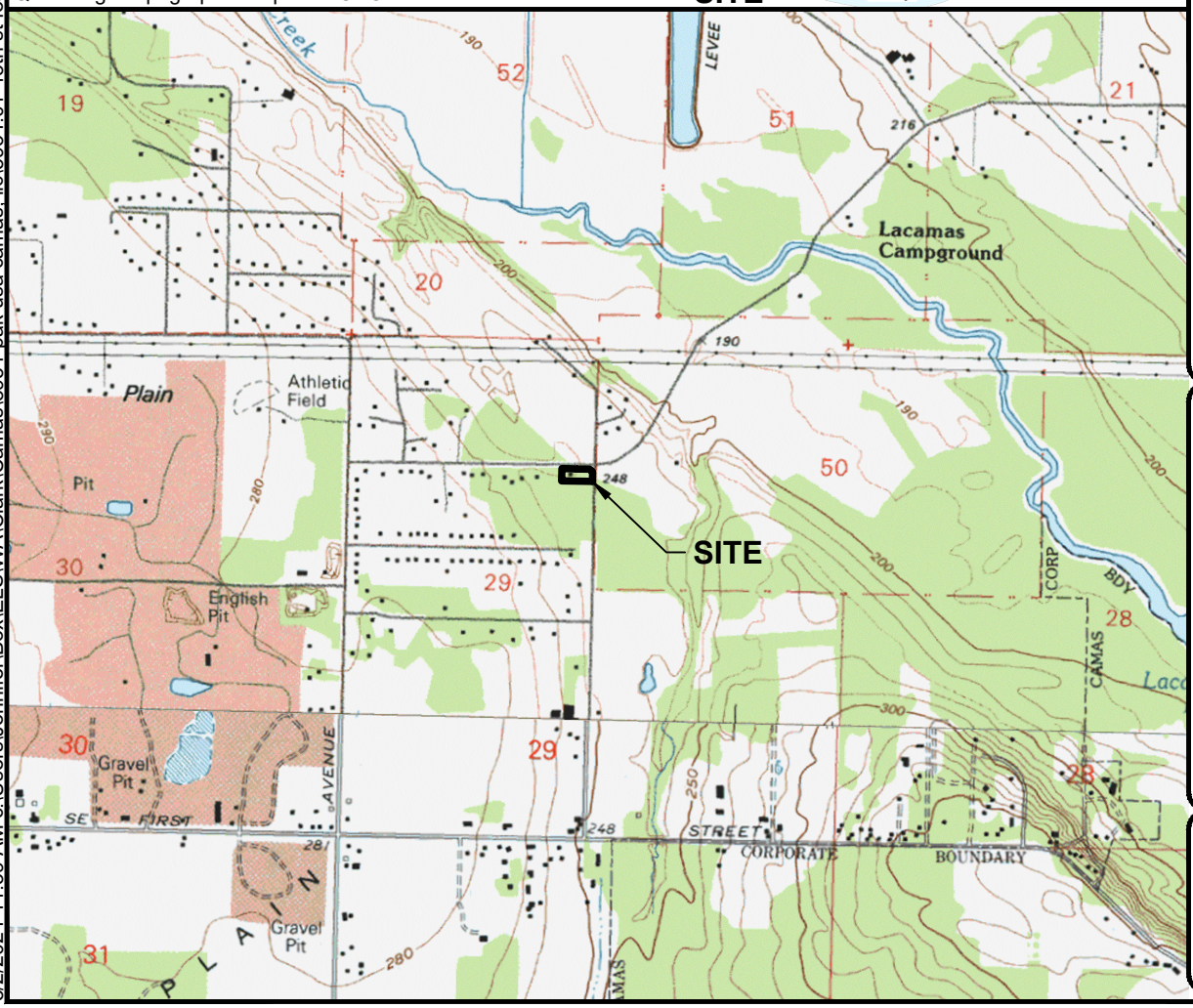


Figure 1
VICINITY MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/2/24
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com
Ecological Land Services

0 2000 4000
SCALE IN FEET

N W E S

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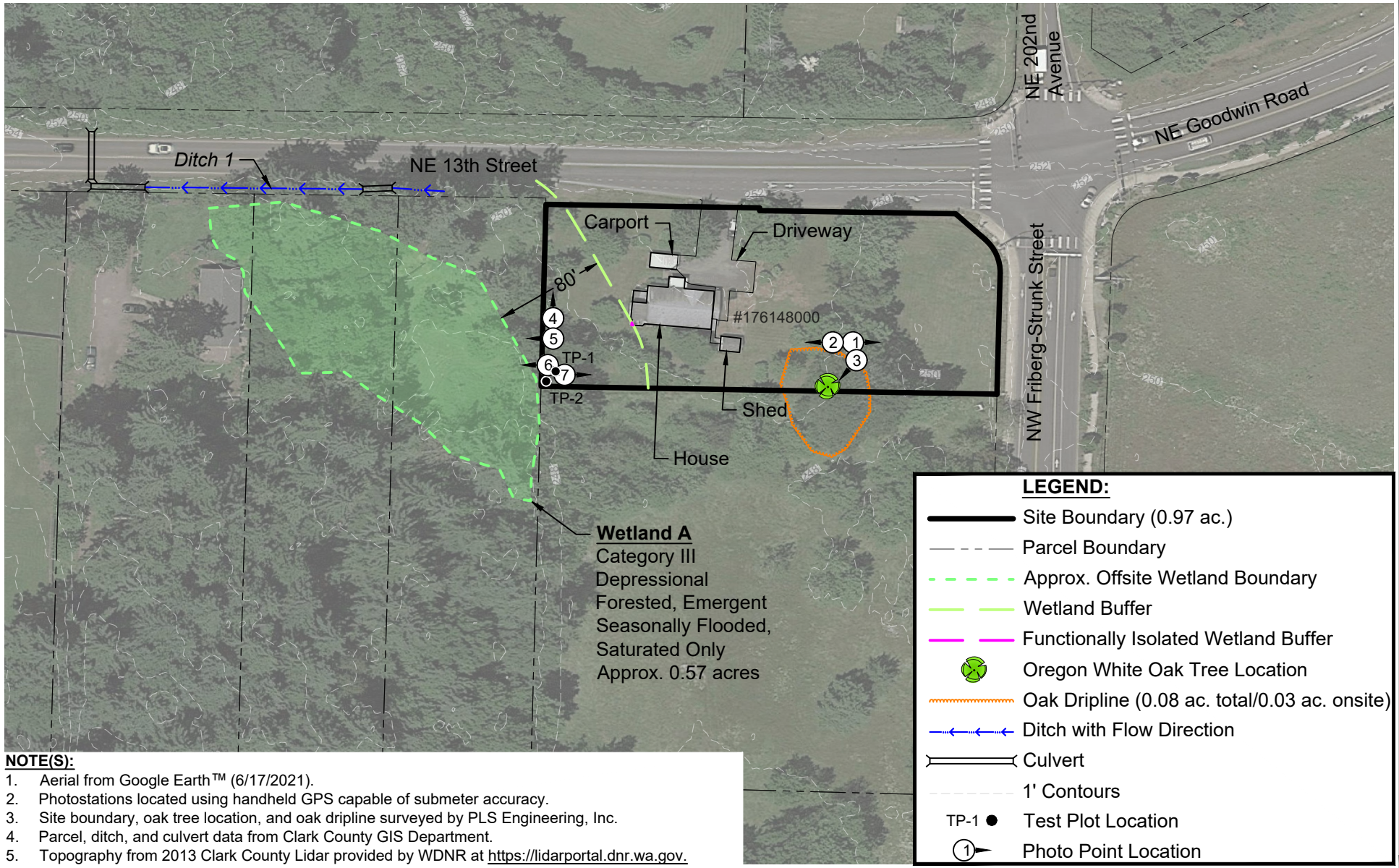
5/2/2024 11:39 AM c:\Users\Jennifer\Box\ELS\WA\Clark\Camas\3934-pak usa camas, llc\3934.01-13th st feasibility\3934.01-figures cad only\3934.01_DL.dwg Jennifer



NOTE(S):

1. Aerial from Google Earth™ (6/17/2021).
2. Photostations located using handheld GPS capable of submeter accuracy.
3. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
4. Parcel, ditch, and culvert data from Clark County GIS Department.
5. Topography from 2013 Clark County Lidar provided by WDNR at https://lidarportal.dnr.wa.gov.

N W E S

0 100 200
SCALE IN FEET

Ecological Land Services
1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com

DATE: 5/2/24
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 2
EXISTING CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

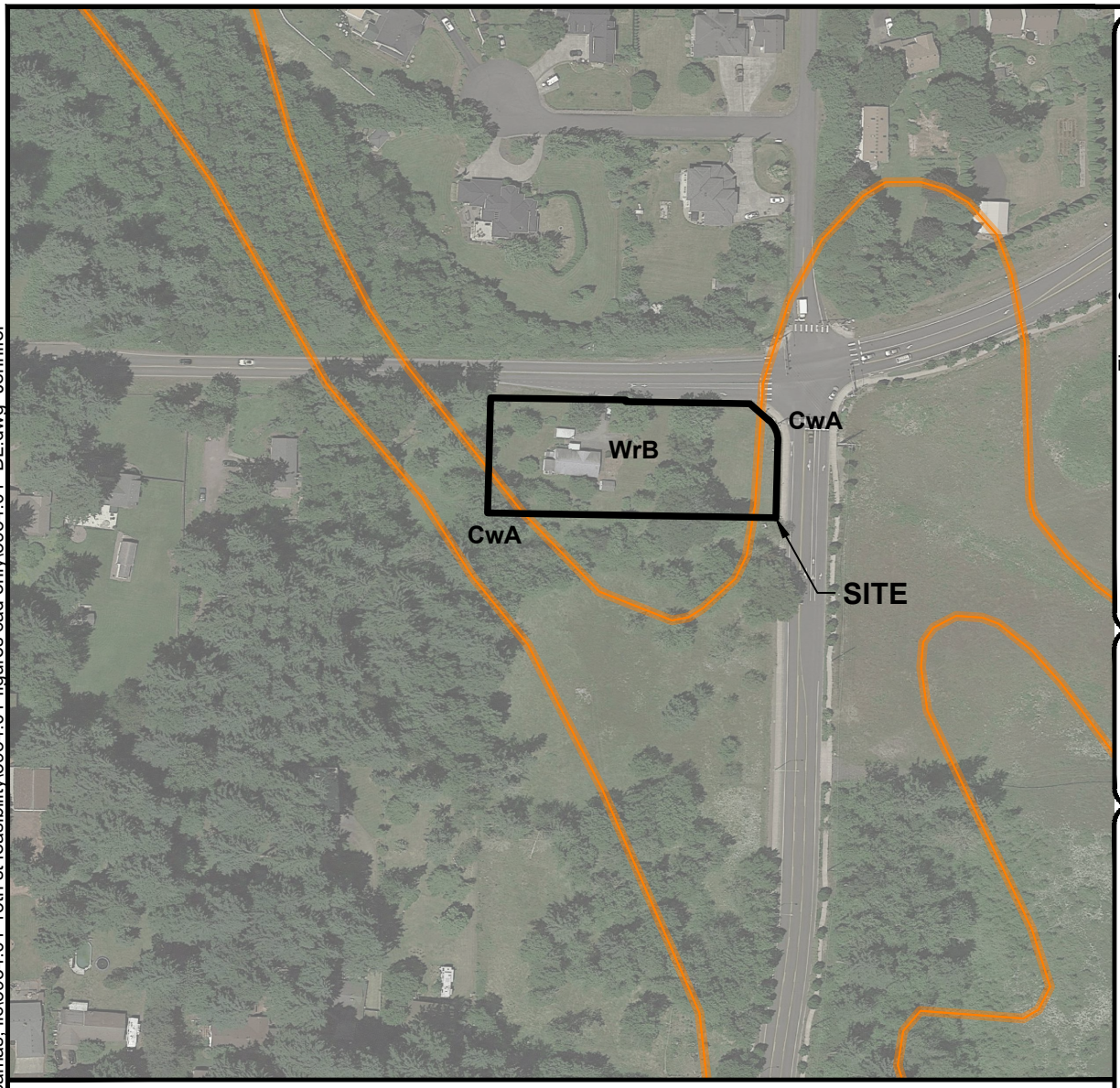


Figure 3
NRCS SOIL SURVEY
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/2/24
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

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SCALE IN FEET

N W E S

LEGEND:

Site Boundary
NRCS Soil Boundary
CwA Cove silty clay loam, thin solum, 0 to 3 percent slopes. **Hydric.**
WrB Wind River gravelly loam, 0 to 8 percent slopes. Not hydric.

NOTE(S):
1. Map provided on-line by NRCS at web address: *http://websoilsurvey.nrcs.usda.gov/app/*

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No mapped wetlands indicated onsite by US Fish & Wildlife Service.

LEGEND:

Site Boundary

Wetlands

Riverine

NOTE(S):

1. Map provided on-line by US Fish & Wildlife Service at web address: *https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper*

Figure 4
USFWS NATIONAL WETLANDS INVENTORY
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/2/24
DWN: JKJ
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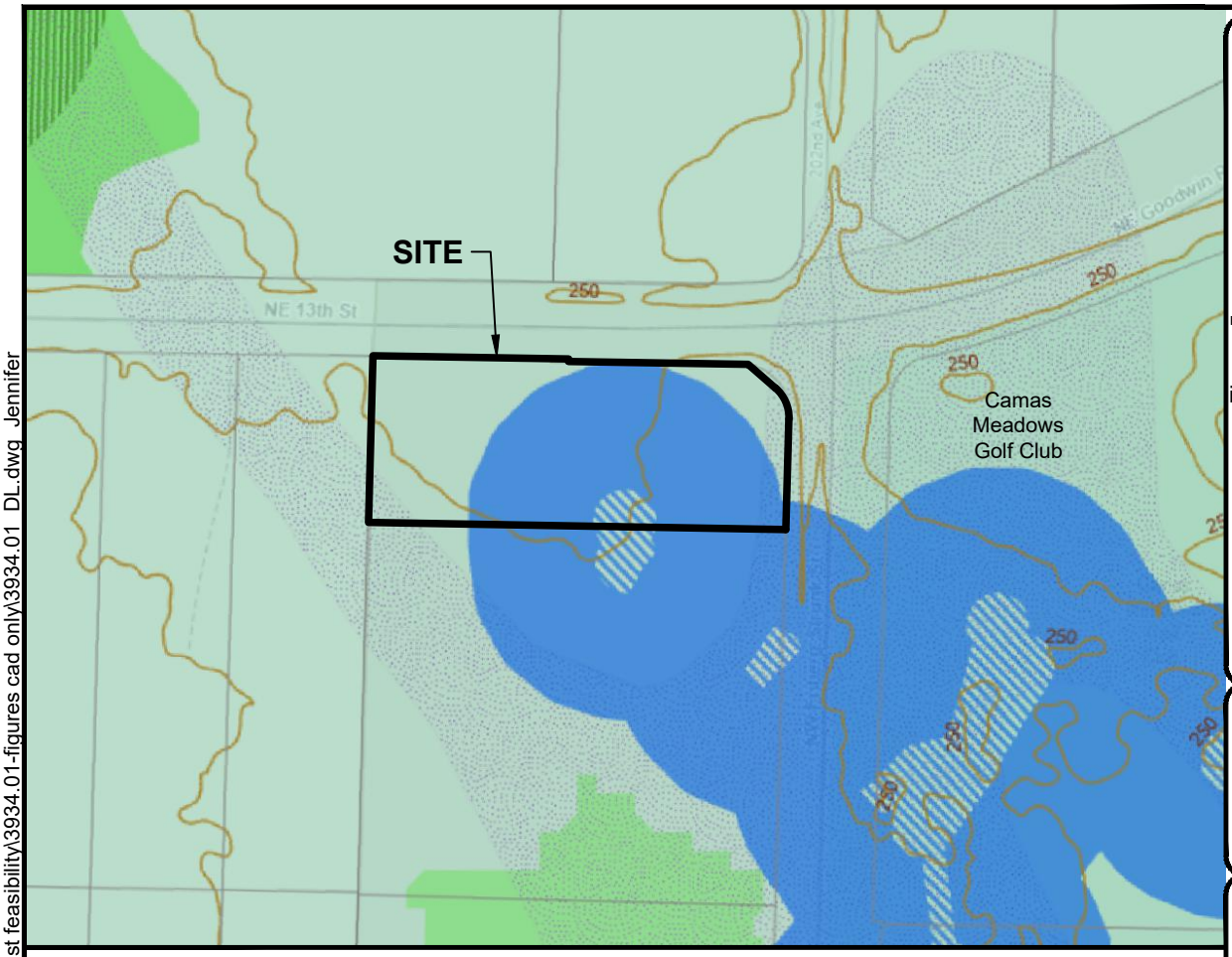

Figure 5
CLARK COUNTY CRITICAL AREAS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/2/24
DWN: JKJ
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LEGEND:

Site Boundary

Slopes and Geologic Hazards Group
Contour Lines
Contour Lines - 10 ft

Soils and Wetlands Inventory
Hydric Soils
Potential Wetlands Presence
Permitted Wetland

Priority Habitats and Species Group Habitat
Habitat Area
Adjacent to Habitat Area

Riparian Habitat
Riparian Habitat Area

Location Generalized Due to Sensitivity
Habitat Area

0 150 300
SCALE IN FEET

N W E S

NOTE(S):
1. Map provided on-line by Clark County at web address: *https://gis.clark.wa.gov/mapsonline/index.cfm?site=Environmental*

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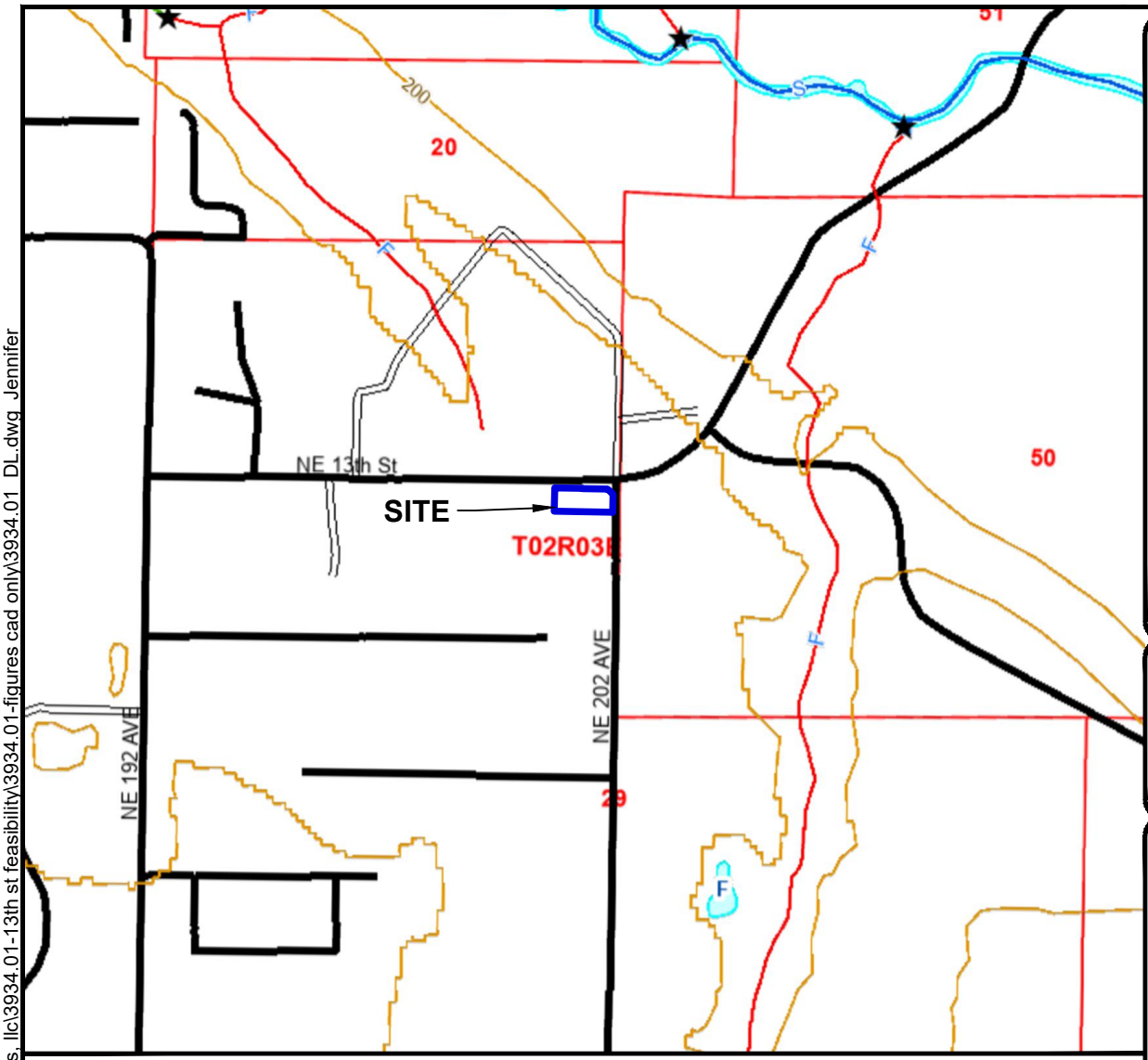

No mapped streams indicated onsite by the Washington State Department of Natural Resources (DNR).

LEGEND:

Site Boundary

40-foot Contours
- 40 ft. Contours

Water Courses (FP)
- Type S
- Type F
- Type N, Np, Ns
- U, unknown
- X, non-typed per WAC 222-16

WRIA Boundaries
- WRIA Boundaries

DNR Roads
- Paved Road
- Unpaved Road/Surface Unknown

Unpaved Road/Surface Unknown
- Water Type Breaks (FP)

NOTE: Map provided on-line by Washington State Department of Natural Resources at web address: *http://fortress.wa.gov/dnr/app1/Fpars/viewer.htm*

Figure 6
WDNR STREAM TYPE MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/2/24
DWN: JKJ
REQ. BY: JB
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Figure 7
WDFW PRIORITY HABITAT AND SPECIES
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/2/24
DWN: JKJ
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SCALE IN FEET

N W E S

LEGEND:

- Site Boundary
- Parcel Boundary
- Oak Woodland - Habitat Feature

By Township
Caves or Cave-rich Areas

NOTE: Map provided on-line by Washington State Department of Fish & Wildlife at web address: *http://apps.wdfw.wa.gov/phsontheweb/*

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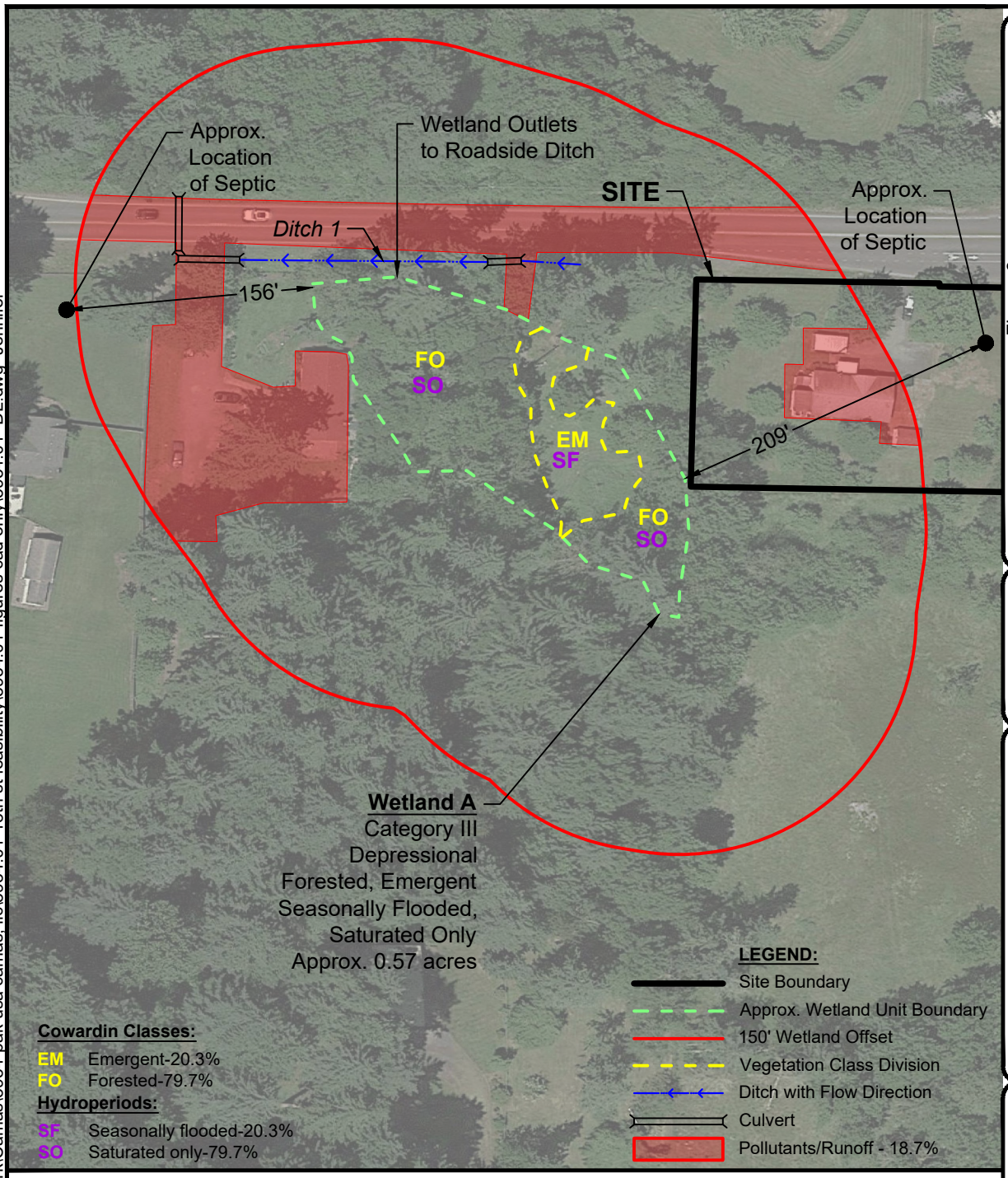

Rating Question Depressional	Description	Wetland A
D 1.1, D 4.1	Location of Outlet	Wetland has an intermittently flowing stream or ditch.
D 1.3	Distribution of persistent plants	Wetland has persistent plants >1/2 the area.
D. 1.4	Area of seasonally flooded	Area seasonally ponded <1/4 of area.
D 2.2	Boundary of area w/in 150' of the wetland in land uses that generate pollutants	>10% area within 150' in land use that generate pollutants.
D 5.2	Boundary of area w/in 150' of the wetland in land uses that generate excess runoff	>10% area within 150' in land use that generate excess runoff.
D 4.3	Contributing Basin-Contribution of wetland to storage in the watershed	The area of the basin is 10 to 100 times the area of the unit.
D 5.3	Contributing Basin covered in intensive land uses	>25% of the contributing basin is covered with intensive land uses.
H 1.1	Cowardin Plant Classes	Emergent, Forested
H 1.2	Hydroperiods	Seasonally flooded, Saturated only
H 1.4	Interspersion of habitats	Low interspersion of habitats

Figure 8
WETLAND RATING FORM-150' OFFSET
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/2/24
DWN: JKJ
REQ. BY: JB
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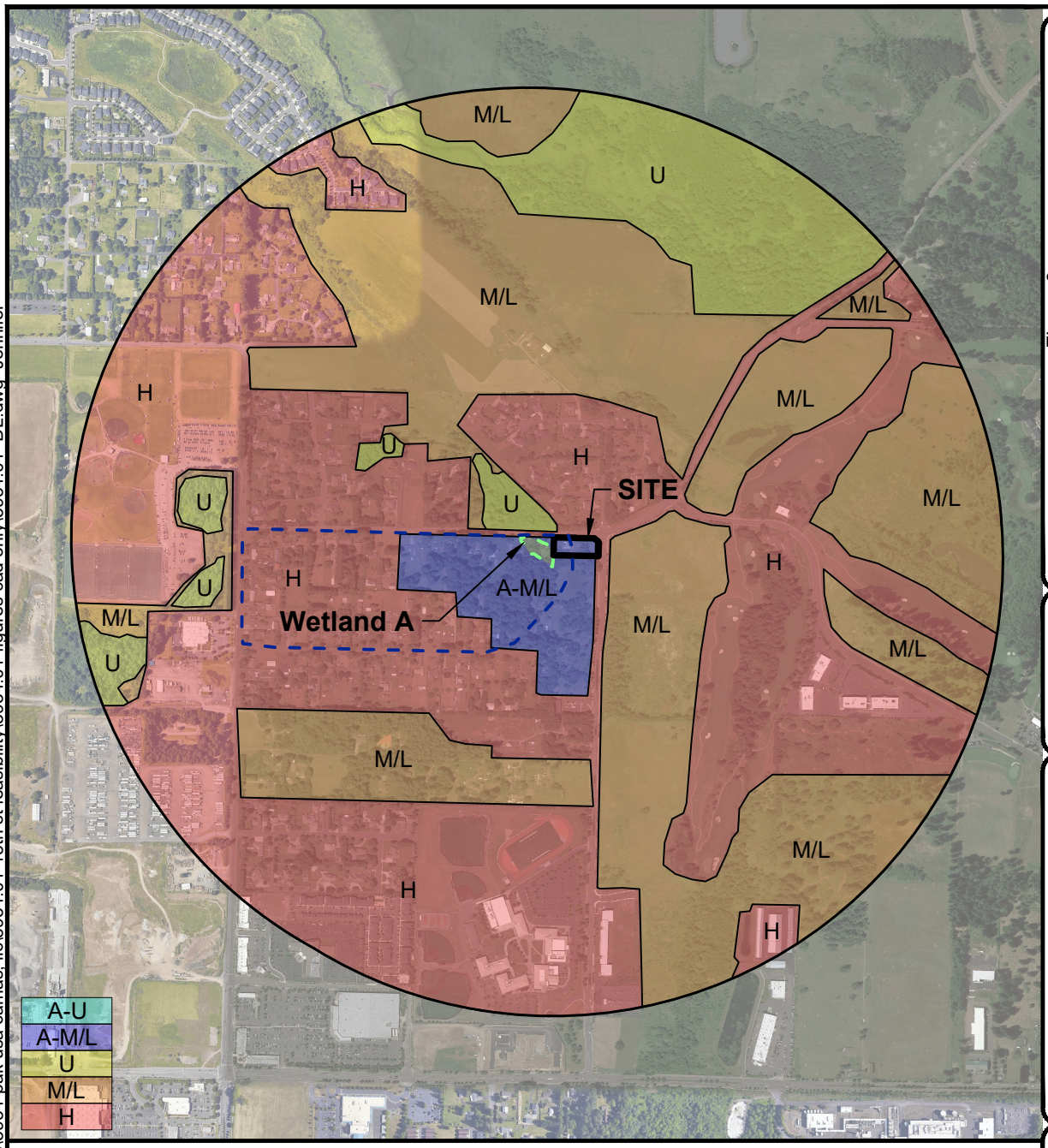

Figure 9
WETLAND RATING FORM-1 km OFFSET
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/2/24
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
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N W E S

LEGEND:

- Site Boundary
- Approx. Wetland Unit Boundary
- Contributing Basin 77x area of Wetland A

H2.1 Accessible Habitat

- A-U — A-U (0.0%)
- A-M/L — A-M/L (2.9%)

H2.2 Undisturbed Habitat

- U — U (9.0%)
- M/L — M/L (37.7%)

H2.3 Land Use Intensity

- H — H (50.4%)

H 2.1. Accessible Habitat Equation

% A-U habitat **0.0%** + [(% A-M/L intensity land uses)/2] **1.5%** = **1.5%**

H 2.2. Total Undisturbed Habitat Equation

% A-U + % U habitat **9.0%** + [(% A-M/L + % M/L land uses)/2] **20.3%** = **29.3%**

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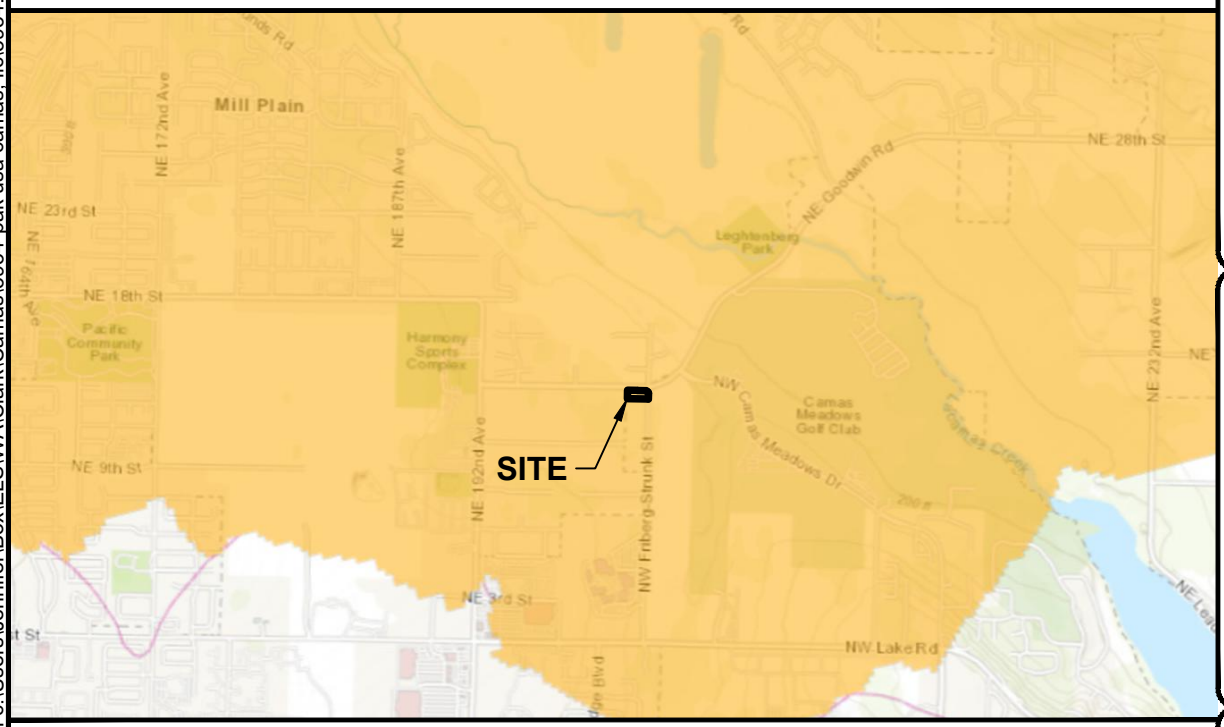
Assessed Waters/Sediment

Water	Sediment	Subbasins
Category 5 - 303d	Category 5 - 303d	12 Digit HUC Boundary
Category 4C	Category 4C	
Category 4B	Category 4B	
Category 4A	Category 4A	
Category 2	Category 2	
Category 1	Category 1	



WQ Improvement Projects

- Approved
- In Development

NOTE(S):

1. Map provided on-line by Washington State Department of Ecology at web address: *https://fortress.wa.gov/ecy/waterqualityatlas/map.aspx?*

Figure 10
WETLAND RATING FORM-303(d) and TMDLs
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/2/24
DWN: JKJ
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Photo 1 was taken facing east and shows general conditions onsite.

Photo 2 was taken facing west and shows general conditions onsite. The oak is visible on the left.

Photo 3 shows the onsite Oregon white oak.

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DATE: 08.29.2023
DWN: JB
PRJ. MGR: JB
PROJ.#: 3934.01

Photoplate 1
13th Street Gas Station
Camas, WA
Section 29, Township 2N, Range 3E, W.M.

Photo 4 was taken facing north at TP-1 and shows general conditions onsite.

Photo 5 was taken facing west.

Photo 6 was taken facing west at TP-1.

Photo 7 was taken facing east at TP-1 and shows general conditions onsite.

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Photoplate 2
13th Street Gas Station
Camas, WA
Section 29, Township 2N, Range 3E, W.M.

APPENDIX A

ROUTINE DETERMINATION METHOD AND PLANT INDICATOR RATING DEFINITIONS

Routine Determination Method

The Routine Determination Method is defined according to the U.S. Army Corps of Engineers' 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual* (Environmental Laboratory 1987)*; Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010). The Routine Determination Method examines three parameters – vegetation, soils, and hydrology – to determine if wetlands exist in a given area. Hydrology is critical in determining what is a wetland, but if often difficult to assess because hydrologic conditions can change periodically (hourly, daily, or seasonally). Consequently, it is necessary to determine if hydrophytic vegetation and hydric soils are present, which would indicate that water is present for a long enough duration to support a wetland plant community. By definition, wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Vegetation Indicator Status

The indicator status, following the scientific names of plant species, indicates the likelihood of the species to be found in wetlands according to the *National Wetland Plant List Indicator Rating Definitions* (Corps 2012). Listed from most likely to least likely to be found in wetlands, the indicator status categories are:

- **OBL** (obligate wetland) - occur almost always under natural conditions in wetlands.
- **FACW** (facultative wetland) - usually occur in wetlands, but occasionally found in non-wetlands.
- **FAC** (facultative) - equally likely to occur in wetlands or non-wetlands.
- **FACU** (facultative upland) - usually occur in non-wetlands, but occasionally found in wetlands.
- **UPL** (obligate upland) - occur almost always under natural conditions in non-wetlands.
- **NI** (no indicator) - insufficient data to assign to an indicator category.

APPENDIX B

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 13th Street Gas Station City/County: Camas/Clark Sampling Date: 08/29/2023
Applicant/Owner: PAK USA Camas, LLC State: WA Sampling Point: TP-1
Investigator(s): J. Blake Section, Township, Range: S29, T2N, R3E
Landform (hillslope, terrace, etc.): Floodplains Local relief: (concave, convex, none): Convex Slope (%): 0-3%
Subregion (LRR): LRRA MLRA2 Lat: 45.6318544 Long: -122.4669931 Datum: NAD83
Soil Map Unit Name: Cove silty clay loam, thin solum, 0 to 3 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes☐ No☒ (If no, explain Remarks.)
Are Vegetation☐, Soil☐, or Hydrology☐ significantly disturbed? Are "Normal Circumstances" present? Yes☒ No☐
Are Vegetation☐, Soil☐, or Hydrology☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** **Yes☐ No☒**
Hydric Soils Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks: TP-1 is located in the southwest corner of the site in an area with mapped hydric soils. TP-1 does not meet all three wetland indicators and is therefore in uplands. Hydrologic conditions were not typical for this time of year, as antecedent rainfall was determined to be drier than normal for the two months prior to the site visit.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Malus* spp.*	20%	yes	FAC
2. *Fraxinus latifolia*	20%	yes	FACW
3. *Robinia pseudoacacia*	20%	yes	FACU
4. *Crataegus monogyna*	15%	yes	FAC
50% = 38 20% = 15	75%	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
50% = ___ 20% = ___	%	=Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *Festuca* spp*	93%	yes	FAC
2. *Iris* spp.*	5%	no	FACW
3. *Rubus ursinus*	2%	no	FACU
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
50% = 50 20% = 20	100%	=Total Cover	
Woody Vine Stratum (Plot size: 15 ft radius)			
1. *Rubus armeniacus*	5%	yes	FAC
2.	%		
50% = 3 20% = 1	5%	=Total Cover	

% Bare Ground in Herb Stratum 0%

Dominance Test Worksheet

Number of Dominant Species That Are OBL, FACW, or FAC:	5	(A)
Total Number of Dominant Species Across All Strata:	6	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	83	(A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x 1=	
FACW species		x 2=	
FAC species		x 3=	
FACU species		x 4=	
UPL species		x 5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A=_____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 – Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes☒ No☐**

Remarks: *Festuca* spp.* and *Malus* spp.* indicator statuses assumed FAC. *Iris* spp.* indicator status assumed FACW.

SOIL

Sampling Point: TP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/3	100%		%			Loam	
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosal (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Minerals (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and Wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: Hardpan
Depth (inches):6

Hydric Soil Present? **Yes**☐ **No**☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (min. of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (Inches): _____
Water Table Present?	Yes ☐	No ☒	Depth (Inches): _____
Saturation Present? (Includes Capillary fringe)	Yes ☐	No ☒	Depth (Inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrologic conditions were not typical for this time of year, as antecedent rainfall was determined to be drier than normal for the two months prior to the site visit.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: 13th Street Gas Station City/County: Camas/Clark Sampling Date: 04/02/2024
Applicant/Owner: PAK USA Camas, LLC State: WA Sampling Point: TP-2
Investigator(s): AJ Rendleman Section, Township, Range: S29, T2N, R3E
Landform (hillslope, terrace, etc.): Floodplains Local relief: (concave, convex, none): Convex Slope (%): 0-3%
Subregion (LRR): LRRA MLRA2 Lat: 45.631925 Long: -122.466933 Datum: NAD83
Soil Map Unit Name: Cove silty clay loam, thin solum, 0 to 3 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes☒ No☐ (If no, explain Remarks.)
Are Vegetation☐, Soil☐, or Hydrology☐ significantly disturbed? Are "Normal Circumstances" present? Yes☒ No☐
Are Vegetation☐, Soil☐, or Hydrology☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** **Yes☐ No☒**
Hydric Soils Present?	Yes ☒	No ☐	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks: TP-2 is located in the southwest corner of the site in an area with mapped hydric soils, just southwest of TP-1. TP-2 does not meet all three wetland indicators and is therefore in uplands. Hydrologic conditions were typical for this time of year, as antecedent rainfall was determined to be normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Robinia pseudoacacia*	65%	yes	FACU
2. *Fraxinus latifolia*	20%	yes	FACW
3.	%		
4.	%		
50% = 43 20% = 17	85%	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1.	%		
2.	%		
3.	%		
4.	%		
5.	%		
50% = ___ 20% = ___	%	=Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *Festuca* spp*	100%	yes	FAC
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
9.	%		
10.	%		
11.	%		
50% = 50 20% = 20	100%	=Total Cover	
Woody Vine Stratum (Plot size: 15 ft radius)			
1.	%		
2.	%		
50% = ___ 20% = ___	%	=Total Cover	

% Bare Ground in Herb Stratum 0%

Dominance Test Worksheet

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC	66	(A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x 1=	
FACW species		x 2=	
FAC species		x 3=	
FACU species		x 4=	
UPL species		x 5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A=_____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 – Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes☒ No☐**

Remarks:

SOIL

Sampling Point: TP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/3	100%		%			Silty clay loam	
10-16	10YR 4/2	80%	10YR 4/6	20%	C	M	Silty clay loam	
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosal (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Minerals (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and Wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____
Depth (inches):_____

Hydric Soil Present? **Yes**☒ **No**☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (min. of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (Inches): _____
Water Table Present?	Yes ☒	No ☐	Depth (Inches): 13
Saturation Present? (Includes Capillary fringe)	Yes ☒	No ☐	Depth (Inches): 15

Wetland Hydrology Present? **Yes** ☐ **No** ☒

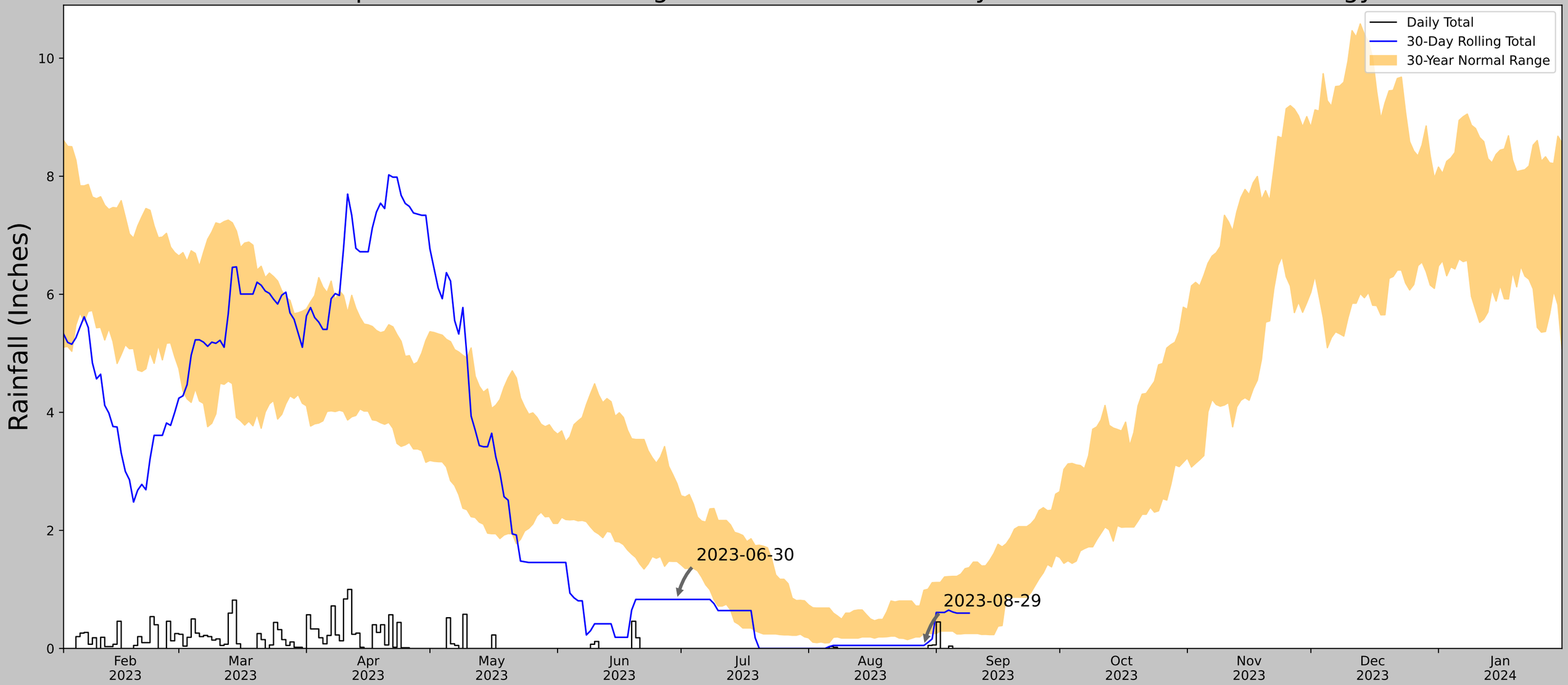
Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:Although the water table and saturation were present in the test pit, they were present too deep in the soil profile to meet wetland hydrologic indicators. Hydrologic conditions were typical for this time of year, as antecedent rainfall was determined to be normal.

APPENDIX C

PRECIPITATION INFORMATION

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	45.632018, -122.467297
Observation Date	2023-08-29
Elevation (ft)	253.44
Drought Index (PDSI)	Severe drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-29	0.253543	0.986221	0.051181	Dry	1	3	3
2023-07-30	0.24252	0.814961	0.0	Dry	1	2	2
2023-06-30	1.475197	2.795276	0.830709	Dry	1	1	1
Result							Drier than Normal - 6

US Army Corps of Engineers

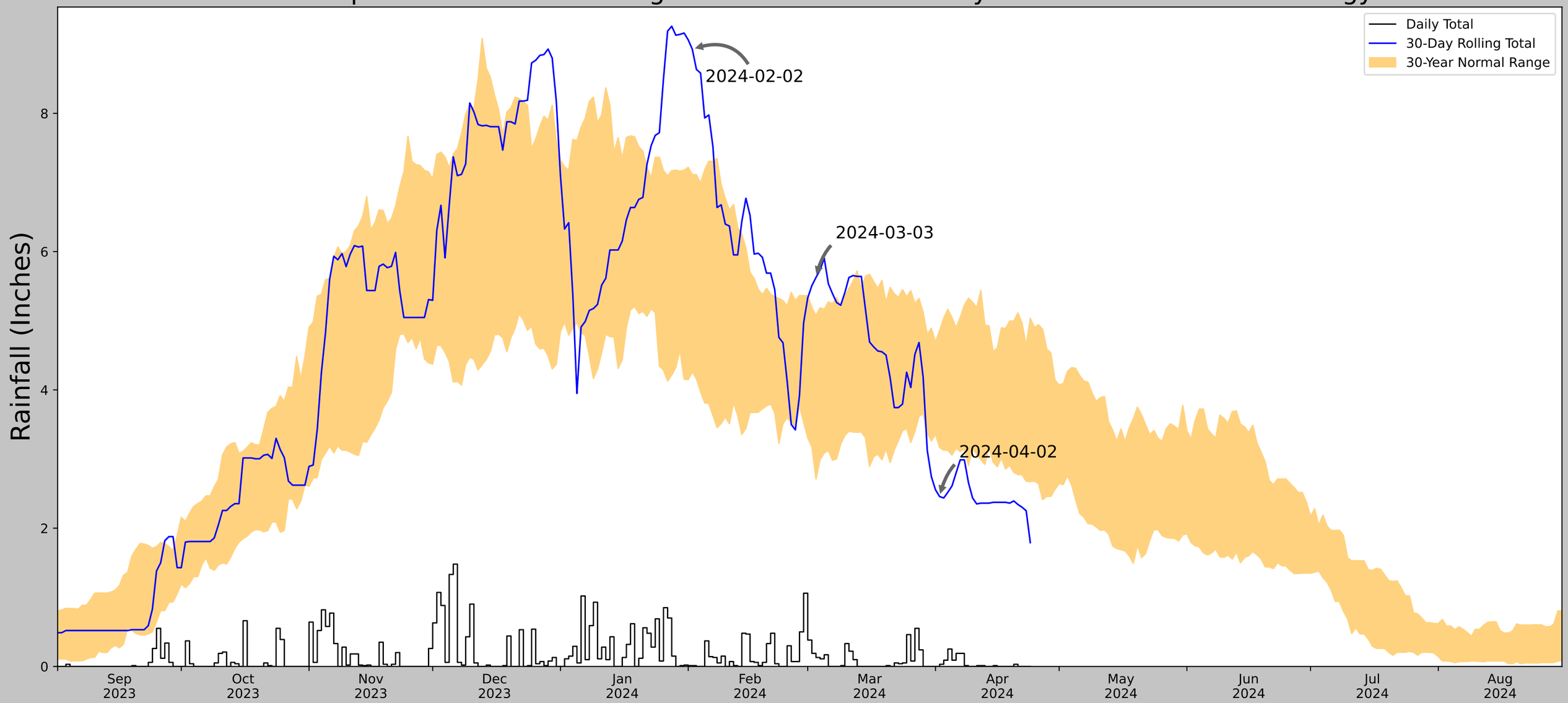
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
BATTLE GROUND	45.7717, -122.5286	284.121	10.094	30.681	4.852	11318	69
BATTLE GROUND 0.8 N	45.794, -122.5443	316.929	1.716	32.808	0.828	0	1
BATTLE GROUND 1.2 NE	45.7958, -122.5275	361.877	1.666	77.756	0.879	0	20
VANCOUVER 4 NNE	45.6775, -122.6514	220.144	8.8	63.977	4.523	4	[illegible]
MERWIN DAM	45.955, -122.5625	224.081	12.769	60.04	6.513	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	45.631925, -122.466933
Observation Date	2024-04-02
Elevation (ft)	253.44
Drought Index (PDSI)	Moderate drought (2024-03)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-04-02	3.166142	4.859449	2.456693	Dry	1	3	3
2024-03-03	2.711811	5.079528	5.625984	Wet	3	2	6
2024-02-02	4.261417	7.114173	8.925197	Wet	3	1	3
Result							Normal Conditions - 12

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PORTLAND WFO	45.5608, -122.5383	20.997	6.005	232.443	4.098	10000	90
PORTLAND 4.6 ENE	45.5548, -122.5645	139.108	1.334	118.111	0.758	4	[illegible]
PORTLAND INTL AP	45.5958, -122.6092	21.982	4.196	0.985	1.892	1348	[illegible]

APPENDIX D

WETLAND RATING FORM FOR WESTERN WASHINGTON

Wetland A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: August 29,2023

Rated by: Julianne Blake Trained by Ecology? X Yes __No Date of training: June 2022

HGM Class used for rating: Depressional Wetland has multiple HGM classes?_____Y _X_N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map: Google Earth

OVERALL WETLAND CATEGORY III (based on functions_X_ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

___X___**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M (L)	H M (L)	H M (L)	
Landscape Potential	(H) M L	(H) M L	H M (L)	
Value	(H) M L	(H) M L	H (M) L	**TOTAL**
Score Based on Ratings	7	7	4	18

Score for each function based on three ratings
(order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	(Not Applicable)

Wetland A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	8
Hydroperiods	D 1.4, H 1.2	8
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	8
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	8
Map of the contributing basin	D 4.3, D 5.3	9
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	9
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	10
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	10

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland A

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3 **YES** – The wetland class is **Flats**
If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
___At least 30% of the open water area is deeper than 6.6 ft (2 m).

NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (slope can be very gradual),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
____The water leaves the wetland **without being impounded**.

NO – go to 5 **YES –** The wetland class is **Slope**
NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland A

5. Does the entire wetland unit **meet all** of the following criteria?
   ____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ____The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**
   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland A

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed plants > 95% of area points = 5 Wetland has persistent, ungrazed plants > ½ of area points = 3 Wetland has persistent, ungrazed plants ≥ $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is ≥ ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	0
Total for D 1 Add the points in the boxes above	5

Rating of Site Potential If score is: ___**12-16 = H** ___**6-11 = M** _X_**0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	3

Rating of Landscape Potential If score is: _X__**3 or 4 = H** _**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which the unit is found.) Yes = 2 No = 0	2
Total for D 3 Add the points in the boxes above	4

Rating of Value If score is: _X__**2-4 = H** _**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland A

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream/ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (question 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part. Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	0
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the area of the wetland unit itself. The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	5

Rating of Site Potential If score is: ___**12-16 = H** ___**6-11 = M** _**X**_**0-5 = L** *Record the rating on the first page*

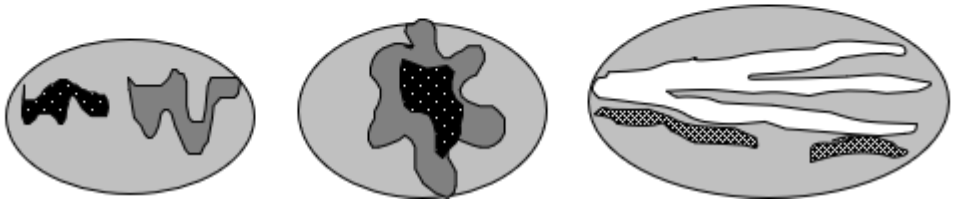
D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	1
Total for D 5 Add the points in the boxes above	3

Rating of Landscape Potential If score is: _**X**__**3 = H** __**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. Is the unit in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met. The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately downgradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther downgradient. points = 1 • Flooding from groundwater is an issue in the sub-basin. points = 1 • The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 • There are no problems with flooding downstream of the wetland. points = 0	2
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	2

Rating of Value If score is: _**X**_**2-4 = H** __**1 = M** __**0 = L** *Record the rating on the first page*

Wetland A

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac. ____Aquatic bed — 4 structures or more: points = 4 _X_Emergent — 3 structures: points = 2 ____Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 _X_Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon	1
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods). ____Permanently flooded or inundated — 4 or more types present: points = 3 _X_Seasonally flooded or inundated — 3 types present: points = 2 ____Occasionally flooded or inundated — 2 types present: points = 1 _X_Saturated only — 1 type present: points = 0 ____Permanently flowing stream or river in, or adjacent to, the wetland ____Intermittently or seasonally flowing stream in, or adjacent to, the wetland ____**Lake Fringe wetland** — **2 points** ____**Freshwater tidal wetland** — **2 points**	1
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	2
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high. **None** = 0 points — **Low** = 1 point — **Moderate** = 2 points All three diagrams in this row are **High** = 3 points 	1

Wetland A

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. _X_ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ____Standing snags (dbh > 4 in.) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	1
Total for H 1 Add the points in the boxes above	6

Rating of Site Potential If score is: ___**15-18 = H** ___**7-14 = M** _X_**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat_0.0_ **+** [(% moderate and low intensity land uses)/2]_1.5_ **=** _1.5_ % Total accessible habitat is: > $^1/_3$ (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat_9.0_ **+** [(% moderate and low intensity land uses)/2]_20.3_ **=** _29.3_ % Total habitat > 50% of Polygon points = 3 Total habitat 10-50% and in 1-3 patches points = 2 Total habitat 10-50% and > 3 patches points = 1 Total habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is**:** ___**4-6 = H** __**1-3 = M** _X_ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more Priority Habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW Priority Species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	1

Rating of Value If score is: ___**2 = H** _X_**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland A

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

— **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland A

_X_ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

__ **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

__ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

__ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

__ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes **= Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No **= Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem ~~that meets~~ their criteria? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under ~~the canopy?~~ Yes = **Category I bog** No = **Not a bog**	**Cat. I**

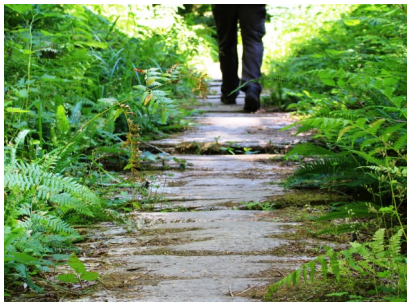
[135] https://www.dnr.wa.gov/NHPdata
[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland A

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* — The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** No = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	**Not Applicable**

OAK BANK USE PLAN - REVISED

May 17, 2024



13th Street Gas Station

Camas, WA

Prepared for

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Prepared by

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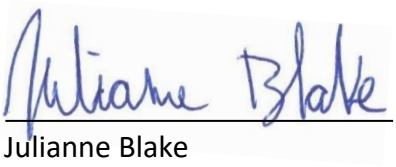
SIGNATURE PAGE

The information in this report was compiled and prepared under the supervision and direction of the undersigned.



Julianne Blake
Biologist III

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INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by PAK USA Camas, LLC to prepare this Oak Bank Use Plan to address Oregon white oak (oak) impacts resulting from the construction of a fuel station, convenience store, and associated parking lot. The site is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). Field work was conducted on August 29, 2023 and April 2, 2024. The project will remove one existing oak (*Quercus garryana*) and impact 0.08 acres (3,456 square feet) of oak canopy. Canopy impacts will be offset by purchasing 0.238 credits from Terrace Oak Bank (Bank). This Bank Use Plan was prepared according to the *Camas Municipal Code (CMC) Title 16 Environment* (2023) and Washington Department of Fish and Wildlife's (WDFW) *Management recommendations for Washington's priority habitats: Oregon white oak woodlands* (1998). This Bank Use Plan will discuss oak impacts only, any impacts to wetland buffers will be addressed in a separate report.

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Project Description

The project area is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). The project consists of constructing a fuel station, convenience store, and associated parking lot. The parking lot will contain electric vehicle charging stations and vacuum pumps as well as pedestrian crossing areas (Figure 3). The existing oak will be removed as part of the project, removing 0.08 acres (3,546 square feet) of oak canopy. Canopy impacts will be mitigated by purchasing 0.238 credits from Terrace Oak Bank. Construction is anticipated to start upon receipt of all necessary permits.

Best management practices (BMPs) that will be completed prior to construction include designating staging and stockpile areas outside of critical areas and associated buffers, establishing a standard construction entrance, and installing silt fencing to prevent sedimentation. When site preparation is complete, construction will occur. A water truck will be available to prevent dust blowing during construction, if needed. Equipment used may include haul trucks, bulldozers, excavators, pavers, and hand tools. Upon completion of construction activities, disturbed areas that will not be paved will be seeded with a native grass seed mix.

Existing Conditions

Existing and Surrounding Land Uses

The 0.97-acre site consists of Clark County Tax Parcel 176148000 and is accessed by a paved driveway off NE 13th Street. The site is zoned as Business Park (BP) and currently contains a single-family mobile home, shed, carport, and paved driveway. The site is bordered to the north by NE 13th Street, to the east by NW Friberg-Strunk Street, to the south by undeveloped land and a commercial development in progress, and to the west by undeveloped land and a single-family residence (Figure 2).

Existing Critical Areas

Two site visits were completed by ELS, following the appropriate technical manuals: *The Routine Determination Method according to the Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010). The first site visit took place in August 2023 and the second in April 2024, with one oak tree identified onsite. No wetlands were identified onsite at either visit; however, one wetland (Wetland A) was observed offsite to the west during the April 2024 visit (ELS 2024).

Wetland A is a Category III, depressional, forested and emergent wetland totaling approximately 0.57 acres offsite to the west, and outlets to a roadside ditch (Ditch 1). Offsite boundaries for Wetland A were estimated by visual observations of changes in vegetation, the presence of surface water, and aerial photos; therefore, Wetland A boundaries are approximate. Vegetation in Wetland A is dominated by deciduous trees and herbaceous vegetation. Wetland hydrology likely comes from a seasonally high groundwater table, runoff, and precipitation. Hydroperiods

include seasonally flooded and saturated only. According to the Washington State Wetland Rating System for Western Washington: 2014 Update (Rating System), Wetland A is a Category III wetland scoring 7 points for water quality functions, 7 points for hydrologic functions, and 4 points for habitat functions, for a total of 18 points. The designated buffer width for a Category III wetland with a high land use intensity and a habitat score of 4 is 80 feet, as listed in CMC Table 16.53.040-1 (Table 3).

Table 1. Wetland Summary

Name	Size	Hydrogeomorphic Classification[1]	Cowardin Class[2]/ Hydroperiod	Habitat Score[3]	Category[3]	Buffer Width[4]
A	Approximately 0.57 acres	Depressional	Emergent, Forested/ Saturated Only	4	III	80 ft.

[1]NRCS 2008, [2]FGDC 2013, [3]Hruby 2014, [4]CMC Table 16.53.040-1

The WDFW Priority Habitats and Species online mapping tool depicts oak woodlands in the vicinity of the observed oak along the southern site boundary. One oak measuring approximately 52 inches diameter at breast height (DBH) was mapped along the southern site boundary during site reconnaissance (Figure 2). The oak has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. The oak location was mapped using a GPS system capable of submeter accuracy in ideal conditions. According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a 20-inch DBH are considered a priority habitat. For more information regarding critical areas onsite, see the *Critical Areas Report for 13th Street Gas Station* (ELS 2024).

Table 2. Oak Summary

Total Canopy Area	DBH	Number of Trunks	Noteworthy Habitat Features
0.08 acres 3,456 square feet	52 inches	1	• Canopy is interconnected with adjacent trees, but not other oaks • Two large cavities

AVOIDANCE AND MINIMIZATION

The preferred mitigation sequencing of first avoidance, then minimization, and finally compensation for unavoidable impacts was taken into consideration during the project design process. The engineering team tested several layouts to avoid oak impacts to the maximum extent practicable, originally placing the convenience store on the western property line. However, *CMC 18.09.030-Table 1* states that parcels zoned BP must have a 50-foot setback for the rear yard, which placed the convenience store in the center of the site. Additional requirements include a turning radius large enough for fuel truck maneuvering, tank filling, and other deliveries. This layout did not allow access or the required interior circulation routes to accommodate fuel trucks and other large turning radius vehicles. To allow necessary ingress, egress, and circulation, the convenience store was moved to the east. Design review standards require the building be located as close as possible to the roadway and a driveway is required

around the outside of the store for a drive-thru car wash. Due to the single oak tree being located in an area of the site needed for the driveway, avoiding Oregon white oak impacts altogether is not feasible. The Oregon white oak proposed for removal is the only oak tree onsite.

Unavoidable Oregon White Oak Impacts

Removal of the oak will result in the loss of 0.08 acres (3,456 square feet) of Oregon white oak priority habitat as measured by the oak canopy coverage (drip line). The following table summarizes proposed oak impacts.

Table 3. Oak Impact Summary

Identifier	DBH	Canopy Coverage	Total Impact
Oregon White Oak (Single Mature Tree)	52 inches	0.08 acres 3,456 square feet	0.08 acres 3,456 square feet

Impacted Priority Habitat Functions

ELS assessed the functions provided by the oak during a site visit on August 29, 2023. The functional assessment is based on Washington Department of Fish and Wildlife's (WDFW) *Management Recommendations for Washington's Priority Habitats, Oregon White Oak Woodlands* (Guidance) (Larsen and Morgan 1998).

Habitat Functions

Oak woodlands are considered "priority habitat and species" by WDFW and are protected locally by the City of Camas Municipal Code (*CMC*). According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a twenty-inch DBH are considered a priority habitat.

In urban or urbanizing areas west of the Cascades, WDFW defines priority oak habitat as single oaks, or stands of pure oak, or oak/conifer associations, 1 acre or greater in size. WDFW may also consider individual Oregon white oak trees a priority habitat when found to be particularly valuable to wildlife (i.e., contains many cavities, has a large DBH, is used by priority species, or has a large canopy) (Larsen and Morgan 1998). The project site is within the City of Camas (City). WDFW recommendation is that in urban and urbanizing areas, single trees should be maintained if they are deemed important to species highly associated with Oregon white oak. Oaks and their associated flora comprise distinct woodland ecosystems with various plant communities providing valuable habitat that contributes to wildlife diversity. Oak woodlands provide a mix of feeding, resting, and breeding habitat for many wildlife species (Larsen and Morgan 1998).

The oak proposed for removal has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. Due to the location of the oak within the City boundaries and lack of habitat connectivity, larger animals or those not adapted to urban conditions are not likely to be present. Therefore, removing the oak would likely result in habitat loss and a food source only for birds and small mammals that are well adapted to urban conditions.

Oregon White Oak Mitigation Selection Rationale

The Oregon white oak proposed for removal is located in the service area for the Terrace Oak Bank (Bank). The oak tree is approximately 4 miles southeast of the Bank, in the Lacamas Creek Watershed which is in the southeastern portion of the service area (Figure 4). The proposed oak removal will be mitigated by purchasing credits from the Bank at ratios specified in the Terrace Oak Bank's Mitigation Banking Instrument (MBI).

Rationale for selecting this mitigation bank is as follows:

- There is not adequate space available within the study area to fully compensate for oak habitat losses utilizing onsite mitigation. The use of the Bank will ensure that habitat functions common to urban areas can be fully replaced.
- The oak onsite does not provide habitat for other priority species that should be replaced onsite. Habitat functions will be impacted for species common to urban areas, which can be fully replaced at the Bank.
- The habitat functions lost from the proposed oak removal correspond directly with the habitat creation purpose, goals, and objectives at the Bank which identifies 13.93 acres of existing Oregon white oak woodland WDFW Priority Habitat that will be restored to pre-agricultural conditions through creation, enhancement, and preservation. Creation and enhancement will be accomplished through planting oak saplings and/or native understory plantings, removing of Douglas-fir, and establishing a conservation easement over the entire 13.93 acres.
- The use of Terrace Oak Bank credits will provide immediate compensation for the accrued oak impacts.

The 2008 *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule* (Corps) recommends purchasing mitigation bank credits for ecological considerations (lower risk of failure and lower temporal loss of resources and services) and to avoid the maintenance and contingency issues and outright failures that often accompany permittee-responsible mitigation sites. Use of the Terrace Oak Bank substantially lowers the risk of failure and temporal loss of resource functions and services over newly established, permittee-responsible mitigation sites and offsite mitigation is anticipated to be more meaningful and beneficial to the watershed's habitat functions.

Functions Provided at Oak Bank

The general goal of the Bank is to restore the approximately 13.93 acres to a state similar to its pre-agricultural condition through creation, enhancement, and preservation of an existing Oregon white oak woodland. All functions related to oak habitat are expected to increase as a result of design implementation. The primary ecological goals of the Bank are as follows:

- Removal of all existing impervious surfaces, including buildings, large equipment, gravel and paved areas, and debris, followed by replanting oak saplings and native understory species.

- Removal of invasive species in creation, enhancement, and preservation areas, primarily English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus armeniacus*).
- Removal of Douglas-fir (*Pseudotsuga menziesii*) overstory as recommended by WDFW to reduce competition and further degradation of the Oregon white oak woodland from shading.
- Replanting of both creation and enhancement areas with oak saplings and native understory species to augment and expand existing Oregon white oak habitat.
- Preserve the Bank through a conservation easement.

Wildlife Habitat

The proposed development site plan will provide diverse habitat for a variety of large and small mammals, songbirds, waterfowl, amphibians, and insects by improving the condition of the existing Oregon White Oak habitat through creation and enhancement that includes replanting of oaks and native understory, removing invasive species, non-native debris, and impervious surfaces, and eliminating Douglas-fir encroachment.

Anticipated Functional Lift

The creation, enhancement, and Douglas-fir stand release activities proposed in the Bank will provide a variety of benefits lifting overall habitat functions. Invasive species eradication and installing oak trees and native understory in open areas will increase the site's potential to provide habitat by providing improved and increased diversity of plant species, structure, and interspersion of habitat. Removing Douglas-fir competition will allow the existing oaks to increase branching and smaller oak trees to become better established. The changes will increase acorn production, provide additional food for wildlife, and support a greater diversity of wildlife species as will removing impervious surfaces and debris. All functions impacted by removing an oak tree at the project site will be fully mitigated at the Bank.

Proposed Mitigation Credits

As stated in the MBI (October 28th, 2020), the local jurisdiction with regulatory authority will determine both how impacts are measured (i.e., square foot of canopy area/root zone, DBH, etc.) and the mitigation ratios required. The mitigation credits required for impacts to Oregon white oak will be determined by using the local jurisdiction's mitigation ratio (6:1) and multiplying this ratio by a "risk reduction factor" of 0.5. Impacts to high functioning Oregon White Oak Priority Habitat stands will be determined by the regulatory agencies on a case-by-case basis. Table 4 summarizes the impact type, mitigation ratio, and total credits proposed for compensation.

Table 4. Proposed Credit Purchase Summary

Impact Type	Impact Amount	Mitigation Ratio	Risk Reduction Multiplier	Mitigation Area Required	Proposed Credit Purchase
Canopy loss	0.08 acres (3,456 sq. ft.)	6:1	0.5	0.238 acres (10,368 sq. ft.)	0.238 credits

Credit Purchase or Transfer Timing

Following permit issuance, PAK USA Camas, LLC, as the applicant, will enter into a Buy/Sell Agreement with Terrace Oak Bank, for purchase of mitigation credits (in the quantity specified in Table 3) that would appropriately mitigate for the proposed project impacts. The actual purchase of credits will occur upon permit issuance. Prior to impacting the project oak, the applicant will submit proof of transfer of mitigation credits to project managers for the City of Camas. Proof of the mitigation transfer will be provided in the form of a notification letter to the approving agencies. Upon service of this notification, the mitigation requirement to purchase 0.238 mitigation credits will be fully satisfied.

Confirmation of Mitigation Credit Availability

Proof of the current number of available mitigation credits at the Terrace Oak Bank site will be confirmed by the approving agency, City of Camas and through the advising members of the Oak Bank Review Team.

Chair:

Brent Davis, Wetland and Habitat Review Program Manager
Clark County Community Development
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Advisory Members:

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Washington Department of Fish and Wildlife
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Washington Department of Natural Resources
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Limitations

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

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City of Camas. 2023. *Camas Municipal Code (CMC) Title 16 Environment.* Camas, Washington. July 31, 2023.

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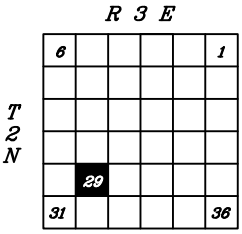
FIGURES

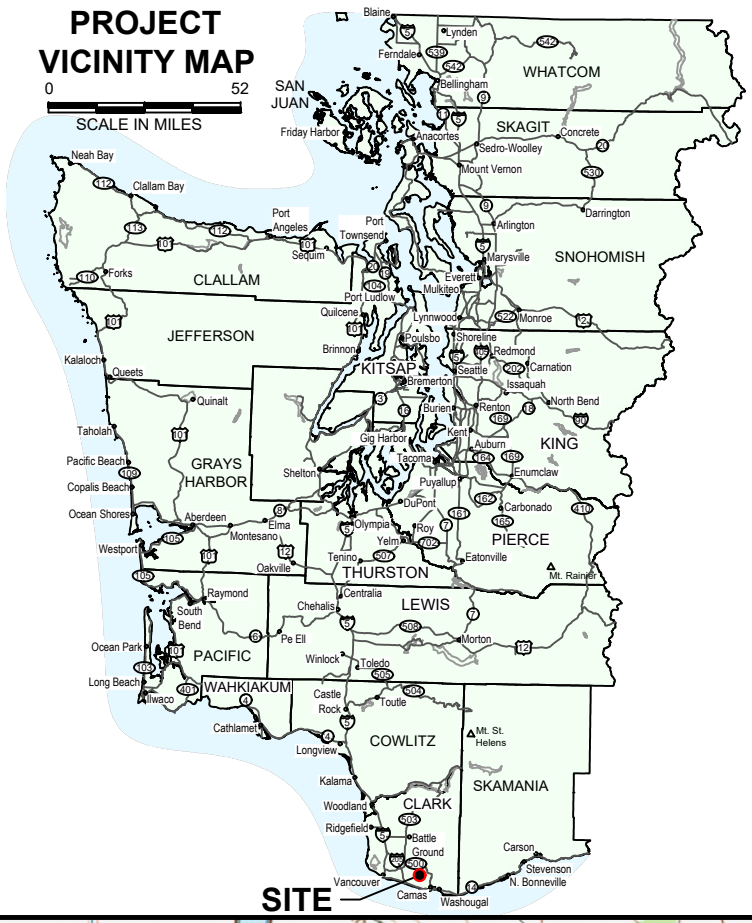
WASHINGTON

45.6321° Latitude
-122.4664° Longitude

LOCATION MAP



PROJECT VICINITY MAP



NOTE:
Quadrangle topographic map from USGS.

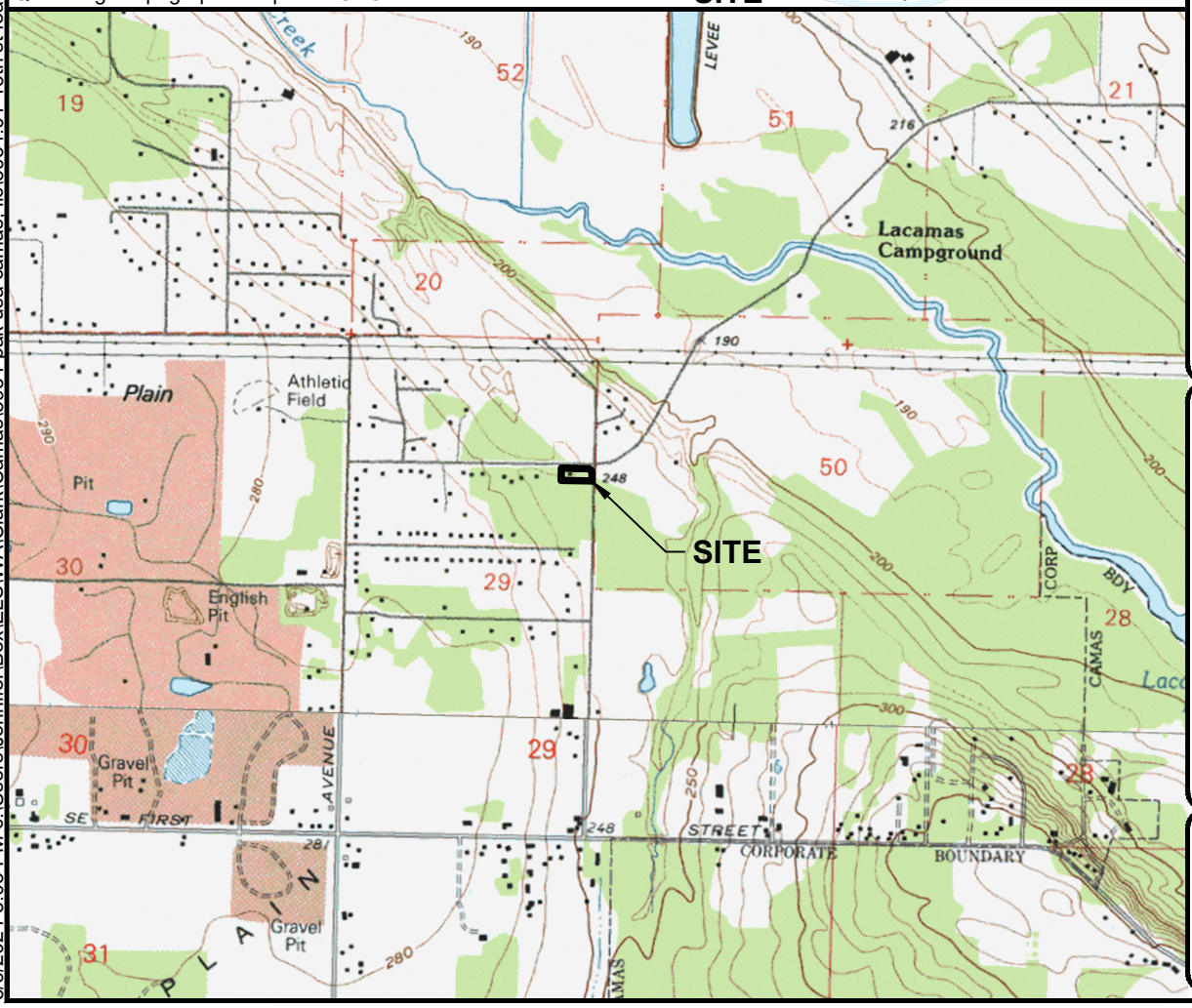


Figure 1
VICINITY MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/6/24
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
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www.eco-land.com
Ecological Land Services

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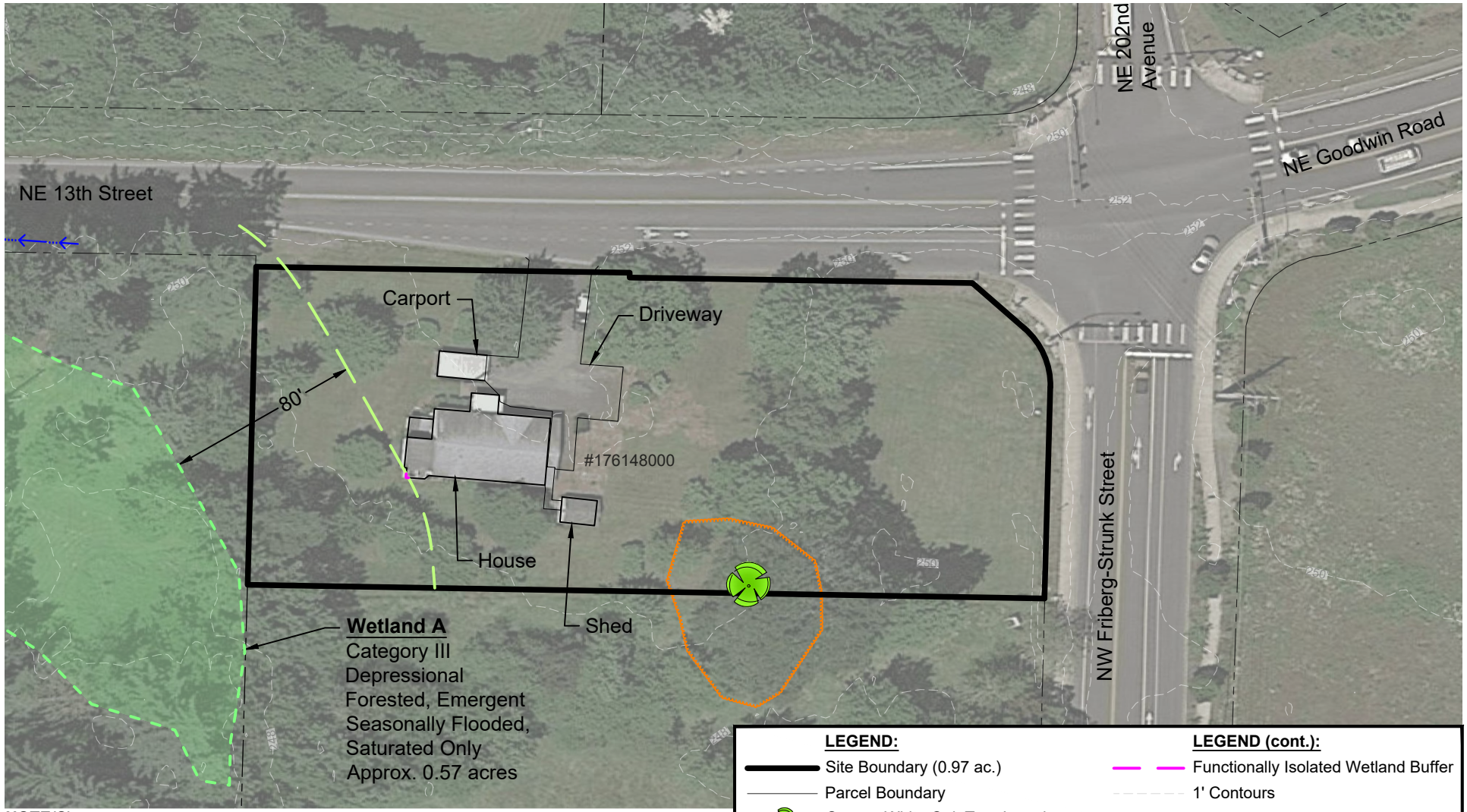

NOTE(S):

1. Aerial from Google Earth™ (6/17/2021).
2. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
3. Parcel data from Clark County GIS Department.
4. Topography from 2013 Clark County Lidar provided by WDNR at https://lidarportal.dnr.wa.gov.

LEGEND:

- Site Boundary (0.97 ac.)
- Parcel Boundary
- Oregon White Oak Tree Location
- Oak Dripline (0.08 ac. total/0.03 ac. onsite)
- Approx. Offsite Wetland Boundary
- Wetland Buffer

LEGEND (cont.):

- Functionally Isolated Wetland Buffer
- 1' Contours

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REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 2
EXISTING CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

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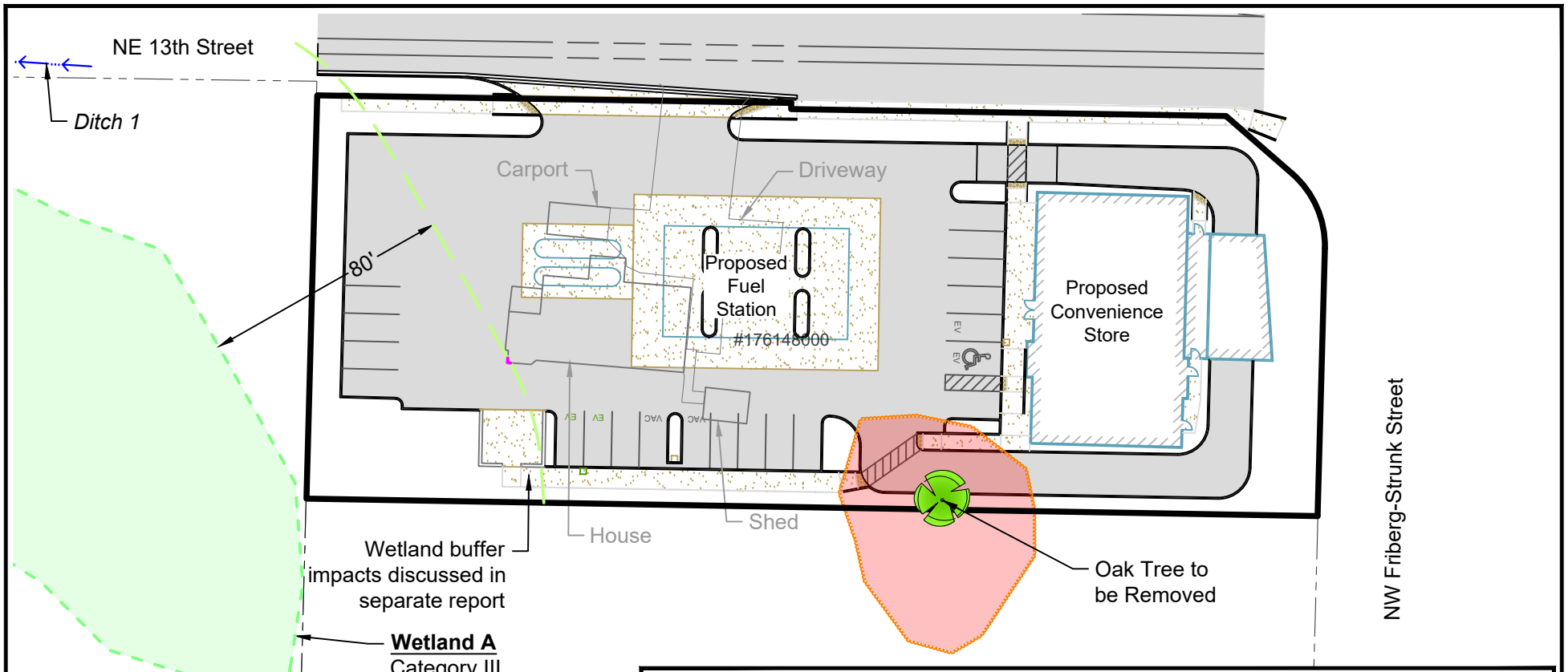

LEGEND:

- Site Boundary (0.97 ac.)
- Parcel Boundary
- Approx. Offsite Wetland Boundary
- Wetland Buffer
- Functionally Isolated Wetland Buffer
- Oregon White Oak Tree Location
- Oak Dripline (0.08 ac. total/0.03 ac. onsite)
- Ditch with Flow Direction

LEGEND:

- Proposed Asphalt
- Proposed Concrete
- Oak Dripline Impact (3,546 sq. ft./0.08 ac.)

NOTE(S):

1. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
2. Parcel, ditch, and culvert data from Clark County GIS Department.
3. Site plan by PLS Engineering.

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CHK:
PROJECT NO: 3934.01

Figure 3
PROPOSED CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

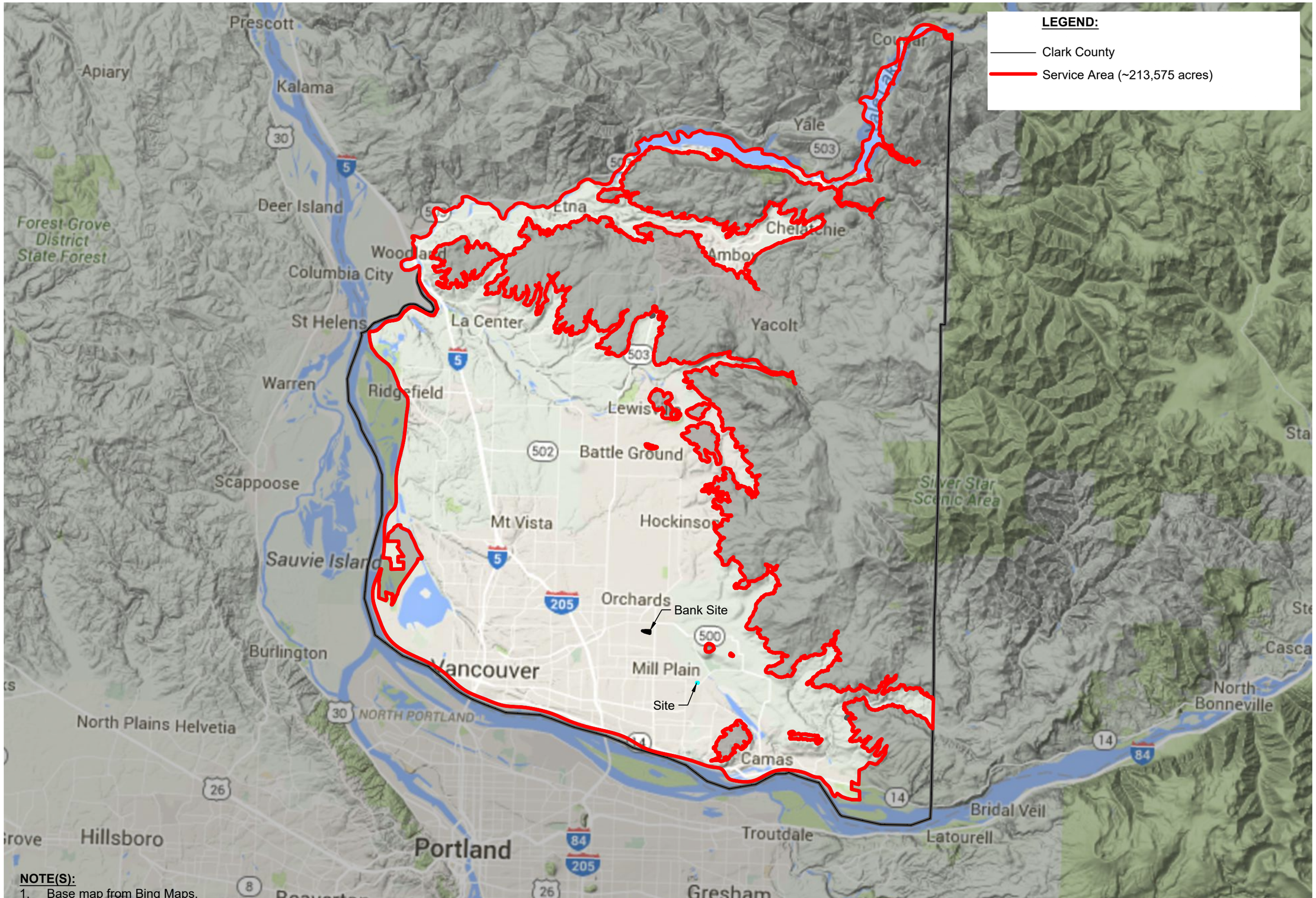

Figure 4
TERRACE OAK BANK SERVICE AREA
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/6/24
DWN: JKJ
REQ. BY: JB
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NOTE(S):
1. Base map from Bing Maps.

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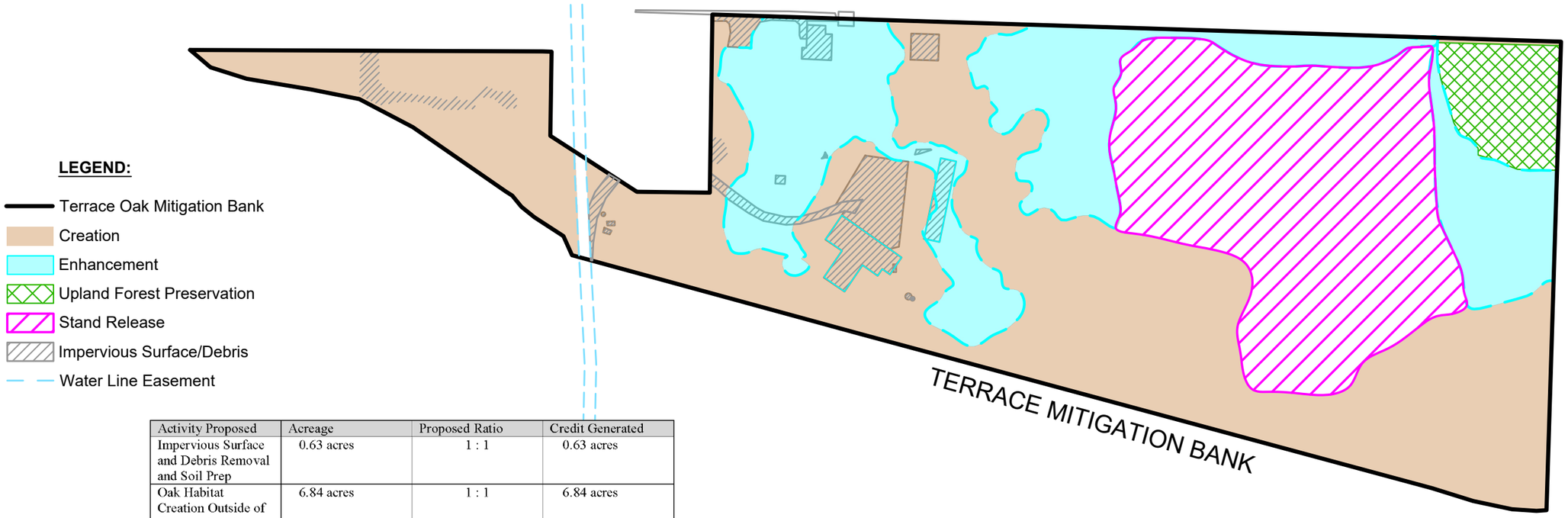

Activity Proposed	Acreage	Proposed Ratio	Credit Generated
Impervious Surface and Debris Removal and Soil Prep	0.63 acres	1 : 1	0.63 acres
Oak Habitat Creation Outside of Existing Oak Stand	6.84 acres	1 : 1	6.84 acres
Douglas Fir Stand Release	3.34 acres	0.4 : 1	8.35 acres
Enhancement of Existing Oak Stand	3.20 acres	0.4 : 1	8.00 acres
Upland Forest Preservation	0.50 acres	0.5 : 1	1.00 acres
Totals	14.51 acres[1]		24.82 acres

[1] Total acreage includes areas of activity overlap and does not include 0.05 acres of water line easement, so is not reflective of the 13.93 acres represented in the legal survey of Oak Bank area.

Table 2. Oak Mitigation Bank Activity Descriptions.

Activity Proposed	Type of Activity/Area
Impervious Surface and Debris Removal and Soil Prep	• Includes: • Buildings, driveways, gravel pads or any other impervious area to be removed (regardless of whether oak tree canopy already covers the area) • Removal of debris piles throughout the site • Loosening of soils following impervious/debris removal
Oak Habitat Creation Outside of Existing Oak Stand	• Includes open areas of all types not currently covered by oak canopy • Areas to be replanted with oak saplings and native understory
Douglas Fir Stand Release	• Includes area of dense fir canopy within existing oak stand • Douglas fir over-story to be removed through harvest or tree girdling/snag creation
Enhancement of Existing Oak Stand	• Includes areas of existing oak canopy • Enhancement areas will have non-natives removed and understory planted with native shrubs typically associated with oak woodlands
Upland Forest Preservation	• Includes areas of deciduous forest adjacent to oak canopy, providing upland forest habitat • Area will be preserved through administration of a conservation easement

Figure 5
TERRACE OAK BANK SITE DESIGN
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/6/24
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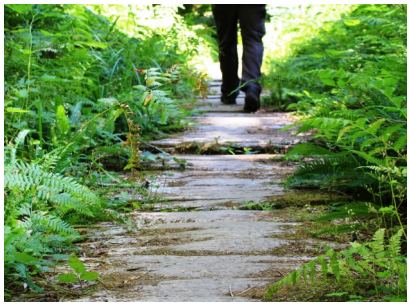
WETLAND BUFFER BANK USE PLAN

May 16, 2024



13th Street Gas Station

Camas, WA

Prepared for

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c/o Taz Khan
3993 NW Currawong Court
Camas, WA 98607
(512) 779-4999

Prepared by

Ecological Land Services

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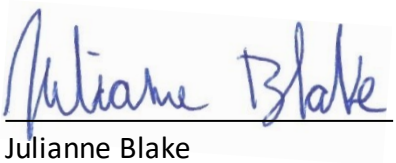
(360) 578-1371 • Project Number 3934.01

SIGNATURE PAGE

The information in this report was compiled and prepared under the supervision and direction of the undersigned.



Julianne Blake
Biologist III

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INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by PAK USA Camas, LLC to prepare this Bank Use Plan to address wetland buffer impacts resulting from the construction of a fuel station, convenience store, and associated parking lot. The site is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). Field work was conducted on August 29, 2023 and April 2, 2024. The project will impact 0.16 acres (6,810 square feet) of wetland buffer. Buffer impacts will be offset by purchasing 0.08 credits from Terrace Wetland Mitigation Bank (Bank). This Bank Use Plan was prepared according to the *Camas Municipal Code (CMC) Title 16 Environment* (2023), *Interagency Review Team (IRT) for Washington State's Guidance Paper, Using Credits from Wetland Mitigation Banks: Guidance to Applicants on Submittal Contents for Bank Use Plans* (June 2020), the Washington State Department of Ecology (Ecology) *Wetland Mitigation in Washington State Parts 1 and 2* (2021 and 2006), and the U.S. Army Corps of Engineers' (Corps) *Compensatory Mitigation for Losses of Aquatic Resources* (33 C.F.R. §332 (2008)). This Bank Use Plan will discuss wetland buffer impacts only, any impacts to Oregon white oak trees (*Quercus garryana*) will be addressed in a separate report.

RESPONSIBLE PARTIES

PROPERTY OWNER/APPLICANT
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MITIGATION BANK
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BIOLOGICAL CONSULTANT
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Longview, Washington 98632
(360) 578-1371
Julianne@eco-land.com

Project Description

The project area is approximately 0.97 acres and consists of Clark County Tax Parcel 176148000 located at 20101 NE 13th Street within the NW ¼ of Section 29, Township 2 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Figure 1). The project consists of constructing a fuel station, convenience store, and associated parking lot. The parking lot will contain electric vehicle charging stations and vacuum pumps as well as pedestrian crossing areas (Figure 3). The project will impact 0.16 acres (6,810 square feet) of wetland buffer. Buffer impacts will be offset by purchasing 0.08 credits from Terrace Wetland Mitigation Bank. Construction is anticipated to start upon receipt of all necessary permits.

Best management practices (BMPs) that will be completed prior to construction include designating staging and stockpile areas outside of critical areas and associated buffers, establishing a standard construction entrance, and installing silt fencing to prevent sedimentation. When site preparation is complete, construction will occur. A water truck will be available to prevent dust blowing during construction, if needed. Equipment used may include haul trucks, bulldozers, excavators, pavers, and hand tools. Upon completion of construction activities, disturbed areas that will not be paved will be seeded with a native grass seed mix.

Existing Conditions

Existing and Surrounding Land Uses

The 0.97-acre site consists of Clark County Tax Parcel 176148000 and is accessed by a paved driveway off NE 13th Street. The site is zoned as Business Park (BP) and currently contains a single-family mobile home, shed, carport, and paved driveway. The site is bordered to the north by NE 13th Street, to the east by NW Friberg-Strunk Street, to the south by undeveloped land and a commercial development in progress, and to the west by undeveloped land and a single-family residence (Figure 2).

Existing Critical Areas

Two wetland delineation site visits were completed by ELS, following the appropriate technical manuals: *The Routine Determination Method according to the Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010). The first site visit took place in August 2023 and the second in April 2024, with one oak tree identified onsite. No wetlands were identified onsite at either visit; however, one wetland (Wetland A) was observed offsite to the west during the April 2024 visit (ELS 2024).

Wetland A is a Category III, depressional, forested and emergent wetland totaling approximately 0.57 acres offsite to the west, and outlets to a roadside ditch (Ditch 1). Offsite boundaries for Wetland A were estimated by visual observations of changes in vegetation, the presence of surface water, and aerial photos; therefore, Wetland A boundaries are approximate. Vegetation in Wetland A is dominated by deciduous trees and herbaceous vegetation. Wetland hydrology likely comes from a seasonally high groundwater table, runoff, and precipitation. Hydroperiods

include seasonally flooded and saturated only. According to the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Yanke and Hruby 2023; Rating System), Wetland A is a Category III wetland scoring 7 points for water quality functions, 7 points for hydrologic functions, and 4 points for habitat functions, for a total of 18 points. The designated buffer width for a Category III wetland with a high land use intensity and a habitat score of 4 is 80 feet, as listed in CMC Table 16.53.040-1 (Table 3).

Table 1. Offsite Wetland Summary

Name	Size	Hydrogeomorphic Classification[1]	Cowardin Class[2]/ Hydroperiod	Habitat Score[3]	Category[3]	Buffer Width[4]
A	Approximately 0.57 acres	Depressional	Emergent, Forested/ Seasonally Flooded & Saturated Only	4	III	80 ft.

[1]NRCS 2008, [2]FGDC 2013, [3]Yanke and Hruby 2023, [4]CMC Table 16.53.040-1

The WDFW Priority Habitats and Species online mapping tool depicts oak woodlands in the vicinity of the observed oak along the southern site boundary. One oak measuring approximately 52 inches diameter at breast height (DBH) was mapped along the southern site boundary during site reconnaissance (Figure 2). The oak has several live and dead branches, cavities, and has canopy connectivity with other trees in the vicinity but is not connected with other oaks. The oak location and dripline was mapped using a GPS system capable of submeter accuracy in ideal conditions. According to *CMC 16.61.010(3)(a)*, individual Oregon white oak trees with a 20-inch DBH are considered a priority habitat. For more information regarding critical areas onsite, see the *Critical Areas Report for 13th Street Gas Station - Revised* (ELS 2024).

Table 2. Oak Summary

Total Canopy Area	DBH	Number of Trunks	Noteworthy Habitat Features
0.08 acres	52 inches	1	• Canopy is interconnected with adjacent trees, but not other oaks • Two large cavities

Wetland Landscape Position

The site is generally located on a broad terrace in the southwest portion of the Lacamas Creek subwatershed, within Hydrologic Unit Code (HUC) 170800010605, and Water Resource Inventory Area (WRIA) 28 (Salmon-Washougal). In general, hydrology from the offsite wetland is conveyed to the north to a roadside ditch where it then crosses under NE 13th Street via a culvert and eventually discharges to an unnamed stream. Wetland A is a depressional wetland located offsite to the west and may provide localized flood storage and groundwater recharge functions within the lower portion of the HUC.

Avoidance and Minimization of Wetland Impacts

The wetland mitigation requirements of the local, state, and federal agencies specify that all regulated development activities proposing permanent impacts to wetlands or buffers shall examine whether the impacts can be avoided and/or minimized prior to proposing compensation for the impacts. This project has been designed to construct a fuel station, convenience store, and associated parking lot on approximately one acre of maintained land currently containing a single-family residence. Approximately 0.16 acres of the site is affected by the 80-foot buffer for the offsite wetland, Wetland A. The engineering team tested several layouts to try to avoid impacts to the greatest extent practicable. Ultimately, none of the design alternatives avoided buffer impacts while meeting CMC requirements, resulting in the need for wetland buffer impacts. There will be no direct impacts to wetlands as no wetlands exist onsite. The project cannot avoid impacts to Wetland A buffer because there are no other locations where the required parking lot can be constructed that avoids impacts to wetland buffer.

The hydrologic, water quality, and habitat functionality of onsite Wetland A buffer are degraded due to existing residential uses and regularly maintained landscaping. The project minimizes impervious surface impacts by proposing the smallest construction footprint possible to accomplish the project goals. Impacts to other onsite areas will be minimized by the use of best management practices (BMPs) including installing silt fencing along clearing limits, applying native grass seed to disturbed areas, and making a water truck available to prevent dust blowing during construction. Construction staging areas will be located within onsite uplands outside of the wetland and buffer.

Unavoidable Wetland Buffer Impact Acreage

The project will impact 0.16 acres of the buffer for Wetland A, located offsite to the west. Buffer impacts will be offset by purchasing 0.08 credits from the Bank. Table 3 summarizes all unavoidable wetland buffer impacts.

Table 3. Expected Impacts to Wetlands

Wetland Name	Wetland Area (acres)	Direct Impact (acres)	Buffer Impact (acres)	Ecology Rating[1]	Cowardin Class[2]	Hydrogeomorphic Class[3]
A	Approx. 0.57	0.00	0.16	III	Emergent, Forested	Depressional

[1]*Hruby & Yanke 2023*
[2]*FGDC 2013*
[3]*NRCS 2008*

Impacted Wetland and Buffer Functions

Wetland functions were assessed in May 2024 using the analysis provided in the Rating System. The wetland rating form can be found in the *Critical Areas Report for 13th Street Gas Station - Revised* (ELS 2024).

WATER QUALITY FUNCTIONS

Wetland A achieved a moderately high water quality function score of 7 points in the Rating System. The wetland provides low site potential for improving water quality as it contains an intermittently flowing outlet, greater than 1/2 of its area is covered by persistent, ungrazed plants, and the seasonally ponded area makes up less than 1/4 of the total area of the wetland, allowing for nominal particulate retention and filtration. Wetland A has high potential to support the water quality function of the site as it receives sources of pollutants from surrounding land uses within 150 feet, including adjacent septic systems, which would provide the opportunity for pollutant filtration. The wetland provides high water quality functions valuable to society in that it discharges within a mile to a waterbody on the 303d list and is located in a watershed with TMDLs in development and provides the above pollutant filtration and retention functions to runoff prior to it being discharged into adjacent waters. The majority of Wetland A's water quality functions will be retained as the wetland will not be directly impacted by the proposed development and the existing buffer functions are already degraded.

HYDROLOGIC FUNCTIONS

Wetland A achieved a moderately high hydrologic function score of 7 points in the Rating System. The wetland has low site potential for reducing flooding and erosion due to its intermittently flowing surface outlet and marks of ponding less than six inches from the surface or bottom of the wetland's outlet, which does not allow for high levels of flood storage, retention, or groundwater recharge. The wetland has high potential to support the hydrologic functions of the site as more than 25 percent of its contributing basin is covered with intensive human land uses, and greater than 10 percent of the area within 150 feet upslope of the wetland is in land uses or cover that generate excess runoff, allowing for the opportunity to filter and treat incoming stormwater and pollutants. The hydrologic functions provided by Wetland A are highly valuable to society as there are flooding problems within a sub-basin immediately down-gradient and the wetland may provide a small amount of flood water storage. The majority of the hydrologic functions provided by the wetland will be retained as the wetland will not be directly impacted by the proposed development and the existing buffer functions are already degraded.

HABITAT FUNCTIONS

Wetland A achieved a low habitat function score of 4 points in the Rating System. The wetland has low habitat interspersion with both emergent and forested Cowardin classes and one assumed special habitat feature due to the forested class, large woody debris within the wetland. Additionally, there is low landscape potential to support habitat as surrounding land uses within a 1-kilometer radius contain greater than 50 percent high intensity land uses, accessible habitat is less than 10 percent, and undisturbed habitat is less than 50 percent and found in greater than three patches. Accessibility of habitat provided by the wetland and its buffer to other wetlands or forested areas in the local vicinity is limited by adjacent residential land uses and heavy traffic on NE 13th Street and NW Friberg-Strunk Street. The above constraints limit the amount and diversity of species that can inhabit the onsite wetland. The nominal habitat functions provided by the wetland will be retained as the wetland will not be directly impacted by the proposed development and the existing buffer functions are already degraded.

Buffer Functions

Wetland buffers can reduce adverse impacts to wetland functions and values from adjacent development by moderating the effects of stormwater runoff including stabilizing soil to prevent erosion, filtering runoff, and moderating water level fluctuations. Buffers also provide habitat opportunities for forage, refuge, mobility, and thermal protection. Additionally, buffers help screen the wetland from adjacent developments blocking noise, providing visual separation, and providing protection from other human disturbances (Castelle et al. 1992). The portion of wetland buffer that will be impacted provides low functions as it is comprised of compacted soils covered with frequently mowed upland grasses and ornamental landscaped plants. The primary impacts to the functions and values of Wetland A buffer are loss of minimal habitat area and reduced groundwater recharge functions, as the area will be covered with impervious surfaces. Wetland A will not be directly impacted so it will still function to slow surface flows and recharge groundwater.

Wetland Mitigation Bank Site Selection Rationale

The wetland proposed for impact is located within the service area for the Terrace Mitigation Bank. The project site is located approximately 3 miles southeast of the Bank site near the southern boundary of the Salmon Creek Watershed (Sheets 1 and 4).

Rationale for selecting this mitigation bank is as follows:

- The development project does not propose impacts to critical wetland functions that should be replaced onsite. The impacted functions are water quality, hydrology, and habitat, which can be fully replaced within the Bank site.

- The wetland mitigation needs of the project correspond directly with the purpose, goals, and objectives of the Bank, as the general Bank goal is to restore approximately 89.15 acres of self-sustaining, diverse forest, scrub-shrub, and emergent wetland habitat. This restoration will be accomplished through re-establishment of a native emergent wetland plant community, and re-establishment of hydrology through the disabling of the drain tiles throughout the Bank site.

The 2008 *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule* (Corps) recommends purchasing mitigation bank credits for ecological considerations (lower risk of failure and lower temporal loss of resources and services) and to avoid the maintenance and contingency issues and outright failures that often accompany permittee-responsible mitigation sites. Use of the Terrace Mitigation Bank substantially lowers the risk of failure and temporal loss of resource functions and services over newly established, permittee-responsible mitigation sites. As described below, the functional lift anticipated in the Terrace Mitigation Bank will adequately compensate for wetland functions lost by development.

Wetland Functions Provided at Mitigation Bank

The general goal of the Bank is to restore approximately 89.15 acres of self-sustaining, diverse forest, scrub-shrub, and emergent wetland habitat, similar to pre-agricultural conditions.

The primary ecological goals of Terrace Mitigation Bank consist of:

- Re-establishing hydrology through the disabling of the drain tiles throughout the site;
- Establishing a native historic forested, scrub-shrub, and emergent wetland plant community in re-established and rehabilitated wetland areas;
- Establishing a native upland scrub-shrub plant community in the upland buffer area within the BPA easement;
- Reshaping of incised stream banks to reconnect the stream to its floodplain and existing wetlands;
- Enhancement of the riparian area along Burnt Bridge Creek by removing invasive species and planting native trees and shrubs to increase shading and lower water temperatures, and provide improved habitat structure and diversity;
- Removing an existing culvert crossing at the west property boundary to improve stream flow, and;
- Removing existing invasive species and preventing the establishment of invasive species throughout the Bank site.

A wetland functions assessment was performed for the Bank, which was based on the water quality, hydrology, and habitat functions identified in the Rating System (Hruby & Yanke 2023).

Water Quality

Water quality functions will be significantly improved over current conditions by replacing the existing disturbed wetland vegetation with forested, scrub-shrub, and emergent persistent vegetation that can trap sediments and pollutants, and the increased inundation resulting from disabling the drain tiles will increase the wetland's ability to provide denitrification.

Additionally, the Bank site itself directly contributes agricultural runoff high in sediment and herbicides. Establishment of the Bank will allow onsite agricultural practices to cease, eliminating the potential for chemical contaminants to enter the downstream watershed from the site. The resulting overall score for the wetland unit improving water quality functions is high (9 points), which reflects a 3 point increase over baseline conditions.

Hydrology

Currently, groundwater, runoff, and flood water from Burnt Bridge Creek within the Bank site is quickly and effectively conveyed downstream through the extensive drain tile system. Once the drain tiles are disabled, water will be impounded for a much longer duration than current conditions, and groundwater storage will be increased, improving the site's hydrologic function. This will supplement summer base flows within Burnt Bridge Creek, buffer peak flows during flood events, reduce offsite flooding, reduce erosion, provide temperature regulation within the Burnt Bridge Creek during the summer, and recharge groundwater.

By increasing groundwater levels at the Bank site through disabling drain tiles, it will have an effect of "mounding" the groundwater. This adds downward pressure on the groundwater as well as increased storage due to the highly absorbent peat soils. Therefore, it should not be assumed that a groundwater elevation increase at the Bank site only benefits Burnt Bridge Creek Watershed hydrologically. Once the tiles are disabled, the flow path of the shallower groundwater will not only be lateral to Burnt Bridge Creek but also vertical and downward to the larger aquifer within the Upper Troutdale Formation (that bisects and discharges to both Burnt Bridge Creek and Lacamas Watersheds), thus providing hydrological improvements to areas well outside of the Bank boundary. The resulting overall score for the wetland unit improving hydrologic functions is moderately high (7 points), which reflects a 3 point increase over baseline conditions.

Wildlife Habitat

The majority of the Bank site currently contains limited habitat for wildlife. The wetlands onsite are low quality wetlands within managed agricultural fields. Within the Bank site, Burnt Bridge Creek consists of a ditched, incised channel with very little native riparian vegetation, and provides less than ideal conditions for resident fish. The Oregon white oak woodland adjacent to the northeast portion of the Bank provides some adjacent priority habitat for the Bank, but this habitat has been impacted by the construction of residential and commercial structures and associated impervious surfaces, invasive species, and competition and succession by Douglas-fir (*Pseudotsuga menziesii*). The woodland area is currently disconnected from the existing wetlands by the historic and existing agricultural use of the majority of the Bank site.

The proposed site plan will provide diverse wetland habitat for a variety of large and small mammals, songbirds, waterfowl, amphibians, and insects. The addition of trees and shrubs along Burnt Bridge Creek will provide temperature regulation, cover, and leaf litter, all important to the overall health of the stream system. Large woody material incorporated within the Bank site, in the form of horizontal logs and snags, and habitat features such as bird boxes and perch poles will provide additional areas for perching and nesting habitat for avian species. The resulting overall score for the wetland unit providing wildlife habitat functions is moderately high (7 points), which reflects a 2 point increase over baseline conditions.

Anticipated Functional Lift

The Bank site will re-establish high quality wetlands and associated wildlife habitat where there is currently a mostly barren, drained agricultural field, providing for significant overall functional lift. Wetlands onsite are expected to be rated as Category I wetlands post-construction (20 years following final mitigation site work and plantings, in contrast to the majority of onsite wetlands which are currently considered Category IV wetlands. The overall functional lift (an increase of 7 to 8 wetland rating points) provided by the post-construction wetlands is reflected in the change (lift) in wetland rating score from the baseline conditions of the four existing Category III, and fourteen Category IV wetlands with the post-construction wetlands scoring 23 points (Category I wetland), and the existing wetlands scoring 15 or 16 total points (Category IV or Category III wetland).

The Bank site location within the landscape and overall design will provide a significant ecological benefit not only to the immediate, surrounding area, but throughout a large portion of the watershed. The post-construction Bank site will consist of a forested, scrub-shrub, and emergent depressional flow-through wetland system that contain the headwaters of a perennial stream. As a whole, the Bank site will provide variety of water regimes, vegetation interspersion, and habitat features which will provide diverse habitat opportunity for wildlife. The re-established wetlands will also increase flood storage, improve water quality, help prevent downstream erosion, recharge groundwater to supplement low summer flows and keep summer water temperatures cooler, similar to pre-agricultural conditions.

Wetland Functions not Mitigated at Mitigation Bank

The Bank site is designed to have an overall functional lift in all its baseline water quality, hydrology, and habitat functions over time raising them from their existing low moderate to high functions. Stormwater improvement functions are not provided by the Bank; however, the development will direct stormwater to an underground detention facility where it will be treated before it is directed into the City municipal system. Terrace Mitigation Bank will adequately mitigate for all other wetland and buffer functions impacted by the proposed project.

Proposed Mitigation Credits

The table below is from the Mitigation Banking Instrument (MBI) for the Terrace Mitigation Bank (ELS 2017), and it lists the recommended credit ratios for purchasing credits based on the impacted wetland category or buffer.

Table 4. Credits Recommended for Wetland and Buffer Impacts at Terrace Mitigation Bank.

Resource Impact	Bank Credits : Impact Area
Category I Wetland	Case-by-Case
Category II Wetland	1.2:1
Category III Wetland	1:1
Category IV Wetland	0.85:1
Critical Area Buffer	Case-by-Case

Direct impacts result in immediate changes of hydrological characteristics of a wetland, loss of habitat, loss of flood storage, and loss of nutrient removal or retention and shall be mitigated by purchasing credits at the ratios listed in Table 4 above. Wetland buffer impacts will be compensated by multiplying the credits necessary for direct wetland impacts in the table by 0.5 (50 percent of the direct wetland ratio). The 0.50 (50 percent) multiplier is based on the rationale that wetland buffer impacts can be adequately compensated for by using 50 percent of the Bank's required ratio for direct wetland impacts. Buffer impacts adversely affect the ability of the wetland to provide functions and values over time, which the wetland provided prior to disturbance. Examples are changes in drainage characteristics, changes in water levels, and changes in wetland characteristics. Mitigating at 50 percent of the Bank's required ratio for direct wetland impacts is therefore reasonable and ecologically sound.

Bank credits will be purchased from Terrace at the ratio of 1:1 designated for impacts to Category III wetlands. Wetland buffer impacts will be calculated by applying a 0.50 multiplier to the corresponding ratio for wetland category. Table 5 below details the mitigation ratios used to calculate the total number of Bank credits needed to compensate for the project impacts. A total of 0.08 credits will be purchased to compensate for 0.16 acres of wetland buffer impact.

Table 5. Mitigation Bank Credits Proposed for Project Impacts.

Wetland	Wetland Category	Impact Type	Impact Amount	Mitigation Ratio	Multiplier	Proposed Credits
A	III	Buffer	0.16 acres	1:1	0.5	0.08
					Total Credits to be Purchased:	**0.08**

Credit Purchase or Transfer Timing

Following permit issuance, PAK USA Camas, LLC, as the applicant, will enter into a Buy/Sell Agreement with Terrace Mitigation Bank, LLC for purchase of mitigation credits (in the quantity specified in Table 5) that would appropriately mitigate for the proposed project impacts. The actual purchase of credits will occur upon permit issuance. Prior to impacting project wetlands, the applicant will submit proof of transfer of mitigation credits to project managers for both Ecology and the Corps. Proof of the mitigation transfer will be provided in the form of a notification letter to the approving agencies. Upon service of this notification, the mitigation requirement to purchase 0.08 mitigation credits will be fully satisfied.

Confirmation of Mitigation Credit Availability

Proof of the current number of available mitigation credits at the Terrace Mitigation Bank site can be confirmed by approving agency(s) through the Interagency Review Team.

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Washington Department of Ecology
Shorelands and Environmental Assistance Program
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Olympia, WA 98504
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Regulatory Branch, Seattle District
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206-764-3708
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Limitations

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

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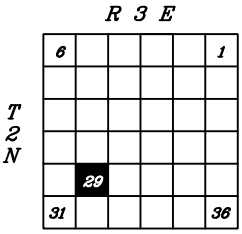
FIGURES

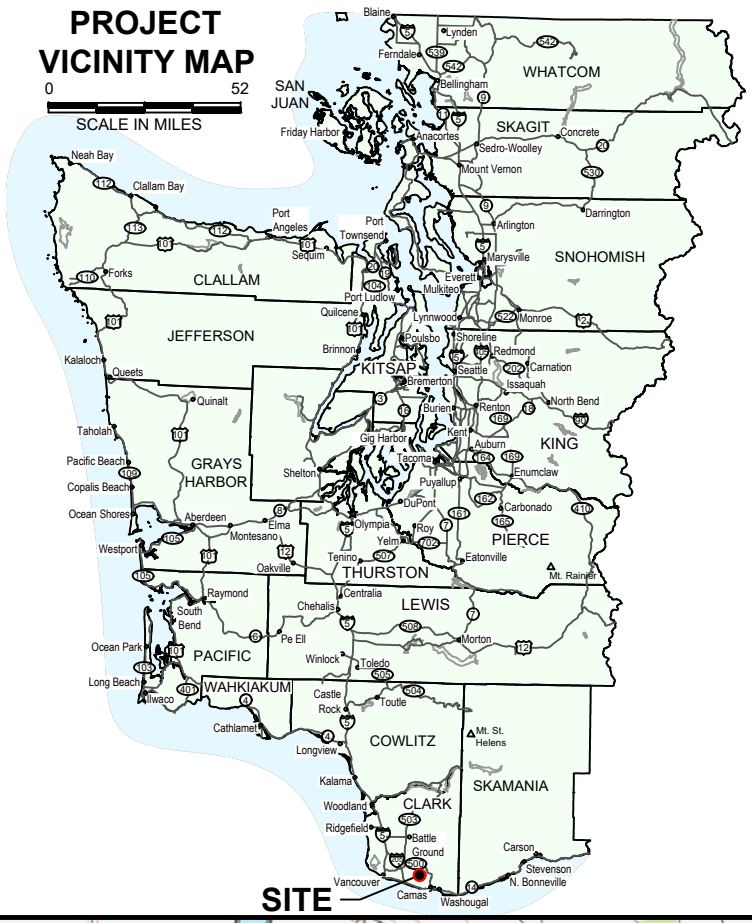
WASHINGTON

45.6321° Latitude
-122.4664° Longitude

LOCATION MAP



PROJECT VICINITY MAP



NOTE:
Quadrangle topographic map from USGS.

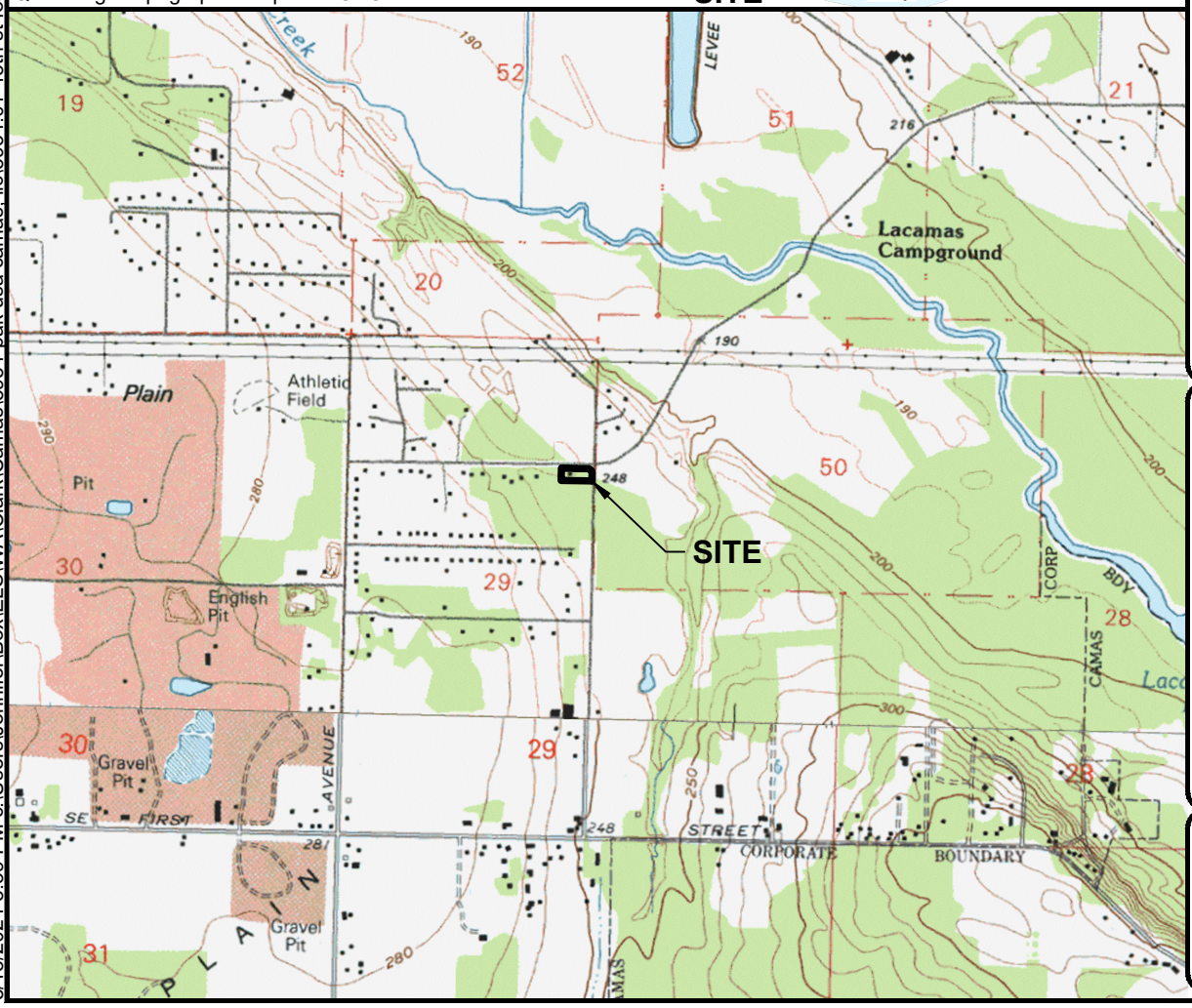


Figure 1
VICINITY MAP
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

DATE: 5/15/24
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com
Ecological Land Services

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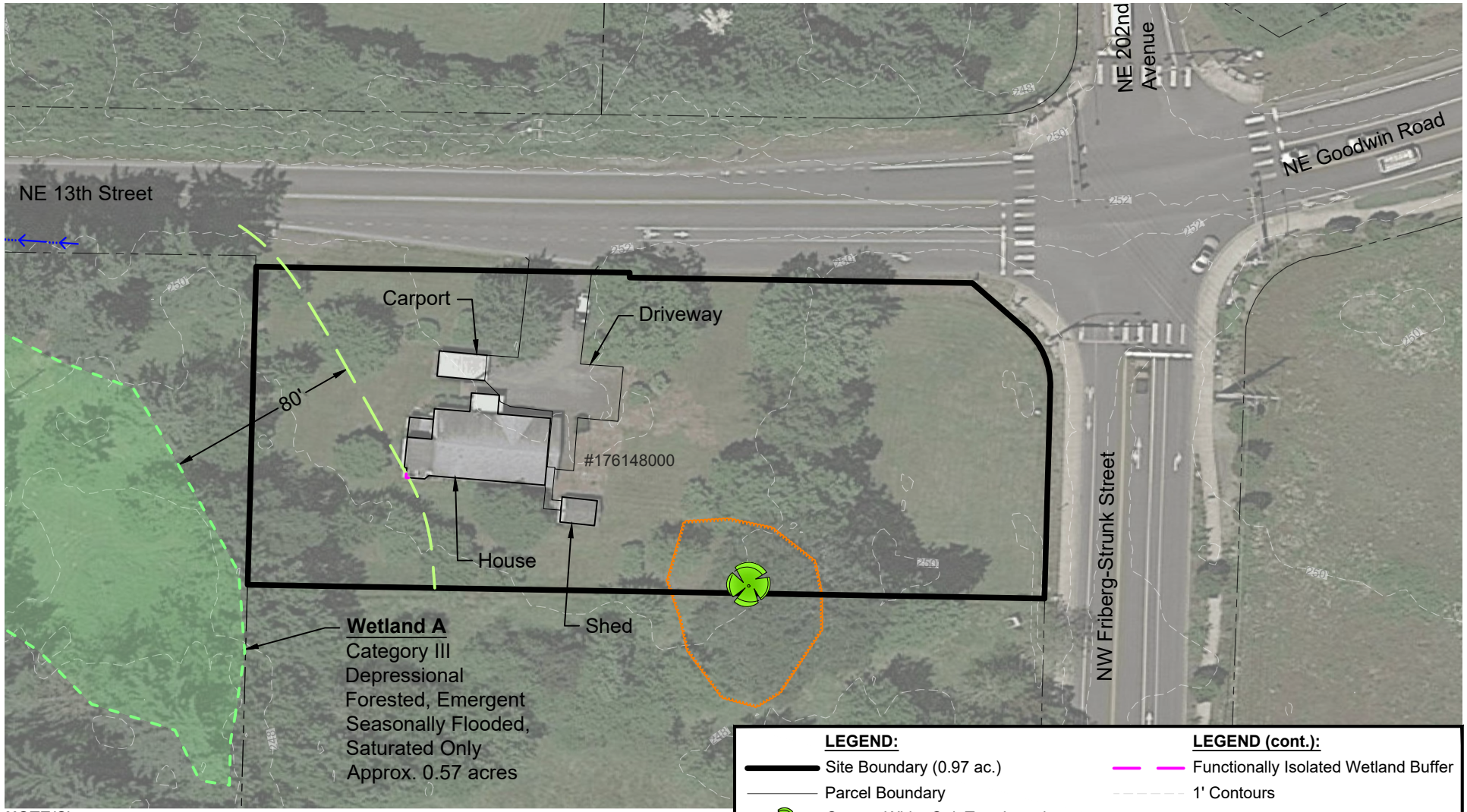

NOTE(S):

1. Aerial from Google Earth™ (6/17/2021).
2. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
3. Parcel data from Clark County GIS Department.
4. Topography from 2013 Clark County Lidar provided by WDNR at https://lidarportal.dnr.wa.gov.

LEGEND:

- Site Boundary (0.97 ac.)
- Parcel Boundary
- Oregon White Oak Tree Location
- Oak Dripline (0.08 ac. total/0.03 ac. onsite)
- Approx. Offsite Wetland Boundary
- Wetland Buffer

LEGEND (cont.):

- Functionally Isolated Wetland Buffer
- 1' Contours

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DATE: 5/15/24
DWN: JKJ
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PRJ. MGR: JB
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PROJECT NO: 3934.01

Figure 2
EXISTING CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

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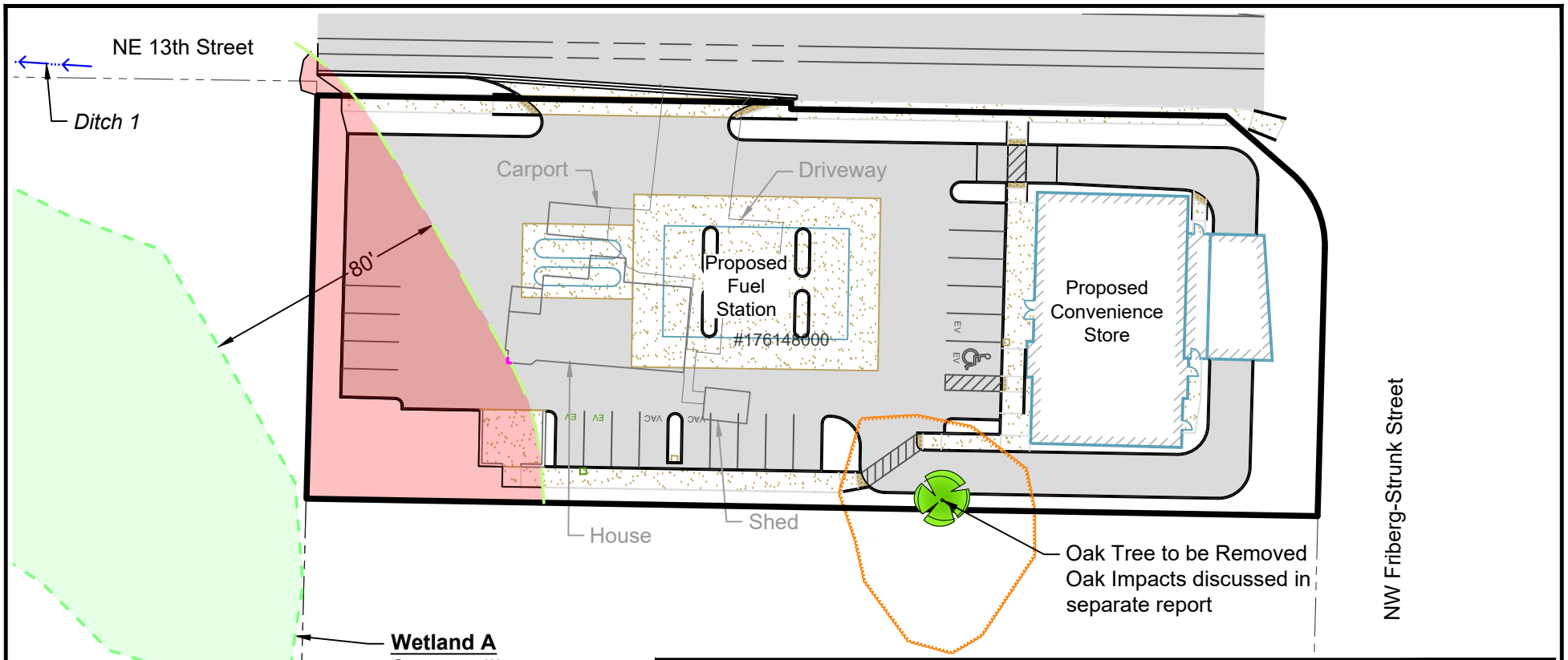

Wetland A
Category III
Depressional
Forested, Emergent
Seasonally Flooded, Saturated Only
Approx. 0.57 acres

NOTE(S):
1. Site boundary, oak tree location, and oak dripline surveyed by PLS Engineering, Inc.
2. Parcel, ditch, and culvert data from Clark County GIS Department.
3. Site plan by PLS Engineering.

LEGEND:
- Site Boundary (0.97 ac.)
- Parcel Boundary
- Approx. Offsite Wetland Boundary
- Wetland Buffer
- Functionally Isolated Wetland Buffer
- Oregon White Oak Tree Location
- Oak Dripline (0.08 ac. total/0.03 ac. onsite)
- Ditch with Flow Direction

LEGEND:
- Proposed Asphalt
- Proposed Concrete
- Buffer Impact (6,810 sq. ft./0.16 ac.)

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SCALE IN FEET

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Phone: (360) 578-1371
Fax: (360) 414-9305
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DATE: 5/15/24
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 3
PROPOSED CONDITIONS
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

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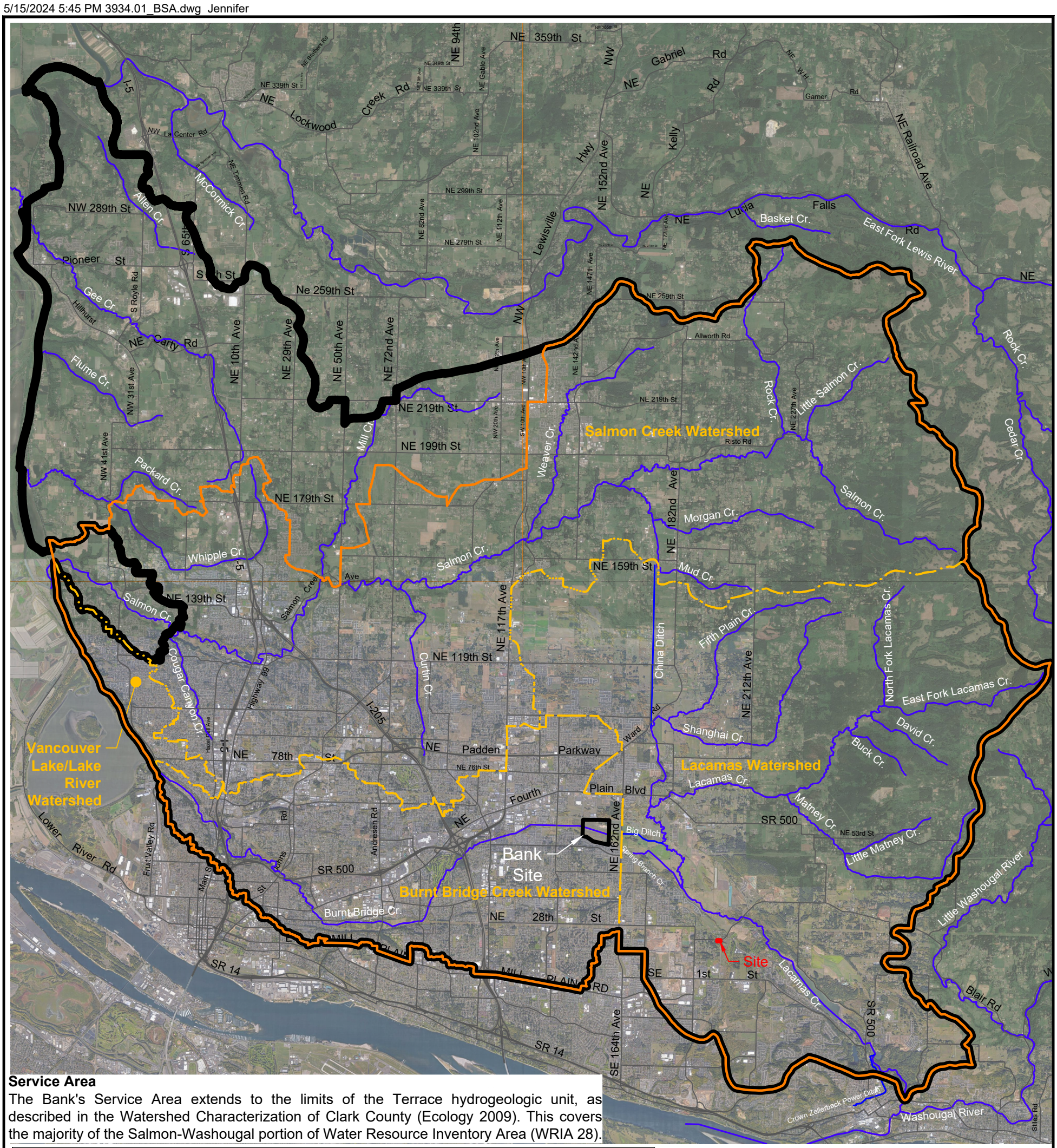


Service Area

The Bank's Service Area extends to the limits of the Terrace hydrogeologic unit, as described in the Watershed Characterization of Clark County (Ecology 2009). This covers the majority of the Salmon-Washougal portion of Water Resource Inventory Area (WRIA 28).

Limits of Terrace Mitigation Bank Service Area	
Northern Limits	Salmon Creek RM 0.60 and 8.96; Upper Whipple Creek, Woodin Creek, and Rock Creek Subwatersheds
Western Limits	Lakeshore and Lower Burnt Bridge Creek Subwatersheds
Southern Limits	Middle Burnt Bridge Creek, Burton Sink, Dwyer Creek, and Lacamas Lake Subwatersheds
Eastern Limits	Matney Creek, Upper Lacamas, and Salmon Creek RM 22.20
Watersheds that are wholly (Lacamas/Burnt Bridge Creek) or partially (Salmon Creek/Vancouver Lake/Lake River) encompassed within the Service Area	**Sub-watersheds in Service Area**
Lacamas	China Ditch, Lower Fifth Plain, Upper Fifth Plain Creek, Shanghai Creek, Upper Lacamas Creek, Lower Lacamas Creek, Matney Creek, Dwyer Creek, and Lacamas Lake
Burnt Bridge Creek	Lower Burnt Bridge Creek, Middle Burnt Bridge Creek, Upper Burnt Bridge Creek, and Burton Sink
Salmon Creek	Salmon Creek RM 0.60, 3.83, 8.96, 14.66, and 22.20; Cougar Creek, Curtin Creek, Woodin Creek, Morgan Creek, Rock Creek, and Upper Whipple Creek
Vancouver Lake/Lake River	Lakeshore

LEGEND:

- Service Area
- Watershed Boundary
- Terrace Hydrogeologic Unit
- Roads
- Streams

N W E S

NOTES: Aerial photo from Google Earth™. Subwatershed boundaries from Clark County GIS Department.

0 2 4
SCALE IN MILES
1 INCH = 2 MILES

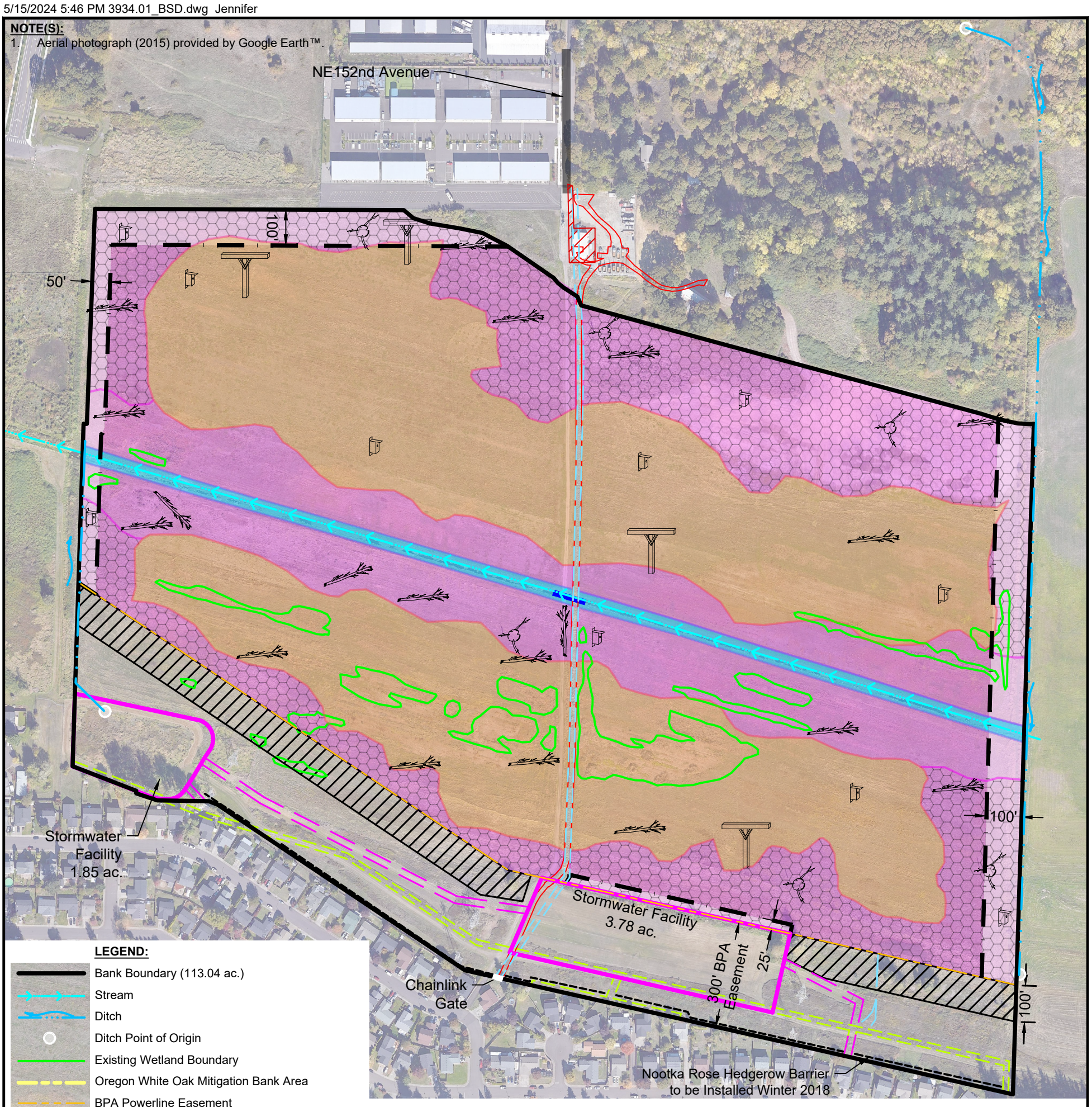
Ecological Land Services
1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com

DATE: 5/15/24
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 4
TERRACE WETLAND MITIGATION BANK SERVICE AREA
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

5/15/2024 5:46 PM 3934.01_BSD.dwg Jennifer

NOTE(S):
1. Aerial photograph (2015) provided by Google Earth™.



LEGEND:

- Bank Boundary (113.04 ac.)
- Stream
- Ditch
- Ditch Point of Origin
- Existing Wetland Boundary
- Oregon White Oak Mitigation Bank Area
- BPA Powerline Easement
- Existing Gravel Road
- Culvert Location
- Mitigation Bank Buffer (7.28 ac.)
- Staging Area
- 20' Storm Sewer Easement
- 20' Sanitary Sewer Easement
- 15' Water Line Easement
- Stormwater Facility
- Area to be Re-graded and Planted Winter 2018 (4.86 ac.)

Proposed Mitigation Habitat

- Palustrine Forested/Scrub-Shrub Mosiac (PFO/PSS) (26.11 ac.)
- Palustrine Forested /Scrub-Shrub Riparian (PFO/PSS) (17.13 ac.)
- Palustrine Emergent (PEM) (45.81 ac.)
- Open Stream Channel Enhancement (2.53 ac.)
- Shrub Buffer Enhancement (SB) (4.85 ac.)
- 8-foot Wide Nootka Rose Hedgerow (NRB) (0.41 ac.) (to be Installed Winter 2018)

Proposed Habitat Features

- Standard Bird Nest Box (10)
- Snags (6)
- Perch Poles (4)
- Horizontal Logs (19)

N W E S

0 300 600
SCALE IN FEET
1" = 300'

Ecological Land Services
1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
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www.eco-land.com

DATE: 5/15/24
DWN: JKJ
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 3934.01

Figure 5
TERRACE WETLAND MITIGATION BANK SITE DESIGN
13th Street Gas Station
PAK USA Camas, LLC
City of Camas, Clark County, Washington
Section 29, Township 2N, Range 3E, W.M.

GLOBAL Transportation Engineering

MEMORANDUM

DATE: May 1, 2024

TO: City of Camas, Anita Ashton

FROM: Dana Beckwith, PE

DANA M. BECKWITH
STATE OF WASHINGTON
39179
REGISTERED
PROFESSIONAL ENGINEER
2024.05.[illegible]37-07'00'

SUBJECT: NE 13th Street Gas Station Traffic Analysis Report Review P24-017

This memorandum summarizes the traffic analysis report review for the proposed NE 13th Street Gas Station Development located on the southwest corner of the NE 13th Street and NW Friberg-Strunk Street intersection within the City of Camas, Washington. The traffic analysis report reviewed is dated September 2023.

1. The applicant needs to provide a site circulation plan with an explanation of ingress / egress at the site entrance and the unloading sequence.
    a. Based on the circulation plan provided the entrance of the site will be blocked while the double trailer semi-tanker is positioning itself to unload fuel. Once positioned, the truck impacts smaller unit trucks (SU-30) entering the site. Both issues create the potential for vehicles wanting to access the site to queue onto NE 13th Street.
    b. What is the purpose of using a WB-67 as the design vehicle? An SU-30, WB-40 and a double trailer semi-tanker would be anticipated on site.
    c. As part of the circulation plan, the path of the double trailer semi-tanker will need to use the right turn and through lane to exit. Is there sufficient distance to the NE 13th Street / NW Friberg-Strunk St intersection for the truck to be positioned to turn onto NW Friberg-Strunk Street and not extend into the northbound left turn lane?
2. The access to the site falls below the City's access spacing of 660ft. This creates several safety concerns near the site access and at the NE 13th Street / NW Friberg-Strunk St intersection. Based on review of the traffic study, the following needs to be provided:
    a. The *Summary and Recommendations* section of the report indicates a left turn is not warranted at 35 mph but is marginally warranted at 40 mph. Due to the sub-standard access spacing, an evaluation using the 85th percentile speed present on the roadway needs to be used for turn lane and sight distance evaluations.
    b. Queuing analysis should be provided using Simtraffic or Poison's distributions. This will typically provide a more conservative estimate of average and 85th percentile queues.
    c. Due to school traffic being predominant along study roadways, traffic counts need to be conducted during the school year to capture the heavy vehicle (bus traffic) presence at the intersection and distribution of that traffic. An actual traffic count will better define the local site and peaking characteristics of traffic. The AM peak is of particular concern for school related traffic. Developing school traffic estimates from the *ITE Trip Generation Manual* does not capture those characteristics in this case.
    d. A westbound left turn lane or restriction of the westbound left turn movement into the site from NE 13th Street needs to be provided due to the sub-standard

distance between the site access and the NE 13th Street / NW Friberg-Strunk St intersection.

i. There is a high probability of eastbound traffic obscuring a vehicle waiting to turn left into the site from motorists turning left from NW Friberg-Strunk Street.

CHARBONNEAU ENGINEERING LLC

MEMORANDUM

Date: June 12, 2024

To: Travis Johnson, PE
PLS Engineering
604 West Evergreen Blvd
Vancouver WA 98660

From: Frank Charbonneau, PE, PTOE

Subject: Response to City Traffic Comments FL2442
NE 13th Street Site Plan Development (Gas Station)
Camas

The City of Camas recently furnished a review of the Charbonneau Engineering traffic study for the NE 13th Street Site Plan (gas station) in Camas. The review memo dated 5/1/24 was prepared by Global Engineering (Dana Beckwith, PE) and listed several issues related to the traffic analysis and site operations.

The proposed gas station is not unique in terms of location and how it will operate. The site is situated at an intersection corner of two moderately busy streets experiencing less than 1,170 total entering vehicles in each of the peak hours. Most often fueling station ownerships prefer an intersection corner location to take advantage of the exposure and accessibility, and typically experience many years of safe operation.

Only one access (NE 13th Street) is permitted to serve the property as no connection is allowed to NE Friberg-Strunk Street. This in itself is unusual for a commercial property use, however, fortunately any potential traffic impacts will be confined to a single driveway location.

To minimize the impacts associated with fueling trucks, deliveries will avoid the peak traffic periods by restricting arrivals and departures to the hours between 7:00PM to 7:00AM. Additionally, the fueling truck operators will be directed to make right turns from/to NE 13th Street when entering and exiting the site. The truck operators will be experienced professional drivers accustomed to accessing similar types of facilities.

Pertaining to comments about the truck turning movements it is recommend that PLS Engineering prepare an illustration showing the wheel paths for trucks entering, maneuvering on-site, and leaving the property. This will demonstrate what infringement (if any) the vehicles may have on the adjacent lanes on the NE 13th Street frontage.

8516 SW 61st Avenue, Portland, OR 97219 Phone: (971) 322-8003

Frontage improvements on NE 13th Street will include a westbound left turn lane for traffic turning into the site. The Charbonneau Engineering memo dated 4/9/24 supports the City's recommendation to install the turn lane as a safety benefit even though the original traffic report noted that the left turn lane was not warranted.

Another set of AM & PM peak hour traffic counts were recently performed at the intersection of NE 13th Avenue/202nd Avenue/NW Friberg-Strunk Street/Goodwin Road. The counts were recorded on Thursday May 16, 2024 when Union High School was in session. The counts used in the original traffic study were taken on August 1, 2023 when school was on summer break. However, to compensate for this condition the school trips were modeled using trip rates from the ITE Trip Generation manual. Listed below are the volume results, including a comparison of the previous traffic study's modeled volumes and those recorded when school was in session. The volumes represent the total entering vehicles (TEV) at NE 13th St/Friberg-Strunk Street intersection.

Peak Hour Count Summary

Data Collected	NE 13th St/Goodwin Rd and NE 202nd Ave/Friberg-Strunk St.	
	AM Peak TEV[1]	PM Peak TEV[1]
Adjusted August 2023 counts[2]	1,062	1,129
May 2024 counts	1,057	1,136
Percent Difference[3]	-0.47%	+0.62%

[1] Total entering vehicles.

[2] The August 2023 counts were adjusted to include modeled Union High School traffic.

[3] Percent Difference = May 2024 TEV / Adjusted August 2023 counts

During the AM peak hour with school in session the volume recorded in May decreased by five vehicles or -0.47% compared to the modeled data used in the year 2023 traffic analysis. In the PM peak hour with school in session the TEV was seven vehicles higher +0.62% compared to the modeled data. These results confirm that using the modeled school trips in the original traffic analysis was accurate and there is no need to perform additional intersection studies. The year 2023 volumes are represented on Figure 3 in the original traffic report. The May 2024 volumes are documented in the traffic count data attached to this memorandum.

A traffic queuing survey was performed on the NE 13th Street eastbound approach to the signal at Friberg-Strunk Street to assess the vehicle stacking length. The output documents if the eastbound queues are currently extending far enough to interfere or block the future gas station access. The surveys were conducted in the AM & PM peak hours with the queues recorded at two-minute intervals. The data is included in the appendix.

The 40-foot-wide site access will be located at a distance of 202 feet from the signalized intersection's eastbound stop bar. For analysis purposes any eastbound queue extending beyond 180 feet from the stop bar would impact the proposed driveway and block left turn traffic entering and leaving the site. During the two-hour period from 7-9AM there were two instances when traffic extended beyond 180 feet (220 feet & 200 feet). During the two-hour

period from 4-6PM there was one instance when traffic extended beyond 180 feet (230 feet). The low blockage frequency is not considered problematic for traffic to safely enter and exit the site throughout the day. Additionally, when the fueling trucks arrive during the off-peak hours no blockages of the access are anticipated.

Based on the results of the follow-up study it is recommended that the City of Camas support the proposed site plan with one 40-foot-wide access on NE 13th Street.

If you should have any questions, please contact Frank Charbonneau, PE, PTOE at 971.322.8003 or email Frank@CharbonneauEngineer.com.

Attachments

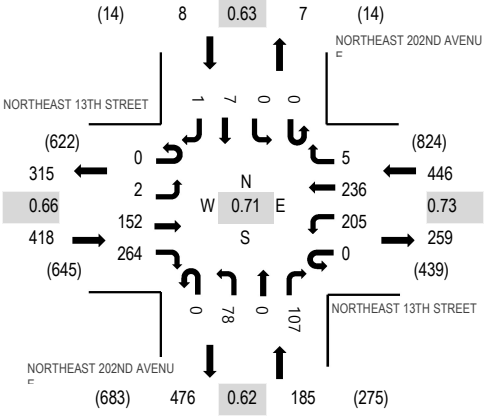
- May 2024 Traffic Count Data
- May 2024 Queuing Survey Results

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

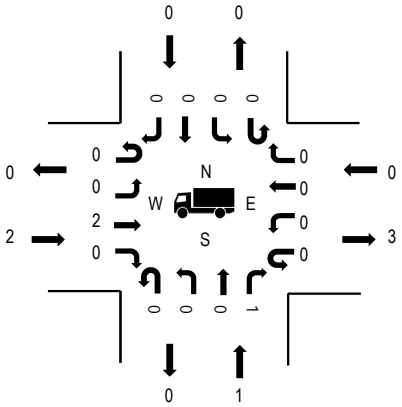
Location: 1 NORTHEAST 202ND AVENUE & NORTHEAST 13TH STREET AM
Date: Thursday, May 16, 2024
Peak Hour: 07:50 AM - 08:50 AM
Peak 15-Minutes: 08:25 AM - 08:40 AM

Peak Hour

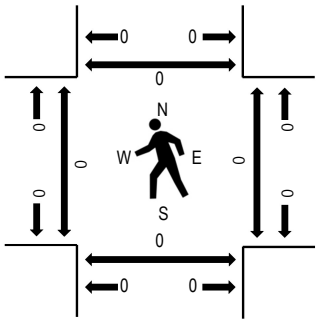
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.5%	0.66
WB	0.0%	0.73
NB	0.5%	0.62
SB	0.0%	0.63
All	0.3%	0.71

Traffic Counts - Motorized Vehicles

Interval Start Time	NORTHEAST 13TH STREET Eastbound				NORTHEAST 13TH STREET Westbound				NORTHEAST 202ND AVENUE Northbound				NORTHEAST 202ND AVENUE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	14	4	0	10	20	0	0	1	0	3	0	0	0	0	52	720
7:05 AM	0	0	13	9	0	9	17	0	0	7	0	4	0	0	0	0	59	729
7:10 AM	0	0	13	4	0	3	17	0	0	4	0	5	0	0	0	0	46	732
7:15 AM	0	0	9	9	0	13	27	0	0	5	0	2	0	0	0	0	65	763
7:20 AM	0	0	12	6	0	5	20	0	0	1	0	5	0	1	0	0	50	765
7:25 AM	0	0	10	18	0	7	17	0	0	5	0	1	0	0	0	1	59	826
7:30 AM	0	1	6	3	0	15	31	0	0	4	1	5	0	0	0	0	66	876
7:35 AM	0	0	13	4	0	5	25	0	0	0	0	2	0	0	0	0	49	950
7:40 AM	0	1	8	8	0	13	30	0	0	4	0	4	0	0	1	0	69	1,023
7:45 AM	0	0	17	10	0	11	24	0	0	7	0	4	0	0	1	0	74	1,050
7:50 AM	0	1	18	9	0	15	16	0	0	5	0	12	0	0	0	0	76	1,057
7:55 AM	0	0	18	8	0	9	12	0	0	1	0	7	0	0	0	0	55	1,044
8:00 AM	0	1	12	8	0	7	23	0	0	3	0	6	0	0	1	0	61	1,038
8:05 AM	0	0	11	13	0	15	16	0	0	3	0	4	0	0	0	0	62	
8:10 AM	0	0	18	13	0	16	17	0	0	3	0	10	0	0	0	0	77	
8:15 AM	0	0	8	15	0	16	16	0	0	8	0	3	0	0	1	0	67	
8:20 AM	0	0	12	34	0	28	22	0	0	7	0	5	0	0	3	0	111	
8:25 AM	0	0	8	38	0	26	22	0	0	8	0	7	0	0	0	0	109	
8:30 AM	0	0	13	50	0	34	21	3	0	5	0	13	0	0	1	0	140	
8:35 AM	0	0	8	44	0	18	21	1	0	9	0	19	0	0	1	1	122	
8:40 AM	0	0	12	24	0	12	18	1	0	16	0	13	0	0	0	0	96	
8:45 AM	0	0	14	8	0	9	32	0	0	10	0	8	0	0	0	0	81	
8:50 AM	0	2	12	8	0	12	19	0	0	3	0	5	0	0	2	0	63	
8:55 AM	0	0	8	5	0	12	16	0	0	2	2	4	0	0	0	0	49	
Count Total	0	6	287	352	0	320	499	5	0	121	3	151	0	1	11	2	1,758	
Peak Hour	0	2	152	264	0	205	236	5	0	78	0	107	0	0	7	1	1,057	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

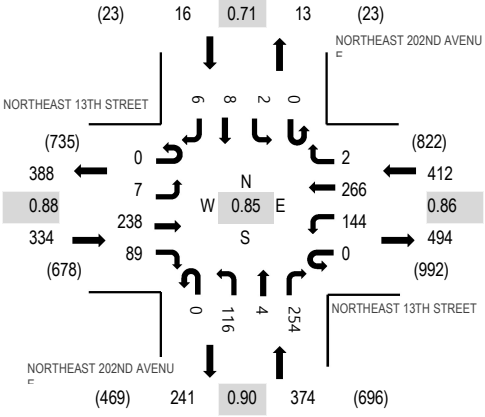
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	1	0	0	0	1	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	1	0	0	0	1	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0	7:20 AM	0	1	0	0	1
7:25 AM	1	0	0	0	1	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	0	0	7:35 AM	1	0	0	0	1	7:35 AM	0	0	0	0	0
7:40 AM	1	0	0	0	1	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0	7:55 AM	2	0	0	0	2	7:55 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	1	0	0	1	8:05 AM	1	0	0	0	1	8:05 AM	0	0	0	0	0
8:10 AM	1	0	0	0	1	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	1	0	0	0	1	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	1	0	0	0	1	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	7	1	0	0	8	Count Total	4	0	0	0	4	Count Total	0	1	0	0	1
Peak Hour	2	1	0	0	3	Peak Hour	3	0	0	0	3	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

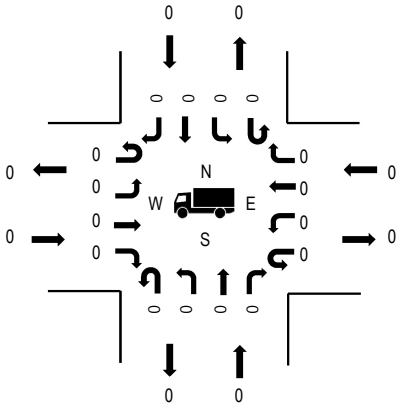
Location: 1 NORTHEAST 202ND AVENUE & NORTHEAST 13TH STREET PM
Date: Thursday, May 16, 2024
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour

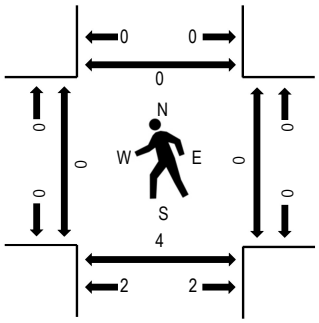
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.88
WB	0.0%	0.86
NB	0.0%	0.90
SB	0.0%	0.71
All	0.0%	0.85

Traffic Counts - Motorized Vehicles

Interval Start Time	NORTHEAST 13TH STREET Eastbound				NORTHEAST 13TH STREET Westbound				NORTHEAST 202ND AVENUE Northbound				NORTHEAST 202ND AVENUE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	24	5	0	7	14	0	0	11	0	20	0	0	0	1	82	1,132
4:05 PM	0	0	16	10	0	14	21	1	0	16	0	23	0	0	0	0	101	1,133
4:10 PM	0	0	37	7	0	5	13	0	0	7	1	15	0	1	0	0	86	1,119
4:15 PM	0	0	8	10	0	27	44	1	0	12	0	23	0	1	0	0	126	1,136
4:20 PM	0	2	21	9	0	11	19	0	0	14	0	24	0	0	0	2	102	1,096
4:25 PM	0	0	31	5	0	15	22	0	0	7	0	25	0	0	2	0	107	1,097
4:30 PM	0	2	22	6	0	6	28	0	0	11	0	19	0	0	0	0	94	1,069
4:35 PM	0	0	17	8	0	14	19	0	0	10	0	13	0	0	1	1	83	1,060
4:40 PM	0	0	13	7	0	9	10	0	0	13	0	26	0	0	0	2	80	1,075
4:45 PM	0	1	15	11	0	14	22	0	0	11	1	20	0	0	0	1	96	1,091
4:50 PM	0	0	25	7	0	11	17	0	0	10	1	18	0	0	0	0	89	1,096
4:55 PM	0	1	20	8	0	7	22	0	0	1	0	24	0	0	3	0	86	1,103
5:00 PM	0	0	18	5	0	12	21	1	0	5	1	19	0	0	1	0	83	1,087
5:05 PM	0	0	20	7	0	10	13	0	0	10	0	25	0	1	1	0	87	
5:10 PM	0	1	28	6	0	8	29	0	0	12	1	18	0	0	0	0	103	
5:15 PM	0	0	19	5	0	17	21	0	0	10	0	13	0	0	1	0	86	
5:20 PM	0	0	22	8	0	16	31	0	0	6	0	20	0	0	0	0	103	
5:25 PM	0	0	21	3	0	9	20	0	0	7	0	19	0	0	0	0	79	
5:30 PM	0	0	20	7	0	12	20	0	0	4	0	22	0	0	0	0	85	
5:35 PM	0	0	23	9	0	20	21	0	0	5	0	20	0	0	0	0	98	
5:40 PM	0	1	27	4	0	16	22	1	0	6	2	17	0	0	0	0	96	
5:45 PM	0	2	20	2	0	14	31	0	0	5	0	25	0	1	0	1	101	
5:50 PM	0	1	19	10	0	11	25	0	0	8	1	21	0	0	0	0	96	
5:55 PM	0	0	17	5	0	11	17	0	0	3	0	15	0	1	0	1	70	
Count Total	0	11	503	164	0	296	522	4	0	204	8	484	0	5	9	9	2,219	
Peak Hour	0	7	238	89	0	144	266	2	0	116	4	254	0	2	8	6	1,136	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	1	0	0	1	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	1	0	1	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	1	0	1	4:30 PM	0	2	0	0	2
4:35 PM	0	0	0	0	0	4:35 PM	0	1	0	0	1	4:35 PM	0	2	0	0	2
4:40 PM	0	0	0	0	0	4:40 PM	0	0	1	0	1	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
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5:45 PM	0	0	0	0	0	5:45 PM	1	0	0	0	1	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	0	0	0	0	0	Count Total	1	2	6	0	9	Count Total	0	4	0	0	4
Peak Hour	0	0	0	0	0	Peak Hour	0	1	2	0	3	Peak Hour	0	4	0	0	4

32041-Camas TMC

1. Northeast 13th Street & Northeast 202nd Avenue

AM Peak Hour: 7:50-8:50 AM PM Peak Hour: 4:15-5:15 PM

EB Movement

TIME	QUEUE BY FEET	ACCESS BLOCKED?
7:00 AM	20	
7:02 AM	90	
7:04 AM	0	
7:06 AM	90	
7:08 AM	90	
7:10 AM	90	
7:12 AM	0	
7:14 AM	125	
7:16 AM	75	
7:18 AM	20	
7:20 AM	0	
7:22 AM	40	
7:24 AM	0	
7:26 AM	20	
7:28 AM	90	
7:30 AM	0	
7:32 AM	40	
7:34 AM	20	
7:36 AM	0	
7:38 AM	0	
7:40 AM	165	
7:42 AM	20	
7:44 AM	65	
7:46 AM	90	
7:48 AM	40	
7:50 AM	30	
7:52 AM	40	
7:54 AM	90	
7:56 AM	150	
7:58 AM	20	
8:00 AM	20	
8:02 AM	25	
8:04 AM	40	
8:06 AM	20	
8:08 AM	30	
8:10 AM	45	
8:12 AM	90	
8:14 AM	90	
8:16 AM	65	
8:18 AM	95	

Charbonneau Engineering LLC

PROJECT: #23-24 13th Street Gas Station DATE: 05.28.24

32041-Camas TMC

1. Northeast 13th Street & Northeast 202nd Avenue

AM Peak Hour: 7:50-8:50 AM PM Peak Hour: 4:15-5:15 PM

EB Movement

TIME	QUEUE BY FEET	ACCESS BLOCKED?
8:20 AM	220	YES
8:22 AM	175	
8:24 AM	35	
8:26 AM	150	
8:28 AM	20	
8:30 AM	175	
8:32 AM	200	YES
8:34 AM	40	
8:36 AM	20	
8:38 AM	65	
8:40 AM	90	
8:42 AM	90	
8:44 AM	70	
8:46 AM	95	
8:48 AM	100	
8:50 AM	130	
8:52 AM	90	
8:54 AM	50	
8:56 AM	40	
8:58 AM	20	
4:00 PM	95	
4:02 PM	45	
4:04 PM	20	
4:06 PM	20	
4:08 PM	130	
4:10 PM	160	
4:12 PM	75	
4:14 PM	80	
4:16 PM	65	
4:18 PM	40	
4:20 PM	100	
4:22 PM	90	
4:24 PM	230	YES
4:26 PM	85	
4:28 PM	175	
4:30 PM	110	
4:32 PM	175	
4:34 PM	30	
4:36 PM	95	
4:38 PM	80	

Charbonneau Engineering LLC

PROJECT: #23-24 13th Street Gas Station DATE: 05.28.24

32041-Camas TMC

1. Northeast 13th Street & Northeast 202nd Avenue

AM Peak Hour: 7:50-8:50 AM PM Peak Hour: 4:15-5:15 PM

EB Movement

TIME	QUEUE BY FEET	ACCESS BLOCKED?
4:40 PM	40	
4:42 PM	105	
4:44 PM	20	
4:46 PM	80	
4:48 PM	50	
4:50 PM	65	
4:52 PM	20	
4:54 PM	45	
4:56 PM	60	
4:58 PM	60	
5:00 PM	20	
5:02 PM	140	
5:04 PM	20	
5:06 PM	95	
5:08 PM	90	
5:10 PM	180	YES
5:12 PM	40	
5:14 PM	130	
5:16 PM	110	
5:18 PM	40	
5:20 PM	85	
5:22 PM	90	
5:24 PM	95	
5:26 PM	20	
5:28 PM	110	
5:30 PM	35	
5:32 PM	90	
5:34 PM	110	
5:36 PM	160	
5:38 PM	90	
5:40 PM	90	
5:42 PM	90	
5:44 PM	90	
5:46 PM	130	
5:48 PM	40	
5:50 PM	40	
5:52 PM	20	
5:54 PM	40	
5:56 PM	20	
5:58 PM	90	

Charbonneau Engineering LLC

PROJECT: #23-24 13th Street Gas Station DATE: 05.28.24

CHARBONNEAU ENGINEERING LLC

MEMORANDUM

Date: April 9, 2024

To: Travis Johnson, PE
PLS Engineering
604 West Evergreen Blvd
Vancouver WA 98660

From: Frank Charbonneau, PE, PTOE

Subject: Westbound Left Turn Lane FL2429
NE 13th Street Site Plan Development (Gas Station)
Camas

In September 2023 Charbonneau Engineering completed a traffic study for the NE 13th Street Site Plan project for a new gas station in Camas. The site location at address #20101 NE 13th Street will have a single access on NE 13th Street.

Originally the analysis found that a separate westbound left turn lane was not warranted for inbound traffic and no recommendation to build the turn lane was made in the traffic report.

At the current time the City is now requiring that a westbound left turn lane be constructed in conjunction with the proposed development. Although initially not warranted the turn lane will provide a safety benefit for vehicles turning into the gas station and westbound flow on NE 13th Street.

Therefore we support the City's recommendation to include the construction of a westbound left turn lane at the site access with NE 13th Street as shown on the attached PLS Engineering site plan.

If you should have any questions, please contact Frank Charbonneau, PE, PTOE at 971.322.8003 or email Frank@CharbonneauEngineer.com.

8516 SW 61st Avenue, Portland, OR 97219 Phone: (971) 322-8003

13th Street Site Plan

Located in the NW ¼ of Section 29, T2N, R3E, W.M.
City of Camas, Washington

PARCEL STATISTICS		
ZONE: Business Park BP		
Gross Site Area	42,208 SQ FT	0.97 AC
Critical Areas	0 SQ FT	0 AC
	REQUIRED	PROPOSED
Density	N/A	N/A
Maximum Lot Coverage	50%	20%
Setbacks		
North	15'	15'
South	15'	15'
East	15'	15'
West	50'	50'
Maximum Building Height	None	28'
Total Parking Spaces *	20	20
Standard Parking Spaces	70% Min of Total	20
Compact Spaces (C)	30% Max of Total	0
Gas Fill-up Stalls *	1 Per Nozzle (8)	8
ADA Spaces (ADA)	1 Per 25 of Total (1)	1
Spaces with Electric Vehicle Charging Infrastructure (E)	10% Now (2) + 10% Future (2)	2 Now + 2 Future

*Note: The Gas stalls are not actually parking stalls and do not count towards the required ADA and EV calculations.

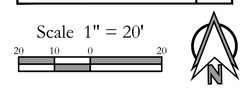
REQUIRED PARKING CALCULATIONS:

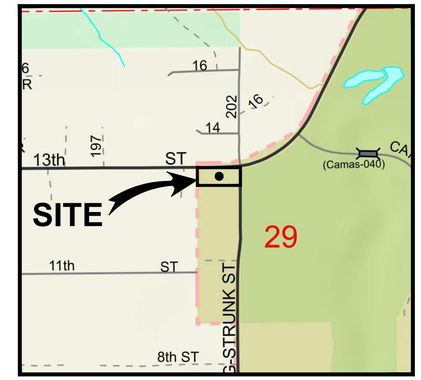
4100 sf c-store @ 1/250 sf	= 17
8 nozzle gas station @ 1/nozzle	= 8
1 stall carwash w/ 2 employees @ 2/stall+1/2 employees	= 3
Total	= 28
Excluding Gas Fill-up Stalls	= 20

Legend

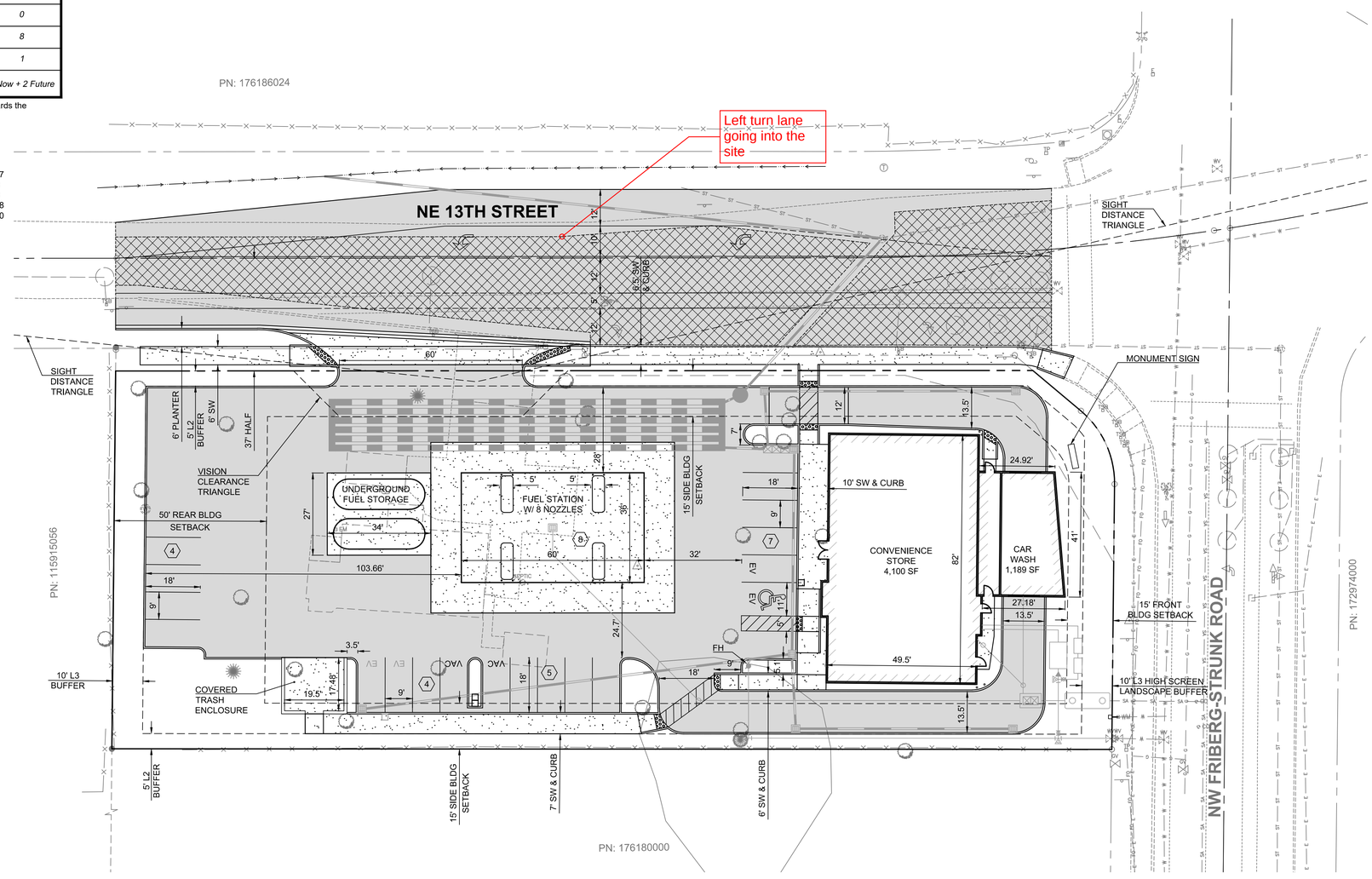
- Proposed Asphalt Concrete
- Proposed Cement Concrete
- Proposed Grind and Overlay

Scale 1" = 20'





VICINITY MAP
NOT TO SCALE



GENERAL NOTES

APPLICANT:
Taz Kahn
3993 NW Currawong Court
Camas, WA 98607
TKahnusa@gmail.com

OWNER:
Pak USA Camas LLC
20107 NE 13th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 176148-000
20101 NE 13TH ST
Camas, WA 98607

SITE STATISTICS:
Existing Site Area: 42,257 SF (0.97 Acre)
ROW Dedication: 1,832 SF (0.04 Acre)
Developed Site: 42,257 SF (0.93 Acre)

PLS ENGINEERING

Preliminary Site Plan For:
13th Street Site Plan
A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6

SCOTT W. GILLILAND — STATE OF WASHINGTON — 42773 — REGISTERED PROFESSIONAL ENGINEER — 8/21/23

Project No. 3632	
SCALE:	H: 1" = 20' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

1070

Ecological Land Services

May 14, 2024

PAK USA Camas, LLC
Attention: Taz Khan
3993 NW Currawong Court
Camas, WA 98607

RE: 13th Street Gas Station Department of Ecology Comment Response (SEPA23-12)

Dear Mr. Khan:

Please find below our responses to comments received from the Washington Department of Ecology (Ecology) in a letter dated March 6, 2024. Comments are stated or paraphrased below in *italics* followed by ELS responses in regular font. This memorandum will address comments by Megan Tait related to Shorelands and Environmental Assistance. The remaining Ecology comments will be addressed by the project engineer.

Ecology Comments

The wetland delineation was conducted in August, typically a dry time of the year for the region. Per the Corps of Engineers WMVC regional supplement to the wetland delineation manual, additional field investigation isnecessary to determine whether a wetland is present. One or more site visits should be scheduled to coincide with the normal wet portion of the growing season, the period of the year when the presence or absence of wetland hydrology indicators is most likely to reflect the true wetland/non-wetland status of the site.

The City of Camas Critical Areas Ordinance states that all wetlands and recommended buffer zones within 300 feet of the project area shall be addressed in the critical area report (16.53.030(B)(2)). Wetlands and buffers on surrounding parcels have not been evaluated and included in the Critical Areas Report dated October 2, 2023 prepared by Ecological Land Services for this project. There are mapped wetlands and hydric soils on the parcel to the west and south of the project area.

An additional site visit was completed on April 2, 2024 to gather data during the normal wet portion of the growing season. The *Critical Areas Report for 13th Street Gas Station* completed by ELS in October 2023 was revised to include the findings from the April 2024 site visit. The site visit confirmed no wetlands were present onsite; however, one wetland (Wetland A) was observed offsite to the west that was not observed during the August 2023 site visit. Offsite boundaries for Wetland A were estimated by visual observations of changes in vegetation, the presence of surface water, and aerial photos; therefore, Wetland A boundaries are approximate. According to the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Rating System), Wetland A is a Category III wetland scoring 7 points for water quality

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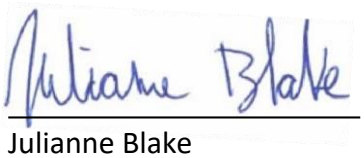
functions, 7 points for hydrologic functions, and 4 points for habitat functions, for a total of 18 points. The designated buffer width for a Category III wetland with a high land use intensity and a habitat score of 4 is 80 feet, as listed in *Camas Municipal Code (CMC) Table 16.53.040-1*. For more information on critical areas onsite and within 300 feet of the project area, please see the *Critical Areas Report for 13th Street Gas Station - Revised* (ELS 2024).

If you have any further questions or need additional information, please contact me by phone at (360) 578-1371 or by email at Julianne@eco-land.com.

Sincerely,



Julianne Blake
Biologist III

Ecological Land Services

May 20, 2024

PAK USA Camas, LLC
Attention: Taz Khan
3993 NW Currawong Court
Camas, WA 98607

RE: 13th Street Gas Station WDFW Comment Response | (SEPA23-12)

Dear Mr. Khan:

Please find below our responses to comments received from the Washington Department of Fish and Wildlife (WDFW) in an email dated February 28, 2024. Comments are stated or paraphrased below in *italics* followed by ELS responses in regular font. This memorandum will address comments by Amaia Smith related to oak impacts and mitigation.

Ecology Comments

WDFW recently published a guidance document, Best management practices for mitigating impacts to Oregon white oak priority habitat*, that describesthe significance of Oregonwhite oaks and identifies best management practices (BMPs) for avoiding, minimizing, and mitigating impacts to this important habitat and is considered best available science. The actions identified in this guidance document can be implemented under the existing critical areas ordinance and is the new standard for evaluating projects that involve Oregon white oak.*

This SEPA notice identifies a priority Oregon white oak on site and states it will be removed for this project. WDFW wants to ensure that the project proponent explored design alternatives that avoid and minimize impacts to the Oregon white oak, as required by CMC 16.51.170 – Mitigation sequencing. If impacts to the Oregon white oak cannot be avoided and is subsequently removed for this project, WDFW recommends updating the mitigation to align with our newly published guidance document. A 6:1 mitigation ratio, as proposed, will result in a net-loss of ecological function due to the life history of Oregon white oaks. Furthermore, we recommend that the proponent explores on-site and off-site options prior to purchasing oak credits from a mitigation bank.

The project application with the City of Camas was deemed Technically Complete on December 19, 2023 and the 2023 ELS reports were completed prior to the release of the updated WDFW guidance. As such, the mitigation plan was designed according to the current guidance at the time of submittal, WDFW's *Management Recommendations for Washington's Priority Habitats, Oregon White Oak Woodlands* (Larsen and Morgan 1998). The project meets the minimum standards for parking and other CMC required improvements and the size and layout of the

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property restrict any onsite oak mitigationpotential. The project also meets mitigationstandards required by CMC and the Terrace Oak Bank's (Bank) Mitigation Banking Instrument (MBI).

The preferred mitigation sequencing of first avoidance, then minimization, and finally compensation for unavoidable impacts was taken into consideration during the project design process. The engineering team tested several layouts to avoid oak impacts to the maximum extent practicable, originally placing the convenience store on the western property line. However, *CMC 18.09.030-Table 1* states that parcels zoned Business Park (BP) must have a 50-foot setback for the rear yard, which placed the convenience store in the center of the site. Additional requirements include a turning radius large enough for fuel truck maneuvering, tank filling, and other deliveries. This layout did not allow access or the required interior circulation routes to accommodate fuel trucks and other large turning radius vehicles. To allow necessary ingress, egress, and circulation, the convenience store was moved to the east. Design review standards require the building be located as close as possible to the roadway and a driveway is required around the outside of the store for a drive-thru car wash. Due to the single oak tree being located in an area of the site needed for the driveway, avoiding Oregon white oak impacts altogether is not feasible.

The oak's functional values were assessed during the August 2023 site visit completed by ELS. The oak canopy is not connected with other oaks in the area and thus is considered an individual tree rather than part of a woodland. Due to the location of the oak within the City boundaries and lack of habitat connectivity, wildlife not adapted to urban conditions are not likely to be present. Therefore, removing the oak would likely result in habitat loss and a food source only for birds and small mammals that are well adapted to urban conditions. The onsite oak does not provide habitat for other priority species that should be replaced onsite. The use of the Bank will ensure that habitat functions common to urban areas canbe fully replaced. Habitat functions will be impacted for species common to urban areas, which can be fully replaced at the Bank. The habitat functions lost from the proposed oak removal correspond directly with the habitat creation purpose, goals, and objectives at the Bank which identifies 13.93 acres of existing Oregon white oak woodland WDFW Priority Habitat that will be restored to pre-agricultural conditions through creation, enhancement, and preservation.

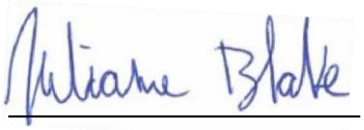
The Corps' 2008 *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule* recommends purchasing mitigation bank credits for ecological considerations (lower risk of failure and lower temporal loss of resources and services) and to avoid the maintenance and contingency issues and outright failures that often accompany permittee-responsible mitigation sites. The lower risk of failure and lower temporal loss of resources and services can also be applied to oak mitigation. According to the WDFW guidance released in January 2024, *Best management practices for mitigating impacts to Oregon white oak priority habitat,* "any plan for compensatory mitigation must address both the physical loss of oak habitat and the temporal loss in ecological function, as many of the critical ecological functions oaks provide are only provided by mature trees, with trees gaining functional capacity as they age. Thus, the loss of functional mature trees can take many decades to replace with young seedlings or saplings." Mitigating onsite or offsite rather than purchasing Bank credits would require the installation of

young seedlings or saplings and lost functions would take decades to replace. Furthermore, there is not adequate space available within the study area to fully compensate for oak habitat losses utilizing onsite mitigation. Use of the Terrace Oak Bank substantially lowers the riskof failure and temporal loss of resource functions and services over newly established, permittee-responsible mitigation sites, and offsite mitigation is anticipated to be more meaningful and beneficial to the watershed's habitat functions by consolidating mitigation into one larger area rather than having smaller isolated mitigation sites. Therefore, purchasing Bank credits will adequately compensate for lost habitat functions.

An additional site visit was completed on April 2, 2024 to gather data during the normal wet portion of the growing season to identify whether wetlands were present in the project vicinity. The *Critical Areas Report for 13th Street Gas Station* completed by ELSin October 2023 was revised to include the findings from the April 2024 site visit. Subsequently, the *Bank Use Plan for 13th Street Gas Station* completed by ELS in October 2023 was also revised to include the updated critical areas information. For more information regarding the onsite oak's functional values and other critical areas in the project vicinity, please see the *Critical Areas Report for 13th Street Gas Station - Revised* (ELS 2024) and the *Oak Bank Use Plan for 13th Street Gas Station – Revised* (ELS 2024).

If you have any further questions or need additional information, please contact me by phone at (360) 578-1371 or by email at Julianne@eco-land.com.

Sincerely,



Julianne Blake
Biologist III

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

Date Published: August 15, 2024

To Whom It May Concern:

A revised SEPA Checklist and supporting documents were received for the proposed project on July 15, 2024. As such, staff is redistributing the SEPA review that was originally published on February 22, 2024. Please find enclosed a Determination of Non-Significance (DNS) for the **13th Street Gas Station (SEPA23-12)** that was issued pursuant to the State Environmental Policy Act (SEPA) Rules, Chapter 197-11, Washington Administrative Code. The enclosed review comments reflect evaluation of the environmental checklist by the lead agency as required by WAC 197-11-330(1)(a)(i).

The following materials were submitted with the application:

- Application Form and Fees
- Applicant's narrative
- Archaeological Predetermination*
- Critical Areas Report
- Geotechnical Study
- Project Plans
- Public Health Review Letter
- SEPA checklist
- Stormwater Drainage Report

The following materials were submitted with the Revised SEPA Checklist:

- Response to Ecology re: Wetlands – Dated May 14, 2024
- Wetland Buffer Bank Use Plan – Dated May 16, 2024
- Response to Ecology re: Oregon white oaks – Dated May 20, 2024
- Revised Oak Mitigation Plan – Dated May 17, 2024
- Traffic Memo Dated April 9, 2024 – Westbound Left Turn Lane
- Traffic Memo Dated June 12,2024 – Response to City Traffic Comments

All application materials are available for review upon request from the Community Development Department. *Archaeological information is exempt from public disclosure, consistent with RCW 42.56.300.

Written comments may be submitted on this determination within fourteen (14) days of its issuance, after which the DNS will be reconsidered in light of the comments received.

Please address all correspondence to:
City of Camas, SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607
communitydevelopment@cityofcamas.us

Distribution:

Applicant
C-Tran
Camas School District
Camas Building Official, Brian Smith
Camas Communications Director, Bryan Rachal
Camas Engineering Department Managers and Staff
Camas Fire Department, Randy Miller
Camas Finance Director, Cathy Huber Nickerson
Camas Community Development Director, Alan Peters
Camas Mayor and City Council Members
Camas Parks and Recreation Interim Director, Bryan Rachal
Camas Planning Manager and Staff
Camas Police Chief, Tina Jones
Camas Public Works Director, Steve Wall
Camas Public Library, Connie Urquhart
Camas-Washougal Post Record
Chinook Indian Nation
Cultural Resource Program, Cowlitz Indian Tribe
Cultural Resource Program, Yakama Indian Nation
Clark County Department of Environmental Services
Clark County Department of Transportation
Clark County Natural Resources Council
Clark Public Utilities
Department of Ecology
Department of Fish and Wildlife, Region 5
Department of Natural Resources, SEPA Center
Southwest Clean Air Agency
US Army Corps of Engineers
Vancouver - Clark Parks & Recreation
Washington Office of Archaeology & Historic Preservation
Washington State Department of Transportation
Washington State Parks and Recreation Commission, Environmental Program
Property Owners within 300 feet *(mailed the SEPA Determination & map)*

Preliminary Plat (SEPA23-12)

N

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SEPA23-12 13th Street Gas Station

APPLICANT: PLS Engineering, Travis Johnson
604 W Evergreen Boulevard
Vancouver, WA 98660

REQUEST: To construct a gas station, car wash, and convenience store on the subject 0.97-acre site currently developed with a single-family residence, in the BP – Business Park Zone.

LOCATION: 20101 NE 13TH STREET, CAMAS, WA 98607
PARCEL NUMBER 176148000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE NW ¼ OF SECTION 29, TOWNSHIP 2 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: **AUGUST 29, 2024, AT 5:00 P.M.**

A revised SEPA Checklist and supporting documents were received for the proposed project on July 15, 2024. As such, staff is redistributing the SEPA review that was originally published on February 22, 2024. As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on August 15, 2024 Legal Publication #928290
Mailed to property owners within 300-feet on August 14, 2024
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Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that, after review of the revised SEPA Checklist and supporting documents, this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **August 15, 2024,** and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **August 29, 2024**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

Responsible Official: Robert Maul (360) 817-1568

Robert Maul, Planning Manager and Responsible Official	**August 15, 2024** **Date of publication**

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Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]

   13th Street Site Plan

2. Name of applicant: [help]

Taz Khan

3. Address and phone number of applicant and contact person: [help]

3993 NW Currawong Court
Camas, WA 98607

4. Date checklist prepared: [help]

August 23, 2023
Revised May 2, 2024

5. Agency requesting checklist: [help]

City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]

Development is expected to start at the time of final construction drawing approval, likely in early 2024. No phasing is proposed.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

No, not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

SEPA Checklist, Archaeological Predetermination, Geotechnical Report, Critical Areas Report, Oak Mitigation Plan and Wetland Buffer Mitigation Plan

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

No, there are no known government approvals pending related to this property.

10. List any government approvals or permits that will be needed for your proposal, if known.

- *Preliminary Type II Site Plan*
- *Public notification and staff report publications*
- *Final engineering plan review and approval*
- *Final Site Plan Approval*
- *SEPA*
- *SWWPPP*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The applicant proposes to construct a 4,100 sf convenience store with gas pumps and a drive through car wash. The site is zoned BP, Business Park, and is 0.97 acres in size.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

The site is located at 20101 NE 13th Street, Camas, WA 98607, in the NW ¼ of Section 29, Township 2 North, Range 3 East of the Willamette Meridian. The site is comprised of tax lot 176148000. See the proposed development plans for a preliminary site plan, grading plan, vicinity map and topographical data.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

5% per Clark County GIS data

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

This site has the following soils onsite per Clark County GIS data:

WrB – Wind River Gravelly Loam, 0-8% slopes
CvA – Cove Silty Loam, 0-3% slopes

It is unknown if these soils are classified as agricultural or if the site contains prime farmland.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate area.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

There will be grading for the construction of drive aisles, the installation of utilities, and the preparation of the site for the future convenience store, car wash and gas pumps. Surplus material may be required to be hauled from the site to an approved dump site or offsite fill may be required. Quantities and source are unknown at this time.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Standard erosion control measures will be followed during grading construction on the site. A final erosion control plan will be reviewed and approved by City of Camas.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 80%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Proposed measures to reduce and control erosion include providing an erosion control plan for review and approval prior to starting construction on the site and following the conditions of the approved grading and erosion control plan during all phases of construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal commercial/retail uses as well as possible vapor from the gas tanks.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are no known off-site sources of emissions or odor that may affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Dust from construction can be mitigated by sprinkling the site with water during construction as needed. Stage 2 vapor recovery systems will be included in the gas storage tanks and

delivery systems.

3. Water [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

There is a wetland to the south of the site that has permits to be filled for the proposed Lacamas Tech Business Park. There is an offsite wetland that has been identified to the west on adjacent property.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

Yes, work will take place within 200' of the offsite wetland to the west. No wetland impacts are proposed however a portion of the wetland buffer will be impacted. Approximately 0.16 acres of wetland buffer will be impacted by a paved parking area.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

No fill or dredge material is proposed to be placed in or removed from the offsite wetland.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

The proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, the site does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No, there will be no discharge of waste material to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No ground water will be withdrawn with this proposal. Stormwater from pollution generating surfaces will be treated prior to being routed to an existing roadside ditch. Runoff around gas pumps will go through an oil/water separator before being discharged to the storm sewer.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if

any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

No waste material is proposed to be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

The main source of runoff is from stormwater. There will be runoff from impervious roof area, drive aisles, parking areas, and landscaped areas. Onsite catch basins will connect to a pipe network that leads to an underground detention facility that will discharge to an existing roadside ditch. Runoff around gas pumps will go through an oil/water separator before being discharged to the storm sewer.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

Not anticipated.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

Use of approved erosion control measures during all phases of development. Runoff around gas pumps will go through an oil/water separator before being discharged to the storm sewer. Wetland buffer impacts are proposed to be mitigated offsite by purchasing 0.08 mitigation credits through the Terrace Mitigation Bank LLC. The Wetland Buffer Bank Use Plan, prepared by Ecological Land Services (ELS) and dated May 16, 2024, provides further details.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

x deciduous tree: alder, **maple**, aspen, **other: Oregon white oak, ash, cottonwood, cherry**
x evergreen tree: **fir**, cedar, pine, other
x shrubs
x grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other

x other types of vegetation: **blackberry**

b. What kind and amount of vegetation will be removed or altered? [help]

Site vegetation will be stripped for site preparation. Trees beyond the property line are proposed to be retained.

c. List threatened and endangered species known to be on or near the site. [help]

There is 1 priority habitat Oregon white oak onsite.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Landscaping will be provided onsite in accordance with City of Camas requirements. One Oregon white oak will be removed and mitigated offsite at the Terrace Mitigation Bank. Approximately 0.238 credits are proposed to be purchased for mitigation. The revised Oak Bank Use Plan, prepared by ELS and dated May 17, 2024, provides further details.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

None known.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:

birds: hawk, heron, eagle, **songbirds, other:** mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Small mammals, such as mice, voles, and rabbits are located on and near the site. This site is also in an area where larger mammals, such as raccoons, opossum, and mammals indigenous to the Clark County area are sometimes located.

b. List any threatened and endangered species known to be on or near the site. [help]

There are no known threatened or endangered species on or near the site.

c. Is the site part of a migration route? If so, explain. help]

This site is part of the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

The site will provide landscaped buffers and street trees.

e. List any invasive animal species known to be on or near the site. [help]

None known

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

The site will be served primarily by electricity.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

The convenience store and car wash will have energy efficient windows and will comply with state building codes which include conservation measures.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

The gas station will store and dispense gasoline and diesel, which are flammable and could spill.

1) Describe any known or possible contamination at the site from present or past uses. [help]

Utilizing the "What's in My Neighborhood" section of DOE's database shows that there are no cleanup sites or known hazards within 0.5 miles of the site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

There are no known existing hazardous chemicals/conditions that may affect the development.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

The site proposes a gas station; gas and diesel will be stored and used on the site after development.

4) Describe special emergency services that might be required. [help]

No special emergency services outside those normally expected in a

commercial/business area are anticipated to be required in association with this proposal.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

Emergency shut-off switches will be located inside of the convenience store and outside at the gas pumps. Underground storage and pipes will be double-containment construction with rupture protection. Underground tanks also include monitoring of the inner walls for leaks. Overfill protection, gravity return of undispensed product, breakaway valves and stage 2 vapor recovery systems are also included in the storage tanks and delivery systems.

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)? [help]

Light traffic noise from surrounding areas/roads along with typical home and business use noises. None of these will affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site. [help]

Short term noises would include construction noises which would occur during approved hours as mandated by City of Camas and Washington State. Long term noises could include slight increase in traffic noise and vehicle noise at the site.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Construction on the site will take place during normal working hours as allowed by the City.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed site has an existing single-family residence and two outbuildings. To the south is a developing business park. West of the site is a single-family residence. To the east of the site across NW Friberg-Strunk Street is land owned by Camas Meadows Golf Club. To the north across NE 13th Street are single family homes.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

It is unknown whether the site has been used as working farmlands or forest lands. There are not currently any agricultural or forest uses associated with the site.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No, the proposal will not be affected by, nor will it affect, any surrounding working farm or forest land business.

c. Describe any structures on the site. [help]

Single family residences and two outbuildings.

d. Will any structures be demolished? If so, what? [help]

All structures will be demolished.

e. What is the current zoning classification of the site? [help]

BP – Business Park

f. What is the current comprehensive plan designation of the site? [help]

IND - Industrial

g. If applicable, what is the current shoreline master program designation of the site? [help]

The site does not lie within the shoreline master program.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

There is one Oregon white oak on site.

i. Approximately how many people would reside or work in the completed project? [help]

It is currently planned that approximately 2-4 people will work at this site at the time of full buildout.

j. Approximately how many people would the completed project displace? [help]

The removal of one single-family residence has the potential to displace up to 3 people.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

There are no measures proposed to avoid or reduce displacement impacts.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

By complying with the zoning designation, the comprehensive plan, and the City of Camas Development Code, the proposal will be compatible with the existing and projected land uses.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

No impacts are expected to agricultural or forest lands, therefore no measures are proposed.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

Not applicable, no homes are proposed.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

One existing residence will be eliminated. The income level housing type is unknown.

c. Proposed measures to reduce or control housing impacts, if any: [help]

The applicant will pay all impact fees associated with the development at the time of building permit.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

All new construction will meet City of Camas building codes for commercial/business development. Exterior building materials will include composite wood siding, fiber cement panels, CMU, metal roofing and accents, and veneer stone. The tallest structure will not exceed 28'.

b. What views in the immediate vicinity would be altered or obstructed? [help]

The site will change from a large-lot single family residence to a commercial/retail development with a convenience store, gas station and drive-through car wash. No views will be obstructed though they will be altered as the site develops.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The site will be landscaped as required by the City of Camas. The main roadway frontages will be landscaped with trees per the City of Camas roadway standards.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

When the site is built out external illumination will be provided for the canopy/fueling area and for perimeter lot lighting and parking areas.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No, light or glare from the finished project will not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are existing off-site sources of light from adjacent homes and roads, but they will not affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Lights and streetlights will be shielded to reduce light and glare.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Camas Meadows Golf Club is adjacent to the east. The Harmony Sports Complex is approximately ½ mile to the west.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

There will be no recreational uses displaced with this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

No impacts are proposed, therefore no measures to reduce or control impacts on recreation are proposed.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

There are no structures recommended for listing in national, state or local preservation registers per the Archaeological Predetermination.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

Archaeological Services, LLC (ASCC) performed an onsite field investigation on August 17, 2023. No mention of landmarks, features or other evidence of Indian use or occupation are mentioned. Several artifacts were found including pink glass fragments suspected to be Depression Glass, a coin bank dated to 1926-1930, and a metal bolt. Based on these items, along with the former structures that appear on site in historic photos, ASCC is recording the debris scatter as a historic-area archaeological site and recommends a Cultural Resource Survey Report prior to any ground disturbing activity.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and

historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The report utilized surface surveys and excavation of test pits, as well as reviewing historical maps and records on file at the Washington State Department of Archaeology and Historic Preservation.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

Based on the findings of the Archaeological Predetermination, a Cultural Resources Study is recommended prior to ground disturbing activity. If during the course of construction any artifacts are discovered, all work will cease, and proper notification shall be given to City of Camas and DAHP.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

NE 13th Street and NW Friberg-Strunk Street abut the site to the north and west. A new driveway off of NE 13th Street will provide access to the site.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

C-tran does not operate in close proximity to the site. The nearest stop is 1.6 miles SE of the site along SE 192nd Avenue at Mill Plain Blvd.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

20 parking spaces, plus 8 gas fill-up spaces, will be provided with this development. The project will eliminate approximately 2-4 parking spaces with the removal of the existing home.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Frontage improvements are proposed to bring NE 13th Street up to half-width roadway standards. NW Friberg-Strunk Street is currently built out to standard.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help].

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would

be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

A Traffic Analysis Report and Traffic Memo-"Response to City Traffic Comments" have been prepared by Charbonneau Engineering, LLC for the site and are included with this application. The Traffic Analysis estimated that 2,281 new trips per day would be generated by the project. It is expected that 60 trips will occur in the AM peak hour (7:00 – 9:00 AM) and 81 trips will occur in the PM peak hour (4:00 – 6:00). Note that fueling tank trucks will be limited to filling tanks onsite during the hours of 7 pm and 7 am to avoid impacting peak hour traffic.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

Not anticipated

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The applicant will pay transportation impact fees. A west bound left turn lane on NE 13th Street is proposed that will improve safety at the site access.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes. The completion of this development will increase the need for public services in the area.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

This project will pay impact fees for traffic at the time of building permit.

16. Utilities [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

- *Electricity: Clark Public Utilities*
- *Water: City of Camas*
- *Telephone: Century Link, Comcast*
- *Sanitary Sewer: City of Camas*
- *Natural Gas: NW Natural*

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

DocuSigned by:

Signature: _____
EF97DED7F6DD4E...

Name of signee Faz Khan

Position and Agency/Organization Managing Member Pak USA Camas, LLC

Date Submitted: 7/9/2024

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Southwest Region 5 • 5525 South 11th St Ridgefield, WA 98642
Telephone: (360) 696-6211 • Fax: (360) 906-6776

August 30, 2024

Attn: Yvette Sennewald
City of Camas – Community Development
616 NE 4th Avenue
Camas, WA 98607

Dear Yvette Sennewald:

Thank you for the opportunity to comment on the **SEPA DNS for the 13th Street Gas Station project (SEPA23-12).** My predecessor, Amaia Smith, contributed comments via email in February of this year; after reviewing the applicant's revised Oak Bank Use Plan (May 2024), I would like to reiterate her message and provide additional details on WDFW's recommendations based on best available science.

The proposed plan indicates that a large Oregon white oak (OWO) tree growing at the southern edge of the property will be removed. This tree is not only large, with a trunk that is 52 inches diameter at breast height (DBH), it also has high ecological value due to two large cavities which can be used by nesting birds and other types of wildlife. WDFW's Priority Habitats and Species (PHS) List (2023) classifies individual OWO trees of this size (in urban areas) as priority habitats. The Camas Municipal Code (CMC) also classifies individual OWO trees, if they are at least 20-in DBH, as habitats of local importance and thereby a type of fish and wildlife conservation area, per CMC 16.61.010(3). The tree proposed to be removed for this project is more than twice this 20-in threshold value, which highlights the quantity of habitat that this tree currently provides.

Considering the distinct importance of OWO trees to local ecosystems, it is important to ascertain whether all avoidance and minimization alternatives have been thoroughly explored for this project, as is required by CMC 16.51.170 – Mitigation sequencing. If all avoidance and minimization alternatives are deemed unachievable, it is critical to evaluate whether proposed mitigation measures will adequately provide for no net loss of ecological function. When mitigation is necessary, WDFW recommends that project proponents explore on-site or, secondarily, off-site mitigation opportunities before resorting to the purchase of mitigation credits.

The applicant's Critical Areas Report (Oct 2023) and revised Oak Bank Use Plan (May 2024) cite an OWO management document which our agency published in 1998. Notably, our agency published updated guidance on this subject in January 2024: *"Management recommendations for*

Washington's priority habitats: Best management practices for mitigating impacts to Oregon white oak priority habitat" (Nolan & Azerrad 2024). WDFW has recommended that the project proponent update their mitigation plan to align with this updated guidance, which is based on best available science.

WDFW's current OWO mitigation guidance (Nolan & Azerrad 2024) indicates that removal of a high-functioning OWO tree with a 52-in DBH trunk and a 0.08-acre canopy should require **both**:

- Physical mitigation in the form of 250 OWO saplings planted
- Temporal mitigation in the form of 0.80 acres of OWO habitat enhanced

By contrast, the proposed mitigation plan provides for only 0.238 acres of oak habitat to be planted/enhanced (via mitigation bank credit). According to the applicant's revised Oak Bank Use Plan, this value is based on a 6:1 mitigation ratio with a 0.5 "risk reduction multiplier", which effectively brings the mitigation ratio to only 3:1. Our agency's best available science indicates that such efforts would fall short of accomplishing no net loss of ecological function.

Finally, WDFW recommends that any trees felled in the course of construction be retained on the property or moved to nearby woodland habitat. Dead snags and logs provide valuable habitat to cavity-nesting birds and mammals, which is why WDFW's PHS List identifies snags and logs as a type of priority habitat. CMC 16.61.010(3) also classifies OWO snags as habitats of local importance and thereby a type of fish and wildlife conservation area.

Please feel free reach out if there are any questions about our updated OWO mitigation guidance document. Additionally, the project proponent can contact me directly with questions about this guidance.

Thank you,

Joy Peplinski
Habitat Biologist
Washington Department of Fish & Wildlife

Outlook

13th St Gas Station Public Comment

From SHANNON CONNELL <gsconnell@comcast.net>
Date Tue 8/27/2024 8:06 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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To Whom it may concern,

A couple of comments regarding the issue regarding the SEPA 23-12 13th St. Gas Station. I find it interesting, per the report, the gas station convience store was originally going to be placed on the west end of the property but due to 50ft buffer requirements it would not fit on the lot. Therefore the site of the location of the convience store was moved to the east end of the lot. The Oak tree was the only thing holding up this location. The reality is this is a poor lot for this type of business. Single access with a needed driveway variance to make it even possible is ridiculous. Observing the the complex method fuel trucks will have to maneuver to fill the tanks is also ridiculous. This will back up traffic on an increasingly busy 2 lane road with no plan to improve it on the county road plan (I assume the county will require significant traffic impact fees in its approval process). 13th is quickly becoming the primary access road for the numerous housing developments to the north of Lacamas Lake. Vehicles traveling west attempting a left turn into the gas station will routinely back up into the intersection making an already dangerous intersection worse. More then likely this will result in a left turn restriction and therefore severely hampering the success of such a business. Since this study was undertaken multiple businesss have entered the area increasing traffic even more (the warehouse, food cart pod, and more business park. The study didn't study traffic when school was in session when traffic is busy for hours a day. This is a poor business plan for this location. An actual business park business is the most appropriate occupier of this lot not a high traffic convience store. There have been to many "adjustments" to make this "work".

Greg & Shannon Connell
20002 NE 14th St. Camas WA

Outlook

Gas station on 13th street

From Cooper Dean <jklantchnek@gmail.com>
Date Mon 9/16/2024 7:23 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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As a local of Camas, DO NOT PUT IN ANOTHER GAS STATION.

We have enough traffic in this city, the air pollution and water runoff are SERIOUS concerns and another gas station will only cause MORE damage. Just look at Lacamas Lake, its pollution is entirely from water runoff and lack of care.

Besides, what about all of those kids who walk to school? Are you just going to let traffic accidents happen?

By the way, who do you people think you are trying to move an entire family just to destroy their home? That is downright evil, no matter the reason. Do you not care about the lives you're playing with?

If you all TRULY care about the citizens who live here, THEN DON'T BUILD THE GAS STATION ON 13TH STREET, OUR ENVIRONMENT CAN'T HANDLE ANY MORE DEVELOPMENT.

Once more, as a local, I can clearly see that this towns development is NOT for the good of the people, it's just so the city can get tourist revenue. It's painfully obvious.

Outlook

Gas Station Development

From Sophia Hackl <sghackl08@gmail.com>
Date Sat 8/24/2024 12:11 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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As someone who grew up in Camas, I'd like to express my dissatisfaction with the ruling that the gas station won't have an impact on the environment. Every single thing human beings do and add to the world changes and impacts the environment. Demolishing homes creates waste to create space, removing vital tree species to clear space for a parking lot. It's pretty clear profit has won out over actually caring about the environment in Camas, but it's easy to line your own pockets when it's not you who has to breathe the air in 20 years. Consider your children, and your children's children. It's not fair you are choosing profit over protecting the local community, but it's certainly not surprising.

Best,
Sophia Hackl

Outlook

Updated/new Traffic study request regarding Proposed 13th Street Gasoline Station Project

From Karin Nosrati, DC <bforback@gmail.com>
Date Wed 8/28/2024 10:57 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Hi,

In light of the increased traffic due to

- newly built housing developments to the east (Green Mountain Golf course area) from Goodwin Rd.
- further housing development in progress to the east from Goodwin
- apartments to the south along Friberg,
- new business center building in progress along Friberg (Nex Generation)
- new high cube warehouse with semi truck traffic along Friberg,
- the food truck location, Oak Tree Station, along Friberg,
- new housing development in progress along Camas Meadows Drive
- traffic from Union High School previously not captured (because the traffic study was conducted in August (!) when high school was not in session)

and the previous traffic study having been conducted during Covid, when traffic was slowed significantly.

We request that an updated traffic study will be conducted.

Traffic at this intersection has grown so significantly that any barriers to smooth flow could result in motor vehicle accidents.

To improve the validity of the new traffic study, it should be conducted with common sense timing, which would capture the traffic from Union High School.
Bell schedule: 8:45 a.m. - 3:15 p.m., traffic naturally occurring prior to start and right after end of school day. Early Release hours should be paid attention to, which are only some Wednesdays: 8:45 a.m. - 12:50 p.m.

The importance of including High School traffic in these projections/studies has been echoed by many residents of Camas, regarding Camas High School, who experience delays in trip times.

Thank you,

Karin Nosrati
360-254-1585

Comments to the SEPA revision of May 2, 2024 for the 13th Street Gasoline Station Project

B. 2.: Air: The revised SEPA does not address the following issues

- Vapor leaks of gasoline during customer filling and tanker truck filling of underground storage tank (UST)
- Exhaust fumes from cars waiting, idling, from trucks idling, even more from diesel powered engines on cars and trucks, exhaust fumes from tanker trucks
- Exhaust fumes from 2,281 of additional trips of cars and trucks to the site
- The City of Camas has permitted a large warehouse with 50+ truck bays, storing highly flammable batteries, which may simultaneously arrive and depart. The air pollution from this amount of exhaust fumes and exacerbated by another project with exhaust and vapor fumes is overwhelming and beyond excessive, given that it is surrounded by residences and a high school.
- Vacuums from car wash operation/customers vacuuming releasing particles.

3.: Water: a. Surface water

1) The revised SEPA does NOT acknowledge that there are 4 bodies of surface water

· Neighbor to the west at 20005 NE 13th Street has standing water most of the year (more about this later), 17' from the property line to the proposed development

· Neighbor to the north at 20107 NE 14th Street has a storm water pond that contains water most of the year (ours)

* Neighbor, also to the north at 20009 NE 14th Street has a large green belt with wetland protection

· Commercially zoned parcel to the south at 7163 NW FRIBERG-STRUNK ST has a wetland immediately adjacent to the parcel, belongs to the same developer (only this one is mentioned in the revised SEPA)

2) Work would need to be performed within 200 feet of the surface water pond to the north, which drains toward Lacamas Creek

· See wetlands map

· Camas Municipal Code 16.55.080 F. prohibits Fuel and/or gas stations

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

- Surface spills during the rainy season may be carried away to the street and from there to the storm water pond and Lacamas Creek/Lacamas Lake below
- The car wash suds and grime-laden waste water (Hydrofluoric acid, waxes/petroleum products) will supposedly be treated by the "waste water treatment". However,

afterwards it will be discharged to the ditch which will drain toward Lacamas Creek/Lacamas Lake

- What is the reliability of these waste water treatment systems, their capacity, inspection frequency, and ability to dissolve petroleum products and car wash chemicals?
- These waste waters may also discharge to the property to the west (that has wetlands/standing water) which may even seep to the aquifer below.
- Researchers at John Hopkins University have found that spillage of fuel releases an average of 40 gallons of gasoline annually at the pumps of a typical gas station. Furthermore they found that spilled gasoline can migrate through the concrete pads.

c. Water Runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

- Yes, this water will flow into other waters.
- When there is snow and ice melt it will cross the road and run toward the property at 20107 NE 14th Street and others.
- Surface spills during the rainy season will mix with storm water which would then be discharged into the nearby ditch which leads to Lacamas Creek/Lacamas Lake, toward the west and its wetland/standing water, the aquifer below.
- With 80% impervious surfaces, as proposed for the development and the types of sudden excessive rainfall we frequently experience, extremely harmful chemicals will be discharged from the parcel to neighboring residents. Onsite catch basins are designed to capture average rainfall, but will fail during sudden bursts of rain which will result in flooding, to the detriment of adjacent parcels and the stormwater pond across 13th Street.
- A geohydrolic study is needed

2) Could waste materials enter ground or surface waters? If so, generally describe.

The revised SEPA acknowledges that waste materials could enter ground or surface waters. They do not have a proposal for a remedy should this problem occur.

This is not an acceptable risk to have petroleum and other chemicals which are toxic to human health enter the area where adjacent neighbors get their drinking water through wells from an aquifer below.
Periodic testing of wells along 13th Street and special insurance coverage for cleanup of future problems of contaminated wells and drinking water and health-related issues need to be written into the design plan. The stormwater pond across the street should be tested periodically and a potential cleanup plan/funding needs to be put into place now. It should

not be the taxpayer's responsibility or the EPA to pay to clean the problems caused by gasoline contamination from a business.

3) The revised SEPA does not address the fact that the prior developments of Nex Generation have already affected the drainage pattern of the property at 20005 NE 13th Street, as we described in our previous comments.

There is a strong probability that this development would further aggravate a situation caused by the current development to the south (Nex Generation) of the projected project. It states that 80% of its surfaces are impervious. Water may continue to seep westward.

(Please see our previous submission below:

- The property owner at 20005 NE 13th Street experienced drainage problems and flooding onto this property, when the parcel of the current Lacamas Tech Center was initially leveled, a trench was dug in the western perimeter and wetlands were filled in. (To our knowledge the filling of the wetlands at that time was not properly managed by the City of Camas. The property owner complained and wrote to the City, with no avail.) However, water will continue to find its way and it has: In this case, consequential to activities on the neighboring commercial property it has created or enlarged a wetland at the property at 20005 NE 13th Street that is not yet on the original maps. This property is IMMEDIATELY adjacent to the proposed gas station, the new wetland is 17' from the east boundary of the proposed gas station and would very likely receive run-off.
- The current project would once again affect the drainage pattern to this property.

7. Environmental

4) **Describe special emergency services that might be required.**

- Added new storage of highly flammable batteries in a warehouse battery storage facility across the street from a gasoline fuel station is a HIGH RISK PROJECT, that the City of Camas may not be equipped to deal with in the case of an emergency. These adjacent uses are not compatible.
  - Police activity to deal with shoplifting, break-ins and robberies
  - Fire truck activity for fuel fires
  - Police activity to address unhoused people loitering and camping due to access to bathrooms and trash receptacles
  - Spill clean-up cannot be performed with 2 or 3 employees and a 4,000 sq. ft. convenience store. The employees will be pre-occupied tending to customers and

preventing shoplifting to care about performing a spill clean-up/over flow that is also dangerous to their health.

- Too few employees to monitor for spills/environmental hazards
- Spills caused by customers driving away with the nozzle still attached causing a large spill, which will need more manpower than 2 or 3 employees tending to other duties. (Costco has a dedicated employee tending their gas station [which is literally within walking distance])

b. Noise

1) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site)?

The revised SEPA fails to acknowledge the increase in noise pollution.

- In the section Transportation f) it states that fueling tank trucks will be onsite during hours of 7 pm to 7 am, resulting in an unacceptable noise burden to residences during the night.

Please note the following real scenarios that will occur daily, hourly:

- car wash: swooshing, blowing, loud noises
- customers: music from cars when doors are opened, and/or windows rolled down
- idling cars
- motor cycle and diesel truck engine noises
- starting of motor vehicles and motorcycles
- braking noise from motor vehicles
- horns if there is congestion, which is likely given how the entry/exit is designed
- tanker truck delivery process
- customers' loud voices
- this violates Section 9.32.050 Public disturbance noises. of the Camas Municipal Code,

- 4. The creation of frequent, repetitive or continuous sounds in connection with the starting, operation, repair, rebuilding or testing of any motor vehicle, motorcycle, off-road vehicle, or internal combustion engine so as to unreasonably disturb or interfere with the peace, comfort and repose of owners or possessors of neighboring or nearby real property, provided, however, that this subsection shall not apply to the operation of lawn mowers, garden tools, chain saws or other power equipment used for building repair or grounds maintenance between the hours of 7 a.m. and 10 p.m.

  2.The making of any loud or raucous sound within one thousand feet of any school, hospital, sanitarium, nursing or convalescent facility, which unreasonably interferes with the use of such facility, or with the peace, comfort or repose of persons therein.
  - Union High School is 1,839 feet from the proposed property
  - A chiropractic office is within 70 feet of the proposed property

Proposed measures to reduce or control noise impacts, if any:

- There are companies which prepare noise level reports. This report should be generated for a project with the equivalent scope.

8. Land and shoreline use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The revised SEPA fails to address how the proposal will affect current land uses.

It does not address how the developer will set aside funding for the owners of parcels within ¼ mile to pay for additional appraisals – see below.

The revised SEPA does not address the City of Camas's own Neighborhood Preservation Standards.

- Surrounded by quiet residential properties
- It will disturb and interfere with the peace, comfort and repose of owners or possessors of neighboring and nearby real property
- The externalities from this project will destabilize property values of all neighbors (more than 27 homes) which is a violation of Camas City code:
- Section 18.01.020 of the Camas Municipal code states

A.The purposes of this title are: to implement the comprehensive plan for the city; to encourage the most appropriate use of land; to conserve and stabilize the value of property; to aid in rendering of fire and police protection; to provide adequate open space for light and air; to lessen the congestion on streets; to give an orderly growth to the city; to prevent undue concentration of population; to improve the city's appearance; to facilitate adequate provisions for community utilities and facilities such as water, sewerage, and electrical distribution system, transportation, schools, parks, and other public requirements; and in general to promote public health, safety and general welfare.

B.Since the public health, safety and general welfare is superior to the interests and pecuniary gains of the individual, this title may limit the use of property and prevent its most profitable gain. If some reasonable use of property is allowed by this title and the effect is not confiscatory, the city is exercising a proper use of police power. (Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

- This next section shows how the land use of a gas station, car wash and convenience store next to residential properties violates the City of Camas' Neighborhood Preservation Ordinance:

  - **8.06.010 - General provisions.** This chapter shall be known as the "neighborhood preservation ordinance" of the city, may be cited as such, and will be referred to hereinafter as "this chapter." (Ord. 2193 § 1 (part), 1999)

8.06.020 - Purpose and scope.

A. The purpose of this chapter is to promote the health, safety and welfare of the citizens of Camas, Washington, and to protect neighborhoods against hazards, blighting, and deteriorating influences or conditions that have a negative impact on families; encourage social disorder and crime; and decrease area property values, by establishing minimum standards for the maintenance of all residential and nonresidential buildings and structures, and vacant and improved land.

B. This chapter shall apply to all buildings, structures and lands within the city regardless of the use, the date of construction, improvement or alteration.

C. This chapter shall be fairly, sensibly and reasonably applied to promote the maintenance of all existing buildings and land in the city. The intent is to ensure that individuals and families do not suffer undue hardship.

- In this section is also a definition of Public nuisance. Near residential land use, a gas station, car wash and convenience store fits the description of the a public nuisance. Please see below, as each item individually qualifies as a definition of a public nuisance, because they are separated by the word "or":

- "Public nuisance" <u>means</u> a thing, act, omission to act, occupation, or use of property which annoys, injures or endangers the safety, health, comfort, or repose of the public, offends public decency<u>, is offensive to the senses</u>, lawfully interferes with, obstructs, or renders dangerous any portion of the city, or in any way renders other persons insecure in life or use of property, or obstructs the free use of property so as to essentially interfere with the comfort and enjoyment of life and property.

- The "senses" above are sense of smell (vapors and diesel and gasoline exhaust fumes), soundnoise (engines starting, vacuums from car wash, car wash water spraying, spinning brushes, etc.), sight (lights and lighting and lack of dark sky after dark)

- The proposed Camas development will cause undue burden on the adjacent neighborhoods and the City will experience a strain to their 911 call system.

- **Per Camas Municipal code 9.20.020 - Public consumption.** Except as permitted by RCW

Chapter 66, no person shall open the package containing liquor or consume liquor in a public place within the limits of the city.

- This convenience store will make our neighborhoods and driveways targets for local loitering and consumption of items purchased. Trash is likely to be tossed into our neighborhood lawns, streets and Clark County public spaces.

  The proposed development will create additional cost for adjacent well-owning properties within ¼ mile of the gas station, when they try to sell their property:

- The FHA Single Family Housing Policy Handbook for Appraiser and Property Requirements for Title II Forward and Reverse Mortgages states …that properties within one quarter mile of a gas station will need to conduct an independent inspection of their wells ('for the appraisal').
- Has the developer made provisions to set aside funding for these homeowners within these distances?
- This requirement is an additional burden and expense to all the homes on NE 13th Street and in Morning Meadows and Katie's Hill neighborhoods that are on drinking water wells.
- https://www.hud.gov/sites/documents/SFH_POLI_APPR_PROP.PDF
- https://www.hud.gov/sites/dfiles/OCHCO/documents/4000.1hsgh-080923.pdf page 604

L) **Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.**

- This project is incompatible in this location which consists of one-acre residences. It does not take into account that it surrounded by quiet residences and that this project would vault its collective problems onto them. This would be a complete "lose" situation for the pre-existing homes, and a "win" for the gasoline station. The project would gain from the appearance of the residential community and the residences would suffer from all the reasons no one wants to live near a gas station.

10. Aesthetics

a. What views in the immediate vicinity would be altered or obstructed?

- A 28' structure at a corner of an intersection would reduce sight distances. We already have everyone comment about the Great Wall of Camas when referring to how the City-approved set-back from the warehouse in the southeast corner of the intersection is too narrow, representing an eye-sore.
- Customers of convenience stores and gas stations will litter and leave trash on the adjacent side-walks, properties, undeveloped ditches and NE 13th Street and Friberg-Strunk Road.
- Will the City of Camas clean this, or because it is adjacent to Clark County, it will only be cleaned twice per year, never, or become the burden of the residents living in the homes surrounding the gas station?
- Our neighbors have been walking with trash bags for years collecting the trash littering this portion of Camas leading to our neighborhood. Camas has not been collecting the trash and we are concerned that the City will not send crews to collect roadside trash.
- Customers may decide to consume purchases from the convenience store (including but not limited to alcohol) in the nearby residential neighborhoods, causing disturbances and leaving trash behind.
- Will the developer help with Graffiti removal and replacement? This development could create foot traffic that never existed before that may target our fence.

- A monument sign at the corner would obstruct the view for drivers making a right turn. Building set-backs should not be deviated from for the same reason as not to violate Camas City Code:
- **18.15.080 - Signs prohibited.**
- The following signs are specifically prohibited in the city:

  B.Signs located in such a manner so that by location, color, size, shape, nature would tend to <u>obstruct the view</u> or be confused with official traffic signage.

11. Light and glare

What type of light or glare will the proposal produce? What time of day would it mainly occur?

- The revised SEPA does not address the time of day that light or glare would be emitted.
- During what hours would light be emitted from the proposed project? It does not address any light emitted from signage.

- Can it be assumed that there will be no lighted signs?
- Will the business go completely dark, just like the surrounding residences to preserve dark sky and avoid light and colored light pollution, typical of gas station canopy/signage lighting?

  - Camas Municipal code 18.21.060 G.:
  - Lighting. Site and building lighting shall be designed to minimize glare or objectionable effects to the adjacent properties. Residential neighborhoods are of particular concern. Site-lighting poles shall not exceed twenty feet in height and shall direct the light downward. Lighting sources viewed from above or below on adjacent property shall be shielded. Building lighting is to be concealed and indirect. Lighting in service areas is to be contained to conceal visibility of light sources from street and adjacent property. Site lighting is to be designed to provide uniform distribution, and the light levels shall be adequate for reasonable security and safety on the premises.
  - Monument sign would create light pollution outside of the perimeter of the parcel
  - LED bright lighting of the interior of the convenience store will project onto the concrete surfaces and reflect to neighboring properties
  - LED lighting from the gas station canopy will reflect off the concrete surfaces.
  - The area is steeped in darkness, except at the intersection. Dark sky benefits to wildlife and humans (improved sleep) have been widely documented.

Could light or glare from the finished project be a safety hazard or interfere with views?

The revised SEPA does not address and even denies the impact created by the proposed development.

- Each vehicle exiting the parcel, which will be hundreds (2,000+) per day, will shine their headlights at the two residential homes on the other side of NE 13th Street (20107 NE 14th Street and 20009 NE 14th Street). Especially during darkness which is in the early morning and late afternoons for 50% of the year, this will create a strobe-light effect, shining light into these properties. (The existing trees located on these properties do not adequately shield this light created by the development's customers, nor should they have to, because it is the responsibility of the development to shield the neighboring properties from light.
- Extra tall walls/fence needs to be erected to shield against any light projected in the north direction by cars. Keep in mind that if there is a curb an exiting vehicle may project very high up, before entering the roadway

- Each vehicle entering the parcel making a left turn will shine their headlights at the residential property at 20005 NE 13th Circle. This also needs to be shielded or remedied by a tall wall
- This project would significantly change the night sky. There are many mammals in the wooded residential lots and the wetland at 20009 NE 14th Street, which is within 70 feet of the proposed development (including deer, which use the proposed development to move to/from the Camas Meadows Golf course.)

Proposed measures to reduce or control light and glare impacts, if any:

- The Camas code referenced above needs to be enforced such that residential properties and animal habitat are completely shielded from the light used and emanating from the site.

12. Recreation

The revised SEPA is incomplete:

What designated and informal recreational opportunities are in the immediate vicinity?

- Developer did not mention that Union High School with enrollment over 2,000 students and all their sports facilities, including walking paths are along Friberg-Strunk Road. It is just 1,839 feet away.
- They only mention a golf course and a sports complex further away

Would the proposed project displace any existing recreational uses? If so, describe.

- Currently the sidewalks are used by Union High School daily for a class called “Fit for Life walking”
- Cross-country teams from the High School run along this road
- Due to exposure to vapors and fumes during exercise, and the attractive nuisance of a convenience store, these school and recreational activities may have to be abandoned by the students and the school district

14. Transportation

Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle, or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

We have contacted the City of Camas' engineering department, regarding questions arising from reading the pre-application meeting notes dated August 8. 2022. There are access spacing standards that should not be deviated from when they would make car travel unsafe. A permitted left turn into the parcel short of the existing 660 ft minimum spacing standard would create a high risk left turn.

We have already experienced another deviation that was granted for the Oak Tree Station, for which drivers are often caught off-guard for having to slow down for vehicles entering via a right turn to the food truck driveway on Friberg-Strunk Road.

As Union High school begins session next week, it will be interesting to see if this deviation will result in any vehicular accidents, because it does not allow drivers enough time to react to a car slowing down ahead of them.

Concerns:

- Will NE 13th Street receive a left turn median turning strip/lane into the gas station?
- Will the speed limit be lowered to 25 mph?
- Will the traffic coming north on Goodwin be warned with a flashing sign about "slow traffic ahead" whenever a car is stopped in the west-bound lane awaiting it's turn to turn into the driveway?

These are the unanswered questions:

- On page 6, "Streets: 4.c. ...The applicant will be required to dedicate ... and a center left turn median." Does the applicant have to widen the road to accommodate this median? Will a left turn allowed from NE 13th Street <u>into</u> the proposed development? If so, will there be a median lane, essentially widening that portion from the existing 3 lanes (1-east, 1-west, 1-right turn) to 4 lanes with the center median lane? How long would that median lane be and would it extend into the Clark County portion of the road, even to the west of the parcel?

- And, will cars exiting the proposed development be allowed to make a left turn? If not, will a concrete traffic curb be installed to prevent this?

- Will funding be set aside for repair of our fence, if the gas station access/egress situation caused damage to our fence through a vehicular accident?

Due to the poor sight distance created by the uphill and around the corner design of Goodwin Road, one would think cars would travel at the recommended 35 mph.

However, most don't and as a remedy would you consider lowering the speed limit to 25 mph to accommodate this development to prevent rear-end collisions resulting from left-turn being allowed from the proposed development?

- also on page 6, "Streets: 5.b.i. Meeting the required offset from the back of sidewalk would further reduce the developable area. ii. A deviation request from the minimum 50-foot setback requirement should be submitted. A deviation request from this standard would be supported by the city engineer."
- The developer is asking the City to disregard the setback “standards” and allow them to place more parking spaces closer to the road.

Will the City of Camas uphold the setback standard?

I request that the City of Camas reject granting any deviations.

- also on page 6, "Streets:6. "Per CDSM Table 3, Access Spacing Standards on a roadway classified as an arterial are 660-feet minimum ... c. A deviation request from meeting the minimum access spacing required should be submitted."

- The developer is asking for a dangerous shortening of the City access standard. This will result in rear-end collisions. West-bound collisions will almost exclusively be suffered by City of Camas residents as the come up the hill on Goodwin from the homes below. I predict that east-bound collisions will be suffered mostly by high school students on their way to school.

The City should protect its citizens and reject any request for a deviations for this high-risk development.

Outlook

Propose Gas Station 13th and Freiburg/Strunk

From Mike Ogden <mogden@westernconstruction.com>
Date Thu 8/29/2024 12:50 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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I would recommend to the City to NOT ALLOW a deviation from their standards in access spacing below 660 ft. A permitted left turn would cause rear-end collisions as vehicles travel up the hill and around the poorly visible intersection with Goodwin Rd. would not expect a car to be stopped to make a left turn.

Mike Ogden
Project Manager
Mogden@westernconstruction.com
Cell: 360.798.4713

Sent from my iPhone
[Western]
Western Construction Services, Inc.<http://www.westernconstruction.com>
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WA LIC WESTECS 162R8 OR CCB 63717 AK LIC 28375

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Outlook

Proposed Project on 13th Street in Camas (Clark County Tax Parcel 176148000, SPRV23-06)

From Kristin Price <19813mkp@gmail.com>
Date Thu 8/29/2024 1:55 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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To: Community Development Office, City of Camas
(communitydevelopment@cityofcamas.us)
Regarding: Proposed Project on 13th Street in Camas (Clark County Tax Parcel 176148000, SPRV23-06)
Date: August 28, 2024
Respectfully submitted,
M. Kristin Price (19813 NE 13th Street, Camas WA.)

On behalf of families residing in the vicinity of the proposed convenience store/gas station, request is made for an extension of the time allotted for review of revised SEP report and additional documents. Residents in the nearby neighborhoods have only recently learned of the the revised SEP report. The City of Camas website indicates recent posting of documents (8/22/2024). Project development has taken place without sufficient planning and consideration for the neighborhood, the community, students & faculty of Union High School. While the proposed project cites adjacent properties in its description, the revised SEP application fails to address environmental impacts for multiple neighborhoods to the north and west of the proposed project site.

To facilitate further review, additional materials are needed: a detailed schematic of the proposed facility, with any modifications; and a schematic with detail about anticipated roadway/sidewalk modifications both on-site and adjacent to the facility. A full copy of the referenced Traffic Analysis Report should be available for review, with updates to reflect current traffic flow. It appears that additional studies may be required before reasonable consideration of this project.

Comment: The proposed project requires an updated study of traffic impact. The current study does not accurately represent the volume of traffic in this area, with recent increases due to residential areas to the east, industrial development at the intersection, new high-rise housing on 1st Street, and newly constructed commercial and office buildings. There are significant safety concerns related to the positioning of the project at a busy intersection. The project design does not provide safe entry and egress from the facility site. The proposed facility proposes entry across a stream of traffic on 13th Street - impeding traffic flow and increasing the risk of crashes near the location. Modifications are needed in the project design in terms of crosswalk design and

addressing pedestrian safety, including safety for students who walk or bicycle to school at Union High School. The proposed location would interfere with safe and efficient school bus transport for an extended period of time each afternoon. An updated traffic study detailing impact at peak hours and impact of traffic associated with the industrial facility under construction on the east side of the intersection should be requisite to approval of the proposed project.

1.3. Water runoff (including stormwater):
1) Describe the source of runoff (including storm water) and method of collection and disposal.
The main source of runoff is from stormwater. There will be runoff from impervious roof area, drive aisles, parking areas, and landscaped areas. Onsite catch basins will connect to a pipe network that leads to an underground detention facility that will discharge to an existing roadside ditch. Runoff around gas pumps will go through an oil/water separator before being discharged to the storm sewer.
2) Could waste materials enter ground or surface waters? …. Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

Comment: The SEP proposal does not adequately address the potential for discharge impacting the Lacamas Lake watershed.

7.*Environmental Health Proposed measures to reduce or control environmental health hazards.*
Air. *a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.*
Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal commercial/retail uses as well as possible vapor from the gas tanks.

Comment: The SEP proposal does not include an analysis of the environment impact related to air pollution in the nearby neighborhood areas or approximated quantities of pollutants. How would climate variations (temperature, wind) affect these patterns of pollution?

7. *Noise*

Comment: The revised SEP application indicates a plan to scheduling fueling truck visits between 7p - 7a. This plan has implications for adjacent neighborhoods in terms of noise and disruption during these hours. A clearer plan is needed in terms of operating hours for this location, minimizing impacts for families residing near the location.

12. *Recreation. What designated and informal recreational opportunities are in the immediate vicinity?*
Camas Meadows Golf Club is adjacent to the east. The Harmony Sports Complex is approximately ½ mile to the west.

Comment: The application does not consider current recreational uses of the area, including bicycle paths and walking paths on Friberg-Strunk Road. The proposed facility will interfere with safe passage for bicyclists and pedestrians. The proposal does not identify sports events at Union High School in terms of planning. The facility will result in traffic disruption when events are scheduled at Union High School.

14d. *Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).*
Frontage improvements are proposed to bring NE 13th Street up to half-width roadway standards. NW Friberg-Strunk Street is currently built out to standard.

Comment: Further detail is needed about anticipated improvements, including modifications to roadway and construction of sidewalks to permit safe passage for pedestrians in an increasingly busy area.

h. *Has any part of the site been classified as a critical area by the city or county? If so, specify.*

There is one Oregon white oak on site

Comment: Mitigation has been proposed. However, the area identified for mitigation is Salmon Creek - a geographic area more than 10 miles from the proposed site. Further detail is needed to establish mitigation in the area adjacent to the proposed site, e.g. creation of a buffer area with plantings to the west of the site and detail about other proposed plantings on site or in the immediate area.

Proposed measures to reduce or control transportation impacts, if any:
The applicant will pay transportation impact fees. A west bound left turn lane on NE 13th Street is proposed that will improve safety at the site access

Comment: The revised SEP proposal fails to address the impact to traffic on 13th Street, where the proposed entry to the site is near the intersection, west of the traffic signal at the intersection. The site plan requires modification to establish separate entry and exits to the proposed location. The proposal needs to assure that driveway access will be maintained for residents living along 13th street and in adjacent neighborhoods.

15. *Public Services.*
The revised SEP application confirms that additional public services (for example fire protection, police protection)

'Yes. The completion of this development will increase the need for public services in the area.'

Comment: The SEP proposal does not address increased needs for public services. - including law enforcement and fire department services.

Outlook

SEPA23-12 Comments

From joanier@comcast.net <joanier@comcast.net>
Date Thu 8/29/2024 2:52 PM
To Community Development Email <communitydevelopment@cityofcamas.us>
Cc rickdr@comcast.net <rickdr@comcast.net>; JOAN RICKARD <joanier@comcast.net>

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August 29, 2024

Robert Maul,
City Of Camas SEPA Official
Community Development Department
616 NE 4th Ave.
Camas, WA 68607

Re: SEPA23-12 13th Street Gas Station

Dear Robert Maul,

We are responding to the City of Camas August 15, 2024, letter concerning SEPA23-12 Determination of Non-Significance. We strongly disagree with the Camas Community Development Department recommendation of the **SEPA23-12 13th Street Gas Station Determination of Non-Significance**. We believe that this project will have a negative effect on the environment and our neighborhood. Our property is less than 200' from the proposed gas station.

If this proposed project goes forward the air quality will be affected by the gas vapors escaping from the underground storage tanks when they are being filled and vapor leaks from the underground storage tanks venting systems, and gas vapor leaks from the pumps when customers fill their cars gas tank.

The water quality will be affected by this project. The aquifer and wetlands need to be protected. Several homes on both sides of 13th St. rely on private household drinking water wells. Some of these wells are less than 500' from the proposed gas storage tanks. The FHA single Housing Policy Handbook for Appraisers and Property Requirements states that if you have a drinking water well that is within ¼ mile of a gas station, when you sell your home, you will need to obtain an independent inspection of your well as part of the appraisal process.

From the SEPA Checklist, Ground Water and Water Runoff section, it states that "Stormwater from pollution generating surfaces will be treated prior to being routed to an existing roadside ditch. Runo

around gas pumps will go through an oil/water separator before being discharged to the storm sewer." How well will the catch basin filter system be able to filter out all the everyday surface runoff of gas, oil spills, car wash detergent (Hydrofluoric acid, waxes/petroleum products), and grimy wastewater before it is discharged to the existing roadside ditch that flows into Lacamas Creek?

If this Gas Station / Car Wash Convenience Store project is approved, will they be allowed to operate 24 hours a day? Will gas and other deliveries be allowed in the middle of the night? Are there quiet hours that the gas station / car wash will need to adhere to? The gas station / car wash will create loud noises from many sources such as the car wash and vacuums, customers' loud music and voices, idling cars, motorcycles, trucks, horns, the backup warning beeps from the delivery trucks and the fuel tanker trucks. The surrounding area is a quiet residential neighborhood. The gas station / car wash will disturb and interfere with the peace and quiet of those living in the neighborhood.

Light pollution can negatively affect many parts of our environment, including migratory birds, pollinators, plants, animals, and people. As stated in the SEPA Checklist for this proposed gas station, this site is part of the Pacific Flyway for migratory waterfowl. This project would significantly change the night sky. The lighting from the monument sign would create light pollution outside of the perimeter of the project. The LED bright lighting of the interior of the convenience store will project onto the concrete surfaces and reflect to neighboring properties and the LED lighting from the gas pump overhangs will reflect off the concrete surfaces. Vehicles entering and exiting the gas station would shine their headlights into neighboring homes, this will especially be worse in winter with the prolonged daytime darkness.

The proposed gas station will have only one entrance / exit fronting 13th St. and that entrance is only a couple hundred feet from the intersection of 13th St and Friberg-Strunk. The 13th St. /Strunk-Friberg intersection is already dangerous with school buses and scores of inexperienced high school drivers passing though it twice a day during the school year. Large trucks entering and exiting the warehouse east of the proposed gas station adds even more traffic and congestion at that intersection and then on top of all that adding another 2200 vehicle trips per day to the 13th St. gas station would just compound the problem.

The Traffic Analysis Report traffic study submitted with the SEPA Checklist was done in September 2023 and states that Union High was not in session at the time of the traffic study. Since September 2023 Oak Tree Station, Lacamas Tech Center and the Pananttoni Industrial Building Warehouse have opened on Friberg-Strunk St. and they all contribute to increased traffic and congestion in the area that was not there at the time when the traffic study was done. Also, there are a few other developments that are in the works nearby that will affect the traffic on Friberg-Strunk and 13th St. in the near future. The Traffic Study is outdated and should be redone when school is in session.

While the Traffic Analysis says it compensated for Union High not being in session by using the number of students enrolled, I do not think they took in to consideration that most of the Union High School boundary is to the north of the school so a majority of the students driving to school and the school busses use 13th St. to get to and from the school. While the capacity analysis of the Traffic Report says there would be no impact at the Friberg-Strunk and 13th St. intersection, it did state that the 192nd Ave. and 13th St. intersection would fail during peak PM time by 2026. That intersection is already failing during afternoon peak time, it can take 6 - 10 minutes to drive ½ mile westbound on 13th St. to 192nd. And in the morning eastbound traffic on 13th St. can be almost as bad. During peak morning and evening times cars trying to enter the Gas Station could block traffic. For the entrance/exit of the gas station to be safer for both vehicles and pedestrians, 13th St should be

widened to add a left turn lane. Sidewalks should be installed on both sides of 13th St. from Friberg-Strunk down to 192nd Ave.

In summary we think this project is incompatible with our neighborhood community. The proposed gas station is surrounded by quiet residences and would project its collective problems onto the neighborhood. Due to the environmental concerns and the traffic issues this is not the best location for a gas station, car wash and convenience store. A gas station is not needed at this location. Within 3 miles there are at least 6 gas stations / convenience stores and car washes, most are open 24 hours.

We ask you to carefully consider the environmental, traffic safety, and quality of life issues for the neighborhood and not approve this project. Thank you.

Sincerely,

Richard and Joan Rickard

Outlook

Comments on SEPA for Gas Station at 13th/ Friberg

From Russell Wegner <russwegner@mac.com>
Date Thu 8/29/2024 3:10 PM
To Community Development Email <communitydevelopment@cityofcamas.us>
Cc Karin Nosrati, DC <bforback@gmail.com>

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I stand against this project and the SEPA determination for some basic reasons and disagree with the SEPA for the following reasons:

1. Environmental- Wetlands are too close. Well water for residents is too close. Lacamas Prairie and Lacamas Creek and Lake is too close and contamination would flow directly downhill to the precious areas.
Environmental insurance should be part of this permit and a certification for liability insurance should name additional insured as City of Camas/ Clark County

2. Traffic Study in adequate- Exit/ Entrance is poorly planned in terms of safety, entrance/ exit plan and high school proximity.

3. Re: GMA, gas station is not in line with the goals for the community. The clear lack of support from neighbors and community is a testament to this.

4. The credentials of author of SEPA are questionable and a second study should be done to confirm accuracy. Wetland measurements for example were not verified and the timing of study questionable.The environmental impacts of gas station and risks not truly accounted for. A second study by professional with gas station development experience should be done.

Russell Wegner
19910 NE 16th St.
Camas, WA 98607

360-314-4500 Land
415-716-4373 mobile

russwegner@mac.com

Outlook

Comments for SEPA for 13th St - Gas Station project

From Randy Nosrati <randynos1@gmail.com>
Date Thu 8/29/2024 1:00 PM
To Community Development Email <communitydevelopment@cityofcamas.us>

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Dear Sir / Madam,

Please see my comments / concerns below regarding the Gas Station project at 13th St.

Noise pollution: For context: We have already experienced noise outside of the hours permitted per the Camas Municipal code from the new high cube warehouse. They have trucks arrive and/or depart at night, which try to hook to or uncouple from their landing dock and create loud noises that travel to our residences. In addition, they are planning to install a heavy duty gate. It's operation may create additional noise at night.

A gasoline station, convenience store and car wash, regardless of their zoning, when located in the city limits, have to obey the City of Camas' noise ordinance. As a residential community we will not tolerate any discretion and will pursue all regulatory and when indicated legal means to bring any occupants of adjacent parcels into compliance. We do not believe that the noise generated by the proposed development, its suppliers and customers will conform with the City's intended municipal noise code. This could result in massive complaints and legal challenges for the City of Camas.

Thank you for your consideration,

Randy Nosrati
(360) 954-6757

STAFF REPORT & DECISION

13th Street Gas Station

File Number SPRV23-06 (CONSOLIDATED FILES: ARCH23-07, CA23-08, DR23-09, SEPA23-12)

Type II

Decision Date: September 16, 2024

PROPOSAL	The proposal includes the construction of an 8-pump gas station, a 4,100 square-foot convenience store, and a drive-thru car wash, located at 20101 NE 13th Street, in the BP - Business Park Zone.		
LOCATION	The property is located on the southwesterly corner of the intersection at NE 13th Street and NW Friberg-Strunk Street. The parcel number is 176148000, situated in the NW 1/4 of Section 29, Township 2 North, Range 3 East of the Willamette Meridian, Clark County.		
APPLICANT	PLS Engineering, Travis Johnson 604 W. Evergreen Blvd. Vancouver, WA 98660 (360) 944-6519	**OWNER**	Pak USA Camas, LLC 3993 NW Currawong Court Camas, WA 98607 (512) 779-4999

APPLICABLE LAW: The application was submitted on November 9, 2023, and the applicable codes are those codes that were in effect at the date of application. Camas Municipal Code (CMC) Title 17 Land Development and Title 18, specifically (but not limited to): Chapter 18.11 - Parking, Chapter 18.13 - Landscaping, Chapter 18.18 - Site Plan Review, Chapter 18.19 Design Review, Chapter 18.37 Business Park, and Chapter 18.55 Administrative Procedures.

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SUMMARY

The applicant is currently seeking approval to construct an 8-pump gas station, a 4,100 square-foot convenience, and a drive-thru car wash on an approximately 0.97-acre parcel currently developed with a single-family residence, situated in the BP – Business Park Zone. According to CMC 18.07.030 – Table 1,

the proposed uses are allowed within the BP Zone, subject to the necessary approvals. The convenience store is proposed to have small general retail sales including food items, cold beverages, and potentially some on-site prepared foods.

The site is located at 20101 NE 13th Street and is situated on the southwesterly corner of the intersection at NE 13th Street and NW Friberg-Strunk Street. Parcels to the north across NE 13th Street, as well as directly west, are developed with single-family residential uses under Clark County jurisdiction. The property south of the project site is developed with a business park (Lacamas Tech Business Park). East of the project site is a business park development that is currently under construction.

The subject property is relatively flat with vegetation consisting primarily of grass with scattered trees and is surrounded by properties in Clark County jurisdiction to the North and West zoned Single-Family Residential, to the South and East by properties located within the City of Camas jurisdiction with a BP – Business Park Zone designation.

The proposed project requires permits and approvals from the city to include archeological review, critical area review, design review, SEPA review, site plan review, engineering site construction approvals and building permits.

FINDINGS

Title 16 Environment

STATE ENVIRONMENTAL POLICY ACT (SEPA23-12)	CMC CHAPTER 16.07

A SEPA checklist was submitted, and a Determination of Non-Significance (DNS) was issued February 22, 2024. The comment period closed on March 7, 2024. The city received SEPA comments from the Department of Ecology related to hazardous waste and toxics reduction during demolition of the existing structure as well as comments related to the wetland delineation conducted for the project site. Staff also received comments from the Southwest Clean Air Agency (SWCAA) with regards to demolition of existing structures and construction dust, and comments from Washington Department of Fish & Wildlife (WDFW) related to mitigation measures for the removal of one Oregon white oak that is currently on the project site. During the initial SEPA comment period, staff received 41 comments from residents, both in support of and opposition to the proposed project. The comments in opposition were related to potential increases traffic, air quality, water quality, and pedestrian safety. Because of the comments received during the initial comment period, the applicant placed the project on hold to reevaluate some of the technical reports that were submitted with the initial application.

A revised SEPA checklist and supporting documentation were submitted July 15, 2024. Upon review and acceptance, the revised SEPA checklist was redistributed and a Determination of Non-Significance (DNS) was issued August 15, 2024. The comment period closed on August 29, 2024. In addition to the comments received from the previous SEPA distribution (March 2024), the city received a total of 9 comments from residents related to potential increases in traffic, noise, and environmental impacts. One agency comment from Washington Department of Fish and Wildlife (WDFW) was received related to the applicant's Oak Bank Use Plan. State agencies provide industry standards for different types of development. The applicant will be required to comply with all State Agency requirements for the proposed gas station, car wash, and convenience store.

> **FINDING:** Staff finds the comments and recommendations provided by the Department of Ecology, SWCAA, and WDFW should be complied with and conditioned as such.

ARCHAEOLOGICAL RESOURCE PRESERVATION (ARCH23-07) CMC CHAPTER 16.31

An Archaeological Predetermination Survey was performed by Archaeological Services LLC on August 17, 2023, for the proposed project. Based on the survey report, no further study was necessary. A copy of the report was forwarded to Tribes and the Department of Archaeological and Historic Preservation (DAHP). The report and findings are not subject to the open public records act and as such, the city cannot disclose the results.

> **FINDING:** Staff finds a condition of approval is warranted that if potential artifacts are discovered during construction, work must immediately cease, and both the Department of Archaeological and Historic Preservation and the City must be notified.

CRITICAL AREA (CA23-08) CMC CHAPTER 16.51

WDFW has mapped the site as potentially having oak woodlands and being within a cave rich area. No wetlands were mapped onsite, however potential wetlands are mapped by Clark County GIS on the property to the south. A Critical Areas Report (dated October 2, 2023) has been prepared by Ecological Land Services (ELS) for the project site and concludes that there is one Oregon White Oak on the southerly portion of the site, but no oak woodlands or caves as mapped by WDFW. The potential wetland to the south is located within the footprint of a proposed building and that application has received permits to fill the wetland.

A revised Critical Areas Report (CAR) prepared by ELS and dated May 2, 2024, was submitted to the City of Camas along with other supporting documents that address comments received during the 1st Notice of Application. The revised CAR includes findings from an April 2024 site visit that include a wetland to the southwest of the site with a buffer that extends on to the subject parcel however; no wetlands were identified onsite.

Along with a revised CAR, ELS issued a revised Oak Mitigation Plan (dated May 17, 2024) as well as a Wetland Buffer Mitigation Plan (dated May 16, 2024). The oak tree mitigation plan proposes to purchase credits with the Terrace Oak Bank. The wetland buffer mitigation plan proposes to purchase credits with the Terrace Mitigation Bank

During the comment period for the revised SEPA checklist, staff received comments from WDFW related to the removal and mitigation of the Oregon white oak found on the project site. WDFW noted the recently published guidance document that describes the significance of Oregon white oaks and identifies best management practices for avoiding, minimizing, and mitigating impacts to this habitat. The actions identified in the guidance document can be implemented under the existing critical areas ordinance (CMC 16.51.170 – Mitigation Sequencing) for evaluating projects that involve Oregon white oak.

WDFW wants to ensure that the project proponent explored design alternatives that avoid and minimize impacts to the Oregon white oak, as required by CMC 16.51.170. If impacts to the Oregon white oak cannot be avoided and it is subsequently removed for this project, WDFW recommends updating the mitigation to align with their newly published guidance document. WDFW's current Oregon white oak mitigation guidance indicates that removal of a high-functioning white oak tree with a 52-inch DBH trunk and a 0.08-acre tree canopy should require both:

- Physical mitigation in the form of 250 Oregon white oak saplings planted.
- Temporal mitigation in the form of 0.80 acres of Oregon white oak habitat enhanced.

WDFW noted that the proposed mitigation plan provides for only 0.238 acres of oak habitat to be planted/enhanced (via mitigation bank credit). According to the applicant's revised Oak Bank Use Plan,

this value is based on a 6:1 ratio with a 0.5 "risk reduction multiplier", which brings the mitigation ratio to only 3:1. The agency indicates the proposed efforts would fall short of accomplishing no net loss of ecological function. WDFW recommends any trees felled during construction be retained on site or moved to a nearby woodland habitat as dead snags and logs provide valuable habitat to cavity-nesting birds and mammals, which is why WDFW's PHS List identifies snags and logs as a type of priority habitat.

FINDING: Staff finds that the applicant should comply with the comments received by WDFW and conditions of approval have been added as such.

Title 18 Zoning

SITE PLAN REVIEW (SPRV23-06)	CMC CHAPTER 18.18

CMC Section 18.18.060 Criteria of approval.

A. Compatibility with the city's comprehensive plan;

The subject property is designated Industrial in the Camas 2035 Comprehensive Plan, which includes the BP – Business Park zone designation. The proposed convenience store, gas station, and drive-thru car wash proposal is consistent with the following Comprehensive Plan policies:

- Land Use Policy LU-1.3: Maintain compatible use and design within the surrounding built and natural environments when considering new development or redevelopments.
- Land Use Policy LU-1.5: Where compatible with surrounding uses, encourage redevelopment or infill development to support the efficient use of urban land.
- Employment Land Use Goal LU-2: Create a diversified economy and serve Camas' residents and tourists by providing sufficient land throughout the City to support a variety of business types and employment opportunities.
- Employment Land Use Policy LU-2.1: Attract and encourage a balance of new commercial, light industrial, and knowledge-based business, medical, and high-tech uses, and the expansion of existing businesses to provide regional and local employment.
- Employment Land Use Policy LU-2.5: Ensure industrial development and other employment lands are compatible with adjacent neighborhoods through development and landscaping regulations and design review.
- Economic Development Policy ED-1.8: Ensure that development standards are balanced in order to promote high-quality building and site design and encourage businesses to operate in an environmentally responsible manner.

FINDING: The proposed project provides local employment and compatibility in site design and architecture with the surrounding area. As such, staff finds that the proposed project is compatible with and complements the Comprehensive Plan.

B. Compliance with all applicable design and development regulations;

The applicant provided a project narrative, site plan, utility plan, grading plan, landscape plan, and building elevations that are adequate for Site Plan and Design Review.

<u>Density and Dimensions</u>

Per CMC 18.09.030 Table 1, the Business Park (BP) zone is unrestricted with density and building height but requires a minimum lot area of half and acre and a maximum lot coverage of 50%. The applicable development setback standards in the BP zone are as follows: 1) minimum lot width and depth are 100-feet, 2) minimum front and side yard is 15-feet and 3) minimum rear yard is 50-feet. As proposed, staff finds the applicant complies with the density and dimensional standards of the BP zone.

Parking

New and expanded commercial uses must provide adequate off-street parking pursuant to CMC Chapter 18.11.130 *Standards* and per CMC Table 18.11-1 as follows:

- A "*gas station with mini market*" use requires one parking space per nozzle, plus 1 space per 250 square-feet of gross floor area. Based on the proposed 4,100 square-foot convenience store and 8 gas pumps, 17 parking stalls are required plus 8 spaces at the gas pumps.
- A "*car wash*" use requires 1 space per 2 employees.

As such, a total of 20 parking stalls are required in the parking lot area and 20 have been provided for plus 8 spaces at the pumps. Of the 20 standard parking spaces provided, 2 will have electric vehicle charging infrastructure and the time of development and 2 will be designated as "future electric vehicle parking spaces". The proposed project is in compliance with the required off-street parking space requirements.

Per Camas Design Standards Manual (CDSM), Table 1 Guidelines for Geometry of Private Roadway, Note 2.d Ingress aisles setback from back of sidewalk: collectors minimum 40-feet, arterials minimum 50-feet. NE 13th Street is a federally functional classified as a minor arterial within the city limits of Camas. The preliminary site plans show that the ingress parking spaces on the west side of the proposed development meet the minimum 50-foot setback requirement. The parking spaces along the front of the mini-market also meet the minimum 50-foot setback requirement as they are located over 50-feet from the ingress aisle.

Landscaping

The proposal must comply with the applicable landscaping standards in CMC Chapter 18.13 *Landscaping* in addition to the landscaping standards in CMC Chapter 18.37 *Business Park*. The applicant has focused the planting areas immediately adjacent to the building, at the site's perimeter, within the parking areas. The proposed plant materials indicated on the preliminary landscape plan include a mix of low-maintenance ornamental trees and shrubs. The proposed landscaping will provide a softening to the building, respond to the building architecture, and provide screening of the parking lot while still allowing tenant and patron security and safety. The proposed landscape plan meets the landscaping, screening, and buffering requirements for the parking area, provides for year-round color and texture, and will provide the site with a cohesive design with trees and shrubs that are adapted to the climate of the area and match the surrounding environs.

[Business Park landscape standards]:
Design of business park facilities should be a "campus-style" with landscape buffers. Per CMC 18.37.040.A, the entire street frontage shall receive landscaping of trees, shrubs, and groundcover plants within the landscape buffer. As proposed, the preliminary landscape plan indicates that the street frontage has been provided with this combination of landscaping and is in compliance with this requirement.

[Landscape buffers]:
The preliminary landscape plan shows a 10-foot wide L3 landscape buffer is being provided along the westerly and easterly property lines, and a 5'L2 landscape buffer is provided along the northerly and southerly property lines. The proposed landscape buffers are in compliance with the requirements of CMC 18.13.055 – Table 1.

[Parking lot landscaping]:
The purpose of landscaping within parking areas is to not only minimize the visual impact of paved areas but also provide shade and relief per CMC 18.13.060.B. As noted in CMC 18.13.060.C, parking lots shall

include a minimum ratio of one tree per six parking spaces. The proposed landscape plan shows a variety of trees to be planted throughout the parking areas, such that this requirement can be met. The parking lot planter islands are required to comply with the minimum 8'x 8' planter area requirement and the project will be conditioned as such prior to engineering plan approval. Wheel stops are required at all parking spaces and adjacent to planter areas to protect landscaping from car overhangs per CMC 18.13.060.F. Additionally, wheel stops will be required adjacent to sidewalks to allow for a clear pedestrian pathway and to protect pedestrians from car overhangs and will be conditioned as such prior to engineering plan approval.

[Tree Survey/Tree Density]:
Per CMC 18.13.051(A) Table 1- Required Tree Density, a minimum of 20 tree units (TUs) per net acre is required to be incorporated into the overall landscape plan. The applicant has indicated that the subject site requires a total of 19 tree units where a total of 33 tree units have been provided. The proposed project exceeds the requirement for tree density.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant submit a final landscape plan consistent with the landscaping standards in CMC Chapter 18.13 and CMC Section 18.37.040. Plants proposed for the site are required to be listed on the city's approved Landscape list per the Camas Design Manual planting specifications and landscape notes. For plants not on the approved list, a characteristic card should be submitted for review and approval. Irrigation and landscaping improvements should be installed or bonded prior to final acceptance.

Signage
CMC 18.15.060.A.2 states *"If plans submitted for Design Review include construction plans in sufficient detail to determine compliance with the provisions of this chapter, then issuance of such design review may constitute approval of the placement of sign or signs (other structural/mechanical permits may be required)."* Detailed construction plans for signs were not provided and therefore will require a separate review and approval prior to the issuance of a building permit, if proposed.

> **FINDING:** As identified in this staff report, the applicant's narrative, on the submitted preliminary plans and as conditioned, staff concurs that this project can or will comply with all applicable design and development standards of the code.

C. Availability and accessibility of adequate public services such as roads, sanitary and storm sewer, and water to serve the site at the time development is to occur, unless otherwise provided for by the applicable regulations;

Roads:
The proposed project is to meet the requirements of CMC 17.19.040.B Streets.

[Public Roads]: The proposed project is bordered on the east side by NW Friberg-Strunk Street, a fully improved 3-lane arterial with bike lanes, curbs, sidewalks, and planter strips. Currently the frontage along NE 13th Street, a 2-lane unimproved federally functional minor arterial, is predominantly without bike lanes, curbs, sidewalks, or planter strips on either side of the road. Existing improvements on NE 13th Street are limited to the intersection improvements for the traffic signal upgrade that was completed with the NW Friberg-Strunk Street Road Improvement project in 2015.

Per CMC 17.19.040.B.1, half-width street improvements are required from the centerline of the existing right-of-way and are to be constructed in accordance with the minimum full-depth structural street section per the CDSM, Street Detail ST5 3 Lane Collector/Arterial (74' ROW).

Per CMC 17.19.040.B Table 17.19.040-2 – Minimum Public Street Standards C. 3 Lane Collector/Arterial the minimum requirements are as follows:

- 74-foot right-of-way, 46-feet of paved street width to include 12-foot center median or left-turn lane, bike lanes, 6-foot detached sidewalks, 5.5 & 7.5-foot planter strips, no parking on both sides, and street lighting.
- Curb radii, at drive access locations, are to be a minimum of 35-foot curb radius.
- ADA accessible curb ramps on both sides of the drive access location; and
- Off-street parking setbacks, at the ingress aisles, are to be 50-feet from back of sidewalk.

The preliminary site plans, submitted in December 2023, did not meet the minimum requirements as noted in CMC 17.19.040.B Table 2 nor in the CDSM, Section III Design Standards, Table 2. The preliminary site plans include the existing westbound lane (11.5'), the existing eastbound lane (12'), the existing bike lane (5'), the dedicated right-turn lane (12'), a 6-foot attached sidewalk, and a 6-foot L2 landscape buffer on the east side of the drive access. CDSM Table 1, Note 2.c requires a minimum drive aisle width of 24-feet to allow for 2-way vehicular movements. The drive access is shown to be 60-foot wide, which exceeds the 24-foot drive access width. The west side of the drive access is shown with a 6-foot landscape strip, 6-foot detached sidewalk, and a 6-foot L2 landscape buffer. Additionally, the street sections called out on the preliminary plans show minimal areas of the required full-depth road section with most of the road improvements as a grind and inlay. The frontage improvements as shown on the preliminary plans do not meet the minimum required road improvements as noted in CMC 17.19.040.B.

Staff recommends a condition of approval that prior to engineering plan approval the applicant is to submit site plans with the following revisions:

- Maintain, at a minimum, the existing westbound thru-lane width.
- Provide a dedicated left turn lane onto the site.
- Maintain the eastbound thru-lane and eastbound bike lane.
- Maintain the dedicated right-turn lane onto NW Friberg-Strunk Street.
- The future sidewalk along the frontage is to be a detached sidewalk with planter strip and curb & gutter from the end of the existing curb return and extended the full length of the future frontage to the west end of Parcel no. 176148000.
- The drive access width is to be reduced to a maximum width of 40-feet for personal motorist access, with mountable curb and a concrete island on either side of the drive access to allow for truck accessibility. ADA access must be maintained across the entire driveway opening.
- A full-depth road section is required from the northside of the left-turn lane to the face of curb along the frontage improvements.

Per CMC 17.19.040.B.5 the applicant is required to dedicate sufficient right-of-way (ROW) for the full frontage improvements.

The full existing right-of-way width on NE 13th Street varies from approximately 60-feet to 63-feet along the frontage of the proposed development. The existing right-of-way width from the centerline to the north property line of Parcel no. 176148000 varies from 25-feet to 27-feet. The applicant is required to dedicate sufficient right-of-way width to construct the required frontage improvements from the north side of the dedicated left-turn lane to the south side of the future sidewalk. Per the preliminary site plans sufficient right-of-way width has not been shown for the required frontage improvements.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to dedicate sufficient right-of-way to construct the following improvements:

- The dedicated left-turn lane, the eastbound thru-lane, the eastbound bike lane, the dedicated right-turn lane onto NW Friberg-Strunk Street, curb & gutter, minimum 6-foot-wide planter strip, and 6-foot-wide detached sidewalk.

Per CDSM, Section III Design Standards, *Table 3 Access Spacing Standards*, the access spacing standards on a roadway classified as an arterial are a minimum of 660-feet and a maximum of 1,000-feet.

Per the preliminary site plans the location of the drive access into the proposed development is shown to be approximately 260-feet from the centerline of NW Friberg-Strunk Street to the centerline of the drive access location. The location of the drive access, as shown, does not meet the minimum access spacing standard for a road classified as an arterial. Due to the length of the parcel frontage along NE 13th Street, which is approximately 328-feet, it is not possible for the applicant to meet the minimum access spacing standards and still access the proposed development from NE 13th Street. Therefore, a deviation request to the city engineer was required for the location of the drive access as shown. A deviation request was submitted by the applicant.

The deviation request from the minimum access spacing standards is not supported without a dedicated left-turn lane into the proposed development.

The preliminary site plans, submitted in December 2023, did not include the dedicated left-turn lane as discussed with the applicant's team. However, a revised site plan was submitted with the Traffic Engineer's *Left Turn Lane Memo*, dated April 9, 2024, that includes a dedicated left-turn lane.

Staff recommends a condition of approval that prior to engineering plan approval, the site plans for the proposed development, are to be revised and resubmitted with the dedicated left-turn lane into the site as a requirement for support of the deviation request from the minimum access spacing standards on an arterial from the city engineer.

Per CDSM, Table 1 Guidelines for Geometry of Private Roadway, Note 2.c Aisles dimensions: one-way drive aisles are to be a minimum of 15-feet and two-way drive aisles are to be a minimum of 24-feet. The preliminary site plans indicate that all the on-site drive aisles are a minimum of 24-feet in width to serve as two-way drive aisles.

The preliminary site plans show that the ingress parking spaces on the west side of the proposed development meet the minimum 50-foot setback requirement. Additionally, the parking spaces along the front of the mini-market also meet the minimum 50-foot setback requirement as they are located over 50-feet from the ingress aisle.

FINDING: Staff finds that the development, as conditioned, can and will meet the requirements of the Camas Design Standards Manual (CDSM) for Roads.

Traffic and Transportation:

Per CMC 18.18.040.E a transportation impact analysis (TIA) may be required when a development generates 200 or greater average daily trips (ADTs).

A traffic analysis report (TIA), dated September 2023, was prepared by Charbonneau Engineering, Inc. Per the September 2023 TIA and the 11th Edition Institute of Transportation Engineers (ITE) manual, the total number of average daily trips (ADTs) generated by the proposed development, as shown in Table 1 Trip Generation Summary, is 2,281 ADTs. The ADTs were based on the land-use codes for a Gas Station with Market (LUC 945) which were reduced based on a percentage of pass-by trips for a Gas Station with Market; an Automated Car Wash (LUC 948); and trip credits for the existing single-family residence.

Based on the current 11th Edition ITE Trip Generation manual, the proposed development will generate approximately 2,281 ADTs, with a total of 60 AM Peak Hour trips (30 In / 30 Out) and a total of 81 PM

Peak Hour trips (41 In / 40 Out). Transportation Impact Fees (TIF) are updated yearly on January 1st or when a new TIF study is adopted. The TIF due at the time of building permit approval will be based on the number of PM Peak Hour Trips (81) times the TIF amount during the year that the building permit is submitted.

> Staff recommends a condition of approval that prior to Building Permit approval the applicant is to pay the applicable City of Camas Transportation Impact Fee (TIF) amount during the year the building permit is submitted * 81 PM Peak Hour Trips.

Left Turn Lane Requirements:
Access to the proposed development is located approximately 260-feet from the intersection of NE 13th Street and NW Friberg-Strunk Street. The minimum access spacing standards for a roadway classified as an arterial are 660-feet minimum and 1000-feet maximum. Due to the length of the parcel frontage along NE 13th Street, which is approximately 328-feet, it is not possible for the applicant to meet the minimum access spacing standards. The proposed access location would require a deviation request to, and support from, the city engineer. Based on the reduced distance of the driveway from the intersection, the applicant was informed that the deviation request would not be supported by the city engineer unless a dedicated left-turn lane was provided. The left turn lane will alleviate safety concerns regarding rear end collisions and the potential of stacking vehicles in the westbound through lane into the intersection.

Charbonneau Engineering's initial TIA, dated September 2023, stated the following:

> *"A left turn lane warrant was assessed for the westbound to southbound movement from NE 13th Street for traffic entering the site. The AM & PM peak hours were evaluated for the year 2026 total traffic scenario.*
>
> *The turn lane is not warranted in the PM peak hour.*
>
> *The warrant curve shown on Exhibit 1310-7a in the appendix indicates that a left turn is marginally met based on a 40 MPH travel speed. However, the travel speed on NE 13th Street is 35 MPH which if plotted indicates the warrant would not be met. It is also noted that the queuing analysis for the westbound left turn movement has confirmed that up to one vehicle may queue to make a left turn resulting in a LOS `A` condition. As a result, adding a westbound left turn lane on NE 13th Street is not proposed in conjunction with gas station, market, and car wash development."*

Based on the city engineer's requirement for a dedicated left-turn lane to support the deviation request, the city sent the applicant's initial TIA to Global Transportation Engineering (GTE), for a third-party review.

GTE provided a memo to the city, dated May 1, 2024, after reviewing Charbonneau Engineering's initial TIA. GTE's review addressed the proposed location of the access drive as follows:

> *"The access to the site falls below the City's access spacing of 660ft. This creates several safety concerns near the site access and at the NE 13th Street / NW Friberg- Strunk St intersection. Based on review of the traffic study, the following needs to be provided:*
>
> a. *The Summary and Recommendations section of the report indicates a left turn is not warranted at 35 mph but is marginally warranted at 40 mph. Due to the sub- standard access spacing, an evaluation using the 85th percentile speed present on the roadway needs to be used for turn lane and sight distance evaluations.*
>
> b. *Queuing analysis should be provided using Simtraffic or Poison's distributions. This will typically provide a more conservative estimate of average and 85th percentile queues.*

c. *Due to school traffic being predominant along study roadways, traffic counts need to be conducted during the school year to capture the heavy vehicle (bus traffic) presence at the intersection and distribution of that traffic. An actual traffic count will better define the local site and peaking characteristics of traffic. The AM peak is of particular concern for school related traffic. Developing school traffic estimates from the ITE Trip Generation Manual does not capture those characteristics in this case.*

d. *A westbound left turn lane or restriction of the westbound left turn movement into the site from NE 13th Street needs to be provided due to the sub-standard distance between the site access and the NE 13th Street / NW Friberg-Strunk St intersection.*

    i. *There is a high probability of eastbound traffic obscuring a vehicle waiting to turn left into the site from motorists turning left from NW Friberg-Strunk Street."*

The Memo from GTE was sent to Charbonneau Engineering for review. Charbonneau Engineering subsequently responded to GTE's Memo with a Memo dated June 12, 2024. Highlights of the Charbonneau Engineering Memo and the city's responses are as follows:

- *"Only one access (NE 13th Street) is permitted to serve the property as no connection is allowed to NE Friberg-Strunk Street."*

  The pre-application notes stated no access onto NE Friberg-Strunk Street would be permitted; however, during the application review process, staff stated that access onto NW Friberg-Strunk would be supported as a right-in/right-out only.

- *"To minimize the impacts associated with fueling trucks, deliveries will avoid the peak traffic periods by restricting arrivals and departures to the hours between 7:00 PM to 7:00 AM. Additionally, the fueling truck operators will be directed to make right turns from/to NE 13th Street when entering and exiting the site."* A condition of approval is warranted.

  Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to add the following notes to the site plans:
    - Fueling trucks and delivery trucks are restricted to the hours between 7:00 PM and 7:00 AM.
    - Fueling trucks are restricted to right-in/right-out movements from and onto NE 13th Street when exiting the site.

- *"Pertaining to comments about the truck turning movements it is recommended that PLS Engineering prepare an illustration showing the wheel paths for trucks entering, maneuvering on-site, and leaving the property."*

  An updated circulation plan was submitted on July 17, 2024.

- *"Frontage improvements on NE 13th Street will include a westbound left turn lane for traffic turning into the site. The Charbonneau Engineering memo dated 4/9/24 supports the city's recommendation to install the turn lane as a safety benefit even though the original traffic report noted that the left turn lane was not warranted."*

  The installation of the left turn lane was not a recommendation by the city. The left turn lane is a requirement due to the access spacing standards not being met. The deviation request from the access spacing standards was supported by the city engineer only if the left turn lane is to be installed.

- *"The year 2023 volumes are represented in the original traffic report … and the May 2024 volumes are documented in the traffic count data attached to the June 12, 2024, memo."*

  Based on the 2024 counts and the 2023 traffic counts there does not appear to be a marked difference between the two years. **Staff concurs.**

- *"Based on the results of the follow-up study it is recommended that the City of Camas support the proposed site plan with one 40-foot-wide access on NE 13th Street."* A COA for both is warranted.

  Staff concurs with the memo and a condition of approval requiring the left turn lane and 40-foot-wide access on NE 13th Street.

[Signing and Striping]
The proposed development is required to provide a signing and striping plan for onsite, including the driveway ingress and egress lanes, as well as the dedicated left-turn lane into the site, the dedicated right-turn lane onto NW Friberg-Strunk Street, the eastbound through lane, and the eastbound bike lane.

> Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to submit a signing and striping plan for onsite, including the driveway ingress and egress lanes; and offsite, including for the dedicated left-turn lane into the site, the dedicated right-turn only lane onto NW Friberg-Strunk, the eastbound through lane, and the dedicated through bike lane.

[City of Vancouver Concurrency]:
At the time of the pre-application meeting for the proposed development, the City of Vancouver's (COV) Traffic Engineer provide a memo, dated July 14, 2022, outlining the trip generation and distribution requirements and the concurrency requirements for COV's proportionate share intersections. The September 2023 TIA, was sent to the City of Vancouver and Clark County for transportation concurrency reviews.

- Concurrency review comments were not received from Clark County.
- Concurrency review comments were received from the City of Vancouver on March 5, 2024. The City of Vancouver's review comments are as follows:

The "applicant's traffic study identified City of Vancouver proportionate share fees total $153,050" per the proportionate share Table 4 as shown in the TIA. The proportionate share table below includes only those intersections that meet COVs requirements for proportionate share fees applicable to the proposed project.

Proportionate Share Project Name	Number of PM Peak Hour Trips	Fee Rate per PM Peak hour trip	Total Fee per Intersection
NE 192nd Ave & NE 13th St SE 192nd Ave & SE 34th St	57 13	$400.00 $150 .00	$22,800.00 $1,950.00
SE 192nd Ave & SR-14 ramp terminal	13	$2,000.00	$26,000.00
NE 172nd Avenue & NE 18th Street	20	$300.00	$6,000.00
NE 179th Place & NE 18th Street	20	$900.00	$18,000.00
NE 187th Avenue & NE 18th Street	24	$1,200.00	$28,800.00
NE 192nd Avenue & NE 9th Street	33	$1,100.00	$36,300.00
NE 187th Avenue & SE 1st Street	12	$1,100.00	$13,200.00
Proportionate Share Total Amount Due			**$153,050.00**

The City of Vancouver requests a condition of approval requiring proportionate share payment prior to building permit approval.

> Staff recommends a condition of approval that prior to Building Permit approval the applicant is to provide the City of Camas Building Division verification of payment of the proportionate share fees, in the amount of $153,050.00, to the City of Vancouver.

FINDING: Staff finds that the development, as conditioned, can and will meet the requirements of the Camas Design Standards Manual (CDSM) for Traffic and Transportation.

Sanitary Sewer:

The proposed project is to meet the requirements of CMC 17.19.040.C.2 sanitary sewers.

There is an existing 4-inch PVC sanitary sewer pressure main located just west of centerline, east of the 12-inch watermain, in NW Friberg-Strunk Street. A 4-inch pressure sewer lateral was stubbed to parcel number 176148000 for future development.

Per CMC 13.62.080 The riser lids for the STEP tank are to be accessible at all times to insure proper and timely emergency and/or maintenance response to the system. Per the preliminary utility plans, the proposed STEP tank is shown located east of the mini-market, in the landscape area between the drive aisle for the carwash and the sidewalk along NW Friberg-Strunk Street. There is an oil/water separator shown on the west side of the STEP tank and located in the drive aisle for the carwash.

The applicant is responsible for the sizing of the STEP tank and the oil/water separator for the proposed development. As the oil/water separator is located within a drive aisle, the oil/water separator is to be installed with H-25 traffic-rated lids.

> Staff recommends a condition of approval that prior to engineering plan approval the applicant is to submit to the City for review and approval, the design, specifications, and sizing calculations for the proposed STEP tank and oil/water separator. The design for the oil/water separator is to include H-25 traffic-rated lids.

Per CMC 13.62.060.B "*All STEP systems serving commercial, industrial, and other nonresidential properties shall be owned by the owner of the subject property, except for the service box at the point where the STEP system connects to the city sanitary sewer system, which shall be owned by the city. The owner shall be responsible for maintaining all components of the STEP system and its ownership and shall be responsible for pumping the STEP tank as needed and for disposing of the waste in an approved manner. The owner shall further be responsible for paying all electrical costs associated with the operation of the STEP system".*

> Staff recommends a condition of approval that prior to engineering plan approval a note is to be added to the engineering plans stating that all components of the onsite private sanitary sewer system, including but not limited to the STEP tank, the sanitary catch basins, and the oil/water separator shall be privately owned and maintained by the property owners, with a right-of-entry granted to the city for inspection purposes.

FINDING: Staff finds that the development, as conditioned, can and will meet the requirements of the Camas Design Standards Manual (CDSM) for Sanitary Sewer.

Stormwater:

The proposed project is to meet the requirements of CMC 17.19.040.C.2 Stormwater Control

The total land-disturbing activities for the proposed development consists of approximately 1.13 acres (49,045 sf) total for the proposed improvements. The total includes the future onsite development

improvements which is approximately 0.95 acres (41,382 sf), and the additional frontage improvements which is approximately 0.18 acres (7,663 sf) of new plus replaced impervious surface.

The preliminary stormwater technical information report (PTIR) dated November 2023, was prepared by PLS Engineering, Inc. The proposed development site is located on the southwest corner of NE Friberg-Strunk Street and NE 13th Street. The proposed development improvements include a mini-market, gas station, parking lot, a drive-thru carwash, and stormwater treatment and detention structures.

Per the preliminary stormwater report the onsite "stormwater runoff from the pollution generating impervious surfaces (PGIS) will be routed to the underground treatment vault. After the PGIS surface runoff is treated via the underground treatment vault, the stormwater will drain to the underground detention facility then to a new flow control manhole prior to draining to the existing stormwater manhole in NE 13th Street, which discharges to an existing conveyance system in NE 13th Street/NW Goodwin Road, and ultimately east into Lacamas Creek. The preliminary stormwater report did not address the offsite stormwater runoff from the new pollution generating impervious surfaces constructed with the frontage improvements.

The PTIR was prepared in accordance with Ecology's *Stormwater Management Manual for Western Washington* (2019 SWMMWW). Ecology issued the 2024 *Stormwater Management Manual for Western Washington* which was effective as of August 1, 2024. Both the 2019 and the 2024 manuals state that minimum requirements (MR) #1-#9 will apply for a new development project that results in 5,000 sf or greater of new plus replaced hard surface area. Minimum requirements #1 - #9 applies to the proposed development.

> Staff recommends a condition of approval that prior to engineering plan approval the applicant is to revise the preliminary stormwater report in accordance with the *2024 Stormwater Maintenance Manual for Western Washington (SWMMWW*) and submit as a final stormwater report (TIR) for review and approval.

MR #1 - Preparation of Stormwater Site Plans: The preliminary stormwater utility plan was incomplete as the plans did not include the design plans and details for the stormwater treatment and detention structures, flow control manhole, catch basins, the conveyance system.

> Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to submit a complete set of stormwater plans for review and approval in accordance with CMC 14.02, CDSM, and Ecology's *2024 SWMMWW* and MR #1.
>
> Staff recommends a condition of approval that prior to engineering plan approval, a note is to be added to the stormwater plans stating that "all components of the onsite stormwater system are to be owned and maintained by the property owner, with right-of-entry granted to the city for inspection purposes.

MR #2 – Construction Stormwater Pollution Prevention Plan (SWPPP): The SWPPP was included in the preliminary TIR. The SWPPP is incomplete as it does not include contact information for the Contractor, CESCL, or the plans for erosion and sediment control.

> Staff recommends a condition of approval that prior to any land-disturbing activities the applicant should revise and submit an updated SWPPP, that includes the contact information for the Contractor, CESCL, or the plans for erosion and sediment control.

MR #3 – Source Control of Pollution: The preliminary TIR addresses the various BMPs required for source control, which are included in Section D of the preliminary TIR.

MR #4 – Preservation of Natural Drainage Systems and Outfalls: The preliminary TIR states that the proposed development will "restore the historic flow path" which had flowed to the north side of NW Goodwin Road which in turn will "maintain and preserve the natural drainage systems".

MR #5 – On-site Stormwater Management: The preliminary TIR addresses on-site stormwater management in Section E.

MR #6 – Runoff treatment is addressed in Section F of the preliminary TIR. The proposed development consists of approximately 1.13 acres (49,045 sf) total of onsite and offsite improvements. The report states that stormwater runoff from the onsite improvements will be treated with a system of treatment cartridges contained within a treatment vault. The PTIR specifically states that the runoff from roofs, landscape areas, and the frontage improvements "will not be treated as part of the final design".

The required frontage improvements will result in approximately 0.18 acres (7,660 sf) of new pollution generated surfaces, therefore stormwater runoff from the frontage improvements require treatment for the pollution generated impervious surfaces. Maintenance and ownership of said treatment measures for the frontage improvements are the responsibility of the owner of the proposed development.

> Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to submit a revised stormwater report (TIR) that addresses both the onsite and the offsite treatment measures for stormwater runoff from all the new and existing pollution generating surfaces, per MR #6.
>
> Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to submit revised stormwater plans that provide for treatment of both the onsite and the offsite stormwater runoff, per MR #6.

MR #7 – Flow Control Analysis and Design is addressed in Section G of the preliminary TIR. Per the preliminary TIR, onsite stormwater runoff will be detained in an underground detention facility. The preliminary TIR does not address the new plus replaced hard surface areas constructed as part of the frontage improvements along NE 13th Street.

> Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to revise and resubmit the preliminary stormwater report addressing the new plus replaced hard surface areas constructed with the frontage improvements on NE 13th Street, per MR #7.

MR #8 – Wetland Protection is addressed in Section F of the preliminary TIR. Per the report, there appears to be a potential wetland to the south, which is a development site that is currently under construction, there are no wetlands located onsite.

MR #9 – Operation and Maintenance are addressed in Appendix D of the preliminary TIR. Per the report, maintenance of the facilities will be in accordance with the City of Camas *Stormwater Facility Maintenance Manual*. The property owner is responsible for ownership and maintenance of the onsite stormwater system with right-of-entry granted to the city for inspection purposes.

Ecology's *SWMMWW* requires that a designated concrete washout area (Vol. II, Chap. 3, BMP C154) be constructed on a job site that is provided for washout of concrete trucks and, prior to leaving a job site. This is to ensure that the contaminated washout water is not washed into any storm drains, whether private or public.

> Staff recommends a condition of approval that prior to engineering plan approval the applicant is required to provide a location on the engineering plans as a designated concrete washout area during construction of the building.

FINDING: Staff finds that the development, as conditioned, can and will meet the requirements of the Camas Design Standards Manual (CDSM) for Stormwater.

Water:

The proposed project is to meet the requirements of CMC 17.19.040.C.4 Water System.

There is an existing 12-inch DIP water main on the west side of NW Friberg-Strunk Street. An 8-inch service and a 1-inch water service were stubbed to parcel no. 176148000 for future development improvements. The 8-inch water service is in the southeast corner of the parcel and the 1-inch water service is located approximately 5-feet north of the 8-inch service.

Per the preliminary utility plans submitted on December 4, 2023, show that the applicant is proposing to reduce the 8-inch water service that was stubbed to the parcel to a 6-inch water service to provide for the private onsite water system for the mini-market and carwash; installation of a private fire hydrant to be located between the mini-market and the fueling station; and a dedicated fire line to the mini-market.

The proposed 6-inch water line shows the domestic water service stubbed from the onsite 6-inch water line to provide service to the mini-market and the carwash with a domestic water meter and a double check detector valve assembly on the private side of the meter. As stated in the pre-application notes, an above-ground reduced pressure valve assembly (RPBA) is to be installed behind the water meter and is to be accessible for testing and inspections, both of which are to be located adjacent to the public right-of-way; additionally, the fire line is shown to stubbed to the building from the 6-inch water line, with a double detection check valve (DDCV) vault all of which are to be located adjacent to the public right-of-way.

> Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to revise the water utility plans to include an above-ground reduced pressure valve assembly (RPBA) that is to be installed behind the water meter and is to be accessible for testing and inspections.

Additionally, the preliminary water plans state that there is an existing irrigation meter and double check valve assembly. The applicant is to verify that this is an existing water service only that was stubbed for future development improvements and not the irrigation service for the frontage improvements on NW Friberg-Strunk Street.

> Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to verify that the existing water service referenced as an existing irrigation meter and backflow prevention device is a service stub only for the benefit of the proposed development and not the irrigation service, meter, and backflow prevention device for the landscape improvements along NW Friberg-Strunk Street.

The preliminary landscape plans do not show the location nor size of the proposed irrigation meter on the landscape plans or on the water utility plans. The applicant is required to provide a separate irrigation meter and backflow prevention device. The preliminary water utility plans and the landscape plans are to show the location and size of the irrigation meter and the backflow prevention device.

> Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to submit revised water utility and landscape plans for review and approval with the following changes:
>
> - The irrigation meter and backflow prevention device are to be located adjacent to the public right-of-way.
> - The water utility and the landscape plans are to include the locations and sizes of both the domestic water meter and the irrigation meter with backflow prevention devices.

Per CMC 13.32.080 Backflow prevention devices shall be inspected and tested at least annually, by an authorized representative. Inspection reports are to be submitted to the city. If a device is found to not be in satisfactory operating condition, the connection between the City water supply and the system shall be severed immediately or City water service may be discontinued without notice.

The Fire Department Connection (FDC) needs to be located within 75-ft of a fire hydrant, per fire code. The fire line location is to be shown on the utility plans for informational purposes only. The fire line plans are required to be submitted to the Fire Marshall's office for issuance of the NFPA24 Fire Main Underground Permit prior to any fire line installation beyond the right-of-way.

> Staff recommends a condition of approval that prior to engineering plan approval the applicant is to submit revised onsite water plans that include the proposed location of the fire line, fire hydrant, and the location of the Fire Department Connection (FDC) as the FDC is to be located within 75-ft of a fire hydrant, per fire code.
>
> Staff recommends a condition of approval that prior to engineering plan approval and the applicant is to apply for the required fire permit from the Fire Marshal's Office for this project.
>
> - Plans, specifications, and other information as may be necessary to determine compliance with fire and life safety code and standards shall be submitted with permit.
> - The NFPA24 Fire Main Underground Permit is required for fire line installation beyond the right-of-way.
> - Contact the Fire Marshal's office at 360-834-6191 for submittal information.
> - Fire permit forms and submittal instructions are available online or can be picked up at the Fire Marshal's office at 605 NE 3rd Avenue.

All components of the onsite private water system, including the domestic water line; the fire line, including the private fire hydrant; and the irrigation system are to be privately owned and maintained by the property owner.

> Staff recommends a condition of approval that prior to engineering plan approval, a note is to be added to the engineering plans, which states 'All private fire hydrants are to be ordered from the factory and painted powder coated red.'
>
> Staff recommends a condition of approval that prior to engineering plan approval, a note is to be added to the engineering plans, which states that the onsite private water system, including the domestic water line; the fire line, including the private fire hydrant; and the irrigation system are to be owned and maintained by the property owner.

FINDING: Staff finds that the development, as conditioned, can and will meet the requirements of the Camas Design Standards Manual (CDSM) for Water.

<u>Erosion Control:</u>

The proposed project is to meet the requirements of CMC 14.06 Erosion and Sediment Control. Erosion and sediment control (ESC) plans are to be prepared in accordance with adopted city standards.

The applicant submitted preliminary grading plans with the original application and with subsequent preliminary grading and site plans. However, preliminary plans did not include erosion and sediment control plans.

> Staff recommends a condition of approval that prior to engineering plan approval the applicant is to submit with the *Civil Construction Application* permit, a set of Erosion Sediment Control (ESC) plans for review and approval.

The total land-disturbing activities for the proposed development consists of approximately 1.13 acres (49,045 sf). The total includes the future onsite development parcel which is approximately 0.95 acres (41,382 sf) and an additional 0.18 acres (7,663 sf) of new plus replaced impervious surface with the required frontage improvements along NE 13th Street.

As the proposed development site consists of land-disturbing activities of more than 1 acre, the applicant is required to obtain an *NPDES General Construction Stormwater Permit (GCSWP),* which is issued by the Washington State Department of Ecology.

> Staff recommends a condition of approval that prior to land-disturbing activities the applicant is to submit a copy of the *NPDES General Construction Stormwater Permit (GCSWP)*.

Per CMC 17.21.50.B.3, land-disturbing activities of more than an acre require the applicant to provide an Erosion Control Bond in the amount of 200% of the cost for erosion control measures, prior to commencement of any land-disturbing activities.

> Staff recommends a condition of approval that prior to land-disturbing activities the applicant is to provide an Erosion Control Bond in the amount of 200% of the cost for erosion control measures.

FINDING: Staff finds that the development, as conditioned, can and will meet the requirements of the Camas Design Standards Manual (CDSM) for Erosion Control.

FINDING: Staff finds that the development, as conditioned, can and will meet the roads, transportation, water, stormwater, sanitary sewer, and erosion control requirements of the Camas Design Standards.

D. Adequate provisions are made for other public and private services and utilities, parks, and trails;

[Public Utilities]:
Street lighting currently exists along NW Friberg-Strunk Street; however, street lighting does not exist along either side of the NE 13th Street frontage improvements.

> Staff recommends a condition of approval that prior to engineering plan approval the applicant is to submit for review and approval street lighting plans in accordance with the Camas Design Standards Manual (CDSM), Section III Design Standards for Street Lighting along the NE 13th Street frontage improvements.

[Private Utilities]:
The applicant is proposing to install pole mounted lights within the parking lot and wall mounted lights on the building. Lighting is addressed in further detail under the Design Review section of this staff report.

The applicant will be responsible for the operation, ownership, and maintenance of the on-site private stormwater treatment and conveyance system, with right-of-entry granted to the city for inspection purposes and shall be conditioned as such. A note will be added to the stormwater plans prior to engineering plan approval.

The applicant will be responsible for the maintenance of all other on-site private improvements, including but not limited to, the private water and fire line system, the private irrigation system, the private sanitary sewer system, the parking areas, on-site lighting, and landscaping and shall be conditioned as such. Notes will be added to the utility and landscape plans prior to engineering plan approval.

[Parks and Trails]:
There are no City requirements for parks, trails or other public improvements associated with the development of this property.

FINDING: Staff finds that the applicant, as conditioned, can or will make provisions for adequate maintenance of the private improvements.

E. Adequate provisions are made for maintenance of public utilities;

The applicant is required to extend water and sanitary sewer mains, and construct frontage improvements that include curb and gutter, sidewalk, and planter strip with the frontage improvements on NE 13th Street for the proposed development. The city will maintain the existing and proposed public streets improvements, public storm system, public sanitary sewer, and the public water systems located along NW Friberg-Strunk Street and the future improvements on NE 13th Street.

The applicant is required to obtain fire and building permits and to perform to the standards of CMC Title 15 Buildings and Construction.

FINDING: Staff finds that adequate provisions can or will be made for maintenance of public utilities.

F. All relevant statutory codes, regulations, ordinances, and compliance with the same. The review and decision of the city shall be in accordance with the provisions of CMC Chapter 18.55;

FINDING: As discussed throughout this staff report, and as conditioned, this proposal can or will meet all relevant codes, regulations, ordinances, and other requirements as identified herein.

DESIGN REVIEW (DR23-09) CMC CHAPTER 18.19

Design Review is required for new developments within BP - Business Park zones per CMC 18.19.020 therefore the proposed project is subject to the applicable design review standards in CMC 18.19.050.A *Standard Principles*, the guidelines in the Camas Design Review Manual "DRM", and the Business Park *architectural design standards* in CMC 18.37.030.C.

As conditioned, a Design Review Committee (DRC) public meeting will be held prior to engineering plan approval.

CMC 18.19.050.A Standard Principles:

1. **Landscaping shall be done with a purpose. It shall be used as a tool to integrate the proposed development into the surrounding environment.**

As previously stated, the proposal must comply with the applicable landscaping standards in CMC Chapter 18.13 Landscaping in addition to the landscaping standards in CMC Chapter 18.37 Business Park. The applicant has focused the planting areas immediately adjacent to the building, at the site's perimeter, within the parking areas. The proposed plant materials indicated on the preliminary landscape plan include a mix of low-maintenance ornamental trees and shrubs. The proposed landscape plan meets the landscaping, screening, and buffering requirements for the parking area, provides for year-round color and texture, and will provide the site with a cohesive design with trees and shrubs that are adapted to the climate of the area and match the surrounding environs.

2. **All attempts shall be made at minimizing the removal of significant natural features. Significant natural features shall be integrated into the overall site plan.**

There are no significant natural features on site.

3. **Buildings shall have a "finished" look. Any use of panelized materials shall be integrated into the development in a manner that achieves a seamless appearance.**

The proposed building is approximately 27' 10" tall at the highest point, with the building displaying varying materials that achieve a seamless appearance. A variety of building materials such as fiber cement

panels, CMU Type 1 and 2, and stone veneer will be incorporated into the design. The building will also include an aluminum storefront window system, metal capping and fascia, along with metal roofing and a heavy timber pergola. The west elevation of the building contains articulation to avoid a blank look. This includes areas of cement fiber siding broken up with areas of stone veneer extending to the cornice that ties the building together. The proposed design includes neutral earth toned colors and materials that are consistent with surrounding buildings.

4. A proposed development shall attempt to incorporate or enhance historic/heritage elements related to the specific site or surrounding area.

The proposed development does not incorporate or enhance historic/heritage elements related to the specific site or surrounding area.

<u>CMC 18.19.050.B Specific Principles:</u>

2. Commercial and Mixed Uses

a. On-site parking areas shall be placed to the interior of the development unless site development proves prohibitive. All on-site parking areas along adjacent roadways shall be screened with landscaping.

Onsite parking has been placed towards the interior of the site and landscaping has been utilized to provide screening from the street view. Additionally, a 10-foot L3 landscape buffer has been provided to screen the drive-thru car wash. A 5-foot, L2 landscape buffer is provided along the NE 13th Street frontage that will include trees and shrubs to screen the parking adjacent to the roadway.

b. Buildings shall be used to define the streetscape unless site conditions prove prohibitive.

The subject site is relatively flat with vegetation consisting of grass and scattered trees. The preliminary site plan shows the proposed building to be situated in the easterly portion of the site, providing building presence along the street frontages at the intersection of NE 13th Street and NE Friberg-Strunk Street.

c. Structures abutting, located in, or located near less intensive uses or zoned areas (such as commercial development next to residential areas) shall be designed to mitigate size and scale differences.

To help mitigate size and scale differences with existing single-family residences adjacent to the westerly side property line, the building is located on the easterly portion of subject property with a setback of approximately 80-feet and is screened with 15–20-foot landscape buffer.

d. Developments containing a multiple of uses/activities shall integrate each use/activity in a manner that achieves a seamless appearance or creates a cohesive development.

The proposed development achieves a seamless appearance and cohesive development.

e. Mixed-use development that places uses throughout the site (horizontal development) shall organize elements in a manner that minimizes their impact on adjacent lower intensity uses.

Not applicable as the proposal is not a mixed-use development.

f. Walls shall be broken up to avoid a blank look and a provided a sense of scale.

The building elevations provide visual interest and variety using different materials/colors and design elements that produce slight articulation to the front facades to include stepped parapets.

g. Outdoor lighting shall not be directed off-site.

The applicant's narrative indicates that the lighting plan meets the minimum safety standards and outdoor lighting will be shielded to prevent off-site light intrusion to the greatest extent possible. Landscape,

parking lot and/or building lighting shall be directed, hooded, or shielded away from surrounding properties and is conditioned as such.

18.37.030 – Architectural design standards.

C. Building materials.

a. **A minimum of seventy-five percent of the walls visible to the right-of-way (excluding glass) shall be indigenous such as cedar, wood logs, brick, stone, rusticated block, or comparable modular masonry are preferred. New materials that convey the texture, scale, color and finish similar to these natural products will be considered where appropriate. Large blank walls facing the right of way are prohibited.**

The building's façade is primarily comprised of stone veneer and fiber cement siding. As such, staff finds large blank walls have been avoided using varying materials and a vertical modulated building façade.

b. **Secondary materials such as metal siding may be used as accents and may compose twenty-five percent of the walls visible from the right-of-way (excluding glass).**

Metal accents are proposed via pre-finished metal coping at the top base of the buildings and steel canopies above aluminum storefront entries. Staff finds the proposed metal accents are in compliance with this requirement.

c. **Prefabricated metal buildings or structures are not permitted.**

Prefabricated metal buildings are not permitted, and therefore this criterion is not applicable.

d. **Glare reduction. All glazing must be low-reflective. Given the city's location near airports and within the Pacific Flyway, the use of tinted glass, tilted glass, or other bird-friendly glazing methods (See Exhibit 1) are preferred.**

The architectural elevations do not indicate whether the window glazing is low-reflective and therefore will be conditioned as such.

e. **Use muted earth tone colors for building and roof materials.**
   i. **Bright colors are only appropriate for accents.**
   ii. **A minimum of seventy-five percent of the exterior walls seen from the public right-of-way shall have muted tones.**

The proposed building elevation appears to show muted earth tone colors. Final colors should be reviewed and approved by city staff prior to building permit approval and conditioned as such.

D. Building massing and scale

a. **Provide a human scale to the primary entrance.**
b. **Express the position of each floor in the external design of the building by changing materials between floors, or use an expression line, or articulate structural elements.**
c. **Avoid large, panelized products or extensive featureless surfaces.**

The proposed building utilizes various building materials and muted colors to avoid the appearance of a large monotonous front facade. The building provides vertical modulations that are articulated by stone veneer, fiber cement siding and metal canopies above the primary entrances to provide a sense of human scale.

E. Roof form. Incorporate at least two of the following features to add architectural articulation:

a. **A flat roof with a parapet that screens rooftop equipment from view;**
b. **A cornice or molding to define the top of a parapet;**

c. **Overhanging eaves;**
d. **Sloping roofs with a minimum pitch of 4:12; and/or**
e. **Multiple roof planes.**

The building exhibits a vertical modulation on the portion of the building which exhibits a flat roof with a parapet and molding that defines the top of the parapet and therefore complies with this criterion.

F. All vents, flues, or other protrusions through the roof, less than sixteen inches in diameter need not be screened from view but must be painted or treated to blend with the color of the background. All such vents, flues, or other protrusions through the roof, more than sixteen inches in diameter shall be considered mechanical equipment and shall be screened from view.

Staff finds a condition of approval is required that any proposed mechanical equipment greater than 16-inches diameter should be screened from view and less than 16-inches in diameter should be painted or treated to blend with the structure.

G. Refuses/storage. Refuse areas and service/storage areas are to be located under cover, and/or not visible from the public right-of-way or adjacent properties.

Trash receptacles and service areas should be screened from the public right-of-way including adjacent properties and conditioned as such.

H. Fencing heights may exceed those specified at CMC Chapter 18.18-Supplemental Development Standards as follows. A wrought-iron fence, vinyl-coated chain link, masonry, stone, or a combination, may be up to six feet high along the front property line or within the front yard setback.

The preliminary site plan does not indicate any fencing for the proposed development.

I. Security fencing shall be compatible with landscaping of the entire site. Evergreen plant material will be located adjacent to security fencing and shall provide a vegetative screen when mature.

Security fencing, if proposed, should be compatible with landscaping of the entire site and conditioned as such.

J. Lighting. Lighting shall be directed to the interior of the site and shielded from adjacent properties. Building lighting is to be concealed and indirect.

Any landscape, parking lot, or building lighting should be directed, hooded, or shielded away from surrounding properties. Lighting specifications should be provided for city review and approval prior to building permit approval.

> **FINDING**: The proposed building design is generally in compliance with the Design Review Manual, the applicable design principles and guidelines of CMC Chapter 18.19 and CMC 18.37.030.C as conditioned.

CONCLUSIONS OF LAW

As conditioned in this staff report, this land development application has the ability to meet the requirements of Title 16 – Environment, Title 17 – Land Development, and Title 18 – Zoning of the Camas Municipal Codes.

DECISION

The consolidated application (SPRV23-06 and DR23-09) for the 13th Street Gas Station is approved based on the applicant's narrative, drawings, and technical reports, except as otherwise clarified or modified through the conditions of approval stated herein.

CONDITIONS OF APPROVAL

Standard Conditions:

1. Engineering site improvement plans shall be prepared in accordance with the City of Camas Design Standards Manual (CDSM) and CMC 17.19.040.
2. Per CMC 17.19.040.C.1 and 1.a: All utilities designed to serve the development shall be placed underground. Those utilities to be located beneath paved surfaces, including all service connections, shall be installed prior to application of any surface materials.
3. Installation of public improvements shall be in accordance with CMC 17.21 Procedures for Public Improvements.
4. The engineering site plans shall be prepared by a licensed civil engineer in Washington State and submitted to the City's Community Development Engineering Department for review and approval.
5. After the land-use decision is issued, the applicant is to submit the Civil construction plans via the online portal at www.cityofcamas.us/Permits/Civil Construction Application.
6. Community Development (CDEV) Engineering shall collect a total 3% plan review and construction inspection (PR&CI) fee for the proposed development.
    a. Payment of the 1% plan review (PR) fee shall be due <u>prior</u> to the start of the plan review process. Staff will provide the 1% fee amount.
    b. Payment of the 2% construction inspection (CI) fee shall be due <u>prior</u> to engineering plan approval and release of approved plans to the applicant's consultant. Staff will provide the 2% fee amount.
    c. Under no circumstances will the applicant be allowed to begin land-disturbing activities prior to engineering plan approval.
7. If applicable, existing wells, septic tank, and septic drain fields shall be decommissioned in accordance with state and county guidelines, per CMC 17.19.020.
8. Prior to any land-disturbing activities of an acre or more, the applicant shall submit a copy of the *NPDES General Construction Stormwater Permit* (GCSWP), which is issued by the Washington State Dept. of Ecology, and the *Stormwater Pollution Prevention Plan* (SWPPP), which is required as a component of the NPDES GCSWP permit.
9. Prior to commencing any land-disturbing activities of an acre or more, the applicant shall submit an Erosion Control Bond in the amount of 200% of the cost for erosion control measures, per CMC 14.06.200.
10. If any item of archaeological interest is uncovered during a permitted land-disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
11. Fire permit(s) and inspections are required by the Fire Marshal's Office for this project.
    a. Plans, specifications, and other information as may be necessary to determine compliance with fire and life safety code and standards shall be submitted with permit.

b. Contact the Fire Marshal's office at 360-834-6191 for submittal information.

12. Fire permit forms and submittal instructions are available online or can be picked up at the Fire Marshal's office at 605 NE 3rd Avenue.
13. A building permit shall be required prior to commencement of construction of a building structure.
14. At the time of building permit issuance, the applicant shall pay the appropriate impact fees in accordance with the provisions of CMC 3.88.
15. Prior to final acceptance, the applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering.
16. As a component for final acceptance, final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. The as-built cover sheet is to be the originally approved cover sheet signed by the City Engineer.
    b. As-builts are to be submitted as PDFs.
    c. As-builts are to be submitted in either AutoCad or Carlson formats.
17. Per CMC 17.21.050.B.2 and prior to final acceptance a 2-year warranty maintenance bond is to be submitted for all public improvements.
    a. Per CMC 17.21.070.A Upon final acceptance of the development improvements the two-year (2) warranty bond commences.
18. Per CMC 17.21.070.E A letter of final acceptance will be issued once all items listed in 17.21.070.B-C have been completed, submitted, reviewed, and approved by the city.
19. Per CMC 18.18.070.B, prior to issuance of final occupancy permits, all public and private improvements shall be completed in accordance with CMC 17.21.070 Final Acceptance.
20. The applicant will be responsible for maintenance of all on-site private improvements, including but not limited to the private water and fire line system, the private sanitary sewer system, the on-site stormwater facilities, the parking areas, pedestrian pathways, lighting, and landscaping.
21. Unless construction of this site commences within two (2) years of issuance of this decision, this permit will expire.

Special Conditions:

<u>Prior to Engineering Plan Approval:</u>

Planning:

22. The applicant shall comply with the following SEPA23-12 conditions, including Department of Ecology, Southwest Clean Air Agency, and Washington Department of Fish and Wildlife:
    - Department of Ecology
        a. Review "Dangerous Waste Rules for Demolition, Construction and Renovation Wastes" posted on Ecology's website.
        b. Perform one or more site visits that coincide with the normal wet portion of the growing season to ensure absence of wetland indicators.
    - Southwest Clean Air Agency
        c. Prior to demolition, a thorough asbestos inspection must be conducted by an AHERA-certified inspector in order to determine the presence of asbestos containing materials. A copy of the asbestos inspection report must be posted for viewing at the project site.

d. Comply with Construction Dust General Regulations for Air Pollution Sources.

e. Comply with Registration, Notification, and Permitting of Air Pollution Sources. The proposed project will likely require an ADP from Southwest Clean Air Agency. Contact Agency permitting engineer at 360-574-3058 to discuss project, equipment requirements, and need to obtain ADP before dispensing gasoline.

- Washington Department of Fish & Wildlife

  f. Comply with WDFW's "Washington's Priority Habitats: Best Management Practices for Mitigating Impacts to Oregon White Oak Priority Habitat" with an updated mitigation plan that aligns with adopted guidance document.

23. Prior to Engineering Plan approval, the project is required to go through Design Review Committee for review and input.
24. Prior to Engineering Plan approval, a final landscape, tree, and vegetation plan consistent with the landscaping standards in CMC 18.13 shall be submitted to the city for review and approval to include the following but not limited to:
    a. Lawns, if proposed, shall consist of drought-tolerant grasses per CMC 18.37.040.G.
    b. The planting legend shall identify the 15-gallon container size for the deciduous trees consistent with CMC 18.13.050.C.2.
    c. Parking lot planter islands shall comply with the minimum 8'x 8' planter area requirement.
    d. Wheel stops shall be installed adjacent to planter areas per CMC 18.13.060.F, including installation of wheel stops adjacent to sidewalks to allow for a clear pedestrian pathway and to protect pedestrians from car overhangs.
    e. The final landscape plan shall provide a minimum of 19 total tree units for the proposed project and in compliance with CMC 18.13.051(A) Table 1.
    f. Street trees within the right of way shall not be removed without City review and approval and mitigation may be required at the discretion of the City.
    g. The planting specifications and landscape notes in the Camas Design Manual shall be included on the final landscape plan.
25. The applicant shall take appropriate measures to ensure landscaping success for a minimum of three years after issuance of Certificate of Occupancy. If plantings fail to survive, the property owner shall promptly replace them.
26. Trash receptacles and service areas shall be screened from the public right-of-way including adjacent properties and shown on the final engineering plans.

Engineering:

[Roads]

27. The applicant is to submit site plans with the following revisions:
    a. Maintain, at a minimum, the existing westbound thru-lane width.
    b. Provide a dedicated left turn lane onto the site.
    c. Maintain the eastbound thru-lane and eastbound bike lane.
    d. Maintain the dedicated right-turn lane onto NW Friberg-Strunk Street.
    e. The future sidewalk along the frontage is to be a detached sidewalk with planter strip and curb & gutter from the end of the existing curb return and extended the full length of the future frontage to the west end of Parcel no. 176148000.

f. The drive access width is to be reduced to a maximum width of 40-feet for personal motorist access, with mountable curb and a concrete island on either side of the drive access to allow for truck accessibility. ADA access must be maintained across the entire driveway opening.
g. A full-depth road section is required from the northside of the left-turn lane to the face of curb along the frontage improvements.

28. The applicant is to dedicate sufficient right-of-way to construct the following improvements:
    a. The dedicated left-turn lane, the eastbound thru-lane, the eastbound bike lane, the dedicated right-turn lane onto NW Friberg-Strunk Street, curb & gutter, minimum 6-foot-wide planter strip, and 6-foot-wide detached sidewalk.

29. The site plans for the proposed development are to be revised and resubmitted with the dedicated left-turn lane into the site as a requirement for support of the deviation request from the minimum access spacing standards on an arterial from the city engineer.

[Transportation]

30. The applicant is to add the following notes to the site plans:
    a. Fueling trucks and delivery trucks are restricted to the hours between 7:00 PM and 7:00 AM.
    b. Fueling trucks are restricted to right-in/right-out movements from and onto NE 13th Street when exiting the site.

31. The applicant is to submit a signing and striping plan for onsite, including the driveway ingress and egress lanes; and offsite, including for the dedicated left-turn lane into the site, the dedicated right-turn only lane onto NW Friberg-Strunk, the eastbound through lane, and the dedicated through bike lane.

[Sanitary Sewage]

32. The applicant is to submit to the City for review and approval, the design, specifications, and sizing calculations for the proposed STEP tank and oil/water separator. The design for the oil/water separator is to include H-25 traffic-rated lids.

33. A note is to be added to the engineering plans stating that all components of the onsite private sanitary sewer system, including but not limited to the STEP tank, the sanitary catch basins, and the oil/water separator shall be privately owned and maintained by the property owners, with a right-of-entry granted to the city for inspection purposes.

[Stormwater]

34. The applicant is to revise the preliminary stormwater report in accordance with the *2024 Stormwater Maintenance Manual for Western Washington (SWMMWW*) and submit as a final stormwater report (TIR) for review and approval.

35. The applicant is to submit a complete set of stormwater plans for review and approval in accordance with CMC 14.02, CDSM, and Ecology's *2024 SWMMWW*, per MR #1.

36. A note is to be added to the stormwater plans stating that "all components of the onsite stormwater system are to be owned and maintained by the property owner, with right-of-entry granted to the city for inspection purposes.

37. The applicant is to submit a revised stormwater report (TIR) that addresses both the onsite and the offsite treatment measures for stormwater runoff from all the new and existing pollution generating surfaces, per MR #6.

38. Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to submit revised stormwater plans that provide for treatment of both the onsite and the offsite stormwater runoff, per MR #6.

39. The applicant is to revise and resubmit the preliminary stormwater report addressing the new plus replaced hard surface areas constructed with the frontage improvements on NE 13th Street, per MR #7

40. The applicant is required to provide a location on the engineering plans as a designated concrete washout area during construction of the building.

[Water]

41. The applicant is to revise the water utility plans to include an above-ground reduced pressure valve assembly (RPBA) that is to be installed behind the water meter and is to be accessible for testing and inspections.

42. The applicant is to verify that the existing water service referenced as an existing irrigation meter and backflow prevention device is a service stub only for the benefit of the proposed development and not the irrigation service, meter, and backflow prevention device for the landscape improvements along NW Friberg-Strunk Street.

43. The applicant is to submit revised onsite water plans for review and approval with the following revisions:
    a. The irrigation meter and backflow prevention device are to be located adjacent to the public right-of-way.
    b. The water utility and the landscape plans are to include the locations and sizes of both the domestic water meter and the irrigation meter with backflow prevention devices.

44. The applicant is to submit revised onsite water plans that include the proposed location of the fire line, fire hydrant, and the location of the Fire Department Connection (FDC) as the FDC is to be located within 75-ft of a fire hydrant, per fire code.

45. Fire permit(s) and inspections are required by the Fire Marshal's Office for this project.
    a. Plans, specifications, and other information as may be necessary to determine compliance with fire and life safety code and standards shall be submitted with permit.
    b. The NFPA24 Fire Main Underground Permit is required for fire line installation beyond the right-of-way.
    c. Contact the Fire Marshal's office at 360-834-6191 for submittal information.
    d. Fire permit forms and submittal instructions are available online or can be picked up at the Fire Marshal's office at 605 NE 3rd Avenue.

46. A note is to be added to the engineering plans, which states 'All private fire hydrants are to be ordered from the factory and painted powder coated red.'

47. A note is to be added to the engineering plans, which states that the onsite private water system, including the domestic water line; the fire line, including private fire hydrant; and the irrigation system are to be owned and maintained by the property owner.

[Erosion Control]

48. The applicant is to submit with the *Civil Construction Application* permit, a set of Erosion Sediment Control (ESC) plans for review and approval.

[Public Utilities]

49. The applicant is to submit for review and approval street lighting plans in accordance with the Camas Design Standards Manual (CDSM), Section III Design Standards for Street Lighting along the NE 13th Street frontage improvements.

[Private Utilities]:

50. A note will be added to the stormwater plans stating that the applicant will be responsible for the operation and maintenance of the on-site private stormwater treatment and conveyance system with a right-of-entry granted to the city for inspection purposes.

51. Notes will be added to the utility and landscape plans stating that the applicant will be responsible for the maintenance of all other on-site private improvements, including but not limited to, the private water and fire line system, the private irrigation system, the private sanitary sewer system, the parking areas, lighting, and landscaping.

<u>Prior to Any Land-disturbing Activities:</u>

Engineering:

52. The applicant is to revise and submit an updated SWPPP, that includes the contact information for the Contractor, CESCL, or the plans for erosion and sediment control, per MR #2.

53. The applicant is to provide copies of Ecology's NPDES General Construction Stormwater Permit (GCSWP) and the Erosion and Sedimentation Control (ESC) bond, prior to any land-disturbing activities.

54. The applicant is to provide an Erosion Control Bond in the amount of 200% of the cost for ersion control measures.

<u>Prior to Final Acceptance:</u>

Planning:

55. Landscaping and irrigation shall be installed or bonded prior to final acceptance.

Engineering:

56. Prior to final acceptance, the applicant is to verify that the vision clearance / site distance triangle requirements have been met.

57. Prior to final acceptance, final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. As-builts are to be submitted in PDF format.
    b. As-builts are to be submitted in either AutoCad or Carlson formats.
    c. The originally approved and signed cover sheet is to be included with the as-builts.

58. Prior to final acceptance the 2-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A.

<u>Prior to Building Permit Approval:</u>

Planning:

59. Prior to building permit approval, all window glazing shall be low-reflective and noted on the architectural elevations.

60. Any proposed mechanical equipment greater than 16-inches diameter shall be screened from view and less than 16-inches in diameter shall be painted or treated to blend with the structure.

61. Prior to Building Permit approval, lighting specifications shall be provided for city review and approval. Landscape, parking lot and/or building lighting shall be directed, hooded, or shielded away from surrounding properties.
62. Building materials shall be in conformance with the design review approval. Building colors shall be reviewed and approved by the City prior to building permit approval.

Engineering:

63. Prior to Building Permit approval, the applicant is to pay the applicable City of Camas Transportation Impact Fee (TIF) amount during the year the building permit is submitted * 81 PM Peak Hour Trips.
64. Prior to Building Permit approval, the applicant is to provide the City of Camas Building Dept. verification of payment of the proportionate share fees, in the amount of $153,050.00, to the City of Vancouver.
65. Per CMC 18.18.080, This decision will expire 2-years from date of issuance if construction on the project has not commenced.

DATED this 16th Day of September 2024

_____

Yvette Sennewald, Senior Planner

Community Development Department
616 NE 4th Ave. | Camas, WA 98607

NOTICE OF DECISION

13TH STREET GAS STATION (FILE NO. SPRV23-06)

(CONSOLIDATED FILES: ARCH23-07, CA23-08, DR23-09, SEPA23-12)

DECISION ISSUED: September 16, 2024

CITY STAFF CONTACT: Yvette Sennewald, Senior Planner
Phone: (360) 817-1568
Email: communitydevelopment@cityofcamas.us

APPLICANT: Taz Khan: tkhanusa@gmail.com
PLS Engineering: pm@plsengineering.com

LOCATION: The property is located on the southwesterly corner of the intersection at NE 13th Street and NW Friberg-Strunk Street. The parcel number is 176148000, situated in the NW 1/4 of Section 29, Township 2 North, Range 3 East of the Willamette Meridian, Clark County.

THIS IS TO SERVE AS NOTICE that a decision of APPROVAL has been rendered for a Type II Site Plan Review Application for the **13th Street Gas Station**. The proposal includes the construction of an 8-pump gas station, a 4,100 square-foot convenience store, and a drive-thru car wash, located at 20101 NE 13th Street, in the BP - Business Park Zone.

A detailed staff report and decision with conditions of approval, including application materials, are available upon request. See City staff contact information above.

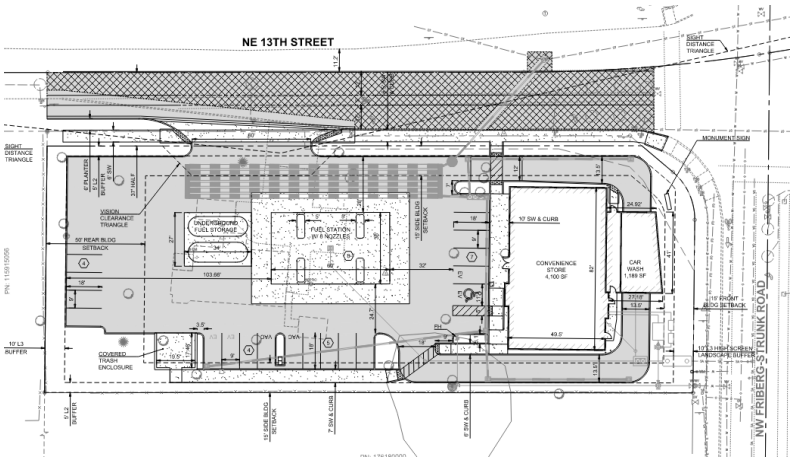
APPEAL PROCEDURES:

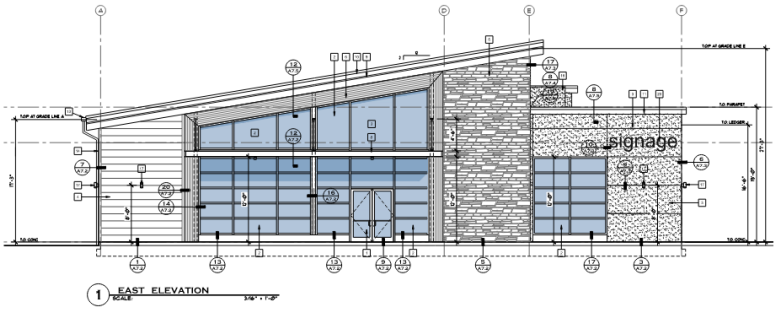
Decisions may be appealed to the hearing examiner. All appeals are initiated by filing a notice of appeal with the appeal fee of $456.00 to the Community Development Director within fourteen (14) days of issuance of the decision being appealed.

The notice of appeal shall be in writing and contain the following information:

(1) Appellant's name, address, and phone number;
(2) Appellant's statement describing his or other standing to appeal;
(3) Identification of the application which is the subject of the appeal;
(4) Appellant's statement of grounds for the appeal and the facts upon which the appeal is based;
(5) The relief sought, including the specific nature and extent;
(6) A statement that the appellant has read the notice of appeal and believes the content to be true, followed by the appellant's signature.

13th Street Gas Station





Karin L Nosrati
20107 NE 14th Street
Camas, WA 98607
360-254-1585

On behalf of the residents of Morning Meadows Estates, residents of Katie's Hill and residents of Evergreen Acre Tracts, I am appealing the approval of a project called 13TH STREET GAS STATION (FILE NO. SPRV23-06). We live in single family residences adjacent to the project.

The project is called 13TH STREET GAS STATION (FILE NO. SPRV23-06)

This project has potential to

- Pollute open waters in the vicinity, increasing concerns about management of the Lacamas Lake watershed.
- Endanger safe drinking water supply of immediate neighbors on wells
- Create noise and light pollution that would interfere with the quiet enjoyment of residences in nearby neighborhoods
- Permit the construction of a car wash in a BP zoning, potentially violating zoning requirements. Camas has previously only permitted car washes in CC zoning. A car wash is not listed in the City of Camas Code of Ordinances
- Create a dangerous intersection with multiple safety concerns: Ingress and egress is proposed where there is poor visibility due to the topography of the Goodwin Road hill and it's near 90 degree turn; insufficient braking distance to avoid a crash; disrupt traffic including school bus traffic to nearby high school
- Expose the City of Camas to liability for granting an exception to the posted Access Standards if permitting a left turn access shorter than 660 ft into the parcel.
- Disrupt recreational use of the designated bicycle route; create a hazardous crossing for pedestrians, including students

Deny approval of this project or allow with the following modifications

- Require 300 ft distance from nearest drinking water wells and open bodies of water to underground storage tanks
- Require the project development owner to conduct a baseline comprehensive chemical drinking water well inspection of nearby wells. Thereafter the gasoline station owner shall be required to perform annual well inspections and if pollutants are detected, they must be remedied.
- Conduct a geological test that verifies the movement of ground water of the existing wells
- Lower the floor/topography of the filling stations 2 ft. below street level to contain spills and vehicle drips to the property to prevent their release to the street during heavy rains

and ice melts, which are common at this intersection and to prevent run-off to property to the north

- Conduct an updated traffic study that accounts for the new warehouse, the new residential traffic east (Goodwin/Green Mountain), Union High School traffic, the new Oak Tree Station, the new Business Park mall buildings on NW Friberg-Strunk St., and to include the traffic impact of Harmony Sports Complex.
- City of Camas to decline the request from the developer to allow a deviation from the City's Access Spacing Standards (Resolution 17-005) and setback requirements
- Only allow a right turn ingress to the project by building a concrete divider in the center of NE 13th Street, to block dangerous left turns
- Require separate ingress and egress for better traffic flow, including a primary exit to NW Friberg-Strunk St.
- Provide an updated circulation plan that describes stacking of cars waiting for a pump and how it would not interfere with traffic on this arterial
- Conduct a separate SEPA study for the carwash facility because the current SEPA addresses mostly the gas station
- Correct and update the Wetland Buffer Bank Use plan, as it omits the wetland to the south and was conducted without access to the wetland or spring on the adjacent property to the west.
- Remove car wash from the project
- Reduce the size of the convenience store due to estimated traffic to the location; limit operation and sales hours for alcohol due to proximity to high school.
- Post signs on project property reminding patrons of City of Camas' noise ordinance. No noise should be added to the surrounding neighborhoods.
- Erect a 12 ft noise and light barrier wall for neighbors to the west, east and north to diminish noise and light pollution
- Establish a litter control plan, including graffiti clean-up, and funding into perpetuity for twice-per-week trash collection along all four roads for 1000 ft.
- Operating hours of the gas station shall be in compliance with BP zoning, including all gasoline tanker trucks filling gasoline and all deliveries. There should be no night time noise generated.
- Require payment to well owners for a well inspection upon project construction start date. Homeowners along 13th Street and adjacent Streets in a ½ mile radius of a gas station, will incur the additional expense of a well inspection during the sale of their property to an FHA buyer due to the underground storage tank.
- Submit a decommissioning plan to address end-of-life of the gas station
- Require all provisions and responsibilities to transfer to subsequent owners of the gas station.

I have read the appeal and believe the content to be true.

Karin L. Nosrati

Please note: We request permission to submit a rebuttal to the traffic study at a later date, given the short period of time since your decision on September 16, 2024.

All previously submitted information/comments shall be part of this appeal.

The following neighbors would like to be included in the appeal and receive an invitation to the hearing:

Judith WILSON

20008 NE 11TH ST
CAMAS WA, 98607

Norma and Ernie HARRISON

20002 NE 11TH ST
CAMAS WA, 98607

Don LINGLE

19912 NE 11TH ST
CAMAS WA, 98607

Jeff and Keli GOERTZEN

20009 NE 14TH ST
CAMAS WA, 98607

Greg and Shannon CONNELL

20002 NE 14TH ST
CAMAS WA, 98607

Ken and Lisa WALTOS

20106 NE 14TH ST
CAMAS WA, 98607

Joan and Richard RICKARD

1417 NE 202ND AVE
CAMAS WA, 98607

Ruth and William SMALL

20217 NE 16TH ST
CAMAS WA, 98607

Heidi and Butch PARKER

20103 NE 16TH ST
CAMAS WA, 98607

SOLDATI MELISSA

19915 NE 16TH ST
CAMAS WA, 98607

Lisa and Mike OGDEN

19916 NE 16TH ST
CAMAS WA, 98607

Kristin Price

19813 NE 13TH ST
CAMAS WA, 98607

Anthony BRAUNSTEIN

19700 NE 11TH ST
CAMAS WA, 98607

Lisa and Michael MCCOLM

19606 NE 11TH ST
CAMAS WA, 98607

Sam WEBER

19514 NE 11TH ST
CAMAS WA, 98607

Stan GHEZZI

19504 NE 11TH ST
CAMAS WA, 98607

Beverly TERRY

19410 NE 11TH ST
CAMAS WA, 98607

Troy TIBBS

19505 NE 11TH ST
CAMAS WA, 98607

MARTIN LYNN E

19701 NE 11TH ST
CAMAS WA, 98607

Linda SHREVES

19805 NE 11TH ST
CAMAS WA, 98607

Rodney SMITH

19813 NE 11TH ST
CAMAS WA, 98607

Tressia and Max MORROW

19821 NE 11TH ST
CAMAS WA, 98607

Alan JOHNSTON

20003 NE 11TH ST UNIT 38
CAMAS WA, 98607

Tim LOY

20009 NE 11TH ST
CAMAS WA, 98607

Tony AGOLIO

19717 NE 11TH ST
CAMAS WA, 98607

Lee and Julie BOLLING

19607 NE 11TH ST
CAMAS WA, 98607

Kylene and Harold STENGEL

19411 NE 11TH ST
CAMAS WA, 98607

Kerry and Carol BASKIN

19403 NE 11TH ST
CAMAS WA, 98607

Jim Hughes
19812 NE 11TH ST
CAMAS WA, 98607

Tim and Julie LOY

20009 NE 11TH ST
CAMAS WA, 9860

Steve and Jeanette MURPHY

20007 NE 16TH ST
CAMAS WA, 98607

Brittany and Jonathan BOZARTH

19821 NE 13TH ST
CAMAS WA, 98607

Chris Yetter
20210 NE 16th
CAMAS, WA 98607

Karin and Randy NOSRATI (Appellant)
20107 NE 14th Street
Camas, WA 98607

Community Development Department

Notice of Public Hearing

Appeal of Decision for SPRV23-06: 13th Street Gas Station

Planning Case APPEAL24-1001

A public hearing will be held on **Thursday, November 14, 2024 at 4:30 p.m.,** or soon thereafter, before the City's Hearings Examiner to consider the appeal of the decision for the 13th Street Gas Station (SPRV23-06). The public hearing will be held remotely and in person at city hall. The proposal includes the construction of an 8-pump gas station, a 4,100 square-foot convenience store, and a drive-thru car wash, located at 20101 NE 13th Street, in the BP - Business Park Zone. The application was determined technically complete on November 7, 2022. A Notice of Decision for the project approval was issued on September 16, 2024. An appeal of the decision was received on September 30, 2024.

Questions/Comments: The public hearing will follow the quasi-judicial process described within Camas Municipal Code §18.55.180. Comments related to this development may be submitted as follows: (1) In person by testifying at the public hearing; (2) by regular mail to Community Development Department staff, Yvette Sennewald, Senior Planner, at Camas City Hall, 616 Northeast Fourth Avenue, Camas, WA 98607; (3) by phone at (360) 817-1568; or (4) by email to: communitydevelopment@cityofcamas.us. It is preferable that written comments be received at least five working days prior to the public hearing, in order to be available with the online agenda and materials. After the agenda has been posted online, all other written comments must be received no later than noon (12:00 p.m.) the day of the hearing, in order for those comments to be handed to the Hearings Examiner by Staff. Written and oral comments may also be submitted in person during the hearing.

Application Materials: The application included the following: project narrative, development plans and environmental reports, as required for a complete application pursuant to Camas Municipal Code (CMC) §18.55.110. The application materials are also available for viewing at the Community Development Department (616 NE 4th Avenue, Camas, WA) during regular business hours Monday – Friday 8 a.m-5 p.m.

Participate: All citizens are entitled to have equal access to the services, benefits, and programs of the City of Camas. Please contact the **City Clerk at (360) 817-1591** for special accommodations if needed. The city will provide translators for non-English speaking persons who request assistance at least three working days prior to a public meeting or hearing.

More Information: The public hearing agenda and supporting documents will be available for review on the City's website at the "Minutes, Agendas & Videos" link within the drop-down menu that is labeled "Your Government" or follow this link: http://www.cityofcamas.us/yourgovernment/minuteagendavideo.

Published in the Post Record on October 31, 2024 Legal Publication# 945930
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to parties of record on October 30, 2024

13th Street Gas Station (APPEAL24-1001)
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5	Narrative	11/9/23
6	Public Health Review Letter	11/9/23
7	SEPA Checklist	11/9/23
8	Geotechnical Report	11/9/23
9	Preliminary TIR	11/9/23
10	Traffic Report	11/9/23
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13	Oak Mitigation	11/9/23
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18	Preliminary Utility Plan	11/9/23
19	Preliminary Grading Plan	11/9/23
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22	Final Landscape Plan	11/9/23
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