PLANNING COMMISSION MEETING

Monday, September 25, 2023 at 6:30 PM
Sandy City Hall and via Zoom

AGENDA

TO ATTEND THE MEETING IN-PERSON:

Come to Sandy City Hall (lower parking lot entrance) - 39250 Pioneer Blvd., Sandy, OR 97055

TO ATTEND THE MEETING ONLINE VIA ZOOM:
Please use this link: https://us02web.zoom.us/j/87946600594

Or by phone: (253) 215-8782; Meeting ID: 879 4660 0594

ROLL CALL

APPROVAL OF MINUTES

1. Approval of Minutes for June 26, 2023

REQUESTS FROM THE FLOOR - CITIZEN COMMUNICATION ON NON- AGENDA ITEMS

The Commission welcomes your comments at this time. Please see the instructions below:

-- If you are participating online, click the "raise hand" button and wait to be recognized.

-- If you are participating via telephone, dial *9 to "raise your hand" and wait to be recognized.

DIRECTOR'S REPORT

COUNCIL LIAISON AND PLANNING COMMISSIONER DISCUSSION

NEW BUSINESS

2. 23-020 DR/CUP/VAR/FSH/TREE Sandy Community Campus Park

ADJOURN

Americans with Disabilities Act Notice: Please contact Sandy City Hall, 39250 Pioneer Blvd. Sandy, OR 97055 (Phone: 503-668-5533) at least 48 hours prior to the scheduled meeting time if you need an accommodation to observe and/or participate in this meeting.

Sandy Planning Commission
Regular Meeting
Monday, June 26, 2023

Chair Crosby called the meeting to order at 6:30 p.m.

1. MEETING FORMAT NOTICE: Instructions for electronic meeting

2. ROLL CALL

Commissioner Wegener – Present
Commissioner Poulin – Present
Commissioner Lee Weinberg– Present
Commissioner Ramseyer – Present
Commissioner Myhrum – Absent
Chairman Crosby – Present

Council Liaison Mayton – Present

Others present: Development Services Director Kelly O'Neill Jr., Executive Assistant Rebecca Markham, City Attorney Josh Soper

3. APPROVAL OF MINUTES – May 22, 2023
Chair Crosby asked for any edits to the draft minutes. With no requested edits, Crosby declared the minutes approved.

4. REQUESTS FROM THE FLOOR – CITIZEN COMMUNICATION ON NON-AGENDA ITEMS:
None

5. PLANNING COMMISSION VICE-CHAIR APPOINTMENT
Chairman Crosby asked for nominations to replace the Vice-Chair position that was held by Commissioner Hook through the remainder of the year. Lee Weinberg self-nominated and with no other nominations it went to a vote.

Motion: Motion to select Lee Weinberg as the Planning Commission Vice-Chair.
Moved By: Commissioner Lee Weinberg
Seconded By: Commissioner Wegener
Yes votes: All Ayes
No votes: None
Abstentions: None

6. CITY COUNCIL LIAISON REPORT
Council Liaison Mayton said that the Sandy Community Campus Park bid has closed, and he is excited to see this project move forward. Mayton also mentioned the success of the "Longest Day Parkway" event that was attended by over 350 people on June 22.

7. DIRECTOR'S REPORT
Development Services Director O'Neill explained that the adoption of the budget for the next two years allowed the department to recruit and fill two new positions. The Senior Planner position

has already been posted and the second position for the Code Enforcement officer is in the works. O'Neill mentioned the Police Department will continue to have a code enforcement officer and a robust webpage will be created to help people looking to file an inquiry or complaint.

O'Neill updated the Commission on the moratorium, upcoming meeting dates, and the posting for the open seat that was formerly held by Commissioner Steven Hook. O'Neill also mentioned the turnaround for the new Commissioner will hopefully be quick so the new commissioner can participate at an August meeting.

Commissioner Lee Weinberg provided a brief update on two house bills. She said that House Bill 3395 was passed and will require changes to some regulations for affordable housing. O'Neill said the City will be addressing as many house and senate bill provisions as possible during the Clear and Objective Audit.

8. NEW BUSINESS:

8.1 Cascade Creek Mixed-Use Development (22-039 DR/VAR/MP/TREE):
Chair Crosby opened the public hearing on File No. 23-039 DR/VAR/MP/TREE at 6:44 p.m. Crosby called for any abstentions, conflicts of interest, ex-parte contact, challenges to the jurisdiction of the Planning Commission, or any challenges to any individual member of the Planning Commission. No challenges were made. Commissioner Wegener said he went by the site during the Longest Day Parkway event on June 22, 2023.

Staff Report:
Director O'Neill provided a presentation that included the vicinity map, code chapters analyzed, noticing, and explained the application wasn't subject to the moratorium as it was submitted prior to October 3, 2022. In O'Neill's presentation he also went through the site proposal, building layouts, zoning regulations, the partition request, and other site amenities. O'Neill also explained the applicant's four requested variances and right-of-way modifications that were included as recommendations in the staff report. Lastly, O'Neill said the project meets the development code criteria for partitions, design review, density, and height while still achieving some major goals consistent with the City's long range planning objectives. O'Neill said staff recommends the Planning Commission approve the design review, major partition, and four variances.

Applicant's Presentation:
Meghan Howey
BCRA Design
2106 Pacific Avenue, Suite 300
Tacoma, WA 98402
Ms. Howey said Director O'Neill did a great job summarizing the project and did not want to be redundant discussing what O'Neill already covered.

Zac Baker
DPS LLC
Development Manager
1911 65th Avenue West
Tacoma, WA 98466
Mr. Baker thanked City staff and said that he appreciated working with them. Baker stated that Director O'Neill did a great job presenting the project and echoed what Howey said.

Public Testimony in favor:
Jerry Jones
38330 Highway 211
Sandy, OR 97055
Mr. Jones said he bought his property 34 years ago and was involved with the Bornstedt Village Overlay project. He said he's in favor of this application as he understands the Governor has declared a 36,000-housing unit per year goal and doesn't see how that can happen without projects like this. His only concern is Pine Street extending to Highway 211, but is encouraged to hear that the City's Transportation Engineer and City staff agree on not connecting Pine Street to Highway 211. Other than his concern with Pine Street, he'd like to see this project move forward as quickly as possible.

Public Testimony against:
Roy Shelby
38420 Highway 211
Sandy, OR 97055
Mr. Shelby told the Commission that his property is the one-acre parcel to the east of the development site. Sheldon asked to have a point-person with either staff or the developer if questions arise during construction. He also has concerns over crime, parking, and Pine Street. Sheldon asked for an amendment to Pine Street as it's directly on his property line and within three feet of his shop, and fifteen feet from his house. Sheldon said that developing Pine Street would cause the removal of five healthy trees and a green strip up the right-of-way that he would like to see stay.

Public Testimony neutral:
Jamie Grandy
19019 Dublin Avenue
Sandy, OR 97055
Ms. Grandy said she didn't receive a notice in the mail and only found out about the project through the City newsletter. Ms. Grandy voiced her concerns about increased traffic, crime, and parking issues. Grandy also had concerns about more people using Bornstedt Park when it's still not fully developed. She said she is not happy about this development.

Staff Recap:
Development Services Director O'Neill agreed with Mr. Shelby and Mr. Jones that extending Pine Street north to Highway 211 is problematic, especially with the current rate of speed that has been documented. He suggested the Commission require sidewalks, curbs, and street trees even if they don't require asphalt at this time. Commissioner Wegener asked if a fee-in-lieu could be used instead of constructing the asphalt section of the road at this time. O'Neill said that a fee in-lieu could potentially work, but his only concern is the amount of money we'd collect today would be less than what the asphalt improvements would cost in the future. In response to saving the trees next to Mr. Shelby's property, O'Neill explained that if the Commission grants a fee-in-lieu tonight in place of asphalt on Pine north, those trees could be saved for now.

O'Neill responded to the concerns over the code compliance issues and said he hopes when the new Code Enforcement officer is hired that hopefully more code violations can be addressed.

In response to Ms. Grandy not receiving her notice in the mail, O'Neill said the mail labels are

compiled by a title company, not the City. O'Neill suggested contacting the County Tax Assessor's office in Oregon City.

Finishing the recap, O'Neill agreed that Bornstedt Park hasn't been built to its full vision and if this project is approved, the City would be able to collect about half a million dollars in parks SDC fees which could possibly be used to upgrade Bornstedt Park.

Applicant Rebuttal:

Zac Baker
DPS LLC
Development Manager
1911 65th Avenue West
Tacoma, WA 98466

Mr. Baker said he echoes what O'Neill mentioned in his rebuttal about the perks of this development such as the parks fee and the roadway improvements on Cascadia Village Drive and Village Blvd. Baker concluded by saying he appreciated everyone's comments and took notes on their feedback.

Discussion:

Commissioner Lee Weinberg asked O'Neill that given the impact on the neighborhood if the Commission could require a substantial portion of the parks SDC fees be used for Bornstedt Park. O'Neill said it's a great question but doesn't believe it can be put in the Final Order and referred the question to City Attorney Sopher. Sopher stated it would be outside the scope of the decision and explained that when to use SDC funds are a City Council decision. Sopher suggested the Commission make a separate motion or recommendation asking City Council to set those funds aside for Bornstedt Park.

Chairman Crosby asked staff to confirm that any improvements they don't require now on Pine Street would be more difficult to collect in the future. O'Neill confirmed and said it could eventually cost the city more out of pocket to complete those improvements but agreed with Wegener that a fee-in-lieu would help recover those costs.

Commissioner Wegener asked about recreation space that is constructed on property in another zoning district with different density requirements. O'Neill said the code is silent on it, but staff is requiring the applicant to legally tie parcel 2 and parcel 3 together with a restrictive covenant.

Chairman Crosby next addressed the Pine Street improvements that some neighbors voiced concerns over. It was decided to modify Pine Street north to have the curb extend all the way north to the back of the sidewalk on Highway 211 as well as remove the requirement of asphalt on Pine Street north and have the applicant pay a fee-in-lieu as agreed in an engineer estimate.

Motion: Motion to close the public hearing at 7:59 p.m.
Moved By: Commissioner Wegener
Seconded By: Commissioner Lee Weinberg
Yes votes: All Ayes
No votes: None
Abstentions: None

Commissioner Lee Weinberg had concerns over the condition that states roofing could or should include wood shingles. Lee Weinberg said that given wildfire concerns, we should

remove wood shingles as an option. It was decided to modify the condition to remove wood shingles as an option.

Chairman Crosby mentioned a few spelling errors in the staff report.
1) Page 16, Finding 29: Carries – spelling error
2) Page 33, Finding 111: Met – spelling error

Commissioner Wegener had concerns over the mitigation and retention trees being planted on one lot and how that would work if in the future only one lot sold. O'Neill said that any parcel with retention or mitigation trees will be encumbered by a recorded tree protection covenant that runs with the land and is identified on the title.

Motion: Motion to approve File No. 23-039 DR/VAR/MP/TREE Cascade Creek Mixed-Use Development, along with the four variances, conditions as stated in the staff report, and changes as noted by the Commissioners along with the adjustment to Pine Street north to require curb, sidewalk, and street trees with a fee in-lieu for the asphalt.
Moved By: Commissioner Wegener
Seconded By: Commissioner Ramsayer
Yes votes: Wegener, Ramseyer, Lee Weinberg, Poulin, and Crosby
No votes: None
Abstentions: None

The Commission discussed the percentage of parks SDC fees from this project they would like to ask Council to set aside for Bornstedt Park.

Motion: Motion to make a recommendation to City Council that the majority of the parks SDC's collected from the Cascade Creek Mixed-Use Development be used for improvements at Bornstedt Park.
Moved By: Commissioner Wegener
Seconded By: Commissioner Ramsayer
Yes votes: All Ayes
No votes: None
Abstentions: None

9. ADJOURNMENT
Chairman Crosby adjourned the meeting at 8:12 p.m.

_____
Chair Jerry Crosby

Attest:

_____ Date signed:_____
Kelly O'Neill Jr., Development Services Director

STAFF REPORT
Executive Summary

Meeting Type:	Planning Commission
Meeting Date:	September 25, 2023
From:	Kelly O'Neill Jr.
Subject:	23-020 DR/CUP/VAR/FSH/TREE Sandy Community Campus Park

DECISION TO BE MADE:

The Planning Commission needs to approve, approve with conditions, or deny the proposal from the City of Sandy Parks and Recreation Department, and Lango Hansen to construct the Sandy Community Campus Park. The Commission will hold a quasi-judicial public hearing to take public testimony and consider that testimony as part of their decision. This proposal was reviewed concurrently as a Type III design review and conditional use permit with four variances, a flood and slope hazard overlay review, and tree removal permit. The exhibits, findings of fact, and conditions (bold text) in the staff report explain the proposal and the proposed conditions of approval.

BACKGROUND / CONTEXT:

The applicant, Lango Hansen, submitted a land use application on behalf of the property owner, the City of Sandy Parks and Recreation Department, to construct an approximately 10-acre area known as The Community Campus Park. This park is proposed on the land formerly owned by the Oregon Trail School District that provided athletic fields for the former location of Cedar Ridge Middle School.

The proposed park improvements include a new skate park, a large pump track for bicycles, an inclusive play area, extensive walking paths, restrooms, two picnic shelters, and grass fields. The park will also include new onsite parking and a direct trail connection to the adjacent Sandy River Park. The City of Sandy is also proposing to enhance Meinig Avenue and complete paving and pedestrian improvements to Scenic Street. The proposed park development is a direct response to the previous planning work and public outreach efforts that were conducted, including an extensive site planning exercise conducted in 2018. Using that planning work as a foundation, the 2022 Amended Parks and Trails Master Plan Update generated specific recommendations for the development of the Community Campus site.

The applicant is also requesting a conditional use permit for a park to be developed on the property zoned as Medium Density Residential (R-2) in accordance with Section 17.38.20 (B)(1) of the Sandy Development Code. The conditional use permit will be reviewed with the criteria and compatibility factors in Section 17.68.20.

The applicant is also requesting the following four variances:

a. Type III Special Variance to Section 17.84.30 to not provide a sidewalk along the west side of the right-of-way of Meinig Avenue and instead construct a pathway in the proposed park to provide similar pedestrian access and connection to Scenic Street.

b. Type III Special Variance to Section 17.84.30 to include a curb-tight sidewalk and to not provide a sidewalk along the south side of the right-of-way of Scenic Street from the eastern terminus of

the right-of-way to a point 77 feet to the east, and instead connecting the sidewalk to a pathway in the proposed park.

c. Type III Special Variance to Section 17.90.120 (A)(3) to locate the proposed parking lot in front of the proposed picnic shelter and restrooms, instead of to the rear or side of the proposed buildings.

d. Type III Special Variance to Section 17.90.120 (C)(4) to not include secondary roof forms on the two proposed shelters.

RECOMMENDATION:

The Development Services Director recommends the Planning Commission **approve** the Type III design review, conditional use permit, tree removal, and four variances associated with the proposed Sandy Community Campus Park subject to the conditions of approval below. This proposal meets the applicable approval criteria in the Sandy Municipal Code and achieves a major goal to develop a park in north Sandy in an area currently underserved with park amenities.

LIST OF ATTACHMENTS / EXHIBITS:

Applicant's Submittals:

Exhibit A. Land Use Application
Exhibit B. Project Narrative
Exhibit C. Civil Plan Set
- Sheet C1.00 – Demo and Erosion Control Plan
- Sheet C2.00 – Layout and Paving Plan
- Sheet C3.00 – Utility Plan
- Sheet C4.00 – Civil Details
- Sheet C4.01 – Civil Details

Exhibit D. Landscape Plans
Exhibit E. Lighting Plans
Exhibit F. Restroom Structure Plans
Exhibit G. Materials Cutsheets
Exhibit H. Stormwater Report and Geotech Report
Exhibit I. Traffic Impact Study

Agency Comments:

Exhibit J. DKS Associates (received August 18, 2023)
Exhibit K. Sandy Area Metro Director (received August 23, 2023)
Exhibit L. Clackamas Fire District #1 (received August 23, 2023)
Exhibit M. Public Works Department (received August 23, 2023)
Exhibit N. SandyNet Director (received August 23, 2023)

Public Comments:

Exhibit O. Janet Nelson (received September 6, 2023)

39250
Sandy, OR 97055
503-668-5533

WHERE INNOVATION MEETS ELEVATION

PLANNING COMMISSION STAFF REPORT

TYPE III LAND USE PROPOSAL

This proposal was reviewed concurrently as a Type III design review and conditional use permit with four variances, a flood and slope hazard overlay review, and tree removal permit. The following exhibits, findings of fact, and conditions (bold text) explain the proposal and the proposed conditions of approval.

DATE OF PUBLICATION: September 15, 2023

FILE NO.: 23-020 DR/CUP/VAR/FSH/TREE

PROJECT NAME: Sandy Community Campus Park

APPLICANT: Lango Hansen

OWNER: City of Sandy

PHYSICAL ADDRESS: 17165 Meinig Avenue / 17225 Smith Avenue

TAX MAP/LOTS: portions of 24E13BD 00101 and 24E13BA 00200 and 00300

ZONING DISTRICT DESIGNATIONS: Medium Density Residential (R-2) and Parks and Open Space (POS)

COMPREHENSIVE PLAN DESIGNATION: Medium Density Residential and Parks and Open Space

TABLE OF CONTENTS:

EXHIBITS

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Exhibit B. Project Narrative
Exhibit C. Civil Plan Set

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Public Comments:

Exhibit O. Janet Nelson (received September 6, 2023)

FINDINGS OF FACT

GENERAL FINDINGS

1. These findings are based on the applicant's submittal items received on June 22, 2023, with additional items received on July 21, 2023. The application was deemed complete on July 24, 2023. The 120-day deadline is November 21, 2023.

2. This report is based upon the exhibits listed in this document, including the applicant's submittals, agency comments, and public testimony.

3. This application is not subject to the moratorium on development adopted by City Council because the proposed restrooms are exempt per Section 4. m. of Resolution No. 2023-27.

4. The property has a Comprehensive Plan Map designation of Medium Density Residential and Parks and Open Space and a Zoning Map designation of Medium Density Residential (R-2) and Parks and Open Space (POS).

5. The proposal includes portions of three lots (24E13BD 00101 and 24E13BA 00200 and 00300) owned by the City of Sandy. The applicant states that the development area is approximately 10 acres in size. Staff did not calculate gross acreage or net acreage as there is no housing proposed and therefore no applicable density provisions.

6. The applicant, Lango Hansen, submitted a land use application on behalf of the property owner, the City of Sandy Parks and Recreation Department, to construct an approximately 10-acre area known as The Community Campus Park. This park is proposed on the land formerly owned by the Oregon Trail School District that provided athletic fields for the former location of Cedar Ridge Middle School.

   The proposed park improvements include a new skate park, a large pump track for bicycles, an inclusive play area, extensive walking paths, restrooms, two picnic shelters, and grass fields. The park will also include new onsite parking and a direct trail connection to the adjacent Sandy River Park. The City of Sandy is also proposing to enhance Meinig Avenue and complete paving and pedestrian improvements to Scenic Street. The proposed park development is a direct response to the previous planning work and public outreach efforts that were conducted, including an extensive site planning exercise conducted in 2018. Using that planning work as a foundation, the 2022 Amended Parks and Trails Master Plan Update generated specific recommendations for the development of the Community Campus site.

   The applicant is also requesting a conditional use permit for a park to be developed on the property zoned as Medium Density Residential (R-2) in accordance with Section 17.38.20 (B)(1) of the Sandy Development Code. The conditional use permit will be reviewed with the criteria and compatibility factors in Section 17.68.20.

   The applicant is also requesting the following four variances:

a. Type III Special Variance to Section 17.84.30 to not provide a sidewalk along the west side of the right-of-way of Meinig Avenue and instead construct a pathway in the proposed park to provide similar pedestrian access and connection to Scenic Street.
b. Type III Special Variance to Section 17.84.30 to include a curb-tight sidewalk and to not provide a sidewalk along the south side of the right-of-way of Scenic Street from the eastern terminus of the right-of-way to a point 77 feet to the east, and instead connecting the sidewalk to a pathway in the proposed park.
c. Type III Special Variance to Section 17.90.120 (A)(3) to locate the proposed parking lot in front of the proposed picnic shelter and restrooms, instead of to the rear or side of the proposed buildings.
d. Type III Special Variance to Section 17.90.120 (C)(4) to not include secondary roof forms on the two proposed shelters.

7. The City of Sandy completed the following notices:

   a. A transmittal was sent to agencies asking for comment on August 8, 2023.
   b. Notification of the proposed application was mailed to affected property owners within 500 feet of the subject property on August 8, 2023.
   c. A legal notice was published in the Sandy Post on September 6, 2023.
   d. A Facebook post about the public hearing is scheduled for September 20, 2023.

8. Agency comments were received from DKS Associates (City Transportation Engineer), Sandy Area Metro, Clackamas Fire District #1, the Public Works Department, and SandyNet.

9. At publication of this staff report, one written public comment (Exhibit O) had been received. The primary concern in the letter is regarding park amenity and improvement needs, such as providing a recreation area for soccer, baseball, volleyball, football, and walking.

ZONING STANDARDS – Chapters 17.32, 17.38, and 17.80

17.32 – Parks and Open Space (POS)

10. A portion of the subject property is zoned Parks and Open Space (POS). Resolution 2018-35 annexed 38.05 acres and zoned it as POS. While this land is still located outside the Sandy UGB, it is located inside the city limits and therefore review of the proposed park is processed by the Sandy Planning Division. As stated in Resolution 2018-35, the applicable parkland is an expansion of the Sandy River Park. Section 17.32.40 states, "that development of the Sandy River Park is guided by and limited to the uses identified in the Sandy River Park Master Plan dated June 3, 2010, and any future Sandy River Park Master Plan amendments adopted by the City Council. The primary uses specified in the plan include hiking, nature study, habitat restoration, and the construction of a trail system to facilitate these uses. Accessory structures identified in the plan include installation of interpretative signage, benches, picnic tables, restroom facilities, and limited parking." These park development limitations are due to the parkland in this situation being located outside the Sandy UGB. The proposed amenities in the area located outside the UGB are limited to pathways for people and bicycles (pump track), benches, picnic tables, and landscaping. All of the proposed amenities on the land zoned as POS and located outside the Sandy UGB meet the restrictions as imposed by Section 17.32.40. In October 2022, the City asked the County Planning Division for comments, and the County Planning Director stated they had no comments as the property is annexed into Sandy.

11. There are no proposed structures in the land zoned as Parks and Open Space (POS) so there is no evaluation needed for setbacks or building height.

17.38 – Medium Density Residential (R-2)

12. The subject site has approximately 10.5 acres of Medium Density Residential (R-2), but a portion of that area has structures for the former Cedar Ridge Middle School and Olin Y. Bignall Aquatic Center, and is being redeveloped as a separate project, not subject to this review. The proposal is for the development of a park known as the Sandy Community Campus Park. Parks are a community service per the definition for community service in Chapter 17.10 of the Sandy Development Code. Since parks are a community service use, the park must receive approval through a conditional use permit.

13. The density range for the R-2 zoning district is a minimum of eight units and a maximum of 14 units per net acre. This land use application does not contain any residential development, so the density standards are not applicable.

14. The setbacks for the R-2 zoning district are listed in Section 17.38.30 as 10 feet for the front yard, 15 feet for the rear yard, 5 feet for the interior side yard, and 10 feet for the exterior side yard (corner lot). As explained in a later section review in this document, Chapter 17.80 requires all structures to be setback at least 20 feet on collector and arterial streets. The applicant is proposing at least 120 feet to the closest lot line in compliance with the Sandy Development Code.

15. The maximum building height in the R-2 zoning district is 35 feet to the mid-point of the gable. The maximum proposed height of the structures to the peak of the roof is 14 feet (Exhibit F), which is far below the maximum height of 35 feet.

17.80 – Setbacks on Arterial and Collector Streets

16. Chapter 17.80 requires all structures to be setback at least 20 feet on collector and arterial streets. Meinig Avenue is classified as a collector street. Scenic Street is classified as a local street. The Plan Set (Exhibit C, Sheet C2.00) details the structures further away than 20 feet from Meinig Avenue in conformance with Chapter 17.80.

CONDITIONAL USES – Chapter 17.86

17. The applicant has requested a Type III Conditional Use Permit to construct "community services" on land zoned Medium Density Residential (R-2) per Section 17.38.20 (B)(1). The specific community service is a park. To approve the conditional use permit the application shall meet the review criteria A. through F. in Section 17.68.20. The Planning Commission may approve an application, approve with modifications, approve with conditions, or deny an application for a conditional use permit after a public hearing. The applicant must submit evidence substantiating that all requirements of this code relative to the proposed use are satisfied and consistent with the purposes of this chapter, policies of the Comprehensive Plan, and any other applicable policies and standards adopted by the City Council.

18. Section 17.68.20(A) requires the use to be listed as a conditional use in the underlying zoning district or be interpreted to be similar in use to other listed conditional uses. A portion of the subject property is zoned Medium Density Residential (R-2). The proposal is for the development of a park known as the Sandy Community Campus Park. Parks are a community service per the definition for community service in Chapter 17.10 of the Sandy Development Code. **Criterion A is met.**

19. Section 17.68.20(B) requires the characteristics of the site to be suitable for the proposed use considering the size, shape, location, topography, and natural features. The portion of the site that is zoned as Medium Density Residential is immediately adjacent to property zoned as POS as well as adjacent to the Sandy River Park and the Sandy River. Being surrounded by a forest of mature Douglas fir and big leaf maple trees, the proposed site is ideally situated for parkland development. The site will soon have direct trail connections down to the Sandy River, creating a pedestrian connection from downtown Sandy to the Sandy River. Additionally, due to the existing topography of the site a majority of the site is below the grade of the adjacent residential properties to the east and south. **Criterion B is met.**

20. Section 17.68.20(C) requires the use to be timely considering the adequacy of the transportation systems, public facilities and services existing or planned for the area affected by the use. The site is currently accessed from Meinig Avenue. The development of the park will include upgrades and improvements to the surrounding streets, including Meinig Avenue and Scenic Street. Streetlights are proposed for installation on both streets to bring the illumination levels up to current City standards. The existing storm line and sanitary line have sufficient capacity to serve the proposed improvements at the park. This application is not subject to the moratorium on development adopted by City Council because the proposed restrooms are exempt per Section 4. m. of Resolution No. 2023-27. Water and electrical connections will be provided from existing services located in the Scenic Street right-of-way. **Criterion C is met.**

21. Section 17.68.20(D) specifies the proposed use will not alter the character of the surrounding area in a manner which substantially limits, precludes, or impairs the use of surrounding properties for the primary uses listed in the underlying zoning district. The

proposed improvements at the park will greatly enhance the surrounding area and will not limit, preclude, or impair the use of the surrounding properties for the primary uses listed in the underlying zoning districts. The surrounding lots to east of the park have been developed largely as residential with the exception of one institutional facility, the Community Church of Sandy. Additionally, this park will help fulfill a neighborhood park need in this area of Sandy that was identified in the 2022 Parks and Trails Master Plan Update. This park will function as both a community park and as the first neighborhood park in the northeast quadrant of Sandy. Finally, while the future of the adjacent Cedar Ridge Middle School facility located to the south is still being determined, the development of the park will directly serve future development of that area. **Criterion D is met.**

22. Section 17.68.20(E) specifies the proposed use will not result in the use of land for any purpose which may create or cause to be created any public nuisance including, but not limited to, air, land, or water degradation, noise, glare, heat, vibration, or other considerations which may be injurious to the public health, safety, and welfare. The proposed development will not create public nuisance, but instead will be a great asset for the neighborhood and the city. The existing skate park will be replaced with a modern facility that meets the needs of today's users. The park includes an accessible trail network, active and passive recreation opportunities, an inclusive play area, a picnic shelter, and many more amenities. Each of these park improvements directly contribute to the park's ability to meet the goals of the Oregon Parks and Recreation District Statewide Comprehensive Outdoor Recreation Plan and provide safe opportunities for the public to be active and experience the natural environment. Additionally, the development only involves the removal of seven (7) trees for development of Scenic Street and to install walkways and other site amenities. The surrounding forest will be kept completely intact. **Criterion E is met.**

23. Section 17.68.20(F) requires the proposed use to be reasonably compatible with existing or planned neighboring uses based on review of 10 factors as listed below in F.1 through F.10.

24. Section 17.68.20(F.1) Basic site design (organization of uses on the site) - The proposed park will blend the existing residential neighborhood with the larger natural spaces that surround the park property. The park will serve as a neighborhood destination to recreate and experience nature as well as a gateway to the Sandy River Park. The more active uses including the parking lot, picnic shelter, and restrooms have been located closer to the street and away from the existing forest. The project process to design the park included significant public outreach, including three public open houses, focused open houses for members of Sandy Vista and for seniors, two public surveys, and a series of targeted outreach meetings focusing on the design of the skate park, pump track, and jump line. **Criterion F.1 is met.**

25. Section 17.68.20(F.2) Visual elements (scale, structural design and form, materials, and so forth) - The materials and colors of the site structures, site amenities, playground elements, and skate park features will blend seamlessly with the natural environment, with priority given to natural colors. The colors selected for the board and batten siding and for the metal

roof will conform with those outlined in Appendix C and Appendix D, Color Palettes. **Criterion F.2 is met.**

26. Section 17.68.20(F.3) Noise - The proposed use is compatible with that of adjacent properties therefore it is reasonable to conclude any noise generated from the use will be compatible with existing neighboring development. Noise from the park will be largely buffered by the grade separation between many of the main park features and the surrounding neighborhood. **Criterion F.3 is met.**

27. Section 17.68.20(F.4) Noxious odors - The proposed use is similar to that of adjacent properties therefore it is reasonable to conclude any noxious odors generated from the use will be compatible with existing neighboring development. **Criterion F.4 is met.**

28. Section 17.68.20(F.5) Lighting - The applicant's Street Photometric (Exhibit E, Sheet 2.1) details street lighting photometrics for two new light poles. One of the new light poles is proposed on Scenic Street to the northwest of the proposed driveway and the second new light pole is located on Meinig Avenue to the east of the parking lot**. The applicant shall submit street lighting details with the construction plans for City staff review and approval. Street lighting shall not use a central photo sensor in the power pedestal and each light shall be installed with Ubicell controllers to match City's lighting system.** Chapter 15.30 requires that on-site lighting is full cut-off, does not exceed 4,125 Kelvins, and does not exceed 0.25-foot candles at 10 feet beyond the property lines. The applicant submitted Lighting Plan (Exhibit E) details several different lighting fixture types. The applicant submitted a Park Electrical and Photometric (Exhibit E, Sheet E1.1) that details foot candles. The on-site foot candles do not exceed 0.05-foot candles at 10 feet beyond the property line along Meinig Avenue, however, the foot candle imagery is not complete along the property line along Scenic Street. **The applicant shall submit a revised Photometric Plan (Exhibit L, Sheet E1.2) detailing foot candles 10 feet beyond the property boundary along Scenic Street, not exceeding 0.25-foot candles. The applicant shall also submit lighting fixture cut sheets detailing all on-site lighting as full cut-off and not exceeding 4,125 Kelvins.** The conditions related to lighting are critical to adhere to in order for the proposal to be in compliance with the City of Sandy lighting standards. **Criterion F.5 is met so long as the recommended conditions of approval are included with the decision.**

29. Section 17.68.20(F.6) Signage – Signage is not reviewed with the land use application but is instead reviewed with a sign permit through a separate procedure. **The applicant shall obtain a permit for any proposed signage**. The proposal can comply with signage regulations. **Criterion F.6 is met**

30. Section 17.68.20(F.7) Landscaping for buffering and screening - The landscaping in the park will consist largely of native plants and trees that will help integrate the park into the existing wooded setting. Large patches of existing blackberries will be removed and replanted with native and climate adapted grasses and shrubs. The submitted Landscape Plans (Exhibit D) details trees at an appropriate spacing per the development code, except an additional tree needs to be planted to the southwest of Scenic Street and two trees

planted to the south of the driveway on Meinig Avenue. Staff also recommends that four additional street trees are planted along Meinig Avenue alternating the five proposed Homestead elms. **The applicant shall revise the Landscape Plan (Exhibit D) to detail six additional street trees along Meinig Avenue and one additional street tree along Scenic Street**. The applicant is proposing three different shrub and groundcover varieties at one gallon, two gallon, and five gallon in compliance with Section 17.92.50. However, the submitted landscape plans do not detail the locations of different shrubs and grasses, and instead uses blanket variety indicators. **The applicant shall submit revised Landscape Plans (Exhibit D) detailing the locations of the different shrubs and grasses on the property, instead of the blanket variety indicators.** Having appropriate shrubs and bushes around the park, especially by property lines is important for creating buffers/screening to residential areas adjacent to the park. **Criterion F.7 is met so long as the recommended conditions of approval are included with the decision.**

31. Section 17.68.20(F.8) Traffic - The proposed park would result in 17 PM peak hour vehicle trips, 40 Saturday peak hour trips, and 50 Saturday peak hour trips when an event is occurring at the park. According to the City Transportation Engineer (Exhibit J) all study intersections will operate at an acceptable v/c ratio and level of service during the 2025 weekday PM peak hour, Saturday peak hour, and Saturday event peak hour under future conditions even with the development of the park. Left-turn lane warrants for both of the proposed driveways and the intersection of Meinig Avenue and Pleasant Street are not projected to be met under buildout year 2025 so no left-turn lanes are necessary or recommended. Traffic signal warrants were examined to determine whether the installation of a new traffic signal will be warranted, but no signalization of the unsignalized study intersections is necessary or recommended. Approximately 75 percent of vehicles traveling to the park are projected to use the Meinig Avenue driveway and 25 percent of vehicles traveling to the park are projected to use the Scenic Street driveway. **Criterion F.8 is met.**

32. Section 17.68.20(F.9) Effects on off-street parking - Section 17.98.20 contains off-street parking requirements; however, the Sandy Development Code does not contain any required off-street parking for park development. Staff asked the applicant and the applicant's traffic consultant to complete off-street parking analysis. The Traffic Impact Study from Lancaster Mobley (Exhibit I) states that the proposed park will include 40 on-site parking spaces, but the site plan details 43 parking spaces. To estimate the parking demand that could be generated by the proposed development, parking generation rates from the *ITE Parking Generation Manual* 5th Edition were used. The City Transportation Engineer (Exhibit J) states that based on the analysis from the applicant there are adequate parking spaces available to accommodate the anticipated parking demand. **Criterion F.9 is met.**

33. Section 17.68.20(F.10) Effects on air quality and water quality - The proposed improvements will not adversely affect air and water quality. The applicant's narrative (Exhibit B) states, "Currently, the site does not have any stormwater facilities to treat stormwater runoff from impervious surfaces. The runoff from the existing track, for example, is sent untreated directly to the adjacent creek. The proposed park will treat and detain all stormwater runoff from impervious surfaces before being released into the

adjacent stream." The project will comply with all applicable state and federal environmental standards. **Criterion F.10 is met.**

DESIGN REVIEW – Chapter 17.90

34. The proposal is subject to all the requirements for Design Review as stated in Section 17.90.00. Section 17.90.120 includes design standard requirements in the General Commercial (C-2) and Industrial Park (I-1) zoning districts, and in non-residential uses in residential zones. In addition, Section 17.32.60 states that park improvements shall comply with Chapter 17.90 design standards.

35. Section 17.90.70 specifies that **design review approval shall be void after two (2) years from the date of the Final Order unless the applicant has submitted plans for building permit approval.**

36. Section 17.90.120(A) contains site layout and vehicle access standards intended to provide for compact, walkable development, and to design and manage vehicle access and circulation in a manner that supports pedestrian safety, comfort, and convenience. The proposed layout provides a compact and walkable development site.

37. Section 17.90.120(A)(3) requires that off-street parking shall be located to the rear or side of buildings with no portion located within 10 feet of the public right-of-way. The applicant is not proposing a building between the parking lot and the public right-of-way. This is reviewed as a special variance in the variance section of this document.

38. Section 17.90.120(A)(5) and (8) require raised or painted pedestrian crossings in parking lots. **The applicant shall revise the plan set to detail a driveway apron or other delineated pedestrian crossing at the driveway on Meinig Avenue that connects the sidewalks on each side of the driveway.**

39. Section 17.90.120(A)(11) requires free standing buildings on a site to connect to one another with a seamless pedestrian network to building entrances and civic spaces. The applicant's Plan Set (Exhibit C) details a well-connected pedestrian environment with walkways between the two buildings, along a portion of the parking lot, and to the public sidewalks on Meinig Avenue and Scenic Street.

40. Section 17.90.120(B) contains standards regarding building facades, materials, and colors intended to be consistent with the Sandy Style. Section 17.90.110(B)(1) requires that buildings be articulated, varied, provide visual interest, and divided into distinct planes of no more than 40 lineal feet. The proposed restroom structure (Exhibit F) only includes walls around the restrooms, but the remainder of the structure is open to the outside air with only support posts. The total wall plane is 16 feet 8 inches by 16 feet 8 inches for a total of 278 square feet. The second structure is for covered seating and does not include walls. No walls exceed 40 feet in length and therefore the proposal meets the code for articulation. Variations include stone base, heavy timbers with brackets, and board and batten siding.

41. Section 17.90.120(B)(2) requires that buildings incorporate pedestrian shelters over primary building entrances. Pedestrian shelters shall extend at least five feet over the pedestrian area. The proposal includes a covered area approximately 7 feet 6 inches over

the entrance to the two restrooms in compliance with the code for pedestrian shelters over entrances.

42. Section 17.90.120(B)(3) specifies approved building materials. Section 17.90.110(B)(3)(b) requires buildings to include strong base materials such as natural stone, split-faced rusticated concrete block, or brick on all sides of a building visible from an abutting public street. A building's base must extend at least 36 inches but not more than 60 inches above the adjacent finished grade and be included on those sides of the building visible from the abutting public street. The proposed restroom structure (Exhibit F) details a 36-inch-high stone base on all four elevations of the restroom structure. The applicant is not proposing a stone base at the individual support columns for either of the buildings. The stone base appears to be a ledgestone finish. **The applicant shall revise the elevations to detail the stone base at the base of all support columns for both of the structures and shall choose a dressed fieldstone finish for consistency with other City property.**

43. Section 17.90.120(B)(3)(d) contains approved siding. The applicant is proposing board and batten siding around the restrooms. Where board and batten are used, the battens shall be a minimum of two inches wide by one-inch deep and spaced 24-inches apart or closer. The applicant detailed the battens as one-inch deep by three-inches wide and spaced 16-inches on-center.

44. Section 17.90.120(B)(3)(e) requires that building elevations facing a public street incorporate at least three architectural features from the list in Section 17.90.110(B(3)(e). The gabled ends of the structures include stone base, heavy timbers with brackets, and covered areas for pedestrians. **The applicant shall submit additional details for the second building without the restroom, mimicking the design elements on the building in Exhibit F.**

45. Section 17.90.120(B)(4) specifies approved colors. The applicant stated that the siding colors will conform to the Sandy Style. **The applicant shall submit revised Elevations (Exhibit F) detailing colors in compliance with Appendix C of the Sandy Development Code for staff review and approval.**

46. Section 17.90.120(C) requires gable roofs on new buildings with a primary roof form slope of at least 6:12 and a secondary roof form slope of at least 4:12. Both proposed buildings will have gabled roofs with a primary roof slope of 6:12 in compliance with Section 17.90.110(C)(1).

47. Section 17.90.120(C)(4) requires secondary roof forms based on roof length. The applicant is not proposing any secondary roof forms. This is reviewed as a special variance in the variance section of this document.

48. Section 17.90.120(C)(5) requires visible roof materials to be wood shingle or architectural grade composition shingle, slate, or concrete tile. The applicant is proposing metal roofing. **The applicant shall revise the Elevations (Exhibit F) detailing the roof color in**

compliance with Appendix D of the Sandy Development Code for staff review and approval.

49. Section 17.90.120(D) contains standards regarding building orientation and entrances intended to maintain and enhance downtown and village commercial streetscapes as public spaces by emphasizing a pedestrian scale and character consistent with the Sandy Style; and to provide for a continuous pedestrian network that promotes pedestrian safety, comfort and convenience, and provides materials and detailing consistent with the Sandy Style. The site development is for a park and is not located in the downtown nor a village commercial area.

50. Section 17.90.120(D)(1) requires at least 50 percent of the subject site's street frontage to be comprised of building(s) placed within 20 feet of the sidewalk or an approved civic space. The applicant is not proposing any buildings within 20 feet of any sidewalk. This is reviewed as a special variance in the variance section of this document.

51. Section 17.90.120(D)(6) specifies that buildings shall provide at least one elevation where the pedestrian environment is "activated." An elevation is "activated" when it meets the window transparency requirements in Subsection 17.90.120(E) and contains a customer entrance with a pedestrian shelter extending at least five (5) feet over an adjacent sidewalk, walkway, or civic space. The proposed restroom structure (Exhibit F) only includes walls around the restrooms, but the remainder of the structure is open to the outside air with only support posts. The second structure is for covered seating and does not include walls. Because of these uses, windows are not proposed in the buildings. However, staff finds the intent of Section 17.90.120(D)(6) is met as the gabled ends of the structures include stone base, heavy timbers with brackets, and covered areas for pedestrians.

52. Section 17.90.120(D)(7) specifies primary entries shall face a public street or a civic space and shall be spaced not more than 30 feet apart on average. There is no primary entrance to anything other than restrooms, therefore this standard is not applicable to this development.

53. Section 17.90.120(E) contains standards for construction and placement of windows. The intent of windows is to promote business vitality, public safety, and aesthetics through effective window placement and design. Section 17.90.110(E)(2) states that the ground floor elevation of all new buildings shall contain display areas, windows, and doorways along street frontages and where the building abuts a civic space. The proposed restroom structure (Exhibit F) only includes walls around the restrooms, but the remainder of the structure is open to the outside air with only support posts. The second structure is for covered seating and does not include walls. Because of these uses, windows are not proposed in the buildings.

54. Section 17.90.120(G) contains standards for civic spaces on development sites. The site development is a park that includes a large seating area, play area, skate park, pump track, and walking trails. Since the entire site acts as one large civic space, staff did not analyze civic space.

55. Section 17.90.120(H) contains standards regarding lighting. **The applicant shall follow all Dark Sky Ordinance requirements as outlined in Chapter 15.30 of this document.**

56. Section 17.90.120(I)(3) requires street address numbers. **The applicant shall provide street address numbers measuring a minimum of six (6) inches high and of contrasting color, which clearly locate the park for patrons and emergency services. The applicant shall verify the location of the address with the Building Official and emergency service providers.**

57. Section 17.90.120(J) contains standards regarding external storage and screening intended to promote land use compatibility and aesthetics, particularly where development abuts public spaces. The park will have trash and recycling cans for park users to deposit items into, but no garbage or recycle enclosure will be located at the site as parks maintenance staff will complete routine trash and recycling collection.

58. The submitted plans do not detail mechanical, electrical, or communications equipment. The narrative (Exhibit C) states the following: "Mechanical, electrical, communications equipment including meters and transformers, and service and delivery entrances and garbage storage areas will be screened from view from public rights-of-way and civic spaces." Per Section 17.90.110(J.3), mechanical, electrical, communications equipment including meters and transformers, and service and delivery entrances and garbage storage areas shall be screened from view from public rights-of-way and civic spaces. **The applicant shall revise the plan set to detail the location of mechanical, electrical, and communications equipment and the proposed screening method for staff review and approval.**

VARIANCES – Chapter 17.66

59. All four variances are being reviewed as special variances in accordance with Section 17.66.80. The applicant requested the following four (4) variances:
    A. Type III Special Variance to Section 17.84.30 to not provide a sidewalk along the west side of the right-of-way of Meinig Avenue and instead construct a pathway in the proposed park to provide similar pedestrian access and connection to Scenic Street.

    B. Type III Special Variance to Section 17.84.30 to include a curb-tight sidewalk and to not provide a sidewalk along the south side of the right-of-way of Scenic Street from the eastern terminus of the right-of-way to a point 77 feet to the east, and instead connecting the sidewalk to a pathway in the proposed park.

    C. Type III Special Variance to Section 17.90.120 (A)(3) to locate the proposed parking lot in front of the proposed picnic shelter and restrooms, instead of to the rear or side of the proposed buildings.

    D. Type III Special Variance to Section 17.90.120 (C)(4) to not include secondary roof forms on the two proposed shelters.

60. To be granted a Type III Special Variance, the applicant must meet one of the following criteria in Section 17.66.80:
    A. The unique nature of the proposed development is such that:

        1. The intent and purpose of the regulations and of the provisions to be waived will not be violated; and

        2. Authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted.

    B. The variance approved is the minimum variance needed to permit practical compliance with a requirement of another law or regulation.

    C. When restoration or replacement of a nonconforming development is necessary due to damage by fire, flood, or other casual or natural disaster, the restoration or replacement will decrease the degree of the previous noncompliance to the greatest extent possible.

Variance A: Not provide a sidewalk in the Meinig Avenue right-of-way

61. The applicant requested a Type III Special Variance to Section 17.84.30(B) to not provide a sidewalk in the Meinig Avenue right-of-way.

62. Staff believes the requested variance to Section 17.84.30(B) to not provide a sidewalk on the west side of Meinig Avenue meets Criterion A of Section 17.66.80. There is a

continuous existing sidewalk on the east side of Meinig Avenue that provides a continuous pedestrian connection from Idleman Street to Scenic Street. A typical street improvement with development of a site, such as the proposed park site, would require the installation of sidewalk along the west side of Meinig Avenue. Due to the existing steep slopes on the west side of Meinig Avenue, extensive regrading and retaining walls would be required to locate a new sidewalk in the public right-of-way. Grading and installation of the retaining wall would require complete removal of all existing trees and create no physical separation between Meinig Avenue and the park site. Instead of requiring a six-foot wide sidewalk along the west side of Meinig Avenue, the applicant is proposing an eight-foot-wide paved pedestrian walkway that connects from the intersection of Meinig Avenue and Idleman Street directly with the central pedestrian plaza in the park. This proposed walkway continues north and makes a direct connection to the proposed sidewalk on Scenic Street. This alternative walkway meets the intent and purpose of the regulations to provide sidewalk connectivity. The location of the walkway in the park provides more direct access to site amenities and provides a more pedestrian friendly experience by creating a greater separation between the pedestrian environment and the vehicular traffic on Meinig Avenue. Not installing the sidewalk on the west side of Meinig Avenue also allows for the preservation of several large existing trees. The one downside to not requiring the sidewalk is that motorists using the on-street parking on the west side of Meinig Avenue will have no sidewalk to accommodate them as pedestrians after they park their vehicle. However, staff finds that tree retention and maintaining the existing buffer between the park property and Meinig Avenue has a greater benefit than installation of the sidewalk. Authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted.

63. For the reasons discussed, **City staff recommends that the Planning Commission approve the requested special variance to not require a sidewalk in the Meinig Avenue right-of-way.**

<u>Variance B: Not provide a planter strip between the sidewalk and curb in the Scenic Street right-of-way and not provide a sidewalk along a portion of the south side of the right-of-way of Scenic Street</u>

64. The applicant requested a Type III Special Variance to Section 17.84.30(A) to not provide a sidewalk separated from the curb with a planter strip and to not provide a sidewalk along the south side of the right-of-way of Scenic Street from the eastern terminus of the right-of-way to a point 77 feet to the east.

65. Staff believes the requested variance to Section 17.84.30(A) to not provide a sidewalk separated from the curb with a planter strip and to not provide a sidewalk along the south side of the right-of-way of Scenic Street from the eastern terminus of the right-of-way to a point 77 feet to the east meets Criterion A of Section 17.66.80. The proposed public sidewalk on the south side of Scenic Street is not proposed to extend to the west terminus of the right-of-way, and the applicant is not proposing any pedestrian or vehicular connections from the west end of Scenic Street into the park. Instead of extending the

sidewalk for the entire length of Scenic Street, the applicant proposes connecting the sidewalk to an eight-foot pedestrian walkway in the park. The lack of connection from the street right-of-way to the park amenities concerns staff as most pedestrians and bicyclists choose the shortest path from their point of origin to their destination. If no walkway or sidewalk is extended from the west terminus of Scenic Street, then staff believes there is a high likelihood that pedestrians and bicyclists will create their own path through proposed landscaping. In order to minimizes user made paths that destroy landscaping, staff recommends that additional trees and shrubs are planted around Scenic Street to the west of where the sidewalk is proposed to terminate. **The applicant shall submit revised Landscape Plans (Exhibit D) detailing the locations of additional trees and shrubs around Scenic Street to the west of where the sidewalk is proposed to terminate to reduce the opportunity for user made paths to the park.**

In addition, the required five-foot wide planter strip along Scenic Street is not being proposed and the applicant is instead proposing a curb tight sidewalk. The removal of the planter strip is being proposed by the applicant for several reasons. First, locating the planter strip at the back of curb would push the sidewalk further south. The existing grades would require a significant regrading effort to construct the sidewalk in this location. This regrading would lead to the loss of additional onsite trees that are currently proposed for preservation. Second, planting the street trees at the back of sidewalk contiguous with the larger park planting area will allow for a more diverse selection of trees, shrubs, and ground cover plants to be used in this area. Third, the traffic volumes on Scenic Street will be very low and as such the applicant believes that pedestrian and vehicular conflicts will be minimal. Authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted.

66. For the reasons discussed, **City staff recommends that the Planning Commission approve the requested special variance to not provide a sidewalk separated from the curb with a planter strip and to not provide a sidewalk along the south side of the right-of-way of Scenic Street from the eastern terminus of the right-of-way to a point 77 feet to the east, with the condition to require additional trees and shrubs around Scenic Street to the west of where the sidewalk is proposed to terminate to reduce the opportunity for user made paths to the park.**

<u>Variance C: Locate the proposed parking lot in front of the proposed picnic shelter and restrooms</u>

67. The applicant requested a Type III Special Variance to Section 17.90.120(D) to not provide 50 percent of the subject's site frontage with buildings and to exceed 20 percent of the subject site's off-street parking in-between the proposed buildings and the adjacent streets.

68. Staff believes the requested variance to Section 17.90.120(D) to not provide 50 percent of the subject's site frontage with buildings and to exceed 20 percent of the subject site's off-street parking in-between the proposed buildings and the adjacent streets meets Criterion A of Section 17.66.80. The applicant states that there are several key reasons that the parking lot was located between the proposed shelter with the restroom and the right-of-way. The

applicant stated the following, "By locating the parking lot in this way, much less of the site is dedicated to the parking lot, drive aisles and the driveways. More of the site is able to be developed as parkland and provide additional amenities for the public. Additionally, this location eliminates pedestrian and vehicular conflicts because the pedestrian path does not have to cross through the parking lot or the driveways. Pedestrians are able to access the entire site without crossing the parking lot or a driveway. Finally, the current site layout allows for the picnic shelter and restroom facility to be more centrally located and provides greater usability for the entire park." The proposed use is not residential, commercial, or industrial in nature, but primarily for outdoor recreation. The proposed site improvements do not include a large structure for indoor recreation and therefore it is impossible to meet the code provision to provide 50 percent of the subject's site frontage with buildings. The intent of locating a building along the street frontage is to provide building massing along the right-of-way instead of parking surface, which is especially important in commercial areas and residential areas where pedestrians are commonly accessing the site from the sidewalk. The proposed park site is entirely being constructed for pedestrian use. If the applicant located the parking lot further west on the site it would encroach further into the FSH Overlay and as the applicant correctly states would bisect the park amenities and create more conflicts between park users and vehicles. Staff finds that the proposed location of the parking lot and two small buildings are appropriate on the site. Also, a large portion of the parking lot will be at a lower elevation than Meinig Avenue.

Authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted.

69. For the reasons discussed, **City staff recommends that the Planning Commission approve the requested special variance to not provide 50 percent of the subject's site frontage with buildings and to exceed 20 percent of the subject site's off-street parking in-between the proposed buildings and the adjacent streets.**

Variance D: Not include secondary roof forms on the two proposed shelters

70. The applicant requested a Type III Special Variance to Section 17.90.120(C)(4) to not provide secondary roof forms on the two proposed shelters.

71. Staff believes the requested variance to Section 17.90.120(C)(4) to not provide secondary roof forms on the two proposed shelters meets Criterion A of Section 17.66.80. The shelter with the restroom is 49 feet 6 inches in length along the roof line which in accordance with Section 17.90.120(C)(4) requires a minimum of two secondary roof forms. The applicant states that each of the walls of the restroom facility measures approximately 16 feet 8 inches. Due to the limited amount of wall surface on the elevation and the amount of enclosed building, the applicant states that the secondary roof forms would be contrary to the scale and proportions of the building form. Based on the restroom and shelter design, staff agrees that installing two secondary roof forms could be odd looking; however, staff finds that installing one secondary roof form centered on the restroom would provide an additional architectural feature that would be highly visible from the parking lot and the

surrounding streets. For a more balanced appearance, staff finds that installing one secondary roof form centered on the restroom on both the east and west sides of the shelter would look even better. **Staff recommends the applicant submit revised Restroom Structure Plans (Exhibit F) with one secondary roof form, such as a windowless dormer, on both the east and west sides of the shelter centered on the restroom.**

The applicant is proposing a second picnic shelter measuring approximately 25 feet in length, with no walls. The slope and materials of the roof will match the picnic shelter with restroom facility. The applicant believes that due to the open-air nature of the picnic shelter, secondary roof forms would be contrary to the scale and proportions of the building form for the second picnic shelter. Staff finds that the second picnic shelter is less than 30 feet in length and therefore doesn't require secondary roof forms in accordance with Section 17.90.120(C)(4).

Authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted.

72. For the reasons discussed, **City staff recommends that the Planning Commission approve the requested special variance to not provide secondary roof forms on the two proposed shelters with the exception of providing one secondary roof form, such as a windowless dormer, on both the east and west sides of the larger shelter centered on the restroom.**

TRANSPORTATION – Chapter 17.84

73. Section 17.84.30(A)(1) requires that all proposed sidewalks on local streets shall be a minimum of five feet wide and separated from curbs by a tree planting area that is a minimum of five feet in width. The applicant is required to install a three-quarter street section with sidewalks on the side of the street of the park property. The applicant is proposing 5-foot curb tight sidewalks along the south side of Scenic Street but is proposing to not install sidewalks for the west most 77 feet of Scenic Street and is instead requesting a special variance. No planter strips are proposed along Scenic Street.

74. As required by Section 17.84.30(A)(2) requires that all proposed sidewalks on arterial and collector streets shall be a minimum of six feet wide and separated from curbs by a tree planting area that is a minimum of five feet in width. **The applicant shall revise the Plan Set (Exhibit C) to detail all sidewalks on Meinig Avenue at least six feet in width.** The applicant is not proposing a sidewalk along Meinig Avenue north of the new driveway and is instead requesting a special variance to not install the required sidewalk.

75. Traffic Study. Section 17.84.50 outlines the requirements for providing a traffic study. The applicant included a Traffic Impact Study from Lancaster Mobley with the application (Exhibit I). According to the traffic study, the assumptions were based on a park with a pump track/skatepark, trails, playgrounds, and other amenities. The ITE Trip Generation Codes were 411 Public Park and 488 Soccer Complex. These uses would result in 17 PM peak hour vehicle trips, 40 Saturday peak hour trips, and 50 Saturday peak hour trips when an event is occurring at the park. According to the City Transportation Engineer (Exhibit J) all study intersections will operate at an acceptable v/c ratio and level of service during the 2025 weekday PM peak hour, Saturday peak hour, and Saturday event peak hour under future conditions even with the development of the park. Left-turn lane warrants for both of the proposed driveways and the intersection of Meinig Avenue and Pleasant Street are not projected to be met under buildout year 2025 so no left-turn lanes are necessary or recommended. Traffic signal warrants were examined to determine whether the installation of a new traffic signal will be warranted, but no signalization of the unsignalized study intersections is necessary or recommended. Approximately 75 percent of vehicles traveling to the park are projected to use the Meinig Avenue driveway and 25 percent of vehicles traveling to the park are projected to use the Scenic Street driveway. The City Transportation Engineer, DKS Associates, reviewed the Traffic Impact Study (Exhibit J) and recommends the following:
    a. **The development shall contribute Transportation System Development Charges toward citywide impacts.**
    b. **Frontage improvements shall be constructed at Collector standards along the site frontage on Meinig Avenue.**
    c. **Frontage improvements shall be constructed at Local Street standard along the site frontage on Scenic Street. A minimum pavement width of 20 feet shall be provided to adequately accommodate two-way vehicle traffic.**
    d. **Minimum AASHTO sight distance requirements shall be met at all site driveways. Sight distances should be verified in the final engineering/construction stages of development.**

76. Scenic Street. This street is defined as a local street. Local streets shall be 50 feet in width or up to 56 feet in width if swales are on both sides of the right-of-way. The applicant is required to install a three-quarter street section with sidewalks on the side of the street of the park property. The proposal is for 28 feet of asphalt in a 40-foot-wide existing right-of-way. The applicant is proposing 5-foot curb tight sidewalks along the south side of Scenic Street but is proposing to not install sidewalks for the west most 77 feet of Scenic Street and is instead requesting a special variance. No planter strips are proposed along Scenic Street. The submitted plan set does not detail a monumentation strip at the back of the sidewalk. **The applicant shall revise the Plan Set (Exhibit C) to detail a six-inch monumentation strip at the back of sidewalk on Scenic Street. To accommodate the required monumentation strip it may require six inches of right-of-way dedication.** The Assistant Public Works Director (Exhibit M) analyzed the proposed park development for street improvements. **The applicant shall submit additional details on relocation of the utility poles on Scenic Street.** The Assistant Public Works Director asked the applicant to confirm if on-street parking on Scenic Street is intended, but a 28-foot-wide asphalt section on a local street, such as Scenic Street, accommodates on-street parking.

77. Meinig Avenue. The only improvements that the applicant is proposing on Meinig Avenue is the installation of a curb, a driveway at the intersection with Idleman Street, some sidewalks and curb ramps around the new driveway, and approximately four feet of asphalt poured back to the new curb. The applicant is proposing a curb tight sidewalk along Meinig Avenue to the south of the proposed driveway for a proposed distance of approximately 44 feet. There is no reason that the transition cannot occur at the south property line and then be setback with a planter strip for approximately 40 feet. **The applicant shall revise the Plan Set (Exhibit C) to detail a transition of the Meinig Avenue sidewalk at the south property line to a setback sidewalk with a planter strip at least five feet in width with two street trees in the planter strip.** The applicant is proposing substandard five-foot-wide sidewalks along Meinig Avenue. **The applicant shall revise the Plan Set (Exhibit C) to detail all sidewalks on Meinig Avenue at least six feet in width.** The applicant is not proposing a sidewalk along Meinig Avenue north of the new driveway and is instead requesting a special variance to not install the required sidewalk. **The applicant shall submit additional Geotech documentation that no further subgrade improvements are required for the widening of Meinig Avenue for staff review and approval.**

78. Average Daily Traffic. While this proposal will undoubtedly increase traffic on Scenic Street there were no Average Daily Traffic (ADT) concerns on local streets raised by the City Transportation Engineer. Approximately 75 percent of vehicles traveling to the park are projected to use the Meinig Avenue driveway and 25 percent of vehicles traveling to the park are projected to use the Scenic Street driveway.

79. Tangent Alignment. The alignment of Scenic Street appears to provide the minimum 50 feet of tangent alignment as required by Section 17.84.50(J)(5)(b) of the Sandy Municipal Code (SMC). There were no comments from the Assistant Public Works Director on tangent alignment.

80. Future Street Plan. Section 17.84.50(E) requires that public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property. This project is improving existing streets and is not proposing any street extensions.

81. Street Naming. The proposed development includes improvements to existing streets. No new streets are being created and therefore no new street names are necessary.

82. Transit. Section 17.84.40(A) requires that the developer construct adequate public transit facilities. The Sandy Area Metro Transit Director submitted a memo (Exhibit K) stating the following: "The proposed development will require a bus stop sign near the entry plaza with overlook and the picnic shelter with restroom indicated with a blue dot in the attached document." **The applicant shall revise the Plan Set (Exhibit C) to detail the location of a bus stop sign per the specifications of Sandy Area Metro. The applicant shall coordinate the exact location of the sign with the Transit Director.**

83. The Sandy Development Code has a list of other considerations in the right-of-way that were evaluated as follows:
    a. Lighting. A lighting plan will be coordinated with PGE and the City as part of the construction plan process and prior to installation of any fixtures as required by Section 17.100.210. The applicant's submission includes details on the proposed public lighting system which is reviewed in the Dark Sky section of this document.
    b. Planter Strips. Planter strips shall be provided along all frontages as required in Section 17.100.290. The applicant is not proposing to install any new planter strips.
    c. Mail Facilities. Section 17.84.100 outlines the requirements for mail delivery facilities. The applicant is not proposing mail delivery to the Sandy Community Campus Park.

PARKING, LOADING, AND ACCESS REQUIREMENTS – Chapter 17.98

84. Section 17.98.20 contains off-street parking requirements; however, the Sandy Development Code does not contain any required off-street parking for park development. Staff asked the applicant and the applicant's traffic consultant to complete off-street parking analysis. The Traffic Impact Study from Lancaster Mobley (Exhibit I) states that the proposed park will include 40 on-site parking spaces, but the site plan details 43 parking spaces. To estimate the parking demand that could be generated by the proposed development, parking generation rates from the *ITE Parking Generation Manual* 5th Edition were used. The City Transportation Engineer (Exhibit J) states that based on the analysis from the applicant there are adequate parking spaces available to accommodate the anticipated parking demand.

85. Section 17.98.160 contains requirements related to bicycle parking facilities; however, the Sandy Development Code does not contain any required bicycle parking for park development. The proposed Plan Set (Exhibit C) details 10 bicycle racks, however, there is no detail on the bicycle racks. Per Section 17.98.160(B) each required bicycle parking space shall be at least two and one-half feet by six feet; vertical or upright bicycle storage structures are exempt from the parking space length. An access aisle of at least five feet wide shall be provided and maintained beside or between each row of bicycle parking. **The applicant shall submit a standard detail for the proposed bicycle racks meeting the space and security requirements in Section 17.98.160 for staff review and approval.**

86. Section 17.98.60 includes standards on parking lot design, size, and access. The Plan Set (Exhibit C) details 41 standard parking spaces and two (2) ADA parking spaces. The total number of parking spaces proposed requires that at two ADA parking spaces are provided. The two ADA parking spaces have a shared 9-foot by 18-foot parking access aisle in compliance with the code and ORS 447.233. **Signage associated with the ADA parking spaces shall meet the head clearance distance requirement in the Building Code. All approved parking spaces shall be clearly delineated with painted lines and the entrance and exit driveways shall be signed or marked with paint.**

87. Section 17.98.60(B.5) states that no more than 40 percent of the parking stalls shall be compact spaces. The proposal does not contain any proposed compact parking spaces.

88. Section 17.98.60(C) contains standards on parking lot aisle width. All proposed parking lot maneuvering aisles are two-way. Most of the parking lot only has parking spaces on one side of the maneuvering aisle, however, the ADA parking spaces have double sided parking on the maneuvering aisle. All maneuvering aisles are proposed at 22 feet in width, but the area through the double-sided parking has to be 25 feet in width according to the municipal code. **The applicant shall revise the plan set to detail the maneuvering aisle at 25 feet in width through the double-sided parking area in compliance with the code.**

89. Section 17.98.80(A) requires access from a lower functional order street where practical. The applicant is proposing one driveway/access point to Meinig Avenue aligned with

Idleman Street and one driveway/access point to Scenic Street. Staff finds that providing two driveways will allow for better access to and through the parking lot. Providing a driveway on Meinig Avenue will alleviate the traffic that would use Scenic Street if only one driveway was installed on Scenic Street. The applicant states that a second driveway is being proposed to allow for ease of access and movement of emergency vehicles. Approximately 75 percent of vehicles traveling to the park are projected to use the Meinig Avenue driveway and 25 percent of vehicles traveling to the park are projected to use the Scenic Street driveway.

90. Section 17.98.100 contains driveway standards. Both driveways are proposed at 22 feet in width. The driveways are sloped between two and three percent. The slope of both driveways is directed back toward the site, routing stormwater back onsite and not across the public sidewalk. **The applicant shall modify the Plan Set (Exhibit C) to detail driveways for all the residential properties to the north of Scenic Street, not to exceed 24 feet in width, with aprons at least 20 feet in depth in accordance with Section 17.98.100 (A).** Installing driveway aprons are essential for reducing gravel and other debris from entering the Scenic Street asphalt section. The submitted plan set does not detail a realigned driveway connection for the SandyNet Building (informally referred to as the Bunker Building). Sheet C2.00 (Exhibit C) states, "Final configuration of temporary access to 17175 SE Meinig Ave building to be determined." **The applicant shall modify the Plan Set (Exhibit C) to detail the realigned access to the SandyNet Building. Access to the SandyNet Building shall be maintained throughout construction and any temporary closures shall be coordinated with the SandyNet Director. If the SandyNet Building access is removed in the future, the access area shall be landscaped.**

91. Section 17.98.120 contains landscaping and screening provisions for parking areas. Section 17.98.120(A) requires screening of parking areas containing 4 or more spaces. The Landscape Plans (Exhibit D) details boundary plantings between the parking areas and adjacent properties, between parking areas and street rights-of-way, as well as plantings between parking bays and vehicle maneuvering areas. However, the submitted landscape plans do not detail the locations of different shrubs and grasses, and instead uses blanket variety indicators. **The applicant shall submit revised Landscape Plans (Exhibit D) detailing the locations of the different shrubs and grasses on the property, instead of the blanket variety indicators.**

92. Section 17.98.120(B) requires parking in a commercial district that adjoins a residential district to include a site-obscuring screen that is at least 80 percent opaque when viewed horizontally from between 2 and 8 feet above the average ground level. This is not applicable as the development is a park.

93. Section 17.98.120(C) requires parking facilities to include at least 10 percent landscaping. The submitted plans detail landscaping and walkways around all parking areas. The applicant states that the parking lot consists of both interior parking islands and surrounding perimeter landscape beds that provide approximately 6,600 square feet of landscaping or 28 percent of the overall parking lot area.

94. Section 17.98.120(D) restricts parking bays to no more than 20 parking spaces and requires landscape planters at the ends of each parking bay that have a minimum width of five feet and a minimum length of 17 feet for a single depth bay and 34 feet for a double bay. There is no parking bay which exceeds 20 parking spaces without a landscape planted breaking the number of continuous parking space. Each planter shall contain one major structural tree and ground cover. The Landscape Plans (Exhibit D) details planter bays at the ends of all the parking bays with dimensions at least as large as required by the Sandy Development Code. All of the proposed planter bays have structural trees, such as Village Green zelkova and Sterling Silver linden.

95. Section 17.98.120(E) states that parking area setbacks shall be landscaped with major trees, shrubs, and ground cover. Section 17.92.80 requires parking area buffers to contain a balance of low-lying ground cover and shrubs, and vertical shrubs and trees. The applicant states that the parking lot will be buffered from Scenic Street and from Meinig Avenue by a mix of evergreen and deciduous trees and shrubs.

96. Section 17.98.120(F) requires wheel stops or other methods to protect landscaped areas and pedestrian walkways. The plan set (Exhibit C, Sheet C2.00) details three wheel stops along the ADA parking spaces at the location of a flush curb. The remainder of the parking spaces are internal to the parking lot and do not warrant a wheel stop.

97. Section 17.98.130 requires that all parking and vehicular maneuvering areas shall be paved with asphalt or concrete. As required by Section 17.98.130, **all parking, driveway, and maneuvering areas shall be constructed of asphalt, concrete, or other approved material.**

98. Section 17.98.140 requires parking areas, aisles, and turnarounds to provide adequate provisions for on-site collection of stormwater to eliminate sheet flow onto sidewalks, public rights-of-way, and abutting private property. **The applicant shall comply with the requirements of Section 13.18 of the Sandy Municipal Code.**

99. Section 17.98.150 requires lighting to be provided in all required off-street parking areas. The applicant submitted a lighting fixture schedule for new site lighting, and a photometric plan. These submittals are reviewed in Chapter 15.30 of this document.

UTILITIES – Chapters 17.84 and 17.100

100. Section 17.84.20(A)(1) requires that all improvements shall be installed concurrently with development or be financially guaranteed.

101. Clackamas Fire District #1 (Exhibit L) reviewed the proposal and provided general comments. This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant shall comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. **The applicant shall adhere to all Fire Marshal requirements in Exhibit L, including but not limited to the following:**

    a. **Ensure parking lot turning radius are 28 feet inside and 48 feet outside radius.**
    b. **Provide no parking restrictions on both sides of the parking lot along the curb lines.**
    c. **Comply with all applicable Oregon Fire Code (OFC) requirements.**

102. Fire Hydrants. If any new fire hydrants are installed, they shall follow the following specifications: **Each new fire hydrant installed shall be ordered in an OSHA safety red finish and have a 4-inch non-threaded metal faced hydrant connection with cap installed on the steamer port (4 ½-inch NST x 4-inch Storz Adaptor). If a new building, structure, or dwelling is already served by an existing hydrant, the existing hydrant shall also be OSHA safety red and have a 4-inch non-threaded metal faced hydrant connection with cap installed.**

103. Water. The applicant is proposing to use the existing water meter in Scenic Street. The Assistant Public Works Director (Exhibit M) analyzed the proposed park development for water utility requirements. Water main extension are not required as part of this development. **The applicant shall relocate the existing water meters along Scenic Street to locations as specified by the Public Works Department. The applicant shall revise the Plan Set (Exhibit C) to detail new locations for the water meters along Scenic Street and detail backflow prevention devices for the irrigation system. The development shall contribute Water System Development Charges toward citywide impacts.**

104. Sanitary Sewer. This application is not subject to the moratorium on development adopted by City Council because the proposed restrooms are exempt per Section 4. m. of Resolution No. 2023-27. The Assistant Public Works Director (Exhibit M) analyzed the proposed park development for sanitary sewer utility requirements. The Assistant Public Works Director stated that connections to the public sewer main shall be approved by the Public Works Department to verify geometry, materials, and cleanout cover details. **The**

development shall contribute Sanitary Sewer System Development Charges toward citywide impacts.

105. Stormwater. Section 17.100.250(A) details requirements for stormwater detention and treatment. The applicant submitted a Preliminary Stormwater Report (Exhibit H) completed by Humber Design Group, Inc. The submitted stormwater report did not include the second covered structure as part of the new impervious area. The applicant proposes using a 96-inch detention tank with a water quality filter. All new infrastructure installed shall conform with City standards. The Assistant Public Works Director (Exhibit M) analyzed the proposed park development for stormwater requirements. The Assistant Public Works Director stated that the connection to the existing storm main shall be approved by the Public Works Department to verify pipe materials, pipe diameters, and details regarding that all manholes and cleanouts shall be accessible at grade. **The applicant shall submit a detailed final stormwater report, including the second structure, stamped by a licensed professional engineer for review. The calculations shall meet the water quality/quantity criteria as stated in the City of Sandy Development Code (SDC) Chapter 13.18 Standards and the City of Portland Stormwater Management Manual (SWMM) Standards that were adopted by reference into the Sandy Development Code.** Portions of the onsite walkways will require access for Public Works to maintain the stormwater facilities and must have the capacity to accommodate a vactor truck. **The applicant shall submit details regarding the onsite walkways, including vehicle weight capacity for the vactor truck, turning radius at the stormwater detention system for the vactor truck, and all associated path widths for staff review and approval.**

106. SandyNet. Broadband vault/conduit infrastructure are required for all new developments. The SandyNet Director (Exhibit N) submitted a letter into the record with requirements. **The applicant shall extend broadband infrastructure from the southwest corner of 39175 Scenic Street, near terminal 165, across Scenic Street. The applicant shall also install conduit along any proposed paths with electrical service.** The IT Director will work with the Parks and Recreation Director to identify ideal paths to provide future broadband services to the park. **When the electrical plan has been developed for the park, the applicant shall send plans to the SandyNet Department. Plans for SandyNet design shall be sent to Greg Brewster at gbrewster@ci.sandy.or.us (503-953-4604).**

FLOOD AND SLOPE HAZARD OVERLAY DISTRICT – Chapter 17.66

107. Section 17.60.40 lists the review procedures for development within the Flood and Slope Hazard (FSH) Overlay. In accordance with Section 17.60.40 (B)(1), construction or expansion of major public facilities identified in sanitary, storm, water or street or parks master plans or of minor public facilities necessary to support development, where no other practical alternative exists, are processed as a Type II FSH review. The subject proposal is a park improvement in accordance with the 2022 Amended Parks and Trails Master Plan Update.

108. Section 17.60.60 includes approval standards and conditions for the Flood and Slope Hazard (FSH) Overlay. The City may approve, approve with conditions, or deny an application based on the provisions of Chapter 17.60. The City may require conditions necessary to comply with the intent and provisions of this chapter.

109. Section 17.60.60 (A)(1) states that the cumulative impacts of development within the FSH overlay district, including planned vegetation removal, grading, construction, utilities, roads and the proposed use(s) of the site will not measurably decrease water quantity or quality in affected streams or wetlands below conditions existing at the time the development application was submitted. Currently, there are no onsite stormwater facilities to treat stormwater runoff from impervious surfaces. The applicant is proposing to treat and detain all stormwater from impervious areas in the Sandy Community Campus Park. These stormwater treatments will improve existing conditions and benefit nearby streams and the Sandy River Basin.

110. Section 17.60.60 (A)(2) states that impervious surface area within restricted development areas shall be the minimum necessary to achieve development objectives consistent with the purposes of this chapter. Impervious areas within the FSH zone have intentionally been kept to a minimum. A large majority of the parking lot is located outside of the FSH zone with only a small portion of a single parking stall located within the FSH. Also, the play area surfacing that was selected is pervious. All impervious surfaces in the park will be treated in a stormwater facility.

111. Section 17.60.60 (A)(3) states that all construction materials and methods shall be consistent with the recommendations of special reports, or third-party review of special reports. The proposed construction methods follow the recommendations of the landscape architect and the civil engineer, Humber Design Group Inc., and follow best management practices for development in areas of slopes.

112. Section 17.60.60 (A)(4) states that all cuts and fills shall be the minimum necessary to ensure slope stability, consistent with the recommendations of special reports, or third-party review of special reports. Applicant Response: The cut and fill that occurs within the FSH zone has been kept to a minimum. The existing contours of the site were studied in depth and site features have been strategically located to reduce site disturbance. The earthwork taking place in the FSH zone is required to provide the accessible park path network and the accessible play area. In all cases, the angle of the slopes in the proposed

development are less steep than the existing slope conditions. The applicant submitted a Geotechnical Report (Exhibit H) completed by Pali Consulting. Pali Consulting's scope of work included reviewing background information, completing drilled borings at locations identified by Lango Hansen, conducting infiltration testing, and completing laboratory tests on select samples. The site is adjacent to a mapped deep-seated landslide which is considered pre-historic. Pali Consulting states that the stability of the landslide was not determined so development of the park should consider the risk of future movement of this landform. **The applicant shall minimize fills on the west field area of the site and shall direct stormwater away from the mapped landslide.**

113. Section 17.60.60 (A)(5) and (6) state that development on the site shall maintain the quantity and quality of surface and groundwater flows to locally significant wetlands or streams regulated by the FSH Overlay District and that development on the site shall minimize the loss of native vegetation. Where such vegetation is lost as a result of development within restricted development areas, it shall be replaced on-site at a 2:1 ratio. Two native trees of at least one and one-half-inch caliper shall replace each tree removed. Disturbed understory and groundcover shall be replaced by native understory and groundcover species that effectively covers the disturbed area. The proposed development does not impact any wetlands or streams. Additionally, the development of the park will only result in the removal of two native trees within the FSH zone. These trees will be replaced onsite at a 2:1 ratio, resulting in four new native trees being planted onsite. There are currently several large patches of invasive blackberries onsite that will be removed and replaced with native grasses and shrubs. **The applicant shall submit revised Landscape Plans (Exhibit D) detailing the locations of the different shrubs and grasses on the property, instead of the blanket variety indicators, including the FSH Overlay area.**

URBAN FORESTRY – Chapter 17.102

114. Section 17.102.20 contains information on the applicability of Urban Forestry regulations. The applicant's narrative (Exhibit B) states the following: "The following trees are being removed in order to construct the required ¾ street improvements of Scenic Street: (1) 8", (1) 10", (2) 12" and (1) 18" Pseudotsuga menziesii – Douglas fir and (1) 8" Acer macrophyllum – big leaf maple. (1) 6" Alnus rubra – red alder is being removed to install site pathways. A total of (7) trees are proposed to be removed, all in good condition. All trees proposed for removal will be replaced at a two-one ratio. A minimum of 14 native trees will be replanted onsite to mitigate for the trees that are being removed." The six trees being removed for the construction of Scenic Street are exempt from retention per Section 17.102.20 (B)(1) and also does not meet the retention standard of 11-inches DBH or greater. The 6-inch red alder has to be removed for demolition of existing walkways and installation of a new walkway and also does not meet the retention standard of 11-inches DBH or greater. Since no trees are proposed to be removed from the site that are 11-inches DBH or greater, other than for street construction purposes, the Director did not require an arborist report.

115. In accordance with Section 17.102.50, at least three (3) trees 11-inches DBH or greater shall be retained for every one-acre of contiguously owned land. The subject site is approximately 48.55 acres requiring retention of at least 146 trees, 11 inches and greater DBH (48.55 x 3 = 145.65). The applicant is proposing to remove three (3) trees from the subject site that meet the minimum retention standard for tree size. However, the site has hundreds of trees, if not thousands of trees on the hillside sloping towards the Sandy River. Also, the applicant is proposing to mitigate the removal of the seven (7) trees by planting 14 native mitigation trees.

116. In addition to the above conditions the applicant shall complete additional conditions prior to grading to make sure that retention trees are adequately protected. The applicant shall complete the following prior to grading:

    a. **Install tree protection fencing at the critical root zone of 1 foot per 1-inch DBH to protect all of the trees proposed to remain on the site. Tree protection fencing shall be 6-foot-tall chain link or no-jump horse fencing and the applicant shall affix a laminated sign (minimum 8.5 inches by 11 inches) every 100 feet to the tree protection fencing indicating that the area behind the fence is a tree retention area and that the fence shall not be removed or relocated.**
    b. **Request an inspection of tree protection measures prior to any tree removal, grading, or other construction activity on the site. The tree protection fence inspection shall be approved by City staff prior to any grading activity.**

117. **No construction activity shall occur within the tree protection zone, including, but not limited to, dumping or storage of materials such as building supplies, soil, waste items, equipment, or parked vehicles. Up to 25 percent of the area between the minimum root protection zone of 0.5 feet per 1-inch DBH and the critical root zone of**

1 foot per 1-inch DBH may be able to be impacted without compromising the tree, provided the work is monitored by a qualified arborist.

118. To make sure that tree protection measures are being adequately conducted the applicant shall also consult with an arborist to monitor construction activity by retention trees. **The applicant shall retain an arborist on site to monitor any construction activity within the critical root protection zones of the retention trees or trees on adjacent properties that have critical root protection zones that would be impacted by development activity on the subject property. The applicant shall submit a post-construction report prepared by a TRAQ qualified arborist to ensure none of the retention trees were damaged during construction.**

119. The applicant did not provide specific information regarding how the trees proposed for removal with this application would be felled. **The applicant shall have the trees felled such that it does not negatively impact other retention trees, any adjacent property, or the right-of-way.**

120. The applicant did not indicate if there are nests in the trees proposed for removal. **If the trees are removed during prime nesting season (February 1- July 31), the applicant shall check for nests prior to tree removal. If nests are discovered, the applicant shall delay tree removal until after the nesting season or shall hire a professional to relocate the nests to an appropriate nearby location, provided the species using the nest is not invasive.**

LANDSCAPING AND SCREENING – Chapter 17.92

121. Section 17.92.10 contains general provisions for landscaping. As required by Section 17.92.10(C), trees over 25-inches circumference measured at a height of 4.5 feet above grade are considered significant and should be preserved to the greatest extent practicable and integrated into the design of a development. A 25-inch circumference tree measured at 4.5 feet above grade has roughly an eight-inch diameter at breast height (DBH). Tree protection fencing and tree retention is discussed in more detail under Chapter 17.102 in this document. **Per Section 17.92.10(L), all landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing. Per Section 17.92.10(D), planter and boundary areas used for required plantings shall have a minimum diameter of five feet (two and one-half foot radius, inside dimensions). Where the curb or the edge of these areas are used as a tire stop for parking, the planter or boundary plantings shall be a minimum width of seven and one-half feet.**

122. Per Section 17.92.10(L), **all landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing.** Landscaping will be maintained or otherwise enforced by Code Enforcement.

123. Section 17.92.20 contains minimum landscaping area requirements. The Medium Density Residential (R-2) zoning district and the Parks and Open Space (POS) zoning district do not contain minimum landscaping area requirements. That said, the majority of the site will be landscaped as the proposal is for the development of a park.

124. Section 17.92.30 specifies that street trees shall be chosen from the City-approved list. As required by Section 17.92.30, the development of the streets requires medium trees spaced 30 feet on center along all street frontages. The submitted Landscape Plans (Exhibit D) details trees at an appropriate spacing per the development code, except an additional tree needs to be planted to the southwest of Scenic Street and two trees planted to the south of the driveway on Meinig Avenue. Staff also recommends that four additional street trees are planted along Meinig Avenue alternating the five proposed Homestead elms. **The applicant shall revise the Landscape Plan (Exhibit D) to detail six additional street trees along Meinig Avenue and one additional street tree along Scenic Street.** Due to concerns with Asian Longhorn Beetle and Emerald Ash Borer as well as an interest in increasing species diversity, staff would prefer that the applicant proposes fewer maples and no ashes as street trees at this time.

125. Mass grading on the site will remove topsoil and heavily compact the existing clay soils. In order to maximize the success of the required trees and other landscaping, **the applicant shall aerate and amend the soil within the planting areas of trees to a depth of 3 feet prior to planting trees. The applicant shall submit a letter from the project landscaper confirming that the soil has been aerated and amended prior to planting trees.**

126. Section 17.92.40 requires that all landscaping shall be irrigated, either with a manual or automatic system. The applicant states that landscaping installed at the park will be irrigated with a combination of an automatic system as well as supplemental manual watering as needed to sustain viable plant life. **As required by Section 17.92.140, the developer and lot owners shall be required to maintain all vegetation planted in the development for two (2) years from the date of completion, and shall replace any dead or dying plants during that period.**

127. Section 17.92.50 specifies the types and sizes of plant materials that are required when planting new landscaping. Trees are typically required to be a minimum caliper of 1.5-inches measured 6 inches from grade if deciduous, or 5 feet in height if coniferous. Shrubs are required to be a minimum of one gallon in size or two feet in height when measured immediately after planting. The applicant has identified Bigleaf maple, Starlight dogwood, Tulip tree, Doug fir, Sawtooth oak, Oregon White oak, Sterling Silver linden, Homestead elm, and Village Green zelkova. The deciduous trees are proposed at 3-inches caliper and the evergreens are proposed at 8 feet in height, both in compliance with Section 17.92.50. The applicant is proposing three different shrub and groundcover varieties at one gallon, two gallon, and five gallon in compliance with Section 17.92.50. However, the submitted landscape plans do not detail the locations of different shrubs and grasses, and instead uses blanket variety indicators. **The applicant shall submit revised Landscape Plans (Exhibit D) detailing the locations of the different shrubs and grasses on the property, instead of the blanket variety indicators.** Having appropriate shrubs and bushes around the park, especially by property lines is important for creating buffers/screening to residential areas adjacent to the park

128. Section 17.92.60 requires revegetation in all areas that are not landscaped or remain as natural areas. The applicant did not submit any plans for re-vegetation of areas damaged through grading/construction, although most of the areas affected by grading will be improved. **Exposed soils shall be covered by mulch, sheeting, temporary seeding or other suitable material following grading or construction to maintain erosion control.**

129. Section 17.92.90 has details on screening of unsightly views or visual conflicts. The applicant states that the parking lot will be screened from the public rights-of-way by planting areas that are a minimum of five feet in depth. These planting areas will consist of native and climate adaptive shrubs and ground cover. However, the submitted landscape plans do not detail the locations of different shrubs and grasses, and instead uses blanket variety indicators. Additionally, the parking lot sits considerably lower than the adjacent streets. **On-grade and above-grade electrical and mechanical equipment such as transformers, heat pumps, etc. shall be screened with sight obscuring fences, walls, or landscaping.**

EROSION CONTROL, NUISANCES, DARK SKIES, AND ACCESSORY DEVELOPMENT – Chapters 15.44, 15.30, and 17.74

130. In accordance with the requirements of Chapter 15.44, Erosion Control, the applicant submitted a Geotechnical Report (Exhibit H) completed by Pali Consulting. Pali Consulting's scope of work included reviewing background information, completing drilled borings at locations identified by Lango Hansen, conducting infiltration testing, and completing laboratory tests on select samples. The site is adjacent to a mapped deep-seated landslide which is considered pre-historic. Pali Consulting states that the stability of the landslide was not determined so development of the park should consider the risk of future movement of this landform. **The applicant shall minimize fills on the west field area of the site and shall direct stormwater away from the mapped landslide.** Soils on the site have very low permeability across the site which makes on-site stormwater infiltration unlikely. Soils at the site are generally medium stiff or better. Pali Consulting states that such soils should be capable of supporting anticipated structures and infrastructure, although areas of fill have the potential to include areas of soft or unsuitable soils which are difficult to predict. Construction records confirming compaction of the fill were not located, but based on the uniform material type, soil consistency, and lack of deleterious materials, the fill appears to have been placed as structural fill in areas of Pali Consulting's explorations. The on-site fill is expected to be able to support the improvements suitably but should be further evaluated during construction.

131. **All the work within the public right-of-way and within the paved area should comply with American Public Works Association (APWA) and City requirements as amended. The applicant shall submit a grading and erosion control permit and request an inspection of installed devices prior to any additional grading onsite.** The grading and erosion control plan shall include a re-vegetation plan for all areas disturbed during construction of the subdivision. **All erosion control and grading shall comply with Section 15.44 of the Municipal Code. The proposed development is greater than one acre which typically requires approval of a DEQ 1200-C Permit. The applicant shall submit confirmation from DEQ if a 1200-C Permit will not be required.**

132. Section 15.44.50 contains requirements for maintenance of a site including re-vegetation of all graded areas. **The applicant's Grading and Erosion Control Plan shall be designed in accordance with the standards of Section 15.44.50.** Grass seeding shall be completed as required by Section 17.100.300. **A Grading and Erosion Control Permit will be required prior to any site grading. The applicant shall request an inspection of erosion control measures and tree protection measures as specified in Section 17.102.50(C) prior to construction activities or grading.**

133. Other development with demolition of mass grading have sparked unintended rodent issues in surrounding neighborhoods. Prior to development of the site, **the applicant shall have a licensed pest control agent evaluate the site to determine if pest eradication, particularly rats, is needed.**

134. Section 17.74.40 specifies, among other things, retaining wall and fence height in front, side, and rear yards. The applicant did not specify the installation of any retaining walls or fences. **The applicant shall submit additional details for any proposed retaining walls or fences, including heights meeting code requirements and architectural finishes, for staff review and approval.**

135. Street Lighting. Chapter 15.30 contains the City of Sandy's Dark Sky Ordinance. The applicant will need to install street lights along all street frontages wherever street lighting is determined necessary at a minimum of 150 feet apart and following the standard detail for street lighting, including Ubicquia control nodes. The applicant's Street Photometric (Exhibit E, Sheet 2.1) details street lighting photometrics for two new light poles. One of the new light poles is proposed on Scenic Street to the northwest of the proposed driveway and the second new light pole is located on Meinig Avenue to the east of the parking lot. **The applicant shall submit street lighting details with the construction plans for City staff review and approval. Street lighting shall not use a central photo sensor in the power pedestal and each light shall be installed with Ubicell controllers to match City's lighting system.**

136. On-Site Lighting. Chapter 15.30 requires that on-site lighting is full cut-off, does not exceed 4,125 Kelvins, and does not exceed 0.25-foot candles at 10 feet beyond the property lines. The applicant submitted Lighting Plan (Exhibit E) details several different lighting fixture types. The applicant submitted a Park Electrical and Photometric (Exhibit E, Sheet E1.1) that details foot candles. The on-site foot candles do not exceed 0.05-foot candles at 10 feet beyond the property line along Meinig Avenue, however, the foot candle imagery is not complete along the property line along Scenic Street. **The applicant shall submit a revised Photometric Plan (Exhibit L, Sheet E1.2) detailing foot candles 10 feet beyond the property boundary along Scenic Street, not exceeding 0.25-foot candles. The applicant shall also submit lighting fixture cut sheets detailing all on-site lighting as full cut-off and not exceeding 4,125 Kelvins.**

RECOMMENDATION

The Development Services Director recommends the Planning Commission **approve** the Type III design review, conditional use permit, tree removal, and four variances associated with the proposed Sandy Community Campus Park subject to the conditions of approval below. This proposal meets the applicable approval criteria in the Sandy Municipal Code and achieves a major goal to develop a park in north Sandy in an area currently underserved with park amenities.

RECOMMENDED CONDITIONS OF APPROVAL

A. Submit the following with the trade permits and prior to any grading or tree removal:

1. Revise the plan set with the following:
   a. Detail a driveway apron or other delineated pedestrian crossing at the driveway on Meinig Avenue that connects the sidewalks on each side of the driveway.
   b. Detail driveways for all the residential properties to the north of Scenic Street, not to exceed 24 feet in width, with aprons at least 20 feet in depth in accordance with Section 17.98.100 (A).
   c. Detail a six-inch monumentation strip at the back of sidewalk on Scenic Street. To accommodate the required monumentation strip it may require six inches of right-of-way dedication.
   d. Detail a transition of the Meinig Avenue sidewalk at the south property line to a setback sidewalk with a planter strip at least five feet in width with two street trees in the planter strip.
   e. Detail all sidewalks on Meinig Avenue at least six feet in width.
   f. Detail the location of mechanical, electrical, and communications equipment and the proposed screening method for staff review and approval.
   g. Detail all planter bays at least five feet in width (interior dimensions) by 17 feet in length or five feet in width and 34 feet in length for a double bay.
   h. Detail the location of a bus stop sign per the specifications of Sandy Area Metro. The applicant shall coordinate the exact location of the sign with the Transit Director.
   i. Detail the maneuvering aisle at 25 feet in width through the double-sided parking area in compliance with the code.
   j. Detail all parking lot turning radius are 28 feet inside and 48 feet outside radius.
   k. Detail ‘no parking’ restrictions on both sides of the parking lot along the curb lines.
   l. Detail broadband infrastructure from the southwest corner of 39175 Scenic Street, near terminal 165, across Scenic Street.
   m. Detail new locations for the water meters along Scenic Street and detail backflow prevention devices for the irrigation system.
   n. Detail the relocation of the utility poles on Scenic Street.
   o. Detail the realigned access to the SandyNet Building.

2. Revise the elevations with the following:
   a. Detail the stone base at the base of all support columns for both of the structures and shall choose a dressed fieldstone finish for consistency with other City property.
   b. Detail the second building without the restroom, mimicking the design elements on the building in Exhibit F.
   c. Detail siding colors in compliance with Appendix C of the Sandy Development Code.
   d. Detail metal roofing colors in compliance with Appendix D of the Sandy Development Code.
   e. Detail one secondary roof form, such as a windowless dormer, on both the east and west sides of the larger shelter centered on the restroom.

3. Revise the landscape plan with the following:
   a. Detail the locations of the different shrubs and grasses on the property, instead of the blanket variety indicators, including the FSH Overlay area.
   b. Detail six additional street trees along Meinig Avenue and one additional street tree along Scenic Street.
   c. Detail the locations of additional trees and shrubs around Scenic Street to the west of where the sidewalk is proposed to terminate to reduce the opportunity for user made paths to the park.

4. Submit details regarding the onsite walkways, including vehicle weight capacity for the vactor truck, turning radius at the stormwater detention system for the vactor truck, and all associated path widths, for staff review and approval.

5. Submit additional Geotech documentation that no further subgrade improvements are required for the widening of Meinig Avenue, for staff review and approval.

6. Submit a standard detail for the proposed bicycle racks meeting the space and security requirements in Section 17.98.160, for staff review and approval.

7. Submit additional details for any proposed retaining walls or fences, including heights meeting code requirements and architectural finishes, for staff review and approval.

8. Submit a revised Photometric Plan (Exhibit L, Sheet E1.2) detailing foot candles 10 feet beyond the property boundary along Scenic Street, not exceeding 0.25-foot candles. Also submit lighting fixture cut sheets detailing all on-site lighting as full cut-off and not exceeding 4,125 Kelvins, for staff review and approval.

9. Submit street lighting details with the construction plans for staff review and approval. Street lighting shall not use a central photo sensor in the power pedestal and each light shall be installed with Ubicell controllers to match City's lighting system.

B. Prior to tree removal, earthwork, grading, or excavation, the applicant shall complete the following and receive necessary approvals as described:

1. Apply for a grading and erosion control permit in conformance with Chapter 15.44. The grading and erosion control plan shall include a re-vegetation plan for all areas disturbed during construction of the subdivision.

2. Submit proof of receipt of a Department of Environmental Quality 1200-C permit or submit confirmation from DEQ if a 1200-C Permit will not be required.

3. Submit proof that a licensed pest control agent evaluated the site to determine if pest eradication, particularly rats, is needed.

4. Install tree protection fencing at the critical root zone of 1 foot per 1-inch DBH to protect all of the trees proposed to remain on the site. Tree protection fencing shall be 6-foot-tall

chain link or no-jump horse fencing and the applicant shall affix a laminated sign (minimum 8.5 inches by 11 inches) every 100 feet to the tree protection fencing indicating that the area behind the fence is a tree retention area and that the fence shall not be removed or relocated.

5. Request an inspection of tree protection measures prior to any tree removal, grading, or other construction activity on the site. The tree protection fence inspection shall be approved by City staff prior to any grading activity.

6. If the trees are removed during prime nesting season (February 1- July 31), the applicant shall check for nests prior to tree removal. If nests are discovered, the applicant shall delay tree removal until after the nesting season or shall hire a professional to relocate the nests to an appropriate nearby location, provided the species using the nest is not invasive.

C. Prior to issuance of building permits, the applicant shall complete the following:

1. Pay the Transportation System Development Charges related to this project.

2. Pay the Sanitary Sewer System Development Charges related to this project.

3. Pay the Water System Development Charges related to this project.

D. Prior to all construction activities, except grading and/or excavation, the applicant shall submit the following additional information as part of the construction plans and complete items during construction as identified below:

1. Pay plan review, inspection, and permit fees as determined by the Public Works Director or their designee.

2. Submit written confirmation from the Sandy Fire District regarding the number and location of required fire hydrants.

3. Submit a detailed final stormwater report, including the second structure, stamped by a licensed professional engineer for review. The calculations shall meet the water quality/quantity criteria as stated in the City of Sandy Development Code (SDC) Chapter 13.18 Standards and the City of Portland Stormwater Management Manual (SWMM) Standards that were adopted by reference into the Sandy Development Code.

4. When the electrical plan has been developed for the park, the applicant shall send plans to the SandyNet Department. Plans for SandyNet design shall be sent to Greg Brewster at gbrewster@ci.sandy.or.us, (503-953-4604).

E. Prior to receiving a Certificate of Occupancy (C of O), the applicant shall complete the following:

1. Complete all public improvements per the approved construction plans.

2. Install all required fire hydrants. Each new fire hydrant installed shall be ordered in an OSHA safety red finish and have a 4-inch non-threaded metal faced hydrant connection with cap installed on the steamer port (4 ½-inch NST x 4-inch Storz Adaptor). If a new building, structure, or dwelling is already served by an existing hydrant, the existing hydrant shall also be OSHA safety red and have a 4-inch non-threaded metal faced hydrant connection with cap installed.

3. Submit a post-construction report prepared by a TRAQ qualified arborist to ensure none of the retention trees were damaged during construction.

4. Plant all approved landscaping, including street trees. Submit documentation from the project landscaper stating that the soil has been amended and aerated to a depth of 3 feet prior to planting trees.

5. Install all proposed park improvements, including but not limited to the play area, skate park, pump track, walkways, and other park amenities.

6. Install screening for all electrical, mechanical, and communication equipment. On-grade and above-grade electrical and mechanical equipment such as transformers, heat pumps, and central air conditioner units shall be screened with sight obscuring fences, walls, or landscaping.

7. Install all parking and maneuvering areas. All parking, driveway and maneuvering areas shall be constructed of asphalt, concrete, or other approved material. Signage associated with the ADA parking spaces shall meet the head clearance distance requirement in the Building Code. All approved parking spaces shall be clearly delineated with painted lines and the entrance and exit driveways shall be signed or marked with paint.

8. Install all building improvements that are included on the approved building plans and as addressed in the findings and conditions in this document.

9. Provide street address numbers measuring a minimum of six (6) inches high and of contrasting color, which clearly locate the park for patrons and emergency services. The applicant shall verify the location of the address with the Building Official and emergency service providers.

F. General Conditions of Approval:

1. Design review approval shall be void after two (2) years from the date of the Final Order unless the applicant has submitted plans for building permit approval.

2. Public plans are subject to a separate review and approval process. Preliminary Plat approval does not connote approval of public improvement construction plans, which will be reviewed and approved separately upon submittal of public improvement construction plans.

3. All on-site earthwork activities including any retaining wall construction should follow the requirements of the City of Sandy Development Code and the current edition of the Oregon Structural Specialty Code (OSSC).

4. No construction activity shall occur within the tree protection zone, including, but not limited to, dumping or storage of materials such as building supplies, soil, waste items, equipment, or parked vehicles. Up to 25 percent of the area between the minimum root protection zone of 0.5 feet per 1-inch DBH and the critical root zone of 1 foot per 1-inch DBH may be able to be impacted without compromising the tree, provided the work is monitored by a qualified arborist.

5. The applicant shall have the trees felled such that it does not negatively impact other retention trees, any adjacent property, or the right-of-way.

6. If park signs are desired, the applicant shall submit a detailed plan showing the location of such signage and a sign permit application.

7. All work within the public right-of-way and within the paved area shall comply with the American Public Works Association (APWA) and City requirements as amended and should be constructed to the City's structural streets standards.

8. All utilities shall be installed underground and in conformance with City standards. The applicant shall install utilities underground with individual service to each lot.

9. The applicant shall be responsible for the installation of all improvements detailed in Section 17.100.310, including fiber facilities. The applicant shall install conduit along any proposed paths with electrical service. The IT Director will work with the Parks and Recreation Director to identify ideal paths to provide future broadband services to the park.

10. Access to the SandyNet Building shall be maintained throughout construction and any temporary closures shall be coordinated with the SandyNet Director. If the SandyNet Building access is removed in the future, the access area shall be landscaped.

11. The applicant shall comply with all applicable Oregon Fire Code requirements. The applicant shall adhere to all Fire Marshal requirements in Exhibit L, including but not limited to the following:

    a. Ensure parking lot turning radius are 28 feet inside and 48 feet outside radius.
    b. Provide no parking restrictions on both sides of the parking lot along the curb lines.
    c. Comply with all applicable Oregon Fire Code (OFC) requirements.

12. Each new fire hydrant installed shall be ordered in an OSHA safety red finish and have a 4-inch non-threaded metal faced hydrant connection with cap installed on the steamer port (4 ½-inch NST x 4-inch Storz Adaptor). If a new building, structure, or dwelling is

already served by an existing hydrant, the existing hydrant shall also be OSHA safety red and have a 4-inch non-threaded metal faced hydrant connection with cap installed.

13. All public utility installations shall conform to the City's facilities master plans.

14. All site runoff shall be detained such that post-development runoff does not exceed the predevelopment runoff rate for the 2, 5, 10 and 25 year storm events. Stormwater quality treatment shall be provided for all site drainage per the standards in the City of Portland Stormwater Management Manual (COP SWMM). In accordance with the Geotech study, the applicant shall minimize fills on the west field area of the site and shall direct stormwater away from the mapped landslide.

15. Lights shall not exceed 4,125 Kelvins or 591 nanometers in order to minimize negative impacts on wildlife and human health.

16. Minimum AASHTO sight distance requirements shall be met at all site driveways.

17. Street trees are required to be a minimum caliper of 1.5-inches measured 6 inches from grade and shall be planted per the City of Sandy standard planting detail. Trees shall be planted, staked, and any planter strips shall be graded and backfilled as necessary, and bark mulch, vegetation, or other approved material installed prior to occupancy. Tree ties shall be loosely tied twine or other soft material and shall be removed after one growing season (or a maximum of 1 year).

18. Per Section 17.92.10(D), planter and boundary areas used for required plantings shall have a minimum diameter of five feet (two and one-half foot radius, inside dimensions). Where the curb or the edge of these areas are used as a tire stop for parking, the planter or boundary plantings shall be a minimum width of seven and one-half feet.

19. As required by Section 17.92.10(L), all landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing. As required by Section 17.92.140, the developer shall maintain all vegetation planted in the development for two (2) years from the date of completion and shall replace any dead or dying plants during that period.

20. On-grade and above-grade electrical and mechanical equipment such as transformers, heat pumps, etc. shall be screened with sight obscuring fences, walls, or landscaping.

21. Exposed soils shall be covered by mulch, sheeting, temporary seeding or other suitable material following grading or construction to maintain erosion control.

22. Comply with all standards required by Section 17.84 of the Sandy Development Code. Public and franchise improvements shall be installed or financially guaranteed in accordance with Chapter 17 of the Sandy Municipal Code prior to temporary or final occupancy of structures. Sanitary sewer lines, water lines, and fire hydrants shall be installed in accordance with City standards.

23. Comply with all other conditions or regulations imposed by the Clackamas Fire District #1 (Exhibit L) or state and federal agencies. Compliance is made a part of this approval and any violations of these conditions and/or regulations may result in the review of this approval and/or revocation of approval.

EXHIBIT A

General Land Use Application

1 page

Name of Project:	Sandy Community Campus Park
Location or Address:	17165 SE Meinig Avenue

Map & Tax Lot #	**T:** 2 South	**R:** 4 East Willamette M	**Section:** 13	**Tax Lot (s):** 24E13BD001010

Request: This is a request for a design review, conditional use permit, four variances, tree removal and FSH Overlay review .

I am the (check one) ☐ owner ☐ lessee of the property listed above, and the statements and information contained herein are in all respects true, complete and correct to the best of my knowledge and belief.

Applicant (if different than owner) Brian Martin	Owner City of Sandy Parks and Recreation
Address 1100 NW Glisan St, Ste 3A	Address 38348 Pioneer Blvd
City/State/Zip Portland, OR 97209	City/State/Zip Sandy, OR
Email brian@langohansen.com	Email randerholmparsch@ci.sandy.or.us
Phone (503) 553-9242	Phone 503-489-2157
Signature Brian Martin	Signature Rochelle Anderholm-Parsch

Staff Use Only

File #:	Date:	Fee$:	Planner:
Type of review: Type I ☐	Type II ☐	Type III ☐	Type IV ☐
Has applicant attended a pre-app? Yes ☐	No ☐	If yes, date of pre-app meeting:	

Type III – LAND USE REVIEW

Applicant's Submittal

6.21.2023

APPLICANT: Lango Hansen Landscape Architects
1100 NW Glisan St #3a
Portland, OR 97209

OWNER: City of Sandy
39250 Pioneer Blvd
Sandy, OR 97055

REQUEST: We are requesting a Land Use Review for the parks improvements and the following sections in the Sandy Municipal code as noted below.

LOCATION: **17165 SE Meinig Avenue (Tax Lot numbers 24E13BD00101 & 24E13BA00200)**

I. BACKGROUND:

1. **Existing Conditions**: The existing site consists of a grass sports fields and a running track. The site is roughly divided into two flat areas an upper field and a lower field, with sloped lawn dividing the two. There is a maintenance access road that leads down to the lower level track but there are no routes that meet current accessible standards. There is an existing skate park onsite. The site is surrounded on three sides by mature forest and is directly connected to the Sandy River Park.
2. **Project Description**: The Community Campus Park is a legacy park project for the City of Sandy. The 10 acre park project will provide a skate park, a pump track, an inclusive play area, extensive walking paths, restrooms, a picnic shelter and more. The park will also include onsite parking and a direct trail connection to the adjacent Sandy River Park. Meinig Avenue and Scenic Street will be improved per City standards.

II. APPROVAL CRITERIA AND RESPONSES:

Municipal Code Standards and Requirements: The following sections of the Sandy Municipal Code are applicable to this land use approval:

CHAPTER ***PAGE***

REQUIRED CODE RESPONSES:

CHAPTER 17.32 PARKS AND OPEN SPACES

17.32.20 Permitted Uses

A. *Primary Uses Permitted Outright:*

1. *Parks, natural areas and open space, and special use areas identified in Map 5 Existing Park Inventory, Map 8 Proposed Park System, Table 12 Tier 1 Capital Improvement Plan, or Table A-3 Proposed Park Capital Improvement Plan of the 2022 Parks and Trails Master Plan;*

Applicant Response: For the portion of the site that is zoned Parks and Open Space, the project consists entirely of a permitted use of a park. The 2022 Amended Parks and Trails Master Plan Update directly addresses the Sandy Community Campus Park, identifying it as an underdeveloped community park. While future potential uses for the Cedar Ridge pool and buildings are being studied by City Council, the 2022 Master Plan included a preliminary concept for the redevelopment of the park. This concept was created as a part of the Aquatic Facility Analysis. The concept was divided into phases with phase 1 focusing on the redevelopment of the east portion of the park. Improvements included a parking lot, a playground, picnic area, basketball court and a community garden. The master plan highlighted the fact that the Sandy Community Campus Park will “fill a neighborhood park service gap for community members within 1/2- mile of the park.” Additionally, there as community support for prioritizing a pump track and the skate park replacement in phase 1, these improvements being achieved by reducing parking.

The proposed park development is a direct response to the previous planning work and public outreach efforts that were conducted, including an extensive site planning exercise conducted in 2018. Using that planning work as a foundation, the 2022 Amended Parks and Trails Master Plan Update generated specific recommendations for the development of the Community Campus site. As recommended by the master plan, improvements include a parking lot, a playground, picnic areas and a pioneer garden. The amenities of the park are designed to fill the current service gap and provide both a neighborhood park and a community park.

The project process has included a significant amount of public outreach including three public open houses, focused open houses for members of Sandy Vista and for seniors, two public surveys, and a series of targeted outreach meetings focusing on the design of the skate park, pump track and jump line.

CHAPTER 17.38 MEDIUM DENSITY RESIDENTIAL

17.38.20 Conditional Uses

B. Conditional Uses:

2. Community services;

Applicant Response: A part of the proposed park is located on land zoned Parks and Open Space, so the development of the property as a park is allowed outright. The other portion of the proposed park improvements are on land zoned Medium Density Residential (R-2) and therefore requires a Conditional Use Approval. The current grass fields and walking track do not fully utilize the potential of this park for the neighborhood and the rest of the community. This park will provide for a service gap identified in the 2022 Amended Parks and Trails Master Plan Update that documented the insufficient neighborhood parks serving the adjacent residential neighborhoods. The development of this park will provide the first park in the northeast quadrant of the City. The programming elements in the park, including a play area, walking paths, a picnic shelter and restroom facilities will benefit people living the in the neighborhood as well as those living in other parts of Sandy and adjacent communities.

17.38.30 Development Standards

Setbacks - Front yard 10 ft min., rear yard – 15 ft min, side yard (interior) 5 ft min, corner lot 10 ft min.

Structure Height - 35' max.

Applicant Response: The proposed combined restroom facility and picnic shelter is located approximately 120 feet from Scenic Street and 175 feet from Meinig Avenue.

The structure is approximately 14' in height.

17.38.40 Minimum Requirements.

A. Shall connect to municipal water.

B. Shall connect to municipal sewer if service is currently within 200 feet of the site. Sites more than 200 feet from municipal sewer, may be approved to connect to an alternative disposal system provided all of the following are satisfied:

C. The location of any real improvements to the property shall provide for a future street network to be developed.

D. Shall have frontage or approved access to public streets.

Applicant Response: The park will connect to municipal water for the restroom facility, drinking fountains and for irrigation water. The park will also be connected to municipal sewer to serve the

restroom facility. The locations of real improvements on the park property allow for the Scenic Street and Meinig Avenue rights-of-ways to be developed to current City of Sandy standards.

CHAPTER 17.60 FLOOD AND SLOPE HAZARD (FSH) OVERLAY DISTRICT

17.60.20 Approval Standards and Conditions

The approval authority may approve, approve with conditions, or deny an application based on the provisions of this chapter. The approval authority may require conditions necessary to comply with the intent and provisions of this chapter.

A. Approval Standards. The following approval standards apply to development proposed within restricted development areas of the FSH overlay district.

1. Cumulative Impacts. Limited development within the FSH overlay district, including planned vegetation removal, grading, construction, utilities, roads and the proposed use(s) of the site will not measurably decrease water quantity or quality in affected streams or wetlands below conditions existing at the time the development application was submitted.

Applicant Response: Currently, there are no onsite stormwater facilities to treat stormwater runoff from impervious surfaces. As a part of the proposed development all of the impervious areas in the park will be treated and detained in stormwater facilities. This will measurably improve the quality of the flowing from the impervious surfaces in the park into the adjacent stream over existing conditions.

2. Impervious Surface Area. Impervious surface area within restricted development areas shall be the minimum necessary to achieve development objectives consistent with the purposes of this chapter.

Applicant Response: Impervious areas within the FSH zone have intentionally been kept to a minimum. A large majority of the parking lot is located outside of the FSH zone with only a small portion of a single parking stall located within the FSH. Also, the play area surfacing that was selected is pervious. All impervious surfaces in the park will be treated in a stormwater facility.

3. Construction Materials and Methods. Construction materials and methods shall be consistent with the recommendations of special reports, or third-party review of special reports.

Applicant Response: The construction methods follow the recommendations of the landscape architect and civil engineer and follow best management practices for development in areas of slopes.

4. *Cuts and Fills.* Cuts and fills shall be the minimum necessary to ensure slope stability, consistent with the recommendations of special reports, or third-party review of special reports.

Applicant Response: The cut and fill that occurs within the FSH zone has been kept to a minimum. The existing contours of the site were studied in depth and site features have been strategically located to reduce site disturbance. The earthwork taking place in the FSH zone is required to provide the accessible park path network and the accessible play area. In all cases, the angle of the slopes in the proposed development are less steep than the existing slope conditions.

5. *Minimize Wetland and Stream Impacts. Development on the site shall maintain the quantity and quality of surface and groundwater flows to locally significant wetlands or streams regulated by the FSH Overlay District.*
6. *Minimize Loss of Native Vegetation. Development on the site shall minimize the loss of native vegetation. Where such vegetation is lost as a result of development within restricted development areas, it shall be replaced on-site on a two:one basis according to type and area. Two native trees of at least one and one-half-inch caliper shall replace each tree removed. Disturbed understory and groundcover shall be replaced by native understory and groundcover species that effectively covers the disturbed area.*

Applicant Response: The proposed development does not impact any wetlands or streams. Additionally, the development of the park will only result in the removal of two native trees within the FSH zone. These trees will be replaced onsite at a two:one ratio, resulting in four new native trees being planted onsite. Currently, there are large patches of invasive blackberries onsite. These blackberries will be removed and native grasses and shrubs will be planted in their place.

B. All development permits for areas partially or fully within the Area of Special Flood Hazard shall be reviewed by the Director to determine that:
   1. The permit requirements of Chapter 17.60 have been satisfied;
   2. All other required state and federal permits have been obtained; and,
   3. The site is reasonably safe from flooding.

Applicant Response: All of the permits will be obtained from Federal agencies as required, including DEQ, DSL and any other applicable agency.

C. Conditions. The required reports shall include design standards and recommendations necessary for the engineer and landscape expert to certify that the standards of this chapter can be met with appropriate mitigation measures. These measures, along with third party reviewer and staff recommendations, shall be incorporated as conditions into the final decision approving the proposed development.

D. Assurances and Penalties. Assurances and penalties for failure to comply with mitigation, engineering, erosion and water quality plans required under this chapter shall be as stated in Chapter 17.06.

Applicant Response: The applicant acknowledges the above conditions, assurances and penalties.

CHAPTER 17.66 ADJUSTMENTS AND VARIANCES

17.66.70 Type II and Type III Variance Criteria

A. The circumstances necessitating the variance are not of the applicant's making.

B. The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located.

C. Granting of the variance will not adversely affect implementation of the Comprehensive Plan.

D. The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.

E. The development will be the same as development permitted under this Code and City standards to the greatest extent that is reasonably possible while permitting some economic use of the land.

F. Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control.

17.66.90 Application

An application for an adjustment or variance shall be made on forms provided by the Director and include the following, where applicable:

A. Description of the land (address, lot, block, tract, or similar description) on which the proposed development is to take place.

B. Narrative addressing how the application meets the specified review criteria.

C. Site plan no larger than 11 inches by 17 inches (include a reduced copy if drawn larger) suitable for photocopy reproduction. The site plan shall be drawn to scale and show:

1. Relationship of the site to adjoining properties, streets, alleys, structures, public utilities, and drainageways;
2. Lot line dimensions;
3. Existing and proposed structures;
4. Structures on adjacent property(ies) affected by the request;
5. Vehicle and pedestrian access points and accessways;
6. Drainageways and any other prominent features;
7. Location of trees and shrubs over three feet in height;
8. Fences and walls;
9. Off-street parking facilities;
10. Any other information relevant to the proposal.

The Director may modify the submission requirements as necessary.

Applicant Response: The variances pursued as a part of this project are as outlined below. See also attached plans and elevations

17.84.30.A. Sidewalks shall be required along both sides of all arterial, collector, and local streets, as follows:

1. Sidewalks shall be a minimum of five feet wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, unless modified in accordance with Subsection 3., below.

Applicant Response: Currently, a sidewalk is provided on the east side of Meinig Avenue that provides a continuous pedestrian connection for the entire length of the park site, extending from Idleman Street to Scenic Street. Due to the existing steep slopes on the west side of Meinig Avenue, extensive regrading would be required to locate a new sidewalk in the public right-of-way. In lieu of the required five foot wide sidewalk adjacent to the on-street parking, the park project is proposing an eight-foot pedestrian path that connects the intersection of Meinig Avenue and Idleman Street directly with the central pedestrian plaza in the park. This path continues on to make a direct connection to Scenic Street to the north. The location of the path in the park provides more direct access to site amenities and provides a more pedestrian friendly experience by creating a greater separation between the pedestrian path and the vehicular traffic on the Meinig Avenue.

Additionally, the proposed public sidewalk on the south side of Scenic Street does not go to the west end of Scenic Street. No pedestrian or vehicular connections will be provided from the west end of Scenic Street into the park. Additionally, existing site grades would require a significant regrading effort to bring a public sidewalk to the west end terminus of Scenic Street. Instead of extending the sidewalk for the entire length of Scenic Street, the five-foot public sidewalk makes a direct connection with the eight-foot pedestrian path in the park. This path connects to all onsite amenities.

Finally, the required five-foot wide planter strip is not curb tight as shown on the City's typical detail. Instead, this five-foot planter strip is located behind the sidewalk making the sidewalk curb-tight. This layout was selected for several reasons. First, locating the planter strip at the back of curb would push the sidewalk further south. The existing grades would require a significant regrading effort to construct the sidewalk in this location. This regrading would lead to the loss of additional onsite trees that are currently proposed for preservation. Additionally, linking the five-foot planter strip with the larger planting area in the park allows for a much more diverse selection of trees, shrubs and ground cover plants to be used in this area. Finally, the traffic volumes on Scenic Street will be very low. As such, pedestrian and vehicular conflicts will be minimal.

17.90.120.A Site Layout and Access

> *3. Off-street parking shall be located to the rear or side of buildings with no portion of the parking lot located within required setbacks or within ten feet of the public right-of-way, as shown in Figure 17.90.120-A. When access must be provided directly from a public right-of-way, driveways for ingress or egress shall be limited to one per 150 feet. For lots with frontage of less than 150 feet or less, shared access may be required.*

Applicant Response: There are several key reasons that the parking lot was located between the building and the right-of-way. By locating the parking lot in this way, much less of the site is dedicated to the parking lot, drive aisles and the driveways. More of the site is able to be developed as parkland and provide additional amenities for the public.

Additionally, this location eliminates pedestrian and vehicular conflicts because the pedestrian path does not have to cross through the parking lot or the driveways. Pedestrians are able to access the entire site without crossing the parking lot or a driveway.

Finally, the current site layout allows for the picnic shelter and restroom facility to be more centrally located and provides greater usability for the entire park.

17.90.120.C.4 Pitched roofs visible from an abutting public street shall provide a secondary roof form (e.g. dormer) in the quantity specified below. Secondary roof forms may be located anywhere on the roof, although grouping these features is preferred.

Applicant Response: Each of the walls of the combined picnic shelter restroom facility measures approximately 16'-8". On the longer elevations, the remaining 24' of the building elevation is open, consisting entirely of wood timber building columns. Due to the limited amount of wall surface on the

elevation and the amount enclosed building, secondary roof forms would be contrary to the scale and proportions of the building form.

A second picnic shelter measuring approximately 15'x25' will be open on all four sides, having no walls. The material of the columns and the slope and materials of the roof will match the picnic shelter restroom facility outlined above. Due to the open air nature of the picnic shelter, secondary roof forms would be contrary to the scale and proportions of the building form.

CHAPTER 17.68 CONDITIONAL USES

17.68.10. - Procedures.

An application filed for a Minor Conditional Use Permit and/or a Conditional Use Permit shall be on forms provided by the Director and include application materials listed in 17.18.30 and the following, unless waived by the Director pursuant to subsection (M):

A. Site plan drawn to scale and showing existing and proposed:
- *1. Relationship of the site to adjoining properties, streets, alleys, structures, public utilities, and drainage way with sufficient information on land areas within at least 300 feet of the subject property specifically addressing land uses, lot lines, circulation systems (including potential for connectivity of streets and pedestrian ways), public facilities, and unique natural features of the landscape.*
- *2. Boundary of the proposed conditional use and any interior boundaries related to proposed development phases.*
- *3. Lot line dimensions.*
- *4. Location of structures.*
- *5. Vehicle and pedestrian access points and accessways.*
- *6. General location of vegetated areas.*
- *7. Fences and walls.*
- *8. Parking, maneuvering and loading areas.*
- *9. Trash and recycling areas.*
- *10. Direction of traffic flow on the property.*
- *11. Existing site conditions including contours at ten-foot intervals, watercourses, flood plains and natural features.*
- *12. Proposed modifications to existing grades.*

B. Exterior lighting plan indicating location, size, height, typical design, material, color, and method of illumination.

C. Architectural elevations of all buildings and structures including heights, entrances and exits, and floor plans, in sufficient detail to permit computation of other requirements.

D. Landscape plan drawn to scale showing:
- *1. Location of existing trees and vegetation proposed to be removed or retained on the site.*
- *2. Location and design of landscape areas.*
- *3. Proposed varieties, quantities, and sizes of trees and plant materials.*
- *4. Other pertinent landscape features and details of irrigation system required to maintain plant materials.*

E. Narrative relating to applicable Comprehensive Land Use Plan policies.

F. Narrative relating to applicable Sandy Development Code standards.

G. Flood, Slope and Hazard Analysis, if portions of the site have slopes in excess of 15 percent, floodplains, floodways, wetlands, etc.

H. Sign Details.

I. Traffic impact report.

J. Utility Plan.

K. Additional data sheet indicating:

1. Square footage of site and structure.

2. Building coverage.

3. Amount of site to be landscaped.

4. Number of parking spaces to be provided.

5. Building materials to be used.

6. Specifications as to type, color, and texture of exterior surfaces of proposed structures.

L. Any additional information that may be required by the Director to properly evaluate the proposed site plan. Such additional information shall only be required where its need can be justified on the basis of special and/or unforeseen circumstances.

M. The Director may waive any of the requirements above where determined that the information required is unnecessary to properly evaluate the proposal.

Applicant Response: All of the above required information is included in the attached site plans and informational cutsheets.

Sec. 17.68.20. - Review criteria.

The Planning Director (Minor Conditional Use Permit) through a Type II process or the Planning Commission (Conditional Use Permit) through a Type III process may approve an application, approve with modifications, approve with conditions, or deny an application for a conditional use permit after a public hearing. The applicant must submit evidence substantiating that all requirements of this Code relative to the proposed use are satisfied and consistent with the purposes of this chapter, policies of the Comprehensive Plan, and any other applicable policies and standards adopted by the City Council.

The following criteria and compatibility factors shall be considered:

A. The use is listed as either a minor conditional use or conditional use in the underlying zoning district or has been interpreted to be similar in use to other listed conditional uses.

Applicant Response: A portion of the site is zoned as Parks and Open Space so is able to be developed as a park outright. The section to the south of Scenic Street is zoned Medium Density Residential and a park a conditional use in the underlying zoning district.

B. The characteristics of the site are suitable for the proposed use considering the size, shape, location, topography, and natural features.

Applicant Response: The physical characteristics of the site lend itself well to the development as a community park. The north side of the park property was annexed into the City as a part of the Sandy River Park and is located outside of the Urban Growth Boundary (UGB). The pump track and bicycle jump line, both classified as trail uses will be located in this portion of the park as trails are allowed uses

on property located outside of the UGB. The portion of the site that is zoned as Medium Density Residential is immediately adjacent to property zoned as Parks and Open Space as well as adjacent to the 127 acre Sandy River Park and the Sandy River. Being surrounded by a forest of mature Douglas fir and big leaf maple trees, the proposed site is ideally situated. The site will soon have direct trail connections down to the Sandy River, creating a pedestrian connection from downtown Sandy to the Sandy River. Additionally, due to the existing topography of the site a majority of the site sits below the adjacent residential properties. This change in grade creates a natural buffer between the two uses.

C. The proposed use is timely considering the adequacy of the transportation systems, public facilities and services existing or planned for the area affected by the use.

Applicant Response: The site is currently accessed from Meinig Avenue. The development of the park will include upgrades and improvements to the surrounding streets, including Meinig Avenue and Scenic Street. This includes a curb on the full length of Meinig Avenue adjacent to the park and a ¾ street section buildout of Scenic Street adjacent to the park. Street lights will be added to both streets to bring the illumination levels up to current City standards. The existing storm line and sanitary line have sufficient capacity to serve the proposed improvements at the park. Water and electrical connections will be provided from existing services located in the Scenic Street right-of-way.

D. The proposed use will not alter the character of the surrounding area in a manner which substantially limits, precludes, or impairs the use of surrounding properties for the primary uses listed in the underlying zoning district.

Applicant Response: The proposed improvements at the park will greatly enhance the surrounding area and will not limit, preclude or impair the use of the surrounding properties for the primary uses listed in the underlying zoning district. The surrounding lots to east of the park have been developed largely as residential with the exception of one institutional facility, the church. Additionally, this park will help fill a gap in neighborhood parks that was noted in the 2022 Parks and Trails Master Plan Update. This park will function as both a community park and as the first neighborhood park in the northeast quadrant of Sandy. Finally, while the future of the adjacent Cedar Ridge Middle School facility located to the south is still being determined, the development of the park will directly serve this future facility.

E. The proposed use will not result in the use of land for any purpose which may create or cause to be created any public nuisance including, but not limited to, air, land, or water degradation, noise, glare, heat, vibration, or other considerations which may be injurious to the public health, safety, and welfare.

Applicant Response: The proposed development will not create public nuisance. In contrast with being injurious to the public health, safety and welfare, this park will be a great asset for the neighborhood, the City and the region. The aging skate park will be replaced with a modern facility that meets the needs of today's users. The park includes an accessible trail network, active and passive recreation opportunities, an inclusive play area, a picnic shelter and many more amenities. Each of these park improvements directly contribute to the park's ability to meet the goals of the Oregon Parks and Recreation District Statewide Comprehensive Outdoor Recreation Plan and provide safe opportunities

for the public to be active and experience the natural environment. Additionally, the development involve only very limited tree removal. The surrounding forest will be kept completely intact.

F. The proposed use will be reasonably compatible with existing or planned neighboring uses based on review of the following:

1. Basic site design (organization of uses on the site).

Applicant Response: The proposed park is highly compatible with the surrounding neighborhood. It will serve to blend the existing residential neighborhood with the larger natural spaces that surround the park property. The park will serve as a neighborhood destination to recreate and experience nature as well as a gateway to the Sandy River Park. Because of its location, the park will provide the neighborhood with direct access to nature and recreation opportunities. The more active uses including the parking lot, picnic shelter and restrooms have been located closer to the street and away from the existing forest.

2. Visual elements (scale, structural design and form, materials, and so forth).

Applicant Response: The materiality and colors of the site structures, site amenities, playground elements and skate park features will blend seamlessly with the natural environment. Priority will be given to natural colors. The materiality and colors of the site structures, site amenities, playground elements and skate park features will blend seamlessly with the natural environment.

3. Noise.

Applicant Response: Noise from the park will be largely buffered by the grade separation between many of the main park features and the surrounding neighborhood. Vegetation will also help reduce any impacts of noise.

4. Noxious odors.

Applicant Response: The improvements at the park will not result in any noxious odors.

5. Lighting.

Applicant Response: Site lighting will be limited to the parking lot and picnic shelter and will include proper shielding to eliminate light trespass.

6. Signage.

Applicant Response: Park signage will be consistent with the City'sh standards and will match the character and materiality as found at other parks in Sandy.

7. Landscaping for buffering and screening.

Applicant Response: The landscaping in the park will consist largely of native and adapted plants that will help integrate the park into the surrounding woodland setting. Large patches of existing blackberries will be removed and replanted with native and climate adapted grasses and shrubs

8. Traffic.

Applicant Response: As a part of the development of the park, ¾ street improvements will be built out on the portion of Scenic Street that is immediately adjacent to the park. Improvements include a pedestrian sidewalk, street lighting and landscape planting. This will improve neighborhood access to the park site as well as through the neighborhood itself. Two driveways are being provided to the park parking lot to ease congestion.

9. Effects on off-street parking.

Applicant Response: The park currently has no off-street parking. The proposed site design includes an off-street parking lot with approximately 43 parking spaces. This amount of parking is in keeping with other parks in the region that provide a similar level of amenities that are proposed at this park.

10. Effects on air quality and water quality.

Applicant Response: The park will have no negative effect on the air or water quality. Currently, the site does not have any stormwater facilities to treat stormwater runoff from impervious surfaces. The runoff from the existing track, for example, is sent untreated directly to the adjacent creek. The proposed park will treat and detain all stormwater runoff from impervious surfaces before being released into the adjacent stream

CHAPTER 17.80 ADDITIONAL SETBACKS ON COLLECTOR AND ARTERIAL STREETS

Sec. 17.80.20. - Specific setbacks.

Any structure located on streets listed above or identified in the Transportation System Plan as arterials or collectors shall have a minimum setback of 20 feet measured from the property line. This applies to applicable front, rear and side yards.

Applicant Response: The combined restroom and picnic shelter structure will be set back approximately 175 feet from Meinig Avenue and 125 feet from Scenic Street.

CHAPTER 17.84 IMPROVEMENTS REQUIRED WITH DEVELOPMENT

Sec. 17.84.30. – Pedestrian and bicyclist requirements

A. Sidewalks shall be required along both sides of all arterial, collector, and local streets, as follows:

1. Sidewalks shall be a minimum of five feet wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, unless modified in accordance with Subsection 3., below.

2. *Sidewalks along arterial and collector streets shall be separated from curbs with a planting area, except as necessary to continue an existing curb-tight sidewalk. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of six feet wide.*

Applicant Response: A 5-foot sidewalk will be provided along the south side of Scenic Street, between the park and the right-of-way. Due to the very low traffic volumes traveling on this portion of Scenic Street, instead of providing a landscape strip between the curb and the sidewalk, the required landscape strip will be provided at the back of the curb. This will combine the planter strip with the planter area in the park. Because the planting area will be much wider than it otherwise would be, a much greater diversity of plant material can be planted in this planting area. In lieu of providing a 5-foot sidewalk on the west side of Meinig Avenue, an 8' wide public path will travel through the park site itself. This is covered in more detail under 17.66 ADJUSTMENTS AND VARIANCES.

4. *Pathways and sidewalks shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian walkways shall be provided in accordance with the following standards:*
   a. *The pedestrian circulation system shall be at least five feet in width and shall connect the sidewalk on each abutting street to the main entrance of the primary structure on the site to minimize out of direction pedestrian travel.*
   b. *Walkways at least five feet in width shall be provided to connect the pedestrian circulation system with existing or planned pedestrian facilities which abut the site but are not adjacent to the streets abutting the site.*

Applicant Response: 8-wide pedestrian pathways link the exterior access points of the site to all of the onsite amenities and destinations. The entire pathway has been graded at slopes less than 5% in order to accommodate users of all abilities.

   c. *Walkways shall be as direct as possible and avoid unnecessary meandering.*

Applicant Response: The pedestrian pathways provide direct connections without unnecessary meandering.

   d. *Walkway/driveway crossings shall be minimized. Internal parking lot design shall maintain ease of access for pedestrians from abutting streets, pedestrian facilities, and transit stops.*

Applicant Response: The onsite pedestrian paths have been designed to avoid driveway crossings and the associated conflicts entirely. From the onsite parking lot, direct access is provided to the central pedestrian plaza and from there to the onsite pedestrian paths. Pedestrian paths lead from offsite points of origin to the central plaza and all onsite destinations.

   e. *With the exception of walkway/driveway crossings, walkways shall be separated from vehicle parking or vehicle maneuvering areas by grade, different paving material, painted crosshatching or landscaping. They shall be constructed in accordance with the sidewalk standards adopted by the City. (This provision does not require a separated walkway system*

to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).

Applicant Response: The pedestrian paths are grade separated from the vehicular parking area. Additionally, the pedestrian paths will be constructed of concrete and the vehicular driving areas will be constructed of asphalt. This material difference will provide a clear distinction between the two use zones.

f. Pedestrian amenities such as covered walk-ways, awnings, visual corridors and benches will be encouraged. For every two benches provided, the minimum parking requirements will be reduced by one, up to a maximum of four benches per site. Benches shall have direct access to the circulation system.

Applicant Response: Numerous benches will be provided as a part of the park improvements and the benches will have direct access to the circulation system. However, these benches are not being calculated to reduce onsite parking requirements.

C. Where a development site is traversed by or adjacent to a future trail linkage identified within the Transportation System Plan, improvement of the trail linkage shall occur concurrent with development. Dedication of the trail to the City shall be provided in accordance with 17.84.90.D.

Applicant Response: A trail that leads from the Sandy River Park and connects to the northwest corner of the park is currently under construction. The park pathway system will provide a direct connection to the trail and link the trail to the public right-of-way.

D. To provide for orderly development of an effective pedestrian network, pedestrian facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).

Applicant Response: The sidewalk being constructed along Scenic Street will be built along the entire Scenic Street frontage. The onsite walkway that will serve Meinig Avenue will connect the far southeast corner of the park side, across from Idleman Street, all the way north to Scenic Street.

E. To ensure improved access between a development site and an existing developed facility such as a commercial center, school, park, or trail system, the Planning Commission or Director may require off-site pedestrian facility improvements concurrent with development.

Applicant Response: The off-site pedestrian facility improvements will be concurrent with the development of the park.

Sec. 17.84.50. - Street requirements.

A. *Transportation Impact Study*

Applicant Response: A traffic impact study has been provided with this application and is attached as separate document.

CHAPTER 17.90 DESIGN STANDARDS

Sec. 17.90.120. - General Commercial and Industrial (C-2 and I-1) and non-residential uses in residential zones design standards.

Development in the C-2 and I-1 districts and non-residential uses in a residential zone shall conform to all of the following standards, as applicable. Where a conflict exists between the requirements of this Chapter and any other code provision, this Chapter shall prevail.

A. Site Layout and Access.

Intent: To provide for compact, walkable development, and to design and manage vehicle access and circulation in a manner that supports pedestrian safety, comfort and convenience. (Figures 17.90.120-A and 17.90.120-B)

1. All lots shall abut or have cross access to a dedicated public street.

Applicant Response: The development will have access to both Meinig Avenue and Scenic Street.

2. All lots that have access to a public alley shall provide for an additional vehicle access from that alley.

Applicant Response: The site does not have access to an alley therefore this standard does not apply.

3. Off-street parking shall be located to the rear or side of buildings with no portion of the parking lot located within required setbacks or within ten feet of the public right-of-way, as shown in Figure 17.90.120-A. When access must be provided directly from a public right-of-way, driveways for ingress or egress shall be limited to one per 150 feet. For lots with frontage of less than 150 feet or less, shared access may be required.

Applicant Response: The location of the off-street parking is between the public right-of-way and the restroom / picnic shelter building. This is addressed in more detail in 17.66 ADJUSTMENTS AND VARIANCES.

4. Adjacent parking lots shall be connected to one another when the City determines it is practicable to do so. Developments shall avoid creating barriers to inter-parcel circulation.

Applicant Response: The proposed development has a single parking lot therefore this standard does not apply.

5. Urban design details, such as raised or painted pedestrian crossings and similar devices incorporating changes in paving materials, textures or color, shall be used to calm traffic and protect pedestrians in parking areas.

Applicant Response: The parking lot is adjacent to the public plaza so there is a direct path from all parking stalls to the pedestrian circulation system. Given the small scale and the specific layout, the parking lot does not necessitate separate internal pedestrian pathways.

6. *Parking lots may include public alley accessed garages at the rear property line, except where a setback is required for vision clearance or to conform to other city standards.*

Applicant Response: The project does not include any alleys therefore this standard does not apply.

7. *Walkways from the public street sidewalk to the building entrance(s) are required. Crosswalks through parking lots and drive aisles shall be constructed of a material contrasting with the road surface or painted (e.g., colored concrete inlay in asphalt).*

Applicant Response: Separated pedestrian pathways from the public street sidewalk to the buildings are provided. These pathways do not cross through the parking lot.

8. *Connection to Adjacent Properties: The location of any real improvements to the property must provide for a future street and pedestrian connection to adjacent properties where the City determines this is practicable and necessary. Where openings occur between buildings adjacent to Highway 26, pedestrian ways should connect the street sidewalk to any internal parking areas and building entrances. Development should avoid creating barriers to pedestrian circulation.*

Applicant Response: The public right-of-way streets adjacent to the park will be fully built out as a part of this development. Therefore this standard does not apply.

9. *Joint use of access points and interconnections and cross-over easements between parcels shall be required, where the City determines it is practicable and necessary. A development approval may be conditioned to require a joint use access easement and interconnecting driveways or alleys to comply with access spacing and other applicable code requirements.*

Applicant Response: Given land ownership, joint use of access points and interconnections are not possible with this development.

10. *Through lots may be permitted with two access points, one onto each abutting street, where necessary to serve a centralized, shared parking facility. Such access points must conform to the above access spacing requirements and parking must be internalized to the property.*

Applicant Response: The parking lot will have a driveway on both Meinig Avenue and Scenic Street, in conformance with the above standard.

11. *Free-standing buildings shall be connected to one another with a seamless pedestrian network that provides access to building entrances and adjacent civic spaces.*

Applicant Response: The development only includes a single structure, therefore this standard does not apply.

12. *Minimum parking requirements are contained in Chapter 17.98. For developments containing more than 150 parking spaces, at least 20 percent of all parking spaces shall be constructed of permeable materials such as permeable asphalt, permeable concrete, pavers, and/or similar materials as approved by the City.*

Applicant Response: The parking lot contains approximately 43 spaces, therefore this standard does not apply.

B. *Building Facades, Materials, and Colors.*

Intent: To provide building façades, materials and colors consistent with the Sandy Style.

1. *Articulation.*

Applicant Response: The longest street-facing elevation of the structure is only approximately 16-feet in length and therefore meets the articulation requirements. Additionally, each of the wall planes incorporate at least one visually contrasting and complementary change in material and texture.

2. *Pedestrian Shelters.*

Applicant Response: The structure will incorporate a pedestrian shelter over the primary entrance. The shelter will extend 5-feet past the face of the building over the pedestrian area.

3. *Building Materials*

Applicant Response: The base of the building will consist of textured cast stone, providing a strong visual foundation. The upper portion of the building will consist of cement fiber board and batt pattern. Exposed members at the picnic shelter portion of the structure will consist of exposed heavy wood timbers.

4. *Colors*

Applicant Response: The colors selected for the cement fiber board and batt pattern and for the standing seam metal roof will confirm with those outlined in Appendix C, Color Palette.

C. *Roof Pitch, Materials and Parapets*

Applicant Response: The roof pitch of the shelter will be 6:12 as outlined. Given the open nature of the picnic shelter that comprises more than half of the usable space of the building, the roof is not proposing to have any secondary roof forms. This is covered in 17.66 ADJUSTMENTS AND VARIANCES. The roof will consist of standing seam metal.

D. *Building Orientation and Entrances*

Applicant Response: The structure does not have a “back” side. All four sides are equally visually appealing and therefore the building is oriented toward the public street.

E. *Windows*

Applicant Response: The interior uses of the building consist of restrooms and storage space. Because of these uses, windows are not included in the building. Therefore this criteria does not apply to this project.

F. *Landscaping and Streetscape Design*

Applicant Response: The project will meet the provisions of 17.92 as outlined in that section of the narrative

G. *Civil Space*

Applicant Response: Given the nature of the uses of this building, restrooms and a picnic shelter, the entire facility is classified as civic space.

H. *Lighting*

Applicant Response: The picnic shelter portion of the structure will include area lighting mounted in the eave of the roof.

CHAPTER 17.92 LANDSCAPING AND SCREENING GENERAL STANDARDS – ALL ZONES

Sec. 17.92.30. – Required Tree Plantings.

Applicant Response: Large street trees will be planted at 30-50' on center along Scenic Street. Numerous mature douglas fir and big leaf maple trees exist along Meinig Avenue in the location where street trees would be planted and exist in sufficient to meet the street tree planting standard. A mix of medium and large parking lot trees will be planted in the parking lot at a rate of 1 per 8 and 1 per 12 cars accordingly.

Sec. 17.92.40. – Irrigation

Applicant Response: Landscaping installed at the park will be irrigated with a combination of an automatic system as well as supplemental manual watering as needed to sustain viable plant life.

Sec. 17.92.50. – Types and Sizes of Plant Material

Applicant Response: The planting at the park will consist of native and climate adapted trees, shrubs and ground cover plants along with lawn areas for active and passive recreation. All plant material will conform to the container and size standards as outlined in this section. Significant areas of invasive blackberries will be removed and these areas will be replanted with native grasses and shrubs.

Sec. 17.92.80. – Buffer Planting – Parking, Loading and Maneuvering Areas.

Applicant Response: Appropriate buffering plants will be located between the parking lot and the two adjacent rights-of way; Meinig Avenue and Scenic Street. This will include a mix of existing and new trees, shrubs and ground cover plant material, strategically located to soften the view between the right-of-way and the parking lot.

Sec. 17.92.90. – Screening (Hedges, Fences, Walls, Berms).

Applicant Response: The parking lot will be screened from the public rights-of-way by planting areas that are a minimum of 5' deep. These planting areas will consist of native and climate adaptive shrubs and ground cover. Additionally, the parking lot sits considerably lower than the adjacent streets, with the grade difference effectively creating a berm between the two uses.

CHAPTER 17.98 PARKING, LOADING AND ACCESS REQUIREMENTS

Sec. 17.98.20. – Off-street Parking Requirements

Applicant Response: Parks are not listed as a specific use with an associated parking quantity requirement. To determine the appropriate amount of parking for this park, other parks in the region with similar amenities and usage levels were analyzed. The quantity of 43 parking stalls is right in the middle of the amount of parking being offered at other similar parks.

Sec. 17.98.50. - Setbacks.

A. Parking areas, which abut a residential zoning district, shall meet the setback of the most restrictive adjoining residential zoning district.

B. Required parking shall not be located in a required front or side yard setback area abutting a public street except in industrial districts. For single family and duplexes, required off-street parking may be located in a driveway.

C. Parking areas shall be setback from a lot line adjoining a street the same distance as the required building setbacks. Regardless of other provisions, a minimum setback of five feet shall be provided along the property fronting on a public street. The setback area shall be landscaped as provided in this Code.

Applicant Response: The parking lot is set back a minimum of 22 feet from Meinig Avenue and 75 feet from Scenic Street.

Sec. 17.98.60. - Design, size and access.

All off-street parking facilities, vehicular maneuvering areas, driveways, loading facilities, accessways, and private streets shall conform to the standards set forth in this section.

A. Parking Lot Design. All areas for required parking and maneuvering of vehicles shall have a durable hard surface such as concrete or asphalt.

B. Size of Space.

1. A standard parking space shall be nine feet by 18 feet.

2. A compact parking space shall be eight feet by 16 feet.

3. Accessible parking spaces shall be nine feet by 18 feet and include an adjacent access aisle meeting ORS 447.233. Access aisles may be shared by adjacent spaces. Accessible parking shall be provided for all uses in compliance with the requirements of the State of Oregon (ORS 447.233) and the Americans with Disabilities Act.

4. Parallel parking spaces shall be a length of 22 feet.

5. No more than 40 percent of the parking stalls shall be compact spaces.

C. Aisle Width. Single sided Two-way 22 feet

Applicant Response: The parking lot will be paved with asphalt. All spaces will be standard sized, nine feet by 18 feet. Two accessible spaces will be provide and they will measure nine feet by 18 feet and the required access stall is provided. The drive aisle width is 22 feet.

Sec. 17.98.70. - On-site circulation.

A. Groups of more than three parking spaces shall be permanently striped. Accessible parking spaces and accompanying access aisles shall be striped regardless of the number of parking spaces.

B. Backing and Maneuvering. Except for a single family dwelling, duplex, or accessory dwelling unit, groups of more than three parking spaces shall be provided with adequate aisles or turnaround areas so that all vehicles enter the right-of-way (except for alleys) in a forward manner. Parking spaces shall not have backing or maneuvering movements for any of the parking spaces occurring across public sidewalks or within any public street, except as approved by the City Engineer. Evaluations of requests for exceptions shall consider constraints due to lot patterns and impacts to the safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

Applicant Response: The parking lot spaces, including the accessible parking spaces and access aisles will be permanently striped. Onside looped vehicular circulation allows for vehicles to enter toe right-of-way in a forward manner. No backing across sidewalks or public streets is required for site circulation.

Sec. 17.98.80. - Access to arterial and collector streets.

A. Location and design of all accesses to and/or from arterials and collectors (as designated in the Transportation System Plan) are subject to review and approval by the City Engineer. Where practical, access from a lower functional order street may be required. Accesses to arterials or collectors shall be located a minimum of 150 feet from any other access or street intersection. Exceptions may be granted by the City Engineer. Evaluations of exceptions shall consider posted speed of the street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

B. No development site shall be allowed more than one access point to any arterial or collector street (as designated in the Transportation System Plan) except as approved by the City Engineer. Evaluations of exceptions shall be based on a traffic impact analysis and parking and circulation plan and consider posted speed of street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

Applicant Response: Meinig Avenue is classified as a collector street. The driveway on Meinig is aligned with the centerline of Idleman Street in order to increase visibility and eliminate potential vehicular and pedestrian conflicts. Only one driveway off of Meinig Avenue is being proposed with this park development. A second driveway is being proposed to access the site off of Scenic Street. This will allow for ease of access and movement of emergency vehicles. It will also more evenly distribute traffic to the surrounding street network.

Sec. 17.98.100. - Driveways.

A. A driveway to an off-street parking area shall be improved from the public right-of-way to the parking area a minimum width of 20 feet for a two-way drive or 12 feet for a one-way drive, but in either case not less than the full width of the standard approach for the first 20 feet of the driveway.

B. A driveway for a single-family dwelling or duplex shall have a minimum width of ten feet. The driveway approach within the public right-of-way shall not exceed 24 feet in width measured at the bottom of the curb transition. A driveway approach shall be constructed in accordance with applicable city standards and the entire driveway shall be paved with asphalt or concrete. Shared driveway approaches may be required for adjacent lots in cul-de-sacs in order to maximize room for street trees and minimize conflicts with utility facilities (power and telecom pedestals, fire hydrants, streetlights, meter boxes, etc.).

C. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of 12 feet for their entire length and width, but such clearance may be reduced in parking structures as approved by the Director.

D. No driveway shall exceed a grade of 15 percent at any point along the driveway length, measured from the right-of-way line to the face of garage or furthest extent of the driveway.

E. The nearest edge of a driveway approach shall be located a minimum of 15 feet from the point of curvature or tangency of the curb return on any street.

F. The sum of the width of all driveway approaches within the bulb of a cul-de-sac as measured in section B., above shall not exceed 50 percent of the circumference of the cul-de-sac bulb. The cul-de-sac bulb circumference shall be measured at the curb line and shall not include the width of the stem street. The nearest edge of driveway approaches in cul-de-sacs shall not be located within 15 feet of the point of curvature, point of tangency or point of reverse curvature of the curb return on the stem street.

G. The location and design of any driveway approach shall provide for unobstructed sight per the vision clearance requirements in Section 17.74.30. Requests for exceptions to these requirements will be evaluated by the City Engineer considering the physical limitations of the lot and safety impacts to vehicular, bicycle, and pedestrian traffic.

H. Driveways shall taper to match the driveway approach width to prevent stormwater sheet flow from traversing sidewalks.

Applicant Response: The driveways are both 22 feet wide with no overhead elements to limit vertical clearances. The driveways are sloped a between two and three percent. The slope of both driveways is directed back toward the site, routing stormwater back onsite and not across the public sidewalk.

Sec. 17.98.120. - Landscaping and screening.

A. Screening of all parking areas containing four or more spaces and all parking areas in conjunction with an off-street loading facility shall be required in accordance with zoning district requirements and Chapter 17.98. Where not otherwise specified by district requirement, screening along a public right-of-way shall include a minimum five feet depth of buffer plantings adjacent to the right-of-way.

B. When parking in a commercial or industrial district adjoins a residential zoning district, a sight-obscuring screen that is at least 80 percent opaque when viewed horizontally from between two and eight feet above the average ground level shall be required. The screening shall be composed of materials that are an adequate size so as to achieve the required degree of screening within three years after installation.

C. Except for a residential development which has landscaped yards, parking facilities shall include landscaping to cover not less than ten percent of the area devoted to parking facilities. The landscaping shall be uniformly distributed throughout the parking area and may consist of trees, shrubs, and ground covers.

D. Parking areas shall be divided into bays of not more than 20 spaces in parking areas with 20 or more spaces. Between, and at the end of each parking bay, there shall be planters that have a minimum width of five feet and a minimum length of 17 feet for a single depth bay and 34 feet for a double bay. Each planter shall contain one major structural tree and ground cover. Truck parking and loading areas are exempt from this requirement.

E. Parking area setbacks shall be landscaped with major trees, shrubs, and ground cover as specified in Chapter 17.92.

F. Wheel stops, bumper guards, or other methods to protect landscaped areas and pedestrian walkways shall be provided. No vehicle may project over a property line or into a public right-of-way. Parking may project over an internal sidewalk, but a minimum clearance of five feet for pedestrian circulation is required.

Applicant Response: The parking lot will be buffered from Scenic Street and from Meinig Avenue by a mix of evergreen and deciduous trees and shrubs. The planting area will be a minimum of 5' deep, typically much wider in most locations between the parking lot and the adjacent rights-of-ways. The parking lot consists of both interior parking islands and surrounding perimeter landscape beds that provide approximately 6,600 sf of landscaping or 28% of the overall parking lot area. The parking lot is broken up by planting islands so that there are no more than 9 contiguous stalls. Trees and ground cover will be planted in each planter. The landscaped areas will be protected by a concrete curb.

Sec. 17.98.130. - Paving.

A. Parking areas, driveways, aisles and turnarounds shall be paved with concrete, asphalt or comparable surfacing, constructed to City standards for off-street vehicle areas.

B. Gravel surfacing shall be permitted only for areas designated for non-motorized trailer or equipment storage, propane or electrically powered vehicles, or storage of tracked vehicles.

Applicant Response: The parking lot, driveways and aisles will be paved with asphalt.

Sec. 17.98.140. - Drainage.

Parking areas, aisles and turnarounds shall have adequate provisions made for the on-site collection of drainage waters to eliminate sheet flow of such waters onto sidewalks, public rights-of-way and abutting private property.

Applicant Response: The parking lot is graded to drain the stormwater runoff to catch basins. Runoff will not be directed to sheet flow across sidewalks and public rights-of-way.

Sec. 17.98.150. - Lighting.

The Dark Sky Ordinance in Chapter 15 of the municipal code applies to all lighting. Artificial lighting shall be provided in all required off-street parking areas. Lighting shall be directed into the site and shall be arranged to not produce direct glare on adjacent properties. Light elements shall be shielded and shall not be visible from abutting residential properties. Lighting shall be provided in all bicycle parking areas so that all facilities are thoroughly illuminated and visible from adjacent sidewalks or vehicle parking lots during all hours of use.

Applicant Response: Dark Sky Ordinance compliant lighting will be provided in the parking lot. The lighting will be directed onto the site and arranged to not produce direct glare to adjacent properties. This incudes the use of shields to prevent light trespass.

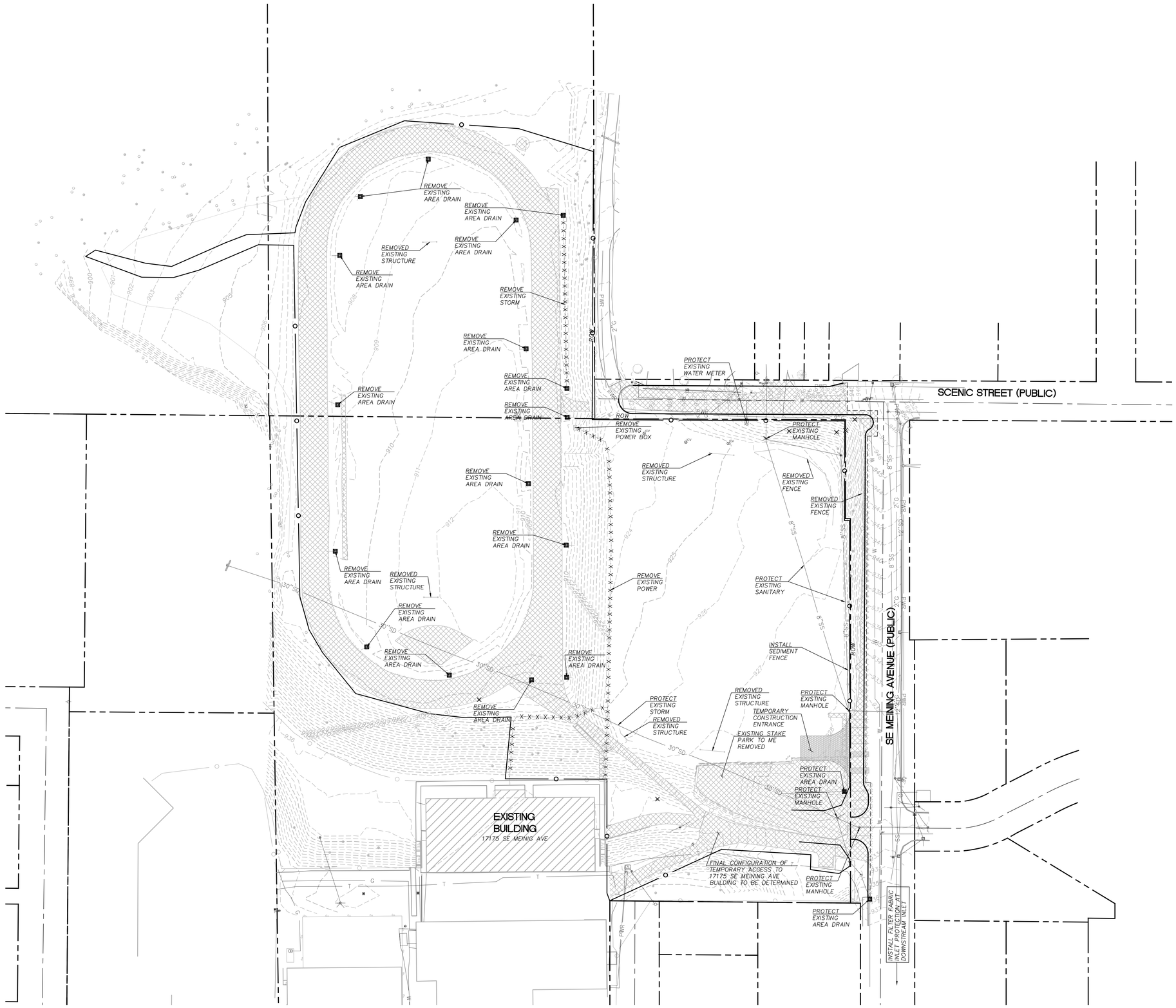
CHAPTER 17.102 URBAN FORESTRY

Sec. 17.102.50. - Tree retention and protection requirements.

A. Tree Retention. The landowner is responsible for retention and protection of trees required to be retained as specified below:

1. *At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership.*
2. *Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.*
3. *Trees proposed for retention shall be healthy and likely to grow to maturity, and be located to minimize the potential for blow-down following the harvest.*
4. *If possible, at least two of the required trees per acre must be of conifer species.*
5. *Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.*

Applicant Response: The following trees are being removed in order to construct the required ¾ street improvements of Scenic Street: (1) 8”, (1) 10”, (2) 12” and (1) 18” Pseudotsuga menziesii – Douglas fir and (1) 8” Acer macrophyllum – big leaf maple. (1) 6” Alnus rubra – red alder is being removed to install site pathways. A total of (7) trees are proposed to be removed, all in good condition. All trees proposed for removal will be replaced at a two-one ratio. A minimum of 14 native trees will be replanted onsite to mitigate for the trees that are being removed.



DEMO AND EROSION CONTROL PLAN
SCALE: 1"=40'

SHEET LEGEND		
	FILTER FABRIC INLET PROTECTION	
	TEMPORARY CONSTRUCTION ENTRANCE	
	DEMOLISH ASPHALT AND CONCRETE	
928	EXISTING CONTOUR	
	SAWCUT	
	SEDIMENT FENCE/ STRAW WATTLES	
X·X·X·X·X·X	REMOVE EXISTING UTILITY	
	REMOVE EXISTING TREE	

SHEET NOTES

1. INSTALL FILTER FABRIC INLET PROTECTION AT ALL EXISTING AREA DRAIN.

LANDSCAPE ARCHITECTS PC
lango.hansen
1100 nw glisan #3B portland OR 97209 T 503 295.2437

REGISTERED PROFESSIONAL ENGINEER
OREGON
SEPT. 12, 2017
PRELIMINARY
ALLEN SCHMITZ
RENEWAL DATE 6/30/24

SANDY COMMUNITY CAMPUS PARK
CITY OF SANDY PARKS AND RECREATION

CITY OF SANDY
17225 SMITH AVE
SANDY, OR 97055

LAND USE

REVISIONS

GRAPHIC SCALE
0 40 80
1 inch = 40 ft.

SCALE	AS NOTED
DRAWN BY	MCS
DATE	07.17.23
PROJECT NO.	2239

DEMO AND EROSION CONTROL PLAN
C1.00

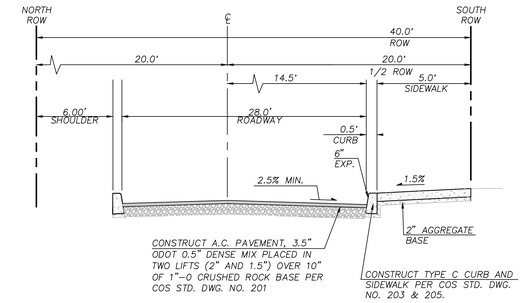
Humber Design Group, Inc.
Civil Engineering • 503.946.6690 • hdgpdx.com

EXHIBIT C

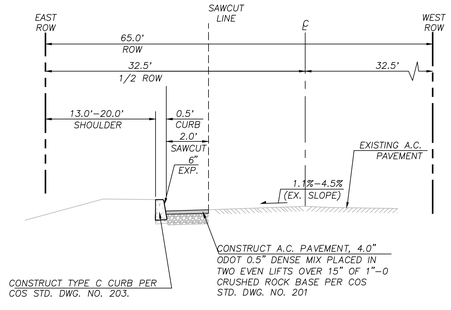
SHEET LEGEND		
	PRIVATE ASPHALT PAVING	9 C4.00
	PRIVATE CONCRETE SIDEWALK	7 C4.00
	PUBLIC CONCRETE SIDEWALK	
	PUBLIC ASPHALT PAVING	
	PUBLIC CONCRETE DRIVEWAY	
L	LANDSCAPING	SEE L-SHTS
	STANDARD CONCRETE CURB	6 C4.00
- - - - - -	SAWCUT	

LANDSCAPE ARCHITECTS PC
lango.hansen
1100 nw glisan #3B portland OR 97209 T 503.295.2437

LAYOUT AND PAVING PLAN
SCALE: 1"=40'



2 SCENIC STREET TYPICAL SECTION (LOCAL)
NTS



1 SE MEINING AVENUE TYPICAL SECTION (COLLECTOR)
NTS

REGISTERED PROFESSIONAL ENGINEER
OREGON
SEPT. 12, 2017
PALLEN SCHMITZ
PRELIMINARY
RENEWAL DATE 6/30/24

SANDY COMMUNITY CAMPUS PARK
CITY OF SANDY PARKS AND RECREATION
CITY OF SANDY
17225 SMITH AVE
SANDY, OR 97055

LAND USE

REVISIONS

GRAPHIC SCALE
0 40 80
1 inch = 40 ft.

SCALE	AS NOTED
DRAWN BY	MCS
DATE	08.07.23
PROJECT NO.	2239

LAYOUT AND PAVING PLAN

C2.00

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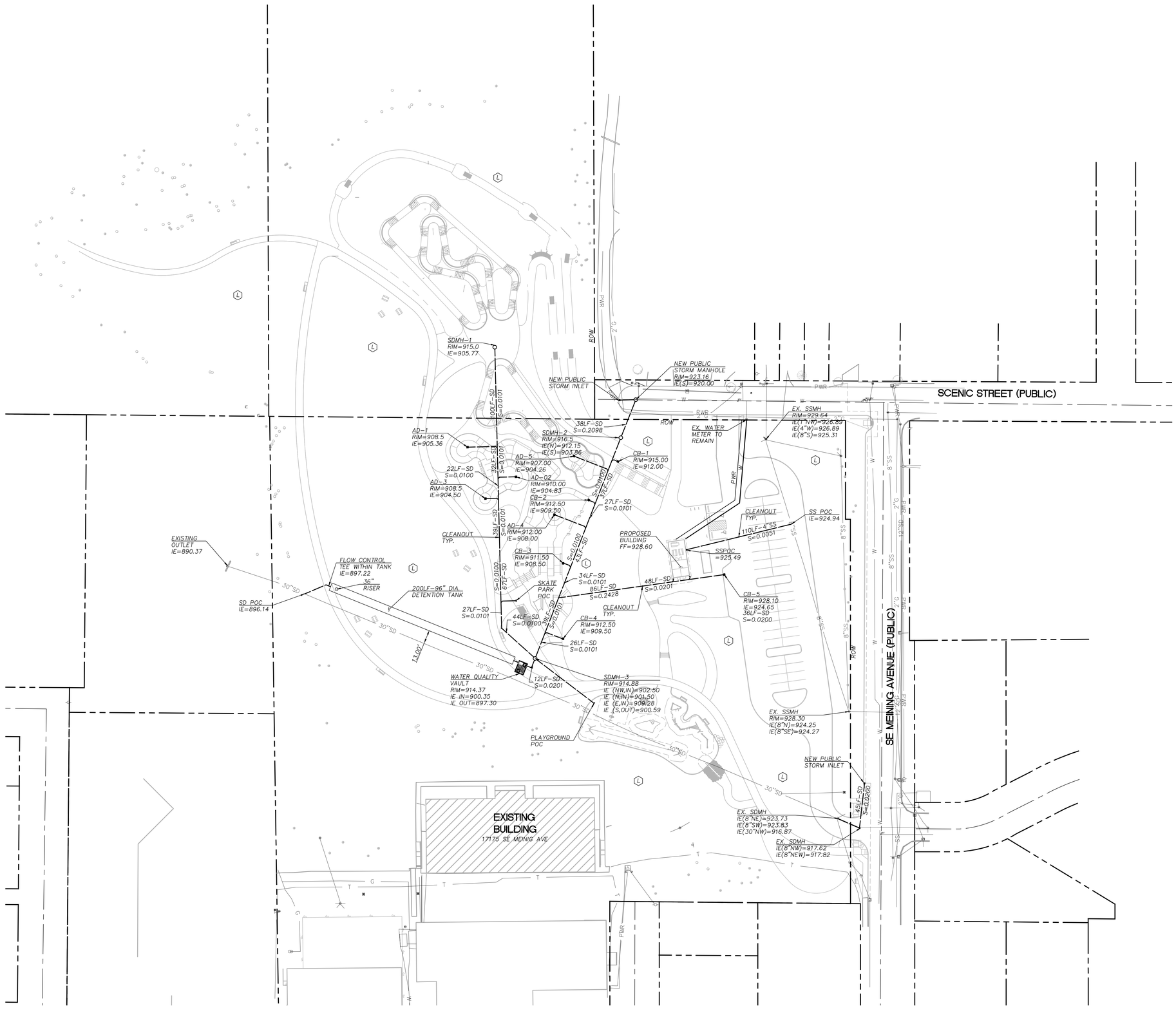

SHEET LEGEND

SD	STORM	
SS	SANITARY	
W	WATER	
PWR	POWER	
■	CATCH BASIN	
•	CLEANOUT	
○	MANHOLE	
▭	DETENTION PIPE	

UTILITY PLAN
SCALE: 1"=40'

GRAPHIC SCALE
0 40 80
1 inch = 40 ft.

LANDSCAPE ARCHITECTS PC
lango.hansen
1100 nw glisan #3B portland OR 97209 T 503.295.2437

REGISTERED PROFESSIONAL ENGINEER
OREGON
SEPT. 12, 2017
PRELIMINARY
ALLEN SCHMITZ
RENEWAL DATE 6/30/24

SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION

CITY OF SANDY
17225 SMITH AVE
SANDY, OR 97055

LAND USE

REVISIONS

SCALE	AS NOTED
DRAWN BY	MCS
DATE	07.17.23
PROJECT NO.	2239

UTILITY PLAN

C3.00

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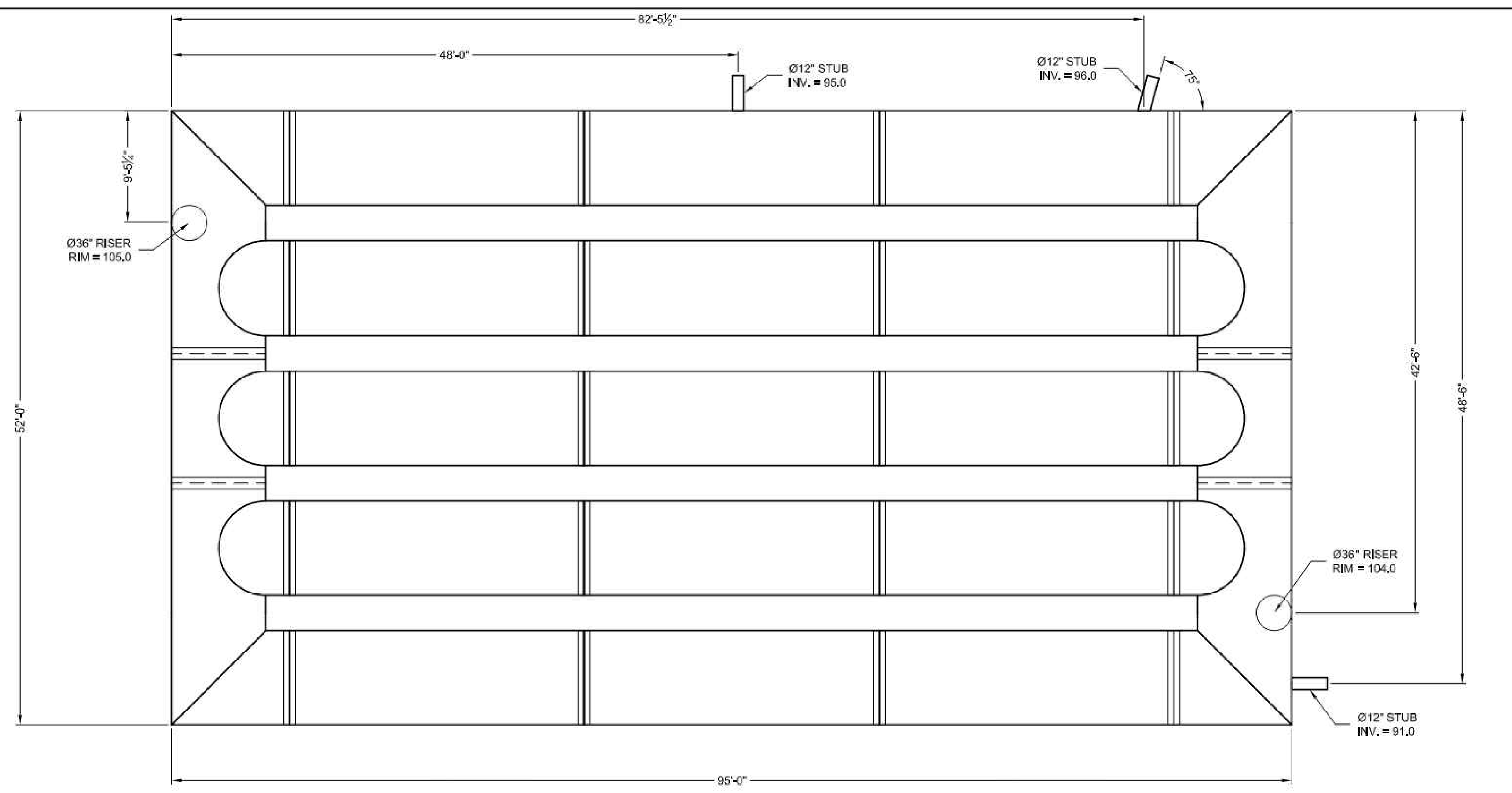


THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (4) PAGES INCLUDING THE FOLLOWING:

- **VOLUME = 25,082 C.F.**
- **MAINLINE PIPE GAUGE = 16**
- **WALL TYPE = SOLID**
- **DIAMETER = 96"**
- **FINISH = ALT2**

CUSTOMER DATE

ASSEMBLY
SCALE: 1" = 10'
VOLUME: 25,082 C.F.
LOADING: H20/H25
SYSTEM INV = 91.0

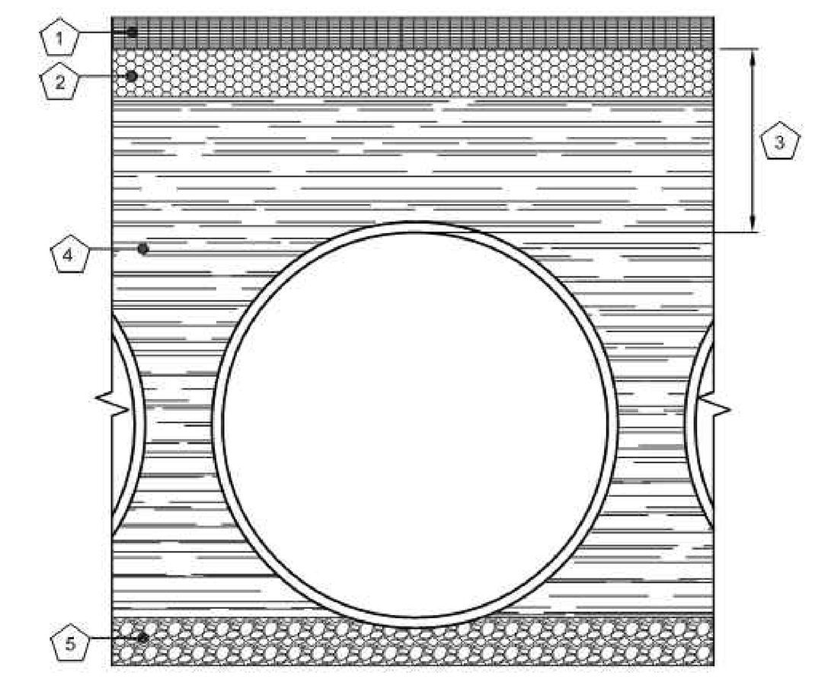
NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX
CONTECH CMP DETENTION SYSTEMS — CONTECH CONTRACT DRAWING

Ø96" UNDERGROUND DETENTION SYSTEM - 000000-001
SAMPLE PROJECT
ANYTOWN, USA
SITE DESIGNATION: UDS

PROJECT No.: XXXXX | SEQ. No.: 001 | DATE: 1/13/2014 | DESIGNED: XXX | DRAWN: RTF | CHECKED: | APPROVED: | SHEET NO.: C1 OF 4



KEY

1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE
3. 12" MIN. FOR DIAMETERS THROUGH 96" 18" MIN. FOR DIAMETERS FROM 102" AND LARGER MEASURED TO TOP OF RIGID OR BOTTOM OF FLEXIBLE PAVEMENT.
4. SELECT GRANULAR FILL PER AASHTO M145 A1, A2 OR A3, OR APPROVED EQUAL. PLACED IN 8" LIFTS (COMPACTED TO MIN. 90% STANDARD DENSITY PER AASHTO T99.)
5. GRANULAR BEDDING, ROUGHLY SHAPED TO FIT THE BOTTOM OF PIPE, 4" TO 6" IN DEPTH

FOUNDATION/BEDDING PREPARATION

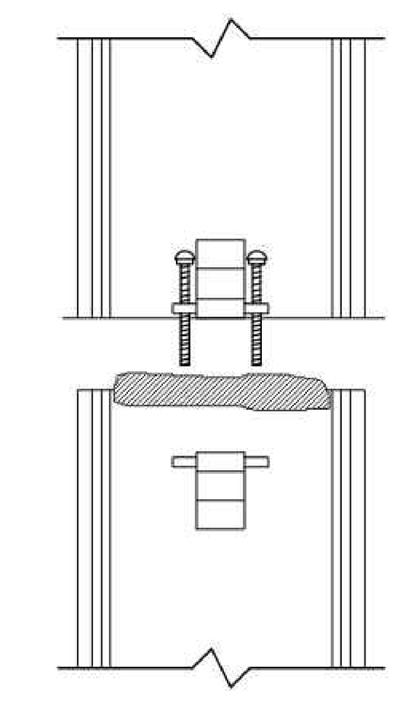
PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, 4" - 6" OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL

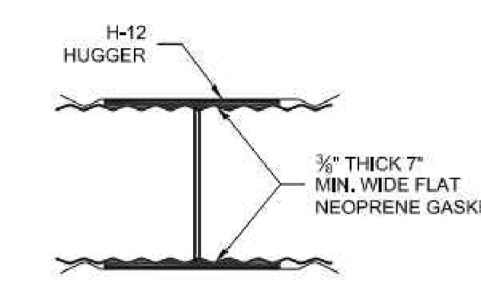
THE BACKFILL SHALL BE AN A1, A2 OR A3 GRANULAR FILL PER AASHTO M145, OR A WELL-GRADED GRANULAR FILL AS APPROVED BY THE SITE ENGINEER (SEE INSTALLATION GUIDELINES). THE MATERIAL SHALL BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 90% AASHTO T99 STANDARD PROCTOR DENSITY. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE DETENTION SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON THE PIPE.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.

1/C3 BACKFILL DETAIL
SCALE: N.T.S.



CONNECTION DETAIL
SINGLE BOLT, BAR AND STRAP



FLAT GASKET

GENERAL NOTES

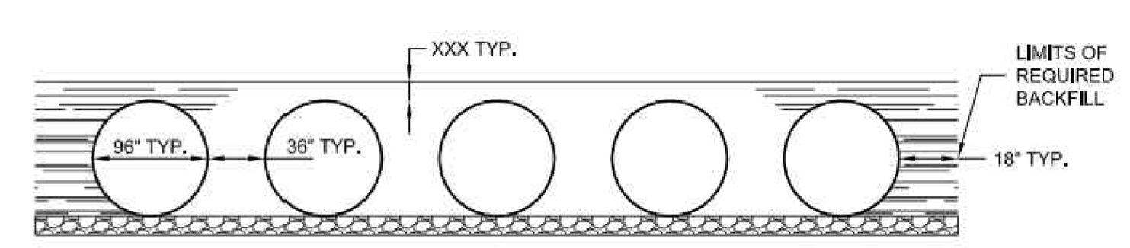
1. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   12" THRU 48", 1-PIECE
   54" THRU 96", 2-PIECE
   102" THRU 144", 3-PIECES
2. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS
3. REROLLED ANNULAR END CORRUGATIONS ARE NORMALLY 2⅔" x ½". DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES

2/C3 H-12 HUGGER BAND DETAIL
SCALE: N.T.S.

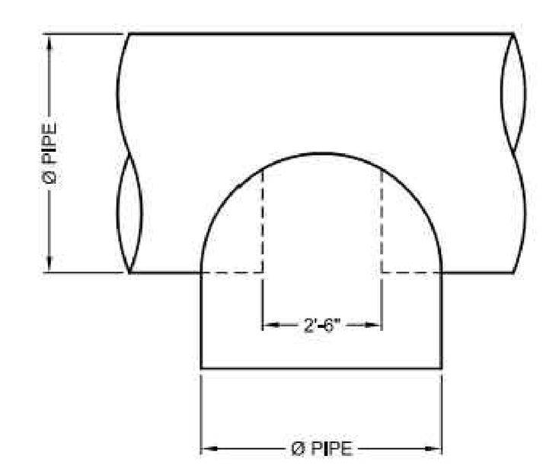
REGISTERED PROFESSIONAL ENGINEER 89353 OREGON SEPT. 12, 2017 ALLEN SCHMITZ
PRELIMINARY
RENEWAL DATE 6/30/24

Ø96" UNDERGROUND DETENTION SYSTEM - 000000-001
SAMPLE PROJECT
ANYTOWN, USA
SITE DESIGNATION: UDS

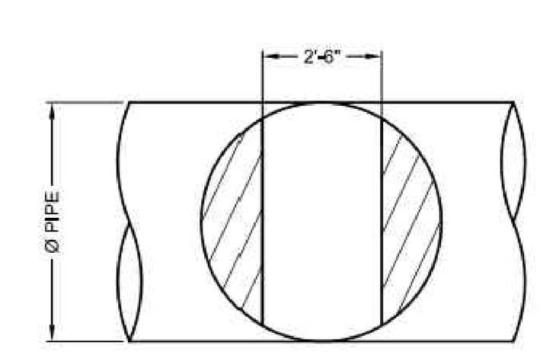
PROJECT No.: XXXXX | SEQ. No.: 001 | DATE: 1/13/2014 | DESIGNED: XXX | DRAWN: RTF | SHEET NO.: C3 OF 4



TYPICAL SECTION VIEW
SCALE: N.T.S.



PLAN



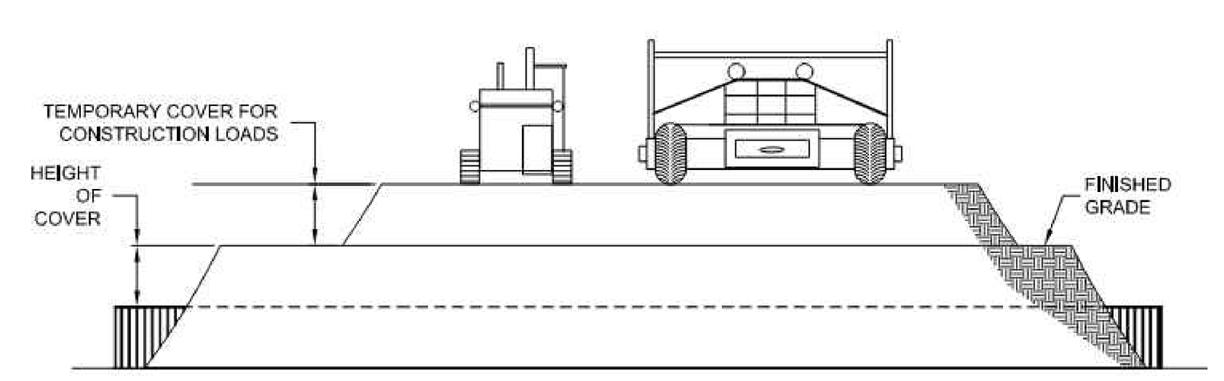
FRONT

TYPICAL MANWAY DETAIL
SCALE: N.T.S.

FABRICATION BoM									
FITTING	TYPE	QTY	Ø	CORRUGATION	GAGE	FINISH	WALL TYPE	LENGTH	TOTAL
BAND FASTENER	12" HUGGER		96	w/BAR BOLT & STRAP	16	ALT2			
GASKETS	FLAT		96	12" WIDE					

PROJECT SPECIFIC BILL OF MATERIALS TO BE COMPLETED AT TIME OF CONTRACT DRAWINGS

SHEET NO.: C2 OF 4



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

3/C4 CONSTRUCTION LOADING DIAGRAM
SCALE: N.T.S.

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

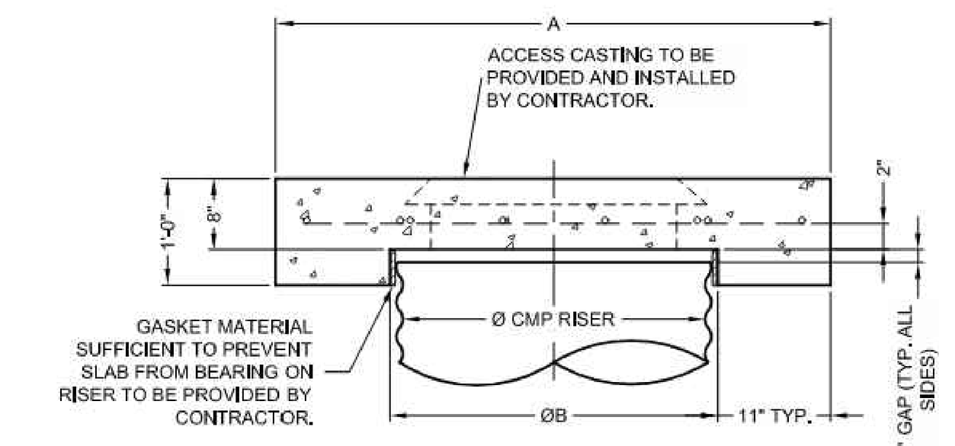
HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

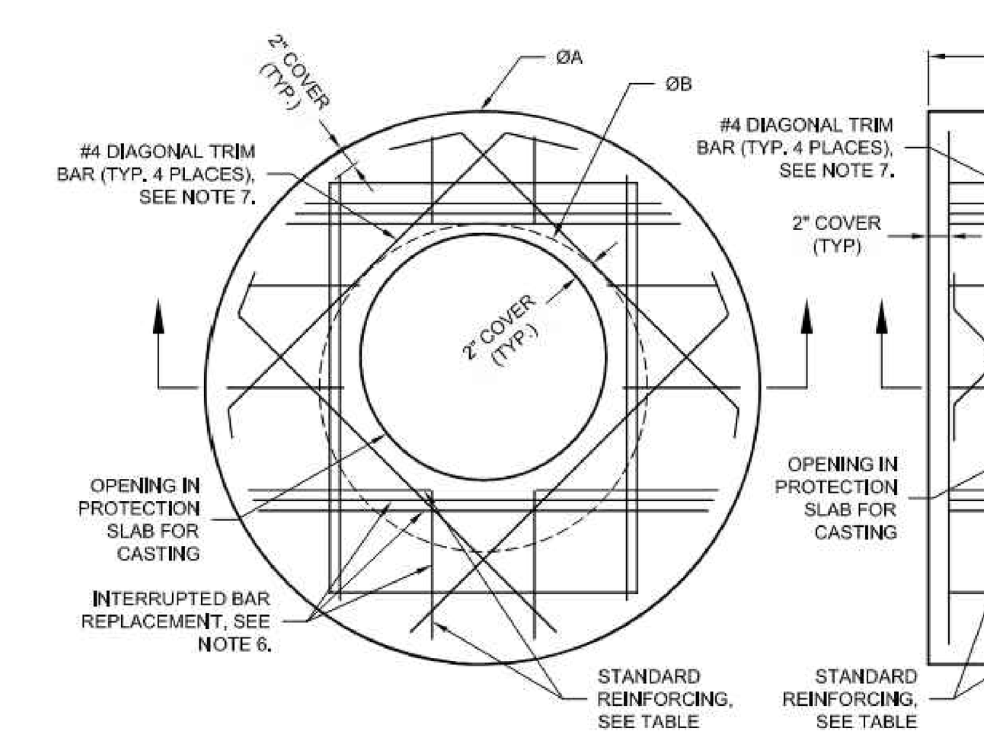
IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.



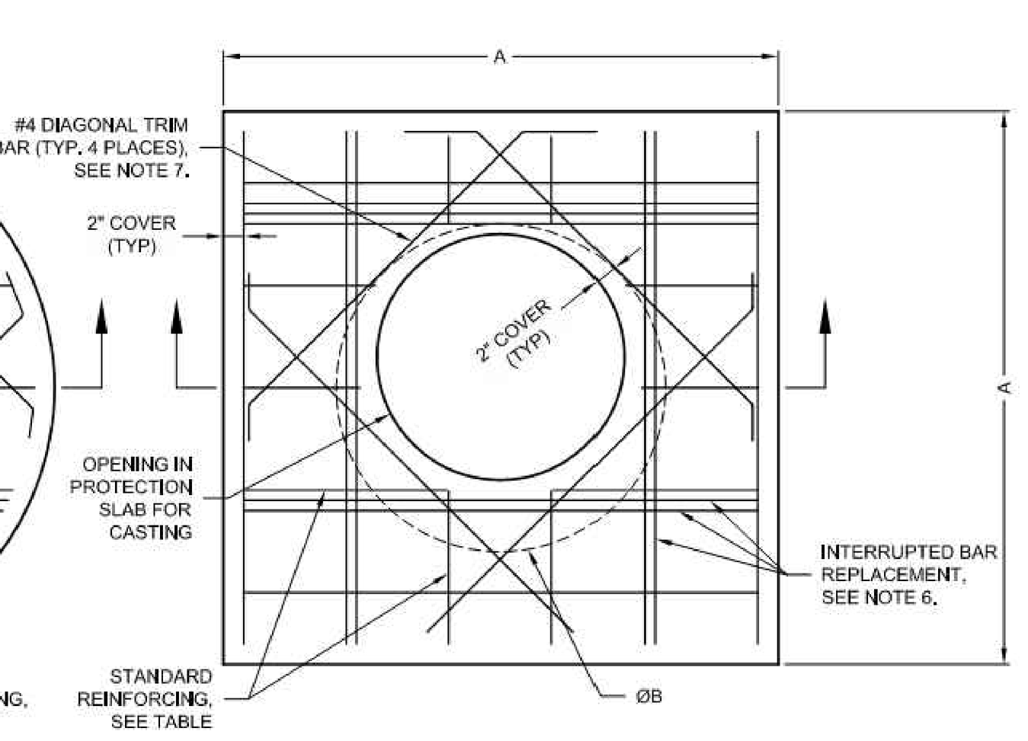
SECTION VIEW

REINFORCING TABLE				
Ø CMP RISER	A	Ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	Ø 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	Ø 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	Ø 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	Ø 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	Ø 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

4/C4 MANHOLE CAP DETAIL
SCALE: N.T.S.

SHEET NO.: C4 OF 4

lango.hansen
LANDSCAPE ARCHITECTS PC
1100 nw glisan #3B portland OR 97209 T 503 295.2437

SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION

CITY OF SANDY
17225 SMITH AVE
SANDY, OR 97055

LAND USE

REVISIONS

SCALE	AS NOTED
DRAWN BY	MCS
DATE	07.17.23
PROJECT NO.	2239

CIVIL DETAILS

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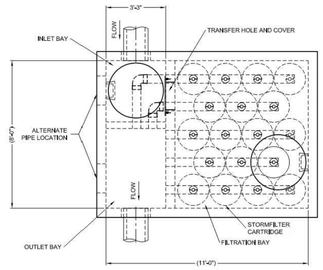
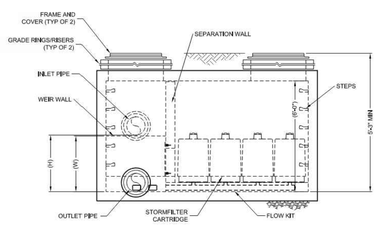
C4.00



PLAN



ELEVATION

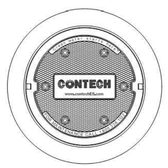
STORMFILTER DESIGN NOTES

- THE 8' x 11' PEAK DIVERSION STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA SPECIFIC FLOW RATE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD.
- THE PEAK DIVERSION STORMFILTER IS AVAILABLE IN A LEFT INLET (AS SHOWN) OR RIGHT INLET CONFIGURATION.
- ALL PARTS AND INTERNAL ASSEMBLY PROVIDED BY CONTECH UNLESS OTHERWISE NOTED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27"			18"			LOW DROP		
RECOMMENDED HYDRAULIC DROP (H)	3.05'			2.3'			1.8'		
HEIGHT OF WEIR (W)	3.05'			2.20'			1.70'		
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf
CARTRIDGE FLOW RATE (gpm)	22.5	18.79	11.25	15	12.53	7.5	10	8.35	5

* 1.67 gpm/sf SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB ® (PSORB) MEDIA ONLY.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs)	*
PEAK FLOW RATE (cfs)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
CARTRIDGE HEIGHT (27", 18", LOW DROP(LD))	*
NUMBER OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (PERLITE, ZPG, PSORB)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE	*	*	*
OUTLET PIPE	*	*	*

UPSTREAM RIM ELEVATION	*
DOWNSTREAM RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

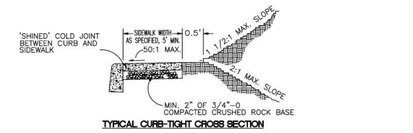
PERFORMANCE SPECIFICATION
FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. **RADIAL MEDIA DEPTH SHALL BE 7 INCHES.** FILTER MEDIA CONTACT TIME SHALL BE AT LEAST **38 SECONDS.** SPECIFIC FLOW RATE SHALL BE **2 GPM/SF (MAXIMUM).** SPECIFIC FLOW RATE IS THE MEASURE OF THE FLOW (GPM) DIVIDED BY THE MEDIA SURFACE CONTACT AREA (SF). MEDIA VOLUMETRIC FLOW RATE SHALL BE **6 GPM/CF OF MEDIA (MAXIMUM).**

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE, www.conteches.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT OR BELOW THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.

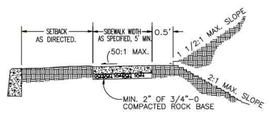
INSTALLATION NOTES
A. ANY SUBGRADE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
F. CONTRACTOR TO REMOVE THE TRANSFER HOLE COVER WHEN THE SYSTEM IS BROUGHT ONLINE.

CONTECH ENGINEERED SOLUTIONS LLC
www.contech-cpi.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

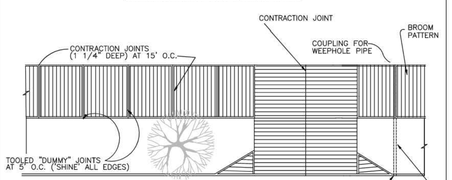
THE STORMWATER MANAGEMENT STORMFILTER
8' x 11' PEAK DIVERSION STORMFILTER
STANDARD DETAIL



TYPICAL CURB-TIGHT CROSS SECTION



TYPICAL SETBACK TYPE CROSS SECTION



TYPICAL PLAN VIEW

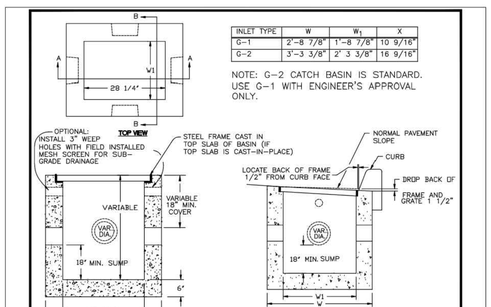
NOTES:
1. SIDEWALK WIDTH DIMENSION DOES NOT INCLUDE CURB FOR CURB-TIGHT SIDEWALKS.
2. SIDEWALKS 8 FEET AND WIDER SHALL HAVE A LONGITUDINAL CONTRACTION JOINT AT THE MIDPOINT.
3. CONCRETE THICKNESS FOR STANDARD SIDEWALKS SHALL BE NOMINAL 4" MIN.; THICKNESS IN DRIVEWAY SHALL BE 6"
4. INSTALL 3" ABS WEEPHOLE PIPES IN SIDEWALKS IN LOCATIONS DIRECTED BY THE ENGINEER. PLACE CONTRACTION JOINT OVER THE TOP OF THE PIPE.

CITY OF SANDY

SIDEWALK

DATE: SEPT 2004 | DRAWING NO. 205

FILENAME: SANDY005.DWG

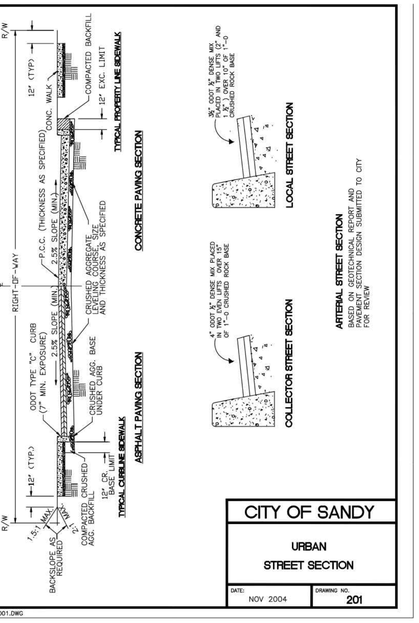


CITY OF SANDY

TYPE G-1, G-2 CATCH BASIN WITH SUMP

DATE: MARCH 2004 | DRAWING NO. 305C

FILENAME: SANDYCB.DWG

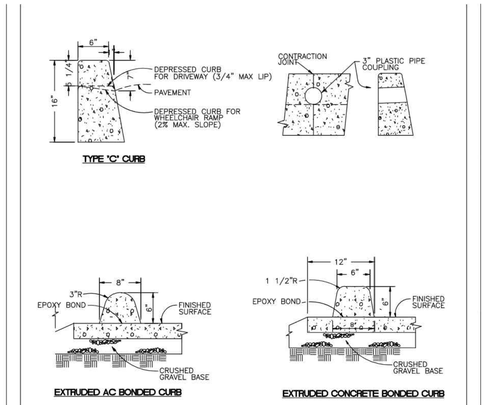


CITY OF SANDY

URBAN STREET SECTION

DATE: NOV 2004 | DRAWING NO. 201

FILENAME: SANDY001.DWG



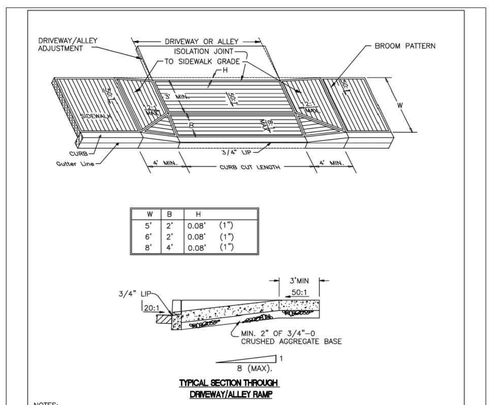
NOTES:
1. ISOLATION JOINTS SHALL BE PLACED ONLY AS SPECIFIED.
2. CONTRACTION JOINTS SHALL BE PLACED AT 15' INTERVALS AND SHALL EXTEND AT LEAST 50% THROUGH THE CURB.
3. A CONTRACTION JOINT SHALL BE PLACED ALONG AND OVER WEEP HOLE THROUGH THE CURB AND THROUGH THE SIDEWALK.
4. WHEN SIDEWALKS ARE CONSTRUCTED, EXTEND 3" PIPE TO BACK OF SIDEWALK AND INSTALL COUPLING.

CITY OF SANDY

CURB AND WEEPHOLE

DATE: SEPT 1997 | DRAWING NO. 203

FILENAME: SANDY003.DWG



TYPICAL SECTION THROUGH DRIVEWAY/ALLEY RAMP

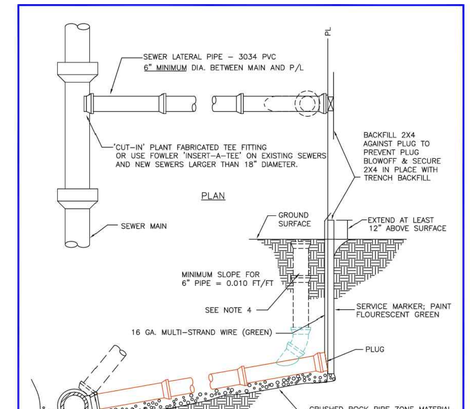
NOTES:
1. RESIDENTIAL DRIVEWAYS AND SIDEWALK SECTIONS THROUGH DRIVEWAYS SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 4". CONCRETE STRENGTH SHALL BE 3300 PSI.
2. CONCRETE FOR COMMERCIAL USE AND ALLEY APPROACHES SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 6". CONCRETE STRENGTH SHALL BE 3300 PSI.
3. CURB TRANSITIONS FOR COMMERCIAL USE AND ALLEY APPROACHES
4. CONSTRUCT CONTRACTION JOINT IN CENTER OF DRIVEWAY WHEN DRIVEWAY WIDTH EXCEEDS 15'.
5. NO LIP AT GUTTER LINE IF USED AS SIDEWALK ACCESS RAMP.
6. SEE SIDEWALK DETAILS FOR RESTRICTIONS AND SPECIFICATIONS NOT SHOWN.
7. THE 50:1 CROSS-SLOPE OF SIDEWALK IS MEASURED FROM HORIZONTAL. THE 12:1 SLOPE OF SIDEWALK TRANSITION TO DRIVEWAY/ALLEY IS RELATIVE TO THE RUNNING SLOPE OF THE SIDEWALK. THE SLOPE OF THE APRON IS MEASURED RELATIVE TO HORIZONTAL.

CITY OF SANDY

DRIVEWAY AND ALLEY APPROACHES WITH DEPRESSED CURBLINE SIDEWALK

DATE: SEPT 1997 | DRAWING NO. 208

FILENAME: SANDY056.DWG



NOTES:
1. SANITARY MAIN, LATERAL AND FITTINGS SHALL BE LIKE MATERIALS. ONLY MANUFACTURED FITTINGS SHALL BE USED.
2. MINIMUM DEPTH AT RIGHT OF WAY OR EASEMENT LINE SHALL BE 4 FEET.
3. MARKER POSTS AND BLOCKING SHALL BE TREATED WOOD. POST SHALL BE 2" x 4" FIR. POST TO EXTEND 12" MINIMUM ABOVE FINISH GRADE AND EXPOSED AREA SHALL BE PAINTED FLOURESCENT GREEN.
4. INSTALL CLEANOUT WHEN SPECIFIED IN PERMIT OR PLAN REVIEW. REFER TO SANDY052.DWG (DRAWING 310) FOR CLEANOUT DETAIL.
5. LAY BUILDING SEWER AT MAX. 45° FROM HORIZONTAL TO ACHIEVE REQUIRED DEPTH AT PROPERTY LINE WHEN MINIMUM SLOPE RESULTS IN EXCESSIVE DEPTH.

CITY OF SANDY

SHALLOW TRENCH SERVICE CONNECTION, BLOCKING, AND MARKERS

DATE: DEC 2003 | DRAWING NO. 308

FILENAME: SANDY023.DWG

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LANDSCAPE ARCHITECTS PC
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REGISTERED PROFESSIONAL ENGINEER
89259
OREGON
PRELIMINARY
SEPT. 12, 2017
ALLEN SCHMITZ
RENEWAL DATE 6/30/24

SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION

CITY OF SANDY
17225 SMITH AVE
SANDY, OR 97055

LAND USE

REVISIONS

SCALE	AS NOTED
DRAWN BY	MCS
DATE	07.17.23
PROJECT NO.	2239

CIVIL DETAILS

C4.01

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SANDY COMMUNITY CAMPUS PARK - LAND USE SUBMITTAL

EXHIBIT D

PROJECT TEAM

CLIENT
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38348 Pioneer Boulevard
Sandy, OR 97055

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Lango Hansen Landscape Architects
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Portland, OR 97209
Contact: Brian Martin
Email: brian@langohansen.com
Phone: 503.295.2437

CIVIL ENGINEER
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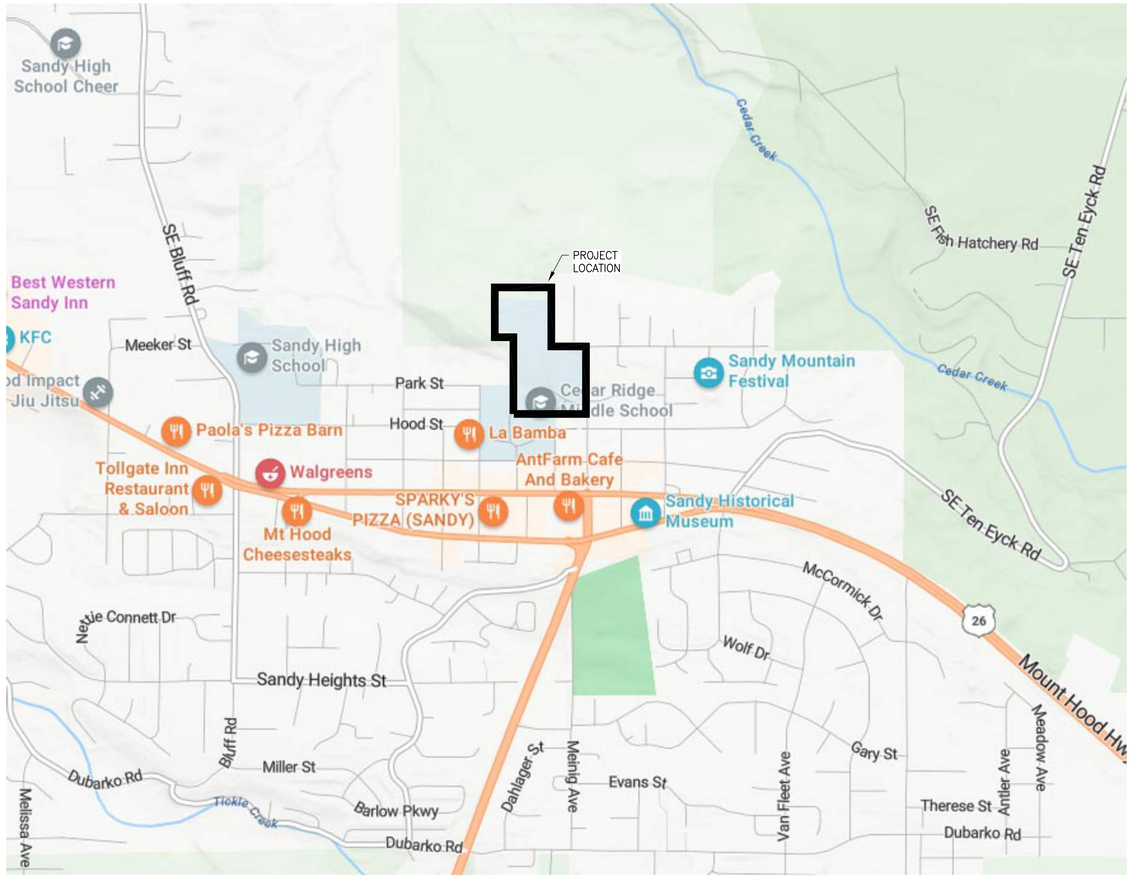
Phone: 503.488.5711

ELECTRICAL ENGINEER
R&W Electrical Engineering
9615 SW Allen Blvd #107,
Beaverton, OR 97005
Contact: Jonathan Lilly
Email: jlilly@rweng.com
Phone: 503.726.3337

UTILITY CONTACTS



VICINITY MAP

PARK ADDRESS: 17165 SE MEINIG AVE, SANDY, OR 97055

SHEET INDEX

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SANDY COMMUNITY CAMPUS PARK
CITY OF SANDY PARKS AND RECREATION
CITY OF SANDY
17165 SE MEINIG AVE
SANDY, OR 97055

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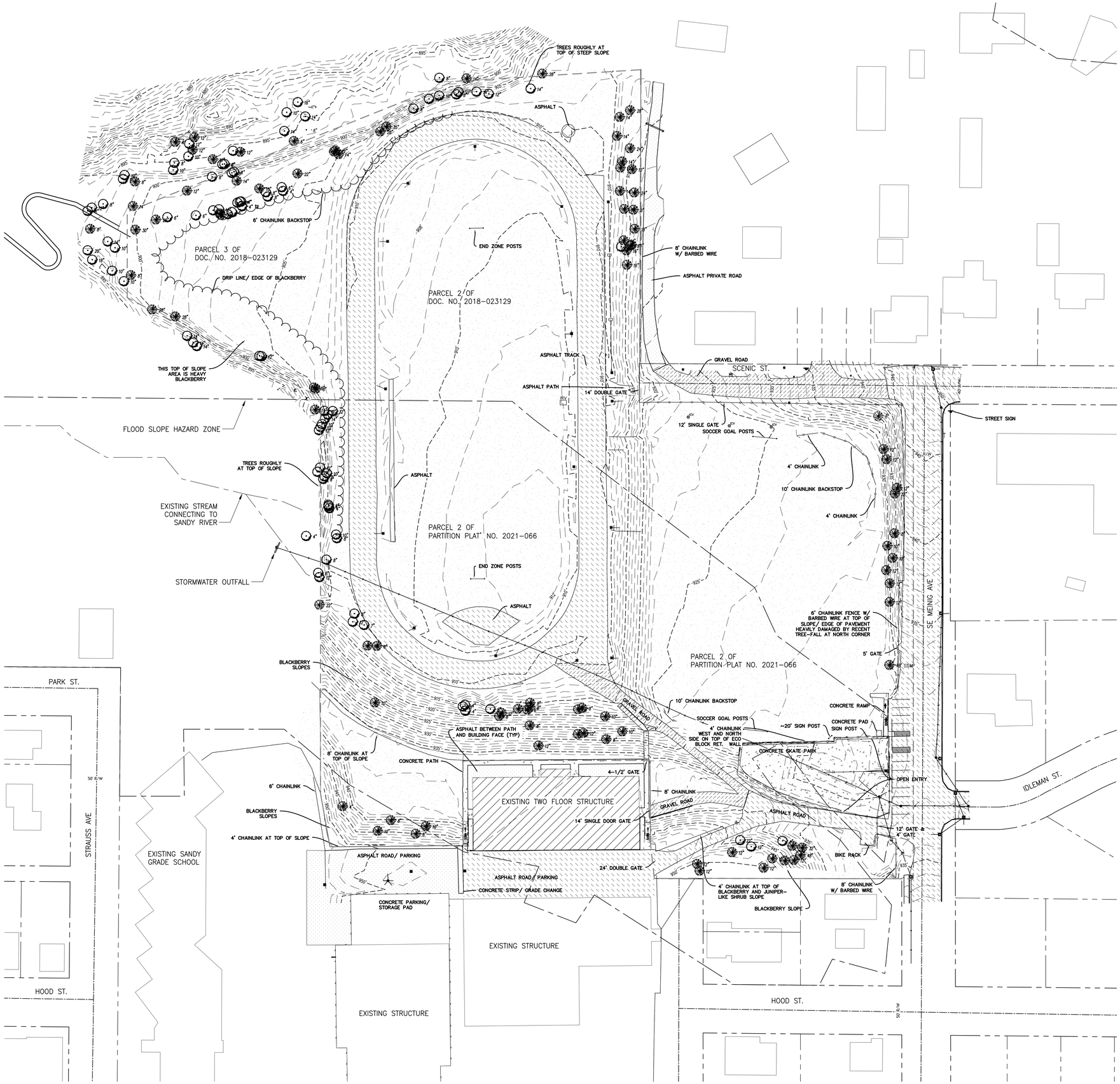
COVER SHEET

G0.01



SITE SURVEY LEGEND

- LIMIT OF WORK
- PROPERTY LINE
- CHAINLINK FENCE
- EDGE OF BRUSH
- MAJOR CONTOUR (5')
- MINOR CONTOUR (1')
- FLOOD SLOPE HAZARD (25' SETBACK ON SLOPES)
- ASPHALT
- CONCRETE
- GRAVEL
- GRASS
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE

1 SITE ANALYSIS

SCALE: 1" = 40'

0 8' 20' 40' 80'

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SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION

CITY OF SANDY
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SANDY, OR 97055

LAND USE SUBMITTAL

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SITE ANALYSIS

G0.02

MATCHLINE L1.02

SCENIC STREET

SEE CIVIL FOR ROW IMPROVEMENTS

STORMWATER FACILITY, TYP

SKATE PARK, PUMP TRACK AND JUMP-LINE IMPROVEMENTS SHOWN FOR REFERENCE ONLY

VEHICULAR CONCRETE PAVING, TYP

BIKE RACK

PARK OVERLOOK

SHELTER W/ RESTROOMS

ORNAMENTAL PLANTER

CONCRETE STAIRS W/ METAL HANDRAILS, TYP

ASPHALT PARKING LOT W/ CONCRETE CURBS, SEE CIVIL

PLAY EQUIPMENT, TYP

ENGINEERED WOOD FIBER SAFETY SURFACING

ORNAMENTAL PLANTING, TYP

IRRIGATED LAWN, TYP

PICNIC TABLE, TYP

EXISTING DECIDUOUS TREE TO REMAIN, TYP

EXISTING EVERGREEN TREE TO REMAIN, TYP

BENCH, TYP

UNIRRIGATED LAWN, TYP

1 L1.03 PLAY AREA ENLARGEMENT

PARK MONUMENT SIGN

MEINIG AVENUE

IDLEMAN STREET

SL

PA

STM

E

1 MATERIALS PLAN SOUTH

SCALE - 1" = 20'-0"

N

0 10 20 40

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SANDY COMMUNITY CAMPUS PARK

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MATERIALS PLAN SOUTH

L1.01

LEGEND

- LIMIT OF WORK – PARK IMPROVEMENTS
- LIMIT OF WORK – SKATE PARK, PUMP TRACK, JUMP–LINE
- PROPERTY LINE/RIGHT–OF–WAY
- PEDESTRIAN CONCRETE PAVING
- VEHICULAR CONCRETE PAVING
- SOFT SURFACE PATH
- CONCRETE CURB
- CONCRETE WHEELSTOP
- BIKE RACK
- SITE LIGHT, SEE ELEC DWG
- BENCH WITH BACK
- PICNIC TABLE
- TRASH RECEPTACLE
- DRINKING FOUNTAIN
- BOULDERS
- BOLLARD
- AREA DRAIN, SEE CIVIL UTILITY DWG
- FIRE HYDRANT, SEE CIVIL UTILITY DWG
- EXISTING TREE TO REMAIN

ABBREVIATIONS

ARCH	ARCHITECTURAL
CONC	CONCRETE
DWG	DRAWINGS
ELEC	ELECTRICAL
MECH	MECHANICAL
NIC	NOT IN CONTRACT
PA	PLANTING AREA
SIM	SIMILAR
SPECS	SPECIFICATIONS
STRUC	STRUCTURAL
TYP	TYPICAL
W/	WITH

MATERIALS NOTES

1. THIS PLAN IS BASED ON A SURVEY BY 45TH PARALLEL GEOMATICS DATED 02/09/2023. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IDENTIFIED ON SITE RELATED TO SURVEY INFORMATION PRIOR TO INSTALLATION.
2. PROTECT EXISTING VEGETATION TO REMAIN. SEE SPECIFICATION SECTION 015639 FOR FENCING AND OTHER REQUIREMENTS.
3. SEE CIVIL DRAWINGS FOR LOCATION OF UTILITIES.
4. SEE ELECTRICAL DRAWINGS FOR FURTHER INFORMATION REGARDING SITE LIGHTING AND ELECTRIC UTILITIES.
5. SEE SHEET ___ FOR LOCATIONS OF IRRIGATION SLEEVES UNDER PAVING.
6. COORDINATE WORK WITH OTHER TRADES, INCLUDING WORK IN OTHER BID PACKAGES.
7. ALL CONCRETE PAVING TO RECEIVE LIGHT BROOM FINISH UNLESS OTHERWISE NOTED. SEE DETAILS FOR CIP CONCRETE RETAINING WALL AND CHEEK WALL FINISHES. CONTRACTOR TO PROVIDE FINISH MOCKUPS FOR APPROVAL, SEE SPECIFICATIONS.
8. CONTRACTOR TO SUBMIT PAVING MOCK–UP FOR APPROVAL BY OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
9. SEE CIVIL DRAWINGS FOR ALL VEHICULAR AREA IMPROVEMENTS, INCLUDING PAVING, CURBS, DRIVEWAY APRONS, STRIPING AND SIGNAGE, AS WELL AS ANY VEHICULAR AND PEDESTRIAN PAVING IMPROVEMENTS WITHIN THE RIGHT–OF–WAY.

1 MATERIALS PLAN NORTH

SCALE - 1" = 20'-0"

0 10 20 40

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SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION

CITY OF SANDY
17165 SE MEINIG AVE
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LAND USE SUBMITTAL

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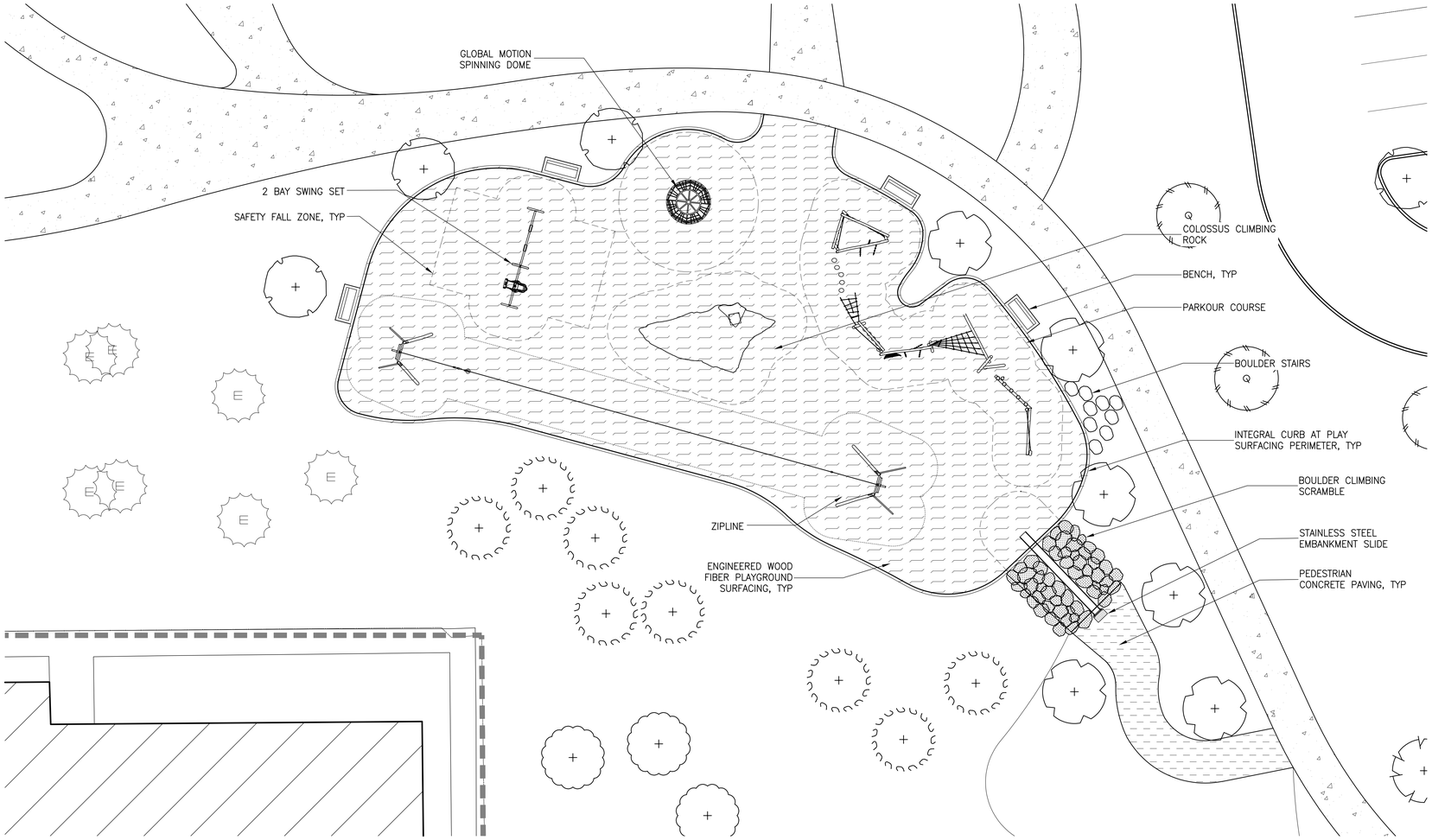
MATERIALS PLAN NORTH

L1.02



1 PLAY AREA ENLARGEMENT

SCALE - 1" = 10'-0"

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SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION

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PLAY AREA ENLARGEMENT

L1.03

MATCHLINE L2.02

SCENIC STREET

SKATE PARK, PUMP TRACK AND JUMP-LINE IMPROVEMENTS SHOWN FOR REFERENCE ONLY

MEINIG AVENUE

IDLEMAN STREET

1 GRADING PLAN SOUTH

SCALE - 1" = 20'-0"

N

0 10 20 40

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SANDY COMMUNITY CAMPUS PARK

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GRADING PLAN SOUTH

L2.01

LEGEND

- LIMIT OF WORK – PARK IMPROVEMENTS
- LIMIT OF WORK – SKATE PARK, PUMP TRACK, JUMP–LINE
- 387 EXISTING CONTOUR
- 387 PROPOSED CONTOUR
- BOTTOM OF SWALE LINE
- GRADE BREAK LINE
- 485.00 / 485.00 SPOT ELEVATION
- 4.8% PERCENTAGE OF SLOPE
- DIRECTION OF SLOPE

ABBREVIATIONS

AD	AREA DRAIN (RIM ELEVATION)
BC	BOTTOM OF CURB
BF	BOTTOM OF FOOTING
BW	BOTTOM OF WALL (FINISHED GRADE)
CB	CATCH BASIN (RIM ELEVATION)
CTV	CONTRACTOR TO VERIFY
EL	ELEVATION
EQ	EQUAL
EX	EXISTING
FFE	FINISH FLOOR ELEVATION
FS	FINISH SURFACE
HP	HIGH POINT
IE	INVERT ELEVATION
LP	LOW POINT
MATCH	MATCH EXISTING GRADE
MAX	MAXIMUM
MIN	MINIMUM
RIM	RIM ELEVATION
SIM	SIMILAR
TC	TOP OF CURB
TF	TOP OF FOOTING
TW	TOP OF WALL (FINISHED)
TYP	TYPICAL

GRADING NOTES

1. THIS PLAN IS BASED ON A SURVEY BY 45TH PARALLEL GEOMATICS DATED 02/09/2023. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IDENTIFIED ON SITE RELATED TO SURVEY INFORMATION PRIOR TO INSTALLATION.
2. PROTECT EXISTING VEGETATION TO REMAIN; SEE SPECIFICATION SECTION 015639 FOR FENCING AND OTHER REQUIREMENTS.
3. SET STRAIGHT GRADES BETWEEN GIVEN ELEVATIONS UNLESS OTHERWISE INDICATED.
4. GRADE BREAK LINES ARE SHOWN GRAPHICALLY TO ILLUSTRATE DRAINAGE PATTERNS, AND ARE NOT INTENDED TO BE ACTUAL JOINT LINES, UNLESS THEY FALL ON EXPANSION JOINT LOCATIONS.
5. SEE CIVIL DRAWINGS FOR UNDERGROUND UTILITIES AND DRAINAGE FEATURES.
6. ENSURE POSITIVE DRAINAGE AWAY FROM ALL BUILDINGS AT 1% MIN.
7. SPOT ELEVATIONS TAKE PRECEDENCE OVER LANDSCAPE CONTOURS.
8. PROVIDE 1.5% CROSS SLOPE ON ALL PAVED WALKS, TYP, EXCEPT AS SHOWN. DO NOT EXCEED 1.8% CROSS SLOPE, EXCEPT AS SHOWN.
9. DO NOT DISTURB AREAS NOT TO BE GRADED.
10. THIS GRADING PLAN IS TO BE COORDINATED WITH THE CIVIL STREET PLANS. NOTIFY OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY DISCREPANCIES.
11. SEE CIVIL DRAWINGS FOR ALL VEHICULAR AREA IMPROVEMENTS, INCLUDING PAVING, CURBS, CURB RAMPS, DRIVEWAY APRONS, WHEEL STOPS, STRIPING AND SIGNAGE, AS WELL AS VEHICULAR AND PEDESTRIAN PAVING IMPROVEMENTS WITHIN THE RIGHT–OF–WAY.
12. DO NOT EXCEED 1.8% SLOPE AT DOOR LANDINGS, EXCEPT AS SHOWN.
13. ADJUSTMENTS OF SOFT SWALE AREAS ±2" MAY BE NECESSARY TO IMPROVE DRAINAGE. THESE ADJUSTMENTS SHALL BE DONE AT NO COST TO THE OWNER.
14. BOTTOM OF WALL (BW) ELEVATIONS EQUAL FINISH SURFACE OF PAVING OR FINISH GRADE, NOT TOP OF FOOTING ELEVATION.
15. CONTRACTOR TO VERIFY EXISTING GRADES AT ALL LOCATIONS WHERE NEW PAVING IS MATCHING EXISTING PAVING AND NOTIFY ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES.
16. CONCRETE PAVING ELEVATIONS AT BACK OF CURB TO MATCH TOP OF CURB ELEVATIONS, UNLESS OTHERWISE NOTED, SEE CIVIL DRAWINGS FOR CURB ELEVATIONS.
17. ALL ADA PARKING STALL AND WALKWAYS TO MEET LOCAL, STATE AND FEDERAL ADA REQUIREMENTS. PRIOR TO FORMING HARD SURFACE MATERIALS, CONTRACTOR TO VERIFY GRADES FOR CURB RAMPS AND PARKING LOT SPACES MEET ADA REQUIREMENTS.

1 GRADING PLAN NORTH

SCALE - 1" = 20'-0"

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SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION

CITY OF SANDY
17165 SE MEINIG AVE
SANDY, OR 97055

LAND USE SUBMITTAL

REVISIONS

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DATE	06.21.23
PROJECT NO.	2239

GRADING PLAN NORTH

L2.02

MATCHLINE L3.02

IRRIGATED LAWN, TYP

SCENIC STREET

(3) LT

3 QM

SKATE PARK, PUMP TRACK AND JUMP-LINE IMPROVEMENTS SHOWN FOR REFERENCE ONLY

(5) LT

(3) QM

ORNAMENTAL PLANTING, TYP

IRRIGATED LAWN, TYP

(2)ZS

(4) PM

(1) QM

3 ZS

(2)ZS

PIONEER GARDEN, TYP

MEINIG AVENUE

2 CE

(2) QG

(2)ZS

3 CE

UNIRRIGATED NATIVE RESTORATION SEED MIX, TYP

(2)ZS

(3) TT

PA

6 CE

PARKING LOT ORNAMENTAL PLANTING, TYP

IRRIGATED LAWN, TYP

3 ZS

5 PM

(5)UH

3 PM

3 AM

(3) QG

IDLEMAN STREET

PARK MONUMENT SIGN

SL

E

1 PLANTING PLAN SOUTH

SCALE - 1" = 20'-0"

N

0 10 20 40

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SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION CREATION

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PLANTING PLAN SOUTH

L3.01

LEGEND

- LIMIT OF WORK – PARK IMPROVEMENTS
- LIMIT OF WORK – SKATE PARK, PUMP TRACK, JUMP–LINE
- PROPERTY LINE/RIGHT–OF–WAY
- CONCRETE CURB
- CONCRETE WHEELSTOP
- BIKE RACK
- SITE LIGHT, SEE ELEC DWG
- BENCH WITH BACK
- PICNIC TABLE
- TRASH RECEPTACLE
- DRINKING FOUNTAIN
- BOULDERS
- AREA DRAIN, SEE CIVIL UTILITY DWG
- EXISTING TREE TO REMAIN

ABBREVIATIONS

B&B	BALLED & BURLAPPED
CAL	CALIPER
CONT	CONTAINER
DIA	DIAMETER
DBH	DIAMETER AT BREAST HEIGHT
EQ	EQUAL
HT	HEIGHT
MIN	MINIMUM
MAX	MAXIMUM
NO	NUMBER
O.C.	ON CENTER
SIM	SIMILAR
SL	SEEDED LAWN
SPECS	SPECIFICATIONS
TYP	TYPICAL
#	CONTAINER SIZE

PLANTING NOTES

1. THIS PLAN IS BASED ON A SURVEY BY PARALLEL GEOMATICS DATED 02/09/2023. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IDENTIFIED ON SITE RELATED TO SURVEY INFORMATION PRIOR TO INSTALLATION.
2. PROTECT EXISTING VEGETATION TO REMAIN; SEE SPECIFICATION SECTION 015639 FOR FENCING AND OTHER REQUIREMENTS.
3. ALL PLANT MATERIAL SHALL BE NURSERY GROWN, WELL ROOTED, AND WELL BRANCHED. ALL TREES MUST BE FREE OF INSECTS, DISEASES, MECHANICAL INJURY, AND OTHER OBJECTIONABLE FEATURES WHEN PLANTED. ALL PLANT MATERIAL SHALL CONFORM TO "AMERICAN STOCK STANDARDS" LATEST EDITION.
4. ALL PLANT MATERIAL TO BE APPROVED BY OWNER'S REPRESENTATIVEPRIOR TO INSTALLATION. SEE SPECIFICATIONS.
5. PLANT SPACING SHALL TAKE PRECEDENCE OVER VALVE BOX LOCATIONS. INSTALLED VALVE BOXES THAT CONFLICT WITH ACCEPTED PLANT LAYOUT SHALL BE MOVED TO POSITION BETWEEN PLANTS.
6. PLANT COUNTS FOR TREES AND SHRUBS ARE SUPPLIED FOR THE CONTRACTOR'S CONVENIENCE. CONTRACTOR RESPONSIBLE FOR INSTALLING ALL PLANTS IN LOCATIONS AND QUANTITIES SHOWN. FOR GROUNDCOVER PLANTING, SEE DETAIL _/L___.
7. CLEAR PLANT BEDS OF ALL GRAVEL AND DEBRIS PRIOR TO SOIL PREPARATION AND PLANTING, FOR APPROVAL BY OWNER'S REPRESENTATIVE.
8. REPAIR AND RESEED ALL LAWN AREAS DISTURBED BY CONSTRUCTION ACTIVITY, INCLUDING SOIL PREPARATION. SEE 329100 AND 329300.
9. ALL LANDSCAPE AREAS THAT HAVE A SLOPE GREATER THAN 1 VERTICAL FOOT IN 3 HORIZONTAL FEET SHALL RECEIVE JUTE MATTING, SEE SPECIFICATIONS.
10. ALL PARKING LOT AND STREET TREES MUST HAVE 6' CLEAR HEIGHT TO LOWEST BRANCHES.
11. ALL PLANTING AREAS TO BE IRRIGATED WITH A PERMANENT IRRIGATION SYSTEM EXCEPT FOR AREAS TO BE SEEDED WITH RESTORATION SEED MIX. THESE AREAS TO BE MANUALLY WATERED TO ENSURE ESTABLISHMENT.

1 PLANTING PLAN NORTH

SCALE - 1" = 20'-0"

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SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION

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PLANTING PLAN NORTH

L3.02

PLANT SCHEDULE

SYMBOL	ABBR	BOTANICAL NAME	COMMON NAME	SIZE/CONDITION	SPACING
TREES					
	AM	Acer macrophyllum	Bigleaf Maple	3" CAL., B&B	as shown
	CE	Cornus × elwinortonii 'Starlight'	Starlight Dogwood	3" CAL., B&B	as shown
	LT	Liriodendron tulipifera	Tulip Tree	3" CAL., B&B	as shown
	PM	Pseudotsuga menziesii	Douglas Fir	8' HT., B&B	as shown
	QA	Quercus acutissima	Sawtooth Oak	3" CAL., B&B	as shown
	QG	Quercus garryana	Oregon White Oak	3" CAL., B&B	as shown
	TT	Tilia tomentosa 'Sterling'	Sterling Silver Linden	3" CAL., B&B	as shown
	UH	Ulmus 'Homestead'	Homestead Elm	3" CAL., B&B	as shown
	ZS	Zelkova serrata 'Village Green'	Village Green Zelkova	3" CAL., B&B	as shown
ORNAMENTAL SHRUBS AND GROUNDCOVERS					
	LIJA	Ligustrum japonicum	Japanese Privet	#5 CONT	42" O.C.
	LOPI	Lonicera pileata	Privet Honeysuckle	#5 CONT	42" O.C.
	MARE	Mahonia repens	Creeping Oregon Grape	#1 CONT	18" O.C.
	PHLE	Philadelphus lewisii	Western Mock Orange	#5 CONT	48" O.C.
	PHCA	Physocarpus capitatus	Pacific Ninebark	#5 CONT	60" O.C.
	POMU	Polystichum munitum	Sword Fern	#2 CONT	30" O.C.
PIONEER GARDEN					
	ACMO	Achillea x 'Moonshine'	Moonshine Yarrow	#1 CONT	30" O.C.
	CICO	Cistus corbariensis	White Rock Rose	#5 CONT	30" O.C.
	CLSP	Cleome spinosa	Spider Flower	#1 CONT	30" O.C.
	LAAN	Lavandula angustifolia 'Hidcote'	Hidcote Lavender	#2 CONT	30" O.C.
	PEOV	Penstemon ovatus	Broadleaf Penstemon	#1 CONT	30" O.C.
	ROOF	Rosmarinus officinalis 'Blue Boy'	Blue Boy Dwarf Rosemary	#2 CONT	30" O.C.
	SPBE	Spiraea betulifolia 'Tor'	Birchleaf Spirea	#1 CONT	30" O.C.
PARKING LOT PLANTING					
	ARUV	Arctostaphylos uva-ursi	Kinnikinnick	#1 CONT	30" O.C.
	ILCR	Ilex crenata 'Helleri'	Dwarf Japanese Holly	#5 CONT	30" O.C.
	PEAL	Pennesitum alopecuroides 'Little Bunny'	Little Bunny Fountain Grass	#2 CONT	30" O.C.
SEED MIXES					
		Hopkins and Hobbs Native Seed Mix – PT 460 Upland Mix			
		Hopkins and Hobbs Conventional Lawn Seed Mix – PT 305 Shade/Sun Mix			

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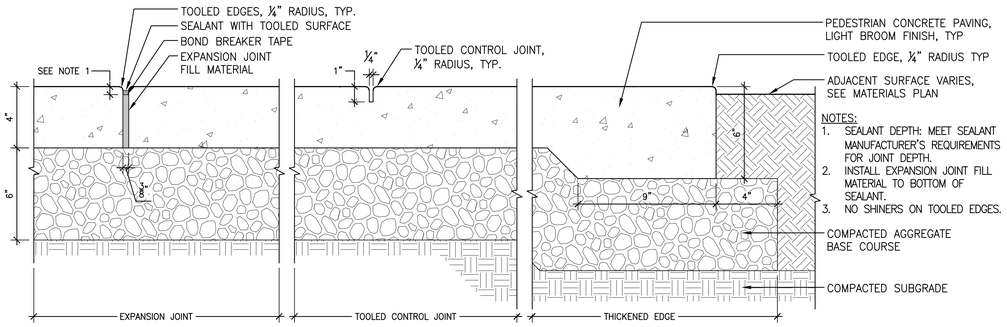
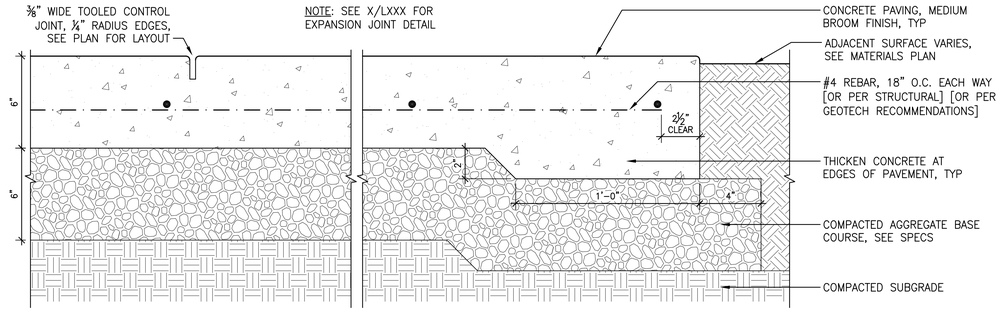
PLANTING PLAN NORTH

L3.03



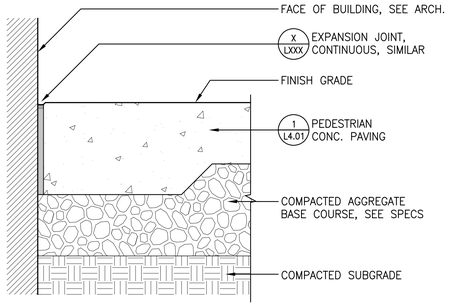
1 PEDESTRIAN CONCRETE PAVING

Section
3"=1'-0"



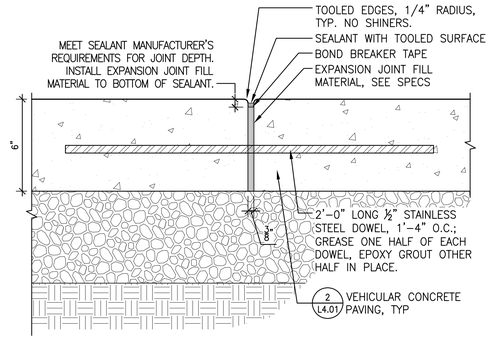
2 VEHICULAR CONCRETE PAVING

Section
3"=1'-0"



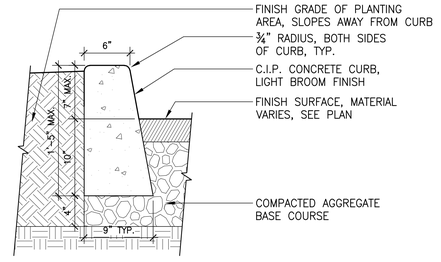
3 EXPANSION JOINT AT BUILDING

Section
3"=1'-0"



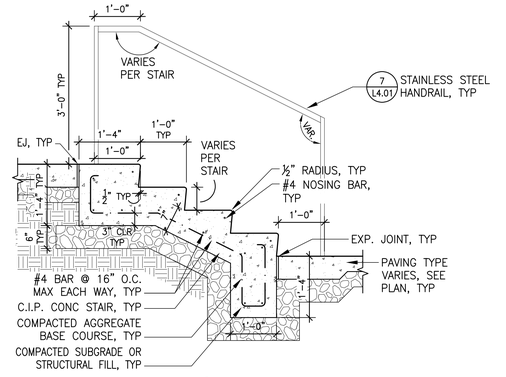
4 VEHICULAR CONCRETE EXPANSION JOINT

Section
3"=1'-0"



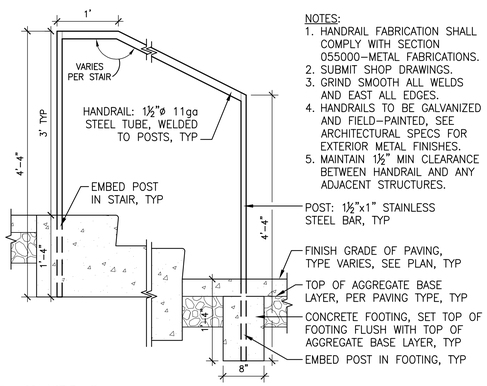
5 CONCRETE CURB AT PLANTING

Section
1 1/2"=1'-0"



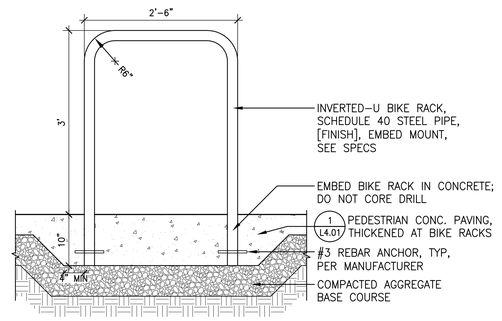
6 CONCRETE STAIRS w/ HANDRAIL

Section
3/4"=1'-0"



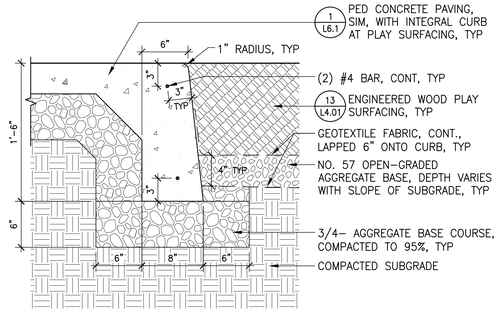
7 HANDRAIL

Section
1"=1'-0"



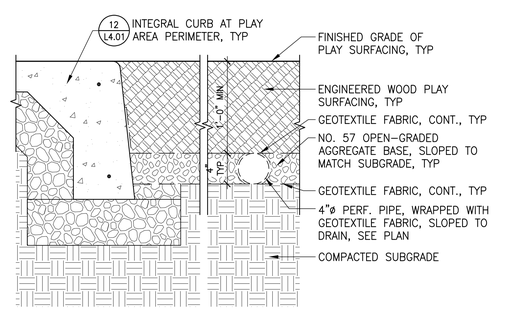
8 BIKE RACK

Section
1"=1'-0"



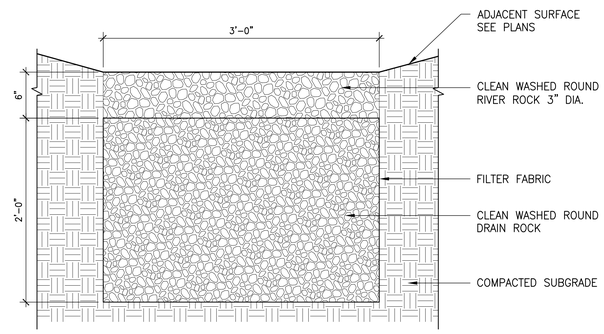
12 INTEGRAL CONC. CURB AT PLAY AREA

Section
1 1/2"=1'-0"



13 PLAY AREA SURFACING

Section
1 1/2"=1'-0"



14 DRYWELL

Section
1 1/2"=1'-0"

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SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION

CITY OF SANDY
17165 SE MEINIG AVE
SANDY, OR 97055

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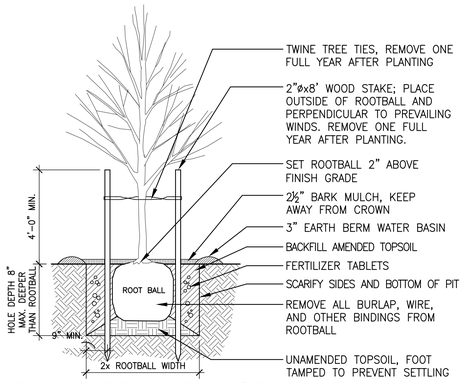
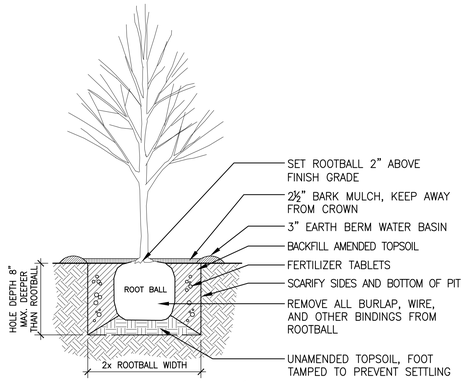
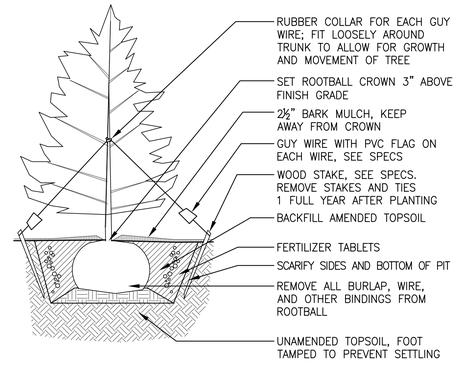
L4.01



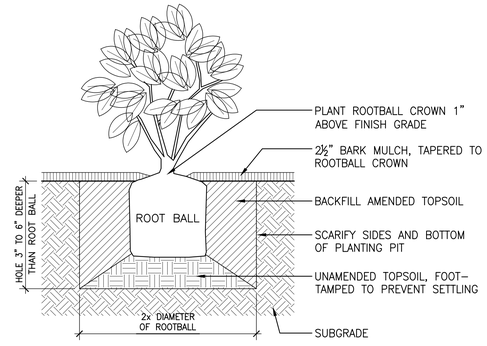
1 DECIDUOUS TREE PLANTING w/STAKES Section 1/2"=1'-0"



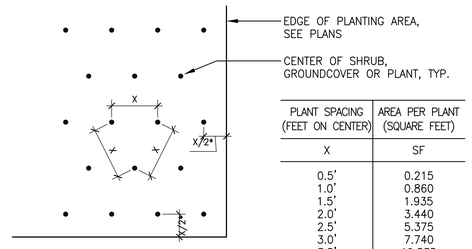
2 DECIDUOUS TREE PLANTING w/o STAKES Section 1/2"=1'-0"



3 CONIFEROUS TREE PLANTING Section 1/2"=1'-0"



4 SHRUB PLANTING Section 1"=1'-0"

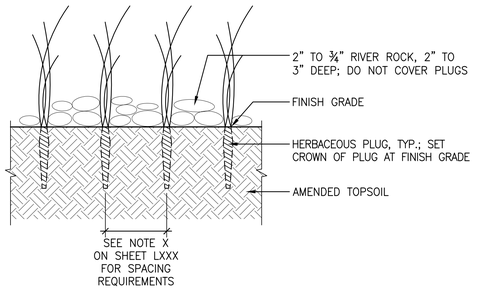


NOTE:
PLANT SPACING DIMENSION "X" SHALL BE AS NOTED ON PLANTING PLANS. DIMENSION FROM EDGES OF WALKS, CURBS, BUILDINGS, ETC., SHALL BE "X/2", UNLESS OTHERWISE NOTED ON PLANS.

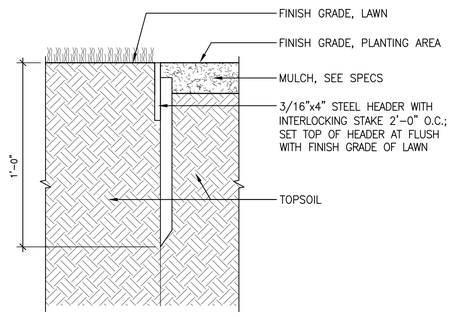
PLANT SPACING (FEET ON CENTER)	AREA PER PLANT (SQUARE FEET)
X	SF
0.5'	0.215
1.0'	0.860
1.5'	1.935
2.0'	3.440
2.5'	5.375
3.0'	7.740
3.5'	10.535
4.0'	13.760
5.0'	21.500
6.0'	30.960

NO. PLANTS = AREA / AREA PER PLANT

5 PLANT SPACING Section 1/2"=1'-0"

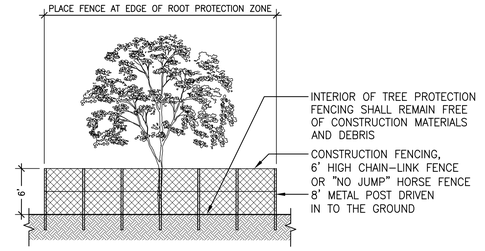


6 PLUG PLANTING Section 3"=1'-0"



7 METAL EDGER - SHRUB/LAWN Section 3"=1'-0"

NOTES:
1. EXISTING SOIL CHEMISTRY SHALL NOT BE ALTERED BY CONSTRUCTION ACTIVITIES. CHEMICAL WASTES AT CONSTRUCTION SITE SHALL BE DISPOSED OF PROPERLY AND NOT DRAINED ONTO SOIL.
2. CONSTRUCTION FENCING SHALL BE PLACED BEFORE CONSTRUCTION STARTS AND REMAIN IN PLACE UNTIL CONSTRUCTION HAS BEEN COMPLETED.



8 TREE PROTECTION FENCING Section NTS

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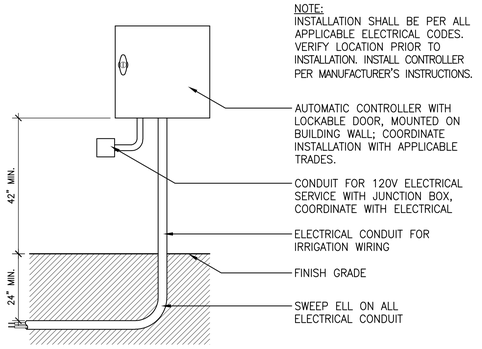
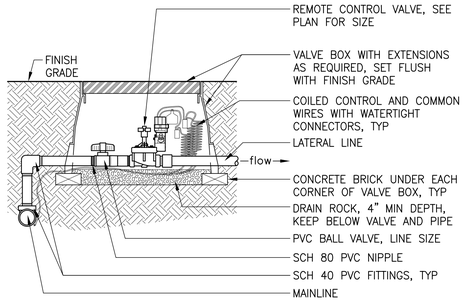
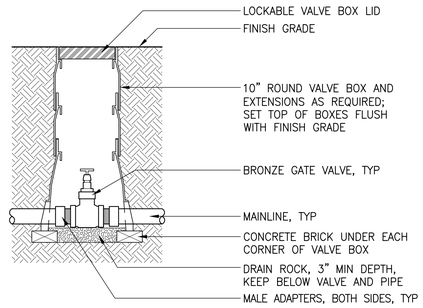


1 IRRIGATION CONTROLLER, WALL MOUNTED — Section NTS

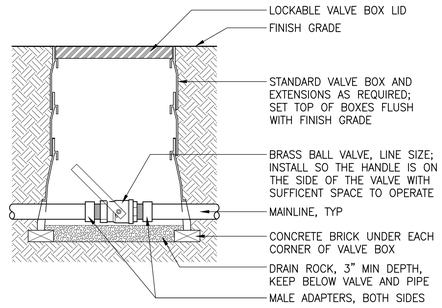


NOTES:
1. PVC PIPE AND FITTINGS UPSTREAM OF VALVE TO BE SAME SIZE AS MAINLINE OR AS INDICATED ON PLAN.
2. USE TEFLON TAPE ON ALL THREADED CONNECTIONS.

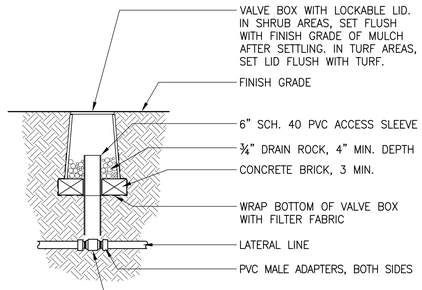
2 REMOTE CONTROL ZONE w/ BALL VALVE — Section NTS



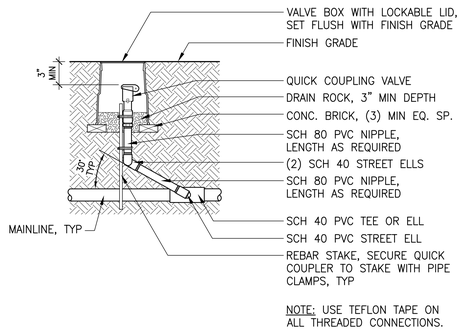
3 GATE VALVE — Section NTS



4 BALL VALVE — Section NTS

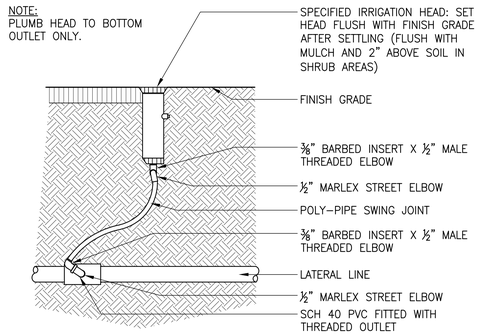


5 SWING CHECK VALVE — Section NTS

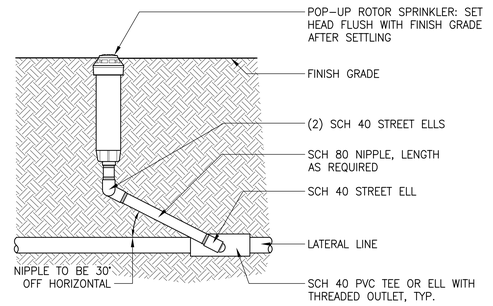


NOTE: USE TEFLON TAPE ON ALL THREADED CONNECTIONS.

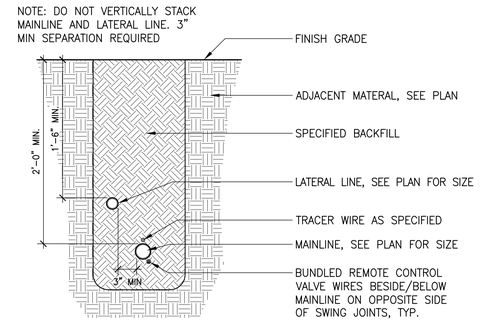
6 QUICK COUPLER — Section NTS



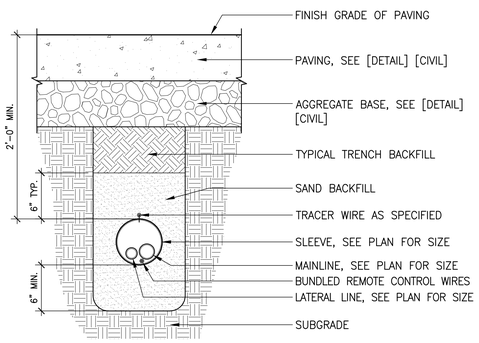
7 SPRAY HEAD — Section NTS



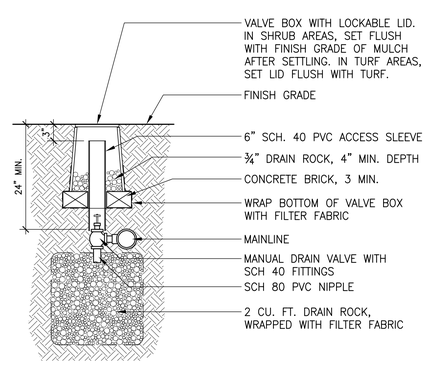
8 ROTOR POP-UP SPRINKLER — Section NTS



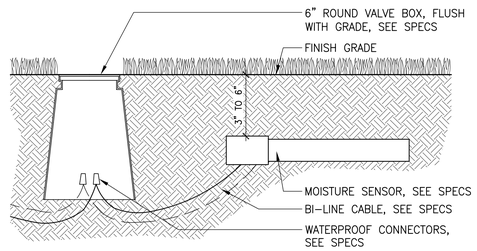
9 IRRG TRENCH — Section NTS



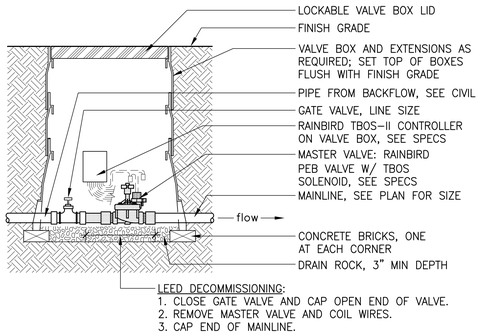
10 IRRG SLEEVE — Section NTS



11 MANUAL DRAIN VALVE — Section NTS



12 SOIL MOISTURE SENSOR — Section NTS



LEED DECOMMISSIONING:
1. CLOSE GATE VALVE AND CAP OPEN END OF VALVE.
2. REMOVE MASTER VALVE AND COIL WIRES.
3. CAP END OF MAINLINE.

13 POC/MASTER VALVE — Section NTS

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SANDY COMMUNITY CAMPUS PARK

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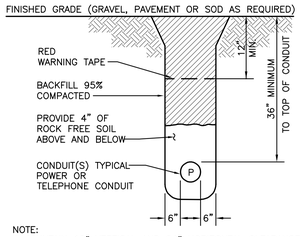
REVISIONS

SCALE	AS NOTED
DRAWN BY	BDM
DATE	06.21.23
PROJECT NO.	2239

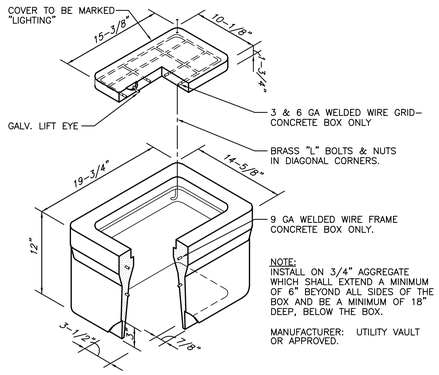
DETAILS

L4.03



NOTE:
A. MAINTAIN 12" VERTICAL AND 24" HORIZONTAL CLEARANCE BETWEEN GAS AND OTHER UTILITIES.

1 E0.1 POWER CONDUIT TRENCH DETAIL
SCALE: NTS



NOTE:
INSTALL ON 3/4" AGGREGATE WHICH SHALL EXTEND A MINIMUM OF 6" BEYOND ALL SIDES OF THE BOX AND BE A MINIMUM OF 18" DEEP, BELOW THE BOX.

MANUFACTURER: UTILITY VAULT OR APPROVED.

2 E0.1 FLUSH HANDHOLE/SPLICE BOX
SCALE: NTS

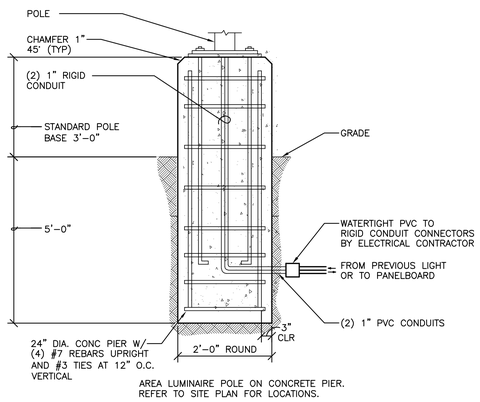
LUMINAIRE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	LAMP	WATTAGE
A	LINEAR 48" HANGING LED AREA LUMINAIRE, MOUNT 9' HIGH, 4000 LM, STANDARD EFFECIENCY, ROUND DIFFUSE, MVOLT (120–277V), 3000K CCT, 80 CRI, 0–10V DRIVER DIMS TO 1%, EMERGENCY BATTERY, WHITE FINISH, 36" HANGER CHAIN (1 PAIR)	LITHONIA LIGHTING	CLX L48 4000LM SEF RDL MVOLT EZ1 30K 80CRI E10WLCP WH HC36 M12 OR APPROVED EQUIVALENT	LED	160 W
B	WALL MOUNT LED, 3000K, 80CRI, VISUAL COMFORT WIDE OPTIC, MVOLT, 750LM, DARK BRONZE FINISH	LITHONIA LIGHTING	WDGE1 LED P0 30K 80CRI VW MVOLT SRM DDBXD OR APPROVED EQUIVALENT	LED	4 W
C	CEILING DOWNLIGHT LED, 3000K, 80CRI, WIDE 33 DEGREE BEAM, 120/277V, 1975LM, BLACK FINISH, 4.5"X4.5" FIXTURE, IP65	LIGMAN LIGHTING	ULD–80021–22W–W–W30–01–120/277V OR APPROVED EQUIVALENT	LED	22 W
D1	POLE MOUNT AREA LUMINAIRE, 3000K CCT, 80 CRI, 11601LM, MVOLT, TYPE 3 DISTRIBUTION, 3" MIN. ROUND POLE MOUNTING, DARK BRONZE FINISH, MOUNT FIXTURE 16' ABOVE GROUND	LITHONIA LIGHTING	DSXO LED P5 30K 80CRI T3M MVOLT RPA DDBXD OR APPROVED EQUIVALENT	LED	90 W
D2	SAME AS 'D1' EXCEPT WITH A HOUSESIDE SHIELD	LITHONIA LIGHTING	DSXO LED P5 30K 80CRI T3M MVOLT RPA HS DDBXD OR APPROVED EQUIVALENT	LED	90 W
E	PGE STREET LIGHT, 8' MAST ARM, WOOD POLE MOUNTING, 18700LM, MOUNT 25' ABOVE GROUND, MVOLT, 3000K CCT, TYPE 3 DISTRIBUTION, GRAY FINISH, PHOTOCONTROL RECEPTACLE, FIXED DRIVE CURRENT, 70 CRI, 610 DRIVE CURRENT CODE, UTILITY WATTAGE LABEL, WILDLIFE GUARD, HOUSESIDE SHIELD	LEOTEK	GCL1–80G–MV–WW–3R–GY–610–FDC–PCR7–WL–RWG–HSSGCL OR PGE APPROVED EQUIVALENT	LED	160 W
––	13' ROUND STRAIGHT STEEL POLE, 3" NOMINAL SHAFT BASE SIZE, 0.120" WALL THICKNESS, DARK BRONZE FINISH, OPEN TOP W/ TOP CAP	LITHONIA LIGHTING	RSS 13 3B PT DDBXD	––	––

SYMBOL LEGEND AND ABBREVIATIONS

CKT	CIRCUIT
CRI	COLOR RENDERING INDEX
LM	LUMENS
GND	GROUND
K	KELVIN
TYP.	TYPICAL
V	VOLT
W	WATT
WP	WEATHERPROOF
	EMERGENCY LUMINAIRE, SIZE AND TYPE AS SHOWN
	EXISTING LUMINAIRE, SIZE AND TYPE AS SHOWN
	STRIP LUMINAIRE, LENGTH AND TYPE AS SHOWN
	UTILITY POLE–MOUNTED LUMINAIRE
	POLE–MOUNTED LUMINAIRE
	SURFACE–MOUNTED LUMINAIRE
	CEILING–MOUNTED LUMINAIRE
J	JUNCTION BOX
$	LIGHT SWITCH
$D	LIGHT SWITCH WITH DIMMER
M	METERED SERVICE CABINET
	RECEPTACLE – DUPLEX, MOUNT 18" AFF, UON
	RECEPTACLE – DUPLEX, CEILING–MOUNTED
$	SWITCH – SINGLE–POLE, MOUNT 48" AFF, UON
$D	SWITCH – DIMMER, MOUNT 48" AFF, UON
1	SHEET NOTE
1 E1.1	SHEET DETAIL

EXHIBIT E



AREA LUMINAIRE POLE ON CONCRETE PIER. REFER TO SITE PLAN FOR LOCATIONS.

3 E0.1 LIGHT POLE BASE DETAIL
SCALE: NTS

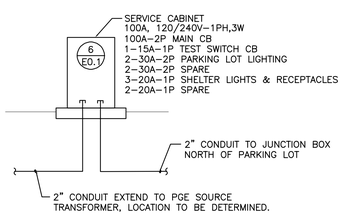
METERED SERVICE PEDESTAL

A1. COORDINATE LIGHTING INSTALLATION WITH OTHER RELATED WORK AND PHASES OF PROJECT AS NECESSARY FOR COMPLETE AND FULLY FUNCTIONAL SYSTEM.
A2. CABINET: 14 GA., 304 STAINLESS STEEL, #4 FINISH VANDAL–PROOF.
A3. DEAD–FRONT PLATE: 14 GA. STAINLESS STEEL.
A4. DOOR TO BE FULLY GASKETED.
A5. CABINET HANDLES: 3–POINT, VAULT TYPE WITH PADLOCK PROVISIONS.
A6. RAISE THE PANEL A MINIMUM OF ONE INCH, INSTALL DOUBLE NUT BENEATH, AND GROUT IN SPACE.
A7. FINISH : UNPAINTED BRUSHED STAINLESS STEEL.

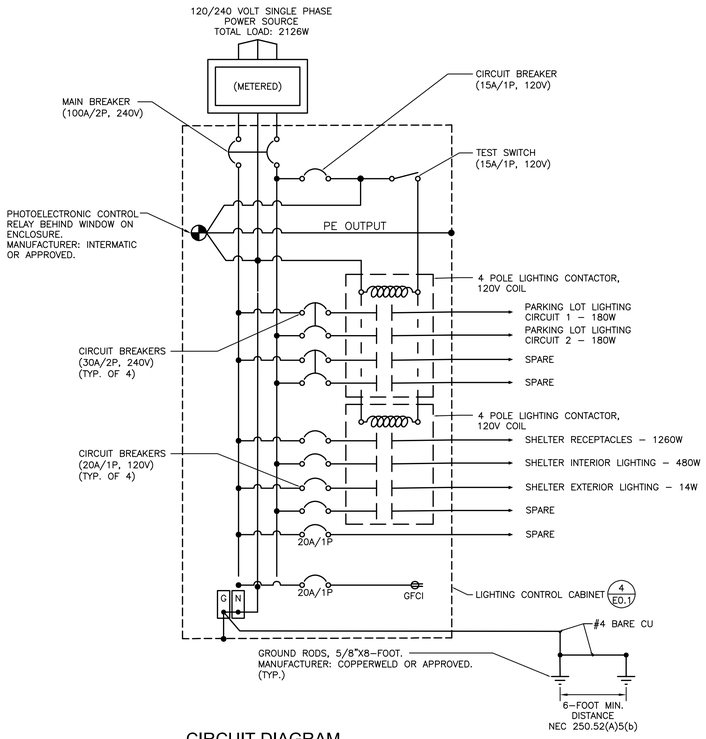
MANUFACTURER SHALL BE COOPER B–LINE CMP SERIES OR APPROVED EQUIVALENT COMPLIANT WITH PGE REQUIREMENTS FOR SERVICE EQUIPMENT

NOTES:

1. LOCATE FACE OF PANELS 30" BACK FROM FACE OF CURB OR IN LINE WITH POLES, WHICHEVER IS GREATER. PANEL DOOR SHALL BE ON PRIVATE PROPERTY SIDE OF CABINET, UNLESS OTHERWISE SPECIFIED.
2. CABINETS SHALL BE FABRICATED FROM 14 GAUGE, 304 STAINLESS STEEL, SPOT–WELDED CONSTRUCTION, #4 FINISH. ALL WELDS SHALL BE THOROUGHLY CLEANED. CABINET SHALL BE DEAD–FRONT CONSTRUCTION DEAD–FRONT SHALL BE FABRICATED FROM 14 GAUGE STAINLESS STEEL. NO ELECTRICAL EQUIPMENT SHALL BE ATTACHED TO THE DEAD–FRONT PANEL.
3. 100A, 240V CABINET SHALL BE U.L. LISTED FOR USE AS SERVICE EQUIPMENT. SEE DETAIL 2/E2 AND 3/E2 FOR CIRCUIT BREAKER TYPE AND QUANTITY. ALL INTERNAL WIRING, EXCEPT FIELD WIRING, SHALL BE DONE BY A U.L. LISTED FACILITY. ALL SCREWS SHALL BE STAINLESS STEEL.
4. TERMINALS SHALL BE SIZED FOR CONDUCTOR SIZES SHOWN ON PLANS.
5. CONTRACTOR SHALL VERIFY AVAILABLE GROUND FAULT CURRENT FOR MAIN BREAKER INTERRUPT CAPACITY.



4 E0.1 METERED DISTRIBUTION PEDESTAL - PARKING LOT
NOT TO SCALE



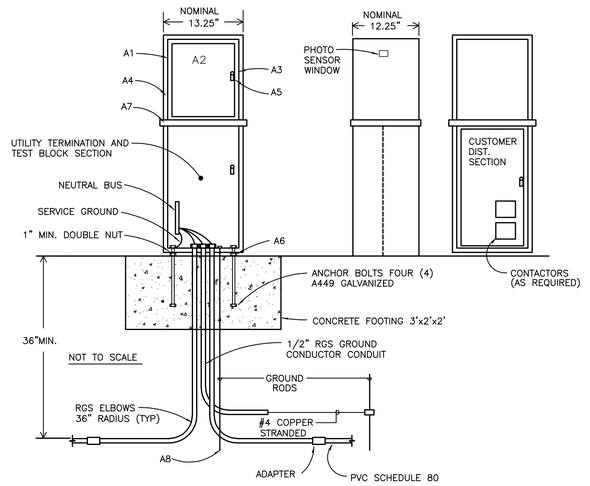
5 E0.1 CIRCUIT DIAGRAM - SERVICE CABINET (SC) - PARKING LOT PANEL 'P'
NOT TO SCALE

INCOMING ELECTRICAL SERVICE DIVISION OF RESPONSIBILITY

	ELEC. CONTR.	UTILITY CO.		ELEC. CONTR.	UTILITY CO.
PRIMARY CONDUIT	☒	☐	SECONDARY CONDUIT	☒	☐
PRIMARY CONDUCTORS	☐	☒	SECONDARY CONDUCTORS	☐	☒
PRIMARY GROUNDING	☐	☒	C/T ENCLOSURE	☒	☐
POST TOP LIGHTING	☒	☐	C/T'S	☐	☒
TRANSFORMER CONNECTIONS	☐	☒	METER BASE	☒	☐
ELECTRIC EQUIPMENT DOOR LOCK BOX (OBTAIN FROM POWER COMPANY)	☒	☐	METER	☐	☒
			METER GROUNDING	☒	☐

NOTES:
1. CONTACT AND COORDINATE ALL REQUIREMENTS AND RESPONSIBILITIES WITH SERVING UTILITY COMPANIES PRIOR TO SUBMITTING BID.
2. ALL SERVICE INSTALLATION WORK SHALL BE IN STRICT COMPLIANCE WITH THE REQUIREMENTS OF THE SERVING UTILITIES.

POWER UTILITY:
PORTLAND GENERAL ELECTRIC (PGE)



6 E0.1 SERVICE METERED POWER PEDESTAL DETAIL
SCALE: NOT TO SCALE

GENERAL NOTES

A. THIS INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NFPA–70, '20 EDITION) AS AMENDED BY OESC 918–305. ALL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER WITHIN STANDARD OF CARE FOR PROFESSION PER NEC 110.12 AND NECA–1. PLANS MAY INDICATE WORK OR STANDARDS WHICH EXCEEDS CODE MINIMUMS. SPECIFICATIONS AND PLAN DRAWINGS ARE TO BE TAKEN TOGETHER AND UNDERSTOOD AS ONE.

GENERAL REQUIREMENTS

1. CONFORM TO CURRENT CODE INCLUDING OSSC, NEC, BUILDING CODE, AND LOCAL REQUIREMENTS.
2. PROVIDE COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEMS AS SPECIFIED, AS SHOWN ON DRAWINGS, AS REQUIRED, AND AS INTENDED.
3. EQUIPMENT SHALL BE NEW AND OF LIKE MATERIALS THROUGH AUTHORIZED DISTRIBUTORS. PROVIDE EQUIPMENT OF SAME SYSTEM AND TYPE BY SAME MANUFACTURER. EQUIPMENT SHALL BE LISTED FOR ITS USE AND SHALL MEET OREGON LISTING REQUIREMENTS. REFER TO OAR 918–306–00 FOR MORE INFORMATION ON OREGON LISTING REQUIREMENTS.
4. WARRANT WORK, MATERIALS, AND EQUIPMENT FOR NOT LESS THAN ONE–YEAR. THIS REQUIREMENT SHALL NOT LIMIT, RESTRICT, OR OTHERWISE LESSEN ANY WARRANTY PROVIDED BY EQUIPMENT MANUFACTURER'S STANDARD WARRANTY IF GREATER THAN ONE–YEAR.
5. PROVIDE SUBMITTALS FOR ELECTRICAL EQUIPMENT. PROVIDE STANDARD CUT–SHEETS CLEARLY INDICATING MODELS TO BE INSTALLED.
6. GROUND SYSTEMS PER NEC ARTICLE 250, AS INDICATED, AND AS SHOWN.
7. ALL ELECTRICAL WORK TO COMPLY WITH NFPA 70E ARC FLASH RULES, WHICH WILL INCLUDE AN ARC FLASH ANALYSIS AND ARC FLASH LABEL FOR THE CONTROLLER CABINET.
8. UNLESS THE COUNTY DETERMINES IN ITS SOLE DISCRETION THAT A CONTRACTOR'S ATTENDANCE IS NOT NECESSARY, CONTRACTORS WILL BE REQUIRED TO ATTEND A PRE–TASK MEETING WITH THE PROJECT MANAGER AND ELECTRICAL SUPERVISOR OR DESIGNEE TO DISCUSS THE HAZARDS AND SAFE WORK PROCEDURES FOR ALL ELECTRICAL WORK TO BE PERFORMED ON THE PROJECT.
9. ELECTRICAL WORK SHALL BE PERFORMED UNDER ELECTRICALLY SAFE WORK CONDITIONS WITH LOCK–OUT TAG–OUT PER NFPA 70E. KEEP POWER DISRUPTIONS TO A MINIMUM AND NOTIFY OWNER IN ADVANCE OF POWER DISRUPTIONS.
10. CALL U–DIG 811 AT LEAST 2–BUSINESS DAYS BEFORE DIG OR TRENCH PER OAR 952–001–0010 THROUGH –0090. SCAN & MARK SUGGESTED ROUTING FOR UTILITIES & IRRIGATION PRIOR TO TRENCHING ACTIVITIES; DO NOT DISTURB UTILITIES OR PIPING, AVOID CONFLICTS. WHERE FEASIBLE, MARK THE ANTICIPATED ROUTE(S) WITH WHITE PAINT; THIS HELPS LOCATING PERSONNEL FIND THE RIGHT AREA AND LOCATE NEARBY FACILITIES AS ACCURATELY AS POSSIBLE.

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Project No.: 816.004.001 Contact: SAMANTHA HOLMAN

Item # 2.

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SANDY COMMUNITY CAMPUS PARK
CITY OF SANDY PARKS AND RECREATION

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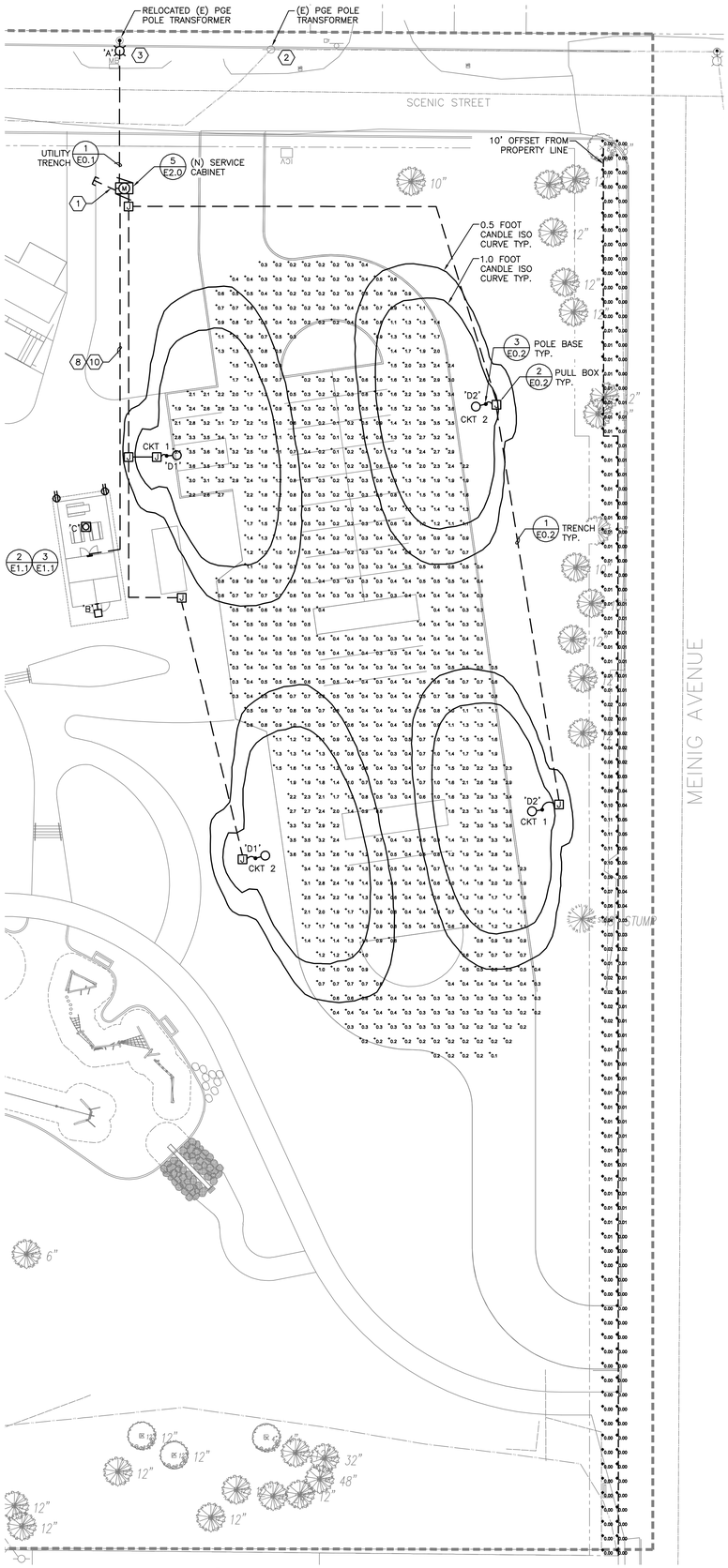
LAND USE SUBMITTAL

REVISIONS

SCALE	AS NOTED
DRAWN BY	R&W
DATE	06.20.23
PROJECT NO.	2239

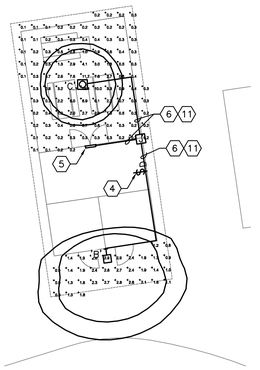
DETAILS

E0.1



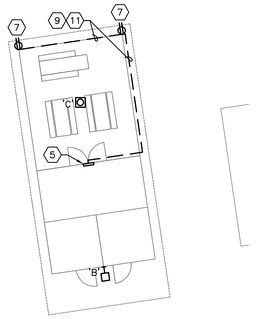
1 E1.1 SITE PLAN - ELECTRICAL
SCALE: 1" = 20'

20 0 20 40 60
SCALE IN FEET
1" = 20'-0



2 E1.1 SHELTER LIGHTING - ELECTRICAL
SCALE: 1" = 10'

10 0 10 20 30
SCALE IN FEET
1" = 10'-0



3 E1.1 SHELTER RECEPTACLES - ELECTRICAL
SCALE: 1" = 10'

10 0 10 20 30
SCALE IN FEET
1" = 10'-0

GENERAL NOTES

A. CABINETS, POLES, JUNCTION BOXES & CONDUIT NEED TO STAY WITHIN CITY'S RIGHT-OF-WAY. BRING ANY CONFLICTS TO THE IMMEDIATE ATTENTION OF THE PROJECT MANAGER SO A MAINTENANCE EASEMENT CAN BE ACQUIRED, OR THE DESIGN CAN BE MODIFIED.

B. ALL SPLICES IN UNDERGROUND BOXES OR DIRECT BURIED SHALL BE INSULATED AND WATERPROOFED, USING SCOTCHCAST EPOXY SPLICING COMPOUNDS SUITED FOR THE PURPOSE.

C. ALL ROUTING FOR POLE-MOUNT SITE LIGHTING TO BE DONE WITH (2) #10 AWG CU AND (1) #10 AWG GND.

NOTES THIS SHEET

1. 2" STUB-OUT FOR COMMUNICATION CABLING. CONTRACTOR TO EXTEND PER UTILITY REQUIREMENTS. VERIFY SIZE AND REQUIREMENTS PRIOR TO START OF WORK.
2. EXISTING WOOD POLE WITH EXISTING ATTACHMENTS TO BE RELOCATED WEST AS SHOWN ON SITE PLAN.
3. NEW LOCATION FOR RELOCATED WOOD POLE.
4. DIMMABLE LIGHT SWITCH TO CONTROL THE (2) SHELTER EXTERIOR LIGHTS. SWITCH TO BE MOUNTED INSIDE SHELTER BY ROOM DOOR.
5. PANEL PROVIDED BY SHELTER MANUFACTURER. FIELD VERIFY LOCATION OF PANEL AND AVAILABLE CIRCUIT BREAKERS FOR SHELTER EXTERIOR LIGHTING AND RECEPTACLES. COORDINATE ROUTING TO SHELTER PANEL WITH OWNER. SEE SHEET E0.1 FOR PANEL SCHEDULE.
6. RUN OF 3/4" EMT CONDUIT.
7. WEATHERPROOF, GFCI RECEPTACLE IN A LOCKABLE ENCLOSURE. MOUNT ON SHELTER CANOPY COLUMN IN LOCATION SHOWN.
8. RUN OF 2" SCHEDULE 40 PVC CONDUIT FROM SERVICE CABINET TO SHELTER PANEL.
9. RUN OF 1" SCHEDULE 40 PVC CONDUIT.
10. CONDUIT TO HOLD (3) #1 AWG AND (1) #8 AWG GROUND CONDUCTORS.
11. CONDUIT TO HOLD (2) #12 AWG AND (1) #12 AWG GROUND CONDUCTORS.

RACEWAY / CONDUCTORS FOR POLE-MOUNT LIGHTING

1. PROVIDE NO SMALLER THAN 1" RACEWAY.
2. PROVIDE SCHEDULE 40 PVC FOR UNDERGROUND RACEWAY.
3. PROVIDE NO SMALLER THAN #10 AWG STRANDED COPPER XHHW 600V CONDUCTORS.
4. EVERY UTILIZED RACEWAY SHALL INCLUDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR.
5. A MINIMUM OF (1) 2-INCH CONDUIT SHALL RUN BETWEEN JUNCTION BOXES AND A MINIMUM OF (2) 1-INCH CONDUIT SHALL RUN FROM THE JUNCTION BOX TO THE LIGHT POLE. THE CONDUIT SHALL BE SCHEDULE 40 PVC EXCEPT ALL ELBOWS SHALL BE FIBERGLASS; NO SPLICING ALLOWED WITHIN THE CONDUIT. CONDUIT SHALL BE USED TO MAKE THE CONNECTION BETWEEN THE JUNCTION BOX AND THE POLE. A LOCATE TRACE WIRE SHALL BE INSTALLED IN EACH SPARE CONDUIT PER ODOT/APWA STANDARDS SECTION 960.42A. ALL CONDUIT ENDS SHALL HAVE A BUSHING INSTALLED AND AN APPROVED CONDUIT PLUG.

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LAND USE SUBMITTAL

REVISIONS

SCALE	AS NOTED
DRAWN BY	R&W
DATE	07.14.23
PROJECT NO.	2239

PARK ELECTRICAL AND PHOTOMETRIC

E1.1

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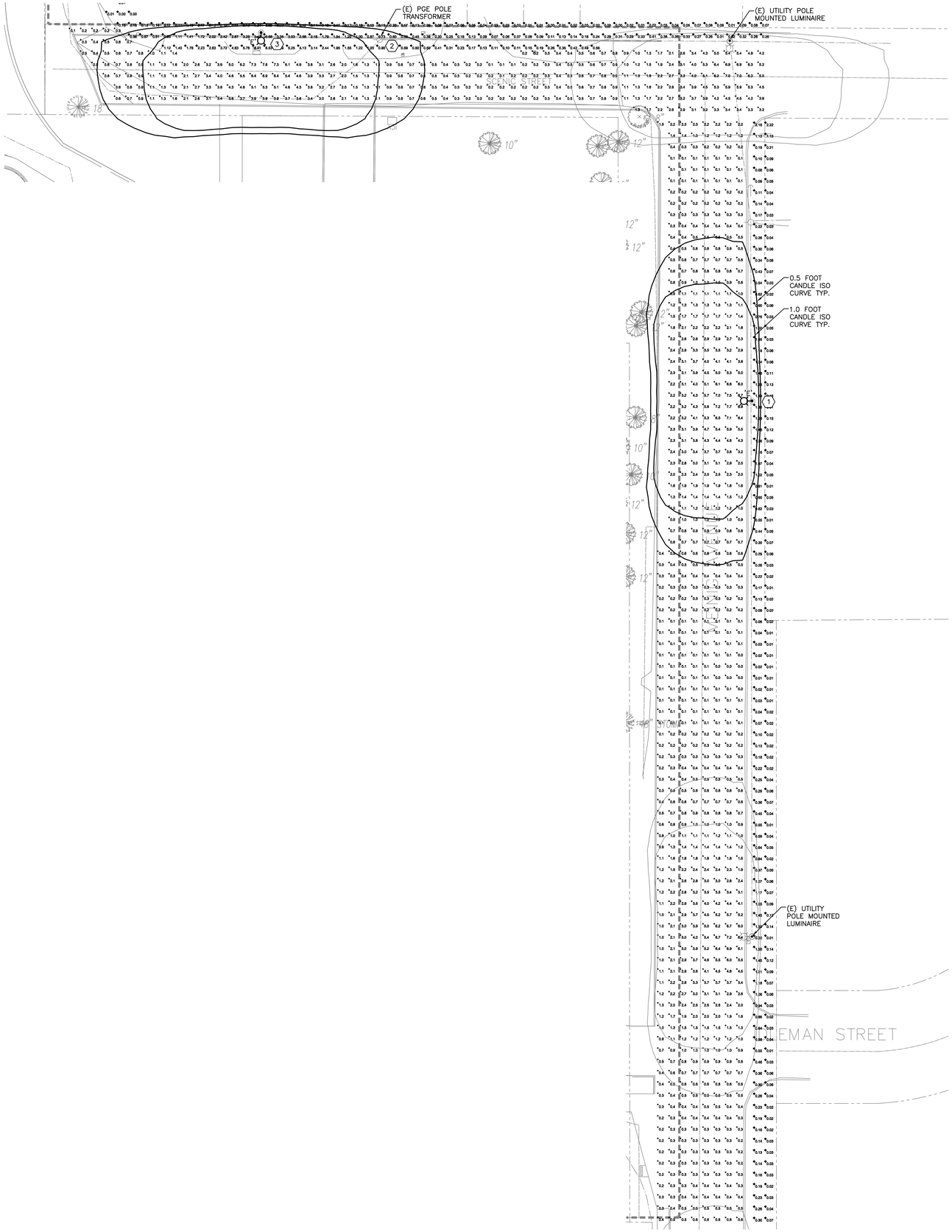
Project No.: 816.004.001 Contact: SAMANTHA HOLMAN



1 E2.1 SITE PLAN - STREET LIGHTING
SCALE: 1" = 20'

20 0 20 40 60
SCALE IN FEET
1" = 20'-0

GENERAL NOTES

A. ALL EXISTING STREET LIGHTS ARE MOUNTED ON WOOD POLES.

B. NEW STREET LIGHTS TO BE MOUNTED ON EXISTING WOOD POLES.

NOTES THIS SHEET

1. NEW STREET STREET LIGHT.
2. EXISTING WOOD POLE WITH EXISTING ATTACHMENTS TO BE RELOCATED WEST AS SHOWN ON SITE PLAN.
3. NEW LOCATION FOR RELOCATED WOOD POLE.

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SANDY COMMUNITY CAMPUS PARK

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REVISIONS

SCALE	AS NOTED
DRAWN BY	R&W
DATE	06.20.23
PROJECT NO.	2239

STREET PHOTOMETRIC

E2.1

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Project No.: 816.004.001 Contact: SAMANTHA HOLMAN

SPECIFICATIONS

SECTION 26 000
ELECTRICAL

PART 1–GENERAL

1.1 SUMMARY
A. Electrical systems required for this work includes labor, materials, equipment, and services necessary to complete installation of electrical work shown on Drawings, specified herein or required for a complete operable facility and not specifically described in other Sections of these Specifications. Among the items required are:
1. Service and distribution equipment shown on Drawings.
2. Feeders to distribution panels, Heating–Ventilating and Air Conditioning.(HVAC) equipment, Owner provided equipment and other equipment as detailed.
3. Branch circuit wiring from the distribution panels for lighting, receptacles, motors, signal systems and other detailed circuit wiring.
4. Luminaires, control switches, receptacles, relays, supports and other accessory items.
5. Wiring and power connections for motors installed for heating, cooling and ventilation.
B. Fees:
1. Obtain and pay for electrical permits and inspections from local authorities having jurisdiction (AHJs).

1.2 DEFINITIONS
A. Provide: To furnish and install, complete and ready for the intended use.
B. Furnish: Supply and deliver to the project site, ready for unpacking, assembly and installation.
C. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at the project site as required to complete items of work furnished by others.

1.3 SUBMITTALS
A. Operation and Maintenance Documentation: Provide copies of certificates of code authority acceptance, test data, product data, guarantees, warranties, and the like.
B. Shop Drawings: Provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and the like.
C. Record Drawings: Show changes and deviations from the Drawings. Include written Addendum and change order items. Make changes to Drawings in a neat, clean, and legible manner.

1.4 QUALITY ASSURANCE
A. Conform to requirements of the National Electric Code (NEC), latest adopted version with amendments by local AHJs.
B. Conform to latest adopted version of the International Building Code (IBC) with amendments by local AHJs.
C. Furnish products listed by Underwriters' Laboratories, Inc. (UL) or other testing firm acceptable to AHJ.
D. Conform to requirements of the serving electric, telephone, and cable television utilities.

1.5 SEQUENCING AND SCHEDULING
A. For the proper execution of the work cooperate with other crafts and contracts as needed.
B. To avoid installation conflicts, thoroughly examine the complete set of Contract Documents. Resolve conflicts prior to installation.
C. Prior to installation of feeders to equipment requiring electrical connections, examine the manufacturer's shop drawings, wiring diagrams, product data, and installation instructions. Verify that the electrical characteristics detailed in the Contract Documents are consistent with the electrical characteristics of the actual equipment being installed.

1.6 WARRANTY
A. Driver Manufacturer's Warranty: 5 years for electronic type drivers, based on date of manufacturer embossed on drivers, current with installation date. Warranty includes normal cost of labor for replacement of driver.
B. Contractor shall guarantee all provided workmanship and materials for 12–months after project closeout.

PART 2–PRODUCTS

2.1 MATERIALS
A. Provide new electrical materials of the type and quality detailed, listed by UL, bearing their label wherever standards have been established. Indicated brand names and catalog numbers are used to establish standards of performance and quality. The description of materials listed herein governs in the event that catalog numbers do not correspond to materials described herein.
B. Include special features, finishes, accessories, and other requirements as described in the Contract Documents regardless of the item's listed catalog number.
C. Provide incidentals not specifically mentioned herein or noted on Drawings, but needed to complete the system or systems, in a safe and satisfactory working condition.
D. Firestopping Foam Sealant: Foam sealant for use around conduit penetrations to prevent passage of smoke, fire, toxic gas or water. Maintain seal before, during and after fire. In and around conduit for thermal break at penetration of barrier between heated and unheated spaces. Chase Technology Corporation CTC PR–855, Fire Foam, Thomas & Betts.

2.2 RACEWAYS
A. Galvanized Rigid Steel Conduit (GRC): Federal Specification WWC–581 and American National Standards Institute (ANSI) C80.1.
B. Intermediate Metal Conduit (IMC): Federal Specification WWC–581.
C. Electrical Metallic Tubing (EMT): Federal Specification WWC–563 and ANSI C80.3.
D. Flexible Conduit: Reduced wall flexible steel conduit. Federal Specification WWC–566.
E. Conduit Fittings:
1. Bushings: Malleable iron with plastic insulator lining, 150C rated.
2. Ground Bushings: Malleable iron with plastic insulating liner and aluminum grounding lug rated for copper or aluminum conductor, 150C rated.
3. EMT Connectors and Couplings:
a. Set Screw Type: Zinc plated steel, insulated throat connectors.
b. Compression Type: Zinc plated steel, insulated throat connectors, raintight up to 2–inch.

2.3 WIRES AND CABLES
A. Copper, 600 volt rated throughout. Conductors 14AWG to 10AWG, solid or stranded. Conductors 8AWG and larger, stranded. Phase color to be consistent at feeder terminations; A–B–C, top to bottom, left to right, front to back. Conductors 3AWG and larger, minimum insulation rating of 75C. Insulation types THWN, THHN or XHHW. Minimum insulation rating of 90C for branch circuits.
B. MC Cable: High strength galvanized steel or aluminum flexible armor. Full length minimum size No. 12 copper ground wire, THHN 90C conductors, full length tape marker. Overall PVC or nylon cable tape. Short circuit throat insulators. Manufacturers: Alflex, AFC, or Carol. AC/MC cable allowed only for 20 amp branch circuits concealed in accessible building void, walls or ceiling space.
C. Type NM, type NMC, and type NMS cables: Annealed copper conductors, 600 volt rated. Minimum Size No. 12 with ground wire for 20A. 90C rated PVC, nylon jacketed insulation per NEC Article 334; protect form damage per NEC Article 300.4.
D. SO Cable: Annealed copper conductors, 600 colt rated. Minimum size No. 12, with ground wire. Maximum of six current carrying conductors and ground per cable. 90C rated thermoset jacket. Manufacturers: Tiger Brand.

2.4 BOXES
A. Luminaire Outlet: 4–inch octagonal box, 1.5–inches deep with 3/8–inch luminaire stud if required. Provide raised covers on bracket outlets and on ceiling outlets.
B. Device Outlet: Minimum 4–inch square, minimum 1.5–inches deep. Single or 2–gang flush device raised covers. Raco Series 681 and 686 or Bowers.
C. Multiple Devices: Three or more devices at common location. Install 1–piece gang boxes with 1–piece device cover, one device per gang.
D. Junction and Pull Boxes: Galvanized sheet steel junction and pull boxes, with screw–on covers; of the type shape and size, to suit each respective location and installation; with welded seams and equipped with steel nuts, bolts, screws and washers.
E. Provide J–box(es) per NEC Article 314; provide listed NM fitting.

2.5 WIRING DEVICES
A. Finish: Verify finish with Architect.
B. Wall Switches: Toggle type, quiet acting, 20 amp, 120/277 volt, UL listed for motor loads up to 80 percent of rated amperage. Arrow–Hart 1221, Leviton 1221, Pass & Seymour 20ACI, Bryant 4901, Hubbell 1221.
C. Pilot Light Switches: Lighted handle, toggle type, red, neon pilot lamp. Pilot lamp energized when load is energized. 20 amp/120 volt, Arrow–Hart 1991–PL, Leviton 1221–PL, Pass & Seymour 20ACI–PL, Bryant 4901–PL, Hubbell 1221–PL.
D. Receptacles: Straight parallel blade 15 amp, 125 volt, 2–pole – 3 wire grounding. Arrow–Hart 5352, Leviton 5352, Pass & Seymour 5352, Bryant 5352, Hubbell 5352.
E. Ground Fault Interrupter Receptacle: Feed through type, 20 amp, 125VAC. Hubbell IG–5362, Arrow–Hart IG–5362, Leviton, Pass & Seymour, Bryant.
F. Finish Plates: Stainless Steel. Verify finish with Architect.
G. Provide Tamper resistant receptacles per NEC 210.52 and 406.11.

2.6 SAFETY DISCONNECTS
A. Toggle Type Disconnect Switches: 120 volt, 1–pole, 20 amp, 1 HP maximum. NEMA 1 enclosure for indoors, NEMA 3R enclosure for outdoors.
B. Heavy duty disc. Provide heavy duty disconnect switches where shown or as required by NEC. All safety switches shall be of the heavy duty type, 600a rated with number of poles and amperage rating as required. Provide NEMA 3R switches for those located outside. Fused switches shall have properly sized fuses for equipment being served.

2.7 SUPPORTING DEVICES
A. Hangers: Kindorf B–905–2A channel, H–119–D washer, C105 strap, 3/8–inch rod with ceiling flange.
B. Pipe Straps: Two–hole galvanized or malleable iron.

2.8 ELECTRICAL IDENTIFICATION
A. Engraved Labels: Melamine plastic laminate, white with black core, 1/16–inch thick, manufactured by Lamicoid. Engravers standard letter style, minimum 3/16–inch high letters. Drill or punch labels for mechanical fastening except where adhesive mounting is necessary because of substrate. Use self tapping stainless steel screws.
B. Conductor Numbers: Manufacturers standard vinyl–cloth self–adhesive cable and conductor markers of the wraparound type.
C. Branch Circuit Schedules: Provide branch circuit identification schedules, typewritten, clearly filled out, to identify load connected to each circuit and location of load.
D. Distribution Panelboards: Breaker matching Plug–in type; AFCI per NEC 210.12 where shown.

2.9 GROUNDING MATERIALS
A. Grounding Connectors: Hydraulic compression tool applied connectors or exothermic welding process connectors or powder actuated compression tool applied connectors. Mechanical type of connectors are not acceptable. Manufacturers: Burndy Hyground Compression System, Erico/Cadweld, Amp Ampact Grounding System or approved.
B. Pipe Grounding Clamp: Mechanical ground connector with cable parallel or perpendicular to pipe.
C. Telecommunications Grounding Bar: 1/4–inch thick by 4–inch high by 20–inch long copper ground bar with insulators.

2.10 SWITCHBOARD AND DISTRIBUTION PANELBOARD CONSTRUCTION
A. Manufacturers: Cutler–Hammer or approved.
B. Standards: Comply with requirements of UL 891, NEMA PB2 and NEC 384 in construction of switchboards. Provide short circuit current rating (Integrated Equipment Rating, IER) for panelboards.
C. Distribution Panelboards:
1. Enclosure: Flush panelboards rated 600 amp or less provide maximum enclosure depth of 6 inches. Provide galvanized metal finish.
2. Bussing: Copper bar with suitable electroplating (tin) for corrosion control at connection. Provide ground bar to accommodate specified terminal lugs.
3. Provide fully rated integrated equipment rating greater than the available fault current. See drawings for available fault current, if drawings do not have the available fault currents then coordinate with serving electric utility. Minimum ratings is 10,000 amps for 240v class equipment and 22,000 amperage for 480v class equipment.
4. Breakers: Bolt–on type.
5. Cover: Hinged door, flush lift latch and lock, two keys per panel. Key branch circuit panelboards alike. medium light gray finish suitable for field painting to match wall finish.
6. Equipment: All panelboards to be installed will be manufactured by Cutler–Hammer. All panelboards greater than 600A will be series Pow–R–Line 4 or approved equal. All other panelboards will be series Pow–R–Line 3a or approved equal.
D. Switchgear: All switchgear to be installed will be Cutler–Hammer, series Pow–R–Line C or approved equal.

2.11 OVERCURRENT PROTECTIVE DEVICES
A. Molded Case Circuit Breakers: One, two or three–pole bolt on, single handle common trip, rated 15 to 800 amp, as indicated on Drawings. Overcenter toggle–type mechanism, quick–make, quick–break action. Trip indication is by handle position. Calibrate for operation in 40C ambient temperature.

2.12 LED LIGHT FIXTURES
A. General:
1. LED light fixtures shall be in accordance with IES, NFPA, UL, as shown on the drawings, and as specified.
2. LED light fixtures shall be reduction of hazardous substances (ROHS) – compliant.
3. LED drivers shall include the following features unless otherwise indicated.
a. Minimum Efficiency: 85% AT FULL LOAD.
b. Minimum Operating Ambient Temperature: –20˚ C. (–4˚ F.)
c. Input Voltage: 120–277V (±10%) AT 60 HZ.
d. Integral Short Circuit, Open Circuit, and Overload Protection.
e. Power Factor: ≥ 0.95.
f. Total Harmonic Distortion: ≤ 20%.
g. Comply with FCC 47 CFR Part 15.
4. LED modules shall include the following features unless otherwise indicated:
a. Comply with IES LM–79 and LM–80 requirements.
b. Minimum CRI80 and color temperature 3000˚K unless otherwise specified in lighting fixture schedule.
c. Minimum Rated Life: 50,000 hours per IES L70.
d. Light output lumens as indicated in the lighting fixture schedule.
B. LED Downlights:
1. Housing, LED Driver, AND LED Module shall be products of the same manufacturer.
C. LED Troffers:
1. LED Drivers, Modules, and Reflector shall be accessible, serviceable, and replaceable from below the ceiling.
2. Housing, LED Driver, and LED Module shall be products of the same manufacturer.

PART 3–EXECUTION

3.1 EXAMINATION

A. Drawings are diagrammatic with symbols representing electrical equipment, outlets, luminaires, and wiring. Examine the entire set of Drawings to avoid conflicts with the other systems. Determine exact route and installation of electrical wiring and equipment with conditions of construction.
B. Clarification:
1. The Drawings govern in matters of quantity, the Specification in matters of quality. In event of conflict on Drawings or in the Specifications, the greater quantity and the higher quality apply.
2. Should the Electrical Documents indicate a condition conflicting with the governing codes and regulations, refrain from installing that portion of the work until clarified by Architect.

3.2 MOTORS/APPLIANCE/UTILIZATION BRANCH CIRCUIT WIRING
A. Electrical Connections: Connect equipment, whether furnished by Owner or other Divisions of the Contract, electrically complete.
B. Connect motor branch circuits complete from panel to motor as required by code and manner herein described.
C. Appliance/Utilization Equipment: Provide appropriate cable and cord cap for final connection unless equipment is provided with same. Verify special purpose outlet NEMA configuration and ampere rating with equipment supplier prior to ordering devices and coverplates.

3.3 INSTALLATION
A. Install electrical equipment complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough–in of the electrical equipment, examine the instructions thoroughly.
B. Noise Control: Do not place outlet boxes at opposite side of partitions or walls back to back. Do not place contactors, transformers, starters or similar noise producing devices on walls which are common to occupied spaces unless specifically called for on Drawings. Where such devices must be mounted on walls common to occupied spaces, mount or isolate in such a manner as to effectively prevent the transmission of their inherent noise to the occupied space.
C. Firestopping: Coordinate with the Drawings the location of fire rated walls, ceilings, floors and the like. When these assemblies are penetrated by electrical equipment, seal around the equipment with approved firestopping material. Install firestopping material complete as directed the manufacturer's installation instructions.
D. Conduit:
1. Conceal conduits. Exposed conduits are permitted only in the following areas: Mechanical rooms, electrical rooms or spaces where walls, ceilings and floors will not be covered with finished materials. Existing walls that are concrete or block construction and where specifically noted on the Drawings.
2. Do not install conduits on surface of building exterior, across roof, on top of parapet walls, or across floors.
3. Below Grade Conduit and Cables: Place a minimum 3–inch cover of sand or clean earth fill around the cable or conduit on a leveled trench bottom. Lay conduit on a smooth level trench bottom, so that contact is made for its entire length. Remove water from trench before electrical conduit is installed.
4. Conduit Terminations: Provide conduits shown on Drawings which terminate without box, panel, cabinet or conduit fitting with conduit connector or bushing.
5. Conduit Size: Minimum trade size 1/2–inch.
6. Provide pull cord in empty conduits.
7. Conduit Use Locations:
a. Underground: PVC.
b. Cast–in–Place Concrete, Masonry, Damp Locations and Subject to Mechanical Damage: GRC or IMC.
c. Dry, Protected: GRC, IMC, EMT.
d. Sharp Bends and Elbows: GRC, EMT use factory elbows.
e. Motors, recessed luminaires and equipment connections subject to movement or vibration, use flexible metallic conduit.
f. Motors and equipment connections subject to movement or vibration and subjected to the following conditions; exterior location, moist or humid atmosphere, water spray, oil or grease use PVC coated liquid tight flexible metallic conduit.
g. MC cable to be installed vertically in wall from j–box up to accessible building void space unless other wise noted.
8. Branch Circuits: Do not change the intent of the branch circuits or controls without approval. Homeruns for 20 amp branch circuits may be combined to a maximum of six conductors in a homerun. Apply derating factors as required by NEC 310. Increase conductor size as needed.
E. Wires and Cables:
1. Conductor Installation: Install conductors with care to avoid damage to insulation. Do not apply greater tension on conductors than recommended by manufacturer during installation.
2. Conductor Size and Quantity: Install no conductors smaller than 12AWG unless otherwise shown. Provide required conductors for a fully operable system.
3. MC Cable Allowed in the Following Locations Only: In areas where there is an accessible ceiling. Do not use in areas where there is no accessible ceiling.
F. Boxes:
1. Anchoring: Secure boxes rigidly to the substrate upon which they are being mounted, or solidly embed boxes in concrete or masonry.
2. Provide weatherproof outlets for locations exposed to weather or moisture.
3. Code Compliance: Comply with NEC as applicable to construction and installation of electrical boxes and fittings and size boxes according to NEC 370, except as noted otherwise.
4. Mount Center of Outlet Boxes as Required by Americans With Disabilities Act (ADA), or Noted on Drawings, the Following Distance above the Floor:
a. Control Switches: 48–inches.
b. Receptacles: 18–inches.
c. Telecom Outlets: 18–inches.
d. Other Outlets: As indicated in other Sections of Specifications or as detailed on Drawings.
G. Provide NEC–required disconnect switches whether specifically shown on Drawings or not. Provide disconnect switch at each motor location within 5–feet unless otherwise noted. Coordinate fuse ampere rating with installed equipment. Fuse ampere rating variance between original design information and installed equipment, size in accordance with Bussmann Fusetron 40C recommendations.
H. Supporting Devices:
1. Safety factor of 4 required for every fastening device or support for electrical equipment installed. Support to withstand four times weight of equipment it supports. Bracing to comply with Seismic Zone 3 requirements.
2. Provide vertical support members for equipment and luminaires, straight and parallel to building walls. Provide independent supports to structural member for electrical luminaires, materials, or equipment installed in or on ceiling, walls or in void spaces or over furred or suspended ceilings.
I. Electrical Identification:
1. Conductor Identification: Apply markers on each conductor for power, control, signaling and communications circuits.
2. Provide an engraved label on each major unit of electrical equipment, including but not limited to the following items: Disconnect switches, relays, contactors, time switches, override switches, service disconnects, distribution switches, branch circuit panelboards, and central or master unit of each electrical system including communication/signal systems.
J. Service and Distribution: New 120/240V 1–phase service fed from existing 25KVA pole mounted transformer. See 5/E0.1 circuit diagram for service load information. See sheet E1.1 for location.
K. Grounding:
1. Performance Requirements: Supplement the grounded neutral of the secondary distribution system with an equipment grounding system to properly safeguard the equipment and personnel. Install equipment grounding such that metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items in close proximity with electrical circuits operate continuously at ground potential and provide a low impedance path for possible ground fault currents.
2. Raceway Grounding: Ground metallic raceway systems. Bond to ground terminal with code size jumper except where code size or larger grounding conductor is included with circuit, use grounding bushing with lay–in lug. Install ground bushings on metallic raceway terminations in pull boxes, panelboards and the like for circuits with overcurrent protection set at 60 amp and greater.
3. Install equipment grounding conductor, code size minimum in nonmetallic and metallic raceway systems.
4. Motors, Equipment and Appliances: Install code size equipment grounding conductor from outlet box to (motor) equipment frame or manufacturer's designated ground terminal.
5. Receptacles: Connect ground terminal of receptacle to equipment ground system by No. 14 conductor bolted to outlet box. Self grounding nature of receptacle devices does not eliminate conductor bolted to outlet box.
L. Control Devices:
1. Install time switches and other automatic control devices in accessible locations near the source of power or grouped at a common location in mechanical rooms or similar spaces.
2. Install photoelectric control devices at such locations as necessary to be most effective. Avoid locating photoelectric devices in or at locations where they can be influenced by other than natural light or under eaves. Verify location of equipment with Architect.
M. Lighting:
1. Install luminaire of types indicated where shown and at indicated heights; in accordance with manufacturer's written instructions and with recognized industry practices.
2. Avoid interference with and provide clearance for equipment. Where the indicated locations for the luminaires conflict with the locations for equipment, change the locations for the luminaire as directed by Architect.
3. Suspended Luminaires: Mounting heights indicate the clearances between the bottom of the luminaire and the finished floors.
4. Support Luminaires: Anchor supports to the structural slab or to structural members within a partition, or above a suspended ceiling.
5. Provide lighting indicated on Drawings with a luminaire of the type designated and appropriate for the location. Where outlet symbols appear on Drawings without a type designation provide a luminaire the same as those used in similar or like locations.

3.4 FIELD QUALITY CONTROL
A. Tests: Conduct tests of equipment and systems to demonstrate compliance with requirements specified in Division 26. Refer to individual Specification Sections for required tests. Document tests and include in Closeout Documents.
B. Verify electrical characteristics of equipment prior to installation of conduits and wiring for equipment.
C. Coordinate HVAC voltage requirements with Drawings and equipment submittals prior to rough in.
D. Wiring Device Tests: Test wiring devices to ensure electrical continuity of grounding connections, and after energizing circuitry, to demonstrate compliance with requirements. Test receptacles for line to neutral, line to ground and neutral to ground faults. Correct defective wiring.
E. Verification of Conditions: Verify ceiling construction, recessing depth and other construction details prior to release of luminaire for shipment.
F. Test each GFCI receptacle and each AFCI circuit breaker.

3.5 CLEANING
A. Remove dirt and debris caused by the execution of the electrical work. Leave the entire electrical system installed in clean, dust–free and proper working order.
B. Thoroughly clean the exterior and the interior of each switchboard and distribution panelboard in accordance with manufacturer's installation instructions.
C. Where finish of luminaires or enclosures is damaged, touch up finish with matching paint in accordance to manufacturer's specifications and installation instructions.
D. Clean paint splatters, dirt, dust, fingerprints, and debris from luminaires.

END OF SECTION

R&W ENGINEERING, INC.
9615 S.W. Allen Boulevard
Suite 107
Beaverton, Oregon 97005
Phone: (503)726-3328
Office: (503) 292-6000
E-mail: rweng@rweng.com
Project No.: 816.004.001 Contact: SAMANTHA HOLMAN

lango.hansen LANDSCAPE ARCHITECTS PC
1100 nw glisan #3B portland OR 97209 T 503 295.2437

Item # 2.

SANDY COMMUNITY CAMPUS PARK
CITY OF SANDY PARKS AND RECREATION
CITY OF SANDY
17225 SMITH AVE
SANDY, OR 97055

LAND USE SUBMITTAL

REVISIONS

SCALE	AS NOTED
DRAWN BY	R&W
DATE	06.20.23
PROJECT NO.	2239

ELECTRICAL SPECIFICATIONS

E3.1

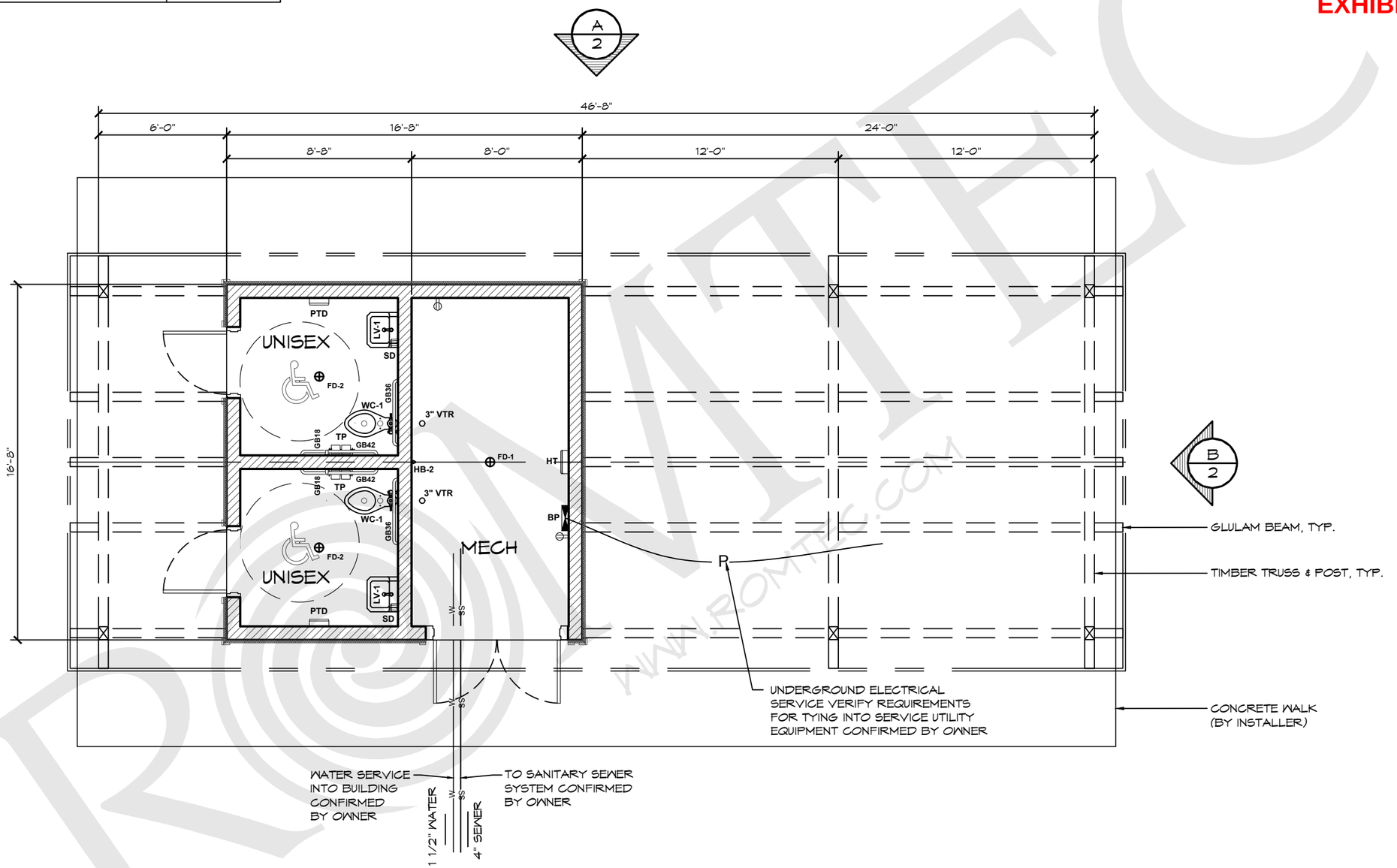
LEGEND		
SYMBOL	DESCRIPTION	AREA/ QUANTITY
	INTERIOR RECESSED LIGHT	2
	INTERIOR MECH LIGHT	1
⊕ FD	FLOOR DRAIN	3
	ELECTRICAL OUTLET	2

THESE PLAN VIEW AND ELEVATION DRAWINGS ARE A PRELIMINARY ARCHITECTURAL REPRESENTATION OF THE BUILDING. ALL DIMENSIONS, FEATURES AND COMPONENTS SHOWN ON THESE PRELIMINARY DRAWINGS MAY OR MAY NOT BE PART OF THE QUOTE. PLEASE REFER TO THE "SCOPE OF SUPPLY AND SERVICES" LETTER PROVIDED WITH YOUR QUOTE FOR ROMTEC'S PROPOSED SCOPE OF SUPPLY.

WALL TYPE SCHEDULE

8" REINFORCED CONCRETE MASONRY BLOCK WALL WITH MORTAR JOINTS, GROUTED SOLID ALL CELLS RUNNING BOND PATTERN.

EXHIBIT F



1 FLOOR PLAN

SCALE: 3/16" = 1'-0"

ROMTEC
18240 NORTH BANK ROAD - ROSEBURG, OR 97470
(541) 496-3541 FAX (541) 496-0803

PRELIMINARY

ARCHITECTS

PROJECT: LANGO HANSEN LANDSCAPE AREA
SANDY COMMUNITY PARK
SANDY, OREGON

SHEET TITLE: FLOOR PLAN

PROJECT#: 2086

MODEL#:

DATE: 6/08/2023

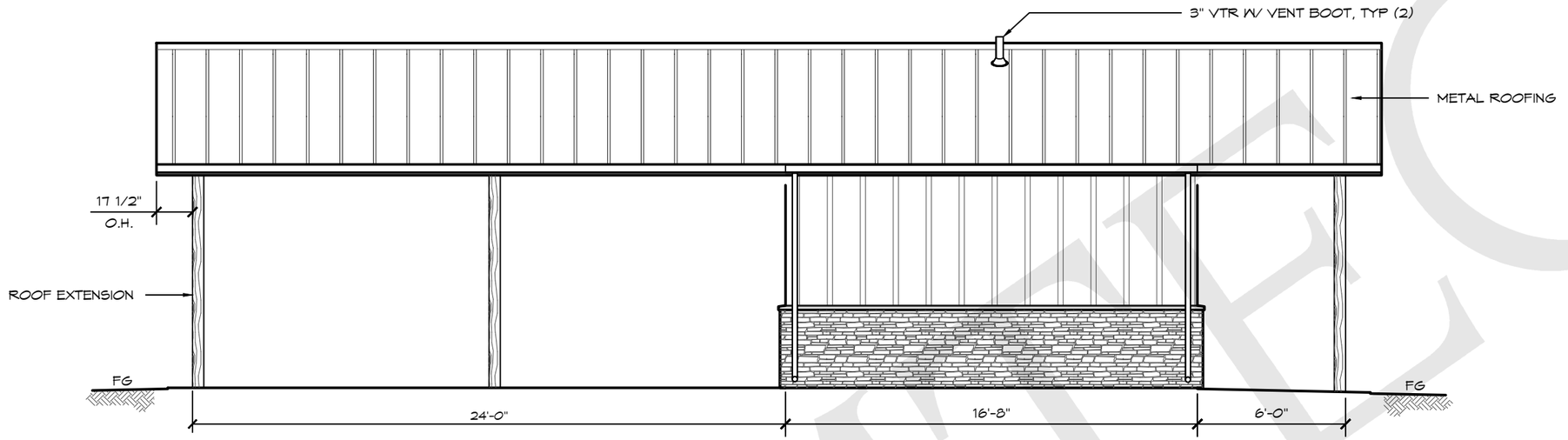
REVISIONS

REV.	DATE:	BY

DRAWN BY: JRM

SHEET NO. 01

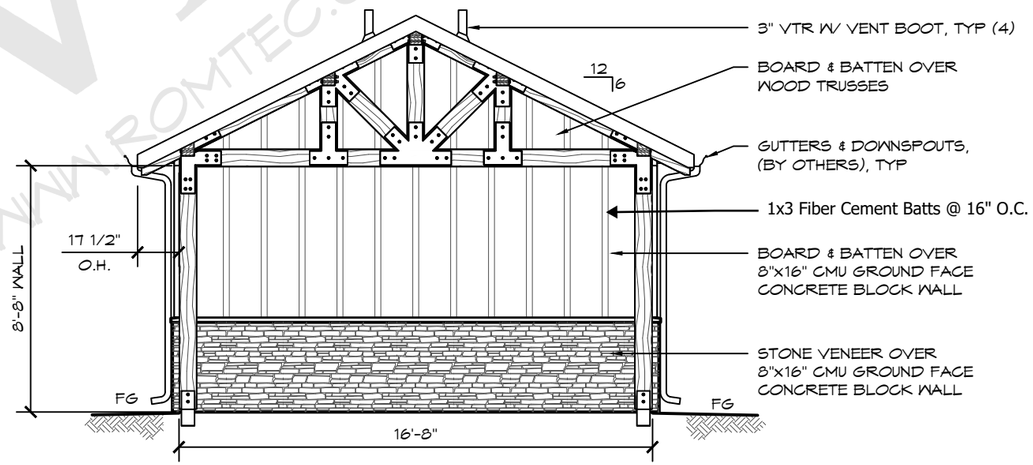
JOB CREATED: 6/8/2023 - LAST SAVED BY: jmiller ON 6/8/2023 - LAST PRINTED: 6/8/2023 - LOCATION: O:\Engineering R\Sales Drawings\Projects\2000 - 2499\2086- Sandy Com, OR\2086- Sandy Com-2024M, OR -230608.dwg



A ELEVATION VIEW

SCALE: 3/16" = 1'-0"

THESE PLAN VIEW AND ELEVATION DRAWINGS ARE A PRELIMINARY ARCHITECTURAL REPRESENTATION OF THE BUILDING. ALL DIMENSIONS, FEATURES AND COMPONENTS SHOWN ON THESE PRELIMINARY DRAWINGS MAY OR MAY NOT BE PART OF THE QUOTE. PLEASE REFER TO THE "SCOPE OF SUPPLY AND SERVICES" LETTER PROVIDED WITH YOUR QUOTE FOR ROMTEC'S PROPOSED SCOPE OF SUPPLY.



B ELEVATION VIEW

SCALE: 3/16" = 1'-0"

ROMTEC
18240 NORTH BANK ROAD - ROSEBURG, OR 97470
(541) 496-3541 FAX (541) 496-0803

PRELIMINARY

PROJECT: LANGO HANSEN LANDSCAPE ARCHITECTS
SANDY COMMUNITY PARK
SANDY, OREGON

SHEET TITLE: ELEVATION VIEW

PROJECT#: 2086

MODEL#:

DATE: 6/08/2023

REVISIONS

REV.	DATE:	BY

DRAWN BY: JRM

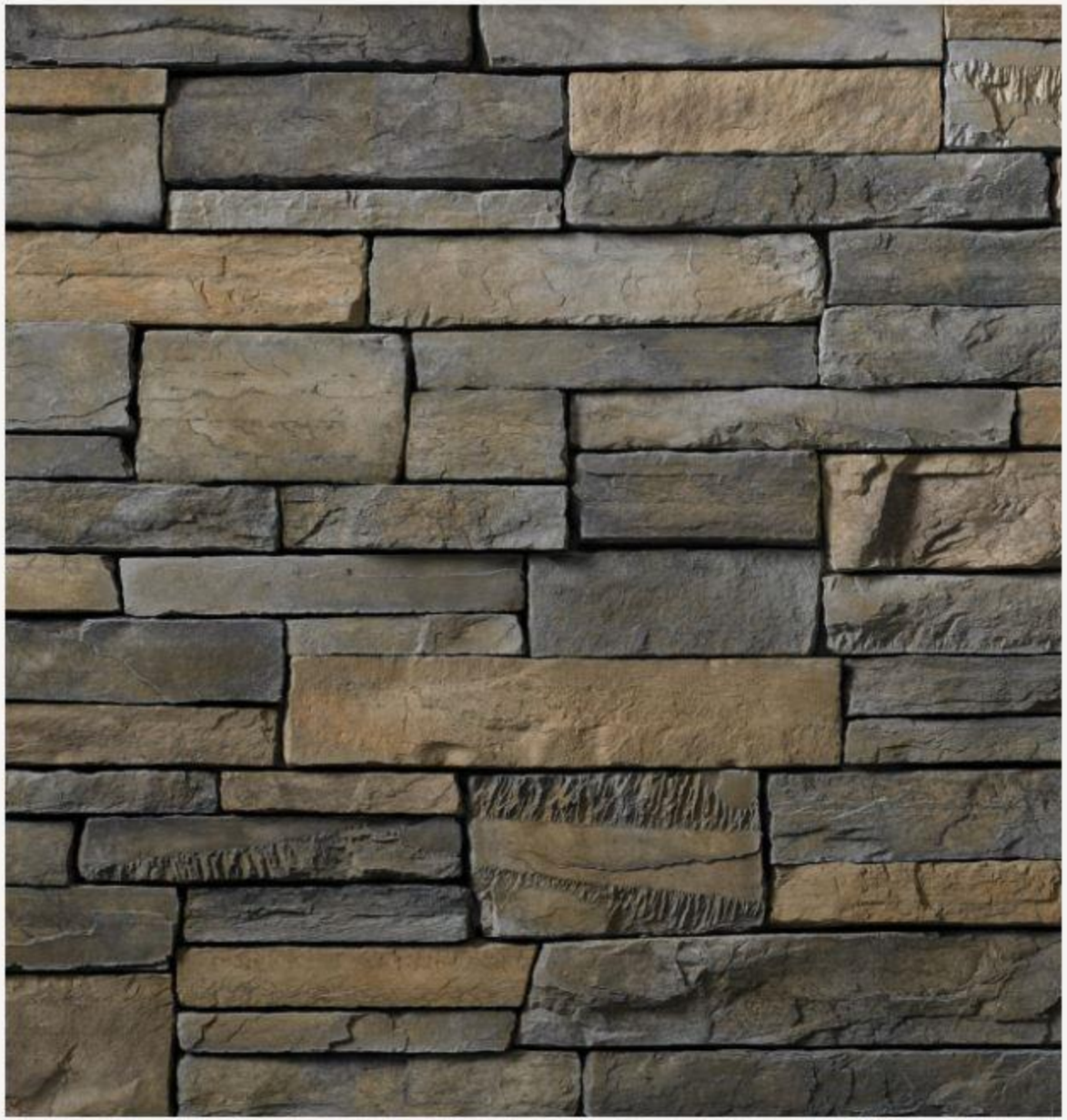
SHEET NO. 02

Board and Batten paint color

EXHIBIT G

Goldrenrod Historic	Curry Historic	Farmhouse Ochre Historic	English Bartlett Historic	Gable Green Historic	Danish Pine Historic	Canyon Gold Historic	Barrett Quince Historic	York Bisque Historic	Lyman Camellia Historic	Woodstock Rose Historic	Tailor's Buff Historic
Historic Morning Dew	Melville Historic	Coral Springs Historic	Bristol Green Historic	Longfellow Historic	Viscaya Historic	Venetian Glass Historic	Green Bonnet Historic	Wainscot Green Historic	Whispering Willow Historic	Brookside Historic	Veranda Blue Historic
Winter Meadow Historic	Coastal Sand Historic	Britches Historic	Toffee Historic	Ginger Root Historic	Maple Historic	Bean Pot Historic	Palomino Historic	Portobello Historic	Tankard Gray Historic	Hitching Post Historic	Cummings Oak Historic

COUNTRY LEDGESTONE



Country Ledgestone is easy to install and offers an extensive color palette that helps differentiate one ledgestone from another.

Dimensions (approx): 1.5" - 6.5" H x 4.25" - 22" L

SKYLINE

stone to be used a base of shelter


ASHFALL


ASPEN


BLACK RUNDLE


BUCKS COUNTY


CARAMEL


CHARDONNAY


ECHO RIDGE®


GRAND MESA


GUNNISON™


HUDSON BAY®


MOJAVE


SEVILLA™


SKYLINE


UMBER CREEK


WHEATON™


WHITE OAK


WOLF CREEK®

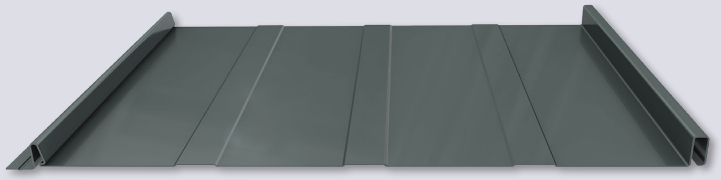
FABRAL®
METAL WALL AND ROOF SYSTEMS

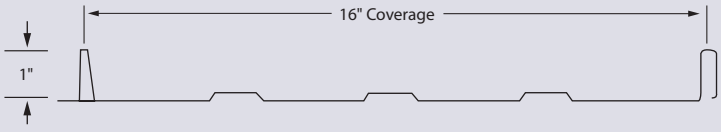
HORIZON 16®
PRODUCT DETAILS

A CLASSIC DESIGN FEATURING VALUE AND BEAUTY

Horizon 16 brings value, beauty and performance together while offering a superior roofing choice for residential and light commercial applications. The value is clear in the substrate and finish, featuring 26 gauge high strength Galvalume steel, ENERGY STAR® approved standard colors and 10 layers of protection provided by the Enduracote® paint system. Performance stands out with the proven snap together design, standard shadow lines and standard factory applied sealant.

Applications	Commercial & Residential
Finish	• Enduracote SMP paint system • Horizon 16 available in 12 colors
Warranty	• Lifetime film integrity warranty for walls and roofs • 30-year warranty against fade and chalk for walls and roofs • 20-year non-perforation warranty





PANEL SPECIFICATIONS

- Minimum pitch recommended 3:12
- 16” coverage with 1” seam height
- 26 gauge high strength Galvalume steel
- UL 790 Class A Fire Resistance Rating
- UL 2218 Class 4 Hail Impact Resistance
- UL 580 Class 90 Uplift Test Rating
- Nail flange system for faster installation
- Stiffening ribs standard
- Custom cut to lengths up to 40
- Must be installed over solid decking
- Standard fastening pattern, 12” on center
- Strippable film for protection in shipping
- To reduce the likelihood of oil canning, install an ethofoam backer rod under the center of the panels prior to installation

FABRAL®
METAL WALL AND ROOF SYSTEMS

ENDURACOTE®
COLOR CHART - SMP PAINT SYSTEM

Brite White 824 IR=.60

White 899 IR=.54

Ivory 883 IR=.62

Light Stone 887 IR=.51

Tan 855 IR=.38

Hickory Moss 870 IR=.36

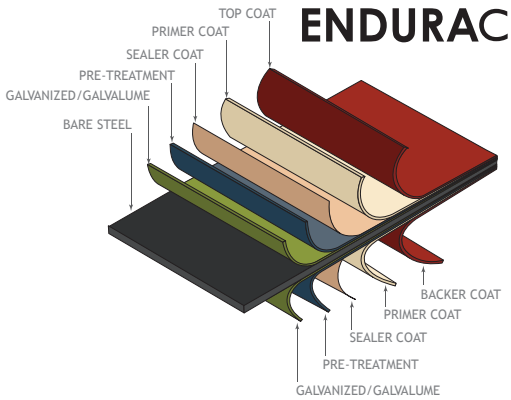
Cocoa Brown 856 IR=.35

Dark Brown 859 IR=.30

Antique Bronze 854 IR=.29

Patina Green 893 IR=.38

Evergreen 875 IR=.27



Colors shown are as close to actual colors as allowed by the printing process. Actual metal samples are available. Colors may appear different when viewed at different angles & under different lighting conditions.

Due to product improvements, changes & other factors, we reserve the right to change or delete information herein without prior notice.

IR = Initial Reflectivity

Hartford Green 821 IR=.29

Caribbean Blue 881 IR=.27

Gallery Blue 826 IR=.29

Brick Red 898 IR=.31

Brite Red 845 IR=.32

Classic Burgundy 853 IR=.26

Ash Gray 848 IR=.38

Light Gray 889 IR=.31

Charcoal Gray 851 IR=.35

True Black 882 IR=.30

Copper Penny 939 ** IR=.4

** Subject to premium pricing.

FABRAL®
METAL WALL AND ROOF SYSTEMS

ENDURACOTE®
COLOR CHART - SMP PAINT SYSTEM

- ● Available in 29 gauge
- ■ Available in 26 gauge
- ▲ Available in 24 gauge
- * not painted

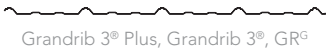
		Grandrib 3® Plus	Grandrib 3®	GR^{G}	Mighti-Rib®	Prime Rib®	ProClad®	StrongClad®	7/8" Corrugated	2 ½" Corrugated	Ultra-Loc 16	Delta Rib	1 ½" SSR	1 ½" SSR-150	Horizon S®	Horizon S-100	Horizon® 16
Availability																	
Northeast / Mid-Atlantic		X	X	X	X								X		X		
Midwest		X	X	X	X	X	X	X		X				X	X	X	
Western		X	X	X	X				X	X	X	X					X
Color																	
Brite White	824	●	● ■	724 ●	■	●	●	●		● ■		●					
White	899	●	● ■	799 ●	■	●	●	●	■	■	■		▲	▲	■	■	■
Ivory	883	●	● ■	783 ●	■	●	●	●		●		●					
Light Stone	887	●	● ■	787 ●	■	●	●	●	■	■							
Tan	855	●	●	755 ●	■	●	●	●									
Hickory Moss	870	●	● ■	770 ●	■	●	●	●		● ■		●	▲	▲	■	■	■
Cocoa Brown	856	●	●	756 ●	■	●	●	●		● ■		●					
Dark Brown	859	●	●	759 ●			●			● ■		●					
Antique Bronze	854	●	● ■	754 ●	■	●	●	●	■	■	■		▲	▲	■	■	■
Patina Green	893	●	●	793 ●			●										
Evergreen	875	●	● ■	775 ●	■	●	●	●		● ■	■	●	▲	▲	■	■	■
Hartford Green	821	●	●	721 ●	■		●			● ■	■	●					
Caribbean Blue	881	●	● ■	781 ●	■	●	●	●		■	■		▲	▲	■	■	■
Gallery Blue	826	●	●	726 ●	■		●										
Brick Red	898	●	● ■	798 ●	■	●	●	●	■	● ■	■	●	▲	▲	■	■	■
Brite Red	845	●	●	745 ●			●										
Classic Burgundy	853	●	●	753 ●		●	●	●			■		▲	▲	■	■	■
Ash Gray	848	●	●														
Light Gray	889	●	● ■	789 ●	■	●	●	●		● ■	■	●		▲	■	■	■
Charcoal Gray	851	●	● ■	751 ●	■	●	●	●		■	■		▲	▲	■	■	■
True Black	882	●	●	782 ●		●	●	●					▲	▲	■	■	■
Copper Penny	939		●								■		▲	▲	■	■	■

Not all colors are available at all locations. Offering subject to change without notice.

Enduracote Warranty
- Lifetime film integrity warranty for walls & roofs
- 30-year warranty against fade & chalk for walls & roofs
- 10-year edge rust warranty against acid rain (Galvanized only)

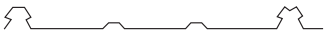
Grandrib 3 PLUS Warranty
- Lifetime film integrity warranty for walls & roofs
- 30-year warranty against fade & chalk for walls & roofs
- 15-year edge rust warranty against acid rain (Galvanized only)
- 25-year non-perforation warranty against acid rain for walls; 20-year warranty for roofs

GR^{G} Warranty
- 40-year film integrity warranty for walls & roofs
- 30-year prorated fade & chalk for walls & roofs


Grandrib 3® Plus, Grandrib 3®, GR^{G}


2 1/2" Corrugated

Mighti-Rib®


Ultra-Loc 16


Prime Rib®


Delta Rib

ProClad®


1 ½" SSR, 1 ½" SSR-150

StrongClad®


Horizon S®, Horizon S-100

7/8" Corrugated


Horizon 16

SHERWIN-WILLIAMS. Coil Coatings

EXHIBIT H

Stormwater Management Facilities

Private Stormwater Report

Sandy Campus Park

HDG Job #: LAN004

Prepared For: City of Sandy
39250 Pioneer Blvd
Sandy, OR 97055

Prepared By:

Humber Design Group, Inc.

110 SE Main St. Suite 200
Portland, OR 97214
(P) 503 946 6690

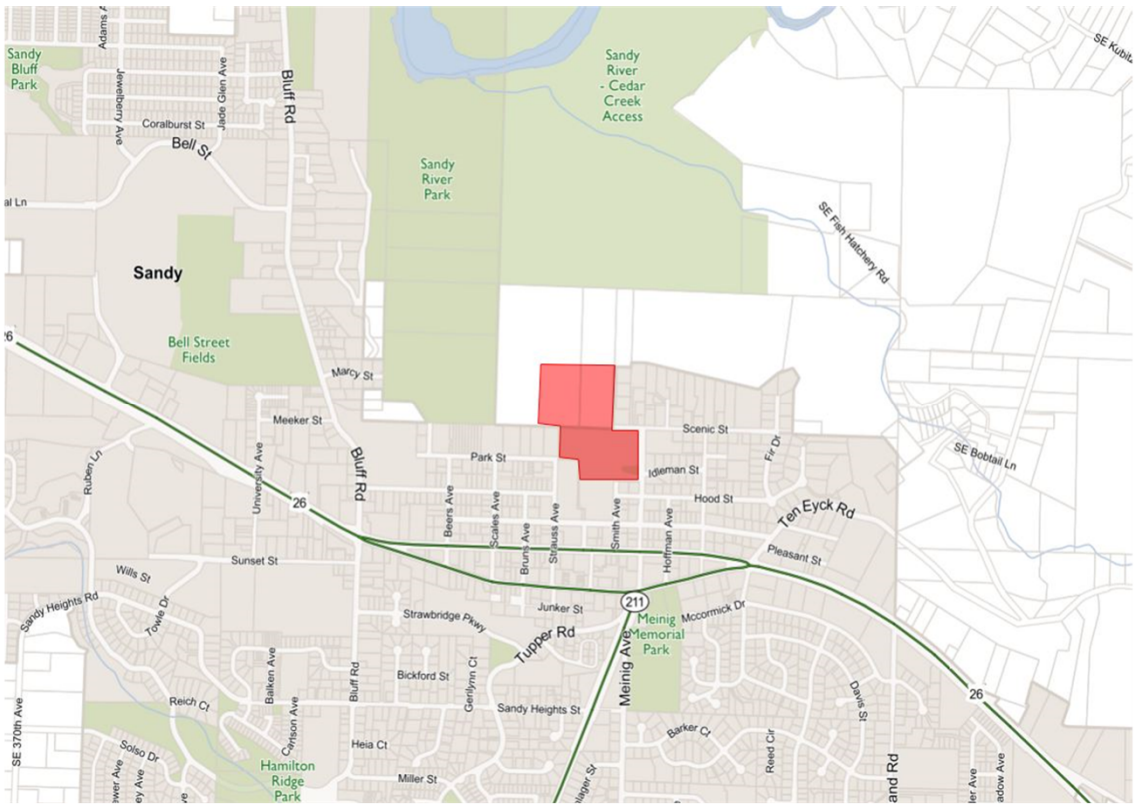
Date: July 17, 2023

Table of Contents

Project Overview and Description

Location of Project	17225 SE Meinig Ave, Sandy, OR 97055
Site Area/Acreage	10 acres
Proposed Impervious Area	
Nearest Cross Street	Scenic St
Property Zoning	Medium Density Residential & Parks and Open Space
Existing Conditions	The existing site contains concrete paving stake park, asphalt sidewalk, and parking lot swith trees and structures.
Proposed Development	The proposed site will consists of a pump track, skate park, play area, and 1 story shelter with parking lot.
Watershed Description	Sandy River
Subwatershed	Sedar Creek
Tax Map	24E13BA & 24E13BD
Tax Lot	24E13BD00101 & 24E13BA00200 & 24E13BA00300
Permits Required	Public Works Permit 1200C Erosion Control Permit

Vicinity Map



Site Location

Methodology

Existing Drainage	Stormwater on the site is currently conveyed to various area drains and catch basins where it is conveyed to as existing public storm pipe that existing 30" outfall located on west side of project site.
Infiltration Results	Pali Consulting, Inc performed (2) infiltration tests. The test were at a depth of 5ft and 15ft BFG with an infiltration rate of 1 in/hr.
PRIVATE Proposed Stormwater Management Techniques	Stormwater from the new impervious area will be managed by providing both flow control and water quantity. Stormwater will be conveyed to a water quality manhole where it treated based SWMM requirements. From there it will be conveyed to a 96" CMP detention tank with orifice control. The flow control orifice has been sized to match the post developed peak flow to pre development peak flow for one-half the 2yr, 2yr, 5yr, 10yr, and 25yr.
PUBLIC Proposed Stormwater Management Techniques	New impervious area along Scenic street will create or replace greater than 500 SF of impervious area, therefore, stormwater management will be required. This area will be managed using the water quality manhole and detention tank.
Discharge Point	Drainage Way, River, Storm Only Pipe
Stormwater Hierarchy Justificatior	Due to poor infiltration at the site, level 1 of the discharged hierarchy is not feasible. This site fall under level two of the discharge hierarchy.

Analysis

Computational Method Used HydroCAD models of a SBUH Type 1A Storm were used to calculate the stormwater management facility sizes for the catchment areas. See attached calculations. Below is a summary of the results.

Soil Types Silty Clay Loam

Table 1 – Curve Numbers

Predeveloped Pervious CN	79
Predeveloped Impervious CN	98
Post-Developed Pervious CN	79
Post-Developed Impervious CN	98

Table 2 – Design Storms

WQ Storm	0.83 inches
2-year	2.40 inches
10-year	3.40 inches
25-year	3.90 inches
100-year	4.40 inches

Table 3 – Time of Concentration

Predeveloped TOC	10 min
Post-Developed TOC	10 min

Stormwater Management Narrative Stormwater runoff from the 87,042 SF of new impervious area from private site and 6,220 SF of new impervious area from public ROW will be managed with a 96" detention tank with water quality filter manhole. Stormwater will be conveyed to existing 30" outfall located on west of property. Stormwater runoff the 10,625 SF of new impervious area from private site will be traded and managed with 96" detention tank with water quality filter manhole, since it it not practical to capture and treat stormwater from the linear pathway the areas that are being captured will be overtreated and overdetermined in order to make up for the areas not captured.

Table 4 – Catchment Areas and Facility Table

Catchment/ Facility ID	Source (roof, road, etc.)	Treatment Area (sf)	Ownership (private/ public)	Facility Type/ Function	Facility Size
A	Roof, Hardscaping	87,042	Private	Mech. Filter, Structural Detention	96"dia. X 200'
B	Road	6,220	Public	Mech. Filter, Structural Detention	96"dia. X 200'
C	Hardscaping	10,625	Private	Mech. Filter, Structural Detention	96"dia. X 200'

Engineering Conclusions

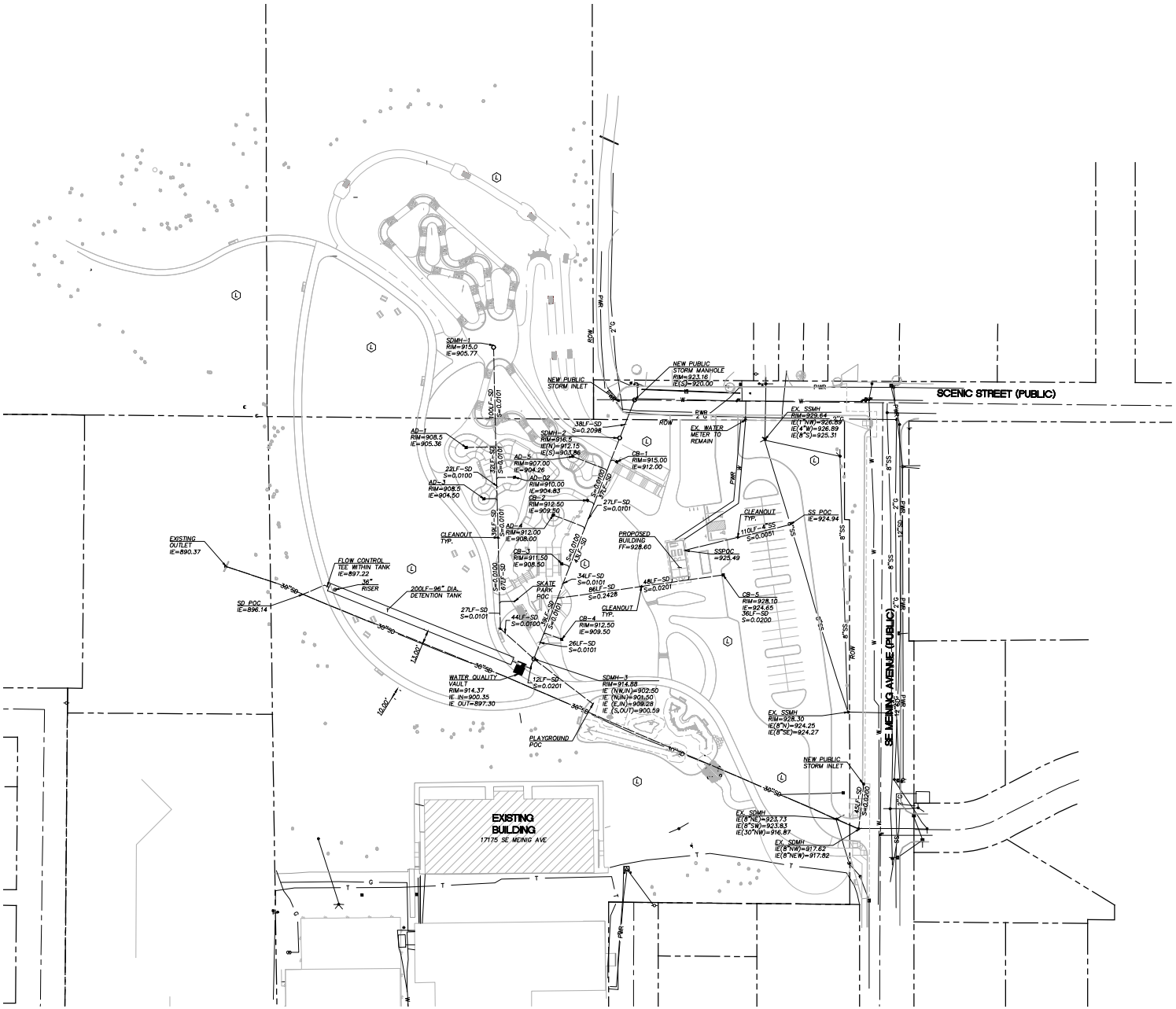
The preceding methodologies and calculations presented indicate compliance with the current jurisdictional stormwater management codes and requirements. A summarized breakdown is presented below:

Water Quality	The proposed development will meet the provisions for water quality per the 2020 Portland Stormwater Management Manual.
Water Quantity	The proposed development will meet the provisions for water quantity per the 2020 Portland Stormwater Management Manual.
Downstream / Upstream Impacts	By providing both the water quality and flow control systems to manage the stormwater runoff from this site we expect there to be no upstream or downstream impacts created by the proposed development.

Appendix A

Stormwater Facility Details / Exhibits

Utility Plan
Catchment Map
Detentaion Tank Details
Water Quaility Manhole Detail



UTILITY PLAN
SCALE: 1"=40'

SHEET LEGEND		
SD	STORM	
SS	SANITARY	
W	WATER	
PWR	POWER	
■	CATCH BASIN	
●	CLEANOUT	
○	MANHOLE	
▭	DETENTION PIPE	

lango hansen LANDSCAPE ARCHITECTS PC
1100 nw glisan #3B portland OR 97209 T 503.295.2437

REGISTERED PROFESSIONAL ENGINEER
OREGON
ALLEN SCHMITZ
RENEWAL DATE 6/30/24

SANDY COMMUNITY CAMPUS PARK

CITY OF SANDY PARKS AND RECREATION

CITY OF SANDY
17225 SMITH AVE
SANDY, OR 97055

LAND USE

REVISIONS

GRAPHIC SCALE
0 40 80
1 inch = 40 ft.

SCALE	AS NOTED
DRAWN BY	MCS
DATE	07.17.23
PROJECT NO.	2239

UTILITY PLAN

115 0

Humber Design Group, Inc.
Civil Engineering • 503.946.6690 • hdgpdx.com

NEW IMPERVIOUS AREA =
87,042 SF

NEW IMPERVIOUS AREA WILL
BE TRADED = 10,625 SF

TOTAL IMPERVISOUSE
AREA=97,667 SF

SE SCENIC STREET

ROW

96"
DETENTION
TANK

30"SD

30"SD

ROW

SE MEINIG AVENUE

PROPERTY LINE

EXISTING
BUILDING

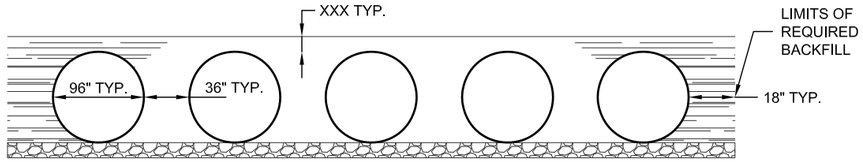
GRAPHIC SCALE
0 100 200
1 inch =100 ft.

SANDY PARK
CATCHMENT MAP

PROJECT NO.:	LAN004
DRAWN BY:	MCS
DESIGN BY:	AKS
REVIEWED BY:	AKS
DATE:	07/17/2023

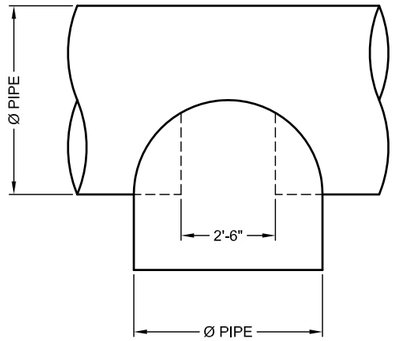
Humber Design Group,
Civil Engineering ▪ 503.946.6690 ▪ hdg

P:\LAN004 - Sandy Campus Park\7 - CAD Drawings\8 - Exhibits\2023-06-07 Impervious Area Exhibit\LAN004 IMPERVIOUS AREA EXHIBIT.dwg Jul 17, 2023 - 9:23am

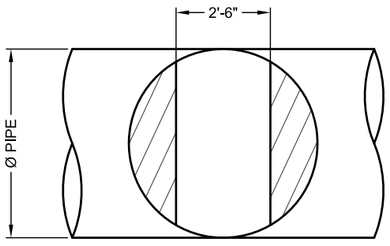


TYPICAL SECTION VIEW

SCALE: N.T.S.



PLAN



FRONT

TYPICAL MANWAY DETAIL

SCALE: N.T.S.

FABRICATION BoM

FITTING	TYPE	QTY	Ø	CORRUGATION	GAGE	FINISH	WALL TYPE	LENGTH	TOTAL
BAND FASTENER	12" HUGGER		96	w/BAR BOLT & STRAP	16	ALT2			
GASKETS	FLAT		96	12" WIDE					

MARK	DATE	REVISION DESCRIPTION	BY

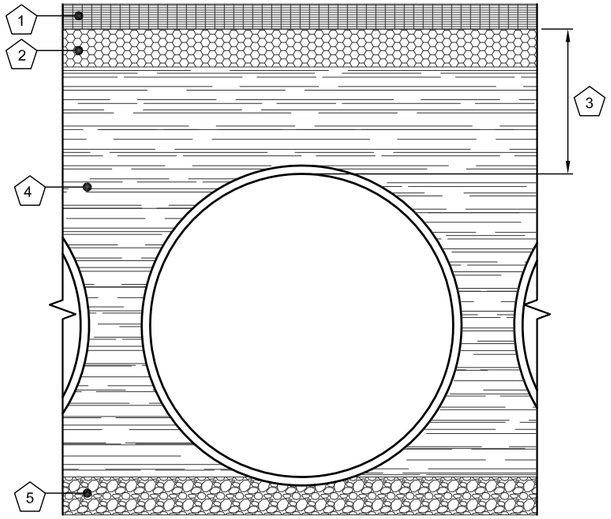
CONTECH® ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH® CMP DETENTION SYSTEMS

CONTECH **CONTRACT** DRAWING

Ø96" UNDERGROUND DETENTION SYSTEM - 000000-001
SAMPLE PROJECT
ANYTOWN, USA
SITE DESIGNATION: UDS

PROJECT No.:	SEQ. No.:	DATE:
XXXXX	001	1/13/2014
DESIGNED: XXX	DRAWN: RTF	
CHECKED:	APPROVED:	
SHEET NO.: C2 OF 4		



KEY

1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE
3. 12" MIN. FOR DIAMETERS THROUGH 96"
   18" MIN. FOR DIAMETERS FROM 102"
   AND LARGER MEASURED TO TOP OF RIGID
   OR BOTTOM OF FLEXIBLE PAVEMENT.
4. SELECT GRANULAR FILL PER AASHTO M145
   A1, A2 OR A3, OR APPROVED EQUAL.
   PLACED IN 8" LIFTS (COMPACTED TO MIN.
   90% STANDARD DENSITY PER AASHTO T99.)
5. GRANULAR BEDDING, ROUGHLY SHAPED TO
   FIT THE BOTTOM OF PIPE, 4" TO 6" IN DEPTH

FOUNDATION/BEDDING PREPARATION

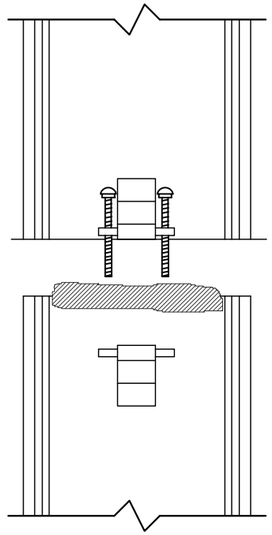
PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, 4" - 6" OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL

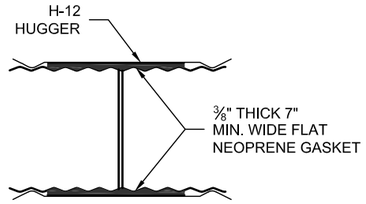
THE BACKFILL SHALL BE AN A1, A2 OR A3 GRANULAR FILL PER AASHTO M145, OR A WELL-GRADED GRANULAR FILL AS APPROVED BY THE SITE ENGINEER (SEE INSTALLATION GUIDELINES). THE MATERIAL SHALL BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 90% AASHTO T99 STANDARD PROCTOR DENSITY. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE DETENTION SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON THE PIPE.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.

1 / C3 BACKFILL DETAIL
SCALE: N.T.S.



CONNECTION DETAIL
SINGLE BOLT, BAR AND STRAP



FLAT GASKET

GENERAL NOTES

1. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   12" THRU 48", 1-PIECE
   54" THRU 96", 2-PIECE
   102" THRU 144", 3-PIECES
2. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS
3. REROLLED ANNULAR END CORRUGATIONS ARE NORMALLY 2⅔" x ½". DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES

2 / C3 H-12 HUGGER BAND DETAIL
SCALE: N.T.S.

MARK	DATE	REVISION DESCRIPTION	BY

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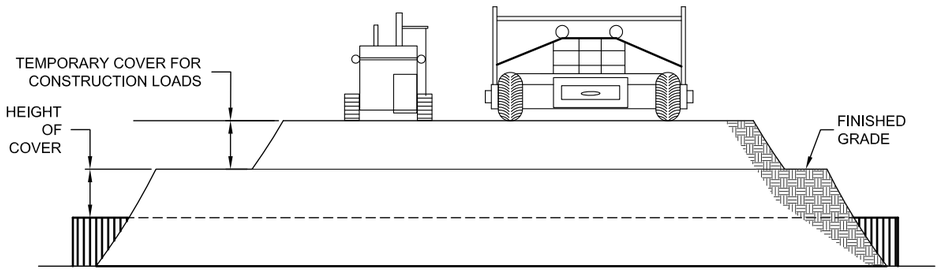
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH CONTRACT DRAWING

Ø96" UNDERGROUND DETENTION SYSTEM - 000000-001
SAMPLE PROJECT
ANYTOWN, USA
SITE DESIGNATION: UDS

PROJECT No.:	SEQ. No.:	DATE:
XXXXX	001	1/13/2014
DESIGNED: XXX	DRAWN: RTF	
CHECKED:	APPROVED:	
SHEET NO.: C3 OF 4		



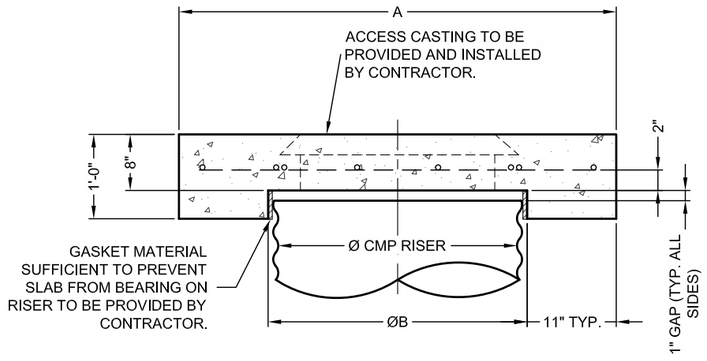
CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

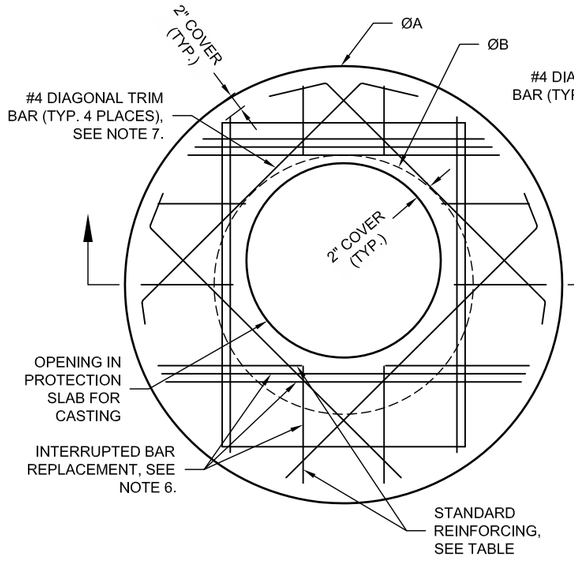
3 / C4 CONSTRUCTION LOADING DIAGRAM
SCALE: N.T.S.



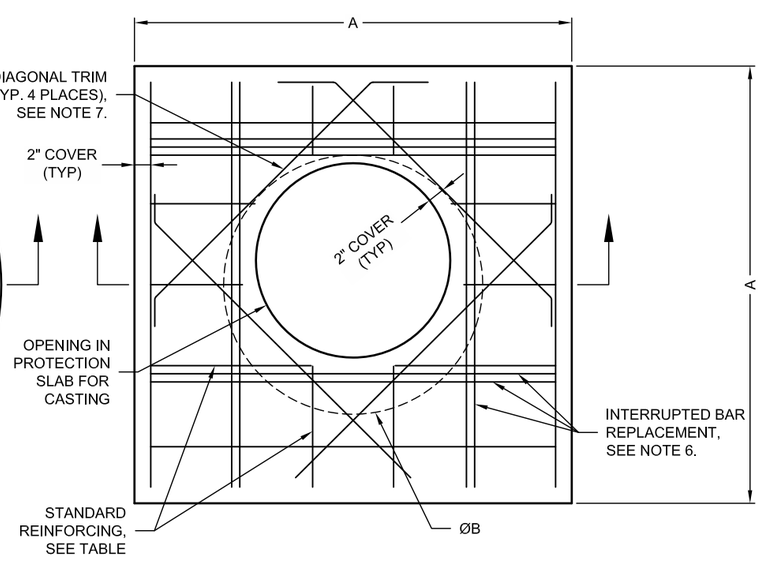
SECTION VIEW

REINFORCING TABLE				
Ø CMP RISER	A	Ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	Ø 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	Ø 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	Ø 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	Ø 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	Ø 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

4 / C4 MANHOLE CAP DETAIL
SCALE: N.T.S.

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

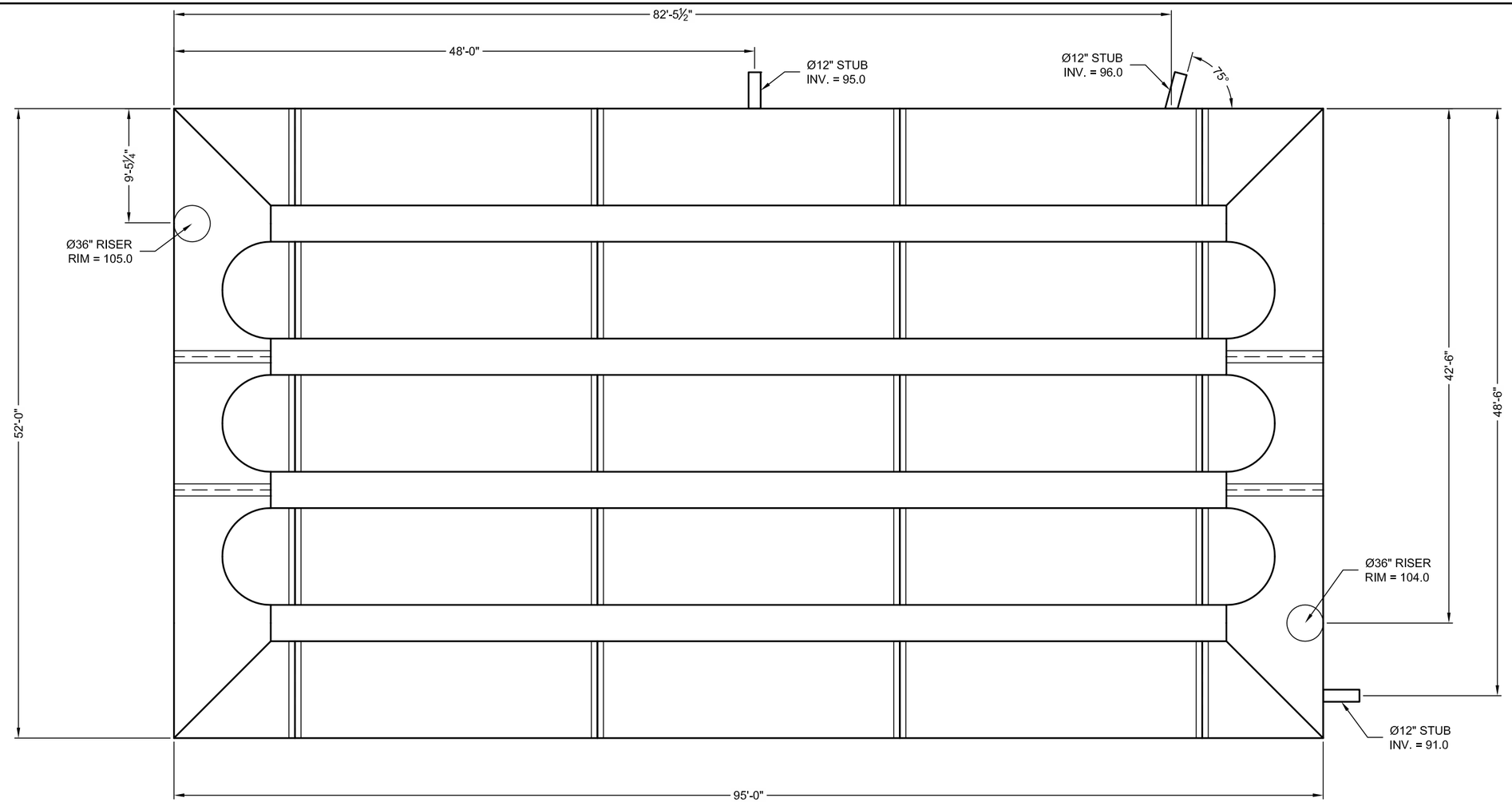
MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH CONTRACT DRAWING

Ø96" UNDERGROUND DETENTION SYSTEM - 000000-001
SAMPLE PROJECT
ANYTOWN, USA
SITE DESIGNATION: UDS

PROJECT No.:	SEQ. No.:	DATE:
XXXXX	001	1/13/2014
DESIGNED:	DRAWN:	
XXX	RTF	
CHECKED:	APPROVED:	
SHEET NO.: C4 OF 4		



THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (4) PAGES INCLUDING THE FOLLOWING:

- **VOLUME = 25,082 C.F.**
- **MAINLINE PIPE GAUGE = 16**
- **WALL TYPE = SOLID**
- **DIAMETER = 96"**
- **FINISH = ALT2**

CUSTOMER _____ DATE _____

ASSEMBLY

SCALE: 1" = 10'
VOLUME: 25,082 C.F.
LOADING: H20/H25
SYSTEM INV = 91.0

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.

MARK	DATE	REVISION DESCRIPTION	BY

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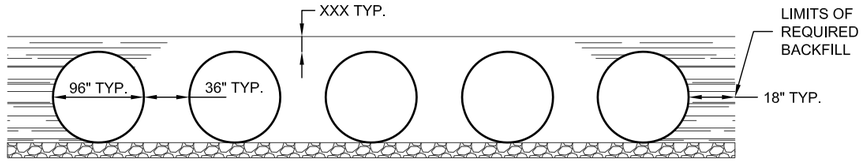
CONTECH® CMP DETENTION SYSTEMS
CONTECH CONTRACT DRAWING

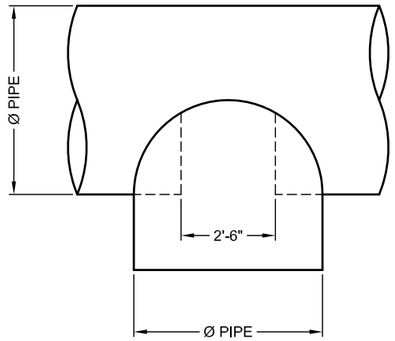
Ø96" UNDERGROUND DETENTION SYSTEM - 000000-001
SAMPLE PROJECT
ANYTOWN, USA
SITE DESIGNATION: UDS

PROJECT No.:	SEQ. No.:	DATE:
XXXXX	001	1/13/2014
DESIGNED: XXX	DRAWN: RTF	
CHECKED:	APPROVED:	
SHEET NO.: C1 OF 4		

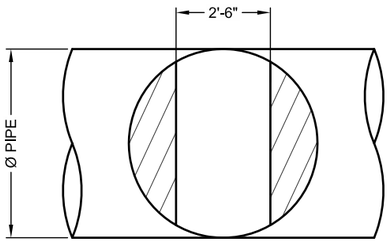


TYPICAL SECTION VIEW

SCALE: N.T.S.



PLAN



FRONT

TYPICAL MANWAY DETAIL

SCALE: N.T.S.

FABRICATION BoM									
FITTING	TYPE	QTY	Ø	CORRUGATION	GAGE	FINISH	WALL TYPE	LENGTH	TOTAL
BAND FASTENER	12" HUGGER		96	w/BAR BOLT & STRAP	16	ALT2			
GASKETS	FLAT		96	12" WIDE					

PROJECT SPECIFIC BILL OF MATERIALS TO BE COMPLETED AT TIME OF CONTRACT DRAWINGS

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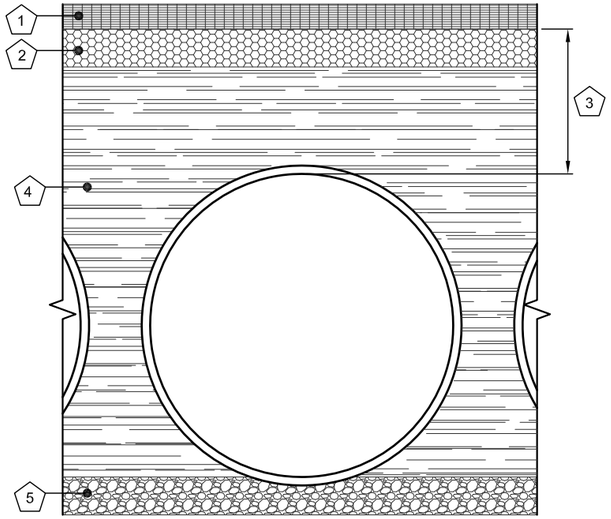
CONTECH® CMP DETENTION SYSTEMS

CONTECH **CONTRACT** DRAWING

Ø96" UNDERGROUND DETENTION SYSTEM - 000000-001
SAMPLE PROJECT
ANYTOWN, USA
SITE DESIGNATION: UDS

PROJECT No.:	SEQ. No.:	DATE:
XXXXX	001	1/13/2014
DESIGNED: XXX	DRAWN: RTF	
CHECKED:	APPROVED:	
SHEET NO.: C2 OF 4		



KEY

1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE
3. 12" MIN. FOR DIAMETERS THROUGH 96"
   18" MIN. FOR DIAMETERS FROM 102"
   AND LARGER MEASURED TO TOP OF RIGID
   OR BOTTOM OF FLEXIBLE PAVEMENT.
4. SELECT GRANULAR FILL PER AASHTO M145
   A1, A2 OR A3, OR APPROVED EQUAL.
   PLACED IN 8" LIFTS (COMPACTED TO MIN.
   90% STANDARD DENSITY PER AASHTO T99.)
5. GRANULAR BEDDING, ROUGHLY SHAPED TO
   FIT THE BOTTOM OF PIPE, 4" TO 6" IN DEPTH

FOUNDATION/BEDDING PREPARATION

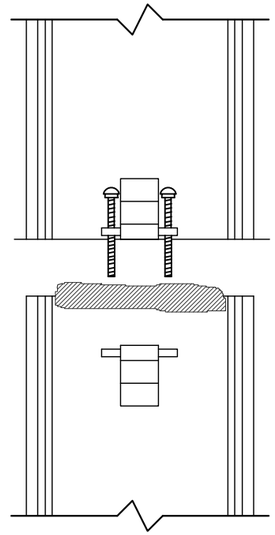
PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, 4" - 6" OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL

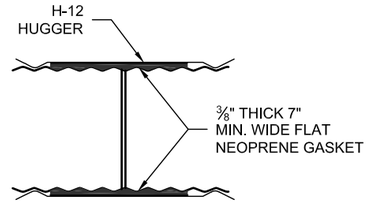
THE BACKFILL SHALL BE AN A1, A2 OR A3 GRANULAR FILL PER AASHTO M145, OR A WELL-GRADED GRANULAR FILL AS APPROVED BY THE SITE ENGINEER (SEE INSTALLATION GUIDELINES). THE MATERIAL SHALL BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 90% AASHTO T99 STANDARD PROCTOR DENSITY. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE DETENTION SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON THE PIPE.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.

1 / C3 BACKFILL DETAIL
SCALE: N.T.S.



CONNECTION DETAIL
SINGLE BOLT, BAR AND STRAP



FLAT GASKET

GENERAL NOTES

1. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   12" THRU 48", 1-PIECE
   54" THRU 96", 2-PIECE
   102" THRU 144", 3-PIECES
2. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS
3. REROLLED ANNULAR END CORRUGATIONS ARE NORMALLY 2⅔" x ½". DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES

2 / C3 H-12 HUGGER BAND DETAIL
SCALE: N.T.S.

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XXXXX	001	1/13/2014
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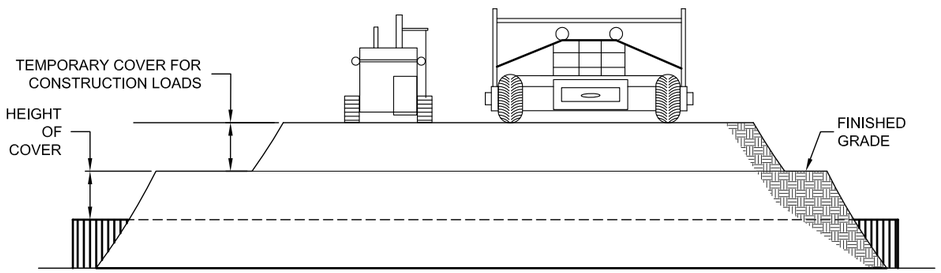


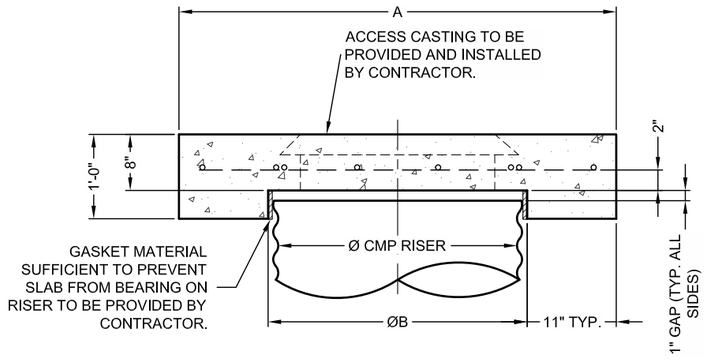
CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

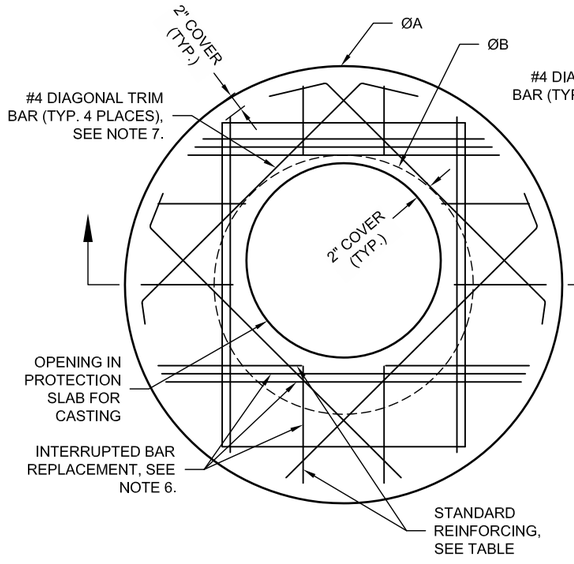
3 / C4 CONSTRUCTION LOADING DIAGRAM
SCALE: N.T.S.



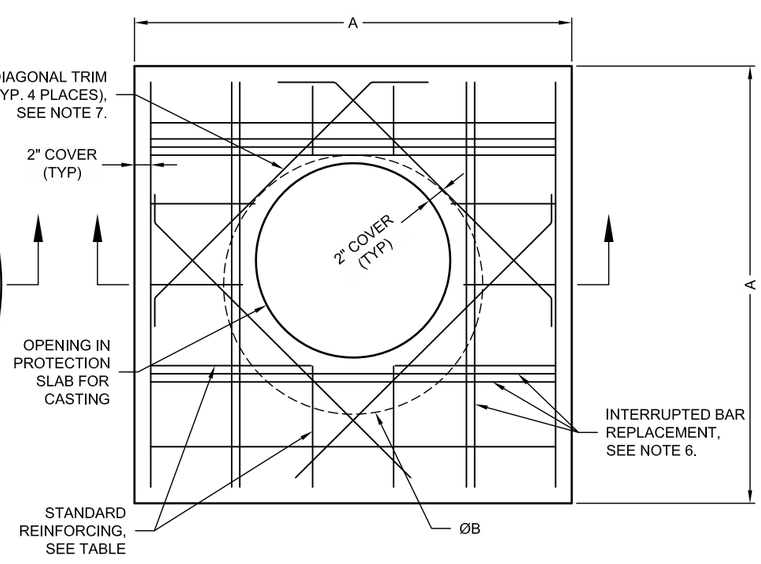
SECTION VIEW

REINFORCING TABLE				
Ø CMP RISER	A	Ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	Ø 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	Ø 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	Ø 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	Ø 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	Ø 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

4 / C4 MANHOLE CAP DETAIL
SCALE: N.T.S.

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

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CONTECH CMP DETENTION SYSTEMS
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Ø96" UNDERGROUND DETENTION SYSTEM - 000000-001
SAMPLE PROJECT
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SITE DESIGNATION: UDS

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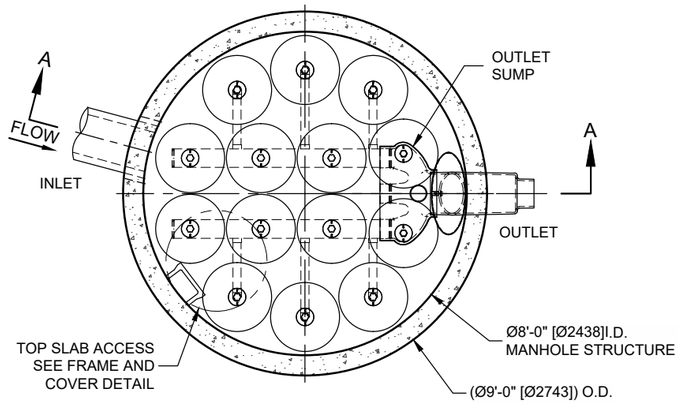
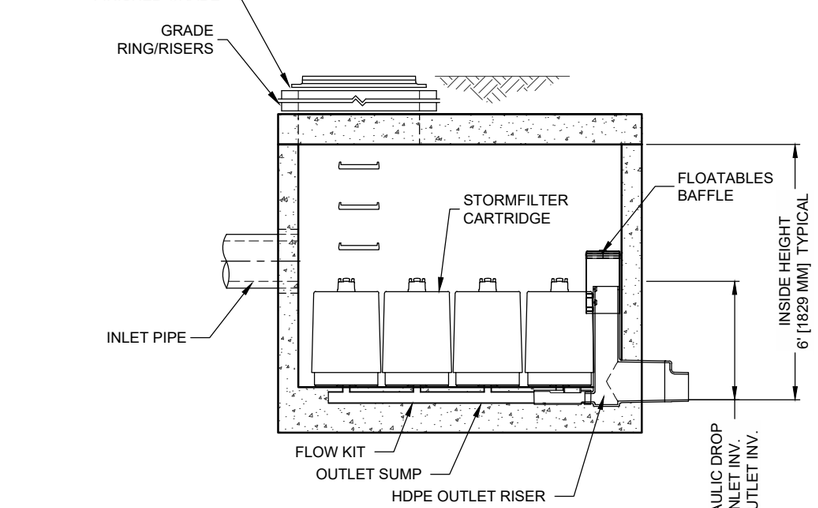
SHEET NO.: C4 OF 4		



PLAN VIEW

STANDARD OUTLET RISER
FLOWKIT: 43A



SECTION A-A

The Stormwater Management StormFilter®

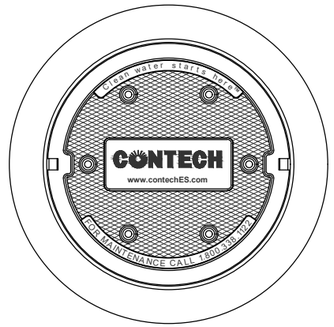
STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (14). VOLUME SYSTEM IS ALSO AVAILABLE WITH MAXIMUM 14 CARTRIDGES. Ø8'-0" [2438 mm] MANHOLE STORMFILTER PEAK HYDRAULIC CAPACITY IS 1.8 CFS [51 L/s] . IF THE SITE CONDITIONS EXCEED 1.8 CFS [51 L/s] AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27" [686 mm]			18" [458 mm]			LOW DROP		
RECOMMENDED HYDRAULIC DROP (H)	3.05' [930 mm]			2.3' [700 mm]			1.8' [550 mm]		
SPECIFIC FLOW RATE (gpm/sf) [L/s/m^2]	2 [1.30]	1.67* [1.08]	1 [0.65]	2 [1.30]	1.67* [1.08]	1 [0.65]	2 [1.30]	1.67* [1.08]	1 [0.65]
CARTRIDGE FLOW RATE (gpm) [L/s]	22.5 [1.42]	18.79 [1.19]	11.25 [0.71]	15 [0.95]	12.53 [0.79]	7.5 [0.44]	10 [0.63]	8.35 [0.54]	5 [0.32]

* 1.67 gpm/sf [1.08 L/s/m^2] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



FRAME AND COVER

(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs) [L/s]	*
PEAK FLOW RATE (cfs) [L/s]	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
CARTRIDGE HEIGHT (SEE TABLE ABOVE)	*
NUMBER OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (PERLITE, ZPG, PSORB)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	*	*	*
INLET PIPE #2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' [1524 mm] AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES [178 mm]. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) [L/s] DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft)[m^2].
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET PIPE(S).
E. CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8 INCHES [200 mm], CONTRACTOR TO REMOVE THE 8 INCH [200 mm] OUTLET STUB AT MOLDED-IN CUT LINE. COUPLING BY FERNCO OR EQUAL AND PROVIDED BY CONTRACTOR.
F. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

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SFMH96
STORMFILTER
STANDARD DETAIL

Appendix B

Support Calculations

HydroCAD Report

Summary for Subcatchment 1: Pre-developed

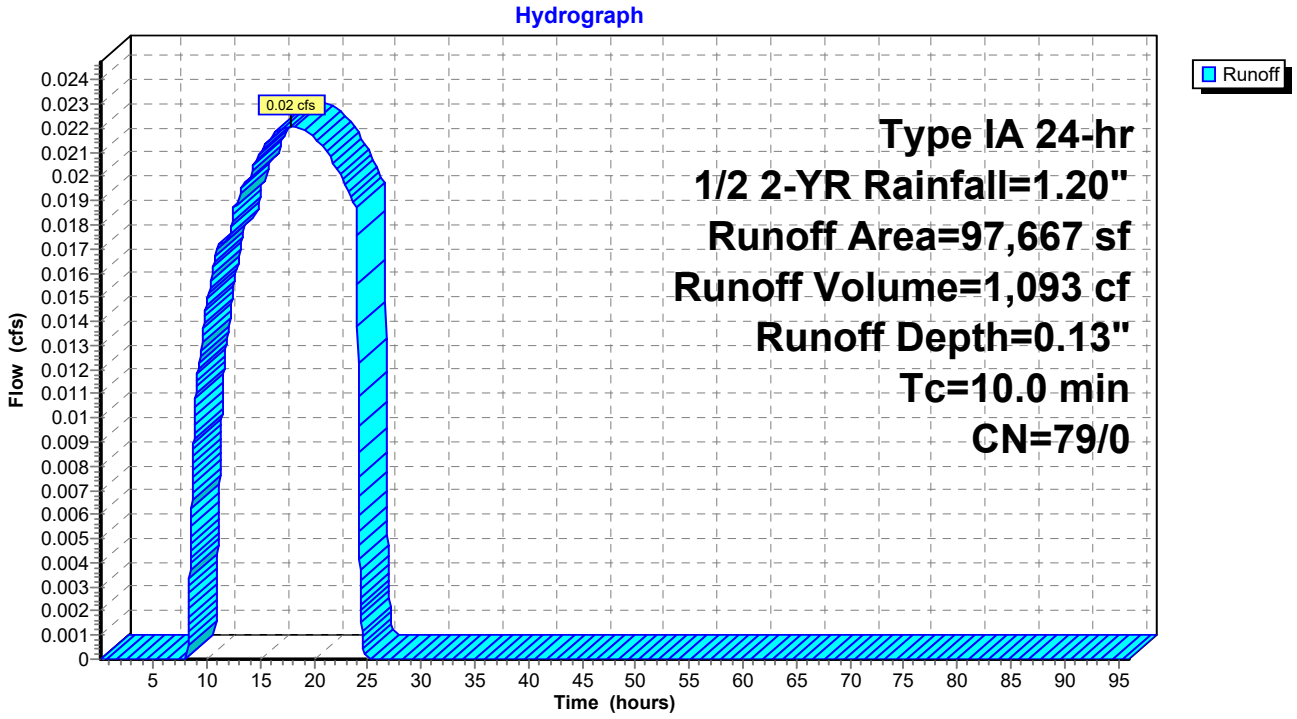
Runoff = 0.02 cfs @ 17.89 hrs, Volume= 1,093 cf, Depth= 0.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-96.00 hrs, dt= 0.02 hrs
Type IA 24-hr 1/2 2-YR Rainfall=1.20"

	Area (sf)	CN	Description
*	97,667	79	
	97,667	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1: Pre-developed



Summary for Pond 3: Detention

Inflow Area = 97,667 sf,100.00% Impervious, Inflow Depth = 0.99" for 1/2 2-YR event
Inflow = 0.54 cfs @ 7.98 hrs, Volume= 8,022 cf
Outflow = 0.09 cfs @ 13.45 hrs, Volume= 8,022 cf, Atten= 83%, Lag= 328.0 min
Primary = 0.09 cfs @ 13.45 hrs, Volume= 8,022 cf

Routing by Stor-Ind method, Time Span= 0.10-96.00 hrs, dt= 0.02 hrs
Peak Elev= 102.53' @ 13.45 hrs Surf.Area= 1,488 sf Storage= 2,730 cf

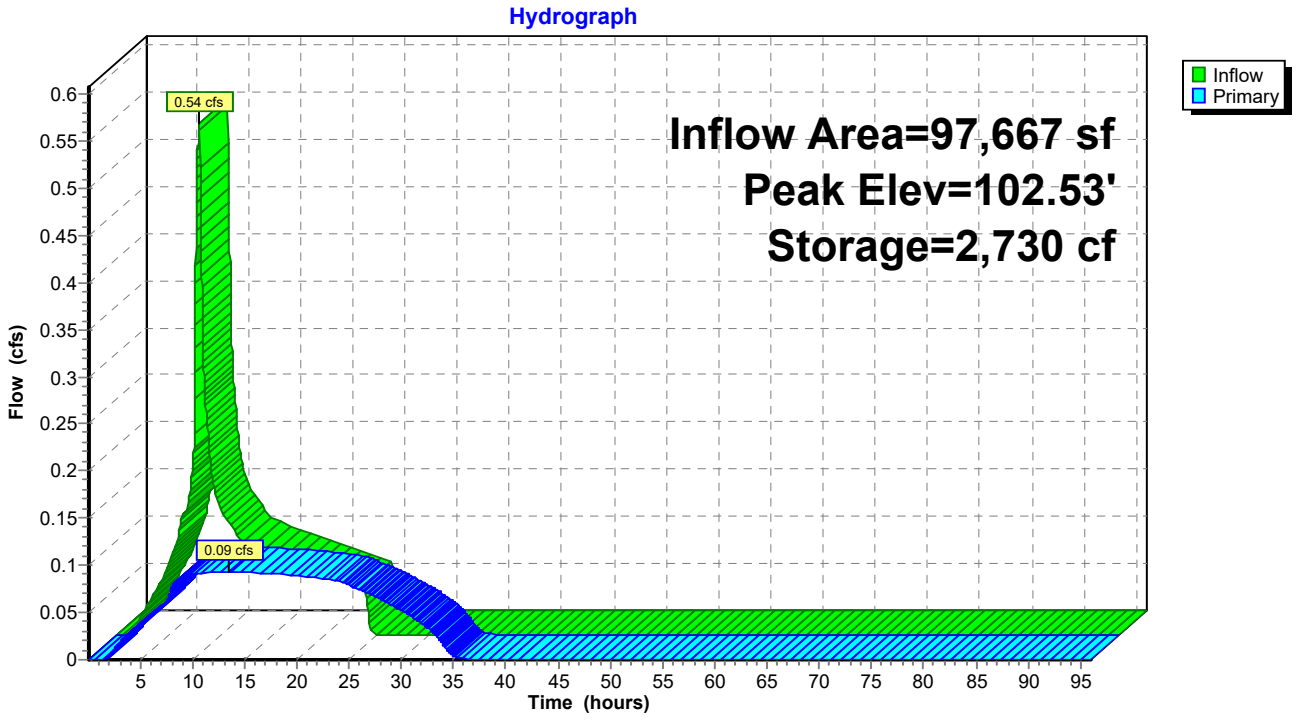
Plug-Flow detention time= 378.7 min calculated for 8,022 cf (100% of inflow)
Center-of-Mass det. time= 378.7 min (1,086.8 - 708.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	10,053 cf	**96.0" Round Pipe Storage** L= 200.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**1.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	105.65'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	107.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.09 cfs @ 13.45 hrs HW=102.53' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.09 cfs @ 7.57 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3: Detention



Summary for Subcatchment 1: Pre-developed

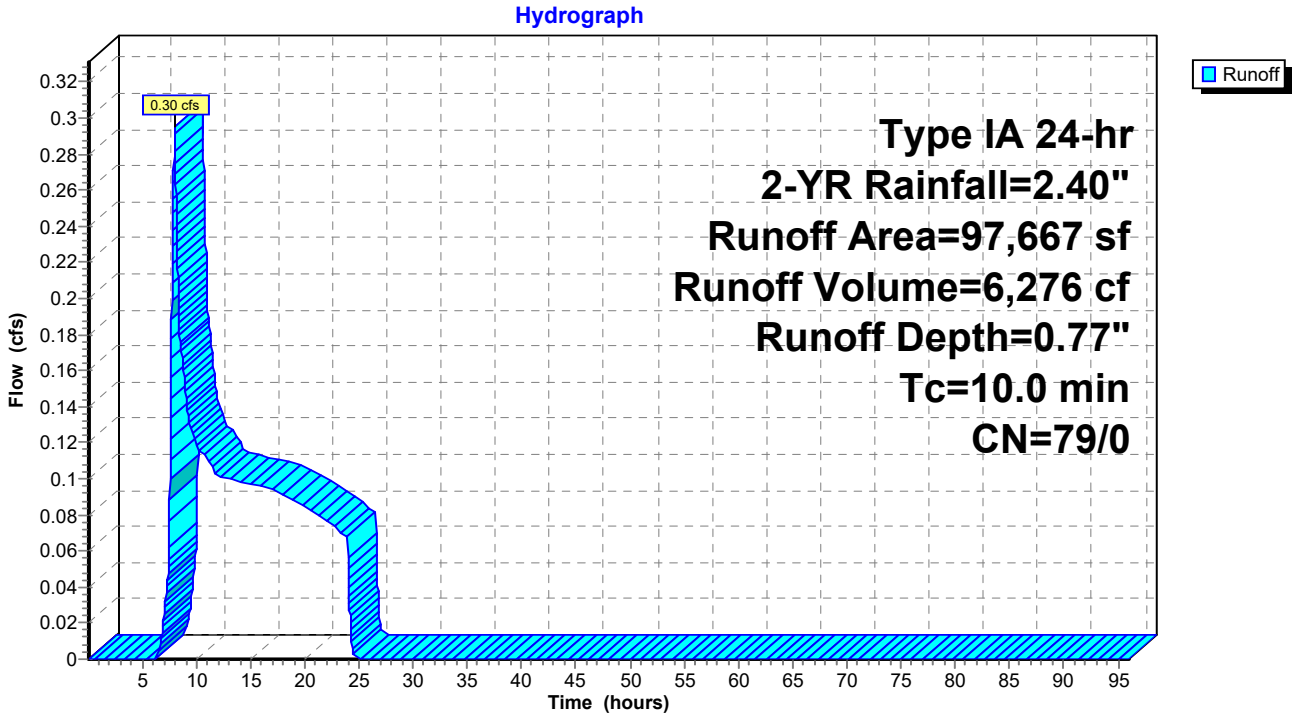
Runoff = 0.30 cfs @ 8.01 hrs, Volume= 6,276 cf, Depth= 0.77"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-96.00 hrs, dt= 0.02 hrs
Type IA 24-hr 2-YR Rainfall=2.40"

	Area (sf)	CN	Description
*	97,667	79	
	97,667	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1: Pre-developed



Summary for Pond 3: Detention

Inflow Area = 97,667 sf,100.00% Impervious, Inflow Depth = 2.17" for 2-YR event
Inflow = 1.17 cfs @ 7.97 hrs, Volume= 17,672 cf
Outflow = 0.19 cfs @ 13.48 hrs, Volume= 17,672 cf, Atten= 84%, Lag= 330.8 min
Primary = 0.19 cfs @ 13.48 hrs, Volume= 17,672 cf

Routing by Stor-Ind method, Time Span= 0.10-96.00 hrs, dt= 0.02 hrs
Peak Elev= 105.78' @ 13.48 hrs Surf.Area= 1,433 sf Storage= 7,776 cf

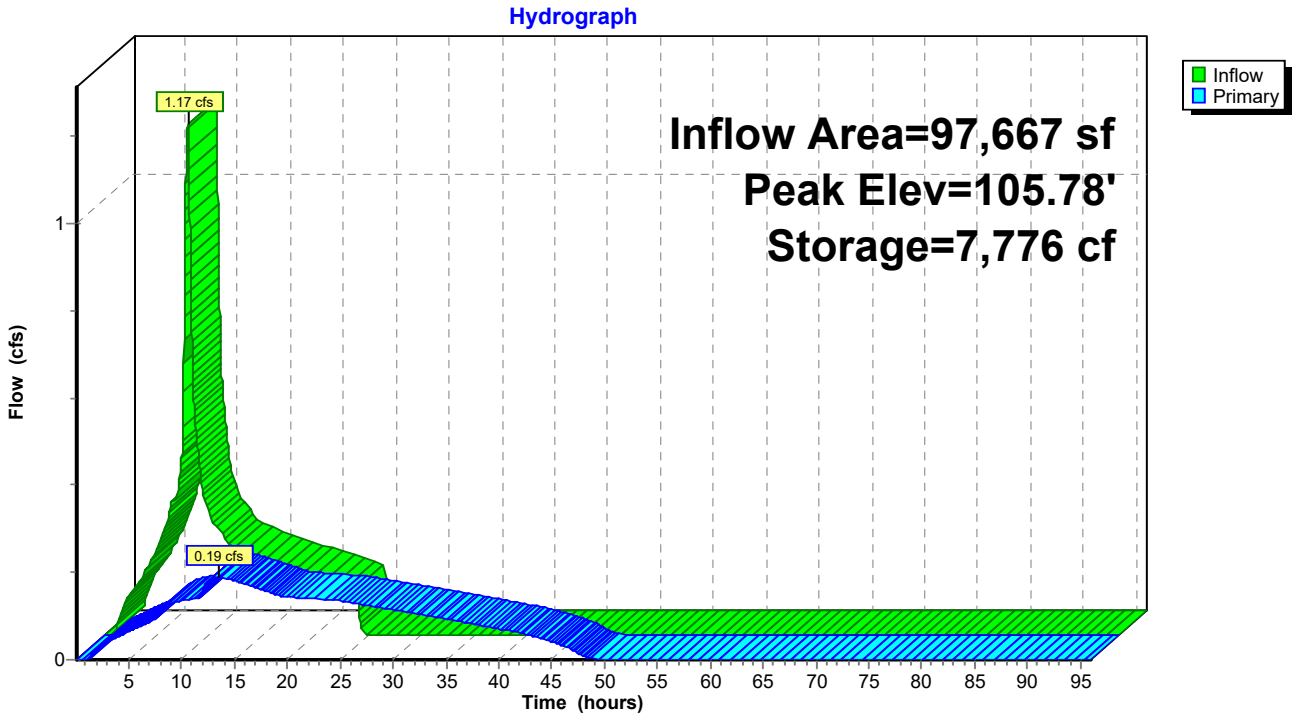
Plug-Flow detention time= 663.9 min calculated for 17,672 cf (100% of inflow)
Center-of-Mass det. time= 663.8 min (1,343.1 - 679.3)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	10,053 cf	**96.0" Round Pipe Storage** L= 200.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**1.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	105.65'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	107.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.19 cfs @ 13.48 hrs HW=105.78' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.14 cfs @ 11.51 fps)
└─**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.22 fps)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3: Detention



Summary for Subcatchment 1: Pre-developed

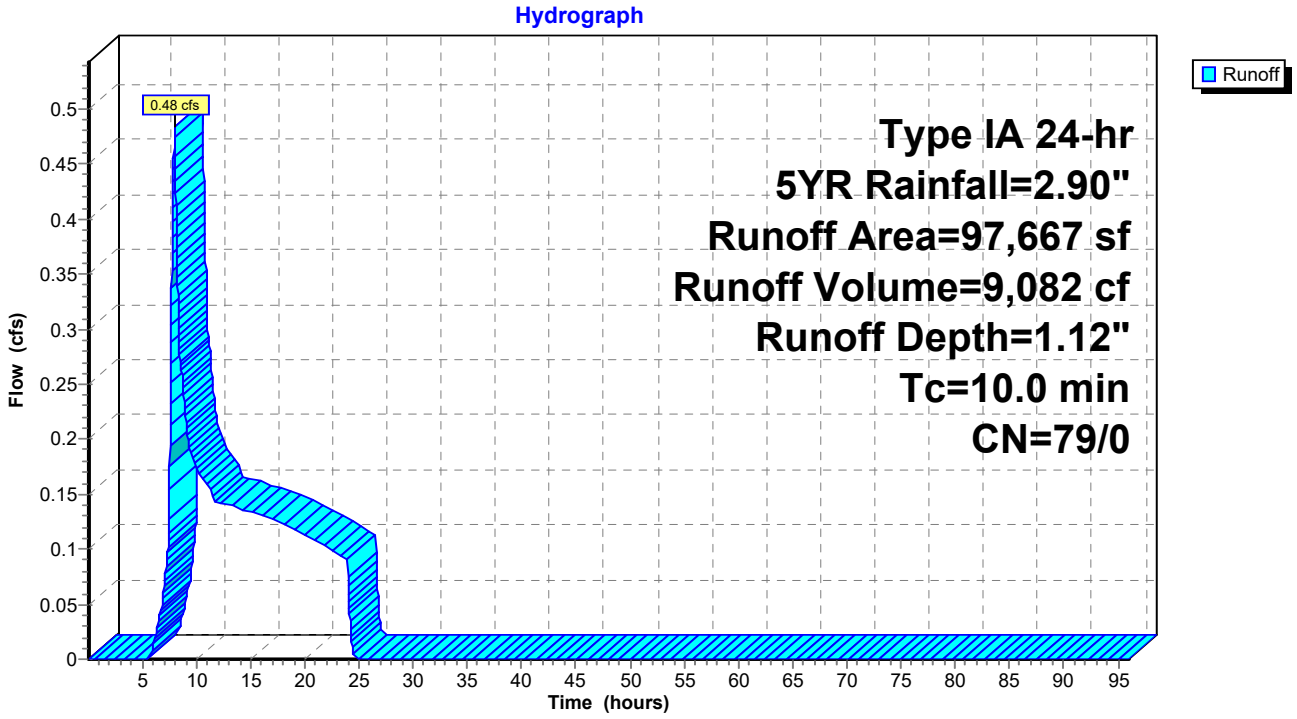
Runoff = 0.48 cfs @ 8.00 hrs, Volume= 9,082 cf, Depth= 1.12"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-96.00 hrs, dt= 0.02 hrs
Type IA 24-hr 5YR Rainfall=2.90"

	Area (sf)	CN	Description
*	97,667	79	
	97,667	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1: Pre-developed



Summary for Pond 3: Detention

Inflow Area = 97,667 sf,100.00% Impervious, Inflow Depth = 2.67" for 5YR event
Inflow = 1.43 cfs @ 7.97 hrs, Volume= 21,720 cf
Outflow = 0.40 cfs @ 9.39 hrs, Volume= 21,720 cf, Atten= 72%, Lag= 85.1 min
Primary = 0.40 cfs @ 9.39 hrs, Volume= 21,720 cf

Routing by Stor-Ind method, Time Span= 0.10-96.00 hrs, dt= 0.02 hrs
Peak Elev= 105.97' @ 9.39 hrs Surf.Area= 1,393 sf Storage= 8,042 cf

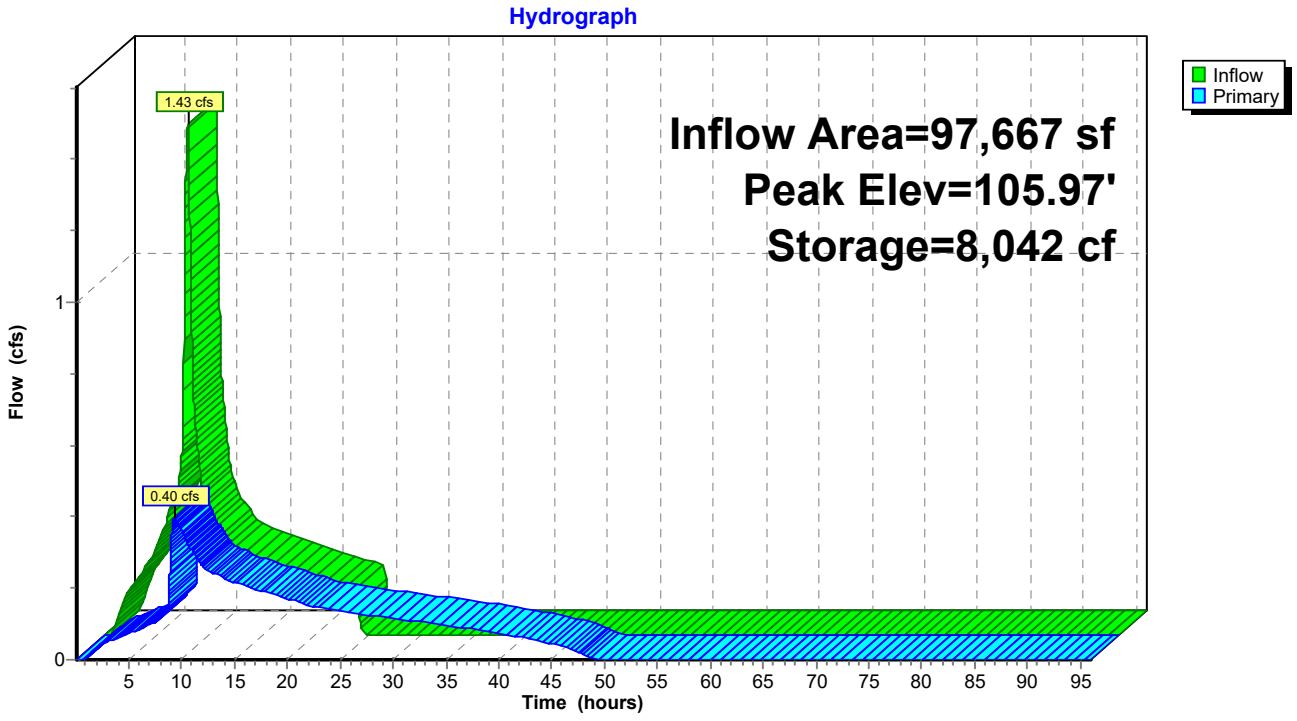
Plug-Flow detention time= 573.7 min calculated for 21,716 cf (100% of inflow)
Center-of-Mass det. time= 573.9 min (1,247.3 - 673.3)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	10,053 cf	**96.0" Round Pipe Storage** L= 200.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**1.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	105.65'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	107.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.40 cfs @ 9.39 hrs HW=105.97' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.14 cfs @ 11.70 fps)
- **2=Orifice/Grate** (Orifice Controls 0.25 cfs @ 1.92 fps)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3: Detention



Summary for Subcatchment 1: Pre-developed

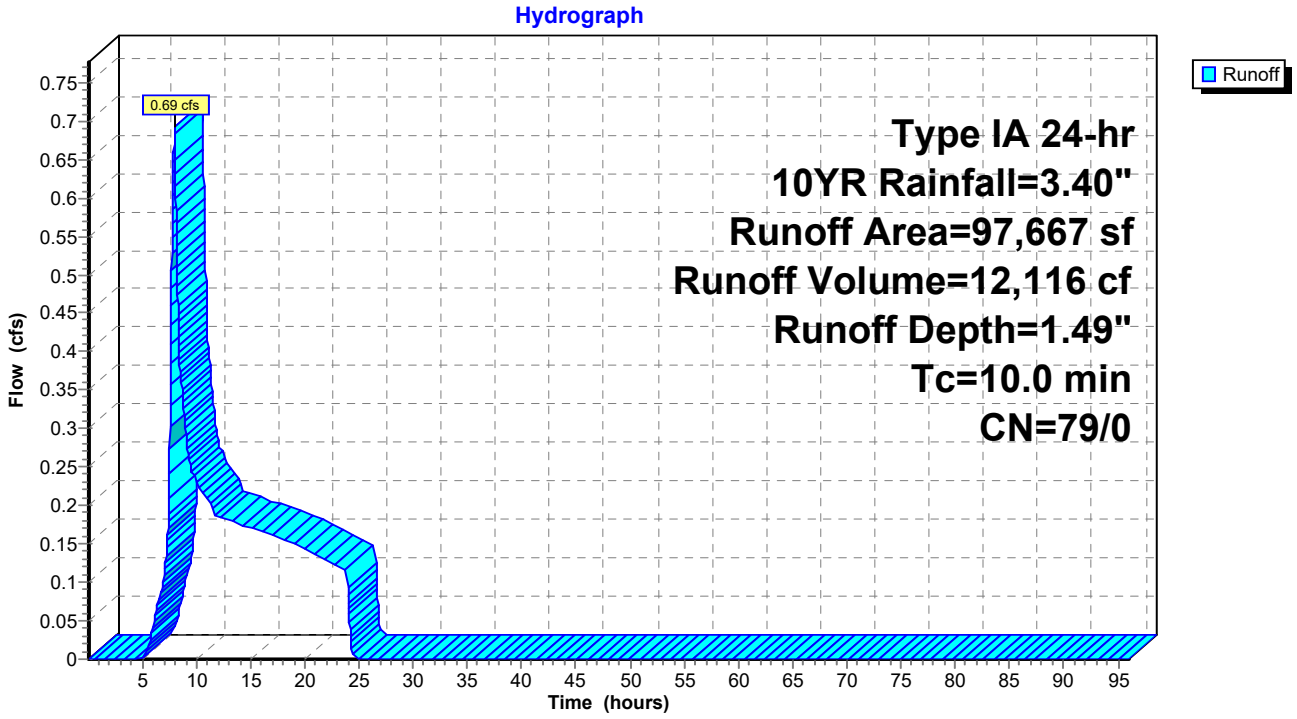
Runoff = 0.69 cfs @ 8.00 hrs, Volume= 12,116 cf, Depth= 1.49"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-96.00 hrs, dt= 0.02 hrs
Type IA 24-hr 10YR Rainfall=3.40"

	Area (sf)	CN	Description
*	97,667	79	
	97,667	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1: Pre-developed



Summary for Pond 3: Detention

Inflow Area = 97,667 sf,100.00% Impervious, Inflow Depth = 3.17" for 10YR event
Inflow = 1.69 cfs @ 7.97 hrs, Volume= 25,774 cf
Outflow = 0.70 cfs @ 8.68 hrs, Volume= 25,774 cf, Atten= 59%, Lag= 42.8 min
Primary = 0.70 cfs @ 8.68 hrs, Volume= 25,774 cf

Routing by Stor-Ind method, Time Span= 0.10-96.00 hrs, dt= 0.02 hrs
Peak Elev= 106.24' @ 8.68 hrs Surf.Area= 1,324 sf Storage= 8,419 cf

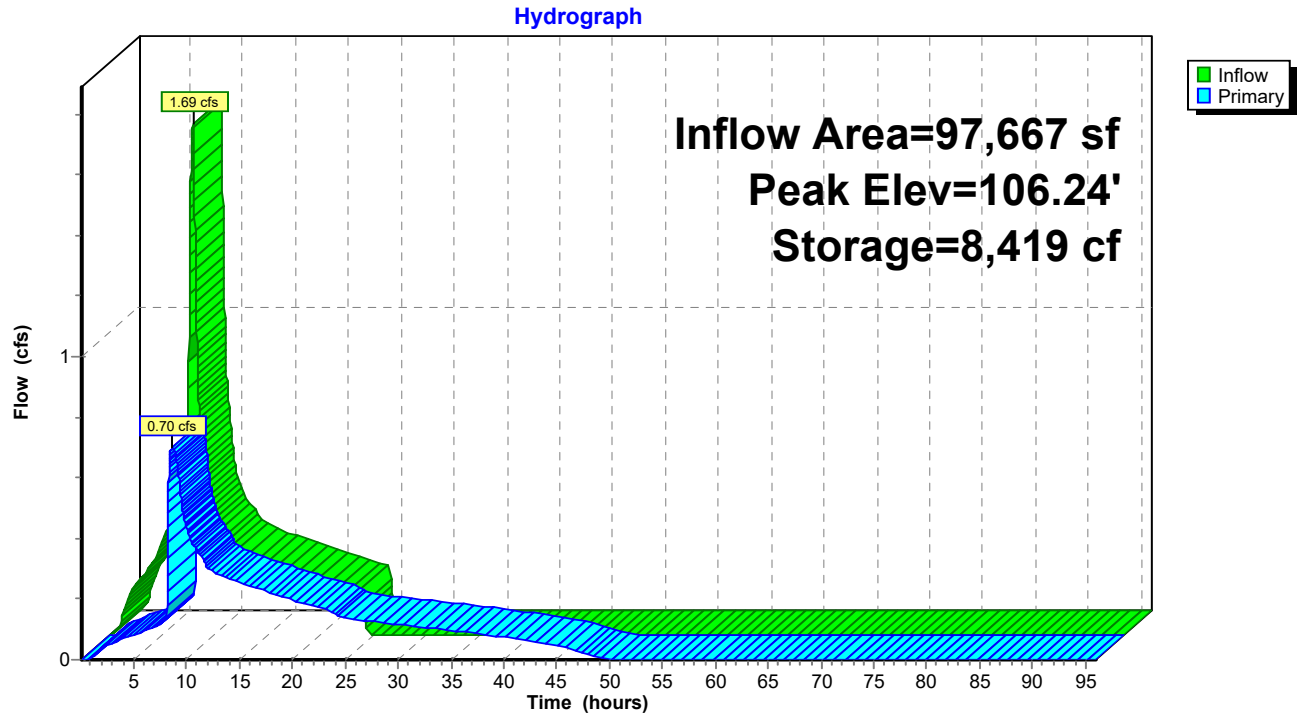
Plug-Flow detention time= 498.8 min calculated for 25,769 cf (100% of inflow)
Center-of-Mass det. time= 499.0 min (1,167.9 - 668.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	10,053 cf	**96.0" Round Pipe Storage** L= 200.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**1.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	105.65'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	107.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.70 cfs @ 8.68 hrs HW=106.24' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 11.97 fps)
- **2=Orifice/Grate** (Orifice Controls 0.56 cfs @ 2.83 fps)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3: Detention



Summary for Subcatchment 1: Pre-developed

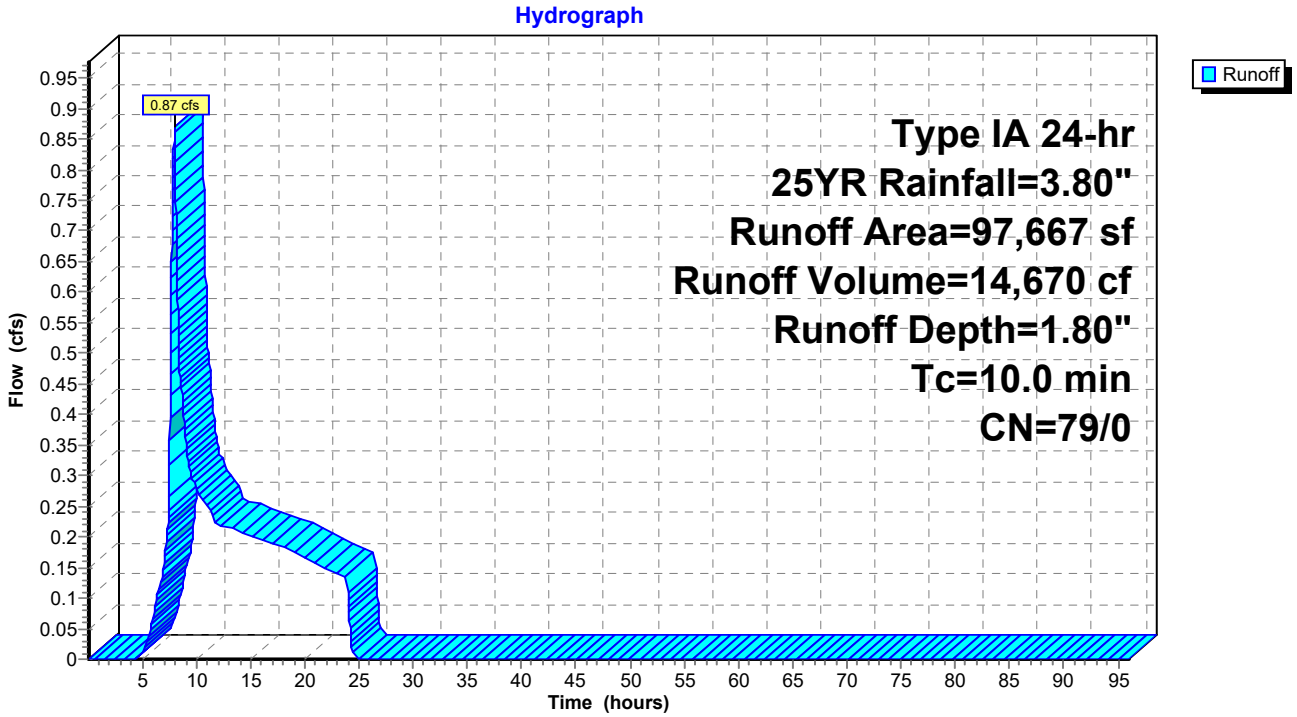
Runoff = 0.87 cfs @ 8.00 hrs, Volume= 14,670 cf, Depth= 1.80"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-96.00 hrs, dt= 0.02 hrs
Type IA 24-hr 25YR Rainfall=3.80"

	Area (sf)	CN	Description
*	97,667	79	
	97,667	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1: Pre-developed



Summary for Pond 3: Detention

Inflow Area = 97,667 sf,100.00% Impervious, Inflow Depth = 3.57" for 25YR event
Inflow = 1.90 cfs @ 7.97 hrs, Volume= 29,020 cf
Outflow = 0.96 cfs @ 8.42 hrs, Volume= 29,020 cf, Atten= 49%, Lag= 27.4 min
Primary = 0.96 cfs @ 8.42 hrs, Volume= 29,020 cf

Routing by Stor-Ind method, Time Span= 0.10-96.00 hrs, dt= 0.02 hrs
Peak Elev= 106.64' @ 8.42 hrs Surf.Area= 1,203 sf Storage= 8,916 cf

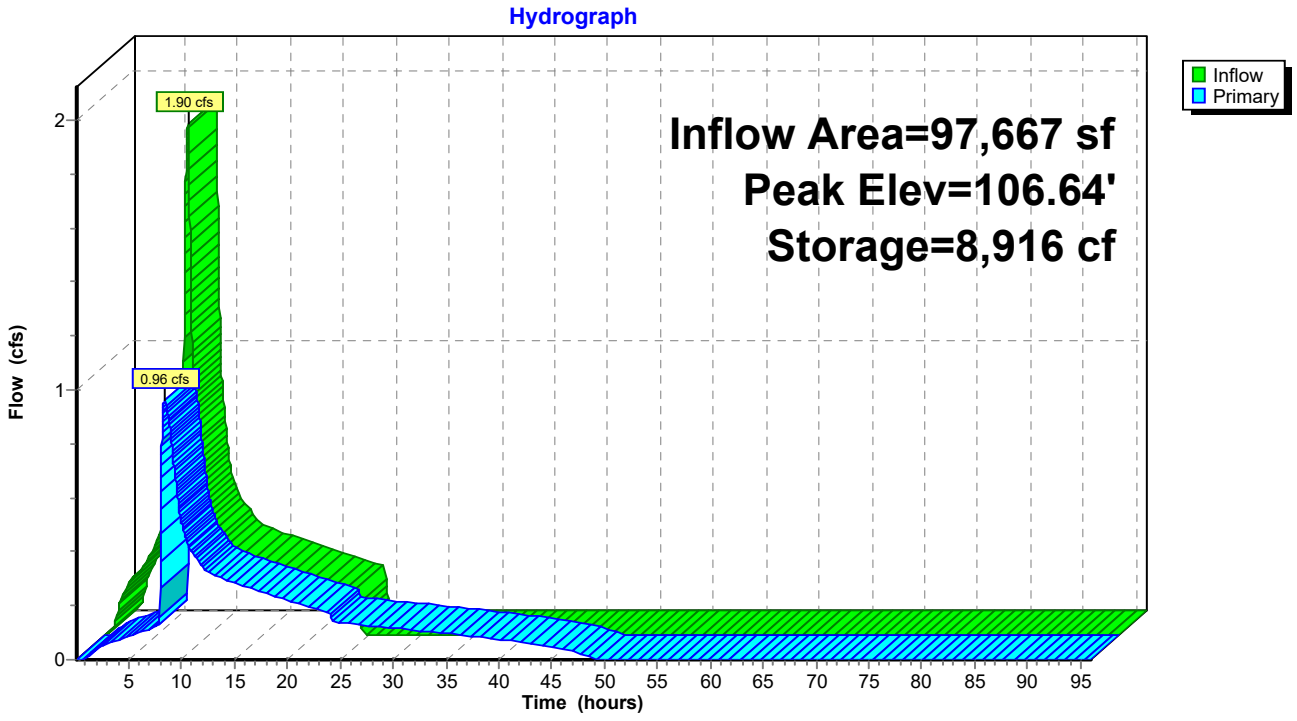
Plug-Flow detention time= 452.7 min calculated for 29,020 cf (100% of inflow)
Center-of-Mass det. time= 452.6 min (1,118.7 - 666.1)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	10,053 cf	**96.0" Round Pipe Storage** L= 200.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**1.5" Vert. Orifice/Grate** C= 0.600
#2	Primary	105.65'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	107.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.96 cfs @ 8.42 hrs HW=106.64' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 12.35 fps)
- **2=Orifice/Grate** (Orifice Controls 0.81 cfs @ 4.13 fps)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3: Detention



Pali Consulting

June 12, 2023

Lango Hansen Landscape Architects
Attn: Kurt Lango, Brian Martin
1100 NW Glisan St #3A
Portland, OR 97209

Report of Geotechnical Services
Sandy Community Campus Park Project
Sandy, Oregon
Project #163-22-002

1.0 INTRODUCTION

Pali Consulting, Inc. (Pali Consulting) presents this report of geotechnical services for the Sandy Community Campus Park Project (Project), located west of the intersection between SE Meinig Avenue and Scenic Street, in Sandy, Oregon. The site is an approximately 7-acre parcel and developed with two athletic fields, an East Field and a West Field, a running track around the West Field, a Skate Park, and street adjacent parking. The location of the site is shown on Figure 1. The current site layout and pertinent features are shown on Figure 2.

Lango Hansen Landscape Architects (Lango Hansen) are designing improvements to the park, which may include a prefabricated lightweight entrance structure, infiltration facilities, and new pavements. Lango Hansen requested that we provide geotechnical design services for the improvements. Our scope of work included reviewing background information, completing drilled borings at locations identified by Lango Hansen, conducting infiltration testing, and completing laboratory tests on select samples, and preparation of this report. Our work was completed in general accordance with our agreement with Lango Hansen, dated December 9, 2022.

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2.0 BACKGROUND REVIEW

2.1 GEOLOGY

The geology in the area is mapped on the Oregon Department of Geology and Mineral Industries' (DOGAMI) website (https://gis.dogami.oregon.gov/maps/geologicmap/#, accessed May 2023). The website maps the parcel within mixed-lithology Troutdale Formation. This formation consists of Miocene to Pleistocene-aged fluvial mudstone, sandstone, and conglomerate, as well as older fluvial terraces.

2.2 GEOLOGIC HAZARDS

Geologic hazards were reviewed using DOGAMI's Statewide Geohazards Viewer (HAZVU) (https://gis.dogami.oregon.gov/maps/hazvu/, accessed June 2023). Geologic hazards mapped at the site include landslides and shaking from Cascadia and local earthquakes. Mapped landslide hazard is low to moderate at the site, but hazard mapping quicky increases from moderate to very high locally where a mapped landslide is present about 60 feet northwest of the outer northwest corner of the track. The mapped landslide is shown on Figure 3. This mapped landslide is about 30 acres in area and has an arcuate headscarp which extends to the north and west of the park and a body extending away from the park to the northwest. Data from DOGAMI indicates that the landside is deep-seated, with an approximate failure depth of 50 feet, a headscarp height of 55 feet, and a complex movement classification. The landslide is pre-historic in age (>150 years) and is described and mapped with moderate certainty. In addition to landslide hazards, very strong earthquake shaking from Cascadia and local earthquakes is also mapped as a hazard at the site.

2.3 WELL LOGS

We reviewed well logs near the site on the Oregon Water Resources Department website (https://apps.wrd.state.or.us/apps/gw/well_log/, accessed May 2023). Logs reviewed adjacent to the site indicated primarily clay or silty clay soils to depths of 25 to 50 feet below the ground surface (bgs) overlying Troutdale Formation bedrock. Nearby well logs reported zones of perched groundwater as shallow as 6 feet bgs, indicating that multiple zones of groundwater may be present.

2.4 GROUNDWATER MAPPING

We reviewed groundwater mapping of the area completed by the United States Geological Survey (USGS) website (https://or.water.usgs.gov/projs_dir/puz/index.html, accessed May 2023). The mapping shows estimated depths to regional groundwater of about 50 feet bgs.

2.5 SOILS MAPPING

We reviewed soils mapped at the site on the Natural Resource Conservation Service (NRCS) Web Soil Survey website (https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx, accessed May 2023). The soil mapping shows three soils mapped at the site: Cazadero silty clay loam (0 to 7 percent slopes), Cazadero silty clay loam (7 to 12 percent slopes) and Dystrochrepts (very steep). Cazadero silty clay loam (0 to 7 percent slopes) and Cazadero silty clay loam (7 to 12 percent slopes) together cover the northernmost 85% of the site. These soils have a parent material of old mixed alluvium and are typically found on terraces. Typical profiles consist of silty clay loam from 0 to 21 inches and clay from 21 to 75 inches. Typical depths to both the water table and a restrictive feature are more than 80 inches. Soils are further described as being well drained with a moderately high capacity of the most limiting layer to transmit water (0.20 to 0.57 in/hr). Dystrochrepts (very steep) is mapped in the southernmost 15% of the site. This soil has a parent material of colluvium derived from andesite and basalt and is typically found on terraces. A typical profile consists of gravelly loam from 0 to 8 inches, very gravelly loam from 8 to 44

inches, and unweathered bedrock from 44 to 48 inches. Depths to the water table range from 36 to 72 inches, and depth to a restrictive feature is about 40 to 60 inches to lithic bedrock. This soil is further described as being well drained with a moderately high to high capacity of the most limiting layer to transmit water (0.20 to 1.98 in/hr).

Fill is not mapped at the site, but based on site grades and our geotechnical explorations, described later in this report, grading has occurred which has included fills and modifications to the natural soils.

2.6 AERIAL PHOTOGRAPHS & CONSTRUCTION PLANS

We reviewed historic aerial photographs from the years 1995 through 2023 available on Google Earth Pro©, and from the years 1952, 1956, 1970, and 1986 available through USGS Earth Explorer. We also reviewed as-built plans provided by Lango Hansen.

2.6.1 Development History

Our review of the aerial photographs found that the site was forested at the time of the earliest air photo in 1952. In the 1952 photo, Scenic Street appears to extend westward of its modern terminus and leads to a tear-shaped cleared area within the trees which is likely a landfill, based on anecdotal reports. By the time of the 1956 photo, most of the trees had been cleared from the park area with a few scattered patches of vegetation remaining on the south and east sides. Between the 1956 photo and the next photo in 1970, the park was constructed and consisted of two mowed grass fields separated by a short steep slope, with a running track on the lower field. Vegetation to the northeast of the park is cleared in the 1970 photo and gradually fills in over the next air photo years to the current condition. Between the 1995 and 2000 air photos, the Skate Park located in the southeast corner of the park was built. In air photos taken from 1970 to present, grading and development at the site appears consistent with what is present today.

2.6.2 Landforms

Because of the nearby mapped landslide, we also reviewed the aerial photographs for signs of slope instability and related landforms. The 1952 air photo shows two irregularly shaped cleared areas in the vicinity of the park area. The first, located west of the park, is likely the landfill noted in the section above. The second cleared area is smaller and located at the terminus of modern-day Scenic Street, to the north of the park. This could be a second landfill, or a cleared and graded area intended for development or other use. These two areas remain visible in the 1956 air photo, and much of the land to the south and east of them (future Sandy Park) is cleared of vegetation. At the time of the next air photo, in 1970, the west (landfill) cleared area is no longer visible, as it has apparently revegetated. The north cleared area, however, appears to be incorporated into a broader cleared area extending down to Scenic Street. An arcuate landform is visible in the 1970 photo at approximately the same location as the mapped scarp of the landslide discussed in *Section 2.2*. This landform is mostly bare, with some scattered vegetation. Downslope (northwest) of the scarp, vegetation consists mostly of forested land with some small bare areas which may indicate ground disturbance. Vegetation appears younger on the east side of the mapped landslide body, but it is not clear whether this is due to die-off caused by ground movement or harvest which occurred between air photo years. There is a triangular patch of bare ground extending northwest from about the middle of the visible scarp which may indicate an area of greater localized instability. The 1986 air photo shows revegetation of the mapped scarp and body areas, with only a small bare area visible at the location of the triangular bare ground in the 1970 photo. Air photos dating from between 1995 and 2023 do not show further evidence of disturbance to these features.

3.0 SITE CONDITIONS

3.1 SURFACE CONDITIONS

The site consists of a 7-acre parcel bound to the northeast by Scenic Street, to the east by SE Meinig Avenue, to the south by a short private road leading to an adjacent commercial development (the SandyNet facility), and to the west and northwest by forested land. The Sandy Skate Park is located in the southeast corner of the property. The bulk of the site is developed with two grass-covered fields, the East Field and West Field, which are separated by a short steep slope. The West Field contains a running track and the ground within the track varies in elevation from the track, raised up to a few feet in some locations and lower than the track in others. A drainage ditch parallels the inside edge of the track and inlet grates are visible within the ditch. Parking for the park consists of off-street parking abutting Meinig Avenue near the Skate Park. Access to the park is via a short paved ramp from parking area. There is also a narrow paved access road which runs down to the West Field from the SandyNet facility.

West of the West Field track, flat ground continues to an area which is heavily wooded. This area is believed to be the former landfill area.

Elevations at the site range from 940 feet MSL in the northwest corner of the site adjacent the skate park to about 900 feet MSL at its westernmost point.

3.2 SUBSURFACE CONDITIONS

We completed three machine-drilled borings, designated B-1 through B-3, to depths ranging between approximately 21.5 feet to 26.5 feet bgs. Infiltration testing was completed adjacent to two of the borings, Borings B-1 and B-2, with test designations IT-1 and IT-2, respectively. IT-1 was completed at a depth of 5 feet bgs and IT-2 was completed at a depth of 15 feet bgs. The approximate locations of our explorations and infiltration tests are shown on Figure 2.

Our site explorations and testing were completed on May 20th, 2023. Descriptions and logs of our subsurface explorations are included in Appendix A. Infiltration testing is described in Appendix A and the results are discussed in *Section 4.0*.

Our site explorations encountered a thin layer of topsoil in all borings, overlying about 5 feet of fill in Borings B-1 and B-3. Beneath the topsoil or fill, we encountered native silt and clay soils to 26.5 feet bgs, the maximum depth of explorations. These units are described in more detail below.

3.2.1 Topsoil

Our explorations encountered moist brown silty topsoil up to 6 inches deep across the site. The topsoil contained a variable root zone/organics which extended to about 4 inches depth. No topsoil samples were collected, and it is not noted on the logs in Appendix A, except the thickness of a root mass where encountered.

3.2.2 Silt Fill

Underlying the topsoil, our explorations encountered up to 5 feet of silt soil we interpret as fill in two of the borings, Boring B-1 and Boring B-3. The fill in Boring B-1 appears to be from raising the field within the track to allow for drainage to a drainage ditch paralleling the inside edge of the track. The fill in Boring B-3 appears to be from general grading for the field. The fill was generally brown with black, red, and grey mottling, and was characterized by a blocky appearance, which was used to distinguish it from similar native soils. The fill was found to be medium stiff based on SPT blow counts (N-values) of 4 to 7 in the borings completed, with an average of 6.

Laboratory testing on samples from the fill found moisture contents ranging from 33 to 37 percent. The plasticity of the fill was interpreted as low in B-1 to high in B-3, based on Atterberg limits testing, which measured plasticity indices (PI's) of 13 to 28, resulting in a USCS classification of ML to MH.

3.2.3 Native Silt

In the West Field we encountered native silt below the topsoil or fill that extended to 26.5 feet bgs, the maximum depth of exploration. This native silt was varicolored, contained small amounts of sand and gravel, and was moist to wet. Mottling of the soils was generally noted at all depths. The silt varied from medium stiff to very stiff, based on N-values that ranged from 5 to 20 in the borings completed, with an average of 11.

Laboratory testing found moisture contents ranging from 31 to 62 percent. The plasticity of the silt was interpreted as low to moderate, based on Atterberg limits testing, which measured a PI of 21 in one sample tested, resulting in a USCS classification of MH. A second sample tested was found to be non-plastic. The silt contained varying amounts of sand and gravel ranging from 7 to 11 percent in the samples tested.

3.2.3 Native Clay

In the east field we encountered native clay below the fill that extended to 21.5 feet bgs, the maximum depth of exploration. This native clay was brown-red to grey, contained small amounts of sand, gravel, wood, and other organic material, and was moist at all depths. Slight mottling of the clay was noted beginning at about 15 feet bgs. The clay varied from soft to stiff, based on N-values that ranged from 4 to 14, with an average of 9.

Laboratory testing found moisture contents ranging from 34 to 57 percent. The plasticity of the clay was interpreted as moderate, based on Atterberg limits testing, which measured a PI of 22 in one sample tested, resulting in a USCS classification of CL. It was noted in the field that plasticity of the clay generally increased with depth. The clay contained about 12 percent sand and gravel, based on one sample tested.

3.2.4 Groundwater

Groundwater was encountered in Borings B-1 and B-2 at depths of 20.3 and 22.8 ft bgs, respectively. These were likely perched zones of groundwater, based on USGS regional groundwater mapping and local water well logs. These perched zones are likely variable and higher during the wet season. We estimate that seasonal high groundwater and/or intermittent saturation occurs within about 15 feet or less of the ground surface during the rainy season. This is based on NRCS soil descriptions, soil mottling we observed, moisture content determined in our laboratory tests, and standing water observed at the site during our site explorations.

We note that groundwater elevations can vary from those encountered and interpreted due to the time of year, precipitation, and other factors.

4.0 INFILTRATION TESTING

We completed infiltration tests at two locations within the West Field. IT-1 was completed at a depth of 5 feet bgs and IT-2 was completed at a depth of 15 feet bgs. The tests were completed on May 20th, 2023, at the approximate locations shown on Figure 2. The tests were completed as described in Appendix A of this report. We measured the results documented in Table 1 below during our field infiltration tests.

Table 1. Field-Measured Infiltration Rates

Location	Unfactored Rate	Soil Type	Notes
B-1	1.1 in/hr	ML (fill)	Measured over a 2-hour period following a 1-hour soaking period.
B-2	0.2 in/hr	ML (native)	Measured over a 2-hour period following a 1-hour soaking period.

As indicated in Table 1, the measured field infiltration rate is moderate to low at Boring B-1 (IT-1) and negligible at Boring B-2 (IT-2). Conclusions regarding the application of the field infiltration rates are provided in *Section 5.0*.

5.0 CONCLUSIONS

Based on our explorations, testing, and analyses, it is our opinion that the proposed improvements are feasible from a geotechnical perspective, provided the recommendations in this report are included in design and construction. We offer the following general summary of our conclusions:

- The site is adjacent a mapped deep-seated landslide which is considered pre-historic, but exhibits possible indications within the photo record. The stability of the landslide was not determined so development of the park should consider the risk of future movement of this landform. Such considerations should, at a minimum, include precluding or minimizing fills on the West Field and directing stormwater away from the mapped landslide.
- The site is underlain by fill locally and native soils throughout that are predominately high to low plasticity silt in the west field and clay in the east field. These soils continue to depths of at least 26.5 feet bgs.
- Perched groundwater is expected to be present at variable depths throughout much of the year and within the upper 15 feet bgs during wetter periods of the year. Regional groundwater is expected to be at about 50 feet bgs, as mapped.
- Soils have very low permeability across the site and to the depths explored. The low permeability of site soils make on-site stormwater infiltration unlikely.
- Excavation and handling of site soils should be readily accomplished with conventional earthwork equipment in good working condition. However, the fine-grained soils are moisture-sensitive and will be easily disturbed (e.g., rutted, pumped, etc.) by construction activities during wet weather if special measures are not taken to reduce disturbance.
- Soils at the site are generally medium stiff or better and, based on the measured N-values, exhibited a relatively uniform stiffness across the site, including in areas of fill. Such soils should be capable of supporting anticipated structures and infrastructure, although areas of fill have the potential to include areas of soft or unsuitable soils which are difficult to predict. Construction records confirming compaction of the fill were not located, but based on the uniform material type, soil consistency, and lack of deleterious materials, the fill appears to have been placed as structural fill in areas of our explorations. The on-site fill is expected to be able to support the improvements suitably but should be further evaluated during construction.
- The use of shallow foundations are suitable for lightly loaded structures.
- Pavements should follow the recommendations in this report.

6.0 EARTHWORK RECOMMENDATIONS

We understand that grading for the site will be limited to cuts and fills of less than about 4 feet. All earthwork activities should be conducted in general accordance with Appendix J of the Oregon Structural Specialty Code (OSSC), City of Sandy (City) Municipal Code, and the Oregon Department of Transportation (ODOT) Standard Specifications for Construction (SSC), and the recommendations that follow.

Due to the presence of the mapped deep-seated landslide, additional fill should not be placed within a distance of at least 110 feet of the mapped landslide headscarp (2 times the mapped headscarp height) without more detailed analysis. The approximate location of this line is shown on Figure 3.

Due to the presence of moisture-sensitive soils, subgrade preparation should be limited to the dry season, typically June through September, and follow the recommendations in *Section 6.2* related to wet weather conditions.

6.1 SITE PREPARATION

Initial site preparation will include demolition of existing facilities where present, followed by clearing, stripping and excavating to grade in areas of improvements. Demolition should include removal of existing structures, improvements, and uncontrolled fill to the full extent they occur. Where piping is present, it should be fully removed, or grouted full if abandoned in place. Excavations and areas below grade resulting from demolition should be backfilled with structural fill as described later in this report.

In unimproved aeras, clearing and stripping should extend approximately 5 feet laterally beyond areas of improvements, as needed for equipment access. Pathways should be stripped at least 2 foot wider than the pathway or the minimum necessary to prepare the subgrade per *Section 6.3*, whichever is greater. Based on our explorations, the average depth of stripping will be approximately 6 inches, although greater stripping depths may be required to remove localized zones of loose or organic soil or in areas of the site which were not explored. Actual stripping depths should be evaluated based on observations during the stripping operation. Stripped materials should be hauled off-site or stockpiled for later use as landscaping material.

6.2 SOFT SOIL/WET SOIL/WET WEATHER CONSTRUCTION

The existing surface soils are fine-grained and will be susceptible to disturbance (e.g., pumping and rutting) during periods of wet weather or when the moisture content of the material is more than a few percentage points above optimum. This may be the case during much of the year, but especially in late fall through spring. When wet, the on-site soils are susceptible to disturbance and generally will provide inadequate support for construction equipment. As such, we recommend that site earthwork operations be scheduled for the dry months. If site grading and fill placement occur during wet weather conditions, however, it will be necessary to use wet weather construction techniques. Such measures may include, but are not limited to the following:

- The use of track-mounted equipment and staging to limit subgrade disturbance.
- The use of haul roads or working pads where the subgrade may be subjected to repeated heavy construction traffic. Haul roads and working pads will likely require 18 inches of imported granular material, while twelve inches of imported granular material may be sufficient for light staging areas. The imported granular material should consist of crushed rock that is well-graded between coarse and fine particle sizes, contains no unsuitable materials or particles larger than 4 inches, and has less than 5 percent by weight passing the U.S. Standard No. 200 sieve. The imported granular material should be placed in one lift over the prepared, undisturbed subgrade

and be compacted using a smooth-drum, nonvibratory roller. A geotextile separator will reduce the required rock section as well as subgrade disturbance.

- The use of smooth edge buckets.
- Other methods to limit subgrade disturbance, as determined by the contractor.
- The use of cement-amended soils may be considered as well.

Because subgrade disturbance can vary greatly depending on the Contractor's means, methods, and schedule, we recommend that the Contractor be responsible to protect the subgrade as needed to complete earthworks and grading necessary for this project.

6.3 SUBGRADE EVALUATION AND PREPARATION

Following demolition and stripping, the existing subgrade within areas to be improved should be proofrolled with a fully-loaded dump truck or similar heavy rubber-tired construction equipment to identify remaining soft, loose, or unsuitable areas, where accessible. The proofrolling should be observed by Pali Consulting, who should evaluate the suitability of the subgrade and identify any areas of yielding that are indicative of soft soil. If soft zones are identified during proofrolling, these areas should be excavated to the extent indicated by Pali Consulting and replaced with structural fill. Because of the presence of undocumented fill encountered in the site explorations, greater than typical overexcavation should be anticipated in areas of undocumented fill.

6.4 EXCAVATION

Site soils within expected excavation depths of up to 4 feet bgs will generally consist of clay and silt soils at variable moisture content but which are typically above optimum. It is our opinion that conventional earthmoving equipment in proper working condition should be capable of making necessary general excavations for the project, although low impact tracked equipment may be required to minimize site disturbance per *Section 6.2*. The earthwork contractor should be responsible to provide the equipment and procedures to excavate the site soils described in the exploration logs and text of this report. Softened material or pumping subgrades at the base of excavations should be moisture-conditioned and compacted as structural fill or replaced with granular structural fill prior to placing additional fill or placing concrete.

6.5 EXCAVATION DEWATERING

Perched groundwater may occur within the depths of planned excavations during most of the year. During the wet season, perched groundwater is expected to be more shallow and likely. Excavations that extend into saturated soils may need to be dewatered. If groundwater is encountered, sump pumps placed in the excavations should be sufficient for dewatering in most situations, however, other methods may be necessary if groundwater inflow becomes significant.

In addition to groundwater seepage, surface water inflow to the excavations during the wet season could be problematic.

Provisions for temporary ground and surface water control should be included in the project plans and should be installed prior to commencing work.

6.6 EXCAVATION STABILITY

Excavation sidewalls should stand near-vertical to a depth of approximately 4 feet or more, provided perched or near-surface groundwater seepage does not affect the sidewalls. Excavations made to construct footings or other structural elements should be laid back at the surface as necessary to prevent soil from falling into excavations. All trench excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and state regulations. On-site soils anticipated within excavation depths are generally OSHA Type B soils.

While this report describes certain approaches to excavation, the contractor is responsible for selecting and designing the specific methods, monitoring the excavations for safety, and providing shoring required to protect personnel and adjacent structural elements.

6.7 STRUCTURAL FILL AND BACKFILL

Structural areas include all areas beneath fields, foundations, pavements, and any other areas intended to support structures or within the influence zones of structures.

Structural fill for the project can consist of the following soils per *Sections 6.7.1* through *6.7.4*. All structural fill should be free of debris, roots, organic matter, frozen soil, man-made contaminants, particles with greatest dimension exceeding 4 inches, and other deleterious materials. The suitability of soil for use as structural fill will depend on the gradation and moisture content of the soil. As the fines content of the soil increases, the soil becomes increasingly more sensitive to small changes in moisture content and achieving the required degree of compaction becomes more difficult or impossible.

6.7.1 On-Site Soils

The on-site soils may be used as structural fill, where they meet the general criteria above and have a PI of less than 20. Of the four PI's measured in site soils, only one had a PI below 20 (13) while two had PI's just over 20 (21 and 22) and one had a PI of 28. Based on the PI testing, shallow soil in the West Field may be suitable for use for fill, but in the East Field may not. Consideration could be given to the use of soils with marginally high PI's if special measures are taken. This general distribution of material can be used for planning purposes, but testing during construction should confirm the suitability of on-site soil used as structural fill.

The on-site soils will be sensitive to moisture content and may require moisture conditioning. If used as structural fill, the material should be placed and compacted in lifts with maximum uncompacted thicknesses and relative densities as recommended in the tables that follow. If proper moisture conditions cannot be attained, we recommend using imported structural fill per the following sections.

6.7.2 Imported Select Structural Fill

Imported granular material used as structural fill should be pit or quarry run rock, crushed rock, or crushed gravel and sand and should meet the specifications provided in SSC 00330.14 – Selected Granular Backfill or SSC 00330.15 – Selected Stone Backfill. The imported granular material should also be angular, fairly-well graded between coarse and fine material, have less than 10 percent by dry weight passing the U.S. Standard No. 200 Sieve, and have at least two mechanically fractured faces. The material should be placed and compacted in lifts with maximum uncompacted thicknesses and relative densities as recommended in the tables that follow. During dry weather, the fines content may be increased to a maximum of 20 percent.

6.7.3 Aggregate Base

Imported granular material used as aggregate base (base rock) beneath structures should be clean, crushed rock or crushed gravel and sand that is well graded between coarse and fine. The base aggregate should

meet the specifications of SSC 00641 – Aggregate Subbase, Base, and Shoulder Base Aggregate, depending upon application, with the exception that the aggregate have less than 5 percent by dry weight passing a U.S. Standard No. 200 Sieve based on the minus 3/4-inch fraction and have at least two mechanically fractured faces. The aggregate base should have a maximum particle size of 1 inch.

The aggregate base material should be placed and compacted in lifts with maximum uncompacted thicknesses and relative densities as recommended in the tables that follow.

6.7.4 Trench Backfill

Utility trench backfill for pipe bedding and in the pipe zone should consist of well-graded granular material with a maximum particle size of 3/4-inch and less than 10 percent fines. The material should meet the structural fill recommendations provided above. Further, the pipe bedding and fill in the pipe zone should meet the pipe manufacturer's recommendations. Above the pipe zone imported select granular fill or on-site soils may be used as described above, consistent with the overlying use of the area.

The pipe bedding and backfill should be placed and compacted in lifts with maximum uncompacted thicknesses and relative densities as recommended in Table 4.

6.8 FILL PLACEMENT AND COMPACTION

Structural fill should be placed and compacted in accordance with the following guidelines.

- Place fill and backfill on an approved subgrade prepared as recommended in *Sections 6.1 through 6.3*. Place fill or backfill in uniform horizontal lifts with a thickness appropriate for the material type and compaction equipment. Table 2 provides general guidance for lift thicknesses.
- Use appropriate operating procedures to attain uniform coverage of the area being compacted.

Table 2. Guidelines for Uncompacted Lift Thickness

Compaction Equipment	Guidelines for Uncompacted Lift Thickness (inches)		
	On-Site Soil	Granular and Crushed Rock (Maximum Particle Size < 1½")	Crushed Rock (Maximum Particle Size > 1½")
Plate Compactors and Jumping Jacks	4 – 8	4 – 8	Not Recommended
Rubber-Tire Equipment	6 – 8	10 – 12	6 – 8
Light Roller	8 – 10	10 – 12	8 – 10
Heavy Roller	10 – 12	12 – 18	12 – 16
Hoe Pack Equipment	12 – 16	18 – 24	12 – 16

Note: The above table is based on our experience and is intended to serve as a guideline. The information provided in this table should not be included in the project specifications.

- Place fill at a moisture content within about 3 percent of optimum as determined in accordance with ASTM Test Method D 1557. Moisture condition fill to achieve uniform moisture content within the specified range before compacting. Compact fill to the percent of maximum dry densities as noted in Table 3.
- Do not place, spread, or compact fill soils during freezing or unfavorable weather conditions. Frozen or disturbed lifts should be removed or properly recompacted prior to placement of subsequent lifts of fill soil.

Table 3. Fill Compaction Criteria

Fill Type	Percent of Maximum Dry Density Determined in Accordance with ASTM D 1557		
	0 – 2 Feet Below Subgrade	>2 Feet Below Subgrade	Pipe Bedding and Pipe Zone
Mass Fill (on-site)[1]	92	90	----
Mass Fill (imported)[1]	95	92	----
Aggregate Base[1]	95	95	----
Trench Backfill	95	92	90
Nonstructural Trench Backfill	88	88	----
Nonstructural Zones	88	88	90

Notes:

1. Structural fill with more than 30 percent retained on the ¾-inch sieve should be compacted to a well-keyed dense state within 3 percent of optimum moisture content.

During structural fill placement and compaction, a sufficient number of in-place density tests should be completed by Pali Consulting to verify that the specified degree of compaction is being achieved.

6.9 CUT AND FILL SLOPES

The following sections provide recommendations for cut and fill slopes up to 4 feet high. If cut or fill slopes greater than 4 feet in height are planned, Pali Consulting should be contacted for additional geotechnical evaluation. Cut and fill slopes should be planted with appropriate vegetation as soon as possible after grading to provide protection against erosion.

6.9.1 Cut Slopes

Permanent cut slopes should be limited to an inclination of 2 horizontal to 1 vertical (2H:1V) or flatter for slopes up to 4 feet in height unless supported by retaining structures. Slopes to be mowed or otherwise maintained should be limited to an inclination of 3H:1V. If seepage occurs within any slope, flatter slopes or structural measures may be needed for stability. A qualified engineer should design such measures.

6.9.2 Fill Slopes

Permanent fill slopes should not exceed 2H:1V gradients, or 3H:1V if mowed or maintained as noted above. Keyways will be necessary for support of all fill slopes where the subgrade slopes at greater than 5H:1V. Additionally, when placed on ground sloping steeper than 5H:1V, the ground should be benched. Keyways should have a minimum embedment of 2 feet into firm, undisturbed native soils. Keyway depths should be evaluated in the field on a case-by-case basis by the geotechnical engineer.

6.10 Drainage and Erosion Control

Surface runoff can be controlled during construction by careful grading practices. Such practices typically include the construction of shallow, perimeter ditches or low earthen berms, and the use of temporary sumps to collect runoff and prevent water from ponding and damaging exposed subgrades.

Storm drainage should be carefully planned so surface gradients direct stormwater away from building foundations, slopes, paved areas, and sidewalks. Water from roof downspouts should similarly be conveyed away from such areas. All storm drainage should be conveyed away from the mapped deep-seated landslide and to the drainage west of the West Field, rather than north of the West Field.

Erosion control measures during and after construction should comply with City standards.

7.0 PAVEMENT DESIGN

New pavements may consist of conventional asphaltic concrete (AC) or Portland cement concrete (PCC) for roadways, parking areas and paths. Our recommendations for these roadways are provided in the sections below.

7.1 Roadway and Parking Design

Roadway and parking pavement will consist of conventional AC or PCC pavements. We understand that traffic counts are not available but are expected to be very light. Traffic is expected to be almost exclusively consist of passenger vehicles with an occasional firetruck in emergencies and an occasional maintenance vehicle. Thus, we assumed a traffic loading of 10,000 equivalent single-axle loads (ESALs).

For AC pavement design, this is consistent with the Asphalt Paving Association of Oregon (APAO) Traffic Level I, which is described as follows:

- Traffic Level I – Very light traffic for parking lots and residential driveways (up to one truck per day and 10,000 equivalent axle loads [EAL's] in a 20-year period).

In calculating the AC pavement, we used a reliability level of 75 percent. A reliability level of 75 percent is recommended for facilities that are moderately important but can allow some disruption in use during the lifetime of the pavements, which is appropriate for this facility.

For PCC pavement design, we used the guidelines developed by the American Association of State Highway and Transportation Officials (AASHTO) Guide for Design of Pavement Structures (AASHTO 1993). We assumed a reliability and standard deviation of 95 percent and 0.35, respectively, a PCC compressive strength of 4,000 psi, and a modulus of rupture of 500 psi.

For all pavements, we assumed that site development occurs during a period of dry weather, and that site and subgrade preparation are completed in accordance with the recommendations of this report.

If the above assumptions are inaccurate, please contact us to develop updated recommendations.

7.1.1 AC and PCC Pavement Sections

Based on the above and provided the soil subgrade will be prepared as described in *Sections 6.1* through *6.3*, the conventional AC pavement section shown in Table 4 may be utilized, with an approximate service life of 20 years. If preferable to the City, the more conservative standard pavement section for a Local Street Section, per Standard Drawing No. 201, can be used in lieu of the minimum section.

Table 4. Minimum Pavement Section with Compacted Subgrade

Pavement Designation	AC (inches)	Aggregate Base (inches)
Conventional AC	3.0	6.0
City Local Street Section	3.5	10.0

For PCC pavements, the recommended section is shown in Table 5 below.

Table 5. Minimum Pavement Sections with Compacted Subgrade

Pavement Type	Pavement (inches)	Aggregate (inches)
PCC	5.0	6.0

The pavement sections in Tables 4 and 5 are minimum recommended material thicknesses and assume the subgrade has been prepared as recommended in this report.

We note that the "design aggregate base" thickness for pavement areas is intended to support post-construction design traffic and should not be used to support construction traffic or when the subgrade soils are wet. Accordingly, if staging areas or haul roads are proposed in pavement areas, the "design thickness" of the base rock should not be relied upon and additional thicknesses of base rock should be placed.

7.1.2 Pavement Materials

7.1.2.1 AC Pavements

The AC should be Level 2, 12.5-mm, dense hot mixed asphalt concrete according to the Oregon Department of Transportation (ODOT) Standard Specifications for Construction (SSC) 00744 – Minor Hot Mixed Asphalt Concrete Pavement. The asphalt cement binder should be PG 64-22 Performance Grade Asphalt Cement. The minimum AC lift thickness should be 1.5 inches. The AC should be compacted to 91 percent of Rice Density of the mix, as determined in accordance with ASTM D 2041.

7.1.2.2 PCC Pavements

The PCC should conform to the specifications provided in OSS Section 00756 - Plain Concrete Pavement. The PCC should have a minimum compressive strength of 4,000 psi and nominal maximum aggregate size of 1.5 inches. The PCC should be constructed with a maximum joint spacing of 15 feet. The slabs shall be interlocked at contraction joints (e.g., continuous slab with no dowels). However, dowels should be used at construction and expansion joints.

7.1.2.3 Aggregate Base

Imported granular material used as base aggregate (base rock) for conventional pavements should meet the criteria specified in *Sections 6.7.3 and 6.8.*

7.1.3 PAVEMENT CONSTRUCTION CONSIDERATIONS

Construction should be completed in general accordance with the SSC and applicable recommendations in *Section* 6.0 of this report. Construction traffic should not be allowed on new pavements. If construction traffic is to be allowed on newly constructed pavements, an allowance for additional traffic will need to be made in the design pavement section.

7.2 PATHWAY PAVEMENTS

Pathways for pedestrian use will consist of conventional AC or PCC surfacing. Minimum sections for AC pathways are provided in the Trail Design Guidelines (Portland Parks & Recreation, 2009). For both single and multiple users, including maintenance vehicles, an AC section of 3 inches is recommended over a crushed rock base. For pedestrian use only, however, a thinner AC section is appropriate. For PCC sidewalks, we recommend the requirements of the City of Sandy Standard Drawing No. 205 be met, except with an increased rock section to improve drainage and support on the seasonally wet soils. The recommended sections for pedestrian only walkways are provided in Table 6, below. If occasional vehicle traffic will use the pathways, for example, maintenance or emergency vehicles, we recommend the sections in Tables 4 and 5, as applicable, be utilized in lieu of those below.

Table 6. Minimum Pathway Pavement Sections with Compacted Subgrade

Pavement Type	Pavement (inches)	Aggregate Base (inches)
AC	2.5	6.0
PCC	4.0	6.0

8.0 STRUCTURAL DESIGN RECOMMENDATIONS

8.1 SHALLOW FOUNDATIONS

Based on our understanding of the site improvements, shallow foundations are suitable for support of proposed lightly loaded structures. The foundations may be continuous wall or individual spread footings bearing on medium stiff or better native soils or structural fill placed over these soils. We recommend that continuous wall footings have a minimum width of 18 inches and individual spread footings have a minimum width of 24 inches.

The bottom of exterior footings should be founded at least 18 inches below adjacent grade. Interior column footings should be founded at least 12 inches below grade.

8.1.1 Foundation Overexcavation and Subgrade Preparation

If unsuitable fill or deleterious material is encountered in footing excavations, we recommend the unsuitable material be overexcavated the depth it occurs and replaced with structural fill. The overexcavation should be wider than the footing by a distance equal to the overexcavation depth, and the footing should be centered on the backfilled subgrade. Before overexcavating, the subgrade should be evaluated by Pali Consulting, to confirm soft, loose, disturbed, or deleterious soils are present that should be removed and the required depth of removal.

Structural fill placement and compaction should be performed as described in *Sections 6.7* and *6.8*. The structural fill should meet the specifications of *Section 6.7.2* or *6.7.3*. Foundation bearing surfaces should not be exposed to standing water. If water infiltrates and pools in the excavation, the water, along with any disturbed soil should be removed before placing foundation forms or reinforcing steel.

We recommend that Pali Consulting observe final foundation subgrades before placing concrete forms and reinforcing steel to determine that bearing surfaces have been adequately prepared and that the soil conditions are consistent with those observed during our explorations.

8.1.2 Bearing Capacity

We recommend that conventional wall and column foundations be proportioned using a maximum allowable bearing pressure of 2,000 pounds per square foot (psf). This bearing pressure applies to the total dead and long-term live loads and may be increased by one-third when considering earthquake or wind loads. This is a net bearing pressure. The weight of the footing and overlying backfill can be ignored in calculating footing sizes.

8.1.3 Foundation Settlement

Shallow foundations designed and constructed as recommended are expected to experience movement (settlement or expansion) of less than 1 inch. Differential settlement up to ½-inch can be expected between adjacent footings supporting comparable loads.

8.1.4 Lateral Resistance

Lateral loads on footings can be resisted by passive earth pressure on the sides of footings and by friction on the bearing surface. We recommend that passive earth pressures be calculated using an equivalent fluid weight of 300 pounds per cubic foot (pcf) for foundations confined by native soils or structural fill. We recommend using a friction coefficient of 0.35 for foundations placed on native soil subgrade or on-site fill and 0.50 for foundations placed on crushed rock. The passive earth pressure and friction components may be combined provided that the passive component does not exceed two-thirds of the total.

The passive earth pressure value is based on the assumptions that the adjacent grade is level and that static groundwater remains below the base of the footing throughout the year. The top 12 inches of soil should be neglected when calculating passive lateral earth pressures unless the foundation area is covered with pavement or is inside a building. The lateral resistance values do not include safety factors.

8.1.5 Foundation and Slab Drains

We recommend that a foundation drain be included at the base of exterior footings if moisture sensitive floorings will be used inside of any structures, high interior moisture is not acceptable, or if the design passive pressures are required to resist lateral forces against the structures. The foundation drain should consist of a perforated drainpipe embedded in free-draining material per the OSSC (2022). The drainpipe should be tightlined to the storm drain system or other suitable discharge point and in accordance with *Section 6.10*.

8.2 SEISMIC DESIGN

We recommend that seismic design be performed using the 2022 Oregon Structural Specialty Code (OSSC) and ASCE 7-22 (or latest edition). We obtained the seismic hazard from the ASCE Hazard Tool Website for Latitude 45.399956 degrees and Longitude -122.260304 degrees for the 2,475-year return period. Risk Category II was assumed appropriate for site structures. The code-based seismic design parameters are included below in Table 7 and are only appropriate for code-level seismic design.

Table 7. Seismic Design Parameters.

Parameter	Value
Site Class	D
Spectral Response Acceleration, S_s	0.71g
Spectral Response Acceleration, S_1	0.27g
Maximum Spectral Response Acceleration (Short Period), S_{MS}	0.92
Maximum Spectral Response Acceleration (1-Seond Period), S_{M1}	0.6
Design Spectral Response Acceleration (Short Period), S_{DS}	061
Design Spectral Response Acceleration (1-Seond Period), S_{D1}	0.4
Maximum Considered Earthquake Geometric Mean PGA, PGA_M	0.39

9.0 LIMITATIONS

We have prepared this geotechnical evaluation for use by Lango Hansen Landscape Architects and their affiliates for the proposed Sandy Community Campus Park improvements, as described in this report. Our work was completed in general accordance with our services agreement for the project. Our report is intended to provide geotechnical recommendations for design of the project in accordance with our scope of work. However, geotechnical conditions can vary between exploration locations and our report should not be construed as a warranty of subsurface conditions. Favorable site performance in the near term does not imply a certainty of long-term performance, especially under conditions of adverse weather or other factors.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty, express or implied, should be understood.

Any electronic form, facsimile, or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by Pali Consulting and will serve as the official document of record.

10.0 REFERENCES

American Association of State Highway and Transportation Officials (AASHTO), 1993, Guide for Design of Pavement Structures.

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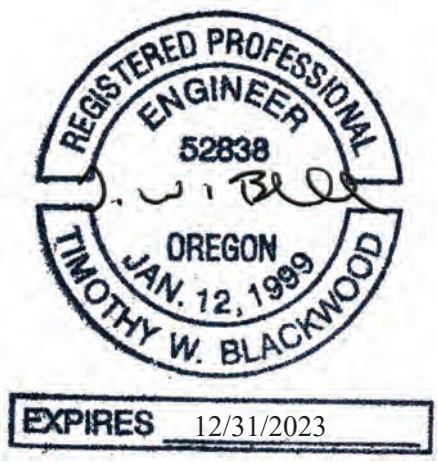
10.0 CLOSING

We appreciate the opportunity to submit this report for your project. Please contact us if you have any questions or need additional information.

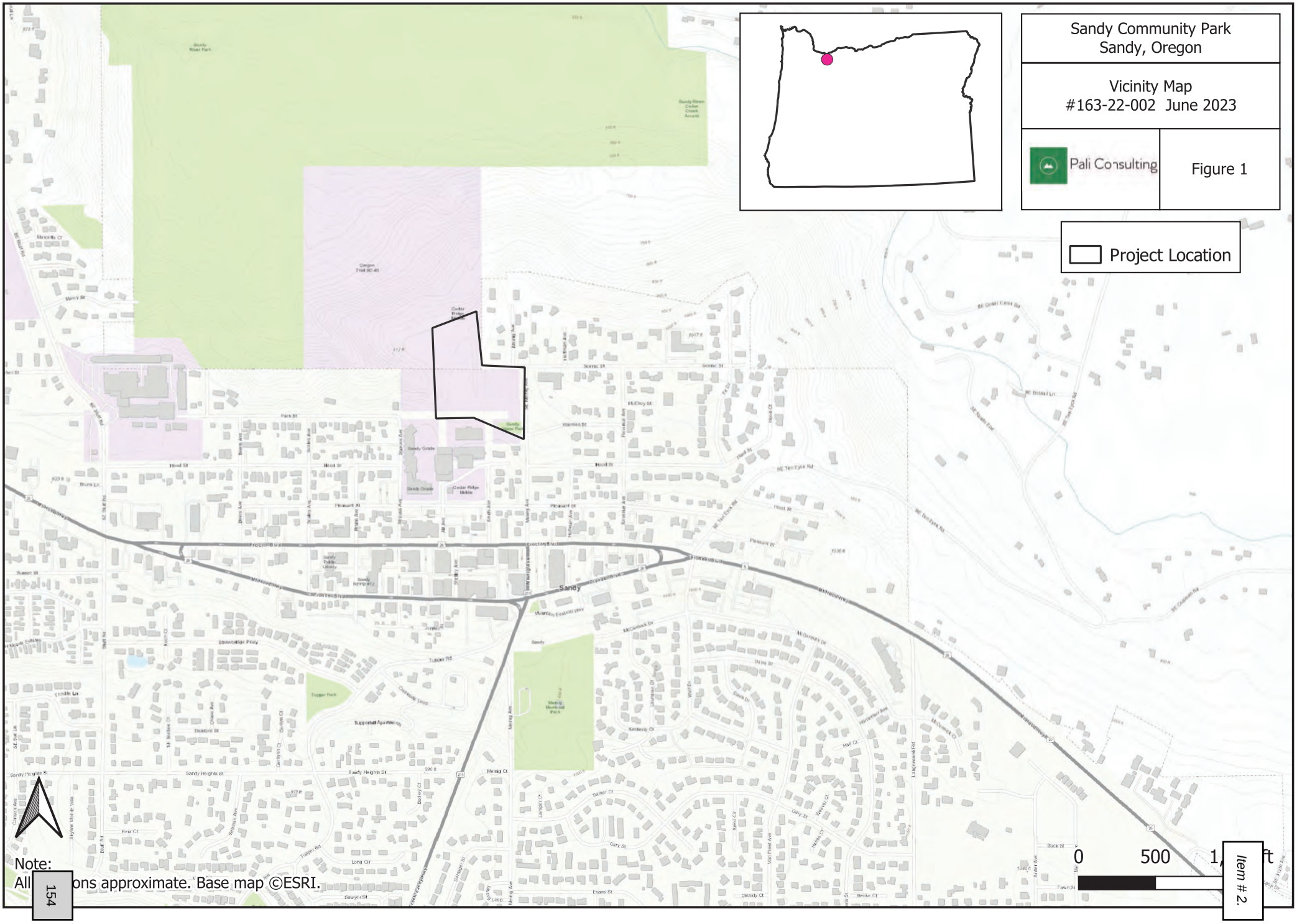
Sincerely,

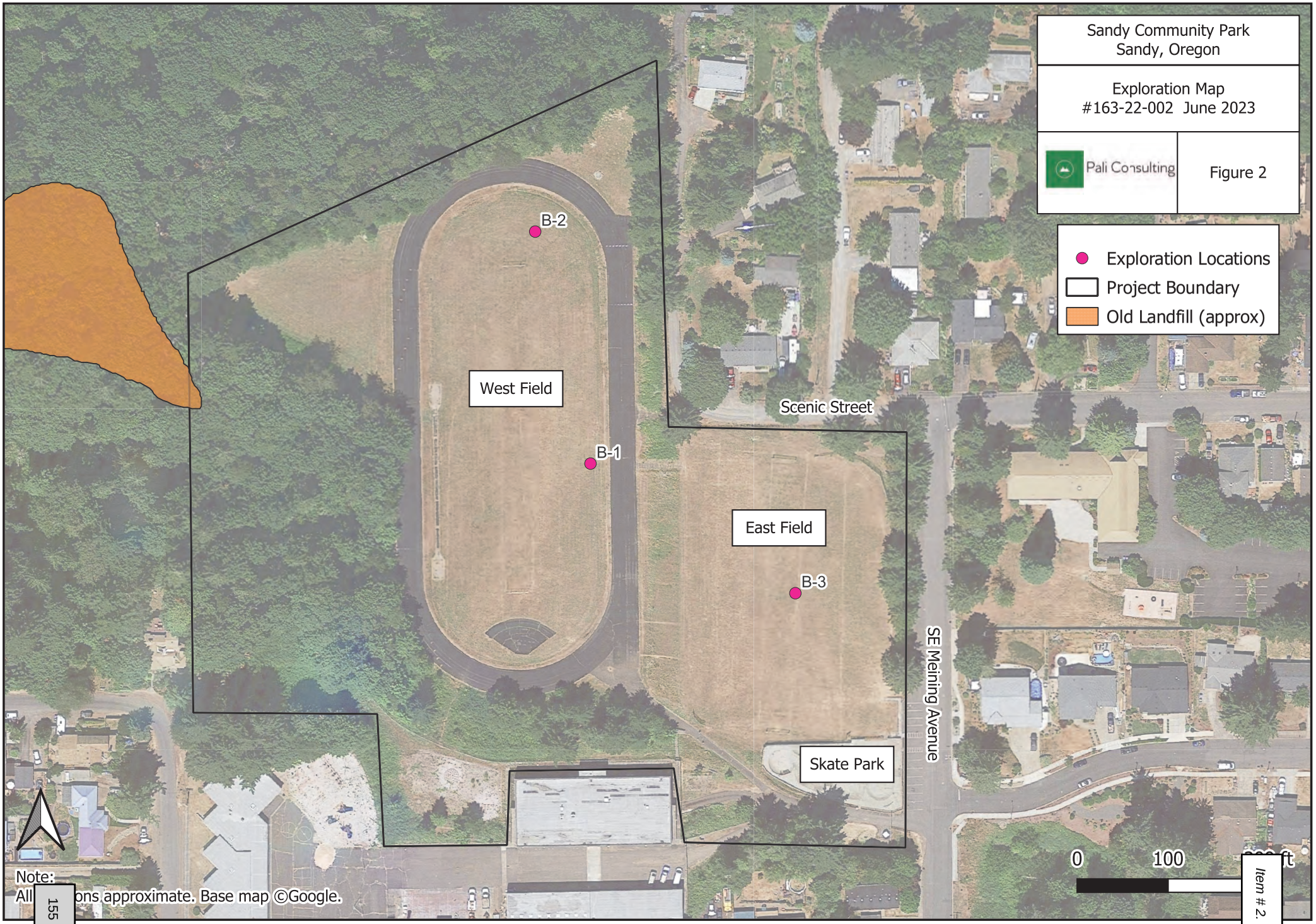


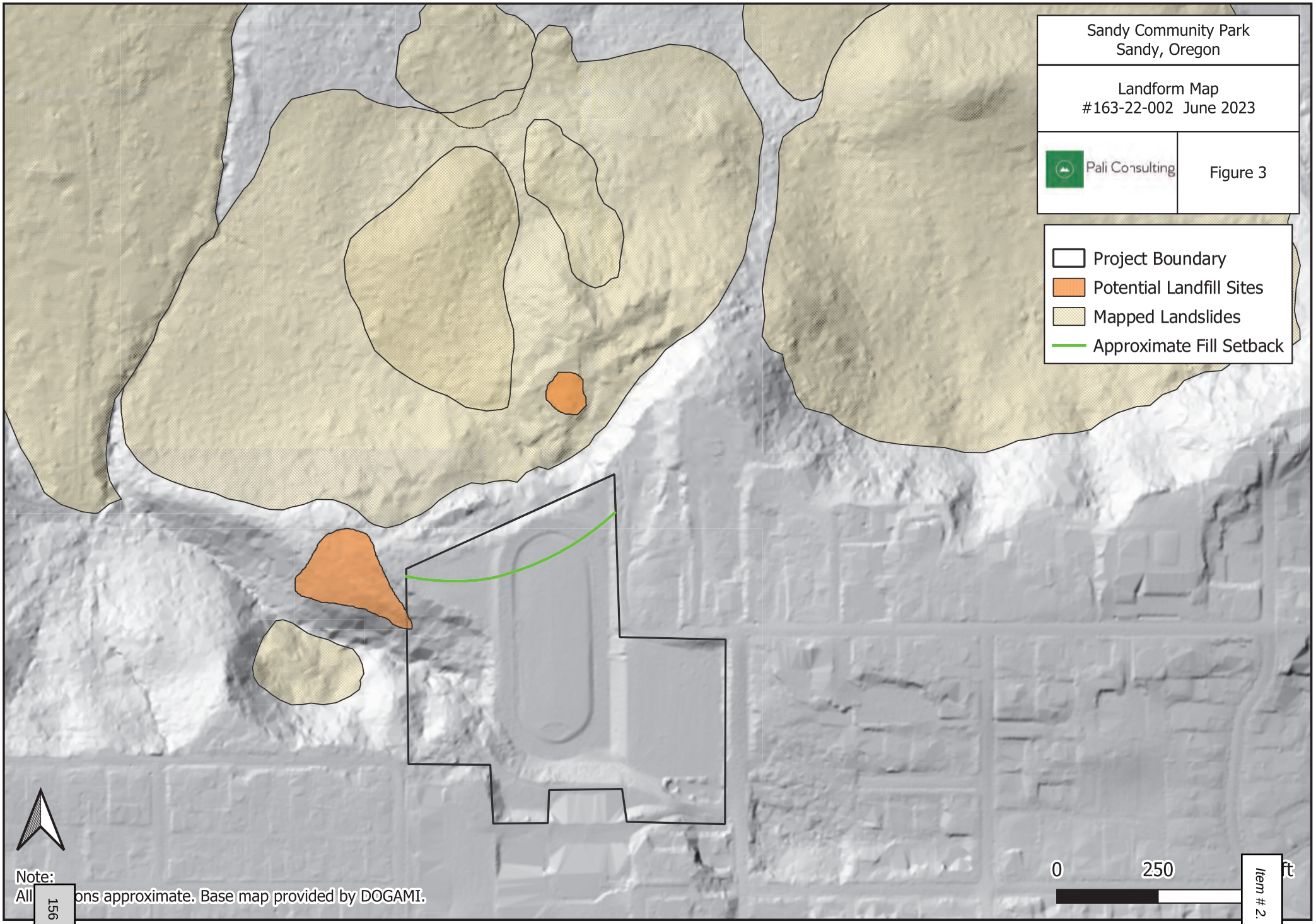
Timothy W. Blackwood, PE, GE, CEG
President/Principal Engineer

Attachments
Figures 1 - 2
Appendix A – Field Explorations, Infiltration and Laboratory Testing

Document ID: 163-22-002SandyGeotechnicalReport


Sandy Community Park
Sandy, Oregon
Vicinity Map
#163-22-002 June 2023
Pali Consulting
Figure 1
Project Location
Sandy
0
500
Note:
All locations approximate. Base map ©ESRI.


Sandy Community Park
Sandy, Oregon
Exploration Map
#163-22-002 June 2023
Pali Consulting
Figure 2
Exploration Locations
Project Boundary
Old Landfill (approx)
B-2
B-1
B-3
West Field
East Field
Skate Park
Scenic Street
SE Meining Avenue
0
100
Note:
All locations approximate. Base map ©Google.


Sandy Community Park
Sandy, Oregon
Landform Map
#163-22-002 June 2023
Pali Consulting
Figure 3
Project Boundary
Potential Landfill Sites
Mapped Landslides
Approximate Fill Setback
0
250
ft
Note:
All locations approximate. Base map provided by DOGAMI.

APPENDIX A -
FIELD EXPLORATIONS, LABORATORY AND INFILTRATION TESTING

FIELD EXPLORATIONS

GENERAL

We evaluated subsurface conditions at the site by completing three machine-drilled borings on May 20th, 2023. The machine-drilled borings were completed with a trailer mounted solid stem auger rig operated by Dan J. Fisher Excavations, Inc. The locations of the explorations are shown on Figure 2 of the report and were estimated based on field measurements.

The field explorations were coordinated by a geologist on our staff, who classified the various soil units encountered, obtained representative soil samples for geotechnical testing, and maintained a detailed log of each boring. Exploration logs are included in this Appendix.

SAMPLING AND LOGGING

The exploration logs within this Appendix show our interpretation of the drilling, sampling, and testing data. They indicate the depth where the soils change. Note that the change may be gradual. In the field, we classified the samples taken from the explorations according to the methods presented on the *Key to Exploration Logs* in this Appendix. The key also provides a legend explaining the symbols and abbreviations used in the logs.

Materials encountered in the explorations were classified in the field in general accordance with American Society for Testing and Materials (ASTM) International Standard Practice D 2488 "Standard Practice for the Classification of Soils (Visual-Manual Procedure)." Soil classifications and sampling intervals are shown in the exploration logs in this Appendix.

Soil samples were obtained from the borings using a SPT sampler completed in general conformance with ASTM Test Method D 1586 "Standard Method for Penetration Test and Split-Barrel Sampling of Soils." The sampler was driven with a 140-pound cathead operated hammer falling 30 inches. The N-value, or number of blows required to drive the sampler 1 foot or as otherwise indicated into the soils, is shown adjacent to the sample symbols on the boring logs. Disturbed samples were obtained from the sampler for subsequent classification and testing.

INFILTRATION TESTING

We conducted two infiltration tests at the locations shown on Figure 2. The tests consisted of encased falling head tests in general accordance with the Clackamas County Service District #1, Stormwater Design Standards, Appendix E, E.2.2.b, but modified for duration due to the limited drilling schedule. Our specific procedures are briefly described below.

- Borings were advanced to the test depths of 5 feet and 15 feet bgs, respectively. Pipes were seated approximately 6 inches into the bottoms of the holes to create plugs of soil at the bases of the pipes. A 6-inch diameter pipe was used for IT-1 (5 feet bgs) and a 3-inch pipe diameter pipe was used for IT-2 (15 feet bgs).

- The pipes were filled with greater than 12 inches of water to saturate the subgrade. The pipes were allowed to saturate for at least one hour. Infiltration test measurements were taken over the subsequent hours.

- To conduct the infiltration tests after the saturation period, the pipes were refilled approximately 5 feet above the test depth and the infiltration rate monitored. Water levels in the pipe were recorded every 10 minutes for a two-hour period.

The results of the testing are provided in our report.

LABORATORY TESTING

GENERAL

Soil samples obtained from the explorations were evaluated to confirm or modify field classifications, as well as to evaluate their engineering properties. Representative samples were selected for laboratory testing. The tests were performed in general accordance with the test methods of the ASTM or other applicable procedures. Test results are indicated on the boring logs and as described below.

SOIL CLASSIFICATIONS

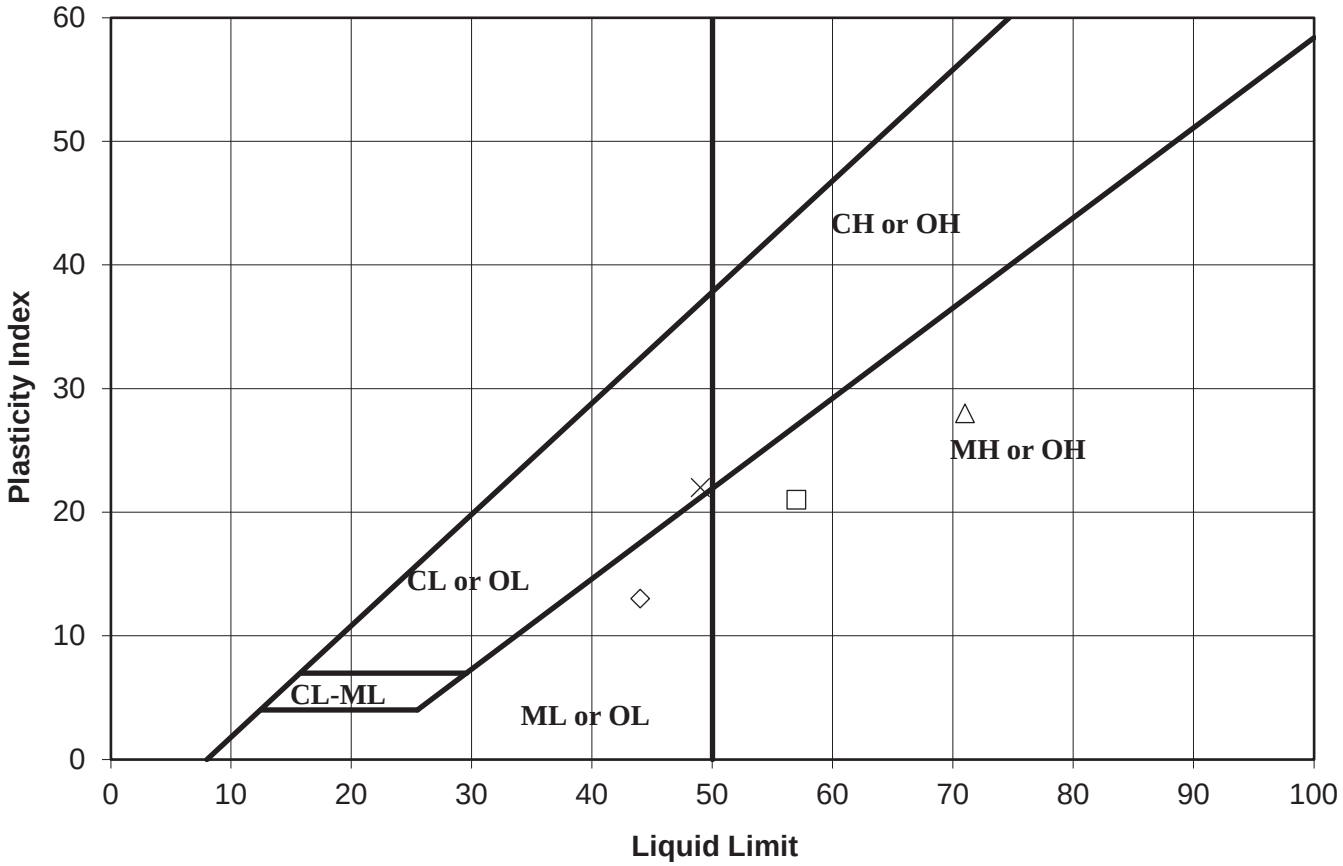
Soil samples obtained from the explorations were visually classified in the field and in our geotechnical laboratory based on the USCS and ASTM classification methods. ASTM Test Method D2488 was used to classify soils using visual and manual methods. ASTM Test Method D2487 was used to classify soils based on laboratory test results.

LABORATORY TESTING

Moisture Content
Moisture contents of samples were obtained in general accordance with ASTM Test Method D 2216. The results of the moisture content tests completed on samples from the explorations are presented on the exploration logs included in this Appendix.

Fines Content Analyses
Fines content analyses were performed to determine the percent of soils finer than the U.S. No. 200 Sieve, the boundary between coarse- and fine-grained soils. The tests were performed in general accordance with ASTM Test Method D 1140. The test results are indicated on the exploration logs included in this Appendix.

Atterberg Limits
Atterberg limits (liquid limit, plastic limit, and plasticity index) of fine-grained soil samples were obtained in general accordance with ASTM Test Method D4318-02. The results of the Atterberg limits tests completed on samples from the explorations are presented in the boring logs and on pages A-15 and A-16 in this Appendix.



Atterberg Limits Determination							
Symbol	Boring	Sample	Depth (ft)	Liquid Limit	Plastic Limit	PI	Classification
◇	B-1	S-1	2.5	44	31	13	ML
□	B-1	S-3	7.5	57	36	21	MH
△	B-3	S-1	2.5	71	43	28	MH
×	B-3	S-2	5	49	27	22	CL

ATTERBERG LIMITS - ASTM D4318

Sandy Community Park
Project No.: 163-22-002

Pali Consulting

Figure A-1

KEY TO EXPLORATION LOGS

Pali Consulting

4891 Willamette Falls Drive, Suite 1
West Linn, Oregon 97068
www.pali-consulting.com

SOILS CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL-GRADED GRAVELS, GRAVEL - SAND - MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVELS - SAND - SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL- SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SITLY SANDS, SAND - SILT MIXTURES
			SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY
			OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT	PEAT-HUMUS, SWAMP SOILS WITH HIGH-ORGANIC CONTENTS

Note: Multiple symbols are used to indicate borderline or dual soil classifications

SYMBOLS LETTER	DESCRIPTIONS
CC	CEMENT CONCRETE
AC	ASPHALT CONCRETE
TS	TOPSOIL/SOD FORREST DUFF

Stratigraphic Contact

——— Distinct contact between soil strata or geologic units

- - - - - Gradual or approximate change between soil strata or geological units

Moisture Modifiers

Dry - Absence of moisture, dusty, dry to the touch

Moist - Damp, but no visible water

Wet - Visible free water or saturated, usually soil is obtained from below the water table

Seepage Modifiers

None	
Slow -	< 1 gpm
Moderate -	1- 3 gpm
Heavy -	> 3 gpm

Caving Modifiers

None	
Minor -	isolated
Moderate -	frequent
Severe -	general

Minor Constituents

Trace:	< 5% (silt/clay)
Occasional:	< 15% (sand/gravel)
With:	5-15% (silt/clay) in sand or gravel
	15-30% (sand/gravel) in silt or clay

Sampler Symbol Descriptions

- Core
- Standard Penetration Test (SPT)
- Shelby tube
- Piston
- Bulk or grab

Laboratory / Field Tests

%F	Percent fines
AL	Atterberg Limits
CP	Laboratory compaction test
CS	Consolidation test
DS	Direct shear
HA	Hydrometer analysis

Laboratory / Field Tests

DD	Dry density
OC	Organic content
PP	Pocket penetrometer
SA	Sieve analysis
TV	Torvane shear
MC	Moisture Content

Blowcount (N) is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted) per ASTM D-1586. See exploration log for hammer weight and drop.

A "P" indicates sampler pushed using the weight of the drill rig.

(2.4-inch) sampler N approximately corrected to equivalent SPT N by 50% reduction in N - modified California.

Note: Refer to the report text and exploration logs for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the exploration locations a the explorations were made. The logs are not warranted to be representative of the subsurface conditions at other locations or times.

Figure A-2

Pali Consulting

Sandy Community Park

Sandy, OR

B-1

Project: Sandy Community Park Project	Driller: Dan Fisher, Inc
Proj No. 163-22-002	Date: 5/20/23
Drilling Method: Solid Stem Auger	Elevation: 913'
Diameter: 4" / Water Table: 20.3'	Logged by: JLE

Sample No.	Sample Type	Recovery (%)	RQD (%)	Blow Count per 6 inches	Blows/Foot (N)	Water Table	Depth (ft BGS)	Graphic Log		Materials Description	Moisture (%)	Remarks
							0		ML	4" topsoil / root mass		
S1		75		2-2-2	4					Soft to medium stiff, moist, brown SILT with minor black and red mottles, occasional charcoal (FILL)	33	AL
S2		75		2-4-5	9		5		MH	Stiff moist, grey to rusty red, mottled ELASTIC SILT (NATIVE)	34	
S3		100		5-8-10	18					Grades to very stiff, orange to grey	31	AL
S4		100		5-10-10	20		10			Grades to varicolored (orange/red/yellow/blue/black), with charcoal	31	
S5		100		5-7-6	13		15			Grades to stiff, varicolored (yellow/grey/brown/red), with a 6" zone of weathered grey siltstone		Drillers report 1' zone of hard drilling at 17' BGS
S6		100		3-5-5	10	▼	20			Grades to wet, with minor sand	57	%F=89
S7		100		1-2-3	5		25			Grades to grey, brown, red		
									END	Boring completed at 26.5' BGS		
							30					

File: C:\Users\Jane\Pali Consulting Dropbox\1-Projects\Active-Projects\163-LangoHansen\163-22-002SandyPark\Analysis\SandyParkLogs.log Date: 6/12/2023

Figure A-3

Pali Consulting

Sandy Community Park

Sandy, OR

B-2

Project: Sandy Community Park Project	Driller: Dan Fisher, Inc
Proj No. 163-22-002	Date: 5/20/23
Drilling Method: Solid Stem Auger	Elevation: 910'
Diameter: 4" / Water Table: 22.8	Logged by: JLE

Sample No.	Sample Type	Recovery (%)	RQD (%)	Blow Count per 6 inches	Blows/Foot (N)	Water Table	Depth (ft BGS)	Graphic Log	Materials Description	Moisture (%)	Remarks
							0		**ML** 4" topsoil / root mass		
S1		100		4-4-5	9				Stiff, moist, varicolored (red/orange/yellow/white/black/green) SILT with rock fragments and minor sand (NATIVE)	51	
S2		100		4-3-3	6		5		Grades to medium stiff, with few rounded gravels	54	
S3		100		2-4-4	8				Grades to medium stiff to stiff, highly variable, with distict color zones and relict rock structures	58	
S4		100		3-5-5	10		10		Grades to stiff, moist to wet, no gravels	47	AL
S5		100		4-6-5	11		15		Varicolored (grey/black/yellow/white), with sand and charcoal, grading to grey and brown mottled silt with few rounded gravels at bottom of sampler	54	%F=91
S6		100		2-2-8	10	▼	20		Grades to wet, varicolored (grey/yellow/white/black/red/pink/purple) silt with sand and rounded gravel	62	Drillers report water at 20' bgs
S7		100		4-3-7	10		25			58	%F=93
									END Boring completed at 26.5' BGS		
							30				

File: C:\Users\Jane\Pali Consulting Dropbox\1-Projects\Active-Projects\163-LangoHansen\163-22-002SandyPark\Analysis\SandyParkLogs.log Date: 6/12/2023

Figure A

Pali Consulting

Sandy Community Park

Sandy, OR

B-3

Project: Sandy Community Park Project	Driller: Dan Fisher, Inc
Proj No. 163-22-002	Date: 5/20/23
Drilling Method: Solid Stem Auger	Elevation: 927'
Diameter: 4" / Water Table: Not encountered	Logged by: JLE

Sample No.	Sample Type	Recovery (%)	RQD (%)	Blow Count per 6 inches	Blows/Foot (N)	Water Table	Depth (ft BGS)	Graphic Log	Materials Description	Moisture (%)	Remarks
							0		**ML** 4" topsoil / root mass		
S1		75		3-3-4	7	GWT not encountered			Medium stiff, moist, red-brown to grey mottled ELASTIC SILT with charcoal (FILL)	37	AL
S2		75		2-2-2	4		5		**CL** Soft to medium stiff, moist, brown to grey to red-brown CLAY with few small gravels / coarse sand, and wood/organic material (NATIVE)	36	AL, %F=88
S3		75		2-2-3	5				Grades to medium stiff, brown to grey	34	
S4		75		2-4-4	8		10		Grades to medium stiff to stiff, with occasional charcoal, no wood / organic material	36	
S5		100		4-6-8	14		15		**CL-CH** Grades to stiff, grey to orange-brown with slight orange mottling, no charcoal, increasing plasticity		
S6		100		4-7-7	14		20			57	
									END Boring completed at 21.5' BGS		
							25				
							30				

File: C:\Users\Jane\Pali Consulting Dropbox\1-Projects\Active-Projects\163-LangoHansen\163-22-002SandyPark\Analysis\SandyParkLogs.log Date: 6/12/2023

EXHIBIT I

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Sandy Community Campus Park

Transportation Impact Study

Sandy, Oregon

Date:
June 15, 2023

Prepared for:
Kurt Lango, Lango Hansen Landscape Architects

Prepared by:
Myla Cross
Todd Mobley, PE

Table of Contents

List of Appendices

List of Figures

List of Tables

Executive Summary

1. The 10.5-acre property north of Pleasant Street between SE Meinig Avenue and Strauss Avenue in Sandy, Oregon has been proposed for redevelopment. The proposed Community Campus Park includes constructing a new park consisting of a pump track/skatepark, trails, playgrounds and other amenities.
2. The trip generation calculations show that the proposed project is projected to generate 17 evening peak hour trips, 40 Saturday peak hour trips, and 50 Saturday peak hour trips when an event is being held at the pump track and/or skatepark.
3. No significant trends or crash patterns were identified at any of the study intersections. Accordingly, no specific safety mitigation is recommended.
4. The projected traffic demand at the unsignalized intersections do not meet the ODOT preliminary traffic signal warrant thresholds under all analysis scenarios.
5. Left-turn lane warrants for either of the site accesses or the intersection of SE Meinig Avenue & Pleasant Street are not projected to be met under buildout year 2025. Accordingly, no left-turn lanes are necessary or recommended.
6. All study intersections are projected to meet ODOT and the City of Sandy standards under all analysis scenarios.
7. The parking analysis shows that there is adequate parking supply available to accommodate the anticipated parking demand.

Project Description

Introduction

The lower field area north of the old Cedar Ridge Middle School buildings in Sandy, Oregon has been proposed for redevelopment. The proposed Community Campus Park includes constructing a new park consisting of a pump track/skatepark, trails, playgrounds and other amenities. Based on the City of Sandy's Traffic Impact Analysis (TIA) requirements as well as correspondence with DKS Associates, the City's consulting transportation engineer, this report conducts safety and capacity/level of service analyses at the following intersections:

1. Scenic Street at Site Access
2. SE Meinig Avenue at Idleman Street / Site Access
3. SE Meinig Avenue at Pleasant Street
4. SE Meinig Avenue at Proctor Boulevard (US 26 westbound)
5. SE Meinig Avenue / Highway 211 at Pioneer Boulevard (US 26 eastbound)

All supporting data and calculations are included in the appendix to this report.

Location Description

The project site is located on several tax lots, which encompass an approximate total of 10.5 acres, north of Pleasant Street between SE Meinig Avenue and Strauss Avenue. The current site includes a few amenities such as the Sandy Skate Park and former school fields, but it is mostly undeveloped. The proposed development will include 40 on-site parking spaces.. The project site will take access along SE Meinig Avenue aligning with Idleman Street, and along Scenic Street. Figure 1 displays a vicinity map of the project area, with the project site outlined in yellow.

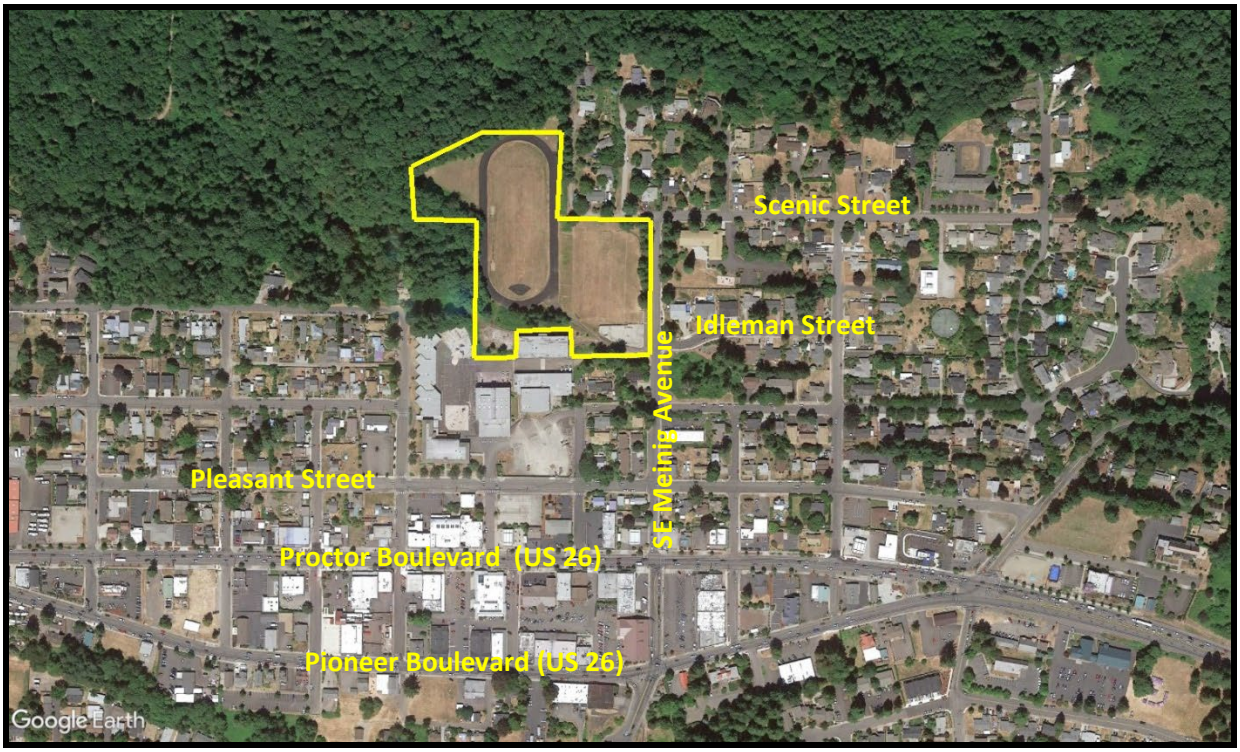

Figure 1: Aerial Photo of Site Vicinity (Image from Google Maps)

Vicinity Streets

The study area includes six roadways expected to be impacted by the proposed development. Table 1 provides a description of each of the vicinity roadways.

Table 1: Roadway Characteristics

Street Name	Jurisdiction	Functional Classification	Travel Lanes	Speed (mph)	Curbs & Sidewalks	On-Street Parking	Bicycle Facilities
SE Meinig Avenue	City of Sandy	Major Arterial / Collector	2	25	Intermittent	Intermittent	None
Idleman Street	City of Sandy	Local Street	2	25	Both Sides	Both Sides	None
Scenic Street	City of Sandy	Local Street	2	25	Intermittent	Both Sides	None
Pleasant Street	City of Sandy	Local Street	2	25	Both Sides	Both Sides	None
Proctor Boulevard (US 26 Westbound)	ODOT	Statewide Highway	2	25	Both Sides	Both Sides	North Side
Pioneer Boulevard (US 26 Eastbound)	ODOT	Statewide Highway	2	25	Both Sides	Both Sides	South Side

Notes: Functional Classification based on the Sandy Transportation System Plan and ODOT's TransGIS online website.

Study Intersections

Through coordination with the City of Sandy's consulting engineer, five study intersections were identified for evaluation. The existing characteristics of these intersections are summarized in Table 2.

Table 2: Vicinity Intersection Descriptions

Intersection		Geometry	Traffic Control	Phasing/Stopped Approaches
1	Scenic Street at Site Access	3-Leg[1]	Stop-Controlled	NB Stop-Controlled
2	Meinig Avenue at Idleman Street / Site Access	4-Leg	Stop-Controlled	EB/WB Stop-Controlled
3	Meinig Avenue at Pleasant Street	4-Leg	Stop-Controlled	EB/WB Stop-Controlled
4	Meinig Avenue at Proctor Boulevard (US 26 westbound)	4-Leg	Signalized	NB/WB Permitted Left
5	Meinig Avenue at Pioneer Boulevard (US 26 eastbound)	4-Leg	Signalized	EB Yield Controlled Channelized Right, SB Protected/Permitted Left

Notes: [1]South leg to be constructed by the proposed development

A vicinity map showing the project site, vicinity streets, and intersection configurations is shown in Figure 2.

Transit

Sandy Area Metro (SAM) Transit has three routes with bus stops located within a 1/2-mile walking/biking distance from the project site:

- The Shopping Shuttle Route has a stop located at the intersection of Proctor Boulevard and Strauss Avenue. The Shopping Shuttle Route loops through the city in a largely clockwise direction and provides service between the Fred Meyer and the Sandy Marketplace. The bus runs from 12:00 PM to 7:15 PM, Monday through Friday, and has no service on Saturday or Sunday. Headways are roughly one to three hours.
- The Sandy Local and Gresham Express route has a stop located at the intersection of Proctor Boulevard and Strauss Avenue, and another stop located at the Sandy Transit Center. This route provides service between the Sandy Transit Center and the Gresham Transit Center. The bus runs from 5:30 AM to 9:55 PM, Monday through Friday, with headways of approximately one-half hour. On Saturdays the bus runs from 5:30 AM to 10:25 PM with headways of approximately one hour, and on Sundays the bus runs from 7:00 AM to 9:55 PM, with headways of approximately one and a half hours to two hours.
- The Sandy and Estacada SAM Route has a stop located at the Sandy Transit Center. The route provides service between the Sandy Transit Center and Estacada City Hall. The bus runs from 7:00 AM to 7:30 PM, Monday through Saturday, with headways ranging from one and half hours to three and a half hours, and has no service on Sunday.

Figure 2
Community Campus Par
6/13/202

LEGEND

- STUDY INTERSECTION
- STOP SIGN
- TRAFFIC SIGNAL
- PROJECT SITE
- INTERSTATE
- ARTERIAL ROADWAY
- COLLECTOR ROADWAY
- LOCAL ROADWAY

No Scale

VICINITY MAP

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Site Trips

Trip Generation

The Sandy Community Campus Park development will include the construction of a public park with a pump track and skatepark on an approximately 10.5-acre site. Based on the proposed site layout, approximately 0.72 acres of the site will be dedicated to a skatepark and pump track. Weekday PM peak hour and Saturday midday trips that will be generated by the proposed use were estimated using trip rates from the *Trip Generation Manual*[1].

Data from land use code 411, *Public Park*, was used based on the acreage for the 9.78-acre portion of the park. The skatepark and pump track facilities are anticipated to generate a higher trip generation than land use code 411, therefore, the 0.72-acre space was analyzed separately using alternative data. The *Trip Generation Manual* does not include trip generation data for skateparks and pump tracks, therefore, trip generation rates from another land use with similar trip generation characteristics were used.

Based on correspondence with the City's consulting transportation engineer, the most similar recreational ITE land use code to compare with the pump track and skatepark portion of the site is land use code 488, *Soccer Complex*. It is assumed that the trip generation of both the pump track and skatepark together would be equivalent to the trip generation of one soccer field.

Additionally, the pump track and skatepark are anticipated to hold occasional events on Saturdays. To account for a reasonable worst-case traffic impact scenario to the surrounding transportation network, trip generation estimates are provided for the Saturday peak hour when an event is being held.

As specific data is not readily available for a community park with the specific program elements identified in the Sandy Community Campus Park, trip generation data for a soccer complex was used for this study to determine the trips generated by the pump track and skatepark portion of the park. It is important to note that the trip generation characteristics of the soccer field may somewhat differ from the park's active elements such as the pump track and skatepark. For example, the soccer field may result in higher intensity trip generation over a shorter period of time compared to the pump track and skatepark, given sports teams, spectators, and/or referee officials will generally arrive and depart a soccer field within a one to two hour period, concurrent to scheduled game/practice times. This can also result in higher peaking for parking demand at soccer facilities compared to the pump track and skatepark.

Therefore, the total number of trips generated by the two land use types are expected to be similar, but utilizing data from land use code 488, *Soccer Complex*, may provide a more conservative evaluation of peak hour impacts to the transportation system.

The resulting trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included in Appendix A.

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

Table 3: Trip Generation Summary

ITE Code	Intensity		Evening Peak Hour			Saturday Peak Hour			Saturday Peak Hour (Event)		
			In	Out	Total	In	Out	Total	In	Out	Total
411 – Public Park	9.78	Acres	1	0	1	2	1	3	2	1	3
488 - Soccer Complex	1	Field	11	5	16	18	19	37	38	9	47
Total:			**12**	**5**	**17**	**20**	**20**	**40**	**40**	**10**	**50**

Based on the above assumptions, the trip generation calculations show that the proposed project is projected to generate 20 evening peak hour trips, 40 Saturday peak hour trips, and 50 Saturday peak hour trips when an event is being held at the pump track and/or skatepark.

Trip Distribution

A preliminary directional distribution of site trips to and from the proposed development was estimated based on locations of likely destinations and locations of major transportation facilities in the site vicinity. The following trip distribution was used for analysis:

- Approximately 10 percent of site trips will travel to/from the west along Pleasant Street;
- Approximately 5 percent of trips will travel to/from the east along Pleasant Street;
- Approximately 20 percent of trips will travel to/from the south along Highway 211;
- Approximately 25 percent of site trips will travel to/from the east along US-26; and
- Approximately 40 percent of site trips will travel to/from the west along US-26.

Approximately 75% of vehicles are estimated to use the access along SE Meinig Avenue and 25% of vehicles are estimated to use the access along Scenic Street. The trip distribution and assignment for the total site trips generated during the morning and evening peak hours are shown in Figure 3.

Figure 3

Community Campus Par

6/13/202

SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips

PM, Saturday, & Saturday (Event) Peak Hours

LEGEND

XX% PERCENT OF PROJECT TRIPS

PROJECT TRIP GENERATION			
	IN	OUT	TOTAL
PM	15	9	24
Saturday	20	20	40
Saturday (Event)	40	10	50

PM PEAK HOUR

SATURDAY PEAK HOUR

SATURDAY (EVENT) PEAK HOUR

No Scale

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Traffic Volumes

Existing Conditions

Traffic counts were conducted at the study intersections on Thursday, March 18, 2023, between 4:00 PM and 6:00 PM, and Saturday, May 20, 2023, between 12:00 PM and 3:00 PM. Each intersection's respective evening and Saturday peak hours were used for analysis. There are 4 single family homes located to the west of the proposed site access along Scenic Street. Eastbound and westbound trips at the site access were estimated using data from land use code 210, *Single-Family Detached Housing*, using trip rates from the *Trip Generation Manual*[2].

ODOT Commuter Trends were used to develop a seasonal adjustment factor (SAF) of 1.03 that was applied to the 2023 traffic counts at the ODOT study intersections. The SAF is intended to adjust traffic volumes along ODOT intersections to reflect the 30th highest hour of traffic.

Background Conditions

For the general background growth, the annual linear growth rate of 2.0 percent per year were applied to the year 2023 existing traffic volumes for City of Sandy, and a liner growth rate of 0.96 percent per year were applied to ODOT intersections using ODOT's 2041 Future Volumes Table. Figure 5 shows the resulting year 2025 background traffic volumes.

Buildout Conditions

The trips to be generated by the proposed development, quantified earlier within the *Site Trips* section, were added to the year 2025 background traffic volumes in order to obtain the year 2025 traffic volumes with the full buildout and proposed development. Figure 6 shows the resulting year 2025 buildout traffic volumes.

[2] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

Figure 4
Community Campus Park
6/13/2023

PM PEAK HOUR

SATURDAY PEAK HOUR

No Scale

Traffic Volumes
Existing Conditions
PM & Saturday Peak Hours

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Figure 5
Community Campus Par
6/13/202

No Scale

Traffic Volumes
Background Conditions
PM & Saturday Peak Hours

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PM PEAK HOUR

SATURDAY PEAK HOUR

SATURDAY (EVENT) PEAK HOUR

No Scale

Figure 5
Community Campus Par
6/13/202

TRAFFIC VOLUMES
Buildout Conditions
PM, Saturday & Saturday (Event) Peak Hours

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Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Data System, a review of approximately five years of the most recent available crash history (January 2017 through December 2021) was performed at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- *PDO* – Property Damage Only
- *Injury C* – Possible Injury
- *Injury B* – Suspected Minor Injury
- *Injury A* – Suspected Serious Injury
- *Fatality*

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak hour represents approximately 10 percent of the annual average daily traffic (AADT) at the intersection.

The study intersections adhere to the crash analysis methodologies within ODOT's Analysis Procedures Manual (APM). According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of their respective 90th percentile crash rates should be "flagged for further analysis". Crash rates in excess of the 90th percentile crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for each of the study intersections. The intersection of SE Meinig Avenue at Idleman Street did not have any crashes reported within the five years of the most recent available crash history. Detailed crash data is provided in Appendix C.

Table 4: Crash Type Summary

Intersection		Crash Type					Total Crashes
		Turn	Rear End	Angle	Fixed Object	Ped	
1	Meinig Avenue at Pleasant Street	0	0	0	0	1	1
2	Meinig Avenue at Proctor Boulevard (US 26 westbound)	5	4	0	1	1	11
3	Meinig Avenue/Highway 211 at Pioneer Boulevard (US 26 eastbound)	1	8	5	0	1	15

Table 5: Crash Severity and Rate Summary

Intersection		Severity					Total Crashes	PHEV	Crash Rate	90th % Rate
		PDO	C	B	A	Fatal				
1	Meinig Avenue at Pleasant Street	0	1	0	0	0	1	247	0.222	0.408
2	Meinig Avenue at Proctor Boulevard (US 26 westbound)	6	5	0	0	0	11	1,511	0.384	0.860
3	Meinig Avenue/Highway 211 at Pioneer Boulevard (US 26 eastbound)	7	2	6	0	0	15	2,282	0.349	0.860

Crash Severity

None of the crashes reported in the five-year analysis period resulted in a fatality or an incapacitating injury (Injury A).

Pedestrian and Bicycle Collisions

Three of the reported crashes involved a pedestrian:

- At the intersection of Meinig Avenue at Pleasant Street, the driver of a right-turning vehicle struck a pedestrian crossing at the intersection. The directions of travel for the pedestrian and vehicle are reported as unknown. The pedestrian sustained injuries consistent with *Injury C* classification and the driver of the vehicle was not reported to have sustained any injuries. The driver of the vehicle was reported to have failed to yield the right of way. The collision occurred during the day under cloudy and dry conditions.
- At the intersection of Meinig Avenue at Proctor Boulevard (US 26 westbound), the driver of a northbound school bus turning left struck a southbound pedestrian traveling in the crosswalk. The pedestrian sustained injuries consistent with *Injury C* classification and the driver of the vehicle was not

reported to have sustained any injuries. The driver of the school bus was reported to have failed to yield the right of way due to inattention. The collision occurred during the daytime under rainy and wet conditions.

- At the intersection of Meinig Avenue at Pioneer Boulevard (US 26 eastbound), the driver of an eastbound left-turning vehicle struck a pedestrian traveling in the crosswalk. The pedestrian sustained injuries consistent with *Injury B* classification and the driver of the vehicle was not reported to have sustained any injuries. The driver of the vehicle was reported to have failed to yield the right of way. The collision occurred during the daytime under clear and dry conditions.

ODOT 90th Percentile Crash Rates

Intersection crash rates were calculated and none of the intersections had a rate above their respective ODOT 90th percentile crash rates.

Conclusion

Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of the study intersections. No safety mitigation is recommended per the crash data analysis.

Traffic Signal Warrants

Preliminary traffic signal warrants were examined for all unsignalized study intersections to determine whether the installation of a new traffic signal will be warranted by the project buildout year 2025. Based on the preliminary analysis, traffic signal warrants are not projected to be met for any of the applicable study intersections. Accordingly, no signalization of the unsignalized study intersections is necessary or recommended.

Left-Turn Lane Warrants

A left-turn refuge is primarily a safety consideration for the major street, removing left-turning vehicles from the through traffic stream. Warrants were based on the methodology outlined in the National Cooperative Highway Research Program (NCHRP) Report Number 457[3]. This methodology evaluates the need for a left-turn lane based on the number of left-turning vehicles, the number of travel lanes, the number of advancing and opposing vehicles, and the roadway travel speed.

Detailed warrant analyses for each study intersection are included in the technical appendix to this report. Left-turn lane warrants were conducted at all intersections under year 2025 conditions where such treatment would be applicable.

Left-turn lane warrants are not projected to be met under buildout year 2025 for either of the site access intersections or the intersection of SE Meinig Avenue at Pleasant Street. Accordingly, no new left-turn lanes are necessary or recommended.

[3] Bonneson, James A. and Michael D. Fontaine, *NCHRP Report 457: An Engineering Study Guide for Evaluating Intersection Improvements*, Transportation Research Board, 2001.

Operational Analysis

An operational analysis was conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM)[4]. The Synchro/SimTraffic software was used for the analysis.

Two performance measures are assessed for intersection operations:

- The Level of service (LOS) is a measure based on average delay per vehicle that ranges from LOS A, which indicates little or no delay, to LOS F, which indicates a significant amount of congestion and delay.
- The volume to capacity (v/c) ratio is a measure that compares the traffic volume (demand) against the available capacity of an intersection, with v/c ratios above 1.0 indicating that an intersection is operating above capacity.

Performance Targets

For study intersections under ODOT jurisdiction, the applicable performance targets are established under the Oregon Highway Plan (OHP) and are based on the v/c ratio of the intersection. The target maximum allowable v/c ratio is 0.85 along US 26 within the study area.

The City of Sandy's Transportation System Plan states that both signalized and unsignalzied intersections are required to operate at LOS D or better.

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 6. Detailed calculations as well as tables showing the relationship between delay and LOS are included in Appendix D.

As shown in Table 6, all study intersections meet ODOT and the City of Sandy standards under all analysis scenarios.

[4] Transportation Research Board, *Highway Capacity Manual 6th Edition*, 2016.

Table 6: Capacity Analysis Summary

Scenario	Evening Peak Hour			Saturday Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. Site Access at Scenic Street						
2025 Buildout Condition	A	8	0.01	A	8	0.01
2025 Buildout Condition (Saturday Event)	-	-	-	A	8	0.02
2. SE Meinig Avenue at Idleman Street / Site Access						
2023 Existing Condition	A	9	0.01	A	9	0.01
2025 Background Condition	A	9	0.01	A	9	0.01
2025 Buildout Condition	A	9	0.02	B	10	0.04
2025 Buildout Condition (Saturday Event)	-	-	-	B	11	0.05
3. SE Meinig Street at Pleasant Street						
2023 Existing Condition	B	10	0.18	B	10	0.14
2025 Background Condition	B	10	0.19	B	10	0.15
2025 Buildout Condition	B	10	0.19	B	11	0.16
2025 Buildout Condition (Saturday Event)	-	-	-	B	11	0.17
4. SE Meinig Avenue at Proctor Boulevard (US 26 westbound)						
2023 Existing Condition	B	14	0.73	B	13	0.73
2025 Background Condition	B	14	0.74	B	14	0.74
2025 Buildout Condition	B	15	0.75	B	15	0.76
2025 Buildout Condition (Saturday Event)	-	-	-	B	15	0.76
5. SE Meinig Avenue / Highway 211 at Pioneer Boulevard (US 26 eastbound)						
2023 Existing Condition	B	16	0.71	B	15	0.67
2025 Background Condition	B	17	0.72	B	15	0.68
2025 Buildout Condition	B	17	0.72	B	15	0.68
2025 Buildout Condition (Saturday Event)	-	-	-	B	16	0.69

BOLDED *results indicate operation above acceptable jurisdictional standards.*

Parking Analysis

The proposed development will provide 40 on-site parking spaces. On-street parking is also available on nearby streets such as SE Meinig Avenue, Scenic Street, Idleman Street, and Hood Street.

To estimate the parking demand that could be generated by the proposed development, parking generation rates from the *ITE Parking Generation Manual*[5] were used. While trip generation estimates using land use code 411, *Soccer Complex*, are deemed appropriate for hourly volumes, parking estimates will differ due to the difference in trip characteristics.

In the *ITE Parking Generation Manual*, it states that parking demand counts for land use code 488, *Soccer Complex*, were "…taken during a tournament or league games for which a series of back-to-back games were held on each field". It can be assumed that for a soccer complex, most patrons will arrive within a short time, specifically near the start of a game, and all remain parked during the duration of the game and again depart within a short time. The arrivals and departures as it relates to the skatepark and pump track will likely be more distributed during the peak hour because these amenities are not necessarily group or team sports. Due to this, using parking demand data for the land use code 488, *Soccer Complex*, from the *Parking Generation Manual* is not appropriate to capture the parking demand estimates for the pump track and skatepark.

The *Parking General Manual* states that the parks surveyed for parking demand data collection for the land use code 411, *Public Park*, varied widely in terms of location, type, and amenities such as hiking trails, picnic facilities, beaches, etc. Therefore, data from the land use code 411, *Public Park*, is more appropriate to estimate the proposed site's peak parking demand as a whole on a Saturday.

The average and 85th percentile parking demand estimates for an average Saturday are reported in Table 7. The 85th percentile parking demand rate is considered to be a conservatively high estimation of parking demand, whereas the average is more indicative of the most likely parking demand scenario throughout the day. However, in this case there is a wide disparity in the parking demand data, which leads to an abnormally high spread between the average and 85th percentile rates.

Table 7: Parking Generation Based on Park Acreage

ITE Code	Independent Variable	Average Rate	85th Percentile Rate	Average Parking Demand	85th Percentile Parking Demand
411 – Public Park	Acres	0.47	5.08	5	53

Using the standard assumption of 25 feet per parked vehicle, there will be approximately 14 on-street parking spaces along SE Meinig Avenue adjacent to the proposed park. Based on the size of the park and the amenities that are planned to be included, it is expected that the 40-space parking lot and 14 on-street parking spaces adjacent to the park on SE Meinig Avenue will provide sufficient parking supply to accommodate the anticipated parking demand.

[5] Institute of Transportation Engineers (ITE), Parking Generation Manual, 5th Edition

Conclusions

Key findings of this study include:

- No significant trends or crash patterns were identified at any of the study intersections. Accordingly, no specific safety mitigation is recommended.
- The projected traffic demand at the unsignalized intersections do not meet the ODOT preliminary traffic signal warrant thresholds under buildout conditions.
- Left-turn lane warrants for either of the site accesses or the intersection of SE Meinig Avenue & Pleasant Street are not projected to be met under buildout year 2025. Accordingly, no left-turn lanes are necessary or recommended.
- All study intersections are projected to meet ODOT and the City of Sandy standards under all analysis scenarios.
- The parking analysis shows that there is adequate parking supply available to accommodate the anticipated parking demand.

Appendix A – Site Information

Site Plan

Trip Generation Calculations

Parking Generation Calculations

THE MEANDER

PLAN NARRATIVE

The park design for The Meander recalls the fluid forms of the Sandy River and surrounding hillsides. The curving paths with woodland plantings bring visitors from the main entry on Meinig Avenue to a central plaza and then descends down into an open grass area. Vehicular access to the parking lot is from both Meinig Avenue and Scenic Street with a vehicular drop-off adjacent to the central plaza. The plaza hosts a shelter, a restroom facility, picnic tables and benches, all with views to the forest beyond. From the plaza, there is a connection to a sinuous walk that connects to other park elements including a play area nestled in the wooded hillside, a skate park at the bottom of a sloped grass seating area and a pump track. Fronting the walkways is a large open grass area along with an additional shelter, benches and planting.

PARK AMENITIES

1. PEDESTRIAN ENTRY
2. VEHICLE ENTRY
3. ENTRY PLAZA WITH SHELTER AND RESTROOM
4. SHELTER
5. BENCH, TYP
6. PICNIC TABLE, TYP
7. WOODLAND WALK
8. PLAY AREA WITH HILLSIDE SLIDE
9. SLOPED LAWN
10. SKATE PARK
11. PUMP TRACK
12. BIKE TRAIL
13. PEDESTRIAN PATH, TYP
14. OPEN LAWN
15. CITY OF SANDY PROPERTY ACCESS/ FUTURE PARK CONNECTION
16. SANDY RIVER PARK TRAIL CONNECTION
17. FUTURE PARK CONNECTION

SCENIC ST

SE MEINIG AVE

0' 30' 60' N

SANDY WHERE INNOVATION MEETS ELEVATION

Soccer Complex
(488)

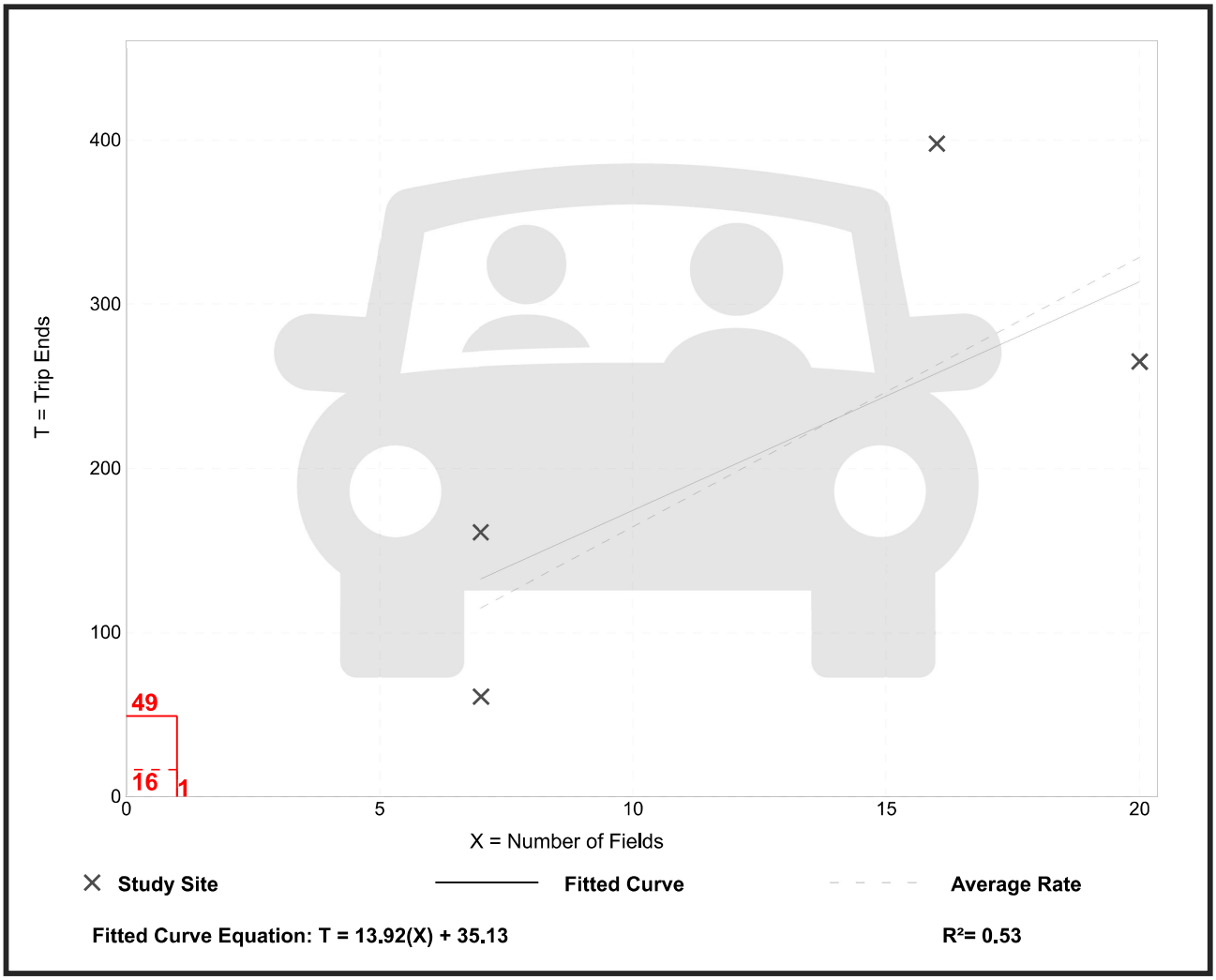
Vehicle Trip Ends vs: **Fields**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. Num. of Fields: 14
Directional Distribution: 66% entering, 34% exiting

Vehicle Trip Generation per Field

Average Rate	Range of Rates	Standard Deviation
16.43	8.71 - 24.88	6.36

Data Plot and Equation

Caution – Small Sample Size



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

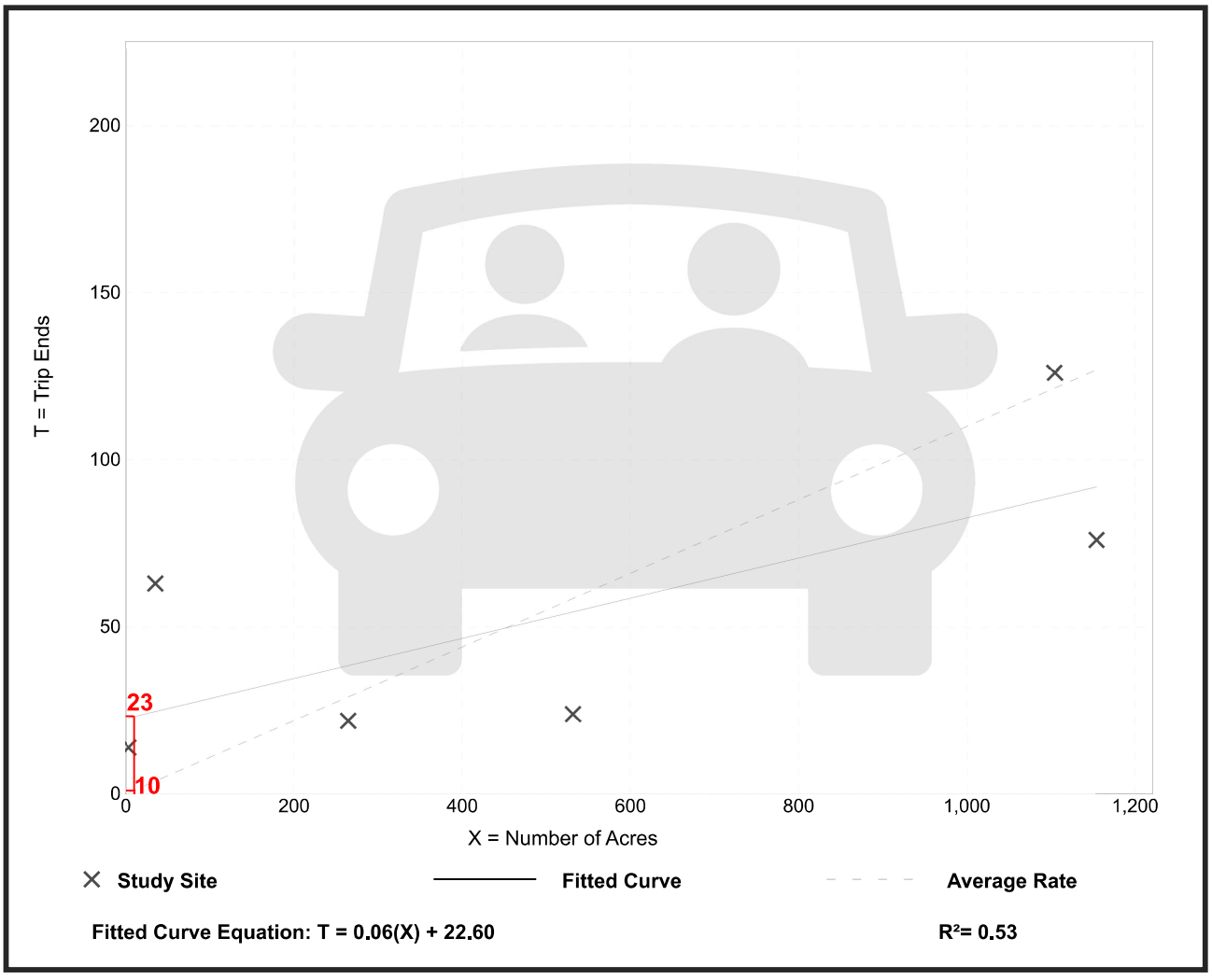
Public Park
(411)

Vehicle Trip Ends vs: **Acres**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 6
Avg. Num. of Acres: 516
Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
0.11	0.05 - 3.50	0.24

Data Plot and Equation



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Public Park
(411)

Vehicle Trip Ends vs: **Acres**
On a: **Saturday, Peak Hour of Generator**

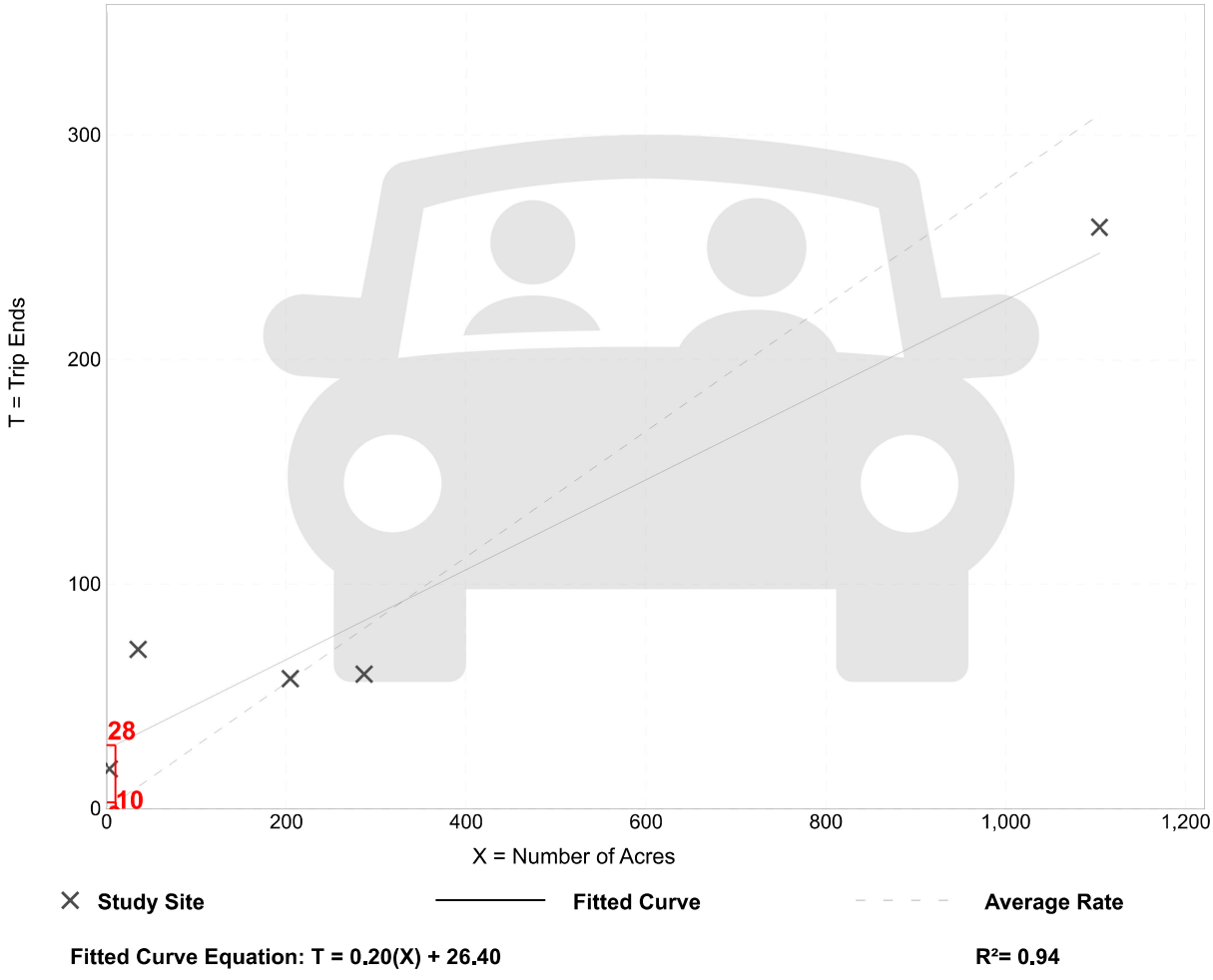
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. Num. of Acres: 327
Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
0.28	0.21 - 4.50	0.37

Data Plot and Equation

Caution – Small Sample Size



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Soccer Complex
(488)

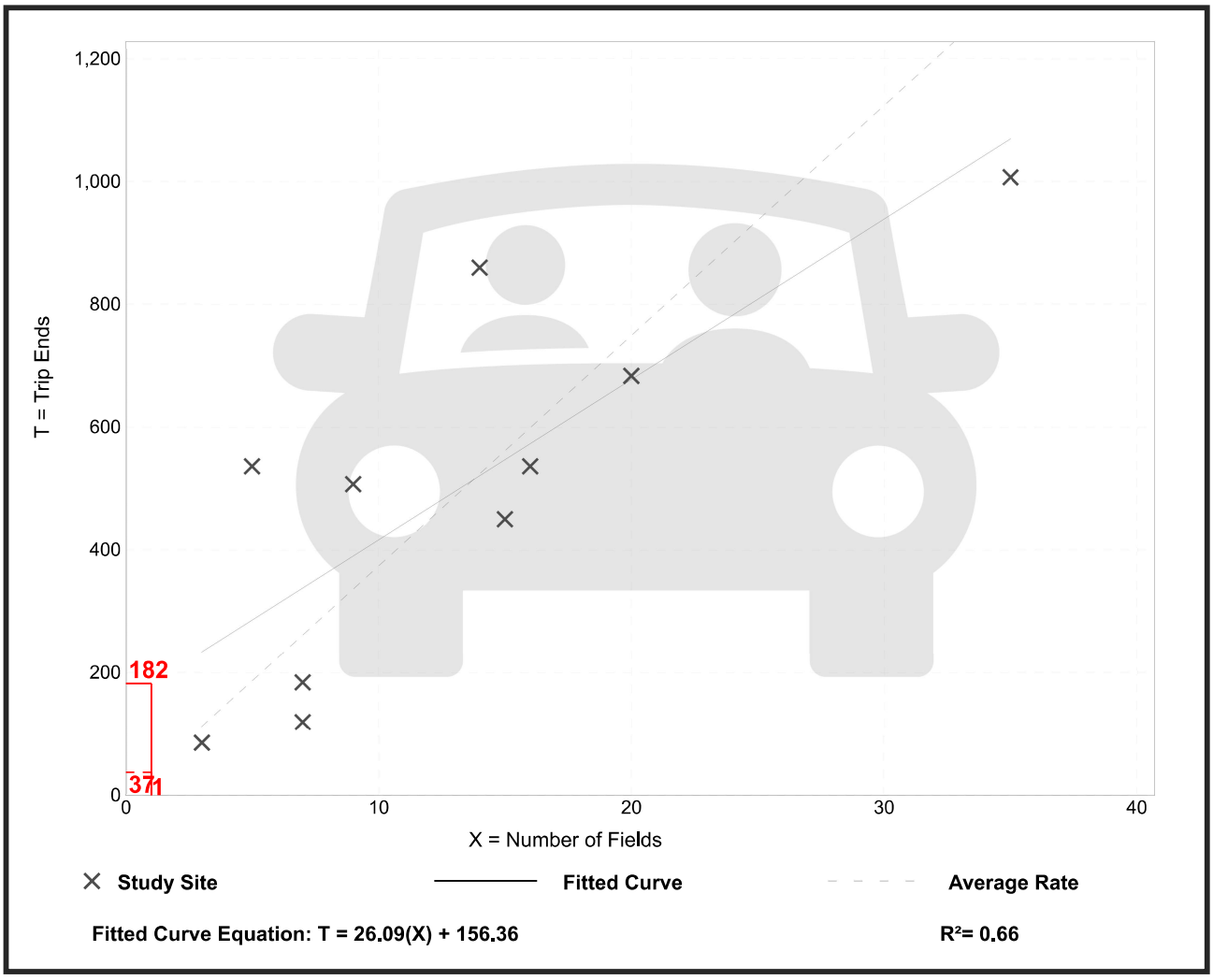
Vehicle Trip Ends vs: **Fields**
On a: **Saturday, Peak Hour of Generator**

Setting/Location: **General Urban/Suburban**
Number of Studies: 11
Avg. Num. of Fields: 14
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per Field

Average Rate	Range of Rates	Standard Deviation
37.48	17.14 - 107.40	17.87

Data Plot and Equation



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Public Park
(411)

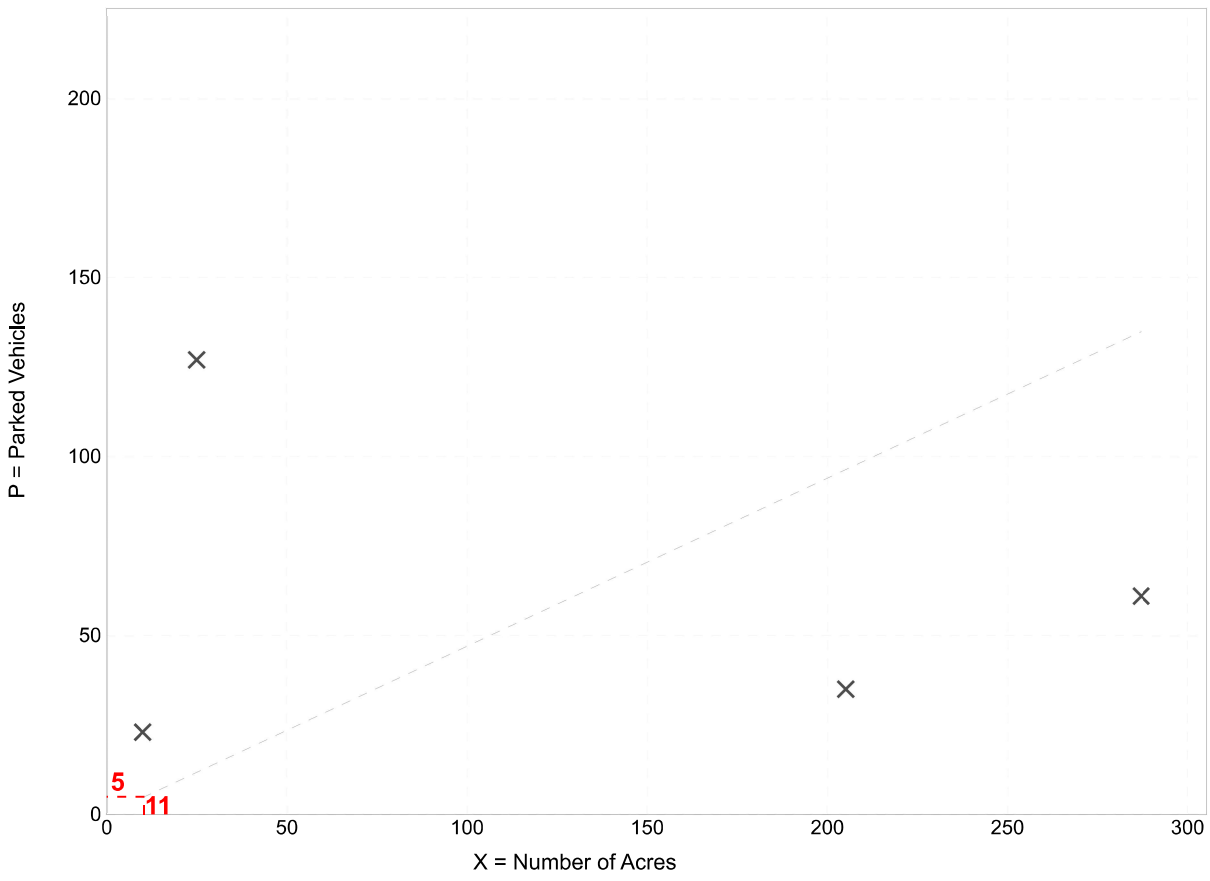
Peak Period Parking Demand vs: **Acres**
On a: **Saturday**
Setting/Location: **General Urban/Suburban**
Peak Period of Parking Demand: **9:00 a.m. - 3:00 p.m.**
Number of Studies: 4
Avg. Num. of Acres: 132

Peak Period Parking Demand per Acre

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.47	0.17 - 5.08	0.20 / 5.08	***	1.23 (262%)

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: ***

R^2= ***

Parking Generation Manual, 5th Edition ● Institute of Transportation Engineers

Appendix B – Traffic Volumes

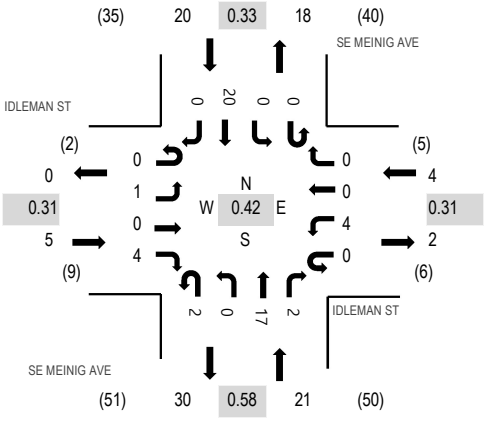
Traffic Counts

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

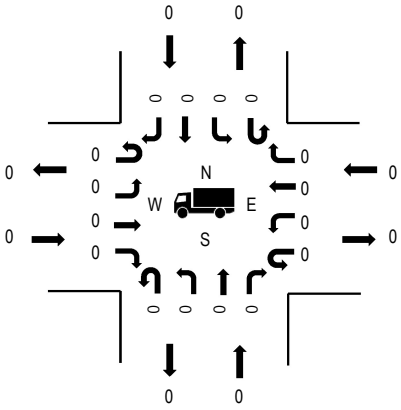
Location: 1 SE MEINIG AVE & IDLEMAN ST Noon
Date: Saturday, May 20, 2023
Peak Hour: 12:00 PM - 01:00 PM
Peak 15-Minutes: 12:15 PM - 12:30 PM

Peak Hour

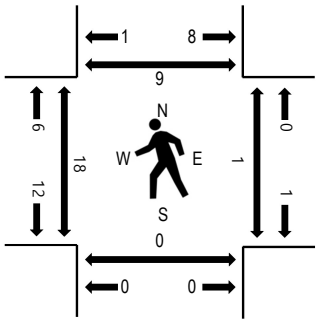
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.31
WB	0.0%	0.31
NB	0.0%	0.58
SB	0.0%	0.33
All	0.0%	0.42

Traffic Counts - Motorized Vehicles

Interval Start Time	IDLEMAN ST Eastbound				IDLEMAN ST Westbound				SE MEINIG AVE Northbound				SE MEINIG AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
12:00 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	4	50
12:05 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	46
12:10 PM	0	0	0	1	0	0	0	0	0	0	3	1	0	0	0	0	5	45
12:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	4	42
12:20 PM	0	1	0	1	0	2	0	0	1	0	1	0	0	0	4	0	10	39
12:25 PM	0	0	0	2	0	1	0	0	1	0	3	0	0	0	9	0	16	31
12:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	15
12:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	21
12:40 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	21
12:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	22
12:50 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	25
12:55 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3	25
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
1:05 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	27
1:10 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2	27
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	26
1:20 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	27
1:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
1:30 PM	0	0	0	2	0	0	0	0	1	0	1	0	0	0	2	1	7	26
1:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	22
1:40 PM	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	3	24
1:45 PM	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	1	4	23
1:50 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	23
1:55 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	26
2:00 PM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	3	25
2:05 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
2:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
2:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	2	

2:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:25 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
2:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
2:35 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
2:40 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
2:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	4
2:50 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	4
2:55 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Count Total	0	1	0	8	0	5	0	0	5	0	39	6	0	0	33	2	99
Peak Hour	0	1	0	4	0	4	0	0	2	0	17	2	0	0	20	0	50

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
12:00 PM	0	0	0	0	0	12:00 PM	0	0	0	0	0	12:00 PM	6	0	0	0	6
12:05 PM	0	0	0	0	0	12:05 PM	0	0	0	0	0	12:05 PM	1	0	0	1	2
12:10 PM	0	0	0	0	0	12:10 PM	0	0	0	0	0	12:10 PM	0	0	0	0	0
12:15 PM	0	0	0	0	0	12:15 PM	0	0	0	0	0	12:15 PM	1	0	0	0	1
12:20 PM	0	0	0	0	0	12:20 PM	0	0	0	0	0	12:20 PM	2	0	0	6	8
12:25 PM	0	0	0	0	0	12:25 PM	0	0	0	0	0	12:25 PM	5	0	0	2	7
12:30 PM	0	0	0	0	0	12:30 PM	0	0	0	0	0	12:30 PM	1	0	0	0	1
12:35 PM	0	0	0	0	0	12:35 PM	0	0	0	0	0	12:35 PM	0	0	0	0	0
12:40 PM	0	0	0	0	0	12:40 PM	0	0	0	0	0	12:40 PM	0	0	0	0	0
12:45 PM	0	0	0	0	0	12:45 PM	0	0	0	0	0	12:45 PM	0	0	0	0	0
12:50 PM	0	0	0	0	0	12:50 PM	0	0	0	0	0	12:50 PM	0	0	0	0	0
12:55 PM	0	0	0	0	0	12:55 PM	0	0	0	0	0	12:55 PM	2	0	1	0	3
1:00 PM	0	0	0	0	0	1:00 PM	0	0	0	0	0	1:00 PM	8	0	0	0	8
1:05 PM	0	0	0	0	0	1:05 PM	0	0	0	0	0	1:05 PM	1	0	1	0	2
1:10 PM	0	0	0	0	0	1:10 PM	0	0	0	0	0	1:10 PM	0	0	0	0	0
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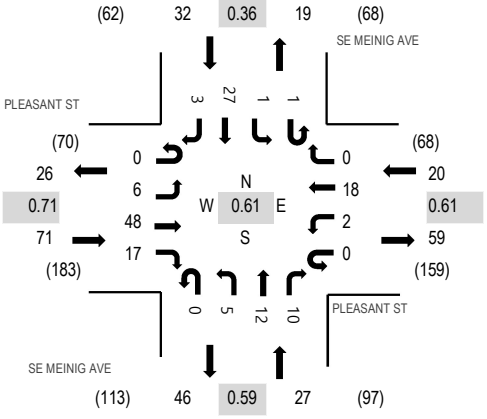
1:25 PM	0	0	0	0	0	1:25 PM	0	0	0	0	0	1:25 PM	1	0	0	0	1
1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	0	0	1:30 PM	6	0	0	0	6
1:35 PM	0	0	0	0	0	1:35 PM	0	0	0	0	0	1:35 PM	0	0	0	0	0
1:40 PM	0	0	0	0	0	1:40 PM	0	0	0	0	0	1:40 PM	1	0	0	0	1
1:45 PM	0	0	0	0	0	1:45 PM	0	0	0	0	0	1:45 PM	0	0	0	0	0
1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0
1:55 PM	0	0	0	0	0	1:55 PM	0	0	0	0	0	1:55 PM	0	0	1	0	1
2:00 PM	0	0	0	0	0	2:00 PM	0	0	0	0	0	2:00 PM	0	0	0	0	0
2:05 PM	0	0	0	0	0	2:05 PM	0	0	0	0	0	2:05 PM	0	0	0	0	0
2:10 PM	0	0	0	0	0	2:10 PM	0	0	0	0	0	2:10 PM	0	0	0	2	2
2:15 PM	0	0	0	0	0	2:15 PM	0	0	0	0	0	2:15 PM	0	0	0	0	0
2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	1	1
2:25 PM	0	0	0	0	0	2:25 PM	0	0	0	0	0	2:25 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	0	0
2:35 PM	0	0	0	0	0	2:35 PM	0	0	0	0	0	2:35 PM	0	0	0	0	0
2:40 PM	0	0	0	0	0	2:40 PM	0	0	0	0	0	2:40 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0	2:45 PM	0	0	0	0	0	2:45 PM	0	0	0	0	0
2:50 PM	0	0	0	0	0	2:50 PM	0	0	0	0	0	2:50 PM	0	0	0	0	0
2:55 PM	0	0	0	0	0	2:55 PM	0	0	0	0	0	2:55 PM	0	0	0	0	0
Count Total	0	0	0	0	0	Count Total	0	0	0	0	0	Count Total	35	0	4	12	51
Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0	Peak Hour	18	0	1	9	28

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

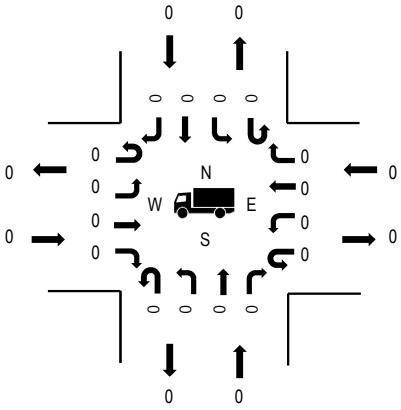
Location: 2 SE MEINIG AVE & PLEASANT ST Noon
Date: Saturday, May 20, 2023
Peak Hour: 12:10 PM - 01:10 PM
Peak 15-Minutes: 12:20 PM - 12:35 PM

Peak Hour

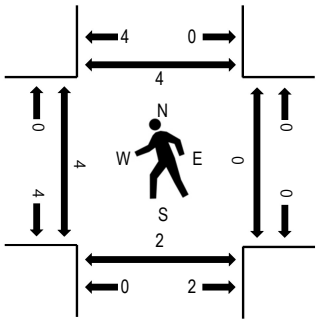
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.71
WB	0.0%	0.61
NB	0.0%	0.59
SB	0.0%	0.36
All	0.0%	0.61

Traffic Counts - Motorized Vehicles

Interval Start Time	PLEASANT ST Eastbound				PLEASANT ST Westbound				SE MEINIG AVE Northbound				SE MEINIG AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
12:00 PM	0	1	0	4	0	0	0	0	0	2	0	2	0	0	1	0	10	149
12:05 PM	0	0	3	0	0	0	0	1	0	0	2	0	0	0	0	0	6	147
12:10 PM	0	1	4	2	0	0	3	0	0	0	2	0	1	0	1	1	15	150
12:15 PM	0	1	6	2	0	0	2	0	0	0	1	0	0	0	1	1	14	146
12:20 PM	0	1	6	2	0	0	2	0	0	2	2	1	0	0	9	0	25	140
12:25 PM	0	1	1	0	0	0	3	0	0	1	1	1	0	0	10	1	19	126
12:30 PM	0	0	5	3	0	1	2	0	0	0	1	2	0	1	2	0	17	116
12:35 PM	0	0	6	0	0	0	1	0	0	0	0	0	0	0	1	0	8	109
12:40 PM	0	0	1	3	0	0	1	0	0	0	1	1	0	0	1	0	8	108
12:45 PM	0	0	3	2	0	1	1	0	0	0	1	1	0	0	0	0	9	113
12:50 PM	0	1	4	0	0	0	0	0	0	0	2	0	0	0	0	0	7	123
12:55 PM	0	0	4	1	0	0	2	0	0	0	1	1	0	0	2	0	11	125
1:00 PM	0	1	4	1	0	0	1	0	0	0	0	1	0	0	0	0	8	129
1:05 PM	0	0	4	1	0	0	0	0	0	2	0	2	0	0	0	0	9	136
1:10 PM	0	2	3	1	0	1	2	0	0	0	1	0	0	0	1	0	11	139
1:15 PM	0	0	2	3	0	1	2	0	0	0	0	0	0	0	0	0	8	136
1:20 PM	0	0	2	1	0	2	2	0	0	0	2	1	0	0	1	0	11	136
1:25 PM	0	0	3	1	0	0	1	0	0	0	0	3	0	0	0	1	9	130
1:30 PM	0	1	3	0	0	0	0	0	0	0	1	0	0	0	4	1	10	136
1:35 PM	0	0	0	2	0	0	1	0	0	1	1	1	0	1	0	0	7	137
1:40 PM	0	1	4	1	0	1	2	0	0	0	1	2	0	0	0	1	13	142
1:45 PM	0	0	3	1	0	2	4	1	0	1	2	2	0	1	2	0	19	140
1:50 PM	0	0	2	0	0	3	0	0	0	1	2	1	0	0	0	0	9	135
1:55 PM	0	2	2	2	0	2	2	0	0	1	1	1	0	0	2	0	15	139
2:00 PM	0	1	8	1	0	2	0	0	0	0	1	1	0	0	1	0	15	132
2:05 PM	0	0	3	3	0	1	2	0	0	0	1	1	0	0	1	0	12	
2:10 PM	0	1	2	0	0	0	1	0	0	0	1	1	0	0	2	0	8	
2:15 PM	0	0	3	2	0	0	1	0	0	0	0	0	0	0	2	0	8	

2:20 PM	0	0	2	1	0	0	1	0	0	0	0	1	0	0	0	0	
2:25 PM	0	1	4	2	0	0	1	2	0	2	1	2	0	0	0	0	
2:30 PM	0	0	4	1	0	0	1	0	0	0	3	0	0	0	2	0	11
2:35 PM	0	1	3	1	0	0	2	0	0	0	3	1	0	0	0	1	12
2:40 PM	0	0	4	0	0	0	1	0	0	1	2	2	0	0	0	1	11
2:45 PM	0	0	6	0	0	1	1	0	0	0	3	1	0	0	2	0	14
2:50 PM	0	0	3	1	0	0	1	0	0	2	4	1	0	0	1	0	13
2:55 PM	0	0	4	0	0	0	0	0	0	0	2	1	0	0	1	0	8
Count Total	0	17	121	45	0	18	46	4	0	16	46	35	1	3	50	8	410
Peak Hour	0	6	48	17	0	2	18	0	0	5	12	10	1	1	27	3	150

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

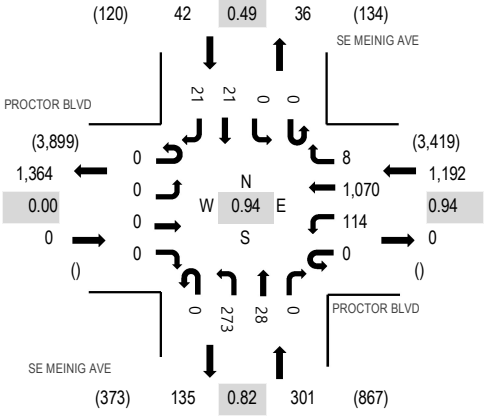
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
12:00 PM	0	0	0	0	0	12:00 PM	0	0	0	0	0	12:00 PM	0	0	0	0	0
12:05 PM	0	0	0	0	0	12:05 PM	0	0	0	0	0	12:05 PM	0	0	0	0	0
12:10 PM	0	0	0	0	0	12:10 PM	0	0	0	0	0	12:10 PM	2	2	0	1	5
12:15 PM	0	0	0	0	0	12:15 PM	0	0	0	0	0	12:15 PM	0	0	0	0	0
12:20 PM	0	0	0	0	0	12:20 PM	0	0	0	0	0	12:20 PM	1	0	0	0	1
12:25 PM	0	0	0	0	0	12:25 PM	0	0	0	0	0	12:25 PM	0	0	0	1	1
12:30 PM	0	0	0	0	0	12:30 PM	0	0	0	0	0	12:30 PM	0	0	0	0	0
12:35 PM	0	0	0	0	0	12:35 PM	0	0	0	0	0	12:35 PM	0	0	0	2	2
12:40 PM	0	0	0	0	0	12:40 PM	0	0	0	0	0	12:40 PM	0	0	0	0	0
12:45 PM	0	0	0	0	0	12:45 PM	0	0	0	0	0	12:45 PM	0	0	0	0	0
12:50 PM	0	0	0	0	0	12:50 PM	0	0	0	0	0	12:50 PM	0	0	0	0	0
12:55 PM	0	0	0	0	0	12:55 PM	0	0	0	0	0	12:55 PM	0	0	0	0	0
1:00 PM	0	0	0	0	0	1:00 PM	0	0	0	0	0	1:00 PM	0	0	0	0	0
1:05 PM	0	0	0	0	0	1:05 PM	0	0	0	0	0	1:05 PM	1	0	0	0	1
1:10 PM	0	0	0	0	0	1:10 PM	0	0	0	0	0	1:10 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0	1:15 PM	3	0	0	0	3	1:15 PM	0	0	0	0	0
1:20 PM	0	0	0	0	0	1:20 PM	0	0	0	0	0	1:20 PM	0	0	0	0	0
1:25 PM	0	0	0	0	0	1:25 PM	0	0	0	0	0	1:25 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	0	0
1:35 PM	0	0	0	0	0	1:35 PM	0	0	0	0	0	1:35 PM	0	1	0	0	1
1:40 PM	0	0	0	0	0	1:40 PM	0	0	0	0	0	1:40 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0	1:45 PM	0	0	0	0	0	1:45 PM	0	0	0	0	0
1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0
1:55 PM	0	0	0	0	0	1:55 PM	0	0	0	0	0	1:55 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0	2:00 PM	0	0	0	0	0	2:00 PM	0	0	0	0	0
2:05 PM	0	0	0	0	0	2:05 PM	0	0	1	0	1	2:05 PM	0	0	0	0	0
2:10 PM	0	0	0	0	0	2:10 PM	0	0	0	0	0	2:10 PM	0	0	1	0	1
2:15 PM	0	0	0	0	0	2:15 PM	0	0	0	0	0	2:15 PM	0	0	2	0	2
2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	1	1
2:25 PM	0	0	1	0	1	2:25 PM	0	0	0	0	0	2:25 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	0	0
2:35 PM	0	0	0	0	0	2:35 PM	0	0	0	0	0	2:35 PM	0	0	0	0	0
2:40 PM	0	0	0	0	0	2:40 PM	0	0	0	0	0	2:40 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0	2:45 PM	0	0	0	0	0	2:45 PM	0	0	0	0	0
2:50 PM	0	0	0	0	0	2:50 PM	0	0	0	0	0	2:50 PM	0	4	0	0	4
2:55 PM	0	0	0	0	0	2:55 PM	0	0	0	0	0	2:55 PM	4	0	0	0	4
Count Total	0	0	1	0	1	Count Total	3	0	1	0	4	Count Total	8	7	3	5	23
Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0	Peak Hour	4	2	0	4	10

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

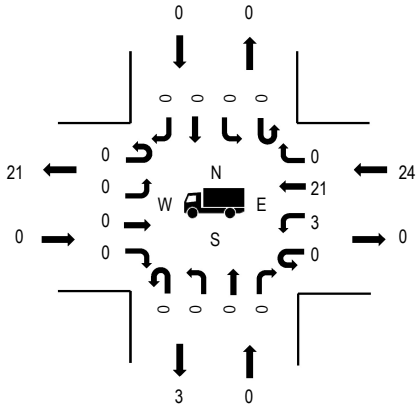
Location: 3 SE MEINIG AVE & PROCTOR BLVD Noon
Date: Saturday, May 20, 2023
Peak Hour: 12:25 PM - 01:25 PM
Peak 15-Minutes: 01:10 PM - 01:25 PM

Peak Hour

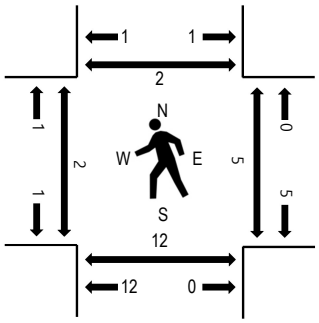
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	2.0%	0.94
NB	0.0%	0.82
SB	0.0%	0.49
All	1.6%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	PROCTOR BLVD Eastbound				PROCTOR BLVD Westbound				SE MEINIG AVE Northbound				SE MEINIG AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
12:00 PM	0	0	0	0	0	4	104	0	0	20	5	0	0	0	4	1	138	1,513
12:05 PM	0	0	0	0	0	10	101	0	0	28	3	0	0	0	0	1	143	1,495
12:10 PM	0	0	0	0	0	5	87	0	0	29	5	0	0	0	2	1	129	1,474
12:15 PM	0	0	0	0	0	6	87	0	0	17	1	0	0	0	1	0	112	1,479
12:20 PM	0	0	0	0	0	9	60	1	0	20	5	0	0	0	2	9	106	1,503
12:25 PM	0	0	0	0	0	11	96	1	0	25	3	0	0	0	1	8	145	1,535
12:30 PM	0	0	0	0	0	10	87	3	0	22	3	0	0	0	2	3	130	1,499
12:35 PM	0	0	0	0	0	7	84	0	0	27	0	0	0	0	0	2	120	1,480
12:40 PM	0	0	0	0	0	11	98	0	0	14	2	0	0	0	2	1	128	1,467
12:45 PM	0	0	0	0	0	12	79	1	0	26	3	0	0	0	4	0	125	1,469
12:50 PM	0	0	0	0	0	11	72	0	0	22	4	0	0	0	1	1	111	1,482
12:55 PM	0	0	0	0	0	13	85	1	0	22	2	0	0	0	2	1	126	1,478
1:00 PM	0	0	0	0	0	8	89	1	0	19	1	0	0	0	1	1	120	1,463
1:05 PM	0	0	0	0	0	7	88	1	0	21	4	0	0	0	1	0	122	1,474
1:10 PM	0	0	0	0	0	7	96	0	0	27	2	0	0	0	0	2	134	1,471
1:15 PM	0	0	0	0	0	10	99	0	0	22	1	0	0	0	3	1	136	1,464
1:20 PM	0	0	0	0	0	7	97	0	0	26	3	0	0	0	4	1	138	1,450
1:25 PM	0	0	0	0	0	5	85	1	0	13	3	0	0	0	2	0	109	1,441
1:30 PM	0	0	0	0	0	5	72	2	0	25	3	0	0	0	0	4	111	1,453
1:35 PM	0	0	0	0	0	8	73	3	0	20	1	0	0	0	1	1	107	1,447
1:40 PM	0	0	0	0	0	13	79	0	0	33	3	0	0	0	2	0	130	1,462
1:45 PM	0	0	0	0	0	12	94	2	0	21	4	0	0	0	2	3	138	1,451
1:50 PM	0	0	0	0	0	5	65	0	0	30	4	0	0	0	1	2	107	1,438
1:55 PM	0	0	0	0	0	5	84	1	0	14	3	0	0	0	3	1	111	1,429
2:00 PM	0	0	0	0	0	11	96	0	0	15	3	0	0	0	1	5	131	1,430
2:05 PM	0	0	0	0	0	14	68	3	0	27	1	0	0	0	5	1	119	
2:10 PM	0	0	0	0	0	8	95	1	0	17	2	0	0	0	2	2	127	
2:15 PM	0	0	0	0	0	10	88	0	0	22	0	0	0	0	1	1	122	

2:20 PM	0	0	0	0	0	13	88	1	0	25	0	0	0	0	1	1	
2:25 PM	0	0	0	0	0	13	80	2	0	20	5	0	0	0	0	1	
2:30 PM	0	0	0	0	0	3	84	1	0	10	4	0	0	0	2	1	105
2:35 PM	0	0	0	0	0	10	96	0	0	12	3	0	0	0	1	0	122
2:40 PM	0	0	0	0	0	7	80	1	0	25	5	0	0	0	0	1	119
2:45 PM	0	0	0	0	0	8	91	2	0	16	3	0	0	0	4	1	125
2:50 PM	0	0	0	0	0	7	68	2	0	12	6	0	0	0	2	1	98
2:55 PM	0	0	0	0	0	8	80	0	0	20	3	0	0	0	0	1	112
Count Total	0	0	0	0	0	313	3,075	31	0	764	103	0	0	0	60	60	4,406
Peak Hour	0	0	0	0	0	114	1,070	8	0	273	28	0	0	0	21	21	1,535

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

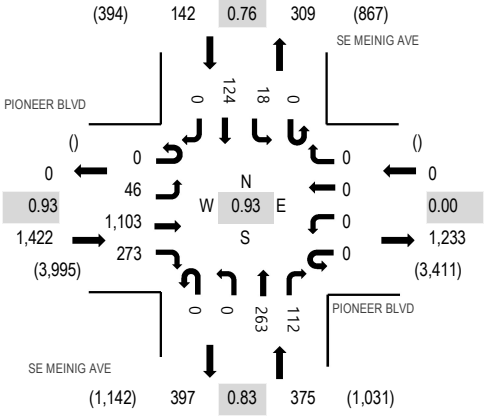
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
12:00 PM	0	0	2	0	2	12:00 PM	0	0	0	0	0	12:00 PM	6	7	0	4	17
12:05 PM	0	0	1	0	1	12:05 PM	0	0	0	0	0	12:05 PM	0	9	3	0	12
12:10 PM	0	0	0	0	0	12:10 PM	0	0	0	0	0	12:10 PM	0	5	2	0	7
12:15 PM	0	0	0	0	0	12:15 PM	0	0	0	0	0	12:15 PM	0	0	0	0	0
12:20 PM	0	0	0	0	0	12:20 PM	0	0	0	0	0	12:20 PM	1	0	0	1	2
12:25 PM	0	0	2	0	2	12:25 PM	0	0	0	0	0	12:25 PM	0	0	0	0	0
12:30 PM	0	0	3	0	3	12:30 PM	0	0	0	0	0	12:30 PM	0	5	0	0	5
12:35 PM	0	0	0	0	0	12:35 PM	0	0	0	0	0	12:35 PM	0	0	3	0	3
12:40 PM	0	0	0	0	0	12:40 PM	0	0	0	0	0	12:40 PM	0	0	0	0	0
12:45 PM	0	0	2	0	2	12:45 PM	0	0	0	0	0	12:45 PM	1	1	0	0	2
12:50 PM	0	0	5	0	5	12:50 PM	0	0	0	0	0	12:50 PM	0	0	2	0	2
12:55 PM	0	0	2	0	2	12:55 PM	0	0	3	0	3	12:55 PM	0	0	0	0	0
1:00 PM	0	0	2	0	2	1:00 PM	0	0	0	0	0	1:00 PM	0	3	0	0	3
1:05 PM	0	0	1	0	1	1:05 PM	0	0	0	0	0	1:05 PM	0	1	1	1	3
1:10 PM	0	0	2	0	2	1:10 PM	0	0	0	0	0	1:10 PM	0	1	0	0	1
1:15 PM	0	0	4	0	4	1:15 PM	0	0	0	0	0	1:15 PM	0	1	0	1	2
1:20 PM	0	0	1	0	1	1:20 PM	0	0	0	0	0	1:20 PM	1	0	0	0	1
1:25 PM	0	0	2	0	2	1:25 PM	0	0	0	0	0	1:25 PM	0	0	0	0	0
1:30 PM	0	0	6	0	6	1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	1	1
1:35 PM	0	0	1	0	1	1:35 PM	0	0	0	0	0	1:35 PM	0	0	0	0	0
1:40 PM	0	0	4	0	4	1:40 PM	0	0	0	0	0	1:40 PM	1	2	0	0	3
1:45 PM	0	0	4	0	4	1:45 PM	0	0	0	0	0	1:45 PM	0	0	0	0	0
1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0	1:50 PM	0	0	2	0	2
1:55 PM	0	0	1	0	1	1:55 PM	0	0	0	0	0	1:55 PM	0	0	0	0	0
2:00 PM	0	0	1	0	1	2:00 PM	0	0	0	0	0	2:00 PM	0	0	0	0	0
2:05 PM	0	0	1	0	1	2:05 PM	0	0	0	0	0	2:05 PM	0	0	0	0	0
2:10 PM	0	0	1	0	1	2:10 PM	0	0	0	0	0	2:10 PM	0	0	0	0	0
2:15 PM	0	0	2	0	2	2:15 PM	0	0	0	0	0	2:15 PM	0	4	0	0	4
2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	0	0
2:25 PM	0	0	0	0	0	2:25 PM	0	0	0	0	0	2:25 PM	0	0	0	0	0
2:30 PM	0	0	3	0	3	2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	2	2
2:35 PM	0	0	3	0	3	2:35 PM	0	0	0	0	0	2:35 PM	0	2	0	0	2
2:40 PM	0	0	1	0	1	2:40 PM	0	0	0	0	0	2:40 PM	0	0	0	0	0
2:45 PM	0	0	2	0	2	2:45 PM	0	0	0	0	0	2:45 PM	0	0	0	1	1
2:50 PM	0	0	0	0	0	2:50 PM	0	0	0	0	0	2:50 PM	0	0	0	1	1
2:55 PM	0	0	1	0	1	2:55 PM	0	0	0	0	0	2:55 PM	0	0	1	0	1
Count Total	0	0	60	0	60	Count Total	0	0	3	0	3	Count Total	10	41	14	12	77
Peak Hour	0	0	24	0	24	Peak Hour	0	0	3	0	3	Peak Hour	2	12	6	2	22

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

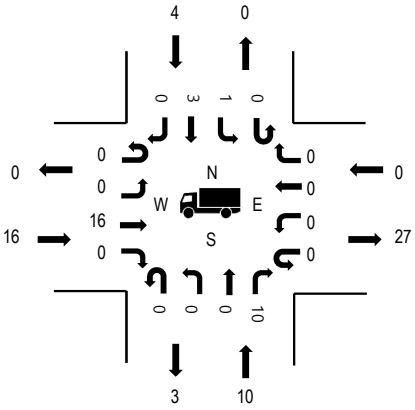
Location: 4 SE MEINIG AVE & PIONEER BLVD Noon
Date: Saturday, May 20, 2023
Peak Hour: 12:30 PM - 01:30 PM
Peak 15-Minutes: 12:40 PM - 12:55 PM

Peak Hour

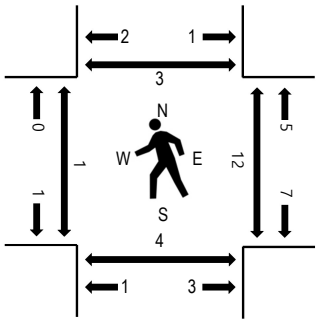
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.1%	0.93
WB	0.0%	0.00
NB	2.7%	0.83
SB	2.8%	0.76
All	1.5%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	PIONEER BLVD Eastbound				PIONEER BLVD Westbound				SE MEINIG AVE Northbound				SE MEINIG AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
12:00 PM	0	5	81	18	0	0	0	0	0	0	23	14	0	3	6	0	150	1,860
12:05 PM	0	8	65	22	0	0	0	0	0	0	20	6	0	4	6	0	131	1,870
12:10 PM	0	6	78	26	0	0	0	0	0	0	22	8	0	0	9	0	149	1,894
12:15 PM	0	3	78	20	0	0	0	0	0	0	23	10	0	1	8	0	143	1,897
12:20 PM	0	2	86	21	0	0	0	0	0	0	20	6	0	2	9	0	146	1,932
12:25 PM	0	4	97	22	0	0	0	0	0	0	16	10	0	1	7	0	157	1,927
12:30 PM	0	4	95	23	0	0	0	0	0	0	22	6	0	0	13	0	163	1,939
12:35 PM	0	1	84	17	0	0	0	0	0	0	20	10	0	0	10	0	142	1,904
12:40 PM	0	5	113	24	0	0	0	0	0	0	14	11	0	3	13	0	183	1,935
12:45 PM	0	6	98	25	0	0	0	0	0	0	21	13	0	2	8	0	173	1,902
12:50 PM	0	2	102	11	0	0	0	0	0	0	25	9	0	3	12	0	164	1,901
12:55 PM	0	6	79	25	0	0	0	0	0	0	23	10	0	2	14	0	159	1,874
1:00 PM	0	4	86	21	0	0	0	0	0	0	26	15	0	1	7	0	160	1,870
1:05 PM	0	3	87	31	0	0	0	0	0	0	20	6	0	1	7	0	155	1,827
1:10 PM	0	4	70	20	0	0	0	0	0	0	35	15	0	1	7	0	152	1,814
1:15 PM	0	3	104	28	0	0	0	0	0	0	25	10	0	0	8	0	178	1,846
1:20 PM	0	2	83	18	0	0	0	0	0	0	16	5	0	4	13	0	141	1,812
1:25 PM	0	6	102	30	0	0	0	0	0	0	16	2	0	1	12	0	169	1,814
1:30 PM	0	2	63	29	0	0	0	0	0	0	22	6	0	1	5	0	128	1,791
1:35 PM	0	5	115	22	0	0	0	0	0	0	15	7	0	0	9	0	173	1,811
1:40 PM	0	5	74	18	0	0	0	0	0	0	29	13	0	2	9	0	150	1,755
1:45 PM	0	5	98	24	0	0	0	0	0	0	26	10	0	1	8	0	172	1,733
1:50 PM	0	2	74	17	0	0	0	0	0	0	25	6	0	1	12	0	137	1,698
1:55 PM	0	3	93	26	0	0	0	0	0	0	17	10	0	1	5	0	155	1,708
2:00 PM	0	4	51	20	0	0	0	0	0	0	18	7	0	0	17	0	117	1,690
2:05 PM	0	2	80	15	0	0	0	0	0	0	21	6	0	1	17	0	142	
2:10 PM	0	6	110	25	0	0	0	0	0	0	17	14	0	3	9	0	184	
2:15 PM	0	2	81	28	0	0	0	0	0	0	19	7	0	0	7	0	144	

2:20 PM	0	8	81	16	0	0	0	0	0	0	19	6	0	0	13	0	
2:25 PM	0	1	87	21	0	0	0	0	0	0	18	5	0	0	14	0	
2:30 PM	0	5	79	38	0	0	0	0	0	0	11	7	0	1	7	0	148
2:35 PM	0	4	66	18	0	0	0	0	0	0	12	7	0	0	10	0	117
2:40 PM	0	5	77	13	0	0	0	0	0	0	19	6	0	0	8	0	128
2:45 PM	0	3	86	20	0	0	0	0	0	0	14	3	0	3	8	0	137
2:50 PM	0	5	79	22	0	0	0	0	0	0	17	11	0	3	10	0	147
2:55 PM	0	1	75	22	0	0	0	0	0	0	19	9	0	2	9	0	137
Count Total	0	142	3,057	796	0	0	0	0	0	0	725	306	0	48	346	0	5,420
Peak Hour	0	46	1,103	273	0	0	0	0	0	0	263	112	0	18	124	0	1,939

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

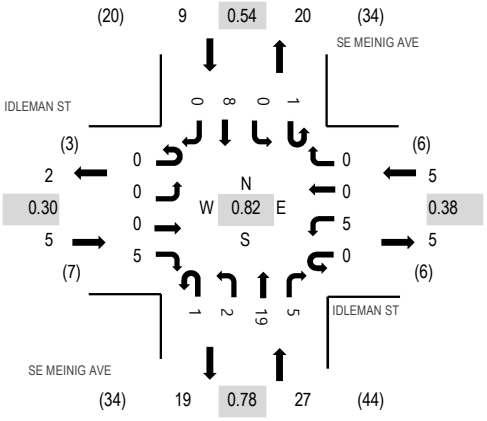
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
12:00 PM	2	2	0	0	4	12:00 PM	0	0	0	0	0	12:00 PM	2	4	1	3	10
12:05 PM	0	0	0	0	0	12:05 PM	0	0	0	0	0	12:05 PM	0	3	0	1	4
12:10 PM	0	1	0	0	1	12:10 PM	0	0	0	0	0	12:10 PM	0	1	5	0	6
12:15 PM	3	0	0	0	3	12:15 PM	0	0	0	0	0	12:15 PM	0	0	4	0	4
12:20 PM	3	0	0	0	3	12:20 PM	0	0	0	0	0	12:20 PM	0	0	1	0	1
12:25 PM	4	1	0	0	5	12:25 PM	0	0	0	0	0	12:25 PM	0	0	0	2	2
12:30 PM	2	0	0	0	2	12:30 PM	0	0	0	0	0	12:30 PM	0	0	2	0	2
12:35 PM	0	0	0	0	0	12:35 PM	0	0	0	0	0	12:35 PM	0	0	1	0	1
12:40 PM	3	0	0	0	3	12:40 PM	0	0	0	0	0	12:40 PM	0	0	1	0	1
12:45 PM	0	1	0	0	1	12:45 PM	0	0	0	0	0	12:45 PM	0	0	2	1	3
12:50 PM	1	1	0	0	2	12:50 PM	0	0	0	0	0	12:50 PM	1	1	1	0	3
12:55 PM	1	0	0	0	1	12:55 PM	0	0	0	3	3	12:55 PM	0	1	3	0	4
1:00 PM	1	3	0	1	5	1:00 PM	0	0	0	0	0	1:00 PM	0	0	2	0	2
1:05 PM	1	0	0	0	1	1:05 PM	0	0	0	0	0	1:05 PM	0	0	1	1	2
1:10 PM	0	5	0	0	5	1:10 PM	0	0	0	0	0	1:10 PM	0	1	0	0	1
1:15 PM	2	0	0	1	3	1:15 PM	0	0	0	0	0	1:15 PM	0	0	1	0	1
1:20 PM	3	0	0	1	4	1:20 PM	0	0	0	0	0	1:20 PM	0	0	0	0	0
1:25 PM	2	0	0	1	3	1:25 PM	0	0	0	0	0	1:25 PM	0	1	0	1	2
1:30 PM	1	0	0	0	1	1:30 PM	0	0	0	0	0	1:30 PM	1	0	1	1	3
1:35 PM	2	0	0	0	2	1:35 PM	0	0	0	0	0	1:35 PM	0	0	1	0	1
1:40 PM	1	1	0	1	3	1:40 PM	0	0	0	0	0	1:40 PM	0	0	3	0	3
1:45 PM	2	0	0	1	3	1:45 PM	0	0	0	0	0	1:45 PM	0	1	2	5	8
1:50 PM	0	0	0	1	1	1:50 PM	0	0	0	0	0	1:50 PM	0	2	0	0	2
1:55 PM	2	0	0	0	2	1:55 PM	0	0	0	0	0	1:55 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0	2:00 PM	0	0	0	0	0	2:00 PM	0	0	0	0	0
2:05 PM	2	0	0	0	2	2:05 PM	0	0	0	0	0	2:05 PM	0	0	0	1	1
2:10 PM	2	1	0	0	3	2:10 PM	0	0	0	0	0	2:10 PM	0	0	0	0	0
2:15 PM	0	1	0	0	1	2:15 PM	0	0	0	0	0	2:15 PM	0	0	1	0	1
2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	0	0	2:20 PM	0	1	2	0	3
2:25 PM	0	1	0	0	1	2:25 PM	0	0	0	0	0	2:25 PM	0	0	0	1	1
2:30 PM	2	0	0	0	2	2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	1	1
2:35 PM	2	0	0	0	2	2:35 PM	0	0	0	0	0	2:35 PM	0	5	1	0	6
2:40 PM	3	0	0	0	3	2:40 PM	0	0	0	0	0	2:40 PM	0	1	0	0	1
2:45 PM	1	0	0	0	1	2:45 PM	0	0	0	0	0	2:45 PM	0	2	3	0	5
2:50 PM	0	0	0	0	0	2:50 PM	0	0	0	0	0	2:50 PM	2	3	1	2	8
2:55 PM	1	1	0	0	2	2:55 PM	0	0	0	0	0	2:55 PM	0	1	0	0	1
Count Total	49	19	0	7	75	Count Total	0	0	0	3	3	Count Total	6	28	40	20	94
Peak Hour	16	10	0	4	30	Peak Hour	0	0	0	3	3	Peak Hour	1	4	14	3	22

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

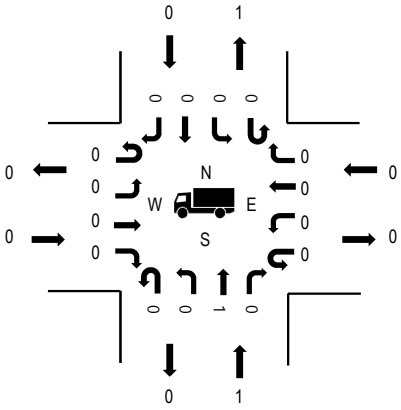
Location: 1 SE MEINIG AVE & IDLEMAN ST PM
Date: Thursday, May 18, 2023
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour

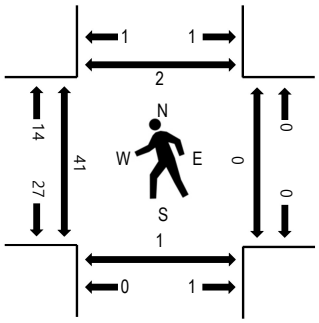
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.30
WB	0.0%	0.38
NB	3.7%	0.78
SB	0.0%	0.54
All	2.2%	0.82

Traffic Counts - Motorized Vehicles

Interval Start Time	IDLEMAN ST Eastbound				IDLEMAN ST Westbound				SE MEINIG AVE Northbound				SE MEINIG AVE 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	0	1	0	0	0	0	0	0	3	0	0	0	1	0	5	41
4:05 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2	38
4:10 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	41
4:15 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	3	40
4:20 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	43
4:25 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3	43
4:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	46
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	43
4:40 PM	0	0	0	0	0	1	0	0	0	0	2	1	0	0	0	0	4	43
4:45 PM	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	3	39
4:50 PM	0	0	0	0	0	1	0	0	0	2	2	0	0	0	1	0	6	40
4:55 PM	0	0	0	1	0	0	0	0	0	0	3	1	0	0	0	0	5	37
5:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	36
5:05 PM	0	0	0	3	0	0	0	0	0	0	1	0	0	0	1	0	5	
5:10 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
5:15 PM	0	0	0	0	0	0	0	0	0	0	3	0	1	0	2	0	6	
5:20 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	
5:25 PM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	2	0	6	
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
5:35 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	4	
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	
5:55 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0	4	
Count Total	0	0	0	7	0	6	0	0	2	3	33	6	1	0	19	0	77	
Peak Hour	0	0	0	5	0	5	0	0	1	2	19	5	1	0	8	0	46	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

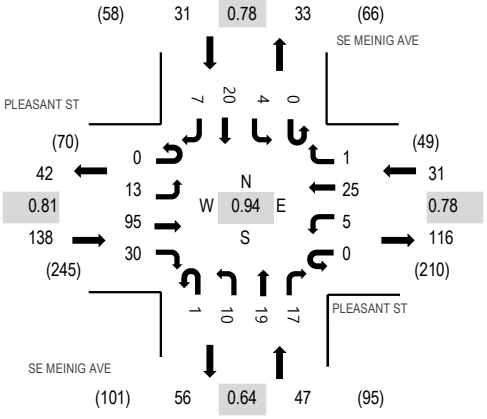
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	2	0	2	4	4:05 PM	0	1	0	0	1
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	2	0	0	0	2
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	7	0	0	0	7
4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0	4:25 PM	11	0	0	0	11
4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0	4:30 PM	6	1	0	0	7
4:35 PM	0	0	0	0	0	4:35 PM	0	2	0	0	2	4:35 PM	1	0	0	0	1
4:40 PM	0	0	0	0	0	4:40 PM	1	0	0	0	1	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	2	2	4:45 PM	1	0	0	0	1
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	1	0	0	1	4:55 PM	0	0	0	0	0	4:55 PM	3	0	0	1	4
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	2	0	0	0	2
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	4	0	0	0	4
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	1	0	0	0	1
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	6	0	0	0	6
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	6	0	0	1	7
5:25 PM	0	0	0	0	0	5:25 PM	0	3	0	0	3	5:25 PM	11	0	0	0	11
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	2	0	0	0	2
5:35 PM	0	0	0	0	0	5:35 PM	0	1	0	2	3	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	2	2	5:40 PM	1	0	0	0	1
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	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	4	0	0	0	4
Count Total	0	1	0	0	1	Count Total	1	8	0	8	17	Count Total	68	2	0	2	72
Peak Hour	0	1	0	0	1	Peak Hour	1	5	0	2	8	Peak Hour	41	1	0	2	44

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

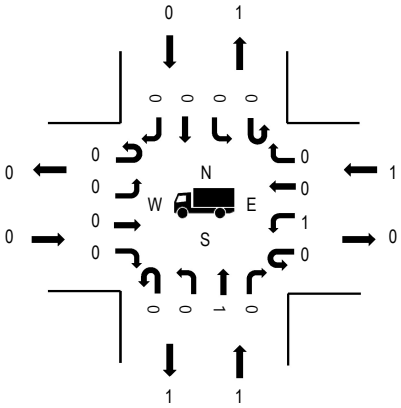
Location: 2 SE MEINIG AVE & PLEASANT ST PM
Date: Thursday, May 18, 2023
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 04:50 PM - 05:05 PM

Peak Hour

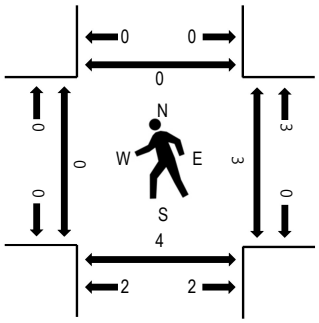
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.81
WB	3.2%	0.78
NB	2.1%	0.64
SB	0.0%	0.78
All	0.8%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	PLEASANT ST Eastbound				PLEASANT ST Westbound				SE MEINIG AVE Northbound				SE MEINIG AVE 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	2	7	0	0	1	3	0	0	2	2	5	0	1	1	0	24	234
4:05 PM	0	1	9	2	0	3	0	0	0	0	4	1	0	0	1	0	21	234
4:10 PM	0	1	3	2	0	0	0	0	0	2	2	1	0	1	2	1	15	234
4:15 PM	0	0	11	4	0	0	3	0	0	0	0	0	0	0	2	2	22	239
4:20 PM	0	3	6	3	0	0	3	0	0	1	1	2	0	0	1	1	21	238
4:25 PM	0	1	3	1	0	0	1	0	0	0	3	2	0	0	1	0	12	235
4:30 PM	0	2	6	6	0	0	1	0	0	0	2	3	0	0	1	0	21	247
4:35 PM	0	1	7	1	0	0	1	0	0	2	1	2	0	1	3	0	19	241
4:40 PM	0	2	6	2	0	0	2	0	0	0	2	0	0	0	1	0	15	233
4:45 PM	0	1	8	4	0	0	3	0	0	0	0	3	0	1	1	1	22	232
4:50 PM	0	2	4	4	0	2	1	1	0	0	1	2	0	0	3	1	21	224
4:55 PM	0	1	13	2	0	0	1	0	0	0	3	0	0	0	1	0	21	214
5:00 PM	0	0	13	0	0	1	3	0	0	1	1	3	0	0	2	0	24	213
5:05 PM	0	1	11	2	0	0	1	0	0	0	1	1	0	0	2	2	21	
5:10 PM	0	0	7	2	0	0	5	0	0	1	2	1	0	0	1	1	20	
5:15 PM	0	2	6	4	0	0	1	0	0	2	2	1	0	0	2	1	21	
5:20 PM	0	0	7	3	0	0	1	0	1	2	1	0	0	2	1	0	18	
5:25 PM	0	1	7	0	0	2	5	0	0	2	3	1	0	0	2	1	24	
5:30 PM	0	2	6	3	0	0	1	0	0	1	1	1	0	0	0	0	15	
5:35 PM	0	0	4	2	0	0	1	0	0	1	0	1	0	0	1	1	11	
5:40 PM	0	1	8	0	0	0	0	0	0	1	0	4	0	0	0	0	14	
5:45 PM	0	1	6	2	0	1	0	0	0	0	2	1	0	0	1	0	14	
5:50 PM	0	2	2	0	0	0	1	0	0	0	0	1	0	1	3	1	11	
5:55 PM	0	2	3	4	0	0	0	0	0	0	2	4	0	0	4	1	20	
Count Total	0	29	163	53	0	10	38	1	1	18	36	40	0	7	37	14	447	
Peak Hour	0	13	95	30	0	5	25	1	1	10	19	17	0	4	20	7	247	

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	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	1	0	0	1	4:05 PM	0	0	2	0	2	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	1	1	4:10 PM	0	0	0	0	0	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	1	0	1
4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	2	0	0	2	4:35 PM	0	1	0	0	1
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	2	2	4:45 PM	0	0	0	0	0
4:50 PM	0	0	1	0	1	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	1	0	0	1	4:55 PM	0	0	0	0	0	4:55 PM	0	0	1	0	1
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	3	1	0	4
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	1	0	1
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	1	2	0	3	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	5	0	0	0	5
5:35 PM	0	0	0	0	0	5:35 PM	0	0	1	0	1	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	6	0	6
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	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	1	0	0	1
Count Total	0	2	1	1	4	Count Total	0	3	5	2	10	Count Total	5	5	10	0	20
Peak Hour	0	1	1	0	2	Peak Hour	0	3	2	2	7	Peak Hour	0	4	3	0	7

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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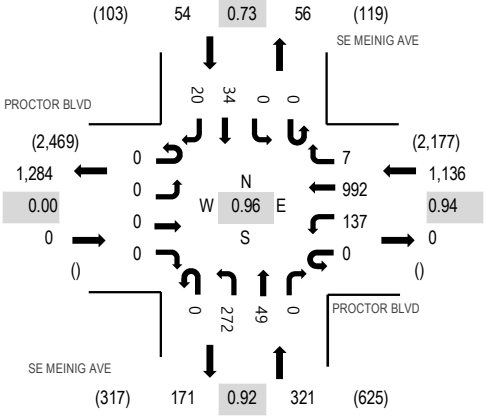
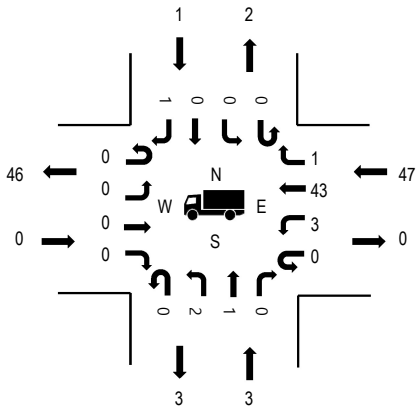
Location: 3 SE MEINIG AVE & PROCTOR BLVD PM
Date: Thursday, May 18, 2023
Peak Hour: 04:05 PM - 05:05 PM
Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour

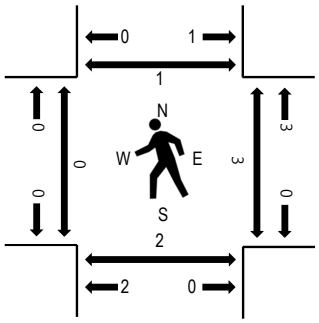
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	4.1%	0.94
NB	0.9%	0.92
SB	1.9%	0.73
All	3.4%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	PROCTOR BLVD Eastbound				PROCTOR BLVD Westbound				SE MEINIG AVE Northbound				SE MEINIG AVE 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	0	0	0	6	65	1	0	12	9	0	0	0	1	2	96	1,483
4:05 PM	0	0	0	0	0	13	83	1	0	20	4	0	0	0	3	0	124	1,511
4:10 PM	0	0	0	0	0	10	77	0	0	24	6	0	0	0	3	2	122	1,510
4:15 PM	0	0	0	0	0	9	96	2	0	16	1	0	0	0	3	2	129	1,501
4:20 PM	0	0	0	0	0	10	96	0	0	22	5	0	0	0	4	1	138	1,489
4:25 PM	0	0	0	0	0	13	66	0	0	22	6	0	0	0	2	1	110	1,476
4:30 PM	0	0	0	0	0	14	82	1	0	22	4	0	0	0	4	1	128	1,508
4:35 PM	0	0	0	0	0	11	86	1	0	25	6	0	0	0	3	2	134	1,498
4:40 PM	0	0	0	0	0	7	68	0	0	29	3	0	0	0	1	0	108	1,477
4:45 PM	0	0	0	0	0	13	88	1	0	21	4	0	0	0	3	2	132	1,470
4:50 PM	0	0	0	0	0	15	67	0	0	29	3	0	0	0	3	5	122	1,454
4:55 PM	0	0	0	0	0	15	92	0	0	25	3	0	0	0	4	1	140	1,451
5:00 PM	0	0	0	0	0	7	91	1	0	17	4	0	0	0	1	3	124	1,422
5:05 PM	0	0	0	0	0	9	88	0	0	19	3	0	0	0	2	2	123	
5:10 PM	0	0	0	0	0	10	74	0	0	24	4	0	0	0	1	0	113	
5:15 PM	0	0	0	0	0	11	70	1	0	25	4	0	0	0	5	1	117	
5:20 PM	0	0	0	0	0	9	85	5	0	19	1	0	0	0	5	1	125	
5:25 PM	0	0	0	0	0	6	96	0	0	24	8	0	0	0	4	4	142	
5:30 PM	0	0	0	0	0	10	80	0	0	22	4	0	0	0	1	1	118	
5:35 PM	0	0	0	0	0	13	73	1	0	18	3	0	0	0	4	1	113	
5:40 PM	0	0	0	0	0	9	69	0	0	17	5	0	0	0	1	0	101	
5:45 PM	0	0	0	0	0	14	77	0	0	19	4	0	0	0	2	0	116	
5:50 PM	0	0	0	0	0	10	70	1	0	31	2	0	0	0	2	3	119	
5:55 PM	0	0	0	0	0	8	70	0	0	20	7	0	0	0	3	3	111	
Count Total	0	0	0	0	0	252	1,909	16	0	522	103	0	0	0	65	38	2,905	
Peak Hour	0	0	0	0	0	137	992	7	0	272	49	0	0	0	34	20	1,511	

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	6	0	6	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	5	0	5	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	1	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	2	0	0	2
4:15 PM	0	0	5	0	5	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	7	0	7	4:20 PM	0	0	0	0	0	4:20 PM	0	0	1	0	1
4:25 PM	0	0	5	0	5	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	4	0	4	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	2	0	2	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	1	1
4:40 PM	0	1	2	0	3	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	1	1
4:45 PM	0	1	1	0	2	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	5	0	5	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	1	1
4:55 PM	0	1	5	1	7	4:55 PM	0	0	0	0	0	4:55 PM	0	1	1	0	2
5:00 PM	0	0	5	0	5	5:00 PM	0	0	0	0	0	5:00 PM	0	0	1	0	1
5:05 PM	0	0	5	0	5	5:05 PM	0	0	0	0	0	5:05 PM	0	0	1	0	1
5:10 PM	0	0	7	0	7	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	3	0	3	5:15 PM	0	0	0	0	0	5:15 PM	0	2	0	3	5
5:20 PM	0	0	5	0	5	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	2	0	2	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	2	0	2	5:30 PM	0	0	0	0	0	5:30 PM	5	0	0	0	5
5:35 PM	0	0	4	0	4	5:35 PM	0	0	0	0	0	5:35 PM	0	2	0	0	2
5:40 PM	0	0	3	0	3	5:40 PM	0	0	0	0	0	5:40 PM	0	0	5	0	5
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	2	0	2	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	3	0	3	5:55 PM	0	0	0	0	0	5:55 PM	1	0	0	2	3
Count Total	0	3	89	1	93	Count Total	0	0	0	0	0	Count Total	6	7	9	8	30
Peak Hour	0	3	47	1	51	Peak Hour	0	0	0	0	0	Peak Hour	0	3	3	3	9

ALL TRAFFIC DATA SERVICES
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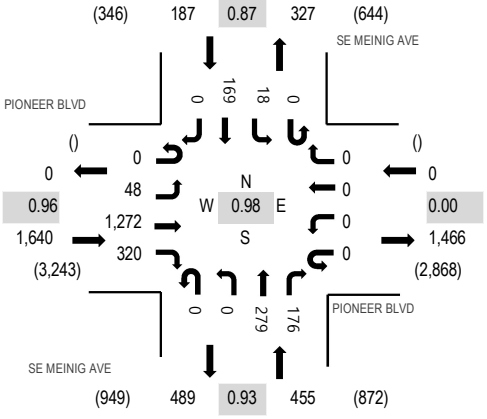
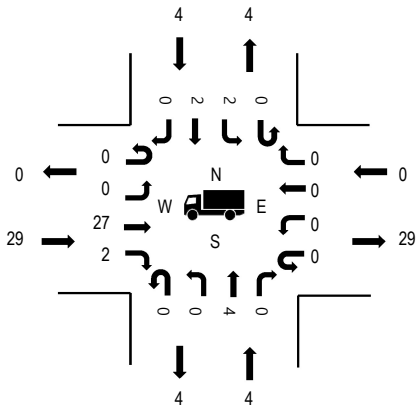
Location: 4 SE MEINIG AVE & PIONEER BLVD PM
Date: Thursday, May 18, 2023
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour

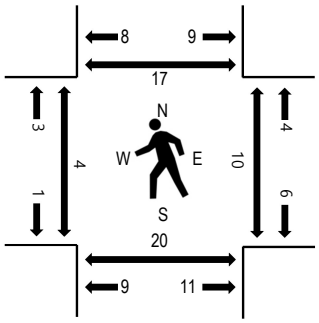
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.8%	0.96
WB	0.0%	0.00
NB	0.9%	0.93
SB	2.1%	0.87
All	1.6%	0.98

Traffic Counts - Motorized Vehicles

Interval Start Time	PIONEER BLVD Eastbound				PIONEER BLVD Westbound				SE MEINIG AVE Northbound				SE MEINIG AVE 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	8	110	27	0	0	0	0	0	0	14	10	0	3	9	0	181	2,282
4:05 PM	0	2	103	31	0	0	0	0	0	0	20	15	0	1	16	0	188	2,282
4:10 PM	0	4	108	24	0	0	0	0	0	0	25	22	0	0	13	0	196	2,279
4:15 PM	0	2	115	28	0	0	0	0	0	0	17	14	0	1	9	0	186	2,278
4:20 PM	0	3	109	28	0	0	0	0	0	0	27	13	0	2	16	0	198	2,279
4:25 PM	0	5	109	26	0	0	0	0	0	0	25	9	0	1	9	0	184	2,277
4:30 PM	0	1	102	21	0	0	0	0	0	0	23	14	0	0	22	0	183	2,264
4:35 PM	0	5	106	27	0	0	0	0	0	0	29	13	0	1	15	0	196	2,266
4:40 PM	0	9	105	30	0	0	0	0	0	0	24	16	0	3	13	0	200	2,268
4:45 PM	0	5	107	21	0	0	0	0	0	0	22	17	0	1	14	0	187	2,244
4:50 PM	0	3	99	26	0	0	0	0	0	0	30	18	0	3	15	0	194	2,213
4:55 PM	0	1	99	31	0	0	0	0	0	0	23	15	0	2	18	0	189	2,204
5:00 PM	0	4	100	28	0	0	0	0	0	0	24	13	0	2	10	0	181	2,179
5:05 PM	0	2	107	30	0	0	0	0	0	0	25	14	0	2	5	0	185	
5:10 PM	0	3	113	33	0	0	0	0	0	0	22	12	0	2	10	0	195	
5:15 PM	0	7	95	38	0	0	0	0	0	0	23	10	0	1	13	0	187	
5:20 PM	0	3	116	23	0	0	0	0	0	0	20	15	0	2	17	0	196	
5:25 PM	0	4	100	23	0	0	0	0	0	0	23	10	0	0	11	0	171	
5:30 PM	0	4	108	30	0	0	0	0	0	0	22	13	0	2	6	0	185	
5:35 PM	0	1	120	21	0	0	0	0	0	0	22	17	0	1	16	0	198	
5:40 PM	0	4	96	28	0	0	0	0	0	0	17	15	0	3	13	0	176	
5:45 PM	0	6	86	28	0	0	0	0	0	0	19	7	0	1	9	0	156	
5:50 PM	0	4	103	19	0	0	0	0	0	0	29	13	0	0	17	0	185	
5:55 PM	0	2	96	18	0	0	0	0	0	0	27	5	0	2	14	0	164	
Count Total	0	92	2,512	639	0	0	0	0	0	0	552	320	0	36	310	0	4,461	
Peak Hour	0	48	1,272	320	0	0	0	0	0	0	279	176	0	18	169	0	2,282	

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	2	0	0	2	4	4:00 PM	0	0	0	0	0	4:00 PM	0	1	0	0	1
4:05 PM	4	0	0	0	4	4:05 PM	0	0	0	0	0	4:05 PM	0	5	0	1	6
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	1	2	4	7
4:15 PM	2	0	0	0	2	4:15 PM	0	0	0	0	0	4:15 PM	0	0	1	1	2
4:20 PM	5	0	0	0	5	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	1	1
4:25 PM	1	1	0	0	2	4:25 PM	0	0	0	0	0	4:25 PM	2	4	6	2	14
4:30 PM	2	1	0	2	5	4:30 PM	0	0	0	0	0	4:30 PM	0	1	1	0	2
4:35 PM	2	1	0	0	3	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	0	0	0	1	4:40 PM	1	0	0	0	1	4:40 PM	0	4	0	6	10
4:45 PM	2	1	0	0	3	4:45 PM	0	0	0	0	0	4:45 PM	2	4	0	2	8
4:50 PM	3	0	0	0	3	4:50 PM	0	0	0	0	0	4:50 PM	0	1	0	2	3
4:55 PM	5	0	0	0	5	4:55 PM	0	0	0	0	0	4:55 PM	0	1	2	0	3
5:00 PM	2	1	0	1	4	5:00 PM	0	0	0	0	0	5:00 PM	1	3	0	0	4
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	1	1
5:10 PM	3	0	0	1	4	5:10 PM	0	0	0	0	0	5:10 PM	0	1	0	1	2
5:15 PM	2	0	0	0	2	5:15 PM	0	0	0	0	0	5:15 PM	2	0	0	0	2
5:20 PM	1	0	0	0	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	1	1
5:25 PM	3	0	0	0	3	5:25 PM	0	0	0	0	0	5:25 PM	0	1	0	0	1
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	2	6	8
5:35 PM	3	1	0	0	4	5:35 PM	0	0	0	0	0	5:35 PM	1	3	4	1	9
5:40 PM	3	0	0	1	4	5:40 PM	0	0	0	0	0	5:40 PM	0	2	0	0	2
5:45 PM	1	0	0	0	1	5:45 PM	0	0	0	0	0	5:45 PM	1	0	5	1	7
5:50 PM	2	0	0	0	2	5:50 PM	0	0	0	0	0	5:50 PM	0	1	0	0	1
5:55 PM	4	1	0	1	6	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	1	1
Count Total	53	8	0	8	69	Count Total	1	0	0	0	1	Count Total	9	33	23	31	96
Peak Hour	29	4	0	4	37	Peak Hour	1	0	0	0	1	Peak Hour	4	22	12	19	57

Appendix C – Safety

Crash Reports

Signal Warrants

e t urn ane arrants

CITY OF SANDY, CLACKAMAS COUNTY

MEINIG AVE at PLEASANT ST, City of Sandy, Clackamas County, 01/01/2017 to 12/31/2021

1 - 1 of 1 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R J U G S	M I C N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
02827	N	N	N	N			10/19/2020	17	MEINIG AVE	INTER	CROSS	N	N	CLD	PED	01	NONE 0	TURN-R										02
CITY							MO	0	PLEASANT ST	UN		STOP SIGN	N	DRY	PED		PRVTE	UN-UN									015	00
N							1P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		029	000	02
N							45 23 52.7	-122 15 35.04																	OR<25				
																		-										
																		STRGHT	01	PED	INJC	16	M		I XWK?	000	034	00
																		UN UN										

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04182	N	N	N	N			11/22/2019	14	MEINIG AVE	INTER	CROSS	N	N	CLR	PED	01	NONE 0	TURN-L											02
NO RPT							FR		PIONEER BLVD	N		TRF SIGNAL	N	DRY	PED		PRVTE	W -N									000		00
N							12P			05	1		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	35	M	OR-Y		029	000		02
N							45 23 46.73	-122 15 35.13	002600100S00															OR<25					
																		- STRGHT	01	PED	INJB	00	F		I XWLK	000	035		00
																		UN UN										
86854	N	N	N	N			10/28/2021	16	MEINIG AVE	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE							TH	0	PIONEER BLVD	N		TRF SIGNAL	N	DRY	REAR		N/A	N -S									000		00
N							6P			06	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 46.73	-122 15 35.13																UNK					
																02	NONE 9	STOP											
																	N/A	N -S									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
04757	N	Y	N	N	N	N	10/14/2016	16	MEINIG AVE	INTER	CROSS	N	Y	UNK	FIX OBJ	01	NONE 9	TURN-R										100	08
CITY							FR		PIONEER BLVD	S		TRF SIGNAL	N	WET	FIX		N/A	W -S									000		00
N							11P			06	1		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 45.91	-122 15 35.58	017200100S00															UNK					
02544	N	N	N	N			06/27/2017	14	MEINIG AVE	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE							TU		PIONEER BLVD	SW		YIELD	N	DRY	REAR		N/A	NW-SE									000		00
N							2P			09	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 46.73	-122 15 35.13	002600100S00															UNK					
																02	NONE 9	STOP											
																	N/A	NW-SE									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
04274	N	N	N	N			10/10/2017	14	MEINIG AVE	INTER	CROSS	N	N	UNK	S-1STOP	01	NONE 9	STRGHT											29
NONE							TU		PIONEER BLVD	SW		YIELD	N	WET	REAR		N/A	NW-SE									000		00
N							4P			09	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 46.73	-122 15 35.13	002600100S00		(02)													UNK					
																02	NONE 9	STOP											
																	N/A	NW-SE									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	I H V	C O R L	W K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT EVENT	CAUSE
01186	N	N	N	N				04/11/2019	14	MEINIG AVE	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT										29
NONE								TH		PIONEER BLVD	SW		YIELD	N	WET	REAR		N/A	NW-SE									000	00
N								1P			09	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N								45 23 46.73	-122 15 35.13	002600100S00															UNK				
																	02	NONE 9	STOP										
																		N/A	NW-SE									011	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																									UNK				
01847	N	N	N	N				04/22/2016	14	MEINIG AVE	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE								FR		PIONEER BLVD	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000	00
N								5P			05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		026	000	29
N								45 23 46.73	-122 15 35.13	002600100S00															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	W -E									011	00
																		PSNGR CAR		01	DRVR	INJC	22	M	OR-Y		000	000	00
																									OR<25				
02932	N	N	N	N				10/31/2020	14	MEINIG AVE	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE								SA		PIONEER BLVD	W		TRF SIGNAL	N	DRY	REAR		N/A	W -E									000	00
N								UNK			06	1		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N								45 23 46.74	-122 15 35.12	002600100S00															UNK				
																	02	NONE 9	STOP										
																		N/A	W -E									011	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																									UNK				
03085	N	N	N	N				07/08/2016	14	MEINIG AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY								FR		PIONEER BLVD	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	W -E									000	00
N								8A			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		000	000	00
N								45 23 46.73	-122 15 35.13	002600100S00															OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	N -S									000	00
																		PSNGR CAR		01	DRVR	INJB	51	F	OR-Y		020	000	04
																									OR<25				
01981	N	N	N	N	N	N		06/09/2018	14	MEINIG AVE	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										27,04
CITY								SA		PIONEER BLVD	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	W -E									000	00
N								12A			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	20	M	OTH-Y		020	000	27,04
N								45 23 46.73	-122 15 35.13	002600100S00															N-RES				
																	02	NONE 0	STRGHT										
																		PRVTE	N -S									000	00
																		PSNGR CAR		01	DRVR	INJB	27	M	OR-Y		000	000	00
																									OR<25				

URBAN NON-SYSTEM CRASH LISTING

CITY OF SANDY, CLACKAMAS COUNTY

MEINIG AVE and PIONEER BLVD, City of Sandy, Clackamas County, 01/01/2016 to 12/31/2021

11 - 13 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S D M / P R J S W / E A U I C O / E L G N H R / D C S V L K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04447	N N N N	12/10/2019	14	MEINIG AVE	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	TURN-R											02,08
NO RPT		TU		PIONEER BLVD	CN		TRF SIGNAL	N	WET	TURN		N/A	S -E									016		00
N		5P			04	1		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N		45 23 46.73	-122 15 35.13	002600100S00															UNK					
											02	NONE 9	STRGHT											
												N/A	W -E									000		00
												PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK					
02445	N N N N N N	09/06/2020	14	MEINIG AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
CITY		SU		PIONEER BLVD	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	W -E									000		00
N		6P			01	1		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	28	F	OTH-Y		020	000		04
N		45 23 46.74	-122 15 35.13	002600100S00															OR<25					
											02	NONE 0	STRGHT											
												PRVTE	N -S									000		00
												PSNGR CAR		01	DRVR	INJB	34	F	OR-Y		000	000		00
																			OR<25					
02725	N N N N N N	10/09/2020	14	MEINIG AVE	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	POLCE 0	STRGHT										084	02
STATE		FR		PIONEER BLVD	CN		TRF SIGNAL	N	WET	ANGL		PUBLC	W -E									000		00
N		10P			01	1		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		000	000		00
N		45 23 46.73	-122 15 35.14	002600100S00															OR<25					
											02	NONE 0	STRGHT											
												PRVTE	N -S									000		00
												PSNGR CAR		01	DRVR	INJC	68	F	OR-Y		028	000	084	02
																			OR<25					
02439	N N N N	09/06/2021	14	MEINIG AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04,27
CITY		MO		PIONEER BLVD	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	W -E									000		00
N		5A			03	1		N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	51	M	OR-Y		020,016	026		04,27
N		45 23 46.73	-122 15 35.12	002600100S00															OR>25					
											02	NONE 0	STRGHT											
												PRVTE	N -S									000		00
												PSNGR CAR		01	DRVR	INJB	36	F	OR-Y		000	000		00
																			OR<25					
											02	NONE 0	STRGHT											
												PRVTE	N -S									000		00
												PSNGR CAR		02	PSNG	INJB	11	F			000	000		00
											02	NONE 0	STRGHT											
												PRVTE	N -S									000		00
												PSNGR CAR		03	PSNG	INJB	12	F			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	S I H L	C O R K	W DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED / LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	04	PSNG	INJB	07	F			000	000		00 00
03554	N	N	N	N	N	N	11/20/2021 SA 9P 45 23 46.73	14 -122 15 35.13	MEINIG AVE PIONEER BLVD 002600100S00	INTER CN 04	CROSS 1	N TRF SIGNAL N	N N N	FOG DRY DLIT	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	INJC	42	F	OR-Y OR<25		020	000		04 00 04
																02	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	INJB	41	F	OR-Y OR<25		000	000		00 00
																02	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	02	PSNG	INJB	07	F			000	000		00 00
04132	N	N	N	N			09/08/2016 TH 10A 45 23 46.97	14 -122 15 33.63	PIONEER BLVD MEINIG AVE 002600100S00	ALLEY E 03	(NONE) (02)	N NONE N	N N N	CLR DRY DAY	ANGL-OTH TURN INJ	01	NONE 0 PRVTE PSNGR CAR	TURN-L N -E	01	DRVR	NONE	80	F	OR-Y OR<25		007	000	001	08 00 08
																02	NONE 0 PRVTE MTRCYCLE	STRGHT W -E	01	DRVR	INJB	59	M	OTH-Y N-RES		000	000	001	00 00
01465	N	N	N	N			05/06/2019 NONE MO 3P 45 23 46.98	14 -122 15 33.63	MEINIG AVE PIONEER BLVD 002600100S00	ALLEY E 04	(NONE) (02)	N NONE N	N N N	CLR DRY DAY	ANGL-OTH TURN PDO	01	NONE 9 N/A PSNGR CAR	TURN-L N -E	01	DRVR	NONE	00	Unk	UNK UNK		000	000		02 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT W -E	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
03598	N	N	N	N			11/24/2021 NONE WE 2P 45 23 46.53	14 -122 15 36.74	PIONEER BLVD MEINIG AVE 002600100S00	ALLEY W 04	(NONE) (02)	N ONE-WAY N	N N N	CLR DRY DAY	ANGL-OTH TURN PDO	01	NONE 9 N/A PSNGR CAR	TURN-L N -E	01	DRVR	NONE	00	Unk	UNK UNK		000	000	040	02 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT W -E	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	I H V	C O R L	W K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT EVENT	CAUSE
00429	N	N	N	N				02/01/2017	14	PIONEER BLVD	STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT									13
NONE								WE		MEINIG AVE	E	(NONE)	UNKNOWN	N	DRY	SS-O		N/A	W -E								000	00
N								6P			03			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N								45 23 46.97	-122 15 33.63	002600100S00		(02)													UNK				
																	02	NONE 9	STRGHT										
																		N/A	W -E								000	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																									UNK				
02991	N	N	N	N				07/23/2017	14	PIONEER BLVD	STRGHT		N	N	CLR	S-OTHER	01	NONE 9	PARKNG									02
NONE								SU		MEINIG AVE	E	(NONE)	UNKNOWN	N	DRY	PARK		N/A	W -E								008	00
N								7P			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N								45 23 46.97	-122 15 33.63	002600100S00		(02)													UNK				
																	02	NONE 9	STRGHT										
																		N/A	W -E								000	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																									UNK				
02578	N	N	N	N				09/24/2020	14	PIONEER BLVD	STRGHT		N	N	CLR	S-OTHER	01	NONE 9	PARKNG									02
CITY								TH		MEINIG AVE	E	(NONE)	NONE	N	DRY	PARK		N/A	W -E								008	00
N								3P			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N								45 23 46.97	-122 15 33.63	002600100S00		(02)													UNK				
																	02	NONE 9	STRGHT										
																		N/A	W -E								000	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																									UNK				
02790	N	N	N	N				09/21/2021	14	PIONEER BLVD	STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT									13
NONE								TU		MEINIG AVE	E	(NONE)	ONE-WAY	N	DRY	SS-O		N/A	W -E								000	00
N								10A			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N								45 23 46.85	-122 15 34.38	002600100S00		(02)													UNK				
																	02	NONE 9	STRGHT										
																		N/A	W -E								000	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																									UNK				
04716	N	N	N	N	N	N		10/12/2016	16	MEINIG AVE	STRGHT		N	N	CLR	PED	01	NONE 0	STRGHT									18
CITY								WE		PIONEER BLVD	S	(NONE)	UNKNOWN	N	DRY	PED		PRVTE	N -S								000	00
N								5P			04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	53	F	OR-Y		000	000	00
N								45 23 45.91	-122 15 35.58	017200100S00		(02)													OR<25				
																			- STRGHT		01	PED	INJB	09	M	ROAD	057	037	18
																			E W										

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N H V	I C L	S O R K	W DAY / TIME / LAT	DATE / CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02738	N	N	N	N			09/17/2021	16	MEINIG AVE	STRGHT		Y	N	CLR	S-1STOP	01	NONE 0	STRGHT										003	29,27
NONE							FR	40	PIONEER BLVD	S	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	S -N									006		00
N							4P			06			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	34	F	OR-Y		026,016	038	003	29,27
N							45 23 45.99	-122 15 35.54			(02)													OR<25					
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		01	DRVR	INJC	57	F	OR-Y		000	000		00
																								OR>25					
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		02	PSNG	INJC	27	F			000	000		00
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		03	PSNG	INJC	37	F			000	000		00
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		04	PSNG	INJC	00	M			000	000		00
02872	N	N	N	N	N	N	06/25/2016	14	PIONEER BLVD	STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29,32
CITY							SA		MEINIG AVE	W	(NONE)	TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000		00
N							7A			03			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	31	M	OR-Y		026,052	026		29,32
N							45 23 46.48	-122 15 36.61	002600100S00		(02)													OR<25					
																02	NONE 0	STOP											
																	PRVTE	W -E									011		00
																	PSNGR CAR		01	DRVR	INJC	52	F	OR-Y		000	000		00
																								OR<25					
04684	N	N	N	N			12/24/2019	14	PIONEER BLVD	STRGHT		Y	N	CLR	S-1STOP	01	NONE	STRGHT										013	29
NONE							TU		MEINIG AVE	W	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	W -E									000		00
N							10A			03			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	31	M	OTH-Y		026	000		29
N							45 23 46.53	-122 15 36.11	002600100S00		(02)													N-RES					
																02	NONE	STOP											
																	PRVTE	W -E									011	013	00
																	PSNGR CAR		01	DRVR	INJB	54	F	OR-Y		000	000		00
																								OR<25					
																03	NONE	STOP											
																	PRVTE	W -E									011		00
																	PSNGR CAR		01	DRVR	NONE	57	M	OR-Y		000	000		00
																								OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	I H V	C R L	S O W K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03721	N	N	N	N				10/23/2019	14	PIONEER BLVD	STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											13
NONE								WE		MEINIG AVE	W	(NONE)	NONE	N	DRY	SS-O		N/A	W -E									000		00
N								5P			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 23 46.45	-122 15 37.64	002600100S00		(02)							UNK										
																	02	NONE 9	STRGHT											
																		N/A	W -E									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK										
01351	N	N	N	N				05/21/2020	14	PIONEER BLVD	STRGHT		N	N	RAIN	S-STRGHT	01	NONE 9	STRGHT											13
NONE								TH		MEINIG AVE	W	(NONE)	NONE	N	WET	SS-O		N/A	W -E									000		00
N								5P			04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 23 46.45	-122 15 38.66	002600100S00		(02)							UNK										
																	02	NONE 9	STRGHT											
																		N/A	W -E									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK										
01586	N	N	N	N				06/21/2020	14	PIONEER BLVD	STRGHT		N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NO RPT								SU		MEINIG AVE	W	(NONE)	TRF SIGNAL	N	DRY	REAR		N/A	W -E									000		00
N								11A			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 23 46.53	-122 15 36.11	002600100S00		(02)							UNK										
																	02	NONE 9	STOP											
																		N/A	W -E									011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK										
02269	N	N	N	N				08/20/2020	14	PIONEER BLVD	STRGHT		N	N	CLR	S-1TURN	01	NONE 9	TURN-L											08
NONE								TH		MEINIG AVE	W	(NONE)	ONE-WAY	N	DRY	TURN		N/A	W -N									000		00
N								8A			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 23 46.85	-122 15 34.38	002600100S00		(02)							UNK										
																	02	NONE 9	STRGHT											
																		N/A	W -E									000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK										

CITY OF SANDY, CLACKAMAS COUNTY

MEINIG AVE and PROCTOR BLVD, City of Sandy, Clackamas County, 01/01/2016 to 12/31/2021

1 - 3 of 13 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N V	I H L	C S	S O R K	W	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05213	N	N	N	N	N	N	N		12/08/2017	14	MEINIG AVE	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									013	27,29
CITY									FR		PROCTOR BLVD	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W								000		00
N									3P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		038,016	000		27,29
N									45 23 50.2	-122 15 34.98	002600200S00									OR<25										
																		01	NONE 0	STRGHT										
																			PRVTE	E -W									000		00
																			PSNGR CAR		02	PSNG	INJC	19	M			000	000		00
																		02	NONE 0	STOP										
																			PRVTE	E -W									011	013	00
																			PSNGR CAR		01	DRVR	INJC	28	M	OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STOP										
																			PRVTE	E -W									011	013	00
																			PSNGR CAR		02	PSNG	INJC	29	F			000	000		00
																		03	NONE 0	STOP										
																			PRVTE	E -W									022		00
																			PSNGR CAR		01	DRVR	INJC	17	M	OR-Y		000	000		00
																										OR<25					
01314	N	N	N	N					04/14/2018	14	MEINIG AVE	INTER	CROSS	N	Y	RAIN	FIX OBJ	01	NONE 9	TURN-L									042	08
NONE									SA		PROCTOR BLVD	E		TRF SIGNAL	N	WET	FIX		N/A	E -S								000		00
N									1A			05	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N									45 23 50.21	-122 15 34.99	002600200S00									UNK										
00809	N	N	N	N	N	N			03/06/2019	14	MEINIG AVE	INTER	CROSS	N	N	SNOW	S-1STOP	01	NONE 0	STRGHT									124	07,29,32
CITY									WE		PROCTOR BLVD	E		TRF SIGNAL	N	WET	REAR		PRVTE	E -W								000		00
N									10A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	38	M	SUSP		043,026,052	000		07,29,32
N									45 23 50.21	-122 15 34.99	002600200S00									OR<25										
																		02	NONE 0	STOP										
																			PRVTE	E -W									011		00
																			PSNGR CAR		01	DRVR	INJC	20	F	NONE		000	000		00
																										OR<25					
																		02	NONE 0	STOP										
																			PRVTE	E -W									011		00
																			PSNGR CAR		02	PSNG	INJC	24	F			000	000		00
02290	N	N	N	N	N	N			08/08/2021	14	MEINIG AVE	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										27,29
CITY									SU		PROCTOR BLVD	E		UNKNOWN	N	DRY	REAR		N/A	E -W								000		00
N									11A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N									45 23 50.22	-122 15 34.99	002600200S00									UNK										

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 9 N/A PSNGR CAR	STOP E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	012 000		00 00
00093	N	N	N	N	N	N	01/09/2018 7A 45 23 50.2	14 -122 15 34.98	MEINIG AVE PROCTOR BLVD 002600200S00	INTER W 06	CROSS 0	N TRF SIGNAL	N N	RAIN WET DLIT	PED PED INJ	01	NONE 0 PUBLC SCHL BUS	TURN-L S -W	01	DRVR	NONE	60	M	OR-Y OR<25		029	038	002	27,02 00 27,02
CITY N N																													
																		- STRGHT N S	01	PED	INJC	28	F		I XWLK	000	035		00
02920	N	N	N	N	N	N	07/19/2017 5P 45 23 50.2	14 -122 15 34.98	MEINIG AVE PROCTOR BLVD 002600200S00	INTER CN 04	CROSS 0	N TRF SIGNAL	N N	CLR DRY DAY	O-1 L-TURN TURN PDO	01	NONE 9 N/A PSNGR CAR	STRGHT N -S	01	DRVR	NONE	00	Unk	UNK UNK		000	000		27,02,08 00 00
CITY N N																02	NONE 9 N/A PSNGR CAR	TURN-L S -W	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
05343	N	N	N	N			12/14/2017 12P 45 23 50.2	14 -122 15 34.98	MEINIG AVE PROCTOR BLVD 002600200S00	INTER CN 04	CROSS 1 (02)	N TRF SIGNAL	N N	CLR DRY DAY	ANGL-OTH TURN PDO	01	NONE 9 N/A PSNGR CAR	STRGHT E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	000		02 00 00
NO RPT N N																02	NONE 9 N/A PSNGR CAR	TURN-L S -W	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
00574	N	N	N	N			02/16/2018 FR 12P 45 23 50.2	14 -122 15 34.98	MEINIG AVE PROCTOR BLVD 002600200S00	INTER CN 03	CROSS 0	N TRF SIGNAL	N N	CLR DRY DAY	S-1TURN TURN PDO	01	NONE 9 N/A MTRCYCLE	STRGHT E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	000		08 00 00
NONE N N																02	NONE 9 N/A SEMI TOW	TURN-L E -S	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
00738	N	N	N	N	N	N	02/01/2019 FR 9A 45 23 50.21	14 -122 15 34.98	MEINIG AVE PROCTOR BLVD 002600200S00	INTER CN 03	CROSS 0	N TRF SIGNAL	N N	RAIN WET DAY	O-1 L-TURN TURN PDO	01	NONE 9 N/A PSNGR CAR	TURN-L S -W	01	DRVR	NONE	00	Unk	UNK UNK		000	000		02 00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES / LOC	PED / ERROR	ACT	EVENT	CAUSE
																02	NONE 9 N/A PSNGR CAR	STRGHT N -S	01	DRVR	NONE	00	Unk	UNK UNK		000 000		00 00
03528	N	N	N	N			11/18/2021 TH 7A 45 23 50.2	14 -122 15 34.98	MEINIG AVE PROCTOR BLVD 002600200S00	INTER CN 01	CROSS 0	N TRF SIGNAL N	N N N	CLR DRY DAY	O-1 L-TURN TURN INJ	01	NONE 0 PRVTE PSNGR CAR	TURN-L S -W	01	DRVR	NONE	16	M	OR-Y OR<25	028,004	000		02,08 00 02,08
																02	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	01	DRVR	INJC	64	F	OR-Y OR<25	000	000 000		00 00
00282	N	N	N	N			01/17/2016 SU 8A 45 23 50.21	14 -122 15 33.53	PROCTOR BLVD MEINIG AVE 002600200S00	ALLEY E 04	(NONE) (02)	N UNKNOWN N	N N N	RAIN WET DAY	S-1TURN TURN PDO	01	NONE 9 N/A PSNGR CAR	TURN-L E -S	01	DRVR	NONE	00	Unk	UNK UNK		000		08 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT E -W	01	DRVR	NONE	00	Unk	UNK UNK		000 000		00 00
00996	N	N	N	N			03/01/2016 TU 2P 45 23 50.21	14 -122 15 33.53	PROCTOR BLVD MEINIG AVE 002600200S00	STRGHT E 06	(NONE) (02)	N UNKNOWN N	N N N	RAIN WET DAY	S-1STOP REAR INJ	01	NONE 0 UNKN UNKNOWN	STRGHT E -W	01	DRVR	NONE	00	M	OTH-Y UNK	026	000		29 00 29
																02	NONE 0 PRVTE PSNGR CAR	STOP E -W	01	DRVR	INJC	33	F	OR-Y OR<25	000	011 000		00 00
																02	NONE 0 PRVTE PSNGR CAR	STOP E -W	02	PSNG	INJC	39	M		000	011 000		00 00
00684	N	N	N	N			02/27/2019 WE 3P 45 23 50.22	14 -122 15 34.27	PROCTOR BLVD MEINIG AVE 002600200S00	STRGHT E 04	(NONE) (02)	N NONE N	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	NONE	62	M	OR-Y OR<25	026	000		29 00 29
																02	NONE 0 PRVTE PSNGR CAR	STOP E -W	01	DRVR	INJC	51	M	OR-Y OR<25	000	011 000		00 00

Preliminary Traffic Signal Warrant Analysis

Project: 23011 - Community Campus Park
Date: 6/15/2023
Scenario: 2025 Buildout PM peak hour

Major Street:	Scenic Street	Minor Street:	Site Access	
Number of Lanes:	1	Number of Lanes:	1	
PM Peak Hour Volumes:	7	PM Peak Hour Volumes:	1	Total
			1	Rights
			0%	RT Discount

Warrant Used:

X — 100 percent of standard warrants used

_____ — 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	70	8,850	
Minor Street*	10	2,650	No
Condition B: Interruption of Continuous Traffic			
Major Street	70	13,300	
Minor Street*	10	1,350	No
Combination Warrant			
Major Street	70	10,640	
Minor Street*	10	2,120	No

* Minor street right-turning traffic volumes reduced by 00%.

Preliminary Traffic Signal Warrant Analysis

Project: 23011 - Community Campus Park
Date: 6/15/2023
Scenario: 2025 Buildout PM peak hour

Major Street:	Meinig Avenue	Minor Street:	Site Access	
Number of Lanes:	1	Number of Lanes:	1	
PM Peak Hour Volumes:	50	PM Peak Hour Volumes:	9	Total
			1	Rights
			0%	RT Discount

Warrant Used:

X — 100 percent of standard warrants used

_____ — 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	500	8,850	
Minor Street*	90	2,650	No
Condition B: Interruption of Continuous Traffic			
Major Street	500	13,300	
Minor Street*	90	1,350	No
Combination Warrant			
Major Street	500	10,640	
Minor Street*	90	2,120	No

* Minor street right-turning traffic volumes reduced by 00%.

Preliminary Traffic Signal Warrant Analysis

Project: 23011 - Community Campus Park
Date: 6/15/2023
Scenario: 2025 Buildout PM peak hour

Major Street:	Pleasant Street		Minor Street:	Meinig Avenue	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	178		PM Peak Hour Volumes:	59	Total
				18	Rights
				0%	RT Discount

Warrant Used:

X — 100 percent of standard warrants used

_____ — 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	1,780	8,850	
Minor Street*	590	2,650	No
Condition B: Interruption of Continuous Traffic			
Major Street	1,780	13,300	
Minor Street*	590	1,350	No
Combination Warrant			
Major Street	1,780	10,640	
Minor Street*	590	2,120	No

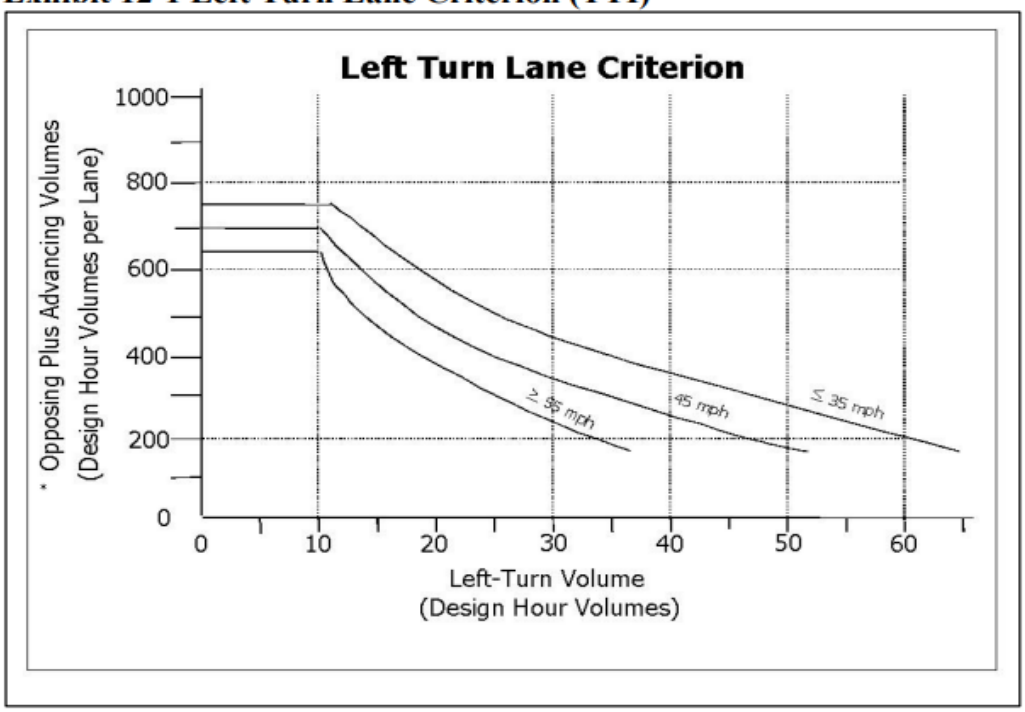
* Minor street right-turning traffic volumes reduced by 00%.

Project: 23011 - Community Campus Park
Intersection: Scenic Street & Site Access
Date: 6/15/2023
Scenario: 2025 Buildout Saturday (Event) peak hour

Speed? 25 mph

	BO (Event) EB	BO (Event) WB
Left-Turn Volume	0	10
Approaching DHV	2	12
# of Advancing Through Lanes	1	1
Opposing DHV	2	2
# of Opposing Through Lanes	1	1
O+A DHV	4	14
Lane Needed?	No	No

Exhibit 12-1 Left Turn Lane Criterion (TTI)



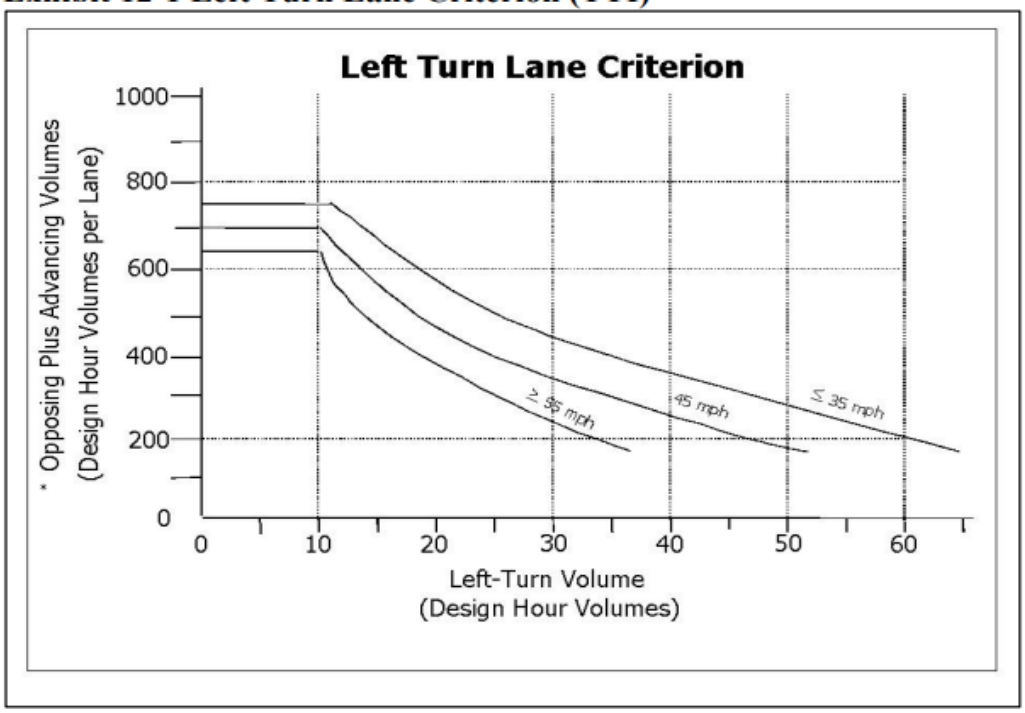
*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)
Opposing left turns are not counted as opposing volumes

Project: 23011 - Community Campus Park
Intersection: SE Meinig Avenue & Idleman Street / Site Access
Date: 6/15/2023
Scenario: 2025 Buildout Saturday (Event) peak hour

Speed? 25 mph

	NB	SB
Left-Turn Volume	30	0
Approaching DHV	60	23
# of Advancing Through Lanes	1	1
Opposing DHV	23	30
# of Opposing Through Lanes	1	1
O+A DHV	83	53
Lane Needed?	No	No

Exhibit 12-1 Left Turn Lane Criterion (TTI)



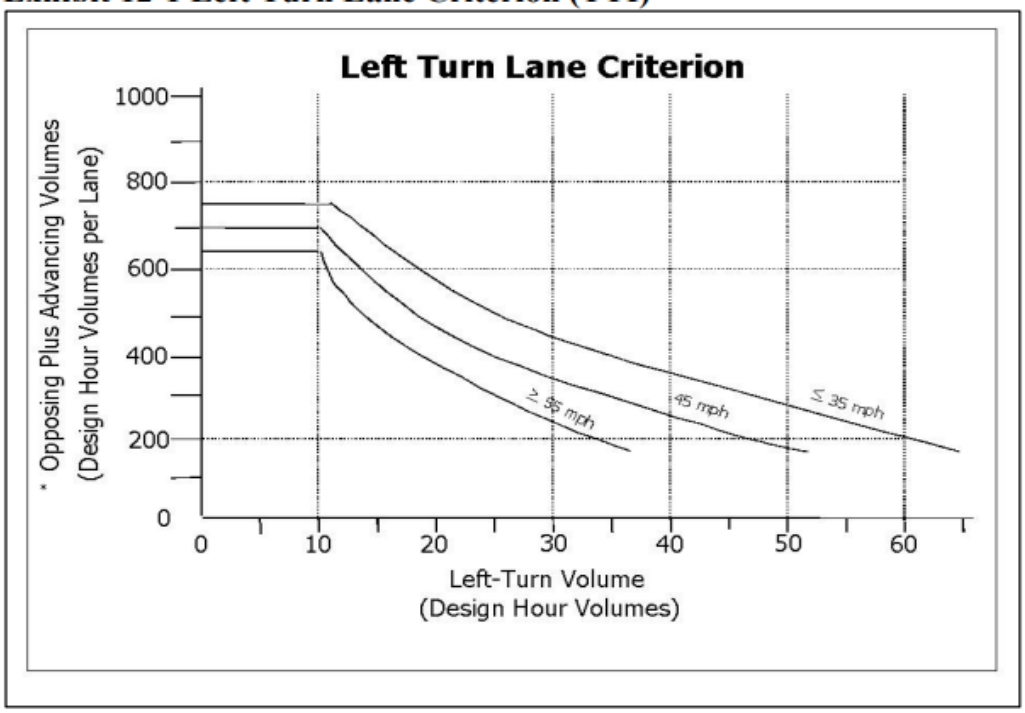
*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)
Opposing left turns are not counted as opposing volumes

Project: 23011 - Community Campus Park
Intersection: SE Meinig Avenue & Pleasant Street
Date: 6/15/2023
Scenario: 2025 Buildout Friday peak hour

Speed? 25 mph

	Friday PM Peak Hour EB	WB
Left-Turn Volume	15	5
Approaching DHV	145	33
# of Advancing Through Lanes	1	1
Opposing DHV	28	130
# of Opposing Through Lanes	1	1
O+A DHV	173	163
Lane Needed?	No	No

Exhibit 12-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)
Opposing left turns are not counted as opposing volumes

Appendix D – Operations

Synchro Operations Reports

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	2	0	0
Future Vol, veh/h	2	0	0	2	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	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	0	0	2	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2	0	4	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	2	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1634	-	1023	1088
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	1026	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1634	-	1023	1088
Mov Cap-2 Maneuver	-	-	-	-	1023	-
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	1026	-

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)	-	-	-	1634	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	5	5	0	0	3	19	5	1	8	0
Future Vol, veh/h	0	0	5	5	0	0	3	19	5	1	8	0
Conflicting Peds, #/hr	2	0	1	1	0	2	41	0	0	0	0	41
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	0	0	0
Mvmt Flow	0	0	6	6	0	0	4	23	6	1	10	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	89	90	52	50	87	28	51	0	0	29	0	0
Stage 1	53	53	-	34	34	-	-	-	-	-	-	-
Stage 2	36	37	-	16	53	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.2	-	-
Pot Cap-1 Maneuver	901	804	1021	955	807	1053	1542	-	-	1597	-	-
Stage 1	965	855	-	987	871	-	-	-	-	-	-	-
Stage 2	985	868	-	1009	855	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	861	769	980	945	772	1051	1482	-	-	1597	-	-
Mov Cap-2 Maneuver	861	769	-	945	772	-	-	-	-	-	-	-
Stage 1	924	821	-	984	868	-	-	-	-	-	-	-
Stage 2	980	865	-	1001	821	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	8.8	0.8	0.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1482	-	-	980	945	1597	-	-
HCM Lane V/C Ratio	0.002	-	-	0.006	0.006	0.001	-	-
HCM Control Delay (s)	7.4	0	-	8.7	8.8	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	13	95	30	5	25	1	11	19	17	4	20	7
Future Vol, veh/h	13	95	30	5	25	1	11	19	17	4	20	7
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	3	3	3	2	2	2	0	0	0
Mvmt Flow	14	101	32	5	27	1	12	20	18	4	21	7

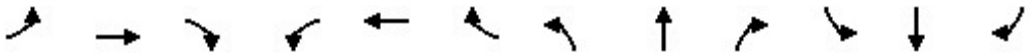
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	100	98	29	159	92	32	28	0	0	41	0	0
Stage 1	33	33	-	56	56	-	-	-	-	-	-	-
Stage 2	67	65	-	103	36	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.53	6.23	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4.027	3.327	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	886	796	1052	804	796	1039	1585	-	-	1581	-	-
Stage 1	988	872	-	954	846	-	-	-	-	-	-	-
Stage 2	948	845	-	900	863	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	855	785	1048	692	785	1036	1585	-	-	1576	-	-
Mov Cap-2 Maneuver	855	785	-	692	785	-	-	-	-	-	-	-
Stage 1	980	869	-	944	837	-	-	-	-	-	-	-
Stage 2	910	836	-	766	860	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	9.9	1.7	0.9
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1585	-	-	837	774	1576	-	-
HCM Lane V/C Ratio	0.007	-	-	0.175	0.043	0.003	-	-
HCM Control Delay (s)	7.3	0	-	10.2	9.9	7.3	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.1	0	-	-

HCM Signalized Intersection Capacity Analysis
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023



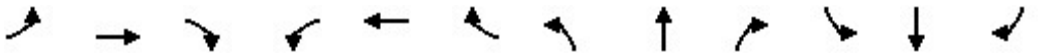
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	141	1023	7	281	61	0	0	35	21
Future Volume (vph)	0	0	0	141	1023	7	281	61	0	0	35	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.5			4.5			4.5	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			1.00	
Flpb, ped/bikes					1.00			1.00			1.00	
Frt					1.00			1.00			0.95	
Flt Protected					0.99			0.96			1.00	
Satd. Flow (prot)					3264			1712			1674	
Flt Permitted					0.99			0.72			1.00	
Satd. Flow (perm)					3264			1291			1674	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	147	1066	7	293	64	0	0	36	22
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	0	0	0	1220	0	0	357	0	0	44	0
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Heavy Vehicles (%)	0%	0%	0%	4%	4%	4%	1%	1%	1%	2%	2%	2%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)					40.6			30.4			30.4	
Effective Green, g (s)					40.6			30.4			30.4	
Actuated g/C Ratio					0.51			0.38			0.38	
Clearance Time (s)					4.5			4.5			4.5	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					1656			490			636	
v/s Ratio Prot											0.03	
v/s Ratio Perm					0.37			c0.28				
v/c Ratio					0.74			0.73			0.07	
Uniform Delay, d1					15.5			21.3			15.8	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					1.7			5.4			0.0	
Delay (s)					17.2			26.6			15.8	
Level of Service					B			C			B	
Approach Delay (s)		0.0			17.2			26.6			15.8	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	141	1023	7	281	61	0	0	35	21
Future Volume (veh/h)	0	0	0	141	1023	7	281	61	0	0	35	21
Initial Q (Qb), veh				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
Parking Bus, Adj				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	
Adj Sat Flow, veh/h/ln				1744	1744	1744	1786	1786	0	0	1772	1772
Adj Flow Rate, veh/h				147	1066	7	293	64	0	0	36	22
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				4	4	4	1	1	0	0	2	2
Cap, veh/h				205	1565	11	471	79	0	0	344	210
Arrive On Green				0.51	0.51	0.51	0.33	0.33	0.00	0.00	0.33	0.33
Sat Flow, veh/h				398	3045	21	1079	236	0	0	1030	629
Grp Volume(v), veh/h				636	0	584	357	0	0	0	0	58
Grp Sat Flow(s),veh/h/ln				1724	0	1740	1315	0	0	0	0	1659
Q Serve(g_s), s				16.9	0.0	14.6	13.8	0.0	0.0	0.0	0.0	1.4
Cycle Q Clear(g_c), s				16.9	0.0	14.6	15.2	0.0	0.0	0.0	0.0	1.4
Prop In Lane				0.23		0.01	0.82		0.00	0.00		0.38
Lane Grp Cap(c), veh/h				886	0	894	550	0	0	0	0	555
V/C Ratio(X)				0.72	0.00	0.65	0.65	0.00	0.00	0.00	0.00	0.10
Avail Cap(c_a), veh/h				1671	0	1686	1354	0	0	0	0	1496
HCM Platoon Ratio				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	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				11.1	0.0	10.5	18.9	0.0	0.0	0.0	0.0	13.6
Incr Delay (d2), s/veh				1.1	0.0	0.8	1.3	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.7	0.0	4.9	4.4	0.0	0.0	0.0	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				12.2	0.0	11.4	20.2	0.0	0.0	0.0	0.0	13.7
LnGrp LOS				B	A	B	C	A	A	A	A	B
Approach Vol, veh/h					1220			357			58	
Approach Delay, s/veh					11.8			20.2			13.7	
Approach LOS					B			C			B	

Timer - Assigned Phs	2		6		8			
Phs Duration (G+Y+Rc), s	24.3		24.3		35.0			
Change Period (Y+Rc), s	4.5		4.5		4.5			
Max Green Setting (Gmax), s	53.5		53.5		57.5			
Max Q Clear Time (g_c+I1), s	17.2		3.4		18.9			
Green Ext Time (p_c), s	2.6		0.3		11.6			

Intersection Summary		
HCM 6th Ctrl Delay	13.7	
HCM 6th LOS	B	

HCM Signalized Intersection Capacity Analysis
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

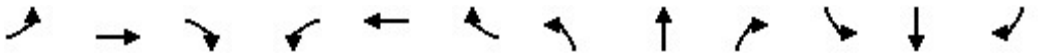
06/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1312	330	0	0	0	0	288	182	19	174	0
Future Volume (vph)	50	1312	330	0	0	0	0	288	182	19	174	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.93					1.00	0.97	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3342	1401					1782	1476	1674	1765	
Flt Permitted		1.00	1.00					1.00	1.00	0.29	1.00	
Satd. Flow (perm)		3342	1401					1782	1476	518	1765	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	51	1339	337	0	0	0	0	294	186	19	178	0
RTOR Reduction (vph)	0	0	121	0	0	0	0	0	72	0	0	0
Lane Group Flow (vph)	0	1390	216	0	0	0	0	294	114	19	178	0
Confl. Peds. (#/hr)	17		20	20		17	4		10	10		4
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		47.8	47.8					20.4	20.4	26.5	26.5	
Effective Green, g (s)		47.8	47.8					20.4	20.4	26.5	26.5	
Actuated g/C Ratio		0.57	0.57					0.24	0.24	0.32	0.32	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1917	803					436	361	186	561	
v/s Ratio Prot								c0.16		0.00	c0.10	
v/s Ratio Perm		0.42	0.15						0.08	0.03		
v/c Ratio		0.73	0.27					0.67	0.31	0.10	0.32	
Uniform Delay, d1		13.0	8.9					28.4	25.7	20.5	21.5	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.4	0.2					4.1	0.5	0.2	0.3	
Delay (s)		14.3	9.1					32.5	26.2	20.8	21.9	
Level of Service		B	A					C	C	C	C	
Approach Delay (s)		13.3			0.0			30.1			21.8	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	83.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1312	330	0	0	0	0	288	182	19	174	0
Future Volume (veh/h)	50	1312	330	0	0	0	0	288	182	19	174	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1786	1786	1772	1772	0
Adj Flow Rate, veh/h	51	1339	0				0	294	148	19	178	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2				0	1	1	2	2	0
Cap, veh/h	67	1835					0	406	339	214	559	0
Arrive On Green	0.55	0.55	0.00				0.00	0.23	0.23	0.02	0.32	0.00
Sat Flow, veh/h	121	3328	1502				0	1786	1494	1688	1772	0
Grp Volume(v), veh/h	745	645	0				0	294	148	19	178	0
Grp Sat Flow(s),veh/h/ln	1766	1683	1502				0	1786	1494	1688	1772	0
Q Serve(g_s), s	22.2	18.9	0.0				0.0	10.3	5.8	0.6	5.2	0.0
Cycle Q Clear(g_c), s	22.2	18.9	0.0				0.0	10.3	5.8	0.6	5.2	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	974	928					0	406	339	214	559	0
V/C Ratio(X)	0.76	0.70					0.00	0.72	0.44	0.09	0.32	0.00
Avail Cap(c_a), veh/h	1446	1379					0	1212	1014	301	1451	0
HCM Platoon Ratio	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	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.8	11.1	0.0				0.0	24.2	22.5	19.0	17.6	0.0
Incr Delay (d2), s/veh	1.4	0.9	0.0				0.0	2.5	0.9	0.2	0.3	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
%ile BackOfQ(50%),veh/ln	7.8	6.3	0.0				0.0	4.5	2.0	0.2	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	12.0	0.0				0.0	26.7	23.3	19.1	18.0	0.0
LnGrp LOS	B	B					A	C	C	B	B	A
Approach Vol, veh/h		1390						442			197	
Approach Delay, s/veh		12.6						25.6			18.1	
Approach LOS		B						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	6.0	19.9		41.9		25.9
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	5.0	46.0		55.5		55.5
Max Q Clear Time (g_c+I1), s	2.6	12.3		24.2		7.2
Green Ext Time (p_c), s	0.0	2.5		13.2		1.2

Intersection Summary		
HCM 6th Ctrl Delay		16.0
HCM 6th LOS		B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	2	0	0
Future Vol, veh/h	2	0	0	2	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	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	0	5	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	5	0	10	5
Stage 1	-	-	-	-	5	-
Stage 2	-	-	-	-	5	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1630	-	1015	1084
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1023	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1630	-	1015	1084
Mov Cap-2 Maneuver	-	-	-	-	1015	-
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1023	-

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)	-	-	-	1630	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	4	4	0	0	2	17	2	0	20	0
Future Vol, veh/h	1	0	4	4	0	0	2	17	2	0	20	0
Conflicting Peds, #/hr	9	0	0	0	0	9	18	0	1	1	0	18
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	42	42	42	42	42	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	0	10	10	0	0	5	40	5	0	48	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	128	122	66	107	120	53	66	0	0	46	0	0
Stage 1	66	66	-	54	54	-	-	-	-	-	-	-
Stage 2	62	56	-	53	66	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	850	772	1003	877	774	1020	1549	-	-	1575	-	-
Stage 1	950	844	-	963	854	-	-	-	-	-	-	-
Stage 2	954	852	-	965	844	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	826	756	986	866	758	1010	1522	-	-	1574	-	-
Mov Cap-2 Maneuver	826	756	-	866	758	-	-	-	-	-	-	-
Stage 1	931	830	-	959	851	-	-	-	-	-	-	-
Stage 2	943	849	-	956	830	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	9.2	0.7	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1522	-	-	949	866	1574	-	-
HCM Lane V/C Ratio	0.003	-	-	0.013	0.011	-	-	-
HCM Control Delay (s)	7.4	0	-	8.8	9.2	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	48	17	2	18	0	5	12	10	2	27	3
Future Vol, veh/h	6	48	17	2	18	0	5	12	10	2	27	3
Conflicting Peds, #/hr	4	0	2	2	0	4	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	61	61	61	61	61	61	61	61	61	61	61	61
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	79	28	3	30	0	8	20	16	3	44	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	120	109	53	152	103	32	53	0	0	36	0	0
Stage 1	57	57	-	44	44	-	-	-	-	-	-	-
Stage 2	63	52	-	108	59	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	860	785	1020	820	791	1048	1566	-	-	1588	-	-
Stage 1	960	851	-	975	862	-	-	-	-	-	-	-
Stage 2	953	856	-	902	850	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	825	776	1014	731	782	1044	1560	-	-	1588	-	-
Mov Cap-2 Maneuver	825	776	-	731	782	-	-	-	-	-	-	-
Stage 1	951	846	-	970	858	-	-	-	-	-	-	-
Stage 2	912	852	-	793	845	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	9.8	1.4	0.5
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1560	-	-	827	777	1588	-	-
HCM Lane V/C Ratio	0.005	-	-	0.141	0.042	0.002	-	-
HCM Control Delay (s)	7.3	0	-	10.1	9.8	7.3	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.1	0	-	-

HCM Signalized Intersection Capacity Analysis
4: SE Meinig Avenue & Proctor Boulevard (US 26)

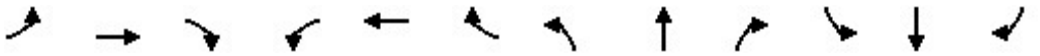
06/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	118	1104	8	282	29	0	0	22	22
Future Volume (vph)	0	0	0	118	1104	8	282	29	0	0	22	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.5			4.5			4.5	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			1.00			1.00	
Frt					1.00			1.00			0.93	
Flt Protected					1.00			0.96			1.00	
Satd. Flow (prot)					3328			1718			1666	
Flt Permitted					1.00			0.71			1.00	
Satd. Flow (perm)					3328			1280			1666	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	126	1174	9	300	31	0	0	23	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	15	0
Lane Group Flow (vph)	0	0	0	0	1309	0	0	331	0	0	31	0
Confl. Peds. (#/hr)	2		12	12		2	2		5	5		2
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)					42.2			28.9			28.9	
Effective Green, g (s)					42.2			28.9			28.9	
Actuated g/C Ratio					0.53			0.36			0.36	
Clearance Time (s)					4.5			4.5			4.5	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					1753			461			601	
v/s Ratio Prot											0.02	
v/s Ratio Perm					0.39			c0.26				
v/c Ratio					0.75			0.72			0.05	
Uniform Delay, d1					14.8			22.1			16.7	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					1.8			5.3			0.0	
Delay (s)					16.6			27.4			16.7	
Level of Service					B			C			B	
Approach Delay (s)		0.0			16.6			27.4			16.7	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	118	1104	8	282	29	0	0	22	22
Future Volume (veh/h)	0	0	0	118	1104	8	282	29	0	0	22	22
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1772	1772	1772	1800	1800	0	0	1800	1800
Adj Flow Rate, veh/h				126	1174	9	300	31	0	0	23	23
Peak Hour Factor				0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %				2	2	2	0	0	0	0	0	0
Cap, veh/h				175	1714	14	485	38	0	0	256	256
Arrive On Green				0.54	0.54	0.54	0.31	0.31	0.00	0.00	0.31	0.31
Sat Flow, veh/h				324	3173	25	1196	124	0	0	825	825
Grp Volume(v), veh/h				684	0	625	331	0	0	0	0	46
Grp Sat Flow(s),veh/h/ln				1756	0	1766	1320	0	0	0	0	1650
Q Serve(g_s), s				17.7	0.0	15.2	13.1	0.0	0.0	0.0	0.0	1.2
Cycle Q Clear(g_c), s				17.7	0.0	15.2	14.3	0.0	0.0	0.0	0.0	1.2
Prop In Lane				0.18		0.01	0.91		0.00	0.00		0.50
Lane Grp Cap(c), veh/h				949	0	954	523	0	0	0	0	512
V/C Ratio(X)				0.72	0.00	0.66	0.63	0.00	0.00	0.00	0.00	0.09
Avail Cap(c_a), veh/h				1675	0	1686	1338	0	0	0	0	1465
HCM Platoon Ratio				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	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				10.4	0.0	9.9	19.8	0.0	0.0	0.0	0.0	14.7
Incr Delay (d2), s/veh				1.0	0.0	0.8	1.3	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.9	0.0	5.1	4.2	0.0	0.0	0.0	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				11.5	0.0	10.6	21.1	0.0	0.0	0.0	0.0	14.8
LnGrp LOS				B	A	B	C	A	A	A	A	B
Approach Vol, veh/h					1309			331			46	
Approach Delay, s/veh					11.1			21.1			14.8	
Approach LOS					B			C			B	

Timer - Assigned Phs	2			6		8						
Phs Duration (G+Y+Rc), s	23.2			23.2		37.1						
Change Period (Y+Rc), s	4.5			4.5		4.5						
Max Green Setting (Gmax), s	53.5			53.5		57.5						
Max Q Clear Time (g_c+I1), s	16.3			3.2		19.7						
Green Ext Time (p_c), s	2.4			0.3		12.9						

Intersection Summary												
HCM 6th Ctrl Delay		13.1										
HCM 6th LOS		B										

HCM Signalized Intersection Capacity Analysis
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

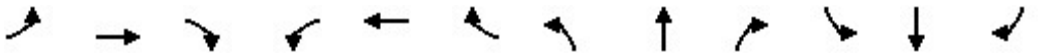
06/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1138	282	0	0	0	0	271	116	19	128	0
Future Volume (vph)	47	1138	282	0	0	0	0	271	116	19	128	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.97					1.00	0.97	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3379	1472					1748	1445	1657	1748	
Flt Permitted		1.00	1.00					1.00	1.00	0.32	1.00	
Satd. Flow (perm)		3379	1472					1748	1445	559	1748	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	51	1224	303	0	0	0	0	291	125	20	138	0
RTOR Reduction (vph)	0	0	125	0	0	0	0	0	78	0	0	0
Lane Group Flow (vph)	0	1275	178	0	0	0	0	291	47	20	138	0
Confl. Peds. (#/hr)	3		4	4		3	1		12	12		1
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		42.5	42.5					20.2	20.2	26.2	26.2	
Effective Green, g (s)		42.5	42.5					20.2	20.2	26.2	26.2	
Actuated g/C Ratio		0.55	0.55					0.26	0.26	0.34	0.34	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1848	805					454	375	209	589	
v/s Ratio Prot								c0.17		0.00	c0.08	
v/s Ratio Perm		0.38	0.12						0.03	0.03		
v/c Ratio		0.69	0.22					0.64	0.12	0.10	0.23	
Uniform Delay, d1		12.8	9.1					25.5	22.0	18.1	18.5	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.1	0.1					3.1	0.1	0.2	0.2	
Delay (s)		13.9	9.2					28.6	22.1	18.3	18.7	
Level of Service		B	A					C	C	B	B	
Approach Delay (s)		13.0			0.0			26.7			18.7	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	13.5
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	1138	282	0	0	0	0	271	116	19	128	0
Future Volume (veh/h)	47	1138	282	0	0	0	0	271	116	19	128	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	0.99		1.00
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1786	1786	1786				0	1758	1758	1758	1758	0
Adj Flow Rate, veh/h	51	1224	0				0	291	85	20	138	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1				0	3	3	3	3	0
Cap, veh/h	70	1751					0	412	344	238	581	0
Arrive On Green	0.52	0.52	0.00				0.00	0.23	0.23	0.02	0.33	0.00
Sat Flow, veh/h	133	3343	1514				0	1758	1467	1674	1758	0
Grp Volume(v), veh/h	683	592	0				0	291	85	20	138	0
Grp Sat Flow(s),veh/h/ln	1779	1697	1514				0	1758	1467	1674	1758	0
Q Serve(g_s), s	18.3	15.8	0.0				0.0	9.4	2.9	0.5	3.5	0.0
Cycle Q Clear(g_c), s	18.3	15.8	0.0				0.0	9.4	2.9	0.5	3.5	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	932	889					0	412	344	238	581	0
V/C Ratio(X)	0.73	0.67					0.00	0.71	0.25	0.08	0.24	0.00
Avail Cap(c_a), veh/h	1598	1524					0	1308	1092	334	1579	0
HCM Platoon Ratio	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	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.4	10.8	0.0				0.0	21.7	19.2	16.8	15.0	0.0
Incr Delay (d2), s/veh	1.1	0.9	0.0				0.0	2.2	0.4	0.2	0.2	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
%ile BackOfQ(50%),veh/ln	6.4	5.2	0.0				0.0	3.9	1.0	0.2	1.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.5	11.6	0.0				0.0	23.9	19.6	17.0	15.2	0.0
LnGrp LOS	B	B					A	C	B	B	B	A
Approach Vol, veh/h		1275						376			158	
Approach Delay, s/veh		12.1						23.0			15.5	
Approach LOS		B						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	6.0	19.0		36.9		24.9
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	5.0	46.0		55.5		55.5
Max Q Clear Time (g_c+I1), s	2.5	11.4		20.3		5.5
Green Ext Time (p_c), s	0.0	2.3		12.0		0.9

Intersection Summary	
HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	2	0	0
Future Vol, veh/h	2	0	0	2	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	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	0	0	2	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2	0	4	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	2	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1634	-	1023	1088
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	1026	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1634	-	1023	1088
Mov Cap-2 Maneuver	-	-	-	-	1023	-
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	1026	-

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)	-	-	-	1634	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	5	5	0	0	3	20	5	1	8	0
Future Vol, veh/h	0	0	5	5	0	0	3	20	5	1	8	0
Conflicting Peds, #/hr	2	0	1	1	0	2	41	0	0	0	0	41
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	0	0	0
Mvmt Flow	0	0	6	6	0	0	4	24	6	1	10	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	90	91	52	51	88	29	51	0	0	30	0	0
Stage 1	53	53	-	35	35	-	-	-	-	-	-	-
Stage 2	37	38	-	16	53	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.2	-	-
Pot Cap-1 Maneuver	900	803	1021	953	806	1052	1542	-	-	1596	-	-
Stage 1	965	855	-	986	870	-	-	-	-	-	-	-
Stage 2	984	867	-	1009	855	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	860	768	980	943	771	1050	1482	-	-	1596	-	-
Mov Cap-2 Maneuver	860	768	-	943	771	-	-	-	-	-	-	-
Stage 1	924	821	-	983	867	-	-	-	-	-	-	-
Stage 2	979	864	-	1001	821	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	8.8	0.8	0.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1482	-	-	980	943	1596	-	-
HCM Lane V/C Ratio	0.002	-	-	0.006	0.006	0.001	-	-
HCM Control Delay (s)	7.4	0	-	8.7	8.8	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	14	99	31	5	26	1	11	20	18	4	21	7
Future Vol, veh/h	14	99	31	5	26	1	11	20	18	4	21	7
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	3	3	3	2	2	2	0	0	0
Mvmt Flow	15	105	33	5	28	1	12	21	19	4	22	7

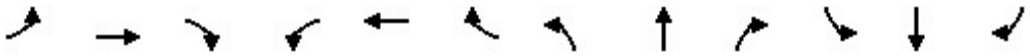
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	103	101	30	165	95	34	29	0	0	43	0	0
Stage 1	34	34	-	58	58	-	-	-	-	-	-	-
Stage 2	69	67	-	107	37	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.53	6.23	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4.027	3.327	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	882	793	1050	797	793	1036	1584	-	-	1579	-	-
Stage 1	987	871	-	951	845	-	-	-	-	-	-	-
Stage 2	946	843	-	896	862	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	850	782	1046	682	782	1033	1584	-	-	1574	-	-
Mov Cap-2 Maneuver	850	782	-	682	782	-	-	-	-	-	-	-
Stage 1	979	868	-	941	836	-	-	-	-	-	-	-
Stage 2	906	834	-	757	859	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	9.9	1.6	0.9
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1584	-	-	834	770	1574	-	-
HCM Lane V/C Ratio	0.007	-	-	0.184	0.044	0.003	-	-
HCM Control Delay (s)	7.3	0	-	10.3	9.9	7.3	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.1	0	-	-

HCM Signalized Intersection Capacity Analysis
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	144	1043	7	286	62	0	0	36	21
Future Volume (vph)	0	0	0	144	1043	7	286	62	0	0	36	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.5			4.5			4.5	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			1.00	
Flpb, ped/bikes					1.00			1.00			1.00	
Frt					1.00			1.00			0.95	
Flt Protected					0.99			0.96			1.00	
Satd. Flow (prot)					3264			1712			1677	
Flt Permitted					0.99			0.72			1.00	
Satd. Flow (perm)					3264			1289			1677	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	150	1086	7	298	65	0	0	38	22
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	0	0	0	1243	0	0	363	0	0	46	0
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Heavy Vehicles (%)	0%	0%	0%	4%	4%	4%	1%	1%	1%	2%	2%	2%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)					42.3			31.4			31.4	
Effective Green, g (s)					42.3			31.4			31.4	
Actuated g/C Ratio					0.51			0.38			0.38	
Clearance Time (s)					4.5			4.5			4.5	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					1669			489			636	
v/s Ratio Prot											0.03	
v/s Ratio Perm					0.38			c0.28				
v/c Ratio					0.74			0.74			0.07	
Uniform Delay, d1					15.9			22.2			16.4	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					1.8			6.0			0.0	
Delay (s)					17.8			28.2			16.4	
Level of Service					B			C			B	
Approach Delay (s)		0.0			17.8			28.2			16.4	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	144	1043	7	286	62	0	0	36	21
Future Volume (veh/h)	0	0	0	144	1043	7	286	62	0	0	36	21
Initial Q (Qb), veh				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
Parking Bus, Adj				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	
Adj Sat Flow, veh/h/ln				1744	1744	1744	1786	1786	0	0	1772	1772
Adj Flow Rate, veh/h				150	1086	7	298	65	0	0	38	22
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				4	4	4	1	1	0	0	2	2
Cap, veh/h				206	1576	11	469	79	0	0	355	206
Arrive On Green				0.52	0.52	0.52	0.34	0.34	0.00	0.00	0.34	0.34
Sat Flow, veh/h				399	3045	20	1076	235	0	0	1053	609
Grp Volume(v), veh/h				648	0	595	363	0	0	0	0	60
Grp Sat Flow(s),veh/h/ln				1724	0	1740	1311	0	0	0	0	1662
Q Serve(g_s), s				18.0	0.0	15.5	14.7	0.0	0.0	0.0	0.0	1.5
Cycle Q Clear(g_c), s				18.0	0.0	15.5	16.2	0.0	0.0	0.0	0.0	1.5
Prop In Lane				0.23		0.01	0.82		0.00	0.00		0.37
Lane Grp Cap(c), veh/h				892	0	901	548	0	0	0	0	560
V/C Ratio(X)				0.73	0.00	0.66	0.66	0.00	0.00	0.00	0.00	0.11
Avail Cap(c_a), veh/h				1656	0	1671	1247	0	0	0	0	1382
HCM Platoon Ratio				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	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				11.6	0.0	11.0	19.7	0.0	0.0	0.0	0.0	14.1
Incr Delay (d2), s/veh				1.1	0.0	0.8	1.4	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.1	0.0	5.3	4.7	0.0	0.0	0.0	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				12.7	0.0	11.8	21.1	0.0	0.0	0.0	0.0	14.2
LnGrp LOS				B	A	B	C	A	A	A	A	B
Approach Vol, veh/h					1243			363			60	
Approach Delay, s/veh					12.3			21.1			14.2	
Approach LOS					B			C			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		25.4				25.4		36.6				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		51.5				51.5		59.5				
Max Q Clear Time (g_c+I1), s		18.2				3.5		20.0				
Green Ext Time (p_c), s		2.6				0.4		12.1				

Intersection Summary												
HCM 6th Ctrl Delay			14.3									
HCM 6th LOS			B									

HCM Signalized Intersection Capacity Analysis
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

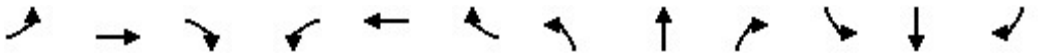
06/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	1337	336	0	0	0	0	294	185	19	177	0
Future Volume (vph)	51	1337	336	0	0	0	0	294	185	19	177	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.93					1.00	0.97	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3342	1399					1782	1476	1674	1765	
Flt Permitted		1.00	1.00					1.00	1.00	0.28	1.00	
Satd. Flow (perm)		3342	1399					1782	1476	498	1765	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	52	1364	343	0	0	0	0	300	189	19	181	0
RTOR Reduction (vph)	0	0	119	0	0	0	0	0	71	0	0	0
Lane Group Flow (vph)	0	1416	224	0	0	0	0	300	118	19	181	0
Confl. Peds. (#/hr)	17		20	20		17	4		10	10		4
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		49.4	49.4					20.8	20.8	26.9	26.9	
Effective Green, g (s)		49.4	49.4					20.8	20.8	26.9	26.9	
Actuated g/C Ratio		0.58	0.58					0.24	0.24	0.32	0.32	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1935	810					434	359	179	556	
v/s Ratio Prot								c0.17		0.00	c0.10	
v/s Ratio Perm		0.42	0.16						0.08	0.03		
v/c Ratio		0.73	0.28					0.69	0.33	0.11	0.33	
Uniform Delay, d1		13.1	9.0					29.3	26.5	21.2	22.3	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.5	0.2					4.7	0.5	0.3	0.3	
Delay (s)		14.6	9.2					34.0	27.0	21.5	22.6	
Level of Service		B	A					C	C	C	C	
Approach Delay (s)		13.5			0.0			31.3			22.5	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	1337	336	0	0	0	0	294	185	19	177	0
Future Volume (veh/h)	51	1337	336	0	0	0	0	294	185	19	177	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1786	1786	1772	1772	0
Adj Flow Rate, veh/h	52	1364	0				0	300	151	19	181	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2				0	1	1	2	2	0
Cap, veh/h	67	1849					0	408	341	209	558	0
Arrive On Green	0.56	0.56	0.00				0.00	0.23	0.23	0.02	0.32	0.00
Sat Flow, veh/h	121	3328	1502				0	1786	1494	1688	1772	0
Grp Volume(v), veh/h	758	658	0				0	300	151	19	181	0
Grp Sat Flow(s),veh/h/ln	1766	1683	1502				0	1786	1494	1688	1772	0
Q Serve(g_s), s	23.3	19.8	0.0				0.0	10.8	6.0	0.6	5.4	0.0
Cycle Q Clear(g_c), s	23.3	19.8	0.0				0.0	10.8	6.0	0.6	5.4	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	981	935					0	408	341	209	558	0
V/C Ratio(X)	0.77	0.70					0.00	0.74	0.44	0.09	0.32	0.00
Avail Cap(c_a), veh/h	1409	1343					0	1181	988	293	1414	0
HCM Platoon Ratio	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	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.0	11.3	0.0				0.0	24.9	23.0	19.5	18.2	0.0
Incr Delay (d2), s/veh	1.7	1.0	0.0				0.0	2.6	0.9	0.2	0.3	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
%ile BackOfQ(50%),veh/ln	8.4	6.7	0.0				0.0	4.7	2.1	0.2	2.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.7	12.2	0.0				0.0	27.5	23.9	19.7	18.5	0.0
LnGrp LOS	B	B					A	C	C	B	B	A
Approach Vol, veh/h		1416						451			200	
Approach Delay, s/veh		13.0						26.3			18.6	
Approach LOS		B						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	6.0	20.4		43.1		26.4
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	5.0	46.0		55.5		55.5
Max Q Clear Time (g_c+I1), s	2.6	12.8		25.3		7.4
Green Ext Time (p_c), s	0.0	2.6		13.4		1.2

Intersection Summary	
HCM 6th Ctrl Delay	16.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	2	0	0
Future Vol, veh/h	2	0	0	2	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	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	0	5	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	5	0	10	5
Stage 1	-	-	-	-	5	-
Stage 2	-	-	-	-	5	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1630	-	1015	1084
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1023	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1630	-	1015	1084
Mov Cap-2 Maneuver	-	-	-	-	1015	-
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1023	-

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)	-	-	-	1630	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	4	4	0	0	2	18	2	0	21	0
Future Vol, veh/h	1	0	4	4	0	0	2	18	2	0	21	0
Conflicting Peds, #/hr	9	0	0	0	0	9	18	0	1	1	0	18
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	42	42	42	42	42	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	0	10	10	0	0	5	43	5	0	50	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	133	127	68	112	125	56	68	0	0	49	0	0
Stage 1	68	68	-	57	57	-	-	-	-	-	-	-
Stage 2	65	59	-	55	68	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	844	767	1001	870	769	1016	1546	-	-	1571	-	-
Stage 1	947	842	-	960	851	-	-	-	-	-	-	-
Stage 2	951	850	-	962	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	820	751	984	859	753	1006	1519	-	-	1570	-	-
Mov Cap-2 Maneuver	820	751	-	859	753	-	-	-	-	-	-	-
Stage 1	928	828	-	956	848	-	-	-	-	-	-	-
Stage 2	940	847	-	953	828	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.9	9.2	0.7	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1519	-	-	946	859	1570	-	-
HCM Lane V/C Ratio	0.003	-	-	0.013	0.011	-	-	-
HCM Control Delay (s)	7.4	0	-	8.9	9.2	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

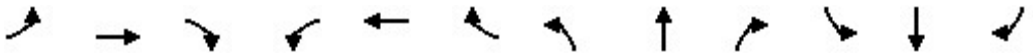
Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	50	18	2	19	0	5	12	10	2	28	3
Future Vol, veh/h	6	50	18	2	19	0	5	12	10	2	28	3
Conflicting Peds, #/hr	4	0	2	2	0	4	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	61	61	61	61	61	61	61	61	61	61	61	61
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	82	30	3	31	0	8	20	16	3	46	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	123	111	55	157	105	32	55	0	0	36	0	0
Stage 1	59	59	-	44	44	-	-	-	-	-	-	-
Stage 2	64	52	-	113	61	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	856	783	1018	814	789	1048	1563	-	-	1588	-	-
Stage 1	958	850	-	975	862	-	-	-	-	-	-	-
Stage 2	952	856	-	897	848	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	819	774	1012	721	780	1044	1557	-	-	1588	-	-
Mov Cap-2 Maneuver	819	774	-	721	780	-	-	-	-	-	-	-
Stage 1	949	845	-	970	858	-	-	-	-	-	-	-
Stage 2	909	852	-	783	843	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	9.9	1.4	0.4
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1557	-	-	825	774	1588	-	-
HCM Lane V/C Ratio	0.005	-	-	0.147	0.044	0.002	-	-
HCM Control Delay (s)	7.3	0	-	10.1	9.9	7.3	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.1	0	-	-

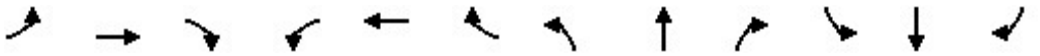


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	120	1125	8	287	30	0	0	22	22
Future Volume (vph)	0	0	0	120	1125	8	287	30	0	0	22	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.5			4.5			4.5	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			1.00			1.00	
Frt					1.00			1.00			0.93	
Flt Protected					1.00			0.96			1.00	
Satd. Flow (prot)					3328			1718			1666	
Flt Permitted					1.00			0.71			1.00	
Satd. Flow (perm)					3328			1280			1666	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	128	1197	9	305	32	0	0	23	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	15	0
Lane Group Flow (vph)	0	0	0	0	1334	0	0	337	0	0	31	0
Confl. Peds. (#/hr)	2		12	12		2	2		5	5		2
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)					44.3			30.0			30.0	
Effective Green, g (s)					44.3			30.0			30.0	
Actuated g/C Ratio					0.53			0.36			0.36	
Clearance Time (s)					4.5			4.5			4.5	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					1769			460			600	
v/s Ratio Prot											0.02	
v/s Ratio Perm					0.40			c0.26				
v/c Ratio					0.75			0.73			0.05	
Uniform Delay, d1					15.2			23.2			17.4	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					1.9			5.9			0.0	
Delay (s)					17.1			29.1			17.4	
Level of Service					B			C			B	
Approach Delay (s)		0.0			17.1			29.1			17.4	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	83.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	120	1125	8	287	30	0	0	22	22
Future Volume (veh/h)	0	0	0	120	1125	8	287	30	0	0	22	22
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1772	1772	1772	1800	1800	0	0	1800	1800
Adj Flow Rate, veh/h				128	1197	9	305	32	0	0	23	23
Peak Hour Factor				0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %				2	2	2	0	0	0	0	0	0
Cap, veh/h				176	1729	14	482	39	0	0	257	257
Arrive On Green				0.54	0.54	0.54	0.31	0.31	0.00	0.00	0.31	0.31
Sat Flow, veh/h				323	3175	25	1196	125	0	0	825	825
Grp Volume(v), veh/h				697	0	637	337	0	0	0	0	46
Grp Sat Flow(s),veh/h/ln				1756	0	1766	1321	0	0	0	0	1650
Q Serve(g_s), s				18.8	0.0	16.1	14.0	0.0	0.0	0.0	0.0	1.2
Cycle Q Clear(g_c), s				18.8	0.0	16.1	15.2	0.0	0.0	0.0	0.0	1.2
Prop In Lane				0.18		0.01	0.91		0.00	0.00		0.50
Lane Grp Cap(c), veh/h				956	0	962	522	0	0	0	0	515
V/C Ratio(X)				0.73	0.00	0.66	0.65	0.00	0.00	0.00	0.00	0.09
Avail Cap(c_a), veh/h				1663	0	1673	1237	0	0	0	0	1352
HCM Platoon Ratio				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	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				10.8	0.0	10.2	20.7	0.0	0.0	0.0	0.0	15.3
Incr Delay (d2), s/veh				1.1	0.0	0.8	1.3	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.4	0.0	5.5	4.5	0.0	0.0	0.0	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				11.9	0.0	11.0	22.0	0.0	0.0	0.0	0.0	15.4
LnGrp LOS				B	A	B	C	A	A	A	A	B
Approach Vol, veh/h					1334			337			46	
Approach Delay, s/veh					11.5			22.0			15.4	
Approach LOS					B			C			B	

Timer - Assigned Phs	2		6		8			
Phs Duration (G+Y+Rc), s	24.1		24.1		38.7			
Change Period (Y+Rc), s	4.5		4.5		4.5			
Max Green Setting (Gmax), s	51.5		51.5		59.5			
Max Q Clear Time (g_c+I1), s	17.2		3.2		20.8			
Green Ext Time (p_c), s	2.4		0.3		13.4			

Intersection Summary		
HCM 6th Ctrl Delay	13.6	
HCM 6th LOS	B	

HCM Signalized Intersection Capacity Analysis
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

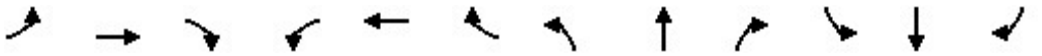
06/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	1160	287	0	0	0	0	276	118	19	130	0
Future Volume (vph)	48	1160	287	0	0	0	0	276	118	19	130	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.97					1.00	0.97	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3378	1471					1748	1445	1657	1748	
Flt Permitted		1.00	1.00					1.00	1.00	0.31	1.00	
Satd. Flow (perm)		3378	1471					1748	1445	544	1748	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	52	1247	309	0	0	0	0	297	127	20	140	0
RTOR Reduction (vph)	0	0	125	0	0	0	0	0	77	0	0	0
Lane Group Flow (vph)	0	1299	184	0	0	0	0	297	50	20	140	0
Confl. Peds. (#/hr)	3		4	4		3	1		12	12		1
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		43.6	43.6					20.6	20.6	26.6	26.6	
Effective Green, g (s)		43.6	43.6					20.6	20.6	26.6	26.6	
Actuated g/C Ratio		0.55	0.55					0.26	0.26	0.34	0.34	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1859	809					454	375	203	587	
v/s Ratio Prot								c0.17		0.00	c0.08	
v/s Ratio Perm		0.38	0.13						0.03	0.03		
v/c Ratio		0.70	0.23					0.65	0.13	0.10	0.24	
Uniform Delay, d1		13.0	9.1					26.1	22.5	18.5	19.0	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.2	0.1					3.4	0.2	0.2	0.2	
Delay (s)		14.2	9.3					29.5	22.6	18.8	19.2	
Level of Service		B	A					C	C	B	B	
Approach Delay (s)		13.2			0.0			27.4			19.1	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	79.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	1160	287	0	0	0	0	276	118	19	130	0
Future Volume (veh/h)	48	1160	287	0	0	0	0	276	118	19	130	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	0.99		1.00
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1786	1786	1786				0	1758	1758	1758	1758	0
Adj Flow Rate, veh/h	52	1247	0				0	297	87	20	140	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1				0	3	3	3	3	0
Cap, veh/h	70	1766					0	414	345	232	580	0
Arrive On Green	0.53	0.53	0.00				0.00	0.24	0.24	0.02	0.33	0.00
Sat Flow, veh/h	133	3343	1514				0	1758	1467	1674	1758	0
Grp Volume(v), veh/h	696	603	0				0	297	87	20	140	0
Grp Sat Flow(s),veh/h/ln	1779	1697	1514				0	1758	1467	1674	1758	0
Q Serve(g_s), s	19.2	16.5	0.0				0.0	9.9	3.1	0.5	3.7	0.0
Cycle Q Clear(g_c), s	19.2	16.5	0.0				0.0	9.9	3.1	0.5	3.7	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	940	896					0	414	345	232	580	0
V/C Ratio(X)	0.74	0.67					0.00	0.72	0.25	0.09	0.24	0.00
Avail Cap(c_a), veh/h	1558	1485					0	1275	1064	324	1539	0
HCM Platoon Ratio	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	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.6	10.9	0.0				0.0	22.3	19.7	17.3	15.5	0.0
Incr Delay (d2), s/veh	1.2	0.9	0.0				0.0	2.4	0.4	0.2	0.2	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
%ile BackOfQ(50%),veh/ln	6.8	5.5	0.0				0.0	4.1	1.0	0.2	1.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	11.8	0.0				0.0	24.7	20.1	17.5	15.7	0.0
LnGrp LOS	B	B					A	C	C	B	B	A
Approach Vol, veh/h		1299						384			160	
Approach Delay, s/veh		12.3						23.6			15.9	
Approach LOS		B						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	6.0	19.4		38.0		25.4
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	5.0	46.0		55.5		55.5
Max Q Clear Time (g_c+I1), s	2.5	11.9		21.2		5.7
Green Ext Time (p_c), s	0.0	2.3		12.3		0.9

Intersection Summary		
HCM 6th Ctrl Delay		15.0
HCM 6th LOS		B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	0	3	2	0	1
Future Vol, veh/h	2	0	3	2	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	0	4	2	0	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2	0	12	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	10	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1634	-	1013	1088
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	1018	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1634	-	1011	1088
Mov Cap-2 Maneuver	-	-	-	-	1011	-
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	1016	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.3	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1088	-	-	1634	-
HCM Lane V/C Ratio	0.001	-	-	0.002	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	9	5	0	0	12	23	5	1	9	0
Future Vol, veh/h	0	0	9	5	0	0	12	23	5	1	9	0
Conflicting Peds, #/hr	2	0	1	1	0	2	41	0	0	0	0	41
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	0	0	0
Mvmt Flow	0	0	11	6	0	0	15	28	6	1	11	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	117	118	53	81	115	33	52	0	0	34	0	0
Stage 1	54	54	-	61	61	-	-	-	-	-	-	-
Stage 2	63	64	-	20	54	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.2	-	-
Pot Cap-1 Maneuver	864	776	1020	912	779	1046	1541	-	-	1591	-	-
Stage 1	963	854	-	955	848	-	-	-	-	-	-	-
Stage 2	953	846	-	1004	854	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	822	737	979	894	740	1044	1481	-	-	1591	-	-
Mov Cap-2 Maneuver	822	737	-	894	740	-	-	-	-	-	-	-
Stage 1	916	820	-	945	840	-	-	-	-	-	-	-
Stage 2	942	838	-	991	820	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	9.1	2.2	0.7
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1481	-	-	979	894	1591	-	-
HCM Lane V/C Ratio	0.01	-	-	0.011	0.007	0.001	-	-
HCM Control Delay (s)	7.5	0	-	8.7	9.1	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	15	99	31	5	26	2	11	30	18	4	25	8
Future Vol, veh/h	15	99	31	5	26	2	11	30	18	4	25	8
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	3	3	3	2	2	2	0	0	0
Mvmt Flow	16	105	33	5	28	2	12	32	19	4	27	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	121	118	36	182	113	45	36	0	0	54	0	0
Stage 1	40	40	-	69	69	-	-	-	-	-	-	-
Stage 2	81	78	-	113	44	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.53	6.23	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4.027	3.327	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	859	776	1042	777	775	1022	1575	-	-	1564	-	-
Stage 1	980	866	-	939	835	-	-	-	-	-	-	-
Stage 2	932	834	-	890	856	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	826	765	1038	663	764	1019	1575	-	-	1560	-	-
Mov Cap-2 Maneuver	826	765	-	663	764	-	-	-	-	-	-	-
Stage 1	972	863	-	929	826	-	-	-	-	-	-	-
Stage 2	892	825	-	751	853	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.4	10	1.4	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1575	-	-	817	758	1560	-	-
HCM Lane V/C Ratio	0.007	-	-	0.189	0.046	0.003	-	-
HCM Control Delay (s)	7.3	0	-	10.4	10	7.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.1	0	-	-

HCM Signalized Intersection Capacity Analysis
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023

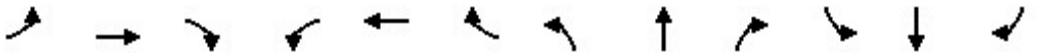
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	144	1043	10	286	69	0	0	38	23
Future Volume (vph)	0	0	0	144	1043	10	286	69	0	0	38	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.5			4.5			4.5	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			1.00	
Flpb, ped/bikes					1.00			1.00			1.00	
Frt					1.00			1.00			0.95	
Flt Protected					0.99			0.96			1.00	
Satd. Flow (prot)					3263			1713			1675	
Flt Permitted					0.99			0.72			1.00	
Satd. Flow (perm)					3263			1291			1675	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	150	1086	10	298	72	0	0	40	24
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	15	0
Lane Group Flow (vph)	0	0	0	0	1246	0	0	370	0	0	49	0
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Heavy Vehicles (%)	0%	0%	0%	4%	4%	4%	1%	1%	1%	2%	2%	2%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)					42.8			32.1			32.1	
Effective Green, g (s)					42.8			32.1			32.1	
Actuated g/C Ratio					0.51			0.38			0.38	
Clearance Time (s)					4.5			4.5			4.5	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					1664			493			640	
v/s Ratio Prot											0.03	
v/s Ratio Perm					0.38			c0.29				
v/c Ratio					0.75			0.75			0.08	
Uniform Delay, d1					16.3			22.4			16.5	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					1.9			6.3			0.1	
Delay (s)					18.2			28.8			16.5	
Level of Service					B			C			B	
Approach Delay (s)		0.0			18.2			28.8			16.5	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	83.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	144	1043	10	286	69	0	0	38	23
Future Volume (veh/h)	0	0	0	144	1043	10	286	69	0	0	38	23
Initial Q (Qb), veh				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
Parking Bus, Adj				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	
Adj Sat Flow, veh/h/ln				1744	1744	1744	1786	1786	0	0	1772	1772
Adj Flow Rate, veh/h				150	1086	10	298	72	0	0	40	24
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				4	4	4	1	1	0	0	2	2
Cap, veh/h				205	1564	15	463	87	0	0	355	213
Arrive On Green				0.52	0.52	0.52	0.34	0.34	0.00	0.00	0.34	0.34
Sat Flow, veh/h				398	3035	29	1053	254	0	0	1037	622
Grp Volume(v), veh/h				650	0	596	370	0	0	0	0	64
Grp Sat Flow(s),veh/h/ln				1724	0	1739	1307	0	0	0	0	1660
Q Serve(g_s), s				18.6	0.0	16.0	15.3	0.0	0.0	0.0	0.0	1.7
Cycle Q Clear(g_c), s				18.6	0.0	16.0	17.0	0.0	0.0	0.0	0.0	1.7
Prop In Lane				0.23		0.02	0.81		0.00	0.00		0.37
Lane Grp Cap(c), veh/h				888	0	896	550	0	0	0	0	569
V/C Ratio(X)				0.73	0.00	0.67	0.67	0.00	0.00	0.00	0.00	0.11
Avail Cap(c_a), veh/h				1620	0	1633	1217	0	0	0	0	1350
HCM Platoon Ratio				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	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				11.9	0.0	11.3	20.0	0.0	0.0	0.0	0.0	14.2
Incr Delay (d2), s/veh				1.2	0.0	0.9	1.4	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.4	0.0	5.5	4.9	0.0	0.0	0.0	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				13.1	0.0	12.2	21.5	0.0	0.0	0.0	0.0	14.3
LnGrp LOS				B	A	B	C	A	A	A	A	B
Approach Vol, veh/h					1246			370			64	
Approach Delay, s/veh					12.7			21.5			14.3	
Approach LOS					B			C			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		26.2				26.2		37.1				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		51.5				51.5		59.5				
Max Q Clear Time (g_c+I1), s		19.0				3.7		20.6				
Green Ext Time (p_c), s		2.7				0.4		12.1				

Intersection Summary		
HCM 6th Ctrl Delay		14.7
HCM 6th LOS		B

HCM Signalized Intersection Capacity Analysis
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

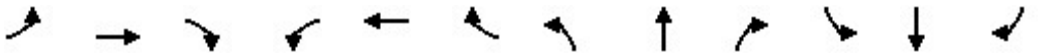
06/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1337	336	0	0	0	0	296	185	20	178	0
Future Volume (vph)	56	1337	336	0	0	0	0	296	185	20	178	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.93					1.00	0.97	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3341	1399					1782	1476	1674	1765	
Flt Permitted		1.00	1.00					1.00	1.00	0.28	1.00	
Satd. Flow (perm)		3341	1399					1782	1476	495	1765	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	57	1364	343	0	0	0	0	302	189	20	182	0
RTOR Reduction (vph)	0	0	119	0	0	0	0	0	70	0	0	0
Lane Group Flow (vph)	0	1421	224	0	0	0	0	302	119	20	182	0
Confl. Peds. (#/hr)	17		20	20		17	4		10	10		4
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		49.5	49.5					20.9	20.9	27.0	27.0	
Effective Green, g (s)		49.5	49.5					20.9	20.9	27.0	27.0	
Actuated g/C Ratio		0.58	0.58					0.24	0.24	0.32	0.32	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1934	809					435	360	178	557	
v/s Ratio Prot								c0.17		0.00	c0.10	
v/s Ratio Perm		0.43	0.16						0.08	0.03		
v/c Ratio		0.73	0.28					0.69	0.33	0.11	0.33	
Uniform Delay, d1		13.2	9.0					29.4	26.5	21.3	22.3	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.5	0.2					4.8	0.5	0.3	0.3	
Delay (s)		14.7	9.2					34.2	27.1	21.5	22.7	
Level of Service		B	A					C	C	C	C	
Approach Delay (s)		13.6			0.0			31.4			22.6	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	85.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	1337	336	0	0	0	0	296	185	20	178	0
Future Volume (veh/h)	56	1337	336	0	0	0	0	296	185	20	178	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1772	1772	1772				0	1786	1786	1772	1772	0
Adj Flow Rate, veh/h	57	1364	0				0	302	151	20	182	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2				0	1	1	2	2	0
Cap, veh/h	73	1844					0	408	341	208	560	0
Arrive On Green	0.56	0.56	0.00				0.00	0.23	0.23	0.02	0.32	0.00
Sat Flow, veh/h	132	3316	1502				0	1786	1494	1688	1772	0
Grp Volume(v), veh/h	761	660	0				0	302	151	20	182	0
Grp Sat Flow(s),veh/h/ln	1765	1683	1502				0	1786	1494	1688	1772	0
Q Serve(g_s), s	23.6	20.1	0.0				0.0	11.0	6.1	0.6	5.5	0.0
Cycle Q Clear(g_c), s	23.6	20.1	0.0				0.0	11.0	6.1	0.6	5.5	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	981	936					0	408	341	208	560	0
V/C Ratio(X)	0.78	0.71					0.00	0.74	0.44	0.10	0.33	0.00
Avail Cap(c_a), veh/h	1397	1332					0	1172	980	290	1402	0
HCM Platoon Ratio	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	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.2	11.4	0.0				0.0	25.1	23.2	19.6	18.3	0.0
Incr Delay (d2), s/veh	1.8	1.0	0.0				0.0	2.6	0.9	0.2	0.3	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
%ile BackOfQ(50%),veh/ln	8.5	6.8	0.0				0.0	4.8	2.2	0.2	2.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	12.4	0.0				0.0	27.8	24.1	19.8	18.6	0.0
LnGrp LOS	B	B					A	C	C	B	B	A
Approach Vol, veh/h		1421						453			202	
Approach Delay, s/veh		13.2						26.5			18.7	
Approach LOS		B						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	6.1	20.5		43.5		26.6
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	5.0	46.0		55.5		55.5
Max Q Clear Time (g_c+I1), s	2.6	13.0		25.6		7.5
Green Ext Time (p_c), s	0.0	2.6		13.4		1.2

Intersection Summary	
HCM 6th Ctrl Delay	16.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	5.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	0	5	2	0	5
Future Vol, veh/h	2	0	5	2	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	12	5	0	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	5	0	34	5
Stage 1	-	-	-	-	5	-
Stage 2	-	-	-	-	29	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1630	-	984	1084
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	999	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1630	-	977	1084
Mov Cap-2 Maneuver	-	-	-	-	977	-
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	992	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.2	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1084	-	-	1630	-
HCM Lane V/C Ratio	0.011	-	-	0.007	-
HCM Control Delay (s)	8.4	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	15	4	0	0	15	23	2	0	26	0
Future Vol, veh/h	0	0	15	4	0	0	15	23	2	0	26	0
Conflicting Peds, #/hr	9	0	0	0	0	9	18	0	1	1	0	18
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	42	42	42	42	42	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	36	10	0	0	36	55	5	0	62	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	219	213	80	211	211	68	80	0	0	61	0	0
Stage 1	80	80	-	131	131	-	-	-	-	-	-	-
Stage 2	139	133	-	80	80	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	741	688	986	750	690	1001	1531	-	-	1555	-	-
Stage 1	934	832	-	877	792	-	-	-	-	-	-	-
Stage 2	869	790	-	934	832	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	708	658	969	708	660	991	1505	-	-	1554	-	-
Mov Cap-2 Maneuver	708	658	-	708	660	-	-	-	-	-	-	-
Stage 1	895	818	-	854	771	-	-	-	-	-	-	-
Stage 2	840	769	-	900	818	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.9	10.2	2.8	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1505	-	-	969	708	1554	-	-
HCM Lane V/C Ratio	0.024	-	-	0.037	0.013	-	-	-
HCM Control Delay (s)	7.5	0	-	8.9	10.2	0	-	-
HCM Lane LOS	A	A	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	8	50	18	2	19	1	5	29	10	3	45	5
Future Vol, veh/h	8	50	18	2	19	1	5	29	10	3	45	5
Conflicting Peds, #/hr	4	0	2	2	0	4	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	61	61	61	61	61	61	61	61	61	61	61	61
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	13	82	30	3	31	2	8	48	16	5	74	8

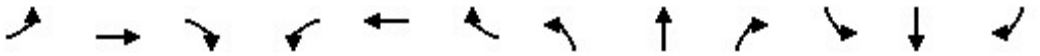
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	185	172	84	218	168	60	86	0	0	64	0	0
Stage 1	92	92	-	72	72	-	-	-	-	-	-	-
Stage 2	93	80	-	146	96	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	780	725	981	743	728	1011	1523	-	-	1551	-	-
Stage 1	920	823	-	943	839	-	-	-	-	-	-	-
Stage 2	919	832	-	861	819	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	743	716	975	652	719	1007	1517	-	-	1551	-	-
Mov Cap-2 Maneuver	743	716	-	652	719	-	-	-	-	-	-	-
Stage 1	912	817	-	938	835	-	-	-	-	-	-	-
Stage 2	876	828	-	747	813	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.6	10.2	0.8	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1517	-	-	767	722	1551	-	-
HCM Lane V/C Ratio	0.005	-	-	0.162	0.05	0.003	-	-
HCM Control Delay (s)	7.4	0	-	10.6	10.2	7.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.2	0	-	-

HCM Signalized Intersection Capacity Analysis
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023

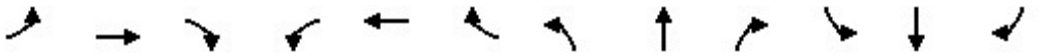


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	120	1125	13	287	42	0	0	31	30
Future Volume (vph)	0	0	0	120	1125	13	287	42	0	0	31	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.5			4.5			4.5	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			1.00			1.00	
Frt					1.00			1.00			0.93	
Flt Protected					1.00			0.96			1.00	
Satd. Flow (prot)					3325			1721			1668	
Flt Permitted					1.00			0.71			1.00	
Satd. Flow (perm)					3325			1271			1668	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	128	1197	14	305	45	0	0	33	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	20	0
Lane Group Flow (vph)	0	0	0	0	1339	0	0	350	0	0	45	0
Confl. Peds. (#/hr)	2		12	12		2	2		5	5		2
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)					45.6			31.7			31.7	
Effective Green, g (s)					45.6			31.7			31.7	
Actuated g/C Ratio					0.53			0.37			0.37	
Clearance Time (s)					4.5			4.5			4.5	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					1756			466			612	
v/s Ratio Prot											0.03	
v/s Ratio Perm					0.40			c0.28				
v/c Ratio					0.76			0.75			0.07	
Uniform Delay, d1					16.1			23.9			17.7	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					2.0			6.7			0.1	
Delay (s)					18.1			30.6			17.8	
Level of Service					B			C			B	
Approach Delay (s)		0.0			18.1			30.6			17.8	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	86.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	120	1125	13	287	42	0	0	31	30
Future Volume (veh/h)	0	0	0	120	1125	13	287	42	0	0	31	30
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1772	1772	1772	1800	1800	0	0	1800	1800
Adj Flow Rate, veh/h				128	1197	14	305	45	0	0	33	32
Peak Hour Factor				0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %				2	2	2	0	0	0	0	0	0
Cap, veh/h				172	1695	21	468	54	0	0	275	267
Arrive On Green				0.54	0.54	0.54	0.33	0.33	0.00	0.00	0.33	0.33
Sat Flow, veh/h				321	3159	39	1118	165	0	0	839	813
Grp Volume(v), veh/h				700	0	639	350	0	0	0	0	65
Grp Sat Flow(s),veh/h/ln				1756	0	1763	1283	0	0	0	0	1652
Q Serve(g_s), s				20.5	0.0	17.6	15.5	0.0	0.0	0.0	0.0	1.8
Cycle Q Clear(g_c), s				20.5	0.0	17.6	17.4	0.0	0.0	0.0	0.0	1.8
Prop In Lane				0.18		0.02	0.87		0.00	0.00		0.49
Lane Grp Cap(c), veh/h				942	0	946	522	0	0	0	0	543
V/C Ratio(X)				0.74	0.00	0.68	0.67	0.00	0.00	0.00	0.00	0.12
Avail Cap(c_a), veh/h				1567	0	1574	1144	0	0	0	0	1276
HCM Platoon Ratio				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	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				11.9	0.0	11.2	21.7	0.0	0.0	0.0	0.0	15.6
Incr Delay (d2), s/veh				1.2	0.0	0.9	1.5	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				7.2	0.0	6.2	5.0	0.0	0.0	0.0	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				13.1	0.0	12.1	23.2	0.0	0.0	0.0	0.0	15.7
LnGrp LOS				B	A	B	C	A	A	A	A	B
Approach Vol, veh/h					1339			350			65	
Approach Delay, s/veh					12.6			23.2			15.7	
Approach LOS					B			C			B	

Timer - Assigned Phs	2			6		8					
Phs Duration (G+Y+Rc), s	26.4			26.4		40.3					
Change Period (Y+Rc), s	4.5			4.5		4.5					
Max Green Setting (Gmax), s	51.5			51.5		59.5					
Max Q Clear Time (g_c+I1), s	19.4			3.8		22.5					
Green Ext Time (p_c), s	2.5			0.4		13.3					

Intersection Summary		
HCM 6th Ctrl Delay	14.8	
HCM 6th LOS	B	

HCM Signalized Intersection Capacity Analysis
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

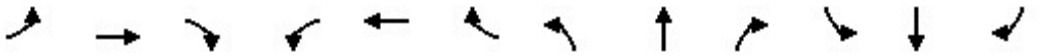
06/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1160	287	0	0	0	0	280	118	24	134	0
Future Volume (vph)	56	1160	287	0	0	0	0	280	118	24	134	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.97					1.00	0.97	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3377	1471					1748	1444	1657	1748	
Flt Permitted		1.00	1.00					1.00	1.00	0.31	1.00	
Satd. Flow (perm)		3377	1471					1748	1444	537	1748	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	60	1247	309	0	0	0	0	301	127	26	144	0
RTOR Reduction (vph)	0	0	123	0	0	0	0	0	74	0	0	0
Lane Group Flow (vph)	0	1307	186	0	0	0	0	301	53	26	144	0
Confl. Peds. (#/hr)	3		4	4		3	1		12	12		1
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		44.9	44.9					21.3	21.3	27.3	27.3	
Effective Green, g (s)		44.9	44.9					21.3	21.3	27.3	27.3	
Actuated g/C Ratio		0.55	0.55					0.26	0.26	0.34	0.34	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1867	813					458	378	201	587	
v/s Ratio Prot								c0.17		0.00	c0.08	
v/s Ratio Perm		0.39	0.13						0.04	0.04		
v/c Ratio		0.70	0.23					0.66	0.14	0.13	0.25	
Uniform Delay, d1		13.2	9.3					26.7	22.9	19.1	19.5	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.2	0.1					3.4	0.2	0.3	0.2	
Delay (s)		14.4	9.4					30.1	23.1	19.4	19.7	
Level of Service		B	A					C	C	B	B	
Approach Delay (s)		13.5			0.0			28.0			19.7	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	81.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	1160	287	0	0	0	0	280	118	24	134	0
Future Volume (veh/h)	56	1160	287	0	0	0	0	280	118	24	134	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	0.99		1.00
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1786	1786	1786				0	1758	1758	1758	1758	0
Adj Flow Rate, veh/h	60	1247	0				0	301	87	26	144	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1				0	3	3	3	3	0
Cap, veh/h	80	1753					0	414	345	235	587	0
Arrive On Green	0.53	0.53	0.00				0.00	0.24	0.24	0.03	0.33	0.00
Sat Flow, veh/h	152	3323	1514				0	1758	1467	1674	1758	0
Grp Volume(v), veh/h	700	607	0				0	301	87	26	144	0
Grp Sat Flow(s),veh/h/ln	1778	1697	1514				0	1758	1467	1674	1758	0
Q Serve(g_s), s	19.9	17.1	0.0				0.0	10.2	3.1	0.7	3.9	0.0
Cycle Q Clear(g_c), s	19.9	17.1	0.0				0.0	10.2	3.1	0.7	3.9	0.0
Prop In Lane	0.09		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	938	895					0	414	345	235	587	0
V/C Ratio(X)	0.75	0.68					0.00	0.73	0.25	0.11	0.25	0.00
Avail Cap(c_a), veh/h	1522	1452					0	1247	1041	316	1504	0
HCM Platoon Ratio	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	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.9	11.3	0.0				0.0	22.9	20.1	17.6	15.7	0.0
Incr Delay (d2), s/veh	1.2	0.9	0.0				0.0	2.5	0.4	0.2	0.2	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
%ile BackOfQ(50%),veh/ln	7.1	5.8	0.0				0.0	4.3	1.1	0.3	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.1	12.2	0.0				0.0	25.3	20.5	17.8	15.9	0.0
LnGrp LOS	B	B					A	C	C	B	B	A
Approach Vol, veh/h		1307						388			170	
Approach Delay, s/veh		12.7						24.3			16.2	
Approach LOS		B						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	6.4	19.8		38.7		26.1
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	5.0	46.0		55.5		55.5
Max Q Clear Time (g_c+I1), s	2.7	12.2		21.9		5.9
Green Ext Time (p_c), s	0.0	2.3		12.3		0.9

Intersection Summary	
HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	0	10	2	0	2
Future Vol, veh/h	2	0	10	2	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	24	5	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	5	0	58	5
Stage 1	-	-	-	-	5	-
Stage 2	-	-	-	-	53	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1630	-	954	1084
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	975	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1630	-	940	1084
Mov Cap-2 Maneuver	-	-	-	-	940	-
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	960	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1084	-	-	1630	-
HCM Lane V/C Ratio	0.004	-	-	0.015	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	8	4	0	0	30	28	2	0	23	0
Future Vol, veh/h	0	0	8	4	0	0	30	28	2	0	23	0
Conflicting Peds, #/hr	9	0	0	0	0	9	18	0	1	1	0	18
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	42	42	42	42	42	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	19	10	0	0	71	67	5	0	55	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	294	288	73	278	286	80	73	0	0	73	0	0
Stage 1	73	73	-	213	213	-	-	-	-	-	-	-
Stage 2	221	215	-	65	73	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	662	625	995	678	627	986	1540	-	-	1540	-	-
Stage 1	942	838	-	794	730	-	-	-	-	-	-	-
Stage 2	786	729	-	951	838	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	621	584	978	639	586	977	1514	-	-	1539	-	-
Mov Cap-2 Maneuver	621	584	-	639	586	-	-	-	-	-	-	-
Stage 1	881	824	-	754	694	-	-	-	-	-	-	-
Stage 2	741	693	-	932	824	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	10.7	3.7	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1514	-	-	978	639	1539	-	-
HCM Lane V/C Ratio	0.047	-	-	0.019	0.015	-	-	-
HCM Control Delay (s)	7.5	0	-	8.8	10.7	0	-	-
HCM Lane LOS	A	A	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	50	18	2	19	2	5	46	10	2	37	4
Future Vol, veh/h	10	50	18	2	19	2	5	46	10	2	37	4
Conflicting Peds, #/hr	4	0	2	2	0	4	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	61	61	61	61	61	61	61	61	61	61	61	61
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	16	82	30	3	31	3	8	75	16	3	61	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	195	182	71	228	177	87	72	0	0	91	0	0
Stage 1	75	75	-	99	99	-	-	-	-	-	-	-
Stage 2	120	107	-	129	78	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	769	716	997	731	720	977	1541	-	-	1517	-	-
Stage 1	939	836	-	912	817	-	-	-	-	-	-	-
Stage 2	889	811	-	880	834	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	731	707	991	641	711	973	1535	-	-	1517	-	-
Mov Cap-2 Maneuver	731	707	-	641	711	-	-	-	-	-	-	-
Stage 1	930	831	-	907	812	-	-	-	-	-	-	-
Stage 2	844	806	-	767	829	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	10.3	0.6	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1535	-	-	760	721	1517	-	-
HCM Lane V/C Ratio	0.005	-	-	0.168	0.052	0.002	-	-
HCM Control Delay (s)	7.4	0	-	10.7	10.3	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.2	0	-	-

HCM Signalized Intersection Capacity Analysis
4: SE Meinig Avenue & Proctor Boulevard (US 26)

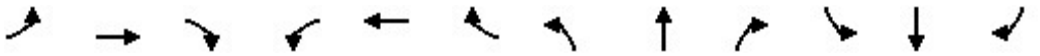
06/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	120	1125	18	287	54	0	0	27	26
Future Volume (vph)	0	0	0	120	1125	18	287	54	0	0	27	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)					4.5			4.5			4.5	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					1.00			1.00			0.99	
Flpb, ped/bikes					1.00			1.00			1.00	
Frt					1.00			1.00			0.93	
Flt Protected					1.00			0.96			1.00	
Satd. Flow (prot)					3323			1723			1668	
Flt Permitted					1.00			0.72			1.00	
Satd. Flow (perm)					3323			1293			1668	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	128	1197	19	305	57	0	0	29	28
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	18	0
Lane Group Flow (vph)	0	0	0	0	1343	0	0	362	0	0	39	0
Confl. Peds. (#/hr)	2		12	12		2	2		5	5		2
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)					46.0			32.4			32.4	
Effective Green, g (s)					46.0			32.4			32.4	
Actuated g/C Ratio					0.53			0.37			0.37	
Clearance Time (s)					4.5			4.5			4.5	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					1748			479			618	
v/s Ratio Prot											0.02	
v/s Ratio Perm					0.40			c0.28				
v/c Ratio					0.77			0.76			0.06	
Uniform Delay, d1					16.5			24.0			17.7	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					2.1			6.7			0.0	
Delay (s)					18.6			30.7			17.8	
Level of Service					B			C			B	
Approach Delay (s)		0.0			18.6			30.7			17.8	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
4: SE Meinig Avenue & Proctor Boulevard (US 26)

06/14/2023



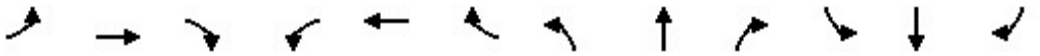
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	120	1125	18	287	54	0	0	27	26
Future Volume (veh/h)	0	0	0	120	1125	18	287	54	0	0	27	26
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1772	1772	1772	1800	1800	0	0	1800	1800
Adj Flow Rate, veh/h				128	1197	19	305	57	0	0	29	28
Peak Hour Factor				0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %				2	2	2	0	0	0	0	0	0
Cap, veh/h				172	1687	28	464	68	0	0	277	268
Arrive On Green				0.54	0.54	0.54	0.33	0.33	0.00	0.00	0.33	0.33
Sat Flow, veh/h				320	3144	52	1109	207	0	0	841	812
Grp Volume(v), veh/h				703	0	641	362	0	0	0	0	57
Grp Sat Flow(s),veh/h/ln				1756	0	1760	1316	0	0	0	0	1652
Q Serve(g_s), s				20.9	0.0	17.9	16.0	0.0	0.0	0.0	0.0	1.6
Cycle Q Clear(g_c), s				20.9	0.0	17.9	17.6	0.0	0.0	0.0	0.0	1.6
Prop In Lane				0.18		0.03	0.84		0.00	0.00		0.49
Lane Grp Cap(c), veh/h				942	0	945	533	0	0	0	0	545
V/C Ratio(X)				0.75	0.00	0.68	0.68	0.00	0.00	0.00	0.00	0.10
Avail Cap(c_a), veh/h				1549	0	1553	1148	0	0	0	0	1261
HCM Platoon Ratio				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	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				12.1	0.0	11.4	21.8	0.0	0.0	0.0	0.0	15.7
Incr Delay (d2), s/veh				1.2	0.0	0.9	1.5	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				7.4	0.0	6.3	5.3	0.0	0.0	0.0	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				13.3	0.0	12.3	23.3	0.0	0.0	0.0	0.0	15.8
LnGrp LOS				B	A	B	C	A	A	A	A	B
Approach Vol, veh/h					1344			362			57	
Approach Delay, s/veh					12.8			23.3			15.8	
Approach LOS					B			C			B	

Timer - Assigned Phs	2		6		8			
Phs Duration (G+Y+Rc), s	26.8		26.8		40.7			
Change Period (Y+Rc), s	4.5		4.5		4.5			
Max Green Setting (Gmax), s	51.5		51.5		59.5			
Max Q Clear Time (g_c+I1), s	19.6		3.6		22.9			
Green Ext Time (p_c), s	2.6		0.3		13.3			

Intersection Summary		
HCM 6th Ctrl Delay	15.1	
HCM 6th LOS	B	

HCM Signalized Intersection Capacity Analysis
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

06/14/2023

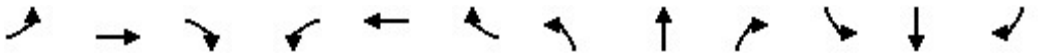


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	1160	287	0	0	0	0	284	118	22	132	0
Future Volume (vph)	64	1160	287	0	0	0	0	284	118	22	132	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.97					1.00	0.97	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3376	1471					1748	1444	1657	1748	
Flt Permitted		1.00	1.00					1.00	1.00	0.30	1.00	
Satd. Flow (perm)		3376	1471					1748	1444	527	1748	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	69	1247	309	0	0	0	0	305	127	24	142	0
RTOR Reduction (vph)	0	0	122	0	0	0	0	0	74	0	0	0
Lane Group Flow (vph)	0	1316	187	0	0	0	0	305	53	24	142	0
Confl. Peds. (#/hr)	3		4	4		3	1		12	12		1
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		45.4	45.4					21.5	21.5	27.5	27.5	
Effective Green, g (s)		45.4	45.4					21.5	21.5	27.5	27.5	
Actuated g/C Ratio		0.55	0.55					0.26	0.26	0.34	0.34	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1871	815					458	379	197	586	
v/s Ratio Prot								c0.17		0.00	c0.08	
v/s Ratio Perm		0.39	0.13						0.04	0.04		
v/c Ratio		0.70	0.23					0.67	0.14	0.12	0.24	
Uniform Delay, d1		13.3	9.3					27.0	23.1	19.3	19.7	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.2	0.1					3.6	0.2	0.3	0.2	
Delay (s)		14.6	9.5					30.6	23.3	19.6	19.9	
Level of Service		B	A					C	C	B	B	
Approach Delay (s)		13.6			0.0			28.5			19.8	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	81.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
5: Highway 211/SE Meinig Avenue & Pioneer Boulevard (US 26)

06/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	1160	287	0	0	0	0	284	118	22	132	0
Future Volume (veh/h)	64	1160	287	0	0	0	0	284	118	22	132	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	0.99		1.00
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1786	1786	1786				0	1758	1758	1758	1758	0
Adj Flow Rate, veh/h	69	1247	0				0	305	87	24	142	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1				0	3	3	3	3	0
Cap, veh/h	92	1748					0	416	347	230	585	0
Arrive On Green	0.53	0.53	0.00				0.00	0.24	0.24	0.03	0.33	0.00
Sat Flow, veh/h	174	3300	1514				0	1758	1467	1674	1758	0
Grp Volume(v), veh/h	704	612	0				0	305	87	24	142	0
Grp Sat Flow(s),veh/h/ln	1777	1697	1514				0	1758	1467	1674	1758	0
Q Serve(g_s), s	20.2	17.3	0.0				0.0	10.5	3.1	0.7	3.8	0.0
Cycle Q Clear(g_c), s	20.2	17.3	0.0				0.0	10.5	3.1	0.7	3.8	0.0
Prop In Lane	0.10		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	941	899					0	416	347	230	585	0
V/C Ratio(X)	0.75	0.68					0.00	0.73	0.25	0.10	0.24	0.00
Avail Cap(c_a), veh/h	1509	1441					0	1237	1033	313	1493	0
HCM Platoon Ratio	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	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.0	11.3	0.0				0.0	23.0	20.2	17.7	15.8	0.0
Incr Delay (d2), s/veh	1.2	0.9	0.0				0.0	2.5	0.4	0.2	0.2	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
%ile BackOfQ(50%),veh/ln	7.2	5.9	0.0				0.0	4.4	1.1	0.3	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	12.2	0.0				0.0	25.5	20.6	17.9	16.0	0.0
LnGrp LOS	B	B					A	C	C	B	B	A
Approach Vol, veh/h		1316						392			166	
Approach Delay, s/veh		12.7						24.4			16.3	
Approach LOS		B						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	6.3	20.0		39.1		26.2
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	5.0	46.0		55.5		55.5
Max Q Clear Time (g_c+I1), s	2.7	12.5		22.2		5.8
Green Ext Time (p_c), s	0.0	2.4		12.4		0.9

Intersection Summary	
HCM 6th Ctrl Delay	15.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

DKS
720 SW WASHINGTON STREET, SUITE 500, PORTLAND, OR 97205 • 503.243.3500 • DKSASSOCIATES.COM

DATE: August 18, 2023

REQUEST: Sandy Community Campus Park
Transportation Impact Analysis Review

FILE NO: 23-020 DR/CUP/VAR/FSH/TREE

REVIEWER: Reah Flisakowski, PE and Hallie Turk, EI | DKS Associates

DKS Associates has reviewed the traffic impact study[1] and site plan for the Sandy Community Campus Park in Sandy, Oregon. The proposed development application would construct a new park consisting of a pump track/skatepark, trails, playgrounds, and other amenities. The project site is located north of Pleasant Street between SE Meinig Avenue and Strauss Avenue. The development will connect with the transportation system via a site access driveway on Scenic Street.

The general comments and listing of recommended conditions of approval are based on a review of the impact study and site plan.

DEVELOPMENT TRANSPORTATION IMPACT REVIEW

Key comments and issues related to the proposed development's transportation impact analysis include:

Existing

- Study Intersections
  - Scenic Street at Site Access
  - SE Meinig Avenue at Idleman Street / Site Access
  - SE Meinig Avenue at Pleasant Street
  - SE Meinig Avenue at Proctor Boulevard (US 26 westbound)
  - SE Meinig Avenue / Highway 211 at Pioneer Boulevard (US 26 eastbound)

- Traffic operations were evaluated using HCM 6th edition. All study intersections operate at an acceptable v/c ratio and level of service during the 2023 weekday PM peak hour, Saturday peak hour, and Saturday event peak hour.
- Crash data from January 2017 to December 2021 was analyzed. No reported crashes during this period resulted in fatal or serious injury (Injury A), and no significant trends or crash patterns

[1] Sandy Community Campus Park Transportation Impact Study, Lancaster Mobley, June 15, 2023.

were identified at any of the study intersections. In addition, none of the intersection crash rates exceeded their respective ODOT 90th percentile crash rates. There is no safety mitigation recommended at this time.

Future (2025) Background Condition

- To account for background growth, a growth rate of 2.0 percent per year was applied to the existing 2023 volumes at the City of Sandy intersections, and a growth rate of 0.96 percent per year was applied at ODOT intersections.
- All study intersections operate at an acceptable v/c ratio and level of service during the 2025 weekday PM peak hour, Saturday peak hour, and Saturday event peak hour under background conditions.

Future (2025) With Project Condition

- ITE Trip Generation Codes 411 Public Park and 488 Soccer Complex were used for the trip generation estimation.
- The proposed project would result in additional vehicle trips: 17 (12 in/5 out) weekday PM peak hour vehicle trips, 40 (20 in/20 out) Saturday peak hour vehicle trips, and 50 (40 in/10 out) Saturday event peak hour trips.
- Trip distribution was based on existing traffic counts.
- Preliminary traffic signal warrants were examined at all unsignalized study intersections. Signal warrants are not projected to be met at any study intersection under buildout year 2025 because traffic at intersection approaches does not meet the minimum volume.
- Left turn lane warrants were examined at the two site access intersections and the intersection of SE Meinig Avenue and Pleasant Street according to NCHRP Report 457 methodology. Left turn lane warrants are not projected to be met at any study intersection under buildout year 2025 because left turning traffic and opposing/advancing traffic do not meet the minimum volume.
- All study intersections operate at an acceptable v/c ratio and level of service during the 2025 weekday PM peak hour, Saturday peak hour, and Saturday event peak hour under future with project conditions.
- The proposed development will provide 40 on-site parking spaces in addition to the street parking available on SE Meinig Avenue, Scenic Street, Idleman Street, and Hood Street. The parking analysis shows that there are adequate parking spaces available to accommodate the anticipated parking demand.

DEVELOPMENT SITE PLAN REVIEW

Key comments and issues related to the proposed development's site plan include:

- The site plan shows appropriate internal vehicle circulation through the parking lot and pedestrian and bicycle circulation throughout the park.
- The site plan proposes a pedestrian access connecting to the Sandy River Park Trail in the property's northwest corner and a vehicle access connecting to Sandy Grade School in the southeast corner.
- A site distance review was not conducted at the site accesses. However, preliminary review of the site plan and existing conditions at the proposed access locations does not indicate there would be sight distance issues.

RECOMMENDED CONDITIONS OF APPROVAL

The following conditions of approval are recommended based on a review of the traffic impact study and site plan:

1. The development shall contribute Transportation System Development Charges toward citywide impacts.
2. Frontage improvements shall be constructed at Collector standards along the site frontage on Meinig Avenue.
3. Frontage improvements shall be constructed at Local Street standards along the site frontage on Scenic Street. A minimum pavement width of 20 feet shall be provided to adequately accommodate two-way vehicle traffic.
4. Minimum AASHTO sight distance requirements shall be met at all site driveways. Sight distances should be verified in the final engineering/construction stages of development.

SANDY AREA METRO

Memorandum

Date: August 23, 2023

To: Kelly O'Neill, Planning Director

From: Andi Howell, Transit Director

Re: Transit Amenities

Sandy Community Campus Park Development Plan

The proposed development will require a bus stop sign near the entry plaza with overlook and the picnic shelter with restroom indicated with a blue dot in the attached document.

If I can be of further assistance please contact me at 503-489-0925.

Draft Park Design.png

100%

Clackamas Fire District #1

Pre-Application Comments:

To: **City of Sandy**

From: **Shawn Olson, Fire Marshal, Clackamas Fire District #1**

Date: **8-23-23**

Re: **City of Sandy-Park SE Meinig Ave.**

This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant must comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. The following items should be addressed by the applicant:

1. **Ensure parking lot turning radius are 28' inside and 48' outside radius.**
2. **Provide no parking restrictions on both sides of parking lot along curb line**

Thank you,

Shawn Olson
Fire Marshal

To: Kelly O'Neill, Development Services Director
From: AJ Thorne, Assistant Public Works Director
RE: 23-020 Sandy Community Campus Park Comments

Please see comments below regarding the portions of the project that are in Public Works purview. Note that some comments require further detail for approval and others are conditional where unknowns are present. Please let me know if you have any further questions.

Public Utilities:
All public utilities installed with this development will conform to section 17.84 of Sandy's Municipal Code with the exception of variances granted in the land use process.

Water:
Water main extension is not required as part of this development. Water line service material will be inspected and brought to City standards as necessary. Relocation of existing water meters will be required as part of this development. The water meters in question all lie in Scenic Dr. Confirm if final locations of meters are acceptable to PWD. Ensure Irrigation includes backflow prevention devices where required.

Sewer:
Confirm connection to public sewer main through PW to determine connection technology, geometry and materials. Connection shall be made as close to 90 degrees as possible. The sewer main shown for connection is c-900 PVC. Cleanout cover in parking lot shall meet city standards.

Storm:
All new infrastructure installed shall conform with City standards. Connection to existing storm main shall be coordinated with PW to approve materials and geometry. Storm line may have been repaired in connection location prior to time of connection, confirm pipe materials at this location with PW prior to connection. All manholes and cleanouts must be accessible at grade. Prior to construction, plans showing pipe diameter and material will be submitted for review.

Street
Include driveway connections for driveways on Scenic Street. Provide cross section of Scenic showing elevations of sidewalk relative to planter area. Provide information on power poles to be relocated on Scenic. Provide detail on pedestrian crossing at Meining. Have geotech report documenting that no further subgrade improvements are required for the widening of Meinig. Provide location of fence/barrier along Meinig. Street lighting shall not use a central photo sensor in the power pedestal. Each light shall be installed with Ubicell controllers to match City's lighting system.

Site
Confirm if parking on Scenic is intended. Portions of the path which require access for PW maintenance shall be constructed to accommodate a Vactor truck: this includes, but is not limited to path

construction for vehicle weight, space available to turn a truck around(particularly at the detention and water quality facilities,) and path width adequate for the travel of maintenance vehicles. Access to Sandynet building must be maintained through construction.

Assistant Public Works Director
City of Sandy
503-489-2162

SANDY
WHERE INNOVATION MEETS ELEVATION

39250 Pioneer Blvd
Sandy, OR 97055
503-668-5533

EXHIBIT N

August 23, 2023

SandyNet Comments for Sandy Community Campus Park

SandyNet is requesting that broadband infrastructure be extended from the southwest lot of 39175 Scenic St., near terminal 165, and brought across Scenic St. In an attempt to futureproof the park, it is requested that conduit be installed along any proposed electrical paths. The IT Director will work with the Parks and Recreation Director to identify ideal paths to provide future broadband services to the park. When the electrical plan has been developed for the park, the SandyNet department requests an electronic copy to overlay with the proposed broadband paths.

Contact

Greg Brewster

IT Director

503-489-0937

gbrewster@ci.sandy.or.us

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RECEIVED
SEP 06 2023
City of Sandy

EXHIBIT O

39250 Pioneer Blvd
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Comment Sheet for file number 23-020 DR/CUP/VAR/FSH/TREE:

Open space needed for soccer practice for children; Baseball practice for all ages; Volleyball teams, 24 adults playing Saturday evening 8/12. Wonderful.

I count #40 parking spaces on the parkplan & I never see that many cars there. There are about #30 spaces along both sides of Meinig currently - if you need more space for something else.

Youth soccer matches, can run 2 different games in the lower football field currently this summer

Lots of people walk around the track, some adults bicycle

Your name: Janet Nelson Your phone number: 971-678-4016

Your address: 39245 Scenic St.

Applicable code criteria: Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.22 Notices; 17.30 Zoning Districts; 17.32 Parks and Open Space (POS); 17.38 Medium Density Residential (R-2); 17.56 Hillside Development; 17.60 Flood and Slope Hazard (FSH) Overlay District; 17.66 Adjustments and Variances; 17.68 Conditional Uses; 17.74 Accessory Development; 17.80 Setbacks on Arterial and Collector Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.90 Design Standards; 17.92 Landscaping and Screening; 17.98 Parking, Loading and Access Requirements; 17.102 Urban Forestry; 15.30 Dark Sky; and 15.44 Erosion Control.

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SITE PLAN