



# City of Sandy

## Agenda

### Planning Commission Meeting

**Meeting Location:** City Hall- Council Chambers, 39250 Pioneer Blvd., Sandy, Oregon 97055

**Meeting Date:** Tuesday, December 3, 2019

**Meeting Time:** 7:00 PM

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<b>1. ROLL CALL</b>	
<b>2. APPROVAL OF MINUTES</b>	
2.1. <a href="#">Planning Commission - 19 Nov 2019 - Minutes - Pdf</a>	2 - 10
<b>3. REQUESTS FROM THE FLOOR - CITIZEN COMMUNICATION ON NON- AGENDA ITEMS</b>	
<b>4. OLD BUSINESS</b>	
<b>5. NEW BUSINESS</b>	
5.1. 19-042 AP Space Age Appeal <a href="#">19-042 AP Space Age Appeal - Pdf</a>	11 - 491
<b>6. ITEMS FROM COMMISSION AND STAFF</b>	
<b>7. ADJOURN</b>	



**MINUTES**  
**Planning Commission Meeting**  
**Tuesday, November 19, 2019 City Hall-**  
**Council Chambers, 39250 Pioneer Blvd.,**  
**Sandy, Oregon 97055 6:30 PM**

**COMMISSIONERS PRESENT:** Don Carlton, Commissioner, Hollis MacLean-Wenzel, Commissioner, Jerry Crosby, Commissioner, John Logan, Commissioner, Chris Mayton, Commissioner, and Todd Mobley, Commissioner

**COMMISSIONERS ABSENT:** Ron Lesowski, Commissioner

**STAFF PRESENT:** Kelly O'Neill, Development Services Director and Emily Meharg, Associate Planner, David Doughman, City Attorney

**MEDIA PRESENT:** None

**1. Roll Call**

**2. Work Session**

Training on House Bills

**2.1.**

David Doughman presented information on House Bills 2001 and 2003.

House Bill 2001 will require duplexes to be allowed anywhere that single family homes are allowed. HB 2001 is effective on June 30, 2021. DLCD will create a model ordinance that is applicable if cities do not adopt their own ordinance modifications by June 30, 2021. With the passing of HB 2001 municipalities cannot require properties with accessory dwelling units (ADUs) to be owner occupied anymore.

House Bill 2003 requires the State of Oregon to conduct a regional housing analysis. HB 2003 will also require cities outside metro to complete a buildable land analysis and a housing needs analysis every 8 years.

Meeting recess at 7:05 PM

**3. Approval of Minutes**



3.1. September 23, 2019 Planning Commission Meeting Minutes

Moved by Don Carlton, seconded by Chris Mayton

*Motion: To approve minutes for September 23, 2019*

*Modification needed on Page 5 of 6 – Modify the motion to show a roll call vote and Commissioner Mayton as a no vote.*

CARRIED.

3.2. October 28, 2019 Planning Commission Work Session Meeting Minutes

Moved by John Logan, seconded by Hollis MacLean-Wenzel

*Motion: To approve minutes for October 28, 2019*

*Modification needed on Page 2 of 3 – Commissioner MacLean-Wenzel asked for staff to modify her statement regarding mixed-used development.*

CARRIED.

**4. Requests From the Floor - Citizen Communication on Non- Agenda Items**

**5. OLD BUSINESS**

**6. NEW BUSINESS**

**6.1. Sandy Health Clinic Zone Amendment (19-032 ZC)**

Chairman Crosby opened the public hearing on File No. 19-032 ZC at 7:18 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, and no declarations were made by the Planning Commissioners. Crosby explained that the decision tonight is only a recommendation to City Council.

**Staff Report:**

Associate Planner Emily Meharg summarized the staff report and addressed the background, factual information, and presented a brief slide show.

**Applicant Testimony:**

Lori Kellow  
Ankrom Moisan  
38 NW Davis, Suite 300  
Portland, OR 97209

Ms. Kellow is the architect for the project. They request the zone change because they want a less restrictive setback standard and an easier path forward for redevelopment of the site.

Steve Kelly  
Clackamas County Health  
2051 Kane Road, Suite 245  
Oregon City, OR 97045

Mr. Kelly said the medical clinic is negotiating with the Immanuel Lutheran Church for 17 parking spaces leased at the church parking lot.

**Proponent Testimony:**

Fawnda Buck  
39627 Pleasant Street  
Sandy, OR 97055

She stated the zone change will be an asset to the community.

**Opponent Testimony:**

None

**Discussion:**

Commissioner Carlton asked if the main reason for the zone change request is for setbacks. Emily Meharg and Kelly O'Neill Jr. stated that the main reason for the zone change is to accommodate reduced setbacks. Commissioner Carlton asked questions about the parking supply and the transportation impacts. Emily Meharg stated that those items will be evaluated with the design review application.

**Motion:** Close the public hearing  
Moved By: Commissioner Carlton  
Seconded By: Commissioner Logan  
Yes votes: All Ayes  
No votes: None  
The motion passed at 7:35 PM

Moved by John Logan, seconded by Todd Mobley

*The Planning Commission forwards a recommendation of approval to City Council for the proposed Zone Map amendment.*

*Yes votes: Carlton, MacLean-Wenzel, Crosby, Logan, Mobley, Mayton*

*No votes: None*

*The motion passed at 7:36 PM*

CARRIED.

6.2. **Mt. Hood Senior Living Conditional Use (19-027 CUP)**

Chairman Crosby opened the public hearing on File No. 19-027 CUP at 7:37 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, and no declarations were made by the Planning Commissioners.

**Staff Report:**

Associate Planner Emily Meharg summarized the staff report and addressed the background, factual information, and presented a brief slide show.

**Applicant Testimony:**

Melissa Meiners  
2117 NE Oregon Street, Suite 201  
Portland, OR 97232

She stated that she represents the applicant as the architect. The fire apparatus turnaround to the rear of the building might have to be modified to accommodate fire trucks. The gravel parking spaces to the rear of the building will be removed and replaced with landscaping.

Mara Carter-Leigh  
16837 Chula Vista  
Sandy, OR 97055

Ms. Carter-Leigh said that for every residential wing there will be 5 to 10 employees.

**Proponent Testimony:**

None

**Opponent Testimony:**

None

**Neutral Testimony:**

Tracy Brown  
17075 Fir Drive  
Sandy, OR 97055

Mr. Brown asked if city staff evaluated the parking based on the parking

numbers presented by the applicant during their testimony. Mr. Brown also asked if the facility operators are licensed and have experience in assisted living care.

**Staff Recap:**

Emily Meharg stated that we will need to evaluate parking based on the new numbers presented by the applicant. Kelly O'Neill Jr. stated that the conditional use permit process doesn't evaluate if the care facility is licensed with the state, but that will be done during the business license process.

**Applicant Rebuttal:**

Reann Voorhies  
20025 Destiny Court  
Bend, OR 97703

Ms. Voorhies stated that the facility will have state approval. Based on the complete phase buildout the site will contain many employees. She also gave a lengthy explanation on how the facility will be licensed and the safe guards that are regulated by the State of Oregon.

**Discussion:**

Commissioner Carlton stated the applicant should submit a parking plan as part. Commissioner Mobley recommends amending Condition 6 labeling 23 parking spaces to recommend the applicant submit a revised off-street parking plan that is evaluated by staff. Carlton stated that this facility is located in a residential neighborhood and we need to minimize impacts to the surrounding neighborhood. Commissioner Mac-Lean Wenzel stated that this use has minimal impact to the surrounding neighborhood and fills a vacant building.

**Motion:** Close the public hearing  
Moved By: Commissioner Carlton  
Seconded By: Commissioner Logan  
Yes votes: All Ayes  
No votes: None  
The motion passed at 8:01 PM

Moved by Don Carlton, seconded by Chris Mayton

*Approve the Conditional Use Permit for Mt. Hood Senior Living with an amendment to Condition 6 requiring the applicant to submit a revised off-street parking analysis for staff review and approval.*

*Yes votes: Carlton, MacLean-Wenzel, Crosby, Logan, Mobley, Mayton*

*No votes: None*

*The motion passed at 8:03 PM*

*Meeting recess at 8:03 PM*

CARRIED.

6.3. **Pleasant Street Duplex (19-028 DR/CUP)**

Chairman Crosby opened the public hearing on File No. 19-028 DR/CUP at 8:08 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, and no declarations were made by the Planning Commissioners.

**Staff Report:**

Development Services Director Kelly O'Neill Jr. summarized the staff report and addressed the background, factual information, and presented a brief slide show.

**Applicant Testimony**

Kevin Cashatt  
41055 SE Kitzmiller Road  
Eagle Creek, OR 97022

Mr. Cashatt states he is a home builder around the Sandy OR area. They recently completed a multi-family development on Hood Street. He also built a duplex on Hood Street. Mr. Cashatt stated that he met with the City thinking that building a duplex on the site was a possibility based on the meetings.

Tracy Brown  
17075 Fir Drive  
Sandy, OR 97055

Mr. Brown was hired by Kevin Cashatt to complete the land use application. He handed out a copy of the pre-application notes and talked about what is written in the notes. Mr. Brown stated that the property to the west was approved with commercial attached, but that after a short period of time the commercial use ceased. He explained that the notes provided options and they used the option list to submit the application with multi-family design standards. He stated that using 'other uses similar in nature' is an elegant way to approach development of the property. Mr. Brown stated that the Planning Commission needs to determine if a duplex is a use similar in nature to multi-family. Mr. Brown would also like to evaluate the conditions in the staff report if the Planning Commission decides to approve the conditional use permit.

**Proponent Testimony:**

None

**Proponent Testimony:**

None

**Staff Recap:**

Kelly O'Neill Jr. stated that he agrees with the applicant that the pre-app notes are not written very clearly and that the site is very tight and will be difficult to develop. However, staff does not find a duplex is similar in use to a multi-family development. David Doughman stated that seeking a variance to the maximum density allowed in a zoning district can be processed through a variance, but an applicant cannot request the density be decreased below the minimum density in a zoning district.

**Applicant Rebuttal:**

Kevin Cashatt  
41055 SE Kitzmiller Road  
Eagle Creek, OR 97022

Mr. Cashatt stated that this process has been a very frustrating process and that building a duplex would be very arduous if built in accordance with the drafted conditions. After meeting with staff Mr. Cashatt thought that constructing a duplex was a possibility.

Tracy Brown  
17075 Fir Drive  
Sandy, OR 97055

Mr. Brown stated that he appreciated the attorney's comments on density. He does not believe that this approval would open the door to allowing multi-family development in single family zoning districts.

**Discussion:**

Commissioner Mac-Lean Wenzel stated this is a commercial zone and the community only has so much commercial land for growth. Mac-Lean Wenzel stated that we should encourage mixed-use on Pleasant Street and more commercial uses. Commissioner Carlton stated that Pleasant Street needs to transition to commercial over time. Carlton stated that the C-1 zoning district does not allow duplexes except duplex units that existed prior to the adoption of the code. Commissioner Mayton stated that not all lots are created equal and that the property is surrounded by residential uses. Carlton said the code

is black and white on this issue, and he does not see a gray area because the code states that duplexes are not allowed. Commissioner Logan asked that if the applicant puts three dwelling units detached from one other on the property could that be considered multi-family? Kelly O'Neill Jr. affirmed that would be considered multi-family. Logan said there is no gray area. Commissioner Crosby said that the Commission is constrained by the code language and that the code was written to not allow duplexes. Carlton said that Pleasant Street will most likely have small boutique commercial on the street. Mac-Lean Wenzel wanted to thank staff for working with the applicant on a fee reduction for the next application on this property. Mayton said that maybe the applicant can apply for a zone change. Carlton said that would create an odd germander of zoning. Crosby said that the Commission grants a lot of variances, but that sometimes that is not an option.

Motion: Close the public hearing  
Moved By: Commissioner Carlton  
Seconded By: Commissioner Mayton  
Yes votes: All Ayes  
No votes: None  
The motion passed at 9:03 PM

Moved by Chris Mayton, seconded by Don Carlton

*The Planning Commission denies the request for a conditional use permit for a duplex.*

*Yes votes: Carlton, Mac-Lean Wenzel, Logan, Mobley, Mayton, Crosby*

*No votes: None*

*Abstention: None*

*The motion passed at 9:05 PM*

CARRIED.

## **7. Items from Commission and Staff**

### **7.1.**

Commissioner Crosby asked if anyone is up for appointment in December 2019. Kelly O'Neill Jr. stated that the next reappointment is in 2020. O'Neill then explained the upcoming meetings and the new staff report format. Commissioner Carlton asked what constitutes a window. O'Neill stated that staff was unaware the windows on the Tractor Supply Store would be adhered to the building and not traditional windows. Doughman said that adhering windows to the exterior of the building is allowed by law. Carlton asked if we could do design awards again. O'Neill stated that we could start the program

again in 2020.

**8. Adjourn**

8.1.

Motion: To adjourn  
Moved By: Commissioner Logan  
Seconded By: Commissioner Carlton  
Yes votes: All Ayes  
No votes: None  
Abstentions: None  
The motion passed.

Chairman Crosby adjourned the meeting at 9:20 p.m.



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Chair, Jerry Crosby



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Planning Director, Kelly O'Neill Jr





## Staff Report

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**Meeting Date:** December 3, 2019  
**From** Emily Meharg, Associate Planner  
**SUBJECT:** 19-042 AP Space Age Appeal

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### **Background:**

JLP Development (Jim Pliska) submitted an application for a 16-pump vehicle fueling station (Space Age) at 15585 SE Orient Drive (File No. 19-012 DR/ADJ/TREE). The development includes a 3,100 square foot convenience store and is located on a 2.5-acre site. The site is proposed to be accessed from Orient Drive and Crescent Road with no direct access from HWY 26. The proposed development includes removal of trees from the subject property and adjacent rights-of-way. A Type III Special Variance was approved (File No. 18-036 VAR) for the property on October 31, 2018 to allow the property to be developed without connecting to City water and broadband fiber service (SandyNet). In addition, the property is allowed to connect to onsite sanitary sewer service and storm drainage facilities rather than city services. The site will be served by an onsite well and septic system and all stormwater will be managed onsite.

The applicant is requesting the following two (2) adjustments to the Sandy Municipal Code:

- Type II adjustment to Section 17.90.120(D.1) to decrease the percent of required street frontage from 50 percent to 40 percent.
- Type II adjustment to Section 17.90.120(D.1) to increase the required street frontage setback from 20 feet to 24 feet.

The original application (File No. 19-012 DR/ADJ/TREE) was processed as a Type II staff level decision. This application (File No. 19-042 AP) is an appeal of staff's decision, which is heard by the Planning Commission as a de novo hearing per ORS 227.175(10).

### **Recommendation:**

Staff recommends the Planning Commission decide if they are comfortable approving a proposal that only meets the code based on a future building that is not planned to be constructed as part of the current application or in the foreseeable future. Staff recommends the Planning Commission consider the following options:

- 1) Deny the applicant's proposal, which relies heavily on a fictitious future building to meet the building frontage requirement of the code. In addition, the applicant's proposal does not adequately implement the Sandy Style due to excessive tree removal and not protecting and enhancing Sandy's tree canopy, particularly along the Highway 26

Landscape Management Corridor. This option includes denying the adjustment request to reduce the required building frontage percent and denying the adjustment request to increase the future building's setback to 24 feet.

2) Require the applicant to construct the future building as part of this application in order to come into conformance with the Development Code. If the Planning Commission chooses this option, the applicant shall also construct a second new southbound lane on Orient Drive as conditioned by ODOT.

3) Approve the applicant's proposal with the conditions outlined in the final order for File No. 19-012 DR/ADJ/TREE as well as the conditions outlined in this document. If the Planning Commission chooses this option, staff recommends the Planning Commission require the applicant to retain the six (6) additional trees and extend the Highway 26 landscape buffer as conditioned by staff in the final order for File No. 19-012 DR/ADJ/TREE. Without retaining additional trees and extending the landscape corridor along Highway 26 to bring the project in better compliance with the Sandy Style, staff does not recommend the Planning Commission support the applicant's proposal, which includes a fictitious building, nor does staff recommend the Planning Commission support the applicant's request for approval of a Type II adjustment to reduce the required building frontage. This option would include approving the applicant's building frontage adjustment request, denying the applicant's future building setback adjustment request but approving a variance to allow a greater setback that better protects the retention trees, allowing the applicant to postpone construction of the future building, and requiring the applicant to retain the six (6) additional trees located adjacent to where the future building would go as conditioned by staff. If the Planning Commission chooses option 3, staff recommends the Planning Commission require the following:

- The future building shall be a minimum of 165 linear feet along the Highway 26 frontage of the site.
- Because the future building will not be constructed as part of this application, the applicant shall extend the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go and shall retain trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115).
- The applicant shall update the south elevation of the proposed convenience store to detail the three window panes directly to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance; the windows into the janitor's closet and women's restroom may remain spandrel windows. All spandrel windows shall be light gray.
- The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours; the primary entrance on the south elevation shall not be a faux entrance.
- The applicant shall record a tree protection covenant specifying protection of the 12 retention trees and Trees # 110-115 and limiting removal without submittal of an Arborist's Report and City approval. This document shall include a sketch identifying the retention trees and Trees # 110-115 and the critical root zone around the retention trees and Trees # 110-115 detailed at 1 foot per 1 inch DBH.

- The applicant shall update the plan set to detail the proposed future building set back outside of the critical root zone (defined as 1 foot per 1 inch DBH, or 5 feet beyond the dripline) of the 12 trees proposed for retention as well as the six (6) additional trees that shall be retained (Trees # 110-115).
- Determine if the applicant should be required to construct the third southbound traffic lane on Orient Drive as conditioned by ODOT as part of this approval.

Staff recommends the Planning Commission determine whether the proposed LED striping should be classified as “strongly thematic architectural style associated with some chain establishments,” in this case, Space Age, or if the LED band is an attention attracting device, which is also prohibited by code. In addition to determining if the LED lighting is considered thematic architecture, and thereby incompatible with the Sandy Style, staff recommends the Planning Commission determine if the proposed LED striping is an integral part of the architectural design, if it complements ornamental street lighting, if it’s in context with the overall architectural character of the district, and if the proposed LED lighting is compatible to the design character of existing structures on adjoining properties and on the proposed development site. Staff recommends the Planning Commission consider approving a painted color band instead of the LED striping. If the Planning Commission decides to approve the LED band, staff requests that the Planning Commission provide clarification on whether they would like the proposed LED band on the fueling canopy to be installed the same way that the LED band will be installed for the convenience store (i.e. in an exterior cove so that it will not be visible except when viewed directly below the fixture).

Staff recommends the Planning Commission require the applicant to update the plan set to detail 5 foot deep minimum pedestrian shelters over the walkways abutting the proposed convenience store building on the south, west, and north elevations as well as over the civic space.

In order to meet Sections 17.90.120(E.2.a), 17.90.120(I.1), and 17.90.120(I.2), staff recommends the Planning Commission require the applicant to provide active windows as recommended by staff. Staff recommends the Planning Commission refine the condition related to the south elevation windows to read: “The applicant shall update the south elevation of the proposed convenience store to detail the three window panes directly to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance; the windows into the janitor’s closet and women’s restroom may remain spandrel windows.” Staff recommends the Planning Commission require all spandrel windows to be light gray. Should the Planning Commission determine that it does not want to require active windows on the south and/or north or east elevations, staff recommends the Planning Commission formally approve three (3) Special Variances to Sections 17.90.120(E.2.a), 17.90.120(I.1), and 17.90.120(I.2), condition that the applicant submit payment of a Special Variance review fee for each of the three specialvariances, and condition that the applicant use light gray spandrel windows in compliance with Section 17.90.120(E.4.a). In addition, if the Planning Commission determines it does not want to require active windows on the north or east elevations, staff recommends the Planning

Commission also consider if they want to require the applicant to move the civic space and/or parking located along the north side of the convenience store as there would not be any active windows nearby.

Staff recommends the Planning Commission approve the Highway 26 sidewalk location proposed by the applicant's arborist, provided that:

- 1) The tree protection fencing is installed prior to any development activities and removed only after completion of all construction activity, as required by Section 17.102.50(B),
- 2) Either the applicant's arborist or the third party arborist is on-site for any construction activity within the tree protection zone of 1 foot per 1 inch DBH identified on Attachment 1 of the Tree Protection Addendum, and
- 3) The plan set is updated to reflect the tree protection fencing location at 1 foot per 1 inch DBH as identified in Attachment 1 of the Tree Protection Addendum with the following modification: the tree protection fencing shall adhere to the standard critical root zone of 1 foot per 1 inch DBH in the area where the future building is proposed to be constructed rather than follow the building footprint of the future building since the building is not actually proposed to be constructed with this application or at any time in the near future.

Staff recommends the Planning Commission require that no more than 25 percent of each tree's critical root zone of 1 foot per 1 inch DBH shall be impacted by development activity, including, but not limited to, grading, stockpiling of soil or materials, impacts from heavy machinery, excavation, compaction, paving, storage of equipment or materials, or other similar activities. Staff recommends that the Planning Commission require the arborist who is on-site during construction activity within the tree protection zone of 1 foot per 1 inch DBH be required to submit a post-construction summary report certifying that the work occurred, that the work did not impact more than 25 percent of each tree's critical root zone of 1 foot per 1 inch DBH, and that the work did not significantly impact the health or structural stability of the preserved trees.

Staff recommends the Planning Commission require the applicant to install tree protection fencing at 1 foot per 1 inch DBH. Staff recommends the Planning Commission require the tree protection fencing to be 6 foot high chain link or no-jump horse fencing and have a sign that clearly marks the area as a Tree Root Protection Zone. Staff recommends the Planning Commission require the applicant to follow all recommendations of the third-party arborist report with respect to air spading, root pruning, and any work within the critical/overall root zone (defined as 1 foot per 1 inch DBH).

If it is determined that Trees # 124, 125, 126, and/or 127 are in the ODOT right-of-way and need to be mitigated, staff recommends the Planning Commission allow the street trees on Highway 26 to also count as ODOT mitigation trees for Trees 124, 125, 126, and/or 127 (or any other trees identified as being the ODOT right-of-way on Highway 26), provided the street tree species is similar to the species of tree(s) removed (i.e. large, native, evergreen species). Staff recommends the Planning Commission allow

the street trees on the ODOT right-of-way portion of Orient Drive to also count as ODOT mitigation trees for Trees # 1, 4, 5, 6, and 7, provided the street tree species is similar to the species of tree(s) removed (i.e. large, native, evergreen species).

Staff recommends the Planning Commission remove the condition: “the applicant shall obtain a letter of credit in the amount of \$500 per tree to cover replacement and establishment of the right-of-way trees should a right-of-way tree die within 3 years.” Staff believes the conditions associated with Sections 17.92.10(B) and 17.92.10(L) will be sufficient to ensure survival of all landscaping and street trees without collecting a letter of credit.

Staff recommends the Planning Commission consider the documented negative impacts of blue-lighting, the recommendations from the various agencies, and the City’s Dark Sky Ordinance and determine whether to require lighting to not exceed 4,125 Kelvins as recommended by Illuminating Engineering Society or to not exceed 3,000 Kelvins as recommended by the American Medical Association, the Audubon Society of Portland, and the International Dark-Sky Association.

Staff recommends the Planning Commission determine if any other conditions should be modified since this appeal hearing is de novo.

**Code Analysis:**

See Draft Order

**Budgetary Impact:**

None

**DRAFT FINDINGS OF FACT and FINAL ORDER**  
**TYPE III DECISION**

**REPORT DATE:** November 26, 2019

**FILE NO.:** 19-042 AP

**PROJECT NAME:** Space Age Fueling Station APPEAL

**APPLICANT/OWNER:** JLP Development

**LEGAL DESCRIPTION:** T2S R4E Section 10, Tax Lot 4500

The above-referenced proposal was reviewed concurrently as a Type III Appeal of a Type II Design Review with Adjustments and Tree Removal. The following Findings of Fact are adopted supporting approval of the plan in accordance with Chapter 17 of the Sandy Municipal Code.

**EXHIBITS:**

**Applicant's Submittals:**

- A. Land Use Application
- B. Project Narrative (April 2019)
- C. Supplemental Project Narrative (July 8, 2019)
- D. Civil Plan Set
  - Sheet 1 – Cover Sheet and Existing Conditions Plan
  - Sheet 2 – Tree Retention Plan
  - Sheet 3 – Site Plan
  - Sheet 4 – Grading Plan and Erosion Control Plan
  - Sheet 5 – Utilities Plan
  - Sheet 6 – Cut-Fill Plan
  - Sheet L-101 – Landscape Plan
  - Sheet E.01 – Site Lighting Photometric Analysis
- E. Architectural Plan Set and Elevations
  - Sheet A-101 – Overall Main Floor Plan
  - Sheet A-161 – Overall Roof Plan
  - Sheet A-192 – Equipment Layout Plan
  - Sheet A-220 – Exterior Elevations (West and South)
  - Sheet A-221 – Exterior Elevations (East and North)
  - Sheet A-222 – Exterior Perspectives C-Store
  - Sheet A-223 – Exterior Perspectives Fuel Island
  - Sheet A-521 – Trash Enclosure
- F. Fire Plan Approval

- G. Lighting Cut Sheets
- H. Traffic Impact Study
- I. Arborist Report
- J. Preliminary Stormwater Report
- K. DEQ Approval
- L. Letter from Clackamas County Department of Transportation and Development

**Agency Comments:**

- M. Clackamas County Onsite Wastewater Systems Program Supervisor (August 14, 2019)
- N. Public Works Director (August 16, 2019)
- O. City Engineer (August 19, 2019)
- P. Clackamas Fire District #1 (September 10, 2019)
- Q. PGE (September 11, 2019)
- R. City Transportation Engineer (September 26, 2019)
- S. Clackamas County Engineering (September 24, 2019)
- T. ODOT (September 26, 2019)

**Public Comments:**

- U. Robert and Patricia Whitlock (August 26, 2019)
- V. Johnathon Nolen (August 26, 2019)

**Additional Documents Submitted by Staff:**

- W. Third-party Arborist Report

**Additional Documents Submitted by the Applicant's Transportation Engineer:**

- X. Technical Memorandum (September 16, 2019)

**Appeal Documents Submitted by Applicant November 4, 2019:**

- Y. Notice of Intent to Appeal
- Z. Appeal Narrative
- AA. Tree Protection Addendum for Space Age
- BB. Green Corridor Agreement

**Additional Documents Submitted by Staff:**

- CC. Email correspondence with ODOT

**Additional Appeal Documents Submitted by Applicant November 13, 2019:**

- DD. Supplemental Narrative No. 1

**Staff-Issued Final Order:**

- EE. October 22, 2019 Final Order

**FINDINGS OF FACT**

**General**

1. These findings are based on the applicant's notice of intent to appeal staff's October 22, 2019 decision for File No. 19-012 DR/ADJ/TREE (Exhibit EE). Staff received the applicant's notice of intent to appeal on November 4, 2019. Staff's October 22, 2019 decision was based on the original submittal for File No. 19-012 DR/ADJ/TREE received on April 15, 2019 and additional information received on May 7, 2019, July 11, 2019, and July 30, 2019. The original application was deemed complete on August 6, 2019 and the 120-day deadline is December ~~46~~, 2019. A supplemental Technical Memorandum was submitted by the applicant's Traffic Engineer on September 16, 2019 (Exhibit X), which significantly held up the review process; however, the applicant never formally requested an extension to the 120 day clock. Updated comments in response to the supplemental Technical Memorandum were received from the City Transportation Engineer on September 26, 2019 (Exhibit R), Clackamas County Engineering on September 24, 2019 (Exhibit S), and ODOT on September 26, 2019 (Exhibit T). This additional information from the applicant's Traffic Engineer resulted in multiple meetings with the City Traffic Engineer and ODOT and led to additional processing time. On October 17, 2019, staff sent the applicant draft conditions at the applicant's request, which further delayed the process, though, again, the applicant did not formally request an extension to the 120 day clock. On October 20 and 21, 2019, staff received comments back from the applicant. This also led to additional processing time.
2. This final order is based upon the Exhibits listed above, as well as agency comments and public testimony.
3. The subject site is approximately 2.5 acres. The site is located north of Highway 26, south and west of Orient Drive, and east of Crescent Road.
4. The parcel has a Comprehensive Plan Map designation of Commercial and a Zoning Map designation of C-2, General Commercial.
5. JLP Development (Jim Pliska) submitted an application for a 16-pump vehicle fueling station (Space Age) at 15585 SE Orient Drive. The development includes a 3,100 square foot convenience store and is located on a 2.5-acre site. The site is proposed to be accessed from Orient Drive and Crescent Road with no direct access from HWY 26. The proposed development includes removal of trees from the subject property and adjacent rights-of-way. A Type III Special Variance was approved (File No. 18-036 VAR) for the property on October 31, 2018 to allow the property to be developed without connecting to City water and broadband fiber service (SandyNet). In addition, the property is allowed to connect to onsite sanitary sewer service and storm drainage facilities rather than city services. The site will be served by an onsite well and septic system and all stormwater will be managed onsite.

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- Type II adjustment to Section 17.90.120(D.1) to decrease the percent of required street frontage from 50 percent to 40 percent.
  - Type II adjustment to Section 17.90.120(D.1) to increase the required street frontage setback from 20 feet to 24 feet.
6. Notification of the proposed application was mailed to affected agencies on August 12, 2019 and to property owners within 300 feet of the subject property on August 13, 2019.



7. Agency comments were received from the Clackamas County Onsite Wastewater Systems Program Supervisor, Public Works Director, City Engineer, Clackamas Fire District #1, PGE, City Transportation Engineer, Clackamas County Engineering, and ODOT.
8. Two written public comments were received. Robert and Patricia Whitlock (Exhibit U) at 15600 Orient Drive expressed concerns about access to/from their property to Orient Drive. They're also concerned about traffic and safety for children getting on/off the school bus at Orient Drive and Crescent Road. Johnathon Nolen (Exhibit V) at 34935 Crescent Road had questions about the dimensions of Crescent Road, how the trip counts were conducted, and where the overflow from the stormwater detention pond would go. He also has concerns about traffic backing up on Orient Drive and blocking the entrance to Crescent Road. He wants to know if the cul-de-sac could be built entirely on the applicant's property.
9. The original application (File No. 19-012 DR/ADJ/TREE) was processed as a Type II staff level decision. This application (File No. 19-042 AP) is an appeal of staff's decision, which is heard by the Planning Commission as a de novo hearing per ORS 227.175(10).
10. Notification of the appeal was mailed to affected agencies on November 13, 2019 and to property owners within 300 feet of the subject property on November 12, 2019.
11. No written public comments were received prior to publication of this document. No agencies provided additional comments related to the appeal.

#### 17.44 – C-2 General Commercial

~~9~~12. Section 17.44.10 lists uses permitted outright in the C-2 zone. Retail businesses, including automotive fueling stations and convenience stores in buildings with less than 60,000 square feet, are permitted outright. The proposal includes a 16-pump vehicle fueling station and one building that is approximately 3,100 square feet, with an additional future building footprint identified on the site plan (Exhibit D, Sheet 3).

~~10~~13. Section 17.44.30(A) contains development standards for buildings in the C-2 zone. To determine the front lot line, the Definitions section of the code (Chapter 17.10) states: "In the case of a corner lot, the front line shall be determined by orientation of the structure based on at least two of the following factors: location of the front door, location of the driveway, or legal street address." Currently, the property has an Orient Drive address. The proposal includes a front door facing Highway 26 and two proposed driveways, one accessing Crescent Road and a second accessing Orient Drive. Based on the definition of front lot line, Orient Drive would be the front lot line of the subject property (legal street address and location of the driveway). However, based on the submitted site layout, it would make more sense for Highway 26 to be considered the front lot line as Highway 26 is the activated frontage with no parking located between the proposed buildings and the Highway 26 right-of-way and no retaining wall in the front yard. In order for Highway 26 to be considered the front yard, it would need either a driveway or legal street address, in addition to a front door, which is proposed. **The applicant shall update the address of the site to be addressed from Highway 26.** Staff contacted Clackamas Fire District #1 to verify that changing the

address to Highway 26 without a Highway 26 driveway access wouldn't be an issue. Clackamas Fire District #1 stated they have no issue with the property having a Highway 26 address even without access from Highway 26 (Exhibit P). With the conditioned change of address to Highway 26, Highway 26 is considered the front yard for the purposes of this review. **The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours as the location of the front door along the Highway 26 frontage is necessary to consider the Highway 26 frontage the front lot line.** The proposed Space Age convenience store is located 20 feet from the property line along Highway 26. The applicant's submittal indicates the landscaping represents 62.6 percent of the site in compliance with these standards. The maximum height of the building is 23 feet 3 inches and the maximum height of the pump area structure is 25 feet, both of which are less than the 45 feet allowed by this section.

#### 17.74 – Accessory Development

~~14.~~ Section 17.74.40(B) contains height requirements for fences and retaining walls in commercial and industrial zones. The subject property is zoned General Commercial (C-2). The applicant is proposing one (1) retaining wall along the north edge of the site adjacent to Orient Drive, which is the rear yard. The proposed wall is a lock and load wall with split face block that varies in exposed height from 1.5 feet to 4.1 feet with a five foot tall fence on top. **The applicant shall propose an appropriate architectural treatment for the wall for staff review and approval.** The maximum combined height of the retaining wall and fence is 9.1 feet, which exceeds the 8 foot maximum for retaining walls/fences in the rear yards of commercial properties. **The applicant shall do one of the following:**

- **Reduce the combined height of the retaining wall and fence to 8 feet or less.**
- **Set the fence back at least 5 feet from the top of the retaining wall to create a break between the wall and the fence.**
- **Apply for a Special Variance to allow a maximum 9.1 foot tall retaining wall and fence in the rear yard.**

#### 17.80 – Additional Setbacks

~~15.~~ Chapter 17.80 requires any structure located on arterial or collector streets to have a minimum 20-foot setback measured from the property line. The subject property has frontage on Highway 26, which is a major arterial, and on Orient Drive, which is a County arterial/collector. **All structures on the subject property shall be constructed to comply with the standards of Section 17.80.20. All structures shall maintain a minimum 20-foot setback from the Highway 26 and Orient Drive public rights-of-way.** The Site Plan (Exhibit D, Sheet 3) depicts the proposed building at 20 feet from the Highway 26 right-of-way and 56 feet from the Orient Drive right-of-way.

#### 17.84 – Improvements Required with Development

~~16.~~ Section 17.84.20 specifies the timing of improvements. **All required improvements shall be installed or financially guaranteed prior to final occupancy of the Space Age fueling station.**

~~17.~~ Section 17.84.30(A) requires setback sidewalks with a minimum width of six feet along arterial streets such as Highway 26 and Orient Drive. The Site Plan (Exhibit D, Sheet 3) indicates the applicant will install 6 foot wide sidewalks along Highway 26 and 5-7 foot

sidewalks along the Orient Drive frontages of the site. Both Highway 26 and Orient Drive are arterial streets; therefore, the minimum sidewalk width is 6 feet per Section 17.84.30(A.2). The standard sidewalk width for sidewalks on ODOT arterials is 6 feet and the standard sidewalk width for sidewalks on Clackamas County arterials is 7 feet. **The applicant shall update the plan set to detail 6 foot wide sidewalks along the Highway 26 frontage and 7 foot wide sidewalks along the Orient Drive frontage of the site.** Per the City Engineer (Exhibit O), **all sidewalks and ADA ramps shall comply with the most current ADA requirements. An ADA ramp shall be installed at the corner of SE Orient Drive and SE Crescent Road. The applicant shall contact the ODOT District Contact (Loretta Kieffer, 503-667-7441) to determine permit requirements and obtain application information. If a design exception is required for street trees the applicant shall adjust the location of the sidewalk to allow street trees that meet ODOT's minimum clear zone criteria and/or apply for a design exception. There appears to be sufficient right-of-way to meet ODOT's clear zone criteria. Any costs for a design exception shall be paid by the applicant.** ODOT (Exhibit T) states that the site plan shows a single ADA ramp at the intersection of Highway 26 and Orient Drive but the ODOT standard is for two ADA ramps. **The applicant shall update the plan set to detail two ADA ramps at the intersection of Highway 26 and Orient Drive.**

~~15~~**18.** Section 17.84.30(B) requires the provision of safe and convenient pedestrian and bicyclist facilities that strive to minimize travel distance to the extent practicable in conjunction with new development within and between new subdivisions, planned developments, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks. The applicant proposes to install a six foot wide sidewalk along Highway 26 and a 5-7 foot wide sidewalk along Orient Drive. **The applicant shall update the plan set to detail 6 foot wide sidewalks along the Highway 26 frontage and 7 foot wide sidewalks along the Orient Drive frontage of the site.** The proposal also includes a 6 foot wide walkway connecting the sidewalk on Highway 26 to both entrances of the proposed Space Age convenience store. On September 9, 2019 staff conducted site visits to four different Space Age gas stations and noticed multiple obstructions placed in the walkway adjacent to the front door of the convenience store, including ice chests, fire wood, trash cans, newspaper boxes, and propane tanks. Per Section 17.84.30(B.4.a), **the applicant shall maintain a minimum 5 foot wide walkway free of obstructions along the north, west, and south building elevations, including the connection to Highway 26.**

~~16~~**19.** Section 17.84.40 requires sites located along existing or future transit routes to incorporate bus pull-outs and/or shelters in the site design. The subject property is located along Highway 26, which is an existing transit route. The Transit Director did not submit any comments.

~~17~~**20.** The subject development required preparation of a Traffic Impact Study in compliance with the requirements of Section 17.84.50. The applicant submitted a Transportation Impact Study (TIS) prepared by Mike Ard, dated April 8, 2019 (Exhibit H) and a supplemental Technical Memorandum dated September 16, 2019 (Exhibit X). The analysis predicts 76 morning peak hour trips, 98 evening peak hour trips, and 1,348 daily trips. Per the TIS, "although the subject property has already been annexed into the City of Sandy with C-2

zoning applied, an analysis of the impacts of the recent zone change was required in conjunction with the proposed development. Based on the analysis, the ‘reasonable worst-case development scenario’ is projected to result in a new increase of 187 trips during the morning peak hour, 225 trips during the evening peak hour, and 2,580 daily trips.” The TIS and Technical memorandum were reviewed by the City’s Transportation Engineer (Exhibit R), Clackamas County Engineering (Exhibit S), and the Oregon Department of Transportation (Exhibit T).

The primary conclusions from the TIS include the following:

- Based on the operational analysis, the unsignalized study intersections currently operate acceptably and are projected to continue to operate acceptable through 2038 either with or without full development within the subject property. No operational mitigations are necessary or recommended for the unsignalized intersections.
- The intersection of Highway 26 and SE Orient Drive is currently operating with volume-to-capacity ratios (V/C) exceeding the targets established in the Oregon Highway Plan. Although the proposed development is projected to worsen performance of the intersection, if a southbound left-turn lane is added on SE Orient Drive approaching Highway 26, intersection operation will not be degraded by the proposed development.
- Crash data for the most recent three years shows no significant crash trends that may be indicative of design deficiencies. No crash mitigations are recommended.
- Based on the warrant analysis, no new traffic signals are recommended. A northbound left-turn lane is projected to be warranted at the intersection of SE Orient Drive and SE Crescent Road.
- Intersection sight distance was evaluated for the unsignalized intersections on SE Orient Drive. The existing intersection of Orient Drive at SE Crescent Road was found to have adequate sight distance in both directions. The proposed site access driveway on SE Orient Drive is projected to have inadequate intersection sight distance to the south. Accordingly, it is recommended that turning movements be restricted to right-in, right-out only to eliminate the potential for conflicts with limited sight distance at this location. No other sight distance mitigations are recommended.
- The change from RRFF-5 to C-2 zoning is projected to result in a significant effect as defined under Oregon’s Transportation Planning Rule. The addition of a second southbound left-turn lane on SE Orient Drive approaching Highway 26 is sufficient to address the impacts of potential site development under the proposed zoning and will therefore satisfy Oregon’s Transportation Planning Rule.

~~18.21~~ 21. A comment letter regarding the submitted Traffic Impact Study and Technical Memorandum was submitted by the City Transportation Engineer (Exhibit R). The City Transportation Engineer concurs with the TIS conclusions and finds that the TIS and Technical Memorandum address City requirements. The City Transportation Engineer states: “To mitigate for the proposed development (the fueling station and convenience market), the [applicant’s] engineer recommends the following mitigation measures: the addition of a left-turn lane on SE orient Drive at Highway 26; the modification of the traffic signals at SE Orient Drive at Highway 26 to accommodate the additional lane; widening SE Orient Drive between Highway 26 and SE Crescent Road to include turn lanes at each intersection.” The

City's Transportation Engineer concurs with the recommendations to mitigate for the added traffic from the development.

The City's Transportation Engineer states: "the September 16, 2019 Technical Memorandum provides additional documentation to illustrate mitigation measures to demonstrate compliance with the TPR during the AM peak hour in 2038 with the full build-out of the site with City of Sandy C-2 zoning. To offset the predicted performance of the intersection of Highway 26 and SE Orient Drive during the AM peak hour, the engineer demonstrates that an additional right-turn lane on the southbound approach of SE Orient Drive allows the intersection to operate no worse than the 2038 background condition during the AM peak hour with full-buildout of the site. The resulting configuration of the southbound approach of SE Orient Drive would consist of three lanes: a left-turn lane; a left-turn, through lane; and a right turn lane... To mitigate for the rezoning and full development of the site under City of Sandy C-2 zoning (e.g. a fast-food restaurant and a drive-in bank *in addition* to the proposed fueling station and convenience market in the initial development), the applicant needs commit [sic] to mitigation measures including three lanes for the southbound approach of SE Orient Drive at Highway 26; traffic signal modifications and related improvements acceptable to ODOT as a condition of approval to allow the development and zone change to be found to be consistent with the Transportation Planning Rule." The City Transportation Engineer concludes: "To show that a zone change to City of Sandy C-2 zoning is consistent with the Transportation Planning Rule, the applicant needs to commit to additional mitigation. This mitigation is not required to offset the impact of the current development proposal (fueling station and convenience market), but should be a condition of approval for any development beyond the current proposal. The applicant needs to provide mitigation measures acceptable to ODOT showing that with the 'reasonable worst case' development scenario under C-2 zoning will be no worse than the 2038 background conditions for both the AM and PM peak hours. With this commitment to implement these measures as conditions of approval, the rezoning can be shown to be consistent with the Transportation Planning Rule."

The City Transportation Engineer recommends the following conditions of approval for the initial phase of the development (the fueling station and convenience market):

- **The applicant shall construct a left-turn lane on southbound SE Orient Drive at Highway 26 with accompanying signal modifications according to ODOT specifications and requirements.**
- **The applicant shall construct a left-turn lane on northbound SE Orient Drive at SE Crescent Road according to Clackamas County specifications and requirements and to ODOT specifications and requirements if any section of SE Orient Drive falls within ODOT jurisdiction.**
- **The applicant shall construct a three-lane section for SE Orient Drive from Highway 26 to north of SE Crescent Road with a raised median to restrict driveway movements at the site to right-in, right-out according to Clackamas County specifications and requirements and to ODOT specifications and requirements if any section of SE Orient Drive falls within ODOT jurisdiction.**
- **The applicant shall dedicate any additional right-of-way adjacent to Highway 26 and SE Orient Drive if necessary to assure that an additional southbound lane can be provided on SE Orient Drive at Highway 26.**

The City Transportation Engineer recommends the following conditions of approval for any development beyond the 3,100 square foot convenience store and Space Age fueling station:

- **The applicant shall construct a right-turn lane on southbound SE Orient Drive at Highway 26 (this will result in three lanes for the southbound SE Orient Drive approach) with accompanying signal modifications according to ODOT specifications and requirements such that the intersection will operate at no worse than 2038 background conditions during both the AM and PM peak hours under full build-out of the site under City of Sandy C-2 zoning.**

If the applicant seeks to modify these conditions of approval due to changes in conditions or standards, the applicant will need to demonstrate compliance with the Transportation Planning Rule. Such compliance will need to include an analysis of the year associated with the most recently adopted City of Sandy Transportation System Plan.

~~19.22.~~ A comment letter regarding the proposal was submitted by Clackamas County Engineering (Exhibit S). Clackamas County states “The proposed lane transition of southbound SE Orient Drive to accommodate the northbound left turn lane at SE Crescent Drive appears to require additional length to meet Roadway Standards Section 250.6.4, based on a design speed of 55 MPH.” Clackamas County recommends the following conditions of approval:

- **All frontage improvements in, or adjacent to Clackamas County right-of-way, shall be in compliance with Clackamas County Roadway Standards. Frontage improvements in, or adjacent to State of Oregon right-of-way, shall be in compliance with Oregon Department of Transportation standards.**
- **The applicant shall dedicate additional right-of-way along the entire site frontage of SE Orient Drive and SE Crescent Road as necessary to accommodate the required frontage improvements, providing a minimum of 6 inches behind the sidewalk.**
- **Written approval shall be obtained from ODOT, in the form of a permit, for access and improvements within the Highway 26 right-of-way and the portion of SE Orient Drive under ODOT’s jurisdiction.**
- **Minimum improvements on the SE Orient Drive frontage consistent with Clackamas County's Roadway Standards include, but are not limited to, up to a one half-street improvement, including:**
  - **Up to a minimum 30-foot wide, one half-street improvement shall be constructed along the entire site frontage to arterial roadway standards, per Clackamas County Roadway Standards Standard Drawing C100. As necessary, additional paved width shall be provided for the proposed second left turn lane at the intersection with Highway 26 and the northbound left from SE Orient Road to SE Crescent Road.**

- **Lane transitions shall be provided per Roadway Standards Section 250.6.4 based on a 55 MPH design speed.**
- **A minimum 1.5-foot wide concrete center median shall be constructed on SE Orient Drive, centered on the site driveway, extending a minimum of 40 feet beyond the north and south edge of the driveway. A minimum shy distance of 1.0 foot shall be provided from the median and travel lane.**  
The applicant's proposal includes a median between the two southbound travel lanes to allow for a left-in and left-out for the existing driveway serving the undeveloped property (Tax Lot 24E10 05490 and 05400) on the east side of SE Orient Drive. For this location, a median will only be permitted at the center of the roadway rather than between southbound travel lanes. Based on the limited use of the existing driveway on the east side of SE Orient Drive, it does not warrant providing full access at this time.
- **Standard curb, or curb and gutter if curb line slope is less than one percent.**
- **Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.**
- **A minimum 7-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. If the sidewalk does not connect to sidewalk on adjacent property, the end of the sidewalk shall require the construction of a concrete ramp, adjacent to the end of the sidewalk, providing a transition from the new sidewalk to the edge of the pavement. The ramps shall meet ADA guidelines.**
- **A minimum 28-foot wide concrete driveway approach shall be constructed, per Standard Drawing D650, and shall be limited to right-out turning movements only. A wider driveway is acceptable with demonstration of the need with truck turning templates. The driveway approach and on-site curbs shall be channelized to limit right-turns into the driveway. The angle of the driveway shall be no more than necessary to accommodate truck turning and shall be demonstrated by turning templates based on anticipated vehicles. A signage plan shall be provided indicating the access restriction.**
- **A striping plan for SE Orient Drive shall be provided. The northbound left turn lane queue storage at SE Crescent Road shall be the minimum as recommended in the project traffic study by Ard Engineering, dated April 8, 2019.**
- **Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.**

- **Minimum improvements on the SE Crescent Road frontage consistent with Clackamas County's Roadway Standards include, but are not limited to, up to a half-street improvement, including:**
  - **Dedicate public right-of-way as needed to accommodate the required frontage improvements.**
  - **A minimum total paved width of 20 feet, with a structural section for a commercial local roadway, per Clackamas County Roadway Standards Standard Drawing C100.**
  - **Standard curb, or curb and gutter if curb line slope is less than one percent.**
  - **Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.**
  - **A minimum 5-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. Dual curb ramps shall be constructed per ODOT Standard Drawing (RD755, RD756 and RD757) at the SE Crescent Road intersection with SE Orient Drive.**
  - **A minimum 28-foot wide concrete driveway approach shall be constructed, per Standard Drawing D650. A wider driveway is acceptable with demonstration of the need with truck turning templates.**
  - **Provide adequate intersection sight distance per Section 240 of the Clackamas County Roadway Standards.**
  - **Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.**
  - **Prior to issuance of a Development Permit and start of construction activities, off-site construction easements shall be obtained.**
- **Prior to commencement of site work, a Development Permit is required and must be obtained from Clackamas County for all work performed in the road right-of-way. A Utility Placement Permit is required for any utility work within the public right-of-way, per Chapter 7 of the Roadway Standards. When there are multiple utility service trenches in the road, the trench repairs will grind and inlay the top 2" of the pavement restoration to include a minimum 12" tee beyond the furthest trench, and to combine multiple trenches into one surface repair.**

**If the applicant is advised to or chooses to modify the proposal in terms of access location and/or design following the preparation of these comments the applicant shall give the Clackamas County Engineering office an opportunity to review and comment on such changes prior to a decision being made.**



~~20-23.~~ A comment letter regarding the proposal was submitted by ODOT (Exhibit T). ODOT recommends that the applicant be required to add two southbound lanes on Orient Drive (for a total of three southbound lanes) with this proposed development. As discussed in Finding #18, the applicant's TIS finds that the addition of one southbound lane on Orient Drive will suffice to mitigate the effects of the current proposal (fueling station and convenience store); the addition of a second southbound lane will become necessary at future build-out. The City's Transportation Engineer concurs with the findings in the TIS, thus, staff is only requiring the addition of one southbound lane at this time, as proposed. However, **the applicant shall update the plan set to ensure all site modifications (e.g., sidewalks, relocated signal pole, etc.) are located appropriately in anticipation of the addition of the second additional southbound lane in the future.**

~~21-24.~~ Section 17.84.50(D) requires sites to provide access from a public street improved to City standards. The site contains frontage on Highway 26, Orient Drive, and Crescent Road. Per the Public Works Director (Exhibit N), **complete frontage improvements including streetlighting, curbs, sidewalks, and planter strips per Chapter 15.20 and Chapter 17.84 of the Sandy Municipal Code shall be required on all site roadway frontages, including Crescent Road.** Per the City Engineer (Exhibit O), **half street improvements on SE Orient Drive shall be required along the entire site frontage to minor arterial standards to include signing and striping plans. Input from ODOT shall be required on Highway 26, particularly at the intersection with SE Orient Drive, and on the impacts on the existing traffic signal function and performance and lane configuration. The proposed cul-de-sac shall be designed to include plan and profile as part of this development to assure grades will be met.**

~~22-25.~~ Section 17.84.60 contains specifications for public facility extensions. A Type III Special Variance was approved (File No. 18-036 VAR) for the property on October 31, 2018 to allow the property to be developed without connecting to City water and broadband fiber service (SandyNet). In addition, the property is allowed to connect to onsite sanitary sewer service and storm drainage facilities rather than city services. The site will be served by an onsite well and septic system and all stormwater will be managed onsite. Per the City Engineer (Exhibit O), the CDS Manhole water quality doesn't appear to meet the 2016 City of Portland SWMM as adopted by the City of Sandy. **All on-site hydrology and hydraulics under the canopy/fueling area shall comply with the requirements of Section 13.18 of the Sandy Municipal Code and shall provide the components explained in the City of Portland Stormwater Management Manual (oil/water separator, spill control manhole, closed shut-off valve). In addition to these, the applicant shall install an impermeable liner in the pond and an emergency shut-off valve (normally open) down stream. In the case of a spill this valve could be closed. The applicant shall submit concurrence from Clackamas County to make sure they approve any potential fuel spill being routed to a stormwater pond that discharges to their roadside storm drain system.**

~~23-26.~~ Section 17.84.70 contains requirements regarding public improvement procedures. **The applicant shall confer with Clackamas Fire District #1 to determine the number and location of on-site fire hydrants necessary to comply with the requirements of the Clackamas Fire District Fire Marshal. The applicant shall follow all Clackamas Fire District requirements.**

~~24.27.~~ Section 17.84.80 contains specifications for franchise utility installations. Municipal Code 15.20.030(B) states the following regarding undergrounding of utilities: “No building permit shall be issued for remodeling, alteration or addition to any building or structure when the estimated cost of the remodeling, alteration or addition exceeds twenty percent of the value of the building or structure before such remodeling, alteration or addition is commenced on any lot which is not served by underground utilities, unless the applicant agrees to construct equipment and related facilities to accept and receive all underground utility lines which shall serve the building or structure, including but not limited to those required for all electric, communication and cable TV services in conjunction with the construction activity related to the building permit.” **The applicant shall place all onsite (including extensions from the poles in the right-of-way) overhead electrical and communications wires underground in conformance with Section 15.20.** Private utility services will be submitted for review and approval by service providers and City staff in association with construction plans, and all utility lines will be extended to the perimeter of the site. **All franchise utilities shall be installed underground and in conformance with City standards.** On September 9, 2019, staff visited four Space Age gas stations and noticed multiple security cameras. At the Happy Valley Space Age, there was an overhead wire running from the roof of the convenience store to a security camera on top of a light pole. **The applicant shall not run any wires overhead.** PGE submitted a comment (Exhibit Q) stating they did not find any conflicts related to the project and that the developer should call PGE’s service coordination when they are ready to start the project. **The applicant shall call PGE’s Service Coordination at 503-323-6700 when they are ready to start the project.**

~~25.28.~~ Section 17.84.100 contains provisions for mail delivery facilities. **Mail delivery facilities shall be provided by the applicant in conformance with 17.84.100 and the standards of the USPS. The applicant shall submit a mail delivery plan to the City and USPS for review and approval prior to installation of the mail delivery facility.**

#### 17.90 – Design Standards

~~26.29.~~ The applicant proposes construction of a new building within the C-2 zoning district. As such the application is subject to the provisions of Chapter 17.90, Design Standards.

~~27.30.~~ Section 17.90.00 contains the intent of the design standards. In implementing these standards, the reviewing body shall refer to the listed objectives in evaluating Design Review requests.

~~28.31.~~ Section 17.90.00(C) lists guiding principles of the Sandy Style, including protecting and enhancing Sandy’s tree canopy, particularly along the Highway 26 Landscape Management Corridor (17.90.00(C.2)). The required landscape management corridor along Highway 26 will be discussed in further detail in Section 17.90.120(F) of this document.

~~32.~~ Section 17.90.00(D) lists elements incompatible with the Sandy Style. The reviewing body may deny, or require modifications to, a project with any of the items contained in Section 17.90.00(D). “Strongly thematic architectural styles, forms, colors, materials, and/or detailing that do not conform to the Sandy Style, including some forms of franchise architectural styles associated with some chain commercial establishments” are considered to be incompatible with the Sandy Style per Section 17.90.00(D.9). The applicant is proposing red LED striping

along the roofline of the gas pump facility and the convenience store, which does not conform to the Sandy Style. As a condition of approval of File No. 19-102 DR/ADJ/TREE, staff required ~~the~~ applicant ~~shall~~ to update the elevations to remove the proposed LED striping. The applicant's appeal narrative (Exhibit Z) states:

*"The proposed LED band is intended to add visual interest similar to a painted color band as allowed with certain parameters by Section 17.90.120(B.4.b). The LED band is similar to what has been installed on the canopies of the Leather's, Shell and Arco stations in downtown Sandy. It should be noted the canopies of the Shell and Arco stations, replaced in the last few years, after adoption of the Sandy Style standards, were approved to contain LED bands. We believe staff has incorrectly considered the lighted band as "a strongly thematic architectural style associated with some chain commercial establishments" that is discouraged by Code. The applicant believes the lighted band instead complements and enhances the building aesthetic and architectural styling of the Sandy Style design and should be approved."*

The applicant's supplemental appeal narrative (Exhibit DD) states:

*"The LED fixtures proposed for the convenience store will be installed in an exterior cove and will not be visible except when viewed directly below the fixture (See Attachment A). This band is intended to light the fascia with a downward was at night, and as described by the Project Architect, this light provided by these fixtures will help to define the profile of the rood at night. He also noted the proposed LED band on the fueling canopy could be designed in a similar fashion if this was desirable."*

**Staff recommends the Planning Commission determine whether the proposed LED striping should be classified as "strongly thematic architectural style associated with some chain establishments," in this case, Space Age, or if the LED band is an attention attracting device, which is also prohibited by code. Staff recommends the Planning Commission consider approving a painted color band instead of the LED striping. If the Planning Commission decides to approve the LED band, staff requests that the Planning Commission provide clarification on whether they would like the proposed LED band on the fueling canopy to be installed the same way that the LED band will be installed for the convenience store (i.e. in an exterior cove so that it will not be visible except when viewed directly below the fixture).**

~~29~~**33.** 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.**

~~30~~**34.** Because the subject property is located in the C-2 zoning district the application was reviewed for compliance with the provisions of Section 17.90.120.

~~31~~**35.** Section 17.90.120(A)(1) requires that all lots abut or have cross access to a dedicated public street. The subject property abuts Highway 26, Orient Drive, and Crescent Road.

~~32~~36. Section 17.90.120(A)(3) requires off-street parking to be located to the rear or side of buildings with no portion of the parking lot located within required setbacks or within 10-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 linear ft. For lots with frontage of less than 150 ft. or less, shared access may be required. The proposed parking area is located on the north and west sides of the proposed building and outside of the 20 foot required setback from Highway 26. Access to the parking area will be from the two proposed driveways on Orient Drive and Crescent Road.

~~33~~37. Section 17.90.120(A)(5) requires 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. The Site Plan (Exhibit D, Sheet 3) details a six foot wide walkway along the north, west, and south sides of the proposed convenience store building that connects to the parking north and west of the building as well as to the Highway 26 sidewalk. However, there are an additional five parking spaces west of the fuel pumps that are not connected to the walkway; the site plan does not detail pavement markings on asphalt areas where pedestrians are proposed to cross from the western parking to the building. At the time of development of the future building, there will be a walkway between the future building and the parking west of the fuel pumps, which will connect to the Highway 26 sidewalk and, thus, will provide a seamless pedestrian route from the parking to the convenience store building. **The applicant shall do one of the following: update the plan set to detail pavement markings that connect the walkway to the parking west of the fuel pumps, or install a walkway that connects the parking spaces to the Highway 26 sidewalk. If the applicant chooses pavement markings, the pavement markings shall be painted periodically as lines become faded. If the applicant chooses to install a walkway, the walkway shall be located such that it has the least impact on retention trees while still providing a connection between the parking spaces and the Highway 26 sidewalk.**

~~34~~38. Section (A)(7) requires walkways connecting from the public street sidewalk to the building entrance(s) to be provided. 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). The proposal includes a six foot wide walkway along the north, west, and south facades of the proposed convenience store building. The proposed walkway connects to the proposed civic space northeast of the convenience store building as well as the proposed six foot wide sidewalk on Highway 26. The site plan does not show a connection between the future building and the sidewalk along Highway 26. **The applicant shall update the plan set to detail a six foot wide walkway connecting a front door on the south side of the future building to the Highway 26 sidewalk. The applicant shall also update the plan set to show the walkway extending around to the south side entrance of the proposed future building. To minimize impact on retention trees, the proposed entrance to the future building along Highway 26 shall be located at the southeast corner of the building.**

~~35~~39. Section (A)(8) requires connection to adjacent properties. Where openings occur between buildings adjacent to Highway 26, pedestrian walkways should connect the street sidewalk to any internal parking areas and building entrances. The proposal contains two buildings along Highway 26. The site plan details a walkway connecting the convenience store to the Highway 26 sidewalk; however, there is no proposed walkway connecting the convenience

store to the future building. This connection could be accomplished by connecting the future building to the Highway 26 sidewalk. **The applicant shall update the plan set to detail a six foot wide walkway connecting a front door on the south side of the future building to the Highway 26 sidewalk.**

~~36-40.~~ Section (A)(11) requires free-standing buildings to be connected to one another with a seamless pedestrian network that provides access to building entrances and adjacent civic spaces. The proposal includes the convenience store as well as a future building. The site plan details a walkway connecting the convenience store to the Highway 26 sidewalk; however, there is no proposed walkway connecting the convenience store to the future building. This connection could be accomplished by connecting the future building to the Highway 26 sidewalk as stated in Section (A)(8), above.

~~37-41.~~ Section 17.90.120(B)(1) requires that buildings be articulated, varied and provide visual interest. The subject property abuts Highway 26, Orient Drive, and Crescent Road. All four elevations of the proposed convenience store building will be visible from a public street. Proposed building articulations include gabled and shed roof elements covering entrances and faux window elements.

~~38-42.~~ Section 17.90.120(B.1.a) requires that all elevations visible from an abutting public street or pedestrian walkway shall be divided into distinct planes of not more than 40 lineal feet. All four elevations exceed 40 lineal feet and, therefore, require a variation in the wall plane that includes a recessing or projecting section that projects or recedes at least six inches from the adjacent plan for a length of at least four feet. The submitted elevations (Exhibit E, Sheets A220-222) detail a projection/recession along the east, west, and south elevations, and a shed roof pedestrian shelter overhang feature along the north elevation in compliance with this section.

~~39-43.~~ Section 17.90.120 (B.1.a.2) requires wall planes to incorporate at least one visually contrasting and complementary change in materials or texture or patterns. All four elevations contain a mix of siding materials including stone veneer, horizontal lap siding, and vertical board and batten siding in conformance with this section.

~~40-44.~~ Section 17.90.120(B)(2) requires that buildings incorporate pedestrian shelters over primary building entrances and all pedestrian areas (i.e. sidewalks, and civic spaces) abutting the subject building. Features such as canopies, arcades, awning, roof overhangs, covered porches, alcoves, and/or porticoes are required to protect pedestrians from the rain and sun. Pedestrian shelters shall extend at least five feet over the pedestrian area. The primary entrance for the proposed convenience store building is located on the west elevation and has a covered entry way that extends five feet five inches (5'5"). The plan set details an additional 5 foot deep pedestrian shelter over the secondary entryway along Highway 26 as well as a 5 foot deep pedestrian shelter over the service door on the south elevation. The plan set does not detail pedestrian shelters over the abutting walkways or proposed civic space. Staff did not catch this during the initial staff review; however, since this appeal is being heard de novo, staff recommends correcting this oversight and correctly applying the code standard. Staff recommends the Planning Commission require the applicant to update the plan set to detail 5 foot deep minimum pedestrian shelters over the walkways

**abutting the proposed convenience store building on the south, west, and north elevations as well as over the civic space.**

- ~~44.45.~~ Section 17.90.120(B.3.a) requires all buildings on the same site be architecturally unified. There is one building proposed for the subject property as well as the fueling pump structure; both will contain “Sandy Style” elements such as gabled roofs, heavy timber framing, and a stone base. **At the time of future development, the future building shall be designed to meet the Sandy Style requirements and shall be architecturally unified with the other building and structure on the site.**
- ~~42.46.~~ Section 17.90.120(B.3.b) requires that at least 36 inches of a buildings base contains stone on the sides of the building visible from the public street. The proposed building has a three foot - eight inch (3’8”) stone base on all four elevations. The north, east, and west elevations contain sections with additional stone that extends up to the roof fascia. The proposed stone base is Mountain Lodge - Russet by Eldorado Stone, which is a cultured fieldstone similar to stone used on other approved Sandy Style buildings. The stone base is proposed on the supporting columns of the fuel pump structure as well.
- ~~43.47.~~ Section 17.90.120(B.3.d) specifies approved building materials and states that siding shall consist of wood, composite-wood (e.g., concrete fiberboard, panels, or shingles), stone, brick, split-faced or rusticated concrete block, concrete form liner, or a combination of these materials. The proposed siding for the convenience store includes a mix of composite-wood, board and batten, and stone. The pump area structure also includes matching stone on the supporting columns and vertical board and batten under the gabled roofs on each elevation.
- ~~44.48.~~ Section 17.90.120(B.3.d.1) states that where wood siding is used, it shall consist of horizontal (e.g., lap, v-groove, or tongue-and-groove) siding, vertical (board and batten) siding, shingles, or combinations thereof. Vertical grooved (i.e., T1-11) sheet siding and similar materials are prohibited. The proposed vertical wood siding is Mountain Cedar board and batten by LP Smartside. The convenience store building also includes horizontal lap siding.
- ~~45.49.~~ Section 17.90.120(B.3.d.2) states that where board and batten siding is used, battens shall be a minimum of 2-inches wide by 1-inch deep and spaced 24 inches apart or closer; rough-sawn boards (specialty panel) are preferred over panels having a resin overlay. Per the submitted narrative (Exhibit B), the proposed vertical board and batten siding has battens that are 3-inches wide and spaced 12 inches apart in compliance with this standard.
- ~~46.50.~~ Section 17.90.120(B.3.d.3) states that where masonry siding is used, it shall consist of brick, stone, or rusticated concrete block, and must incorporate decorative patterns over not less than 15 percent of every elevation where it is used. Examples of decorative patterns include multi-toned masonry units, such as brick, stone, or cast stone, in layered or geometric patterns or split-faced concrete block to simulate rusticated stone-type construction. Changes in pattern should be used to accentuate breaks in building stories, corners, windows, structural bays, and building tops (e.g., parapets where flat roofs are allowed). The proposal includes Mountain Ledge – Russet stone veneer by Eldorado Stone on both the convenience store building and the pump station.



~~47~~51. Section 17.90.120(B.3.e) requires building elevations facing a public street to incorporate at least three (3) of the features from the list in Section 17.90.120(B.3.e). The north, east, and south elevations of the proposed convenience store building face public streets. The north, south, and east elevations incorporate heavy timbers, a metal canopy, a gabled roof, and a stone base.

~~48~~52. Section 17.90.120(B.3.f) specifies that materials required on elevations visible from an abutting public street must turn the building corner and incorporate appropriate transitions onto elevations not requiring these materials for a distance of not less than four (4) feet. A stone base is proposed along the entirety of all four elevations.

~~49~~53. Section 17.90.120(B.4) requires exterior building colors to include warm earth tones that conform to the Color Palette in Chapter 17.90, Appendix C. The submitted building elevations and Color Schedule (Exhibit E, Sheets A-220 and A-221) detail the vertical board and batten as “Mountain Cedar” and the horizontal lap siding as “Jewett White” with a “Nankeen” trim. Both Jewett White and Nankeen conform to the Color Palette in Appendix C. Mountain Cedar is not on the color palette. **The applicant shall either submit additional information demonstrating that Mountain Cedar is a wood stain or update the Color Schedule with an approved color for the vertical board and batten.**

~~50~~54. Section 17.90.120(C.1) requires that primary roof forms on buildings with a span of 50-feet or less contain a minimum roof pitch of 6:12. The proposed building span is less than 50 feet so the building is required to be constructed with a pitched roof; however, the applicant is requesting an exception to the pitched roof requirement, which is discussed in Section 17.90.120(C.8). All sloped roof forms are designed with a 6:12 pitch.

~~51~~55. Section 17.90.120(C.3) states that, when practicable, buildings shall be oriented so the gable end of the roof faces the abutting street. Each elevation includes at least one gabled roof feature.

~~52~~56. Section 17.90.120(C.5) states that visible roof materials must be wood shingle or architectural grade composition shingle, slate, or concrete tile. The proposed roof is a “Dark Brown” metal roof by Metallion Industries. Dark Brown is on the City of Sandy approved metal roof color palette.

~~53~~57. Section 17.90.120(C.6) states that all roof and wall-mounted mechanical, electrical, communications, and service equipment, including satellite dishes and vent pipes, shall be screened from view from all adjacent public rights-of-way and civic spaces by parapets, walls or by other approved means. The submitted elevations (Exhibit E, Sheets A-220 and A-221) do not show any rooftop equipment. The applicant did not submit line of sight analysis for the rooftop equipment. **The applicant shall submit line of sight analysis for the rooftop equipment prior to submitting building permits. All proposed rooftop equipment shall be screened from view from all adjacent public rights-of-way and civic spaces.**

~~54~~58. Section 17.90.120(C.8) contains standards for exceptions to pitched roofs. Based on the internal function of the building, the reviewing body may allow an alternative roof form. The proposed convenience store building includes a kitchen and a walk-in cooler, which require a rooftop condensing unit and a rooftop grease vent; thus, an alternative roof form may be allowed. Section 17.90.120(C.8.a.1) requires the applied pitch roof on a building with a span of less than 50 feet to extend at least 50 percent of the distance from the eave to the ridge as if it had been constructed as a pitched roof. The proposed convenience store building has a span of 49 feet 11 inches. Per the submitted narrative (Exhibit B) the applied pitch roof extends 6 feet from the eave, which is at least 50 percent of the distance from the eave to the ridge if it had been constructed as a pitched roof. The submitted roof plan (Exhibit E, Sheet A-161) details 23 feet 6 3/16-inches as half the distance of the roof, and details the roof pitch length at 12 feet 2 inches, which is greater than half the distance.

~~55~~59. Section 17.90.120(D) contains standards related to building orientation and entrances. Section 17.90.120(D.1) states that buildings shall be oriented to a public street or civic space and that at least 50 percent of the subject site's street frontage is comprised of building(s). The proposed convenience store building contains frontage on Highway 26 and Orient Drive. The building is proposed at 49.23 feet in length (including the entry vestibule on the west elevation) and the Highway 26 frontage of the subject property is 517 feet. Thus, the building comprises 9.5 percent of the site's frontage, which is ~~much~~ significantly less than the requirement of 50 percent of the site's frontage. The applicant is proposing an additional future building footprint as part of the proposal; however, the applicant is not proposing to construct this building at this time nor did the applicant provide staff with an estimated timeframe for construction. The future building is proposed to be 165 feet in length. The proposed convenience store and future building are 214.23 feet total, which is 41.4 percent of the Highway 26 frontage. The applicant is requesting a Type II Adjustment to Section 17.90.120(D.1) to allow the buildings to comprise less than 50 percent of the site's Highway 26 frontage. The requested building frontage adjustment will be discussed further in Chapter 17.66 of this document.

~~56~~60. Section 17.90.120(D.1) also states that buildings shall be located within 20 feet of a sidewalk, walkway, or civic space. The convenience store is proposed to be located 20 feet from the proposed sidewalk along Highway 26. The future building is proposed to be located 24 feet from the proposed sidewalk along Highway 26. The applicant is requesting a Type II Adjustment to Section 17.90.120(D.1) to allow the proposed future building to be located greater than 20 feet from the adjacent sidewalk. The requested building setback adjustment will be discussed further in Chapter 17.66 of this document.

~~57~~61. Section 17.90.120(D.2) states that where parking is placed between a front façade and a street, a landscaped berm and/or architectural features, such as a knee wall, colonnade, arbor, trellis and/or similar device, shall be placed behind the sidewalk to partially screen the parking area from the sidewalk. The partial screen shall be designed to achieve at least 50 percent opacity at the time of installation, with openings for walkways connecting to the building's primary entrance. The proposal does not include parking between the building and the Highway 26 frontage. The applicant is proposing two landscape berms between the parking located to the north of the building and Orient Drive. Each berm is proposed to contain one tree (a Cherokee Brave dogwood) and a mix of groundcover and shrubs (red flowering currant and Massachusetts



manzanita). The easternmost berm is also proposed to contain rhododendron ‘Nova Zembla’ and coastal strawberry.

~~58-62.~~ Section 17.90.120(D.3) states that ground floor spaces shall face a public street or civic space and shall be connected to it by a direct pedestrian route (i.e., avoid out-of-direction travel). The proposal includes a pedestrian walkway connecting the Highway 26 sidewalk to the proposed convenience store. **The applicant shall update the plan set to detail a six foot wide walkway connecting a front door on the south side of the future building to the Highway 26 sidewalk.**

~~59-63.~~ Section 17.90.120(D.4) states that buildings located at the intersection of two streets shall use a corner building entrance, or provide an entrance within 40 feet of the corner. The proposed convenience store building is located at the intersection of Highway 26 and Orient Drive. The applicant is proposing a primary entrance on the south elevation within 40 feet of the southeast corner of the building. **The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours; the primary entrance on the south elevation shall not be a faux entrance.**

~~60-64.~~ Section 17.90.120(D.5) states that for structures greater than 40,000 gross square feet, there shall be at least two (2) clearly articulated public entrances on the structure; at least one such entrance shall be visible from a public street and connected to that street by a pedestrian sidewalk or walkway. The proposed building is less than 40,000 square feet and the proposal includes a pedestrian walkway connecting the Highway 26 sidewalk to the proposed entries on the south and west elevations.

~~61-65.~~ Section 17.90.120(D.7) states that buildings shall provide at least one (1) elevation where the pedestrian environment is “activated.” An elevation is “activated” when it meets the window transparency requirements in subsection 17.90.120(E), below, and contains a public entrance with a pedestrian shelter extending at least five (5) feet over an adjacent sidewalk, walkway or civic space. Per the narrative (Exhibit B), the “activated” frontage is the west elevation facing the fueling station. The proposed design for the west elevation includes multiple ground level windows as well as a two tiered window/front entrance under the gabled entry with 5 foot overhang. The west elevation is adjacent to a proposed walkway. An analysis of the window requirement is in Section 17.90.120(E) of this document.

~~62-66.~~ Section 17.90.120(D.8) states that primary entrances must be architecturally emphasized, visible from the public right-of-way, and sheltered with a canopy, overhang, or portico with a depth of at least five (5) feet. Architectural emphasis should be provided by a gabled shelter where practical, consistent with the Sandy Style. Detailing around the base of the building, such as stonework, benches or art, should also be used to emphasize an entrance. The proposed entrance on the south elevation and will include a gable roofed entry featuring heavy timbers. The proposal also includes stonework along the entirety of the building.

~~63-67.~~ 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. All four elevations include windows so that all sides of the building relate to one another in compliance with this section. The north, south, and east elevations primarily contain spandrel window treatments while the west elevation

primarily contains active windows. The applicant's narrative (Exhibit B) identifies the west elevation as the "activated" elevation and states that the west elevation is 1090 square feet with 362 square feet of clear vision windows and doors resulting in 32.2 percent of the elevation. This complies with the 30 percent minimum window coverage standard for buildings up to 10,000 square feet.

68. Section 17.90.120(E.4) prohibits darkly tinted windows, mirrored windows, and similar windows adjacent to street sidewalks, civic spaces, and walkways. The applicant is proposing active windows on the west elevation, facing the fuel station; however, the applicant is proposing primarily spandrel windows on the north, south, and east elevations. The north and south elevations are adjacent to walkways, the south and east elevations are adjacent to street sidewalks, and the civic space is located at the northeast corner of the building. As a condition of approval for File No. 19-012 DR/ADJ/TREE, staff required the applicant ~~shall to~~ update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance. The windows into the janitor's closet and women's restroom may remain spandrel windows. Staff also required the applicant ~~shall to~~ update the north and/or east elevations of the proposed convenience store to detail at least one active window in the storage and/or kitchen area in order to provide at least one active window adjacent to the north walkway or civic space. The applicant's narrative (Exhibit Z) indicates that the applicant's architect is developing additional information to address these two conditions. Regarding staff's condition for at least one active window on the east or north façade, the applicant's appeal narrative states:

*"In general, the furnishing requirements and internal function of the convenience store is not conducive to providing clear glass for entire windows except on the West elevation. It is because of these limitations only the upper portion of these windows contain clear glass. The applicant is not opposed to approval of a Special Variance to this requirement if it is deemed necessary."*

With regards to staff's requirement that the windows adjacent to the primary entrance on the south elevation be active windows, the applicant's appeal narrative states:

*"In general, the layout and design of the interior of the convenience store is not conducive to providing clear glass along the entire south elevation. As noted above, the building design was changed to include a second primary entrance on the South elevation. This elevation is about 80 feet from the North westbound travel lane of Highway 26 which has a speed limit of 45 mph, increasing to 55 mph just past the site. The applicant believes the functionality of providing clear glass windows is marginal. As shown on the building elevations this elevations contains five windows segments and a service door east of the entrance. All of these openings feature clear glass at the top. The applicant is not opposed to approval of a Special Variance to this requirement if it is deemed necessary."*

The applicant submitted a supplemental appeal narrative (Exhibit DD) that requests that the condition be re-written to clarify that the window's into the janitor's closet and restrooms do not have to be active. The supplemental appeal narrative further states:

“...the three windows along this elevation to the right of the entrance door will be blocked by three 2-door coolers...Unless the Planning Commission prefers these clear glass windows allow the backs of these coolers to be viewed, the applicant does not believe [sic] there is any other option to what is proposed. The applicant doesn’t believe it is reasonable to require the relocation or removal of these coolers to accommodate clear glass windows.”

Staff understands that providing glass windows may result in a reconfiguration of the interior space. If the interior space is insufficient to accommodate the various coolers and other equipment the convenience store requires, the applicant has the option of reconfiguring the interior layout, reducing the number of pieces of equipment, or expanding the building to accommodate the desired equipment.

The supplemental appeal narrative also states that the project architect is recommending spandrel glass in a light gray color with a blue hue to provide a contrasting color between the glass and the bronze anodized aluminum frames. A light gray spandrel glass would be in compliance with Section 17.90.120(E.4.a), which prohibits darkly tinted windows.

In order to meet Sections 17.90.120(E.2.a), 17.90.120(I.1), and 17.90.120(I.2), staff recommends the Planning Commission require the applicant to provide active windows as recommended by staff. Staff recommends the Planning Commission refine the condition related to the south elevation windows to read: “The applicant shall update the south elevation of the proposed convenience store to detail the three window panes directly to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance; the windows into the janitor’s closet and women’s restroom may remain spandrel windows.” Staff recommends the Planning Commission require all spandrel windows to be light gray. Should the Planning Commission determine that it does not want to require active windows on the south and/or north or east elevations, staff recommends the Planning Commission formally approve three (3) Special Variances to Sections 17.90.120(E.2.a), 17.90.120(I.1), and 17.90.120(I.2), condition that the applicant submit payment of a Special Variance review fee for each of the three special variances, and condition that the applicant use light gray spandrel windows in compliance with Section 17.90.120(E.4.a).

69. The intent of Section 17.90.120(F) is to promote business vitality, public safety and aesthetics through effective landscaping and streetscape design, 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. Section 17.90.120(F.2) states that parcels abutting Highway 26 shall provide a landscape buffer comprising not less than 30 percent of the highway frontage, to a depth of not less than 20 feet. Section 17.90.120(F.3) contains a list of species approved for the landscape buffer. Based on the proposed Landscape Plan (Exhibit D, Sheet L-101), the applicant is proposing to re-plant a portion of the Highway 26 frontage with a mix of vegetation from the list in Section 17.90.120(F.3) including incense cedar, dogwood, pacific wax myrtle, serviceberry, red flowering currant, rhododendron, manzanita, and coastal strawberry. The subject property abuts Highway 26 and, therefore, is required to provide a

landscape buffer comprising not less than 30 percent of the highway frontage to a depth of not less than 20 feet. There is an existing Green Corridor Agreement with Clackamas County that protects existing trees along the Highway 26 side of the site that extends along the entire property. The applicant is proposing to retain existing trees in a 172 foot section along Highway 26 (33 percent of the Highway 26 frontage) to meet the 30 percent landscape buffer requirement. All trees within the remaining 67 percent of the green corridor are proposed to be removed. Because the future building is not proposed to be built at this time or at any time in the foreseeable future, staff required the applicant ~~shall to~~ extend the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go and shall retain trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115) as a condition of approval in File No. 19-012 DR/ADJ/TREE. This condition was tied to approval of the applicant's request for two separate adjustments. Trees 110 through 115 are in good or fair condition and can be retained per the applicant's arborist. This will help achieve the goals of the Green Corridor Agreement by maintaining existing vegetation and trees. This will also help the proposal meet the intent of the Sandy Style to "protect and enhance Sandy's tree canopy, particularly along the Highway 26 Landscape Management Corridor" (Section 17.90.00(C.2)). In addition, protecting additional trees within the Green Corridor along Highway 26 will result in the proposal having a lesser degree of "excessive tree removal and/or grading that may harm existing vegetation within a designated landscape conservation area," which is identified as an element incompatible with the Sandy Style (Section 17.90.00(D.1)). Retaining additional trees will also help demonstrate that the applicant is preserving trees to the greatest extent practicable and integrating trees into the design of the development, as encouraged by Section 17.92.10(C). ~~Based on the proposed Landscape Plan (Exhibit D, Sheet L-101), the applicant is proposing to re-plant a portion of the Highway 26 frontage with a mix of vegetation from the list in Section 17.90.120(F.3) including incense cedar, dogwood, pacific wax myrtle, serviceberry, red flowering currant, rhododendron, manzanita, and coastal strawberry.~~ The applicant's appeal narrative (Exhibit Z) states:

*"The applicant is opposed to retaining additional trees along the Highway 26 frontage. Section 17.90.120(F) requires, 'Parcels abutting Highway 26 shall provide a landscape buffer comprising not less than 30 percent of the highway frontage, to a depth of not less than 20 feet. Within the buffer existing trees shall be preserved to the extent practicable.' The proposal includes retention of 13 existing trees within an area comprising about 33% of this site's highway frontage in compliance with this standard. In addition, as shown on the Landscape Plan, the applicant proposes planting the remainder of this frontage to contain a mixture of trees, shrubs, and groundcover species, including several evergreen and deciduous trees, as required. Findings #66 and #111 cite the Green Corridor Agreement with Clackamas County as justification for requiring retention of additional trees in this area. As noted above, Staff is incorrectly applying the Green Corridor Agreement to the subject property as it is applicable only to properties outside the city's Urban Reserve."*

The Green Corridor is only one of many considerations that led to staff's recommendation to extend the Highway 26 Landscape Management Corridor. Technically, the subject property was included in the "Highway 26 Corridor" definition in the 2011 Green Corridor agreement,

as the subject property was not in City limits at that time and the agreement has not been updated since. At this time the property is not in the Green Corridor area specified in the agreement, but staff still finds the proposal does not meet the Development Code. Staff's primary reasoning for extending the Highway 26 Landscape Management Corridor is to best meet the intent of the City's adopted Design Standards. The intent of the Design Standards (Section 17.90.00) explicitly states: "In implementing these standards, the reviewing body shall refer to the following objectives in evaluating Design Review requests," thus staff is including the text from Section 17.90.00 in this finding as written below:

**"17.90.00 INTENT**

Chapter 17.90 is intended to implement the following design standards. In addition to these standards, several appendices are included to aid in the implementation of these standards. Applicable appendices are referenced in this chapter and kept on file by the Planning Director at City Hall. In implementing these standards, the reviewing body shall refer to the following objectives in evaluating Design Review requests:

- A. Protect and enhance the city's quality of life and community image.
- B. Encourage functional, safe, and aesthetically pleasing development, while maintaining compatibility with the surrounding built and natural environment.
- C. Implement the *Sandy Style*, as described by this chapter. The Sandy Style is based on the following guiding principles:
  - 1. Celebrate Sandy as the Gateway to Mount Hood through contextually appropriate landscaping and building designs.
  - 2. Protect and enhance Sandy's tree canopy, particularly along the Highway 26 Landscape Management Corridor.
  - 3. Emphasize a "village" scale and character in new development. Village scale means development is compact and walkable, building entrances are oriented to the street sidewalk or a plaza, and large building masses are broken down through a combination of design elements such as articulation, combinations of complementary building materials and detailing.
  - 4. Express elements of or reflect Cascadian architecture by adapting appropriate elements of *English Arts and Crafts Style (1900-1920)* and *Oregon Rustic Style (1915-1940)*, and/or similar elements, into new buildings and exterior remodels, *except* in locations where this code allows or requires a different architectural style (e.g., *C-1 Historic Roadside Commercial District*).
  - 5. Encourage green building practices in new construction, such as the use of renewable energy (e.g., solar and wind), use of recycled materials, integration of water quality facilities in landscapes, capture of rainwater for irrigation, and similar practices.

D. The city considers the following elements to be incompatible with the Sandy Style. The reviewing body may deny, or require modifications to, a project with any of the following:

1. Excessive tree removal and/or grading that may harm existing vegetation within a designated landscape conservation area.
2. Commercial development where buildings are setback from the street behind surface parking lots.
3. Excessive surface parking lot paving and redundant driveways.
4. Drive-up facilities adjacent to a street that interrupt pedestrian circulation patterns or create potential safety hazards.
5. Disjointed parking areas, confusing or unsafe circulation patterns.
6. Box-like structures with large, blank, unarticulated wall surfaces.
7. Building materials or colors that do not conform to this code.
8. Highly reflective surfaces or heavily tinted glass storefronts.
9. Strongly thematic architectural styles, forms, colors, materials, and/or detailing, that do not conform to the Sandy Style, including some forms of franchise architectural styles associated with some chain commercial establishments.
- ~~10.~~ Inadequate landscape buffers adjacent to parking lots, walkways and streets.
11. Visible outdoor storage, loading, and equipment areas.”

Section 17.90.00(A) requires the reviewing body to consider the City’s objective to “Protect and enhance the city’s quality of life and community image.” Section 17.90.00(B) requires the reviewing body to consider the City’s objective to “Encourage functional, safe, and aesthetically pleasing development, while maintaining compatibility with the surrounding built and natural environment.” Section 17.90.00(C) requires the reviewing body to consider the City’s objective to “Implement the Sandy Style” based on five guiding principles, including “Protect and enhance Sandy’s tree canopy, particularly along the highway 26 Landscape Management Corridor.” Section 17.90.00(D) requires the reviewing body to consider the City’s objections to consider elements incompatible with the Sandy Style and allows the reviewing body to deny, or require modifications to, a project that contains any of the nine listed elements, which include “Excessive tree removal and/or grading that may harm existing vegetation within a designated landscape conservation area.” Section 17.90.120(F.2) contains the design standards related to provision of a landscape buffer along Highway 26 and sets the buffer minimum as “comprising not less than 30 percent of the highway frontage, to a depth of not less than 20 feet.” This is the bare minimum identified by the code. The applicant’s proposal for just the fuel station and convenience store does not meet the building orientation and frontage requirements of the Development Code (Section



17.90.120(D)); therefore, the applicant is proposing a future building. The future building, which will not be constructed as part of this proposal, does more to meet the code's frontage requirements than the proposal itself. The site will remain out of compliance with the code until the future building is constructed. Because the applicant has given no indication that they plan to construct the future building at any point in the foreseeable future, staff is recommending that the applicant be required to better meet the intent of the Sandy Style Design Standards by retaining additional trees located adjacent to where the future building would be constructed. Staff recommends the Planning Commission decide if they are comfortable approving a proposal that only meets the code based on a future building that is not planned to be constructed as part of the current application or in the foreseeable future. Staff recommends the Planning Commission consider the following options:

- Deny the applicant's proposal, which relies heavily on a fictitious future building to meet the building frontage requirement of the code. In addition, the applicant's proposal does not adequately implement the Sandy Style due to excessive tree removal and not protecting and enhancing Sandy's tree canopy, particularly along the Highway 26 Landscape Management Corridor.
- Require the applicant to construct the future building as part of this application. If the Planning Commission chooses this option, the applicant shall also construct a third southbound lane on Orient Drive as conditioned by ODOT.
- Approve the applicant's proposal with the conditions outlined in the final order for File No. 19-012 DR/ADJ/TREE as well as the conditions outlined in this document. Should the Planning Commission decide to approve the applicant's proposal, staff recommends the Planning Commission require the applicant to retain the six (6) additional trees and extend the Highway 26 landscape buffer as conditioned by staff in the final order for File No. 19-012 DR/ADJ/TREE. Without retaining additional trees and extending the landscape corridor along Highway 26 to bring the project in better compliance with the Sandy Style, staff does not recommend the Planning Commission support the applicant's proposal, which includes a fictitious building, nor does staff recommend the Planning Commission support the applicant's request for approval of a Type II adjustment to reduce the required building frontage.

~~64.70.~~ Section 17.90.120(G) contains standards for civic spaces within developments. The intent of civic space is to connect buildings to the public realm and create comfortable and attractive gathering places and outdoor seating areas for customers and the public. The code requires 3 percent of the building area be developed as civic space and in no instance have an area less than 64 square feet. The proposed building is 3,069 square feet and the proposed pump structure is 4,320 square feet for a total of 7,389 square feet. Therefore, the required civic space is 222 square feet. The submitted Site Plan (Exhibit D, Sheet 3) details a circular plaza area to the northeast of the proposed convenience store. The circular civic space is 22 feet in diameter, which is 380 square feet in compliance with the code. The narrative (Exhibit B) indicates that the civic space will include pedestrian scale lighting and seating, at a

minimum. **The applicant shall include at least two public benches and one public art element or similar pedestrian amenity reviewed and approved by staff.**

~~65~~**71.** Section 17.90.120(H) contains standards regarding lighting. Section 17.90.120(H.3) specifies that walkways and parking lots should be illuminated at 1.5 – 2.0 foot candles. The submitted Site Lighting Photometric Analysis (Exhibit D, Sheet E1.0) details parking lot and vehicle maneuvering area illumination at 0.6 to 15.6 foot candles and walkway illumination at 0.2 to 10.2 foot candles. The primary lighting concerns relate to up lighting and trespass onto adjacent properties as analyzed further in Chapter 15.30 of this document. The applicant is not proposing any pedestrian scaled lighting along the walkways; however, the narrative (Exhibit B) states that the civic space will contain pedestrian scale lighting. **If the applicant proposes pedestrian scale lighting as stated in the narrative, the applicant shall submit a lighting cut sheet for the proposed pedestrian scale lighting for staff review and approval; the applicant shall update the Photometric Analysis to include the proposed pedestrian scale lighting in the civic space.** Section 17.90.120(H.2) states that exterior lighting must be an integral part of the architectural design and must complement ornamental street lighting and remain in context with the overall architectural character of the district. The applicant is proposing to outline the convenience store building and fuel pump area with red LED strip lighting, which is not an integral part of the architectural design nor consistent with the architectural character of the area nor in compliance with Section 17.90.00 (D)(9). As a condition of approval of File No. 19-012 DR/ADJ/TREE, staff required ~~the applicant shall to~~ update the elevations to remove the proposed LED striping. The applicant is requesting the Planning Commission allow the LED lighting. In addition to determining if the LED lighting is considered thematic architecture, and thereby incompatible with the Sandy Style, staff recommends the Planning Commission determine if the proposed LED striping is an integral part of the architectural design, if it complements ornamental street lighting, and if it's in context with the overall architectural character of the district. Lighting is discussed further in Chapter 15.30 (Dark Sky Ordinance) of this document.

~~66~~**72.** Section 17.90.120(I) contains standards to promote natural surveillance of public spaces. Section 17.90.120(I.1) requires windows to be located in a manner that enables tenants, employees, and police to watch over pedestrian, parking, and loading areas. The proposed parking is located adjacent to the north and west elevations and the proposed walkways are located on the north, west, and south elevations. The west elevation contains clear windows, which will allow for surveillance of the pedestrian walkway and parking to the west of the building. The north, south, and east elevations contain spandrel windows. The applicant's narrative (Exhibit B) cites the significant interior wall displays and security risks associated with windows as reasons they are not proposing functional (i.e. real) windows. Due to the use of faux windows, the building will have limited surveillance of the parking areas and pedestrian walkways. Thus, as a condition of approval for File No. 19-012 DR/ADJ/TREE staff required ~~the applicant shall to~~ update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows to allow surveillance of the interior activity from the public right-of-way. The lower section of the windows into the janitor's closet and women's restroom may remain spandrel windows, as proposed. Staff also required ~~the applicant shall to~~ update the north and/or east elevations of the proposed convenience store to detail at least one active window in the storage and/or



kitchen area in order to provide increased visibility to the north walkway and/or civic space. The applicant is requesting that the Planning Commission not require additional active windows to what the applicant proposed. As previously discussed, staff recommends the Planning Commission require the applicant to provide active windows as recommended by staff and in compliance with the Sandy Development Code Sections 17.90.120(E.2.a), 17.90.120(I.1), and 17.90.120(I.2). Staff recommends the Planning Commission refine the condition related to the south elevation windows to read: The applicant shall update the south elevation of the proposed convenience store to detail the three window panes directly to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance; the windows into the janitor's closet and women's restroom may remain spandrel windows. Staff recommends the Planning Commission require all spandrel windows to be light gray. Should the Planning Commission determine that it does not want to require active windows on the south and/or north or east elevations, staff recommends the Planning Commission formally approve three (3) Special Variances to Sections 17.90.120(E.2.a), 17.90.120(I.1), and 17.90.120(I.2), condition that the applicant submit payment of a Special Variance review fee for each of the three special variances, and condition that the applicant use light gray spandrel windows in compliance with Section 17.90.120(E.4.a). In addition, if the Planning Commission determines it does not want to require active windows on the north or east elevations, staff recommends the Planning Commission also consider if they want to require the applicant to move the civic space and/or parking located along the north side of the convenience store as there would not be any active windows nearby.

~~67~~73. Section 17.90.120(I.2) states that in commercial, public, and semipublic development, including civic spaces, windows should be located in a manner that enables surveillance of interior activity from the public right-of-way. The proposed civic space is located to the northeast of the convenience store and the public right-of-way is adjacent to the south and east facades. The proposed windows along the north, south, and east facades are spandrel windows. As a condition of approval for File No. 19-012 DR/ADJ/TREE, staff required t~~he~~ applicant ~~shall to~~ update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows to allow surveillance of the interior activity from the public right-of-way. The lower section of the windows into the janitor's closet and women's restroom may remain spandrel windows, as proposed. The applicant is requesting that the Planning Commission not require additional active windows to what the applicant proposed. As previously discussed, staff recommends the Planning Commission require the applicant to provide active windows as recommended by staff and in compliance with the Sandy Development Code Sections 17.90.120(E.2.a), 17.90.120(I.1), and 17.90.120(I.2). Staff recommends the Planning Commission refine the condition related to the south elevation windows to read: The applicant shall update the south elevation of the proposed convenience store to detail the three window panes directly to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance; the windows into the janitor's closet and women's restroom may remain spandrel windows. Staff recommends the Planning Commission require all spandrel windows to be light gray. Should the Planning Commission determine that it does not want to require active windows on the south and/or north or east elevations, staff recommends the Planning

**Commission formally approve three (3) Special Variances to Sections 17.90.120(E.2.a), 17.90.120(I.1), and 17.90.120(I.2) and condition that the applicant submit payment of the Special Variance review fee for each of the three Sections. In addition, if the Planning Commission determines it does not want to require active windows on the north or east elevations, staff recommends the Planning Commission also consider if they want to require the applicant to move the civic space and/or parking located along the north side of the convenience store as there would not be any active windows nearby.**

~~68~~**74.** Section 17.90.120(I.3) contains standards to provide street address numbers. **The applicant shall provide street address numbers measuring a minimum of six (6) inches high, which clearly locates the convenience store building and its entries for patrons and emergency services. The applicant shall verify the location(s) of the address with the Building Official and emergency service providers.**

~~69~~**75.** Section 17.90.120(I.4) states that on-site lighting should be located, oriented, and selected to facilitate surveillance of on-site activities from the public right-of-way and other public areas. On-site lighting is evaluated in Chapter 15.30 of this document. Lighting has been designed to adequately illuminate parking areas and building entrances.

~~70~~**76.** The intent of Section 17.90.120(J) is to promote land use compatibility and aesthetics, particularly where development abuts public spaces. Section 17.90.120(J.1) states that exterior storage of merchandise and/or materials, except as specifically authorized as a permitted accessory use, is prohibited. The applicant is not proposing outdoor storage or display areas. The applicant is proposing a dumpster area, which will be screened. On September 9, 2019, staff visited four Space Age gas stations. Two of the Space Age locations had a large shipping crate located in the parking lot area of the facility. **The applicant shall not place an external storage unit(s) on the property.**

~~71~~**77.** Section 17.90.120(J.3) states that 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. Garbage storage areas are addressed in staff's response to Section 17.90.120(J.4), below. The submitted narrative (Exhibit B) states that the majority of mechanical equipment will be mounted on the roof and will be hidden within a roof well (i.e. screened by the applied pitch roof). The submitted building elevations (Exhibit E) do not detail the proposed locations of rooftop mechanical equipment. The applicant did not submit line of sight analysis for the rooftop equipment. **The applicant shall submit line of sight analysis for the rooftop equipment prior to submitting building permits. All mechanical, electrical, and communications equipment shall be screened from view from all public rights-of-way and civic spaces.**

~~72~~**78.** Section 17.90.120(J)(4) contains standards for trash collection and recycling areas. The applicant proposes a dumpster area to the northwest of the fueling area, which will be screened. The submitted trash enclosure elevations (Exhibit E, Sheet A-521) detail an 8-inch reinforced CMU enclosure with a chain link gate with privacy slats. The detail specifies the enclosure will be stone masonry veneer to match the building veneer. **The trash enclosure**

**shall be constructed of materials as identified in the plan set.** On the September 9, 2019 site visits, staff noticed some trash accumulation at a couple of the Space Age facilities. **The site shall be maintained and kept free of litter. All litter shall be collected and transported for offsite disposal as part of weekly service trips.**

~~73-79.~~ Section 17.90.120(J.5) contains standards for exceptions to the provisions in Section 17.90.120(J). No exceptions to the external storage requirements are being requested.

#### 17.92 – Landscaping

~~80.~~ Section 17.92.10 contains general provisions for landscaping. Per Section 17.92.10(C), trees over 25-inches circumference measured at a height of 4-½ 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 4-½ feet above grade has roughly an eight-inch diameter at breast height (DBH). The submitted arborist report (Exhibit I) inventoried 138 trees, including multiple trees in the adjacent right-of-way as well as on the neighboring property to the west, across the Crescent Road right-of-way. Per the report, all of the trees on the property will be removed, with the exception of trees #76-88. The applicant is also proposing to remove trees in the rights-of-way on Highway 26, Orient Drive, and Crescent Road. Section 17.92.10(C) states that trees to be retained shall be protected from damage during construction by a construction fence located 5 feet outside the dripline. Trees and tree protection fencing will be discussed in more detail in Chapter 17.102 of this document.

~~74-81.~~ Per Section 17.92.10(B), appropriate care and maintenance of landscaping on-site and landscaping in the adjacent public right-of-way is the right and responsibility of the property owner, unless City ordinances specify otherwise for general public and safety reasons. **If street trees or other plant materials do not survive or are removed, materials shall be replaced in kind within 6 months.**

~~75-82.~~ 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.

~~76-83.~~ Section 17.92.20 contains minimum landscaping area requirements. The subject property is zoned General Commercial, C-2. Section 17.92.20 requires that the General Commercial (C-2) zoning district requires a minimum of 20 percent of the site be landscaped. The submitted Landscape Plan (Exhibit D, Sheet L-101) details 63,329 square feet of proposed landscaped area, which is 62.6 percent of the total site area (101,208 square feet), which exceeds the landscaping requirement for the site. However, the 63,329 square feet includes the area where the future building and parking are proposed. **The applicant shall provide an updated landscaped area calculation based on the full proposal for the site, including the proposed future building and associated parking area.** However, because the proposed future building is not planned to be constructed at this time, **the applicant shall plant the area where the future building and future parking will be located according to the approved Landscape Plan.**

~~77-84.~~ Section 17.92.30 requires trees to be planted in parking lots with more than four parking spaces, and along public street frontages. The submitted Landscape Plan (Exhibit D, Sheet L-

101) does not detail street trees along the frontages of Crescent Road, Highway 26, and parts of Orient Drive. The Highway 26 frontage is 517 feet, which requires 10 large street trees or 17 medium street trees. As a condition of approval for File No. 19-012 DR/ADJ/TREE, staff required ~~the applicant shall to~~ update the Landscape Plan to detail 10 large street trees or 17 medium street trees along the Highway 26 frontage of the site. The applicant's appeal narrative (Exhibit Z) states that the applicant is not necessarily opposed to this condition, but wants to make sure required street trees can also be counted as mitigation trees required by ODOT. Based on email correspondence between the applicant, staff, and ODOT (Exhibit CC), both ODOT and City staff are amenable to allowing the required street trees to also be counted as required mitigation trees for trees removed from the ODOT right-of-way. The email also indicated that it is unclear whether Trees # 124, 126 and 127 are in the ODOT right-of-way or not and, therefore, whether or not their proposed removal would need to be mitigated. Based on the Tree Retention Plan (Exhibit D, Sheet 2), it appears Tree #125 may also be in the Highway 26 ODOT right-of-way. Trees # 124, 125, 126, and 127 are all Douglas firs (*Pseudotsuga menziesii*). With regards to mitigation tree type, ODOT's landscape architect states that the corridor currently has native trees and a forested feel and recommends planting larger trees considering the context and space; staff concurs with this recommendation. Staff recommends the Planning Commission require the applicant to update the Landscape Plan to detail 10 large street trees or 17 medium street trees along the Highway 26 frontage of the site. **If it is determined that Trees # 124, 125, 126, and/or 127 are in the ODOT right-of-way and need to be mitigated, staff recommends the Planning Commission allow the street trees on Highway 26 to also count as ODOT mitigation trees for Trees 124, 125, 126, and/or 127 (or any other trees identified as being in the ODOT right-of-way on Highway 26), provided the street tree species is similar to the species of tree(s) removed (i.e. large, native, evergreen species). The applicant shall submit details on the proposed street tree species and locations for staff review and approval. The applicant shall obtain a permit from ODOT to place trees within the highway right-of-way. The applicant shall also update the Landscape Plan to detail street trees along Crescent Road and along the southeastern portion of Orient Drive. The email correspondence between the applicant, ODOT, and City staff (Exhibit CC) also indicates that there are five (5) Douglas fir trees being proposed for removal from ODOT's Orient Drive right-of-way that will need to be mitigated for (Trees # 1, 4, 5, 6, and 7). Thus, staff recommends the Planning Commission allow the street trees on the ODOT right-of-way portion of Orient Drive to also count as ODOT mitigation trees for Trees # 1, 4, 5, 6, and 7, provided the street tree species is similar to the species of tree(s) removed (i.e. large, native, evergreen species). All street trees shall be a minimum of 1.5-inches in caliper measured 6 inches above the ground if deciduous and 6 feet in height if conifers and shall be planted per the City of Sandy standard planting detail. Trees and the planter strip shall be installed per the approved landscape plan. Tree ties shall be loosely tied twine or other soft, elastic material and shall be removed after one growing season (or a maximum of 1 year). The applicant is proposing to grade large portions of the site, including the right-of-way, which will result in compacted soils. In order to better protect newly planted trees, the applicant shall amend and aerate the soil in any areas where the soil has been compacted in a 15 foot radius around each tree to be planted and to a depth of 24 inches prior to planting trees in the right-of-way; in locations where there is a constructed planter strip (i.e. Crescent Road and Orient Drive), the applicant shall aerate the soil within the planter strip 15 feet in both directions from**

where the tree will be planted. The applicant shall call for an inspection with the City after aerating the soil and before planting the trees. As a condition of approval for File No. 19-012 DR/ADJ/TREE, staff required ~~In addition,~~ the applicant ~~shall to~~ obtain a letter of credit in the amount of \$500 per tree to cover replacement and establishment of the right-of-way trees should a right-of-way tree die within 3 years. The applicant's appeal narrative (Exhibit Z) states the applicant is opposed to this condition due to the cost it requires. Regardless of whether or not a letter of credit is obtained, the owner of the subject property is responsible for maintaining all landscaping on the property and the adjacent right-of-way, including street trees, and ensuring plant materials survive, as conditioned by Sections 17.92.10(B) and 17.92.10(L). Thus, staff believes the conditions associated with Sections 17.92.10(B) and 17.92.10(L) will be sufficient to ensure survival of all landscaping and street trees without collecting a letter of credit. Staff recommends the Planning Commission remove this condition.

~~78-85.~~ Section 17.92.40 requires that landscaping shall be irrigated. The submitted Landscape Plan (Exhibit D, Sheet L-101) states all landscaping shall be irrigated with an automatic system to sustain viable plant life.

~~79-86.~~ Section 17.92.50 requires that plant materials meet a particular size. Shrubs and bushes shall be a minimum of one gallon in size or two feet in height when planted. Evergreen trees shall be at least five feet in height and deciduous trees at least 1.5 inches in caliper when planted. The Landscape Plan (Exhibit D, Sheet L-101) identifies the following deciduous trees at 1.5-inch caliper:

- 6 *Cladrastis kentukea*
- 5 *Cornus florida* 'Cherokee Brave'
- 15 *Cornus kousa* 'KN 30-8' PP 16309

The Landscape Plan also identifies five (5) evergreen *Calocedrus decurrens* at 5 feet in height. The Landscape Plan identifies all shrubs at least one gallon in size.

~~80-87.~~ Section 17.92.50(B) encourages the use of native plant materials or plants acclimatized to the Pacific Northwest where possible. A majority of the proposed plants included in the landscape plan are native to this region.

~~81-88.~~ Section 17.92.60 requires revegetation of areas where natural vegetation has been removed or damaged in areas that are not proposed to be occupied by structures or other improvements. **The applicant shall revegetate all areas where natural vegetation has been removed or damaged in areas that are not proposed to be occupied by structures or other improvements. This includes the area where the future building and parking are proposed.**

~~82-89.~~ Section 17.92.90 contains standards for screening. Screening is used where unsightly views or visual conflicts must be obscured or blocked and where privacy and security are desired. The applicant is proposing two planted berms in the northeast portion of the site, which will help screen the parking area located north of the proposed convenience store building. The applicant is also proposing a mix of small trees, shrubs, and groundcover along Highway 26 adjacent to the proposed parking and fueling area.

~~83.90.~~ Section 17.92.130 contains standards for a performance bond. The applicant has the option to defer the installation of street trees and/or landscaping for weather-related reasons. Staff recommends the applicant utilize this option rather than install trees and landscaping during the dry summer months. **If the applicant chooses to postpone street tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the landscaping, assuring installation within 6 months. The cost of street trees shall be based on the street tree plan and at least \$500 per tree. The cost of landscaping shall be based on the average of three estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a three-year maintenance and warranty period.**

#### 17.94 – Drive-Up Uses

~~84.91.~~ Section 17.94.00 contains the intent of the drive-up uses provisions, which is to ensure safe, functional drive-up uses while not impeding flow of traffic.

~~85.92.~~ Section 17.94.20 contains minimum requirements for drive-up uses. Section 17.94.20(A) states that parking maneuvers shall not occur in the stacking area and that the stacking area shall not interfere with safe and efficient access to other parking areas on the site. The proposed stacking area appears to conflict with three or four of the five proposed westernmost parking spaces. However, staff does not think that all eight gas pump aisles will typically be at full stacking capacity. Moreover, even without four of those spaces, the proposed development would still have 13 available parking spaces, which meets the minimum requirement. Therefore, staff does not think it is necessary to remove or relocate the westernmost parking area.

~~86.93.~~ Section 17.94.20(B) states that drive-up aisles must be located a minimum of fifty feet from residential zones to avoid adverse impacts. The adjacent properties to the north and west are outside City limits and are currently zoned residential (RRFF-5). The proposed fueling station is located more than 50 feet from the property to the north or west.

~~87.94.~~ Section 17.94.30 contains minimum stacking distances. Section 17.94.30(D.1) states that each lane of an automotive fueling station shall provide a minimum capacity for 4 vehicles. The submitted Site Plan (Exhibit D, Sheet 3) details 8 lanes, each of which can stack 4 vehicles.

#### 17.98 – Parking

~~88.95.~~ Section 17.98.20 contains off-street parking requirements for different uses. The proposed uses are ‘Convenience Store’ and ‘Fuel Sales’ in the off-street parking requirement table. The proposed convenience store building is 3,069 square feet, which would require 8 parking spaces (3,069 divided by 400), plus 1 parking space per 2 employees. The supplemental narrative (Exhibit C) indicates that the Space Age will have 9 employees for the largest shift, or five parking spaces. Thus, the total parking requirement is 13 parking spaces. The applicant is proposing 17 parking spaces. Per Section 17.98.10(Q), the maximum parking allowed for commercial zoned properties shall not be permitted to exceed the minimum off-street vehicle parking required by Section 17.98.20 by more than 30 percent. Thus, the maximum parking spaces allowed is 17 parking spaces (13 x 1.3).



~~89-96.~~ The proposal also includes a future building and 20 future parking spaces. The future building is detailed at 7,425 square feet; neither the specific use nor the number of employees on the largest shift are known at this time. **Vehicular and bicycle parking requirements associated with the future building shall be analyzed at the time of development of the future building.**

~~90-97.~~ Based on the required 13 parking spaces, two (2) bicycle parking spaces are required. The submitted Site Plan (Exhibit D, Sheet C4) details 2 bicycle parking spaces along the west side of the proposed convenience store building.

~~91-98.~~ Section 17.98.50 contains parking setback requirements. The proposed parking area is located to the north and west of the proposed convenience store building. The proposed parking spaces are set back greater than 20 feet from the Highway 26 and Orient Drive rights-of-way in adherence with the code requirement.

~~92-99.~~ Section 17.98.60 includes standards on parking lot design, size, and access. Section 17.98.60(A) requires parking lots to be constructed with a durable hard surface such as concrete or asphalt. Per the submitted supplemental narrative (Exhibit C) all parking and maneuvering areas will be surfaced with asphalt.

~~93-100.~~ Section 17.98.60(B) contains standards for the size of parking spaces. The plan set (Exhibit D) identifies 37 parking spaces, including the 20 future parking spaces. All of the parking spaces are standard parking spaces at 9 feet by 18 feet, with the exception of one (1) ADA parking space with a passenger side aisle. All proposed parking spaces comply with these dimensional standards. The ADA space is located to the west of the proposed convenience store. There is no proposed ADA space detailed in the future parking area that's associated with the future building. **Signage associated with the ADA parking spaces shall meet the head clearance distance requirement in the Building Code.**

~~94-101.~~ Section 17.98.60(C) contains standards on parking lot aisle width. All parking aisles are proposed to meet or exceed the minimum aisle width standards for one-way and two-way parking aisles. Parking aisles are detailed between 25 feet and 55 feet wide (the 55 foot wide aisle to the west of the fueling pumps includes a stacking area for two vehicles).

~~95-102.~~ Section 17.98.80 contains provisions for access to arterial and collector streets. Primary access to the site is proposed via a driveway from Crescent Road. An additional secondary right-in, right-out driveway is proposed from Orient Drive. The applicant submitted a letter from Clackamas County (Exhibit L) approving the proposed second access on Orient Drive.

~~96-103.~~ Section 17.98.100 contains standards for driveways. The proposed development will gain access from a proposed 28-foot wide driveway on Crescent Road. The proposal also includes a secondary right-in, right-out driveway on Orient Drive. The Site Plan (Exhibit D, Sheet 3) details the Orient Drive driveway with a 68-foot apron and a 40-foot throat. The supplemental narrative (Exhibit C) states that the wide driveway is to facilitate maneuvering by fueling trucks exiting the site onto Orient Drive and that turning templates for large delivery and fueling trucks are in the traffic study. The Traffic Impact Study (Exhibit H) includes 3 truck turning templates, including a truck turning template for a large truck with a

67 foot wheel base (WB-67). The truck turning templates are difficult to read, do not include a legend, and are based on an outdated site plan (i.e. not the site plan the applicant is proposing with this application). The turning templates do not include any turning movements associated with the proposed Orient Drive driveway, but rather focus on a truck entering the subject property from Crescent Road, turning-around on site, and exiting back onto Crescent Road. The TIS did not include a turning template that shows the need for a 68 foot wide driveway with a 40 foot throat. Presumably, the 68 foot wide driveway would make it easier to accommodate large semi-trailer trucks; however, this configuration results in an extended pedestrian crossing distance and potential higher speeds for motorists exiting the site, both of which pose a hazard to pedestrians crossing the driveway. **The applicant shall do one of the following:**

- **Update the plan set to detail the driveway on Orient Drive at a maximum of 40 feet wide, including throat and apron.** This will improve pedestrian safety at the driveway crossing and will also help discourage vehicles heading west on Orient Drive from slipping into the extra-wide driveway against traffic; or,
- **Provide an updated truck turning template based on the submitted site plan layout that demonstrates the need for the requested 68 foot driveway with 40 foot approach. The updated truck turning template shall be reviewed and approved by the City's traffic engineer. The updated turning template shall be legible and shall include a legend.**

~~97~~104. Section 17.98.120 contains landscaping and screening provisions. Section 17.98.120(A) requires screening of parking areas containing 4 or more spaces. The proposed parking spaces are located north and west of the proposed convenience store building. A landscaped berm is proposed between the Orient Drive right-of-way and the parking located north of the building. A landscape buffer is proposed between the parking located west of the building and the Highway 26 right-of-way.

~~98~~105. 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% opaque when viewed horizontally from between 2 and 8 feet above the average ground level. The properties to the north and west of the subject property are outside city limits and currently zoned residential (RRFF-5). The Landscape Plan (Exhibit D, Sheet L-101) details a mix of trees and shrubs between the parking and vehicle maneuvering areas and the adjacent street/property.

~~99~~106. Section 17.98.120(C) requires parking facilities to include at least 10 percent landscaping. The proposal features two (2) landscaped berms and several landscape planter bays. The applicant did not submit a landscaping analysis for the parking area. **The applicant shall submit additional information regarding landscaping in the parking area to ensure that the 10 percent minimum landscaping is met.**

~~100~~107. Section 17.98.120(D) restricts parking bays to no more than 20 spaces and requires landscape planters at the ends of each parking bay. The proposal contains planter bays at the ends of each parking bay that are at least five feet in width. The proposed future parking associated with the future building contains 20 parking stalls; the parking bays associated with the fueling station contain six or fewer stalls.



~~101~~108. Section 17.98.120(E) states that parking area setbacks shall be landscaped with major trees, shrubs, and ground cover. The submitted Landscape Plan (Exhibit D, Sheet L-101) details a landscaped buffer between the parking area and both Highway 26 and Orient Drive. The landscaped buffer is proposed to contain a mix of plant materials including trees, shrubs, and groundcover.

~~102~~109. Section 17.98.120(F) requires wheel stops or other methods to protect landscaped areas. The plan set details wheel stops in the parking areas directly north and west of the convenience store. The Landscape Plan (Exhibit D, Sheet L-101) details curb in the westernmost parking row, which is proposed to be adjacent to a walkway once the future building is built; however, will be adjacent to landscaping until the future building is built. **The applicant shall update the plan set to detail wheel stops in the westernmost parking row to protect landscaping and future walkways.**

~~103~~110. 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, as discussed in Chapter 17.84 above.**

~~104~~111. 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 below.

~~105~~112. Section 17.98.160 details requirements related to the provision of bicycle parking. The submitted Site Plan (Exhibit D, Sheet 3) details 2 bicycle parking spaces located between the proposed convenience store building and the adjacent walkway to the west.

~~106~~113. Section 17.98.190 contains minimum standards for off-street loading facilities for commercial and industrial developments. The submitted supplemental narrative (Exhibit C) states that a separate designated loading area is not needed. Staff agrees with the assessment.

#### 17.102 – Urban Forestry

~~107~~114. Section 17.102.20 contains information on the applicability of Urban Forestry regulations. The subject property contains 2.5 acres and therefore compliance with this chapter is required.

~~108~~115. Section 17.102.50 requires the retention of at least three trees 11 inches DBH or greater to be retained for every one acre of contiguous ownership. The subject property is 2.5 acres and, therefore, requires retention of at least eight (8) trees 11-inches or greater DBH and in good health. The submitted arborist report (Exhibit I) and Tree Retention Plan (Exhibit D, Sheet 2) detail removal of 105 trees (including approximately 29 trees from the adjacent rights-of-way) and retention of 12 trees that are in good condition and are 11-inches DBH or greater, plus one tree in fair condition. Because the future building is not proposed to be constructed at this time, staff required the applicant ~~shall to~~ extend the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go and shall retain trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115) as a

condition of approval for File No. 19-012 DR/ADJ/TREE. This will result in retention of an additional five (5) trees in good condition and one (1) tree in fair condition and will help achieve the goals of the Green Corridor Agreement by maintaining existing vegetation and trees along Highway 26 as well as the intent of Section 17.92.10(C) to preserve significant trees to the greatest extent practicable. In addition, retention of the six (6) additional trees will better meet the Sandy Style objective to “protect and enhance Sandy’s tree canopy, particularly along the Highway 26 Landscape Management Corridor” and will reduce excessive tree removal, which is identified as incompatible with the Sandy Style (Sections 17.90.00(C.2) and 17.90.00(D.1)). Tree # 115 is the tree closest to the proposed improvement area of the project. Tree # 115 is a 16-inch DBH Douglas fir. The proposed improvement area is located approximately 24 feet from Tree #115; thus, a 16 foot critical root protection zone for Tree #115 should not interfere with the proposed improvements. The applicant’s appeal narrative (Exhibit Z) cites two primary reasons they do not want to retain additional trees along Highway 26: 1) additional tree retention will restrict the visibility of the primary functions on the site (fueling station and convenience store) and, 2) retaining these trees with the City recommended tree protection zone may require construction of a wall and add additional construction costs to an already costly project. Staff recommends the Planning Commission do one of the following:

**1) Deny the applicant’s proposal as submitted and deny the adjustment request to reduce the required building frontage percent,**

**2) Require the applicant to construct the future building as part of the current application in order to come into conformance with the Development Code and require the applicant to construct the second new southbound lane on Orient Drive per ODOT’s comments, or**

**3) Approve the applicant’s building frontage adjustment request, allow the applicant to postpone construction of the future building, and require the applicant to retain the six (6) additional trees located adjacent to where the future building would go as conditioned by staff.**

As a condition of approval for File No. 19-012 DR/ADJ/TREE, staff required ~~the~~ the applicant ~~shall to~~ update the plan set to detail the Highway 26 sidewalk as far away from the trunks of the retained trees as possible without intruding on ODOT’s clear zone; the applicant shall work with ODOT and the City of Sandy Planning Division staff to determine an appropriate location for the relocated sidewalk. Staff also required ~~the~~ the applicant ~~shall to~~ retain an arborist on-site for any construction activity within the critical root zone of 1 foot per 1 inch DBH or 5 feet beyond the dripline of the retained trees, as required by Section 17.92.10(C). The applicant submitted a Tree Protection Addendum (Exhibit AA) prepared by the applicant’s hired arborist as one of the appeal submittals. With regards to the sidewalk location, the Tree Protection Addendum states “We also adjusted the sidewalk location as far from the trees as possible while minimizing grading. Note that the proposed sidewalk location is at the top of a bank where it can be constructed using a modified pavement profile to minimize root disturbance. If the sidewalk were shifted further south, it would require more root/soil disturbance and grading to construct it on a steep slope.” Attachment 1 of the Tree Protection Addendum details the applicant’s arborist’s recommendation of where to

install tree protection fencing and where to install the sidewalk. Attachment 1 details that the tree protection fencing should be placed at the edge of the root protection zone, which is labeled as the overall root zone at 1 foot per 1 inch of DBH. Staff noticed that the arborist is calling the 1 foot per 1 inch DBH protection area the “overall root zone” but also identifying an inner protection zone at 0.5 feet per 1 inch DBH and calling that the “critical root zone.” The arborist report and the staff recommendation recommend locating the tree fencing in the same location (i.e. 1 foot per 1 inch DBH); the confusion is that the arborist report calls this the “overall root zone” whereas staff is referring to the same area as the “critical root zone” since that is how the ISA, PNW ISA, and Arbor Day foundation define critical root zone. Staff recommends the Planning Commission approve the Highway 26 sidewalk location proposed by the applicant’s arborist, provided that:

- 1) The tree protection fencing is installed prior to any development activities and removed only after completion of all construction activity, as required by Section 17.102.50(B),
- 2) Either the applicant’s arborist or the third party arborist is on-site for any construction activity within the tree protection zone of 1 foot per 1 inch DBH identified on Attachment 1 of the Tree Protection Addendum, and
- 3) The plan set is updated to reflect the tree protection fencing location at 1 foot per 1 inch DBH as identified in Attachment 1 of the Tree Protection Addendum with the following modification: the tree protection fencing shall adhere to the standard critical root zone of 1 foot per 1 inch DBH in the area where the future building is proposed to be constructed rather than follow the building footprint of the future building since the building is not actually proposed to be constructed with this application or at any time in the near future.

The Tree Protection Addendum acknowledges the third part arborist’s recommendation to allow no more than 25 percent disturbance within the critical root zone of 1 foot per 1 inch DBH and includes a table demonstrating that no more than 25 percent of any trees critical root zone of 1 foot per 1 inch DBH will be impacted. As recommended by both the applicant’s arborist and the third party arborist, staff recommends the Planning Commission require that no more than 25 percent of each tree’s critical root zone of 1 foot per 1 inch DBH shall be impacted by development activity, including, but not limited to, grading, stockpiling of soil or materials, impacts from heavy machinery, excavation, compaction, paving, storage of equipment or materials, or other similar activities. Staff recommends that the Planning Commission require the arborist who is on-site during construction activity within the tree protection zone of 1 foot per 1 inch DBH be required to submit a post-construction summary report certifying that the work occurred, that the work did not impact more than 25 percent of each tree’s critical root zone of 1 foot per 1 inch DBH, and that the work did not significantly impact the health or structural stability of the preserved trees.

~~109.116.~~ The applicant is proposing to remove several mature trees within the ODOT and Clackamas County rights-of-way. ODOT submitted comments (Exhibit T) stating that **the applicant shall replace the trees that are removed at a 2 to 1 ratio. The trees shall be located 36 feet from the edge of the travel lane. The applicant shall coordinate with the**

**City of Sandy Planning Division and Magnus Bernhardt (ODOT Landscape Architect at (503) 731-8283) to discuss type of tree species and location.** Clackamas County did not submit comments regarding mitigation of trees removed from the Clackamas County right-of-way so staff is unsure what the County's requirements are. **The applicant shall work with Clackamas County to determine if the County will require replacement trees for trees removed from the Clackamas County right-of-way.**

~~10~~117. Section 17.102.50(B) contains standards for the tree protection area and states that trees identified for retention shall be protected by protective fencing placed no less than 10 horizontal feet from the outside edge of the trunk. The arborist report ([Exhibit I](#)) proposes tree protection fencing at 0.5 feet per inch of DBH and states this is a typical critical root zone. However, the International Society of Arboriculture, Pacific Northwest Chapter of the International Society of Arboriculture, and Arbor Day Foundation all cite the typical critical root zone at 1 foot per 1 inch DBH. Section 17.102.50(A) states that retention trees shall be likely to grow to maturity, meaning the impacts of the development can't harm the tree in a way that makes it not capable of growing to maturity. Moreover, Section 17.92.10(C) states that retained trees shall be protected from damage during construction by a construction fence located 5 feet outside the dripline. The applicant's submitted Tree Retention Plan (Exhibit D, Sheet 2) appears to detail tree protection fencing at 0.5 feet per inch DBH; however, the plan set submitted for the completeness check detailed a wider tree protection area, presumably at 5 feet beyond the dripline in compliance with Section 17.90.10(C). In addition, Attachment 2 of the arborist report details a proposed tree protection area approximately twice as wide as that shown on the applicant's Tree Retention Plan. Due to the inconsistencies between the submitted plan sets as well as the inconsistency between what the applicant's arborist stated as a typical critical root zone and what the leading arboricultural organizations state as a typical critical root zone, staff requested an additional review of the proposed tree retention plan by a third-party arborist. The third-party arborist report (Exhibit W) confirms that the industry standard for the critical root zone is 1 foot per 1 inch DBH. The report further recommends that tree protective fencing be installed consistent with the one foot per inch diameter formula and that the fencing be a minimum of 6-foot high chain link fence with a sign that clearly marks the area as a "Tree Root Protection Zone." As a condition of approval of File No. 1-012 DR/ADJ/TREE, staff required ~~the~~ the applicant ~~shall~~ to install tree fencing at the standard critical root zone of one foot per one inch DBH, or 5 feet beyond the dripline of the retained trees per Section 17.92.10(C). Staff also required that ~~the~~ the tree protection fencing ~~shall~~ be 6 foot high chain link or no-jump horse fencing and ~~shall~~ have a sign that clearly marks the area as a Tree Root Protection Zone. Staff also required ~~the~~ the applicant ~~shall to~~ follow all recommendations of the third-party arborist report with respect to air spading, root pruning, and any work within the critical root zone. The applicant's appeal narrative (Exhibit Z) states that the applicant's primary concern is that the condition doesn't acknowledge approval of a modified root protection zone proposed by the project arborist. As discussed above, staff believes much of this confusion comes from the terms used by staff versus the project arborist. The project arborist defines the area that is 1 foot per 1 inch DBH as the overall root zone and an area that is 0.5 feet per 1 inch DBH as the critical root zone; staff uses the ISA, PNW-ISA, and Arbor Day Foundation definition of critical root zone, which is defined as 1 foot per 1 inch DBH. Either way, staff's recommendation, the project arborist's recommendation, and the third-party arborist's recommendation is to install the tree protection fencing at 1 foot per 1 inch DBH. Staff

recommends the Planning Commission require the applicant to install tree protection fencing at 1 foot per 1 inch DBH. Staff recommends the Planning Commission require the tree protection fencing to be 6 foot high chain link or no-jump horse fencing and have a sign that clearly marks the area as a Tree Root Protection Zone. Staff recommends the Planning Commission require the applicant to follow all recommendations of the third-party arborist report with respect to air spading, root pruning, and any work within the critical/overall root zone (defined as 1 foot per 1 inch DBH).

~~118.~~ 118. To ensure protection of the required retention trees, staff required the applicant ~~shall to~~ record a tree protection covenant specifying protection of the 12 retention trees and Trees # 110-115 and limiting removal without submittal of an Arborist's Report and City approval as a condition of approval of File No. 19-012 DR/ADJ/TREE. Staff required ~~this~~ document ~~shall to~~ include a sketch identifying the retention trees and Trees # 110-115 and the critical root zone around the retention trees and Trees # 110-115 detailed at 1 foot per 1 inch DBH. The applicant's appeal narrative (Exhibit Z) states that the applicant requests this condition be modified to eliminate the requirement to protect Trees # 110-115 and that the root protection zone be modified as detailed by Attachment 1 of the Tree Protection Addendum (Exhibit CC). As previously discussed, the applicant is not proposing to construct the future building at this time. Staff does not believe the applicant has any intention of constructing the future building in the near future as this would most likely require extending the sewer line to the property, which would be costly. As previously stated, staff recommends the Planning Commission do one of the following:

1) Deny the applicant's proposal as submitted and deny the adjustment request to reduce the required building frontage percent,

2) Require the applicant to construct the future building as part of the current application in order to come into conformance with the Development Code and require the applicant to construct the second new southbound lane on Orient Drive per ODOT's comments, or

3) Approve the applicant's building frontage adjustment request, allow the applicant to postpone construction of the future building, and require the applicant to retain the six (6) additional trees located adjacent to where the future building would go as conditioned by staff. If the Planning Commission chooses option 3, staff recommends the Planning Commission require the applicant to record a tree protection covenant specifying protection of the 12 retention trees and Trees # 110-115 and limiting removal without submittal of an Arborist's Report and City approval. Staff recommends the Planning Commission require this document to include a sketch identifying the retention trees and Trees # 110-115 and the critical root zone around the retention trees and Trees # 110-115 detailed at 1 foot per 1 inch DBH.

#### 15.30 – Dark Sky Ordinance

~~119.~~ 119. Chapter 15.30 regulates outdoor lighting in order to reduce or prevent light pollution. The applicant submitted a Lighting Photometric Analysis (Exhibit D, Sheet E1.0) detailing the location of proposed lighting and projected foot candles. Section 15.30.60(D)

requires all lighting systems to be designed so that the area 10 feet beyond the property line receives no more than 0.25 (one quarter) of a foot-candle of light. The submitted photometric analysis indicates that light trespass 10 feet beyond the subject property lines does not exceed the 0.25 foot-candle limit.

Section 17.90.120(H.3) specifies that walkways and parking lots should be illuminated at 1.5 to 2.0 foot candles. The submitted Lighting Photometric Analysis (Exhibit D, Sheet E1.0) details parking lot and vehicle maneuvering area illumination at 0.6 to 15.6 foot candles and walkway illumination at 0.2 to 10.2 foot candles. This is not within the 1.5-2.0 foot candle range; however, the primary lighting concerns are up lighting and trespass onto adjacent properties so the proposed on-site foot candles are fine.

The applicant is proposing 12 exterior wall sconces on the convenience store, three (3) type II medium pole mount flood lights, one (1) type III medium pole mount flood light with backlight shield, two (2) type II medium pole mount flood lights with backlight shield, six (6) LED surface mount super saver canopy lights in the fuel island, and four (4) LED surface mount very low watt canopy lights in the fuel island. The Dark Sky ordinance requires that all new lighting be full-cutoff and downward facing. Section 15.30.020 (E) is outdated and prefers low-pressure sodium lights. Staff is amenable to allowing LED lighting. The submitted lighting cut-sheets (Exhibit G) indicate that multiple proposed lights are 4,000 or 5,000 Kelvins. Based on recommendations from the Audubon Society of Portland, the American Medical Association, and the International Dark-Sky Association the lighting should not exceed 3,000 Kelvins. Based on recommendations from the Illuminating Engineering Society (IES) of North America, staff requires all proposed lighting be full-cutoff and not exceed 4,125 Kelvins. As a condition of approval for File No. 19-012 DR/ADJ/TREE, staff required t~~The applicant shall to~~ submit updated lighting fixture cut-sheets for all proposed exterior lighting that detail the lighting fixtures as full-cutoff and not exceeding 4,125 Kelvins in order to minimize negative impacts on wildlife and human health. Staff based this requirement on IES RP 33-14 (13.0), which states that color temperatures in the 2,100 Kelvin to 3,500 Kelvin should be considered, and that higher temperatures at 4,000 Kelvins to 5,000 Kelvins may also be considered in some circumstances. It goes on to state that in all cases, consideration should be given to environmental concerns to minimize the adverse effects of electronic light. Section 13.1.1 of IES RP 33-14 states that light systems shall be less than 4,125 Kelvins (at or below full moon equivalents). Section 15.30.060 requires illumination levels to be in accordance with recommended practices of the IES and that the recommended standards of the IES shall not be exceeded. Section 15.30.070 identifies lighting that presents a clear hazard to motorists, cyclists, or pedestrians as non-permitted lighting. Staff recommends the Planning Commission consider the documented negative impacts of blue-lighting, the recommendations from the various agencies, and the City's Dark Sky Ordinance and determine whether to require lighting to not exceed 4,125 Kelvins as recommended by Illuminating Engineering Society or to not exceed 3,000 Kelvins as recommended by the American Medical Association, the Audubon Society of Portland, and the International Dark-Sky Association. Should the applicant prefer, the applicant may submit an updated lighting plan detailing low-pressure sodium lights in compliance with Chapter 15.30. Staff is supportive of using LED lighting instead of low-pressure sodium lighting as



preferred by the existing Dark Sky Ordinance but would like the LED lighting to minimize the adverse effects of electronic light as preferred by the IES.

#### 17.66 – Adjustments and Variances

~~113.120.~~ 120. Adjustments are a means to vary the development standards normally applied in a particular district. This option exists for those circumstances where uniform, unvarying rules would prevent a more efficient use of a lot. The applicant requested the following two (2) Type II adjustments:

- Adjustment to Section 17.90.120(D.1) to allow less than 50 percent of the street frontage as building.
- Adjustment to Section 17.90.120(D.1) to place a building required to meet the 50 percent frontage requirement more than 20 feet from the property line.

#### ~~114.121.~~ BUILDING FRONTAGE ADJUSTMENT

Section 17.90.120(D.1) requires buildings to be oriented to a public street or civic space such that at least 50 percent of the site’s street frontage is comprised of building(s) placed within 20 feet of a sidewalk, walkway or civic space and not more than 20 percent of the off-street parking is located between a building’s front façade and the adjacent street.

Request: The applicant requests a Type II adjustment to Section 17.90.120(D.1) to not meet the 50 percent building frontage requirement. The proposed building frontage along Highway 26 is 40 percent of the lot frontage and consists of the proposed convenience store building, which will be constructed as part of this application, as well as a future building footprint, which would be constructed at a later date. The applicant is also requesting a second adjustment to this section to allow the future building to be located further than 20 feet from the sidewalk, which will be discussed in Finding #118 below. The proposal does not include parking between the building and Highway 26.

Criteria A of Section 17.66.40 states “The proposed development will not be contrary to the purposes of this chapter, policies of the Comprehensive Plan, and any other applicable policies and standards adopted by the City.” The Comprehensive Plan states that the General Commercial (C-2) District is intended to provide for a wide range of commercial activities and uses that require direct automobile access. The intent of Section 17.90.120(D) is to maintain and enhance General Commercial and Industrial streetscapes as public spaces, emphasizing pedestrian-scale and character in new development consistent with the Sandy Style. The proposed development is consistent with the intent of the General Commercial zone by providing a commercial activity; however, the proposal relies heavily on a future building that is neither proposed to be constructed as part of this application nor anticipated to be constructed in the near future. The proposal also includes multiple sidewalks, which increase the pedestrian character of the area. In addition, ~~the staff’s recommended~~ requirement to preserve additional trees ~~in the Green Corridor~~ adjacent to the sidewalk on Highway 26 will contribute to a richer pedestrian experience. Staff believes Criteria A can be met if the applicant either constructs the proposed future building as part of this current application or retains additional trees along Highway 26.

Criteria B states “The proposed development will not substantially reduce the amount of

privacy enjoyed by users of nearby structures when compared to the same development located as specified by this Code.” The proposal to reduce the percent of building frontage from 50 to 40 percent will not reduce the amount of privacy enjoyed by users of nearby structures. There is one property adjacent to the site to the west that is currently outside City limits and used as a residence. The proposed landscape plan details a mix of vegetation to buffer between the subject property and the property to the west to lessen the impact of the proposed development to the residence.

Criteria C states “The proposed development will not adversely affect existing physical systems and natural systems, such as traffic, drainage, dramatic land forms, or parks.” With the recommended traffic modifications, the proposed development will not adversely affect traffic. All stormwater will be managed on site and will have to meet the Chapter 13.18 of the Sandy Municipal Code.

Criteria D states “Architectural features of the proposed development will be compatible to the design character of existing structures on adjoining properties and on the proposed development site.” The subject property is at the west edge of the City and is not located near other commercial uses. The proposed building ~~and fueling station~~s will be designed to be compatible with Sandy Style for the most part. The applicant is proposing to outline the convenience store building and fuel pump area with red LED strip lighting, which is not compatible with the design character of existing structures on adjoining properties and on the proposed development site. As a condition of approval of File No. 19-012 DR/ADJ/TREE, staff required the applicant to update the elevations to remove the proposed LED striping. The applicant is requesting the Planning Commission allow the LED lighting. In addition to determining if the LED lighting is considered thematic architecture, and thereby incompatible with the Sandy Style, if the proposed LED striping is an integral part of the architectural design, if it complements ornamental street lighting, and if it’s in context with the overall architectural character of the district, staff recommends the Planning Commission determine if the proposed LED lighting is compatible to the design character of existing structures on adjoining properties and on the proposed development site.

Staff believes that a combined building footprint that comprises 40 percent of the site’s street frontage is not contrary to the Comprehensive Plan or other City policies, does not reduce the amount of privacy enjoyed by users of nearby structures, will not adversely affect existing systems, and will be compatible to the design character of existing structures on adjoining properties. However, staff acknowledges that without the proposed future building, the applicant’s current proposal only comprises 9.5 percent of the site’s frontage, which is significantly less than the requirement of 50 percent of the site’s frontage. As a condition of approval for File No. 19-012 DR/ADJ/TREE, Staff approved a Type II Adjustment to allow the proposed convenience store building and future building to occupy 40 percent of the Highway 26 frontage instead of the required 50 percent. Staff required ~~the~~ the future building ~~shall to~~ be a minimum of 165 linear feet along the Highway 26 frontage of the site. Because the future building will not be constructed as part of this application, staff required the applicant ~~shall to~~ extend the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go and ~~shall to~~ retain trees located within the extended landscape buffer (Trees



#110, 111, 112, 113, 114, and 115). Staff required tThe applicant ~~shall to~~ update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows. Staff required tThe applicant ~~shall to~~ ensure that the primary entrance on the south elevation is unlocked and functional during business hours; the primary entrance on the south elevation shall not be a faux entrance. As previously stated, staff recommends the Planning Commission do one of the following:

1) Deny the applicant's proposal as submitted and deny the adjustment request to reduce the required building frontage percent,

2) Require the applicant to construct the future building as part of the current application in order to come into conformance with the Development Code and require the applicant to construct the second new southbound lane on Orient Drive per ODOT's comments, or

3) Approve the applicant's building frontage adjustment request, allow the applicant to postpone construction of the future building, and require the applicant to retain the six (6) additional trees located adjacent to where the future building would go as conditioned by staff. If the Planning Commission chooses option 3, staff recommends the Planning Commission require the following:

- The future building shall be a minimum of 165 linear feet along the Highway 26 frontage of the site,
- Because the future building will not be constructed as part of this application, the applicant shall extend the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go and shall retain trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115).
- The applicant shall update the south elevation of the proposed convenience store to detail the three window panes directly to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance; the windows into the janitor's closet and women's restroom may remain spandrel windows.
- The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours; the primary entrance on the south elevation shall not be a faux entrance.
- Determine if the applicant should be required to construct the third southbound traffic lane on Orient Drive as conditioned by ODOT as part of this approval.

#### ~~115.122.~~ BUILDING FRONTAGE SETBACK ADJUSTMENT

Section 17.90.120(D.1) requires buildings to be oriented to a public street or civic space such that at least 50 percent of the site's street frontage is comprised of building(s) placed within 20 feet of a sidewalk, walkway or civic space and not more than 20 percent of the off-street parking is located between a building's front façade and the adjacent street.

Request: The applicant requests a Type II adjustment to Section 17.90.120(D.1) to place the future building greater than 20 feet from the proposed Highway 26 sidewalk. The proposed convenience store building is 20 feet from the Highway 26 sidewalk, which meets the code requirement; however the proposed future building is located 24 feet from the sidewalk in order to better protect the retention trees. The applicant is also requesting a second adjustment to this section to allow the building frontage to be less than 50 percent, which is discussed in Finding #117 above. The proposal does not include parking between the building and Highway 26.

Staff finds that in order to adequately protect the proposed retention trees, the future building would need to be set back further than 24 feet. The submitted Tree Retention Plan (Exhibit D, Sheet 2) and arborist report (Exhibit I) detail the critical root zone around the retention trees at 0.5 feet per 1 inch DBH. However, the industry standard for an adequate critical root zone is 1 foot per 1 inch DBH; thus, the tree protection area will need to be expanded in order to adequately protect the proposed retention trees such that they will remain healthy and likely to grow to maturity. The third-party arborist report (Exhibit W) recommends that tree protective fencing be installed consistent with the one foot per inch diameter formula. The originally submitted Arborist Report (Exhibit I) and the Tree Protection Addendum submitted with the applicant's appeal (Exhibit CC) both show the tree protection fencing at 1 foot per 1 inch DBH. While the Tree Protection Addendum confirms that no more than 25 percent of the area within each tree's root protection zone of 1 foot per 1 inch DBH will be impacted, staff would like to reiterate that the applicant is not planning to construct the proposed future building at this time, nor is it anticipated that the applicant will construct the proposed future building at any point in the near future as this would most likely require extending the sewer line to the subject property. Therefore, staff would prefer to see the least amount of proposed impact within the root protection zone of 1 foot per 1 inch DBH as possible. Staff believes that setting the proposed future building back more than 24 feet would better protect the retention trees by minimizing construction activity within the 1 foot per 1 inch DBH root protection zone. Staff finds the future building footprint shall be relocated at a sufficient setback to not adversely affect the retention trees. This would require a Variance as the distance would be greater than a 20 percent increase from the 20 foot setback required by Section 17.90.120 (D.1). If staff processed the adjustment per the applicant's request staff would deny the adjustment as staff has no evidence the proposed location at 24 feet would ~~adequately~~ protect the retention trees as well as or better than if the building was placed outside of the critical root zone of 1 foot per 1 inch DBH. While staff acknowledges that up to 25 percent of the area within the 1 foot per 1 inch DBH root zone can be impacted, staff believes the best practice is to minimize negative impact to the roots within this area. Because this project is on an individual lot of record and because the recommendation to increase the setback is not of the applicant's making, this can be processed as a Type II Variance.

Criteria A of Section 17.66.70 states "The circumstances necessitating the variance are not of the applicant's making." The processing change from a Type II adjustment to a Type II variance is not of the applicant's making. The applicant's arborist submitted a recommended critical root zone that is half of the accepted arboricultural industry standard, although the arborist still recommends placing the tree protective fencing at 1 foot per 1 inch DBH. In order to better protect the required retention trees, the landscape management corridor, and

the Green Corridor, staff is requiring that the standard critical root zone be applied and that the preserved trees be protected as best as is practical given the proposed development.

Criteria B states “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.” The intent of Section 17.90.120(D) is to maintain and enhance General Commercial and Industrial streetscapes as public spaces, emphasizing pedestrian-scale and character in new development consistent with the Sandy Style. While setting the building back at a distance adequate to protect retention trees at 1 foot per 1 inch DBH instead of 20 feet will reduce the pedestrian feel of the development, it will also allow for better protection of trees located along Highway 26 in line with Comprehensive Plan policies 5.8, 5.16, and 5.17. Because the applicant is not proposing to construct the future building at this time, protection of the existing trees and planting new street trees along Highway 26 is critical to create a more pedestrian friendly environment and better achieve the goals of Chapter 17.90.

Criteria C states “Granting of the variance will not adversely affect implementation of the Comprehensive Plan.” The Comprehensive Plan states that the General Commercial (C-2) District is intended to provide for a wide range of commercial activities and uses that require direct automobile access. The proposed development is consistent with the intent of the General Commercial zone by providing a commercial activity.

Criteria D states “The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.” The proposal to increase the building setback from 20 to a distance adequate to protect retention trees at 1 foot per 1 inch DBH will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity. There is one property adjacent to the site to the west that is currently outside City limits and used as a residence. The proposed landscape plan details a mix of vegetation to buffer between the subject property and the property to the west to lessen the impact of the proposed development to the residence.

Criteria E states “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.” The proposed convenience store and gas station development is the same as would be permitted under the city code and standards.

Criteria F states “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 the Code), topography, or other circumstances over which the applicant has no control.” ~~There is an existing Green Corridor Agreement with Clackamas County that protects existing trees along the Highway 26 side of the site that extends along the entire property. At this time the property is not in the Green Corridor area specified in the agreement, but staff still finds the proposal does not meet the Development Code.~~ In order to better protect the trees, the future building would need to be set back further than what an adjustment would allow.

As part of the staff decision for File No. 19-102 DR/ADJ/TREE, S~~s~~ staff approved a Type II Variance to allow the proposed future building to be set back from the property line abutting

Highway 26 a distance adequate to protect retention trees at 1 foot per 1 inch DBH or 5 feet beyond dripline per Section 17.92.10(C). ~~The Staff required the~~ applicant ~~shall to~~ update the plan set to detail the proposed future building set back outside of the critical root zone (defined as 1 foot per 1 inch DBH, or 5 feet beyond the dripline) of the 12 trees proposed for retention as well as the six (6) additional trees that shall be retained (Trees # 110-115). **Staff recommends the Planning Commission do one of the following:**

- 1) **Deny the applicant's proposal as submitted and deny the adjustment request to increase the future building's setback to 24 feet.**
- 2) **Require the applicant to construct the future building as part of the current application in order to come into conformance with the Development Code and require the applicant to construct the second new southbound lane on Orient Drive per ODOT's comments, or**
- 3) **Deny the applicant's future building setback adjustment request but approve a variance to allow a greater setback that better protects the retention trees, allow the applicant to postpone construction of the future building, and require the applicant to retain the six (6) additional trees located adjacent to where the future building would go as conditioned by staff. If the Planning Commission chooses option 3, staff recommends the Planning Commission require the following: the applicant shall update the plan set to detail the proposed future building set back outside of the critical root zone (defined as 1 foot per 1 inch DBH, or 5 feet beyond the dripline) of the 12 trees proposed for retention as well as the six (6) additional trees that shall be retained (Trees # 110-115).**

Other Findings:

~~116.123.~~ Recent development at both Zion Meadows subdivision and the remodel of the Pioneer Building (former Sandy High School) have sparked unintended rodent issues in the 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 is needed.**

~~117.124.~~ **The applicant will be required to obtain a permit for any proposed signage.**

**STAFF RECOMMENDATIONS TO THE PLANNING COMMISSION**

**Staff recommends the Planning Commission decide if they are comfortable approving a proposal that only meets the code based on a future building that is not planned to be constructed as part of the current application or in the foreseeable future. Staff recommends the Planning Commission consider the following options:**

- 1) **Deny the applicant's proposal, which relies heavily on a fictitious future building to meet the building frontage requirement of the code. In addition, the applicant's proposal does not adequately implement the Sandy Style due to excessive tree removal and not protecting and enhancing Sandy's tree canopy, particularly along the Highway 26 Landscape Management Corridor. This option includes denying the adjustment request to reduce the required building frontage percent and denying the adjustment request to increase the future building's setback to 24 feet.**

- 2) Require the applicant to construct the future building as part of this application in order to come into conformance with the Development Code. If the Planning Commission chooses this option, the applicant shall also construct a second new southbound lane on Orient Drive as conditioned by ODOT.
- 3) Approve the applicant's proposal with the conditions outlined in the final order for File No. 19-012 DR/ADJ/TREE as well as the conditions outlined in this document. If the Planning Commission chooses this option, staff recommends the Planning Commission require the applicant to retain the six (6) additional trees and extend the Highway 26 landscape buffer as conditioned by staff in the final order for File No. 19-012 DR/ADJ/TREE. Without retaining additional trees and extending the landscape corridor along Highway 26 to bring the project in better compliance with the Sandy Style, staff does not recommend the Planning Commission support the applicant's proposal, which includes a fictitious building, nor does staff recommend the Planning Commission support the applicant's request for approval of a Type II adjustment to reduce the required building frontage. This option would include approving the applicant's building frontage adjustment request, denying the applicant's future building setback adjustment request but approving a variance to allow a greater setback that better protects the retention trees, allowing the applicant to postpone construction of the future building, and requiring the applicant to retain the six (6) additional trees located adjacent to where the future building would go as conditioned by staff. If the Planning Commission chooses option 3, staff recommends the Planning Commission require the following:
- The future building shall be a minimum of 165 linear feet along the Highway 26 frontage of the site.
  - Because the future building will not be constructed as part of this application, the applicant shall extend the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go and shall retain trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115).
  - The applicant shall update the south elevation of the proposed convenience store to detail the three window panes directly to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance; the windows into the janitor's closet and women's restroom may remain spandrel windows. All spandrel windows shall be light gray.
  - The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours; the primary entrance on the south elevation shall not be a faux entrance.
  - The applicant shall record a tree protection covenant specifying protection of the 12 retention trees and Trees # 110-115 and limiting removal without submittal of an Arborist's Report and City approval. This document shall include a sketch identifying the retention trees and Trees # 110-115 and the critical root zone around the retention trees and Trees # 110-115 detailed at 1 foot per 1 inch DBH.

- The applicant shall update the plan set to detail the proposed future building set back outside of the critical root zone (defined as 1 foot per 1 inch DBH, or 5 feet beyond the dripline) of the 12 trees proposed for retention as well as the six (6) additional trees that shall be retained (Trees # 110-115).
- Determine if the applicant should be required to construct the third southbound traffic lane on Orient Drive as conditioned by ODOT as part of this approval.

Staff recommends the Planning Commission determine whether the proposed LED striping should be classified as “strongly thematic architectural style associated with some chain establishments,” in this case, Space Age, or if the LED band is an attention attracting device, which is also prohibited by code. In addition to determining if the LED lighting is considered thematic architecture, and thereby incompatible with the Sandy Style, staff recommends the Planning Commission determine if the proposed LED striping is an integral part of the architectural design, if it complements ornamental street lighting, if it’s in context with the overall architectural character of the district, and if the proposed LED lighting is compatible to the design character of existing structures on adjoining properties and on the proposed development site. Staff recommends the Planning Commission consider approving a painted color band instead of the LED striping. If the Planning Commission decides to approve the LED band, staff requests that the Planning Commission provide clarification on whether they would like the proposed LED band on the fueling canopy to be installed the same way that the LED band will be installed for the convenience store (i.e. in an exterior cove so that it will not be visible except when viewed directly below the fixture).

Staff recommends the Planning Commission require the applicant to update the plan set to detail 5 foot deep minimum pedestrian shelters over the walkways abutting the proposed convenience store building on the south, west, and north elevations as well as over the civic space.

In order to meet Sections 17.90.120(E.2.a), 17.90.120(I.1), and 17.90.120(I.2), staff recommends the Planning Commission require the applicant to provide active windows as recommended by staff. Staff recommends the Planning Commission refine the condition related to the south elevation windows to read: “The applicant shall update the south elevation of the proposed convenience store to detail the three window panes directly to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance; the windows into the janitor’s closet and women’s restroom may remain spandrel windows.” Staff recommends the Planning Commission require all spandrel windows to be light gray. Should the Planning Commission determine that it does not want to require active windows on the south and/or north or east elevations, staff recommends the Planning Commission formally approve three (3) Special Variances to Sections 17.90.120(E.2.a), 17.90.120(I.1), and 17.90.120(I.2), condition that the applicant submit payment of a Special Variance review fee for each of the three special variances, and condition that the applicant use light gray spandrel windows in compliance with Section 17.90.120(E.4.a). In addition, if the Planning Commission determines it does not want to require active windows on the north or east elevations, staff recommends the Planning Commission also consider if they want to require the applicant to move the civic space and/or parking located along the north side of the convenience store as there would not be any active windows nearby.



Staff recommends the Planning Commission approve the Highway 26 sidewalk location proposed by the applicant's arborist, provided that:

- 1) The tree protection fencing is installed prior to any development activities and removed only after completion of all construction activity, as required by Section 17.102.50(B).
- 2) Either the applicant's arborist or the third party arborist is on-site for any construction activity within the tree protection zone of 1 foot per 1 inch DBH identified on Attachment 1 of the Tree Protection Addendum, and
- 3) The plan set is updated to reflect the tree protection fencing location at 1 foot per 1 inch DBH as identified in Attachment 1 of the Tree Protection Addendum with the following modification: the tree protection fencing shall adhere to the standard critical root zone of 1 foot per 1 inch DBH in the area where the future building is proposed to be constructed rather than follow the building footprint of the future building since the building is not actually proposed to be constructed with this application or at any time in the near future.

Staff recommends the Planning Commission require that no more than 25 percent of each tree's critical root zone of 1 foot per 1 inch DBH shall be impacted by development activity, including, but not limited to, grading, stockpiling of soil or materials, impacts from heavy machinery, excavation, compaction, paving, storage of equipment or materials, or other similar activities. Staff recommends that the Planning Commission require the arborist who is on-site during construction activity within the tree protection zone of 1 foot per 1 inch DBH be required to submit a post-construction summary report certifying that the work occurred, that the work did not impact more than 25 percent of each tree's critical root zone of 1 foot per 1 inch DBH, and that the work did not significantly impact the health or structural stability of the preserved trees.

Staff recommends the Planning Commission require the applicant to install tree protection fencing at 1 foot per 1 inch DBH. Staff recommends the Planning Commission require the tree protection fencing to be 6 foot high chain link or no-jump horse fencing and have a sign that clearly marks the area as a Tree Root Protection Zone. Staff recommends the Planning Commission require the applicant to follow all recommendations of the third-party arborist report with respect to air spading, root pruning, and any work within the critical/overall root zone (defined as 1 foot per 1 inch DBH).

If it is determined that Trees # 124, 125, 126, and/or 127 are in the ODOT right-of-way and need to be mitigated, staff recommends the Planning Commission allow the street trees on Highway 26 to also count as ODOT mitigation trees for Trees 124, 125, 126, and/or 127 (or any other trees identified as being the ODOT right-of-way on Highway 26), provided the street tree species is similar to the species of tree(s) removed (i.e. large, native, evergreen species). Staff recommends the Planning Commission allow the street trees on the ODOT right-of-way portion of Orient Drive to also count as ODOT mitigation trees for Trees # 1, 4, 5, 6, and 7, provided the street tree species is similar to the species of tree(s) removed (i.e. large, native, evergreen species).

Staff recommends the Planning Commission remove the condition: "the applicant shall obtain a letter of credit in the amount of \$500 per tree to cover replacement and establishment of the right-of-way trees should a right-of-way tree die within 3 years." Staff believes the conditions associated with Sections 17.92.10(B) and 17.92.10(L) will be sufficient to ensure survival of all landscaping and street trees without collecting a letter of credit.

Staff recommends the Planning Commission consider the documented negative impacts of blue-lighting, the recommendations from the various agencies, and the City's Dark Sky Ordinance and determine whether to require lighting to not exceed 4,125 Kelvins as recommended by Illuminating Engineering Society or to not exceed 3,000 Kelvins as recommended by the American Medical Association, the Audubon Society of Portland, and the International Dark-Sky Association.

Staff recommends the Planning Commission determine if any other conditions should be modified since this appeal hearing is de novo.

## **DECISION**

For the reasons described above, the request by JLP Development to construct a Space Age fueling station and convenience store is hereby ~~approved as modified by the conditions listed below~~ **approved** ~~[decision]~~. The following adjustment and variance are ~~also approved~~ **[decision]**:

- Type II Adjustment to Section 17.90.120(D.1) to allow less than 50 percent of the street frontage as building. Staff approves the buildings to comprise 40 percent of the street frontage.
- Type II Variance to Section 17.90.120(D.1) to allow the building to be placed a distance adequate to protect retention trees at 1 foot per 1 inch DBH or 5 feet beyond dripline (outside the critical root zone) from the property line abutting Highway 26 in order to better protect the retention trees.

## **CONDITIONS OF APPROVAL (If the Planning Commission chooses to approve the proposal)**

**Note: These conditions are from the staff issued October 22, 2019 Final Order and will need to be updated based on the Planning Commissions determinations on the above items.**

### **A. Prior to applying for a grading and erosion control permit or building/plumbing/mechanical permits the applicant shall submit additional information as identified below:**

1. Submit a revised Site Plan and supplemental Plans to include all changes as identified in this Order including:
  - Detail 6 foot wide sidewalks along the Highway 26 frontage and 7 foot wide sidewalks along the Orient Drive frontage of the site.
  - Detail pavement markings that connect the walkway to the parking west of the fuel pumps, or install a walkway that connects the parking spaces to the Highway 26 sidewalk. If the applicant chooses pavement markings, the pavement markings shall be painted periodically as lines become faded. If the applicant chooses to install a walkway, the walkway shall be located such that it has the least impact on the Highway 26 trees while still providing a connection between the parking spaces and the Highway 26 sidewalk.
  - Detail wheel stops in the westernmost parking row.
  - Detail a six foot wide walkway connecting the front door on the south side of the future building to the Highway 26 sidewalk. The applicant shall also update the plan set to show the walkway extending around to the south side entrance of the proposed future building. To minimize impact on retention trees, the proposed entrance to the



future building along Highway 26 shall be located at the southeast corner of the building.

- Detail the proposed future building set back outside of the critical root zone (defined as 1 foot per 1 inch DBH or 5 feet beyond dripline) of the 12 trees proposed for retention as well as the six (6) additional trees that shall be retained (Trees # 110-115).
- Detail extension of the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go.
- Detail two ADA ramps at the intersection of Highway 26 and Orient Drive.
- Ensure all site modifications (e.g., sidewalks, relocated signal pole, etc.) are located appropriately in anticipation of the addition of the future additional southbound lane on Orient Drive.

2. Submit a revised Landscape Plan to include the following changes:

- Detail 10 large street trees or 17 medium street trees along the Highway 26 frontage of the site. The applicant shall submit details on the proposed street tree species and locations for staff review and approval. The applicant shall obtain a permit from ODOT to place trees within the highway right-of-way.
- Detail street trees along Crescent Road and along the southeastern portion of Orient Drive.
- Provide an updated landscape area calculation based on the full proposal for the site, including the proposed future building and associated parking area.
- Submit additional information regarding landscaping in the parking area to ensure that the 10 percent minimum landscaping of the parking facilities is met.
- Detail retention of trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115). The applicant shall retain an arborist on-site for any construction activity within the critical root zone of 1 foot per 1 inch DBH or 5 feet beyond the dripline of the retained trees.
- Detail the Highway 26 sidewalk as far away from the trunks of the retained trees as possible without intruding on ODOT's clear zone; the applicant shall work with ODOT and the City of Sandy Planning Division staff to determine an appropriate location for the relocated sidewalk. The applicant shall retain an arborist on-site for any construction activity within the critical root zone of 1 foot per 1 inch DBH or 5 feet beyond the dripline of the retained trees.
- Detail replacement trees to mitigate for the trees that are removed from the ODOT right-of-way at a 2 to 1 ratio. The trees shall be located 36 feet from the edge of the travel lane. The applicant shall coordinate with the City of Sandy Planning Division and Magnus Bernhardt (ODOT Landscape Architect at (503) 731-8283) to discuss type of tree species and location. The applicant shall work with Clackamas County to determine if the County will require replacement trees for trees removed from the Clackamas County right-of-way.

3. Submit a revised Lighting Layout Plan and Photometric Plan to include the following:

- Detail the proposed pedestrian scale lighting in the civic space, if proposed as indicated in the narrative.

4. Submit revised elevations to include the following:
  - Remove the proposed LED striping on the roofline of the gas pump facility and the convenience store.
  - Update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance.
  - Update the north and/or east elevations of the proposed convenience store to detail at least one active window in the storage and/or kitchen area.
5. Submit updated lighting fixture cut-sheets for all proposed exterior lighting, including the proposed pedestrian scale lighting, if proposed, that detail the lighting fixtures as full-cutoff and not exceeding 4,125 Kelvins to minimize negative impact on wildlife and human health. Should the applicant prefer, the applicant may submit an updating lighting plan detailing low-pressure sodium lights in compliance with Chapter 15.30.
6. Update the Color Schedule with an approved color for the vertical board and batten or submit additional information demonstrating that Mountain Cedar is a wood stain.
7. Submit a line of sight analysis for the rooftop equipment.
8. Propose an appropriate architectural treatment for the retaining wall and submit to the Planning Division for staff review and approval.
9. The applicant shall do one of the following:
  - Reduce the combined height of the retaining wall and fence to 8 feet or less.
  - Set the fence back at least 5 feet from the top of the retaining wall to create a break between the wall and the fence.
  - Apply for a Special Variance to allow a maximum 9.1 foot tall retaining wall and fence in the rear yard.
10. The applicant shall do one of the following:
  - Update the plan set to detail the driveway on Orient Drive at a maximum of 40 feet wide, including throat and apron. This will improve pedestrian safety at the driveway crossing and will also help discourage vehicles heading west on Orient Drive from slipping into the extra-wide driveway against traffic.
  - Provide an updated truck turning template based on the submitted site plan layout that demonstrates the need for the requested 68 foot driveway with 40 foot approach. The updated truck turning template shall be reviewed and approved by the City's traffic engineer. The updated turning template shall be legible and shall include a legend.

**B. Prior to grading and/or excavation, the applicant shall complete the following and receive necessary approvals as specified below:**

1. Submit proof of receipt of a Department of Environmental Quality 1200C permit.  
(Submit to Planning Division)
2. Apply for and receive approval for a grading and erosion control permit in conformance with City standards detailed in Section 15.44 of the Municipal Code.
3. Request an inspection of installed erosion control measures in accordance with the approved plan. (Request to Public Works Department)
4. Install tree fencing at the standard critical root zone of one foot per inch DBH or 5 feet beyond dripline; the tree protection fencing shall be 6 foot high chain link or no-jump horse fencing and shall have a sign that clearly marks the area as a Tree Root Protection Zone.
5. Request an inspection to verify tree protection fencing is appropriately installed.
6. Have a licensed pest control agent evaluate the site to determine if pest eradication is needed. Submit the evaluation summary to the Planning Division.

**C. Prior to all construction activities, except grading and/or excavation, the applicant shall submit additional information with the Building Permit plans and complete required items during construction as identified below:**

1. Pay appropriate SDCs as calculated with building permit.
2. Update the address of the site to be addressed from Highway 26. The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours as the location of the front door along the Highway 26 frontage is necessary to consider the Highway 26 frontage the front lot line.
3. Record a tree protection covenant specifying protection of the 12 retention trees and Trees #110-115 limiting removal without submittal of an Arborist's Report and City approval. This document shall include a sketch identifying the retention trees and Trees # 110-115 the critical root zone around the retention trees and Trees # 110-115 detailed at 1 foot per 1 inch DBH.

**D. Prior to occupancy (temporary or final) of the building the applicant shall complete the following or provide assurance for their completion:**

1. All required improvements shall be installed or financially guaranteed prior to final occupancy of the Space Age fueling station.
2. Install street improvements along the site frontage of Highway 26, Orient Drive, and Crescent Road, including but not limited to: curbs, sidewalks, storm drainage, street lighting, and street trees per Section 17.84.50(D)(1) of the Sandy Municipal Code (SMC)

and the following additional requirements: (any changes to these conditions by ODOT or Clackamas County shall be reviewed by the City of Sandy)

- The applicant shall improve the sidewalk to current ODOT and City standards.
- The applicant shall contact the ODOT District Contact (Loretta Kieffer, 503-667-7441) to determine permit requirements and obtain application information.
- If a design exception is required for street trees the applicant shall adjust the location of the sidewalk to allow street trees that meet ODOT's minimum clear zone criteria and/or apply for a design exception.
- There appears to be sufficient right-of-way to meet ODOT's clear zone criteria.
- Any costs for a design exception shall be paid by the applicant.
- Construct a left-turn lane on southbound SE Orient Drive at Highway 26 with accompanying signal modifications according to ODOT specifications and requirements.
- Construct a left-turn lane on northbound SE Orient Drive at SE Crescent Road according to Clackamas County specifications and requirements and to ODOT specifications and requirements if any section of SE Orient Drive falls within ODOT jurisdiction.
- Construct a three-lane section for SE Orient Drive from Highway 26 to north of SE Crescent Road with a raised median to restrict driveway movements at the site to right-in, right-out according to Clackamas County specifications and requirements and to ODOT specifications and requirements if any section of SE Orient Drive falls within ODOT jurisdiction.
- Dedicate any additional right-of-way adjacent to Highway 26 and SE Orient Drive if necessary to assure that an additional southbound lane can be provided on SE Orient Drive at Highway 26.
- With any future development beyond what is proposed to be constructed with this application, the applicant shall construct a right-turn lane on southbound SE Orient Drive at Highway 26 (this will result in three lanes for the southbound SE Orient Drive approach) with accompanying signal modifications according to ODOT specifications and requirements such that the intersection will operate at no worse than 2038 background conditions during both the AM and PM peak hours under full build-out of the site under City of Sandy C-2 zoning.
- Half street improvements on SE Orient Drive shall be required along the entire site frontage to minor arterial standards to include signing and striping plans.
- Input from ODOT shall be required on Mt Hood Highway 26, particularly at the intersection with Orient Drive, and on the impacts on the existing traffic signal function and performance and lane configuration.
- The proposed cul-de-sac shall be designed to include plan and profile as part of this development to assure grades will be met.
- All frontage improvements in, or adjacent to Clackamas County right-of-way, shall be in compliance with Clackamas County Roadway Standards. Frontage improvements in, or adjacent to State of Oregon right-of-way, shall be in compliance with Oregon Department of Transportation standards.
- The applicant shall dedicate additional right-of-way along the entire site frontage of SE Orient Drive and SE Crescent Road as necessary to accommodate the required frontage improvements, providing a minimum of 6 inches behind the sidewalk.

- Written approval shall be obtained from ODOT, in the form of a permit, for access and improvements within the Highway 26 right-of-way and the portion of SE Orient Drive under ODOT's jurisdiction.
- Minimum improvements on the SE Orient Drive frontage consistent with Clackamas County's Roadway Standards include, but are not limited to, up to a one half-street improvement, including:
  - Up to a minimum 30-foot wide, one half-street improvement shall be constructed along the entire site frontage to arterial roadway standards, per Clackamas County Roadway Standards Standard Drawing C100. As necessary, additional paved width shall be provided for the proposed second left turn lane at the intersection with Highway 26 and the northbound left from SE Orient Road to SE Crescent Road.
  - Lane transitions shall be provided per Roadway Standards Section 250.6.4 based on a 55 MPH design speed.
  - A minimum 1.5-foot wide concrete center median shall be constructed on SE Orient Drive, centered on the site driveway, extending a minimum of 40 feet beyond the north and south edge of the driveway. A minimum shy distance of 1.0 foot shall be provided from the median and travel lane. The applicant's proposal includes a median between the two southbound travel lanes to allow for a left-in and left-out for the existing driveway serving the undeveloped property (Tax Lot 24E10 05490 and 05400) on the east side of SE Orient Drive. For this location, a median will only be permitted at the center of the roadway rather than between southbound travel lanes. Based on the limited use of the existing driveway on the east side of SE Orient Drive, it does not warrant providing full access at this time.
  - Standard curb, or curb and gutter if curb line slope is less than one percent.
  - Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.
  - A minimum 7-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. If the sidewalk does not connect to sidewalk on adjacent property, the end of the sidewalk shall require the construction of a concrete ramp, adjacent to the end of the sidewalk, providing a transition from the new sidewalk to the edge of the pavement. The ramps shall meet ADA guidelines.
  - A minimum 28-foot wide concrete driveway approach shall be constructed, per Standard Drawing D650, and shall be limited to right-out turning movements only. A wider driveway is acceptable with demonstration of the need with truck turning templates. The driveway approach and on-site curbs shall be channelized to limit right-turns into the driveway. The angle of the driveway shall be no more than necessary to accommodate truck turning and shall be demonstrated by turning templates based on anticipated vehicles. A signage plan shall be provided indicating the access restriction.
  - A striping plan for SE Orient Drive shall be provided. The northbound left turn lane queue storage at SE Crescent Road shall be the minimum as recommended in the project traffic study by Ard Engineering, dated April 8, 2019.

- Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.
  - Minimum improvements on the SE Crescent Road frontage consistent with Clackamas County's Roadway Standards include, but are not limited to, up to a half-street improvement, including:
    - Dedicate public right-of-way as needed to accommodate the required frontage improvements.
    - A minimum total paved width of 20 feet, with a structural section for a commercial local roadway, per Clackamas County Roadway Standards Standard Drawing C100.
    - Standard curb, or curb and gutter if curb line slope is less than one percent.
    - Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.
    - A minimum 5-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. Dual curb ramps shall be constructed per ODOT Standard Drawing (RD755, RD756 and RD757) at the SE Crescent Road intersection with SE Orient Drive.
    - A minimum 28-foot wide concrete driveway approach shall be constructed, per Standard Drawing D650. A wider driveway is acceptable with demonstration of the need with truck turning templates.
    - Provide adequate intersection sight distance per Section 240 of the Clackamas County Roadway Standards.
    - Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.
    - Prior to issuance of a Development Permit and start of construction activities, off-site construction easements shall be obtained.
  - Prior to commencement of site work, a Development Permit is required and must be obtained from Clackamas County for all work performed in the road right-of-way. A Utility Placement Permit is required for any utility work within the public right-of-way, per Chapter 7 of the Roadway Standards. When there are multiple utility service trenches in the road, the trench repairs will grind and inlay the top 2" of the pavement restoration to include a minimum 12" tee beyond the furthest trench, and to combine multiple trenches into one surface repair.
  - If the applicant is advised to or chooses to modify the proposal in terms of access location and/or design following the preparation of these comments the applicant shall give the Clackamas County Engineering office an opportunity to review and comment on such changes prior to a decision being made.
3. Install landscape materials as identified on the revised and approved Landscape Plan and install an automatic irrigation system in compliance with Section 17.92.40. Because the proposed future building is not planned to be constructed at this time, the applicant shall plant the area where the future building and future parking will be located according to the approved Landscape Plan. Trees shall be planted per the City of Sandy standard planting detail and shall be staked and tied with loose twine, or other soft, elastic material and shall be removed after one growing season (or a maximum of 1 year). If the applicant chooses to postpone street tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the landscaping, assuring

installation within 6 months. The cost of street trees shall be based on the street tree plan and at least \$500 per tree. The cost of landscaping shall be based on the average of three estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a three-year maintenance and warranty period.

4. Trees and the planter strip shall be installed per the approved landscape plan. In order to better protect newly planted trees, the applicant shall amend and aerate the soil in any areas where the soil has been compacted in a 15 foot radius around each tree to be planted and to a depth of 24 inches prior to planting trees in the right-of-way; in locations where there is a constructed planter strip (i.e. Crescent Road and Orient Drive), the applicant shall aerate the soil within the planter strip 15 feet in both directions from where the tree will be planted. The applicant shall call for an inspection with the City after aerating the soil and before planting the trees. In addition, the applicant shall obtain a letter of credit in the amount of \$500 per tree to cover replacement and establishment of the right-of-way trees should a right-of-way tree die within 3 years.
5. Revegetate all areas where natural vegetation has been removed or damaged in areas that are not proposed to be occupied by structures or other improvements. This includes the area where the future building and parking are proposed.
6. Install at least two public benches and one public art element or similar pedestrian amenity reviewed and approved by staff in the civic space.
7. Install street address numbers measuring a minimum of six (6) inches high, which clearly locates the building and its entries for patrons and emergency services. The applicant shall verify the location(s) of the address with the Building Official and emergency service providers.
8. Install an ADA ramp at the corner of SE Orient Drive and SE Crescent Road. Install two ADA ramps at the intersection of Highway 26 and Orient Drive.
9. Submit a mail delivery plan to the City and USPS for review and approval prior to installation of the mail delivery facility. Mail delivery facilities shall be provided by the applicant in conformance with 17.84.100 and the standards of the USPS.

**E. General Conditions:**

1. Design review, and variance/adjustment 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. Utility and frontage improvement plans are submitted solely to comply with the submission requirements of Section 17.90.100 of the Sandy Municipal Code. Land use approval does not connote approval of utility or street frontage improvement plans, which are subject to separate submittal and review processes.

3. The applicant shall call PGE's Service Coordination at 503-323-6700 when they are ready to start the project.
4. At the time of future development, the future building shall be designed to meet the Sandy Style requirements and shall be architecturally unified with the other building and structure on the site.
5. Vehicular and bicycle parking requirements associated with the future building shall be analyzed at the time of development of the future building.
6. The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours; the primary entrance on the south elevation shall not be a faux entrance.
7. All street trees shall be a minimum of 1.5-inches in caliper measured 6 inches above the ground and shall be planted per the City of Sandy standard planting detail.
8. All landscaping shall be continually maintained in perpetuity, including necessary watering, weeding, pruning, and replacing.
9. The applicant shall follow all recommendations of the third-party arborist report with respect to air spading, root pruning, and any work within the critical root zone.
10. All utilities including franchise utilities shall be installed to City standards. All utilities are required to be placed underground in accordance with Section 17.100.250. All franchise utilities shall be installed underground with the exception of those listed in Section 17.84.80 (E). All onsite (including extensions from the poles in the right-of-way) overhead electrical and communications wires shall be placed underground. The applicant shall not run any wires overhead.
11. The applicant shall maintain a minimum 5 foot wide walkway free of obstructions along the north, west, and south building elevations, including the connection to Highway 26.
12. All structures on the subject property shall be constructed to comply with the standards of Section 17.80.20. All structures shall maintain a minimum 20-foot setback from the Highway 26 and Orient Drive public rights-of-way.
13. The trash enclosure shall be constructed of materials as identified in the plan set.
14. All sidewalks and ADA ramps shall comply with the most current ADA requirements.
15. Signage associated with the ADA parking spaces shall meet the head clearance distance requirement in the Building Code.
16. The pavement markings that connect the walkway to the parking west of the fuel pumps shall be painted periodically as lines become faded.



17. All on-site hydrology and hydraulics under the canopy/fueling area shall comply with the requirements of Section 13.18 of the Sandy Municipal Code and shall provide the components explained in the City of Portland Stormwater Management Manual (oil/water separator, spill control manhole, closed shut-off valve). In addition to these, the applicant shall install an impermeable liner in the pond and an emergency shut-off valve (normally open) down stream. In the case of a spill this valve could be closed. The applicant shall submit concurrence from Clackamas County to make sure they approve any potential fuel spill being routed to a stormwater pond that discharges to their roadside storm drain system.
18. All on-site grading shall be performed in accordance with the current Oregon Structural Specialty Code and shall be observed and documented under the supervision of a geotechnical Engineer or his/her representative.
19. The site shall be maintained and kept free of litter. All litter shall be collected and transported for offsite disposal as part of weekly service trips.
20. All new lighting shall be in compliance with Chapter 15.30, Dark Sky Ordinance which shall minimize light trespass on neighboring properties.
21. The applicant shall confer with Clackamas Fire District #1 to determine the number and location of on-site fire hydrants necessary to comply with the requirements of the Clackamas Fire District Fire Marshal. The applicant shall follow all Clackamas Fire District requirements.
22. The applicant shall obtain a permit for any proposed signage.
23. All rooftop equipment and mechanical, electrical, and communications equipment shall be screened from view from all public rights-of-way and civic spaces.
24. The applicant shall not place an external storage unit(s) on the property.
25. Successors-in-interest of the applicant shall comply with site development requirements prior to the issuance of building permits.
26. Comply with all other conditions or regulations imposed by Clackamas County, Clackamas Fire District #1, 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.



**PRE-APPLICATION CONFERENCE  
REQUEST FORM**

(Please print or type the information below)

**Planning Department  
39250 Pioneer Blvd.  
Sandy OR 97055  
503-668-4886**

Name of Project Space Age Gas Station

Location or Address 15585 SE Orient Dr.

Map & Tax Lot Number T 25, R 4E, Section 10; Tax Lot(s) 4500 Map 24E10

Plan Designation C-2 Zoning Designation Commercial Acres 2.29

Project Description:

Proposed fueling station, 3,100 SF store, associated parking and underground tanks, turn lane to be added, other road improvements, some ROW dedication, some ROW vacation

Applicant All County Surveyors & Planners, Inc.	Owner JLP Development LLC
Address PO Box 955	Address PO Box 1429
City/State/Zip Sandy, OR 97055	City/State/Zip Clackamas, OR 97015-1429
Phone 503-668-3151	Phone 503-212-3900
Email dave@allcountysurveyors.com	Email jimpliska@spacearefuel.com
Signature	Signature 

File No.	Date	Rec. No.	Fee \$
Type of Review (circle one):    Type I    Type II    Type III    Type IV			
Pre-App. Scheduled for:			

**Project Narrative  
for  
JLP Development  
Space Age Fueling Station**

**15585 SE Orient Drive, Boring, Oregon  
(2S 4E 10, tax lot 4500)**



**Prepared by  
Tracy Brown Planning Consultants, LLC**

**April 2019**

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## **I. General Project Description**

The applicant, JLP Development, LLC requests land use approval to construct a 16-position vehicle fueling station with canopy cover and a 3,069 square foot convenience store. The subject property is located at 15585 SE Orient Drive, Boring, OR (24E10 tax lot 4500) at the intersection of Highway 26 and SE Orient Drive. The property is bordered by Highway 26 along its entire southern boundary and SE Orient Drive along its eastern and northern boundaries. SE Crescent Road, an unimproved gravel surfaced public right-of-way, borders the property along its western boundary.

The subject property contains approximately 2.32 acres (101,208 square feet) and a 3,192 square foot, 4 bedroom, 2 bath single family residence built in 1948 and an accessory building. Access to the residence is currently provided from SE Crescent Road. The residence is currently served by an onsite septic system and a 48 gpm domestic well for water. These facilities will be upgraded as needed to serve the proposed development. The site is zoned C-2, General Commercial which permits the proposed automobile fueling station and convenience store outright.

A Type III Special Variance was approved (File No. 18-036 VAR) for the property on October 31, 2018, to allow the property to be developed without connecting to City water and broadband fiber service. In addition, the property is allowed by code to connect to onsite sanitary sewer service and storm drainage facilities rather than these city services. The site will be served by an onsite well and septic system and all stormwater will be managed onsite.

The applicant attended pre-application conferences with the City on January 14, 2019.

## **II. Application Approval Requests**

The applicant requests the following approvals with this application:

- Type II design review to construct a Space Age fueling station and convenience store with associated site improvements.

## **III. Items Submitted With This Application**

- Land Use Application
- Notification List and Mailing Labels
- Exhibit A - Project Narrative
- Exhibit B - Civil Plans
  - Sheet 1 - Cover Sheet and Existing Conditions
  - Sheet 2 - Tree Retention Plan
  - Sheet 3 - Site Plan
  - Sheet 4 - Grading and Erosion Control Plan
  - Sheet 5 - Utility Plan

- Sheet 6 - Cut-Fill Plan
- Exhibit C - Architectural Plans
  - Sheet A101 - Overall Main Floor Plan
  - Sheet A161 - Overall Roof Plan
  - Sheet A191 - Equipment Plan
  - Sheet A220 - Convenience Store West and South Building Elevations
  - Sheet A221 - Convenience Store East and North Building Elevations
  - Sheet A222 - Convenience Store Exterior Perspective Drawings
  - Sheet A223 - Fuel Island Elevations
  - Sheet A521 - Trash Enclosure
- Exhibit D - Landscape Plan
- Exhibit E - Septic System Site Plan
  - AdvanTex - Septic Design Details
- Exhibit F - Preliminary Stormwater Report
- Exhibit G - Traffic Impact Study
- Exhibit H - Arborist Report
- Exhibit I - Photometric Analysis (*provided at a later date*)

#### **IV. Review of Applicable Approval Criteria**

Development applications are required to meet standards set forth in the Sandy Development Code, codified as Title 17 of the Municipal Code. The following section addresses all applicable review criteria. Pertinent code provisions are cited below in plain text followed by a response identifying how the proposal complies with this standard in *italics*.

#### **CHAPTER 17.44 - GENERAL COMMERCIAL (C-2)**

##### **17.44.00 INTENT**

This district is intended to provide for a wide range of commercial activities in a community scale shopping center and for commercial uses and related services and businesses, which require large land areas for structures and parking facilities and direct automobile access. This district is not intended for exclusively residential uses, although mixed-use developments are encouraged.

##### **17.44.10 PERMITTED USES**

A. Primary Uses Permitted Outright in buildings with less than 60,000 square ft. of gross floor area:

1. Retail businesses, including but not limited to:

- a. Automotive fueling station;
- b. Automotive, trailer, recreational vehicle, and motor cycle sales and rental;
- c. Convenience market/store;

***Response:*** *The applicant proposes constructing an automotive fueling station and 3,069 square foot convenience store both uses permitted outright in this zone.*

##### **17.44.30 DEVELOPMENT STANDARDS**

Standard	Requirement	Proposed
Lot Area	No Minimum	The total site contains a gross area of 101,208 sq. ft. (2.32 ac.), and a net area after right-of-way dedication of 97,108 sq. ft. (2.23 ac.).
Lot Dimension	No Minimum	complies
Setbacks ** Front ..... Side ..... Rear ..... Corner .....	10 ft. minimum; 50 ft. maximum None None 15 ft.	35 feet - complies complies complies approx. 55 feet - complies
Outside Display/Sale Lot Area	80%	No outside displays is proposed.
Lot Coverage - Impervious	No maximum	complies
Landscaping	20% (includes required civic space in Section 17.90.120)	68% of the site will be landscaped and a 380 sq. ft. civic space provided.
Structure Height	45 ft.	Approx. 23 feet - complies
Off-Street Parking	See Chapter 17.98	See Chapter 17.98 below
Design Review Standards	See Section 17.90.120	See Section 17.90.120 below

\*\* - Unless abutting a more restrictive zoning district, or as required under Section 17.90.120 Design Standards for C-2.

**Response:** *The subject property is uniquely shaped and is considered a corner lot. Based on the definition of a corner lot found in Chapter 17.10, as shown on the submitted Site Plan the front property line includes both the Northeast and the North property lines adjacent to SE Orient Drive, the rear is the South line adjacent to Highway 26 and the side property lines are the Southeast and the West property lines. The proposed building is located 35 feet from the front property line in compliance with the front setback standard. As shown on the table above, the proposal complies with all development standards.*

**B. Special Setbacks - Side or Rear Yard Abutting a More Restrictive District.**

1. Property abutting a more restrictive zoning district shall have the same yard setback as required by the abutting district. An additional 10 ft. shall be added for each 10 foot increment in building height over 35 ft;
2. Measurement of the height transition area shall be made between the foundation of the proposed building and the property line of the abutting district;



3. When the proposed structure has different sections that have different heights, the height transition area shall be measured for each vertical surface as if it were to be freestanding. The building then must be located on the site so that no section is closer to the abutting property line than it would be if the section was free-standing;
4. The required buffering and screening and utilities may be located within the height transition area. Off-street parking, accessory structures and incidental development may be located within the height transition area but not any areas designated as buffering and screening area.

*Response: Property to the West and north across SE Orient Drive are currently outside the city limits but are conceptually zoned C-2. Property across Highway 26 to the South is also outside the city limits and is conceptually zoned I-1. The proposed project is located such that no additional setbacks are necessary or required.*

## **CHAPTER 17.80 - ADDITIONAL SETBACKS ON COLLECTOR & ARTERIAL STREETS**

### **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.

*Response: Highway 26 is designated a major arterial and SE Orient Drive is classified a minor arterial roadway by Clackamas County but is not included in the City's Transportation System Plan. The Site Plan features a minimum 20 foot setback along Highway 26 and the portion of SE Orient Drive under ODOT's control. No buildings are proposed within 20 feet of either of these rights-of-way.*

## **CHAPTER 17.84 - IMPROVEMENTS REQUIRED WITH DEVELOPMENT**

### **17.84.20 TIMING OF IMPROVEMENTS**

- A. All improvements required by the standards in this chapter shall be installed concurrently with development as follows:

*Response: All improvements will be completed prior to occupancy*

2. Where a land division is not proposed, the site shall have required public and franchise utility improvements installed or financially guaranteed in accordance with the provisions of Chapter 17 prior to temporary or final occupancy of structures.

*Response: As noted above, the applicant previously received Special Variance approval (File 18-036 VAR) to this section. The applicant does not intend to connect to any public utilities at this time.*

### **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 5 ft. 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.

**Response:** *Clackamas County is requiring the applicant to provide a three-foot dedication along SE Orient Drive in order to accommodate frontage improvements. Sidewalk improvements along this road include a seven foot sidewalk as required by the County. The sidewalk along SE Crescent Road and the portion of sidewalk along the Northeast property line are proposed to be five feet in width.*

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 6 ft. wide.

**Response:** *The sidewalk along Highway 26 will be six feet wide in compliance with the standards in the City's TSP.*

4. The timing of the installation of sidewalks shall be as follows:

**Response:** *Sidewalk improvements are proposed to be completed prior to occupancy.*

#### **17.84.50 STREET REQUIREMENTS**

A. Traffic evaluations may be required of all development proposals in accordance with the following:

1. A proposal establishing the scope of the traffic evaluation shall be submitted for review to the City Engineer. The evaluation requirements shall reflect the magnitude of the project in accordance with accepted traffic engineering practices. Large projects should assess all nearby key intersections. Once the scope of the traffic evaluation has been approved, the applicant shall present the results with and an overall site development proposal. If required by the City Engineer, such evaluations shall be signed by a Licensed Professional Civil Engineer or Licensed Professional Traffic Engineer licensed in the State of Oregon.
2. If the traffic evaluation identifies level-of-service conditions less than the minimum standard established in the Transportation System Plan, improvements and funding strategies mitigating the problem shall be considered concurrent with a development proposal.

**Response:** *The City of Sandy and Clackamas County required the applicant to provide a traffic study to address trip generation and access spacing only. The County has required the applicant to provide a more comprehensive study providing an operational analysis of the proposed access drive on SE Orient Drive. The applicant contracted with a Traffic Engineer to complete this study (Exhibit G). Clackamas County has approved the location of the access driveway on SE Orient Drive. Frontage improvements along this road include a seven foot sidewalk, five foot planter, six foot shoulder, and 12 foot travel*

lanes. A concrete raised median with tubular barriers is proposed to prevent westbound left-turns to the site. Westbound vehicles will access the site from SE Crescent Road.

#### 17.84.60 PUBLIC FACILITY EXTENSIONS

- A. All development sites shall be provided with public water, sanitary sewer, broadband (fiber), and storm drainage.  
**Response:** As noted above, the applicant previously received Special Variance approval from the City of Sandy to this section (File No. 18-036 VAR). The site is served by an on-site septic system and well. Stormwater will also be handled onsite and the applicant will make arrangements for internet service as needed. These facilities will be upgraded as necessary to serve the proposed use.
- B. Where necessary to serve property as specified in “A” above, required public facility installations shall be constructed concurrent with development.  
**Response:** This section is not applicable.
- C. Off-site public facility extensions necessary to fully serve a development site and adjacent properties shall be constructed concurrent with development.  
**Response:** This section is not applicable.
- D. As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).  
**Response:** This section is not applicable since no public facilities will be installed.
- E. All public facility installations required with development shall conform to the City’s facilities master plans.  
**Response:** This section is not applicable.
- F. Private on-site sanitary sewer and storm drainage facilities may be considered provided all the following conditions exist:
1. Extension of a public facility through the site is not necessary for the future orderly development of adjacent properties;
  2. The development site remains in one ownership and land division does not occur (with the exception of land divisions that may occur under the provisions of 17.84.50 F above);
  3. The facilities are designed and constructed in accordance with the Uniform Plumbing Code and other applicable codes, and permits and/or authorization to proceed with construction is issued prior to commencement of work.
- Response:** These criteria were evaluated with File No. 18-036 VAR approving use of a private onsite water and sewer system. The applicant intends to comply with these criteria. The proposed onsite septic system will be upgraded as shown on submitted plans (Exhibit E).

#### **17.84.70 PUBLIC IMPROVEMENT PROCEDURES**

*Response: All public improvements will occur within the jurisdiction of either Clackamas County (SE Orient Drive and SE Crescent Road) or the Oregon Department of Transportation (Highway 26). Permitting will be coordinated with these agencies as necessary.*

#### **17.84.80 FRANCHISE UTILITY EXTENSIONS**

These standards are intended to supplement, not replace or supersede, requirements contained within individual franchise agreements the City has with providers of electrical power, telephone, cable television, and natural gas services (hereinafter referred to as “franchise utilities”).

*Response: Franchise utilities as required will be installed according the requirements of this section.*

#### **17.84.90 LAND FOR PUBLIC PURPOSES**

- A. Easements for public sanitary sewer, water, storm drain, pedestrian and bicycle facilities shall be provided whenever these facilities are located outside a public right-of-way in accordance with the following:

*Response: No easements for the purposes identified in this section are anticipated. The applicant proposes dedicating additional right-of-way along SE Orient Drive to accommodate frontage improvements and along SE Crescent Road to accommodate construction of the proposed cul-de-sac street extension.*

### **CHAPTER 17.90 DESIGN STANDARDS**

#### **17.90.10 APPLICABILITY**

The provisions of this chapter apply to all zones and uses as follows except as specified in Sections 17.90.10(B), (C), (D), (E), and (F) below:

- A. All construction within a Commercial or Industrial Zoning District or a non-residential use in a Residential Zoning District including the following:
1. New construction;
  2. Replacement of a building that is destroyed as specified in Section 17.08.30;
  3. Addition to an existing building;
  4. Exterior alterations other than general maintenance on an existing building;
  5. Site improvements including changes to landscaping, parking, civic spaces, etc.

*Response: The proposal includes the new construction of a vehicle fueling station and convenience store. As such, the requirements of this chapter are applicable. This narrative addresses the requirements for both the fueling canopy and convenience store as applicable.*

#### **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.  
**Response:** *The subject property abuts Highway 26, SE Orient Drive, and SE Crescent Road.*
2. All lots that have access to a public alley shall provide for an additional vehicle access from that alley.  
**Response:** *The subject property does not abut an alley and this section is not applicable*
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 10-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 ft. For lots with frontage of less than 150 ft. or less, shared access may be required.  
**Response:** *Proposed off-street parking is located to the side and rear of the building as viewed from the Northeast property line. No parking is proposed within required setbacks or within 10-feet of a public right-of-way.*
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.  
**Response:** *The subject property is not adjacent to any development requiring compliance with this section.*
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.  
**Response:** *The layout of the proposed development as shown on the Site Plan does not require any of these design treatments.*
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.  
**Response:** *This section is not applicable.*
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).

**Response:** *The proposed pedestrian circulation plan as shown on the Site Plan does not conflict with any vehicle maneuvering area. The majority of parking is proposed to be located adjacent to the proposed building. A sidewalk is proposed to be constructed around the entire property boundary. The proposal complies with this standard.*

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.

**Response:** *SE Crescent Road is proposed to be constructed as a cul-de-sac which will be available to be used by the adjacent property to the West. The proposal complies with this standard.*

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.

**Response:** *The proposed primary access is intended to serve the needs of the proposed development. SE Crescent Road is available to be utilized by the adjacent property as necessary.*

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.

**Response:** *No access is permitted to Highway 26. The proposal includes a single access on SE Orient Drive and an access on SE Crescent Road. This section is not applicable.*

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.

**Response:** *A sidewalk system is proposed to essentially circle the entire site. This facility will be utilized to connect any future development on the subject property.*

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.

**Response:** *Parking requirements are evaluated in Chapter 17.98. The proposal contains 12 vehicle parking spaces, considerably less than 150 parking space and this section is not applicable.*

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

Intent: To provide building façades, materials and colors consistent with the Sandy Style. For purposes of interpreting the Sandy Style, representative illustrations and photos are provided. (Figures 17.90.120-C, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, 17.90.120-H, and 17.90.120-I; and the Color Palette and representative photos provided in the Appendix E.)

1. Articulation. The Sandy Style includes asymmetrical building forms, which by definition require buildings to be articulated, varied, and provide visual interest. This standard is met by dividing elevations visible from an abutting public street or pedestrian way into smaller areas or planes to minimize the appearance of bulk as follows:

a. All elevations visible from an abutting public street or pedestrian way shall be divided into distinct planes of no more than 40 lineal feet long to include the following:

**Response:** *The City has determined the North, south, and east elevations of the convenience store require compliance with this section.*

1) Wall planes meeting this standard shall include a feature or variation in the wall plane that are those that are entirely separated from other wall planes by a recessed or projecting section of the structure that projects or recedes at least six (6) inches from the adjacent plane, for a length of at least four (4) feet. Changes in plane may include but are not limited to recessed entries, bays, secondary roof forms (e.g., gables, lower roof sheds, dormers and towers), building bases, canopies, awnings, projections, recesses, alcoves, pergolas, porticos, roof overhangs, or other features consistent with the Sandy Style.

**Response:** *This section requires a feature or variation in the wall plane projecting or receding at least six inches for at least four feet. The North building elevation contains a three foot projection/recession about 20 feet long. The South elevation does not contain a change in the wall plain but does include a one foot roof overhang along the entire elevation, stone columns, and a gable feature in compliance with this standard. The East elevation contains similar features as the South elevation. The proposal complies with the requirements of this standard.*

2) Wall planes shall incorporate at least one visually contrasting and complementary change in materials or changes in texture or patterns, including trim, moldings, or other ornamental devices.

**Response:** All elevations of the convenience store contain a combination of stone and siding material and all windows are proposed to contain trim or are adjacent to stone accents in compliance with this standard.

- 3) The lower and upper floors of multi-storied buildings shall be delineated by using pedestrian shelters, changes in siding materials, heavy timbers, or natural wood accents (e.g. brackets, paneling, or other detailing).

**Response:** Both structures contain a single story and this section is not applicable.

2. Pedestrian Shelters. Buildings must incorporate pedestrian shelters, as follows:

**Response:** This section is only applicable to the convenience store. As reviewed below, the proposal complies with all of the standards in this section.

- a. Pedestrian shelters shall be provided over the building's primary entrance(s) and all pedestrian areas (i.e., sidewalks, and civic spaces) abutting the subject building, where pedestrians are likely to use these facilities.

**Response:** The North and west elevations of the convenience store are adjacent to parking and these areas are expected to be used by pedestrians. To address this standard the North elevation features a horizontal awning over the windows and the service door on this elevation. The West elevation includes a cover over the primary building entrance in addition to two horizontal awnings. These features address the requirements of this standard.

- b. Features such as canopies, arcades, awnings, roofs overhangs, covered porches, alcoves, and/or porticoes are required to protect pedestrians from the rain and sun.

**Response:** The proposed design includes both a roof overhang at the primary entrance and awnings over other pedestrian areas.

- c. Pedestrian shelters must extend at least five (5) feet over the pedestrian area.

**Response:** As shown on submitted building elevations, all pedestrian shelters extend at least five feet over the adjoining pedestrian area.

- d. Shelters designed with gables (e.g., over building entrances) are preferred over flat shelters, and must comply with the roof pitch standards in Section 17.90.120(C). Dome or bubble shaped awnings are not permitted.

**Response:** The primary building entrance is designed with a gable roof in compliance with the roof pitch standards. Because of the height of the building and other design features, all other pedestrian shelters are designed with a flat (horizontal) as permitted by this standard.



3. Building Materials. Exterior building materials shall convey an impression of strength and durability consistent with the Sandy Style, as follows:

- a. Buildings on the same site shall be architecturally unified. Architectural unity means buildings are related in architectural style and share some common elements, such as color scheme, materials, roof forms, and/or detailing. Unity does not mean repetition or mirroring of building elevations.

**Response:** *Both the convenience store and fueling canopy are designed to be architecturally unified. Any other buildings constructed on the site will be designed to address this standard. The proposal complies with this standard.*

- b. Strong base materials such as natural stone (e.g., basalt, granite, river stone), split-faced rusticated concrete block, brick, or concrete form liner replicating these materials are required. Cultured stone may be allowed if it has a stone texture and is similar in appearance and durability to natural stone. 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 an abutting public street. If the site contains a grade differential making construction of a minimum 36-inch base impracticable, the reviewing body may allow portions of the base to be less than 36-inches.

**Response:** *All elevations of the convenience store contain a minimum 44-inch high cultured stone base except on a portion of the West elevation where this base is 4 ft. 10-inches. The eight support posts of the proposed fueling canopy also include a 66-inch stone base. This base is taller than that proposed on the convenience store to better match the scale and height of the canopy structure. The proposal complies with this standard.*

- c. Foundations shall be designed to match the scale of the building being supported. Sheathing the foundation structure with base materials and wall siding are examples of methods which accomplish this purpose.

**Response:** *All of the foundation material will be covered by the proposed base material in compliance with the standard.*

- d. Siding shall consist of wood, composite-wood (e.g., concrete fiberboard, panels or shingles), stone, brick, split-faced or rusticated concrete block, concrete form liner or a combination of these materials. Stucco, synthetic stucco, or metal are only permitted as specified below. Vinyl, plastic or similar siding is not permitted.

**Response:** *Proposed siding materials include a combination of composite board and batten and horizontal siding, and cultured stone.*

- 1) Where wood siding is used, it shall consist of horizontal (e.g., lap, v-groove, or tongue-and-groove) siding, vertical (board and batten) siding,

shingles, or combinations thereof. Vertical grooved (i.e., T1-11) sheet siding and similar materials are prohibited.

**Response:** *Areas covered with wood-like materials on both structures include a combination of horizontal lap siding and board and batten. No vertical grooved sheet siding is proposed in compliance with this standard.*

- 2) Where board-and-batten siding is used, battens shall be a minimum of 2-inches wide x 1-inch deep and spaced 24 inches apart or closer; rough-sawn boards (specialty panel) are preferred over panels having a resin overlay.

**Response:** *Areas covered with board and batten siding feature three-inch wide by one-inch deep battens spaced 12 inches apart in compliance with this standard.*

- 3) Where masonry siding is used, it shall consist of brick, stone, or rusticated concrete block, and must incorporate decorative patterns over not less than 15 percent of every elevation where it is used. Examples of decorative patterns include multicolored masonry units, such as brick, stone, or cast stone, in layered or geometric patterns or split-faced concrete block to simulate a rusticated stone-type construction. Changes in pattern should be used to accentuate breaks in building stories, corners, windows, and building tops (e.g., parapets where flat roofs are allowed).

**Response:** *Stone is used primary as a base material but is also used as an accent material on columns and on several wall panels. Because of the texture and pattern inherent in this material, the proposal complies with the standard.*

- 4) Where metal siding is used, it shall be used as an accent only, comprising not more than 30 percent of the surface area of the building elevation (e.g., wainscoting or other accent paneling). Metal must be architectural grade and have a non-reflective (burnished or painted) finish conforming to the Color Palette in Appendix C. Metal may also be used for flashing, gutters, downspouts, brackets, lighting, and signage and similar functional elements.

**Response:** *No metal siding is proposed. The proposed metal roof color is selected from the approved color palette.*

- 5) Where stucco or synthetic stucco is used, it shall only be used as an accent comprising not more than 30 percent of the surface of the building elevation.

**Response:** *No stucco or synthetic stucco is proposed.*

- 6) Where concrete form liner is used, it shall be limited to patterns replicating horizontal wood siding, stone, or brick as shown in Appendix H and shall not include ribbed, fluted, or similar patterns.

**Response:** *Concrete form liner is not proposed.*

- e. Building elevations facing a public street shall incorporate at least three (3) of the following features: Using these features may also address other code requirements, such as those related to building articulation, change in relief, pedestrian shelters, storefront elements.
  - 1) Exposed, heavy timbers;
  - 2) Exposed natural wood color beams, posts, brackets and/or trim (e.g., eaves or trim around windows);
  - 3) Natural wood color shingles (e.g., used as siding or to accent gable ends);
  - 4) Metal canopies;
  - 5) Heavy metal brackets (e.g., cast iron or similar appearance), which may be structural brackets or applied as cosmetic detailing, and/or;
  - 6) Similar features, consistent with the Sandy Style.

**Response:** *The North, south, and east elevations face public streets. The North elevation facing SE Orient Drive contains heavy timbers, metal awnings, stone, window trim, and decorative lighting fixtures. The South elevation facing Highway 26 contains visible heavy timbers, window trim, stone base materials, a metal roof overhang, and decorative lighting fixtures. The East elevation also facing SE Orient Drive contains visible heavy timbers, window trim, stone base materials, a metal roof overhang, and decorative lighting fixtures. Each of these elevation contain the required number of design features in compliance with this standard.*

- f. Materials required on elevations visible from an abutting public street must turn the building corner and incorporate appropriate transitions onto elevations not requiring these materials for a distance of not less than four (4) feet.

**Response:** *All required materials are provided on all building elevations and all materials turn the corner of the building in compliance with this standard.*

4. Colors. Building exteriors shall comply with the following standards:

- a. Permitted colors include warm earth tones (tans, browns, reds, grays and greens) conforming to Color Palette in Appendix C.

**Response:** *As shown on the submitted building elevations, all painted surfaces (horizontal siding, trim, and metal flashing) will be painted with colors selected from the City's approved color palette (Nankeen and Jewett White) in compliance with this standard.*

- b. High-intensity primary colors, metallic colors and black, may be utilized as trim and detail colors only, not to exceed one percent (1%) of the surface area of any elevation. Such color shall not be used as primary wall colors.

**Response:** *None of these colors are proposed on the convenience store. The applicant proposes including bands of blue and red below the canopy fascia.*

- c. Day-glow colors, highly reflective colors, and similar colors are not permitted.

**Response:** *None of these colors are proposed.*

**C. Roof Pitch, Materials, and Parapets**

Intent: To provide roof forms and detailing consistent with the Sandy Style. For purposes of interpreting the Sandy Style, representative illustrations and photos are provided. (Figures 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, 17.90.120-H, and 17.90.120-I and representative photos in Appendix E)

- 1. Except as provided in subsections 17.90.120(C)(8), below, pitched (gabled or hipped) roofs are required on all new buildings with a span of 50-feet or less. Gable and hipped roof forms must achieve a pitch not less than the following:

Zoning District	Primary Roof Forms (minimum)	Secondary Roof Forms (minimum)
C-2 and I-1	6:12	4:12

**Response:** *As shown on the Overall Roof Plan, the proposed store has a span of approximately 47 feet. Instead of a pitched roof the applicant is proposing an applied pitched roof as allowed by Section (C)(8) below. The proposed roof form has the appearance of a hip and valley roof with an elevated entrance feature on the West elevation and an area of flat roof south of this feature. This design has an appealing asymmetrical appearance when viewed from the West in compliance with this standard.*

- 2. As provided above, “Primary Roof Forms” are those that individually comprise 20 percent or more of the total surface area of a roof elevation. Secondary roof forms (e.g., dormers, towers, cupolas, etc.) are those that comprise less than 20 percent of the roof elevation. See also, Section 17.74.20 Vertical Projections.

**Response:** *All elevations of the convenience store and fueling canopy contain secondary roof forms as shown on submitted plans.*

- 3. When practicable, buildings shall be oriented so the gable end of the roof faces the abutting street.

**Response:** *As noted above, the proposed roof on the convenience is a hip and valley form. The primary entrance of this structure is oriented towards the West in the direction of the fueling canopy. The elevated entrance features with heavy timbers will be visible from and provide a clear entry from all*

*directions. The fueling canopy contains a similar roof form with large dormers on each elevation.*

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.

Roof Length	Number of Secondary Roof Forms
30-40 feet	1
41-80 feet	2
81 feet and greater	4

**Response:** *The roof of each elevation of the convenience store is broken up by a dormer or elevated feature to provide visual interest. The East and west elevations of the fueling canopy roof are broken up by large (28 foot wide) dormers and the North and south elevations are broken up by similar 20 foot wide dormer features. These size of these features address the requirements of this standard.*

5. Visible roof materials must be wood shingle or architectural grade composition shingle, slate, or concrete tile. Metal with standing or batten seam may also be used conforming to the Color Palette in Appendix D.

**Response:** *All roof materials are proposed to be standing seam and comply with the required color palette.*

6. All roof and wall-mounted mechanical, electrical, communications, and service equipment, including satellite dishes and vent pipes, shall be screened from view from all adjacent public rights-of-way and civic spaces by parapets, walls or by other approved means. Roof plans and elevations must show proposed equipment locations, approximate dimensions, and line of sight from public rights-of-way and civic spaces. The reviewing body may require additional equipment setbacks, screen walls, or other mitigation to ensure compliance.

**Response:** *All mechanical equipment will be contained within the roof well of the applied pitched roof. As shown on the submitted Roof Plan, this equipment will be located well below the height of the roof walls and will not be visible from adjacent public rights-of-way.*

7. A-frame buildings and Mansard-style roofs are not permitted.

**Response:** *The proposed roof form is similar to a Hip and Valley roof form and is not an A-frame or a Mansard-style roof form.*

8. Exception to Pitched Roof: When a building requires a roof span greater than 50-feet, or the internal function of the building or a portion of the building

make construction of a pitched roof impractical, the reviewing body may allow an alternative roof form. An alternative roof form includes an “applied pitched roof” or flat roof constructed over the building or portion of the building as specified below. An example when a pitched roof is considered impractical would be the need to have large rooftop stove vents over the kitchen portion of a restaurant. Roof forms constructed under this exception shall comply with the standards below.

- a. Applied Pitched Roof: An “applied pitched roof” is the preferred alternative roof form and shall be considered first. An “applied pitched roof” is a roof form with the general appearance of a pitched roof in terms of materials, pitch, and overhang, but does not extend all the way from the eave of the building to the ridge of the roof as a typical pitched roof. An “applied pitched roof” shall be constructed according to the following:
- 1) For buildings with a span of less than 50 feet, the “applied pitched roof” shall extend at least 50 percent of the distance from the eave to the ridge as if had been constructed as a pitched roof;
  - 2) For buildings with a span of 50 feet or greater, the applied pitched roof shall extend at least 12 feet from eave.
  - 3) The reviewing body may require buildings with a span of 50 feet or greater to include an “applied pitched roof” in lieu of a flat roof along street facing elevations.

***Response:** The proposed convenience store contains a span of approximately 47 feet. As shown on the Equipment Layout Plan a kitchen and rooftop vent are proposed. As such, the applicant proposes an “applied pitched roof” over the majority of the structure in compliance with this section. As shown on the Roof Plan, each side of the hip and valley “applied pitched roof” extends about six feet from the eave, a distance which is at least 50 percent of the distance from the eave to the ridge if this building had been constructed with a full pitched roof. The proposal complies with this standard.*

- b. Flat Roof: Flat roofs shall comply with the following standards:
- 1) Sandy Style stepped parapets and detailed coursing shall be provided on those elevations visible from a public street. Parapets shall be varied so that the length of a parapet does not exceed 40 feet without a change in the parapet height of at least 2 feet or as necessary to hide rooftop equipment.  
***Response:** An “applied pitched roof” is proposed over the majority of the wall. The West elevation contains a 19 foot wide area appearing as a flat roof with a four foot parapet south of the elevated entrance features. These features comply with this standard.*
  - 2) Average parapet height shall not exceed 15 percent of the supporting wall height, and the maximum parapet height shall not at any point exceed one-third (1/3) of the height of the supporting wall;

**Response:** *The proposed parapet height on the short flat roof section is 22 percent less than one-third of the supporting wall height in compliance with this section.*

- 3) A cornice projecting at least six (6) inches from the building face shall be provided at the roofline of all elevations visible from public rights-of-way;

**Response:** *A cornice projecting about sixteen inches from the building face is included on the flat roof section in compliance with this section.*

- 4) Parapet corners shall be stepped and the parapet be designed to emphasize the center or primary entrance(s), unless the primary entrance is at the corner of the building;

**Response:** *The North end of the parapet dies into the elevated entrance feature and the South end turns 90 degrees and dies into the "applied pitched roof". Because this turn is not a building corner stepping of the parapet height is not provided. The proposal complies with the intent of this standard.*

#### **D. Building Orientation and Entrances**

Intent: To maintain and enhance General Commercial and Industrial streetscapes as public spaces, emphasizing pedestrian-scale and character in new development, consistent with the Sandy Style. (Figures 17.90.120-A, 17.90.120-B, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, and 17.90.120-H) and representative photos in Appendix E.

1. Buildings shall be oriented to a public street or civic space. This standard is met when at least 50 percent of the subject site's street frontage is comprised of building(s) placed within 20 feet of a sidewalk, walkway or civic space and not more than 20 percent of the off-street parking on a parcel as required by SDC 17.98, tract or area of land is located between a building's front façade and the adjacent street(s).

**Response:** *The primary building entrance on the West elevation is oriented to the fueling canopy. The North and east building elevations are oriented to SE Orient Drive and the proposed civic space. The proposed building comprises 55 percent of the Northeast (front) property line and is located within eight feet of the proposed civic space and adjacent sidewalk system. Five off-street parking spaces are proposed along the North side of the building but none of these spaces are located between the proposed civic space and the sidewalk system along the Northeast property line. The proposal complies with the intent of this section.*

2. Where parking is placed between a front façade and a street, a landscaped berm and/or architectural features, such as a knee wall, colonnade, arbor, trellis and/or similar device, shall be placed behind the sidewalk to partially screen the parking area from the sidewalk. The partial screen shall be

designed to achieve at least 50 percent opacity at the time of installation, with openings for walkways connecting to the building's primary entrance.

**Response:** *A landscaped berm is proposed to be constructed between a portion of the North and northeast property lines and the five proposed parking spaces on the North side of the building as required by this section. This berm is designed in compliance with this section.*

3. Ground floor spaces shall face a public street or civic space and shall be connected to it by a direct pedestrian route (i.e., avoid out-of-direction travel).

**Response:** *A direct pedestrian sidewalk is proposed to connect the convenience store to both SE Orient and Highway 26.*

4. Buildings located at the intersection of two streets shall use a corner building entrance; where a corner entrance is not practical due to the internal functioning of the building space or due to physical constraints of the site (e.g., topography, accessibility, or similar circumstances), a building entrance must be provided within forty feet of the corner. The building corner must use detailing that emphasizes the corner location and is consistent with the Sandy Style. Examples of acceptable detailing include a rounded or chamfered (beveled) corner, weather protecting canopy, plaza, sculpture, and/or similar pedestrian-oriented features.

**Response:** *The subject property is technically located at the corner of Highway 26 and SE Orient Drive. Due to site constraints and the functioning of the proposed fueling island, the primary entrance of the convenience store is located to face the fuel island (facing west). A pedestrian connection has been provided to the proposed civic space located at the Northeast corner of the building and the primary building entrance. The elevated entrance feature will be visible from the East and a series of horizontal awnings provide weather protection for pedestrians approaching the building from this direction.*

5. For structures greater than 40,000 gross square feet, there shall be at least two (2) clearly articulated public entrances on the structure; at least one such entrance shall be visible from a public street and connected to that street by a pedestrian sidewalk or walkway.

**Response:** *The proposed convenience store contains 3,069 square feet and the fueling area canopy contains 3,240 square feet. This standard is not applicable.*

6. Retail buildings shall provide at least one customer entrance for every 200 lineal feet of anchor store space along at least one of the building's street-facing elevation(s). Such entrances may be oriented to a public street or designated civic space. Where ancillary stores or offices are provided, entrances to those spaces must be placed not more than 40 feet apart on average. For example, a 300 foot long building with one anchor store and four



ancillary stores would provide no fewer than two anchor space entrances spaced not more than 200 feet apart and four ancillary entrances placed not more than 40 feet apart on average.

**Response:** *The proposed 3,069 square foot convenience store contains a primary building entrance facing the proposed fueling area. A service door is provided on the North building elevation. The proposal complies with this section.*

7. Buildings shall provide at least one (1) elevation where the pedestrian environment is “activated”. An elevation is “activated when it meets the window transparency requirements in subsection 17.90.120(E), below, and contains a public entrance with a pedestrian shelter extending at least five (5) feet over an adjacent sidewalk, walkway or civic space.

**Response:** *The West elevation is identified as the “activated” elevation. This elevation contains the primary building entrance and a gabled entry feature extending at least five feet over the sidewalk in front of the entrance. As detailed below, this elevation exceeds the window transparency requirements in subsection 17.90.120(E) below. The proposal complies with this section.*

8. Primary entrances must be architecturally emphasized and visible from the public right-of-way and shall be sheltered with a canopy, overhang, or portico with a depth of at least five (5) feet. Architectural emphasis should be provided by a gabled shelter where practical, consistent with the Sandy Style. Detailing around the base of the building, such as stonework, benches or art, should also be used to emphasize an entrance.

**Response:** *The West building elevation is the primary entrance. This elevation includes an elevated gable entrance feature extending five feet from the face of the building and a secondary gable feature. This elevation also includes a stone base, additional stone treatments, and decorative light fixtures.*

#### E. Windows

Intent: To promote business vitality, public safety and aesthetics through effective window placement and design, consistent with the Sandy Style. (Figures 17.90.120-A, 17.90.120-B, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, and 17.90.120-H)

1. Unified Design. Building plans must provide for unity in window placement and design so that all sides of a building relate to one another and multiple buildings on a development site relate to one another.

**Response:** *All building elevations are proposed to contain windows so that all sides of the building relate to one another as required by this standard.*

2. Ground Floor Windows. The ground floor elevation of all new buildings shall contain ground floor display areas, windows, and doorways on the “activated” frontage as follows:

Building Size	Percentage Windows Required
0 - 10,000 sq. ft.	30 percent of elevation
10,000 sq. ft. - 30,000 sq. ft.	25 percent of elevation
Greater than 30,000 sq. ft.	20 percent of elevation

**Response:** *The West building elevation of the convenience store is considered the “activated” frontage. The area of this elevation totals 1090 square feet and 362 square feet of the elevation are in clear vision windows and doors resulting in 32.2 percent of this elevation. The design complies with the minimum 30 percent standard.*

- a. Windows shall contain clear glass to allow views to interior activity or display areas. The bottom edge of windows shall be no less than three (3) feet above the adjacent finished grade. Where the internal functions of a building preclude windows at this height, the reviewing body may allow windows above or below this height. Display boxes affixed to a building’s exterior are not counted in meeting the above standard.

**Response:** *All windows on this elevation will be clear glass. These windows except at the door will be located an average of three feet above the adjacent finished grade.*

- b. Windows shall be square or vertically oriented and may consist of vertically stacked or horizontally banked window units. Windows located over a door or transom windows may be horizontally oriented.

**Response:** *The majority of windows proposed on the building will be divided into vertically oriented units in compliance with this standard.*

- c. Windows with any dimension exceeding six (6) feet shall be divided to contain two or more smaller panes with real divided panes, vinyl inserts, or applied dividers.

**Response:** *No windows are proposed to exceed six feet in any dimension without being divided into smaller panes.*

- d. Windows shall have trim or moldings at least three (3) inches in width around them, or have reveals of at least three (3) inches in depth. Casings shall consist of a drip cap, head casing, side casings, and/or sills.

**Response:** *All windows are proposed to include trim or will be adjacent to stone. A pre-cast sill is provided at the bottom of all window units.*

3. Upper Floor Window Standards.

- a. The reviewing authority may require buildings exceeding 20 feet in height to provide upper-story windows along the “activated” frontage. Such windows may be required for attic space, or applied to roof forms where no

second story exists, to meet the articulation requirements under Section 17.90.120(B)(1).

**Response:** *The proposed building does not exceed 20 feet in height and does not require upper floor windows. The elevated entry feature includes windows in the upper portion of this element.*

- b. Windows shall be square or vertically oriented. Individual window units shall not exceed five (5) feet by seven (7) feet. Any portion of a window unit with a dimension exceeding four (4) feet shall be divided into smaller panes.

**Response:** *This section is not applicable.*

- c. At least half of all the window area in upper floors shall be made up of glass panes with dimensions no greater than two (2) feet by three (3) feet, unless approved by variance or adjustment. Upper story windows that have one (1) foot by one (1) foot grid inside double pane glass are appropriate and are encouraged.

**Response:** *This section is not applicable.*

- d. Window trim and moldings shall be compatible with those used on the ground floor.

**Response:** *This section is not applicable.*

#### 4. Prohibited Windows.

- a. Darkly tinted windows, mirrored windows, and similar windows are prohibited adjacent to street sidewalks, civic spaces and walkways.

**Response:** *Because of the internal function of the building, some of the windows on the North, east, and south elevation are proposed to contain spandrel glass.*

- b. Glass curtain windows are not permitted facing public right-of-ways, except where the reviewing body finds that such windows are consistent with the Sandy Style.

**Response:** *No glass curtain windows are proposed.*

#### F. Landscaping and Streetscape Design

Intent: To promote business vitality, public safety and aesthetics through effective landscaping and streetscape design, 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. (See Figures 17.90.120-J and 17.90.120- K and Appendix G)

- 1. The provisions of Chapter 17.92 Landscaping and Screening General Standards shall apply.

**Response:** *A Landscape Plan in compliance with requirements of Chapter 17.92 is included with the submittal package.*

2. Parcels abutting Highway 26 shall provide a landscape buffer comprising not less than 30 percent of the highway frontage, to a depth of not less than 20 feet. Within the buffer, existing trees shall be preserved to the extent practicable. New trees, shrubs, and groundcover shall be planted to create a landscape buffer and partial visual screen along the highway as specified below or as approved by the reviewing authority. If approved in writing by the Oregon Department of Transportation, this buffer may be located within the public right-of-way. Any new or modified access must fall outside the designated buffer. Landscape plans shall indicate proposed landscaping, signage and other proposed development.

**Response:** *The site contains frontage along Highway 26. As shown on Sheet 2 of the Civil Plans, 35 percent of this frontage is a buffer of existing Douglas fir trees in compliance with this section. The Landscape Plan shows all plantings within this buffer comply with these standards.*

3. Landscape buffer plantings shall contain a mixture of both deciduous and evergreen species selected from the list below and shall be of a sufficient quantity to provide a partial buffer within two years from the date they are planted:
  - Trees - Deciduous (minimum 1 1/2-inch caliper) -Autumn Blaze Maple, Red Sunset Maple, Scarlet Oak. Evergreen (minimum 8-10 feet) - Hogan Cedar, Incense Cedar, Western Red Cedar, Douglas fir.
  - Small Trees/Shrubs - Vine Maple, Serviceberry, Chinese Kousa Dogwood, Red flowering Currant, Ceanothus 'Blue Blossom', Rhododendron, Pacific Wax Myrtle.
  - Groundcover - Kinnickinick, Salal, Low Oregon Grape, Coastal Strawberry, Rock Rose.

**Response:** *Only species selected from this list are proposed along the Highway 26 frontage as required as shown on the Landscape Plan.*

4. All service and storage areas must be screened from view from all adjacent rights-of-way. (See Figure 17.90.120-K below.)

**Response:** *The proposed trash enclosure will be screened from view by landscape materials as required as shown on the Landscape Plan. This structure will be constructed using materials used on the other structures.*

#### G. Civic Space

Intent: To connect buildings to the public realm and create comfortable and attractive gathering places and outdoor seating areas for customers and the public, consistent with Sandy's Downtown Streetscape Design. (See Figures 17.90.120-L and 17.90.120-M)

1. Not less than three (3) percent of the building area of every development shall be improved as civic space.

**Response:** *The proposed convenience store and fueling canopy total 6,309 square feet requiring 189 square feet of civic space (6,309 x .03). The Site*

*Plan features a 380 square foot civic space which represents about six percent of the overall building area in compliance with this standard.*

2. All civic spaces shall have dimensions of not less than eight (8) feet across and have a surface area of not less than 64 square feet. No civic space is required if the size of this space results in an area of less than 64 square feet.

***Response:*** *As noted above the proposed civic space contains 380 square feet and is about 20 feet across in compliance with this standard.*

3. Civic space improvements may include plazas, private extensions of sidewalks and walkways (i.e., to accommodate outdoor seating), public art, pedestrian-scale lighting, bus waiting areas, tourist amenities (e.g., way finding signs as approved by the city) or similar pedestrian amenities as approved through Design Review.

***Response:*** *The details of the civic space will be determined with submittal of building plans. At a minimum, this area is anticipated to include pedestrian scale lighting and seating.*

4. The highest priority locations for civic space are those areas with the highest pedestrian activity (e.g., street corners and mid-block pedestrian access ways) that have a western or southern exposure.

***Response:*** *The proposed civic space will be located at the Northeast corner of the convenience store in an area with a western and southern exposure in compliance with this section.*

5. Civic spaces should abut a public right-of-way or otherwise be connected to and visible from a public right-of-way by a sidewalk or approved pedestrian access way; access ways shall be identifiable with a change in paving materials (e.g., pavers inlaid in concrete or a change in pavement scoring patterns and/or texture) or painted. Where a right-of-way connection is not possible, the owner must provide a public access way easement to the civic space. Civic spaces shall not be gated or closed to public access, unless otherwise required by the city.

***Response:*** *The proposed civic space will be connected to the sidewalk to the building and the perimeter sidewalk system in compliance with this standard.*

6. The reviewing authority may consider the voluntary provision of civic space or pedestrian amenities in quantities exceeding the minimum standards of this code in approving an adjustment or variance.

***Response:*** *The applicant is proposing 191 square feet more of civic space than the 189 square feet required. The applicant requests this voluntary provision of additional civic space be considered in reviewing any requested adjustment or variance.*

7. Exceptions:

- a. Building additions and remodels subject to Type I Design Review are not required to set aside or improve civic space, though they are encouraged to do so.

**Response:** *This section is not applicable.*

#### H. Lighting

Intent: To promote business vitality, public safety and aesthetics through effective outdoor lighting, consistent with the Sandy Style. (Figures 17.90.120-G, 17.90.120-H, and 17.90.120-M)

1. Streetscape lighting shall conform to Chapter 15.30 Dark Sky Ordinance.  
**Response:** *The applicant is waiting to receive the required photometric analysis addressing the requirements of this standard. This plan will be submitted as soon as it is available.*
2. Exterior lighting must be an integral part of the architectural design and must complement any ornamental street lighting and remain in context with the overall architectural character of the district. On-site light fixtures conforming to the Sandy Style are encouraged.  
**Response:** *All light fixtures on the convenience store are full cutoff Sandy Style fixtures. All fixtures on the fueling canopy will be under the canopy and surface mounted. The design of perimeter parking lot lighting will comply with the requirements of Chapter 15.30, Dark Sky Ordinance.*
3. Lighting must be adequate for safety purposes. Walkways and parking lots should be illuminated at 1.5 - 2.0 foot candles.  
**Response:** *The photometric analysis will be designed to comply with this standard.*

#### I. Safety and Security

Intent: To promote natural surveillance of public spaces for safety and security.

1. Locate windows in a manner that enables tenants, employees and police to watch over pedestrian, parking and loading areas.  
**Response:** *The west elevation is designed with clear windows to allow viewing of the fueling area. Cameras will be installed to allow viewing of all areas around the building.*
2. In commercial, public and semipublic development, including civic spaces, locate windows in a manner that enables surveillance of interior activity from the public right-of-way.  
**Response:** *The design of the building prevents direct viewing of the proposed civic space. Cameras will be installed to provide surveillance of this area.*

3. Provide street address numbers measuring a minimum of six (6) inches high, which clearly locates buildings and their entries for patrons and emergency services.

**Response:** *Street address number complying with this standard will be installed.*

4. Locate, orient and select on-site lighting to facilitate surveillance of on-site activities from the public right-of-way and other public areas.

**Response:** *The lighting plan will be designed to ensure the site is sufficiently lite to ensure safety and security.*

#### J. External Storage

Intent: To promote land use compatibility and aesthetics, particularly where development abuts public spaces. (Figure 17.90.120-K)

1. The exterior storage of merchandise and/or materials, except as specifically authorized as a permitted accessory use, is prohibited.

**Response:** *No exterior storage of merchandise or materials is proposed.*

2. Where such storage is allowed, it must be screened from view from public rights of way and civic spaces at least eight (8) feet and not more than 10 feet unless the screen is a continuation of the building wall.

**Response:** *This section is not applicable.*

3. Mechanical, electrical, and communications equipment including meters and transformers, service and delivery entrances, and garbage storage areas shall be screened from view from all public rights-of-way and civic spaces.

**Response:** *The majority of mechanical equipment will be mounted on the roof and will be hidden within a roof well designed for this purpose. As shown on the submitted Landscape Plan, the proposed trash enclosure will be screened from view by landscape materials.*

4. Trash collection and recycling storage areas must be located within the structure or otherwise screened from view in an enclosed facility. Such facilities must be screened from view from all public rights of way and civic spaces behind a screening wall constructed to match the materials used on the primary building(s) on the subject site.

**Response:** *The Site Plan shows the location of the proposed trash and recycling enclosure to the west of the fueling canopy. This enclosure will be constructed using complementary materials to the convenience store and fueling canopy and will be screened from view by plant materials as shown on the Landscape Plan.*

5. Exceptions to the above provisions may be allowed through Design Review where no other practical alternative exists and such equipment is made to be visually subordinate to the proposed building and landscape, for example,

through the use of common materials for screening walls or landscape berms. The reviewing body may require additional setbacks, screening walls or other mitigation, for aesthetic reasons and to minimize odors or noise impacts on adjoining properties, public rights-of-way or civic spaces.

**Response:** *No exceptions to these standards are proposed or required.*

## **CHAPTER 17.92 LANDSCAPING AND SCREENING GENERAL STANDARDS - ALL ZONES**

**Response:** *As noted above, because of site constraints with the proposed stormwater detention facility and the nature of the proposed use, no onsite landscaping is proposed with this application. The proposal includes landscaping within the public right-of-way in the location of the removed approach on Proctor Blvd.*

### **17.92.10 GENERAL PROVISIONS**

- A. Where landscaping is required by this Code, detailed planting plans shall be submitted for review with development applications. No development may commence until the Director or Planning Commission has determined the plans comply with the purposes clause and specific standards in this chapter. All required landscaping and related improvements shall be completed or financially guaranteed prior to the issuance of a Certificate of Occupancy.

**Response:** *A Landscape Plan (Exhibit D) containing the details of proposed landscape planting is included. The applicant understands that all required landscaping shall be completed or financially guaranteed prior to the issuance of a Certificate of Occupancy.*

- B. Appropriate care and maintenance of landscaping on-site and landscaping in the adjacent public right-of-way is the right and responsibility of the property owner, unless City ordinances specify otherwise for general public and safety reasons. If street trees or other plant materials do not survive or are removed, materials shall be replaced in kind within 6 months.

**Response:** *All required landscape materials will be cared for the duration as required.*

- C. Significant plant and tree specimens should be preserved to the greatest extent practicable and integrated into the design of a development. Trees of 25-inches or greater circumference measured at a height of 4-1/2 ft. above grade are considered significant. Plants to be saved and methods of protection shall be indicated on the detailed planting plan submitted for approval. Existing trees may be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area 5-ft. outside the tree's drip line. Trees to be retained shall be protected from damage during construction by a construction fence located 5 ft. outside the dripline.

**Response:** *The proposal preserves trees to the greatest extent practicable to allow development of the site for the proposed use. Preserved trees are included in a tree protection area adjacent to Highway 26. These trees will be protected by tree protection fencing as required.*



- D. Planter and boundary areas used for required plantings shall have a minimum diameter of 5-ft. (2-1/2 ft. 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 7-1/2 ft.  
**Response:** *All planter areas have a minimum depth of five feet. No vehicle parking is proposed to be located adjacent to any landscape planter.*
- E. In no case shall shrubs, conifer trees, or other screening be permitted within vision clearance areas of street, alley, or driveway intersections, or where the City Engineer otherwise deems such plantings would endanger pedestrians and vehicles.  
**Response:** *The Landscape Plan will be modified as required to address vision clearance requirements necessary.*
- F. Landscaped planters and other landscaping features shall be used to define, soften or screen the appearance of off-street parking areas and other activity from the public street. Up to 35 percent of the total required landscaped area may be developed into pedestrian amenities, including, but not limited to sidewalk cafes, seating, water features, and plazas, as approved by the Director or Planning Commission.  
**Response:** *Landscape planters at the end of the two parking bays help to define and soften the appearance of these areas.*
- G. Required landscaping/open space shall be designed and arranged to offer the maximum benefits to the occupants of the development as well as provide visual appeal and building separation.  
**Response:** *As noted above, about 68 percent of the site will contains landscaping. All landscaped areas are designed to enhance the appearance of the site to provide visual appeal and interest.*
- H. Balconies required for entrances and exits shall not be considered as open space except where such exits and entrances are for the sole use of the unit.
- I. Roofed structures shall not be included as open space except for open unenclosed public patios, balconies, gazebos, or other similar structures or spaces.  
**Response:** *These sections are not applicable.*
- J. Driveways and parking areas shall not be included as open space.  
**Response:** *None of these areas are included in site landscaping calculations.*
- K. All areas not occupied by paved roadways, walkways, patios, or buildings shall be landscaped.  
**Response:** *As shown on the Landscape Plan all areas not occupied by buildings and paved surfaces will be landscaped.*
- L. All landscaping shall be continually maintained, including necessary watering, weeding, pruning and replacing.

**Response:** All landscaping is intended to be maintained as required.

#### **17.92.20 MINIMUM IMPROVEMENTS - LANDSCAPING AND SCREENING**

The minimum landscaping area of a site to be retained in landscaping shall be as follows: C - 2 General Commercial - 20%

**Response:** As show on the Landscape Plan and Site Plan, 65,918 square feet of the 97,108 square foot site (68 percent) is proposed to be landscaped exceeding the minimum required landscaping of 20 percent.

#### **17.92.30 REQUIRED TREE PLANTINGS**

Planting of trees is required for all parking lots with 4 or more parking spaces, public street frontages, and along private drives more than 150 feet long. Trees shall be planted outside the street right-of-way except where there is a designated planting strip or City adopted street tree plan.

The City maintains a list of appropriate trees for street tree and parking lot planting situations. Selection of species should be made from the city-approved list. Alternate selections may be approved by the Director following written request. The type of tree used shall determine frequency of trees in planting areas. Trees in parking areas shall be dispersed throughout the lot to provide a canopy for shade and visual relief.

**Response:** A Landscape Plan is included with the submitted plan set. This plan identifies both onsite landscaping and landscape materials offsite on the perimeter of the site. Trees are proposed adjacent to all driving surfaces and within the planter bay at the Northwest corner of the building.

#### **17.92.40 IRRIGATION**

Landscaping shall be irrigated, either with a manual or automatic system, to sustain viable plant life.

**Response:** All landscape areas will be irrigated using either a manual or automatic system. The details of this system will be determined with building plans.

#### **17.92.50 TYPES AND SIZES OF PLANT MATERIALS**

- A. At least 75% of the required landscaping area shall be planted with a suitable combination of trees, shrubs, or evergreen ground cover except as otherwise authorized by Chapter 17.92.10 F.
- B. Plant Materials. Use of native plant materials or plants acclimatized to the Pacific Northwest is encouraged where possible.
- C. Trees shall be species having an average mature spread of crown greater than 15 feet and having trunks which can be maintained in a clear condition with over 5 feet of clear wood (without branches). Trees having a mature spread of crown less than 15 feet may be substituted by grouping the same so as to create the equivalent of a 15-foot crown spread.
- D. Deciduous trees shall be balled and burlapped, be a minimum of 7 feet in overall height or 1 1/2 inches in caliper measured 6 inches above the ground, immediately after planting. Bare root trees will be acceptable to plant during their dormant season.

- E. Coniferous trees shall be a minimum five feet in height above ground at time of planting.
- F. Shrubs shall be a minimum of 1 gallon in size or 2 feet in height when measured immediately after planting.
- G. Hedges, where required to screen and buffer off-street parking from adjoining properties shall be planted with an evergreen species maintained so as to form a continuous, solid visual screen within 2 years after planting.
- H. Vines for screening purposes shall be a minimum of 1 gallon in size or 30 inches in height immediate after planting and may be used in conjunction with fences, screens, or walls to meet physical barrier requirements as specified.
- I. Groundcovers shall be fully rooted and shall be well branched or leafed. If used in lieu of turf in whole or in part, ground covers shall be planted in such a manner as to provide complete coverage in one year.
- J. Turf areas shall be planted in species normally grown as permanent lawns in western Oregon. Either sod or seed are acceptable. Acceptable varieties include improved perennial ryegrasses and fescues used within the local landscape industry.
- K. Landscaped areas may include architectural features or artificial ground covers such as sculptures, benches, masonry or stone walls, fences, rock groupings, bark dust, decorative hard paving and gravel areas, interspersed with planted areas. The exposed area developed with such features shall not exceed 25% of the required landscaped area. Artificial plants are prohibited in any required landscape area.

***Response:** The submitted Landscape Plan has been designed in accordance with the standards of this section. All trees deciduous trees will be at least 1.5-inch caliper, coniferous trees at five feet in height, shrubs will be three to five gallon, groundcover will be three-four inches and spaced 18 - 36-inches on-center as appropriate. A small area of lawn is proposed adjacent to the proposed civic space.*

**17.92.70 LANDSCAPING BETWEEN PUBLIC RIGHT-OF-WAY AND PROPERTY LINES**

Except for portions allowed for parking, loading, or traffic maneuvering, a required setback area abutting a public street and open area between the property line and the roadway in the public street shall be landscaped. That portion of the landscaping within the street right-of-way shall not count as part of the lot area percentage to be landscaped.

***Response:** Offsite landscaping is not counted toward required landscaping. All areas between the property line and the roadway will be landscaped as required.*

**17.92.80 BUFFER PLANTING - PARKING, LOADING AND MANEUVERING AREAS**

Buffer plantings are used to reduce building scale, provide transition between contrasting architectural styles, and generally mitigate incompatible or undesirable views. They are used to soften rather than block viewing. Where required, a mix of plant materials shall be used to achieve the desired buffering effect. Buffering is required in conjunction with issuance of construction permits for parking areas containing 4 or more spaces, loading areas, and vehicle maneuvering areas.

Boundary plantings shall be used to buffer these uses from adjacent properties and the public right-of-way. On-site plantings shall be used between parking bays, as well as between parking bays and vehicle maneuvering areas. A balance of low-lying ground cover and shrubs, and vertical shrubs and trees shall be used to buffer the view of these facilities. Decorative walls and fences may be used in conjunction with plantings, but may not be used by themselves to comply with buffering requirements. Exception: truck parking lots are exempt from parking bay buffer planting requirements.

**Response:** *Parking spaces proposed on the North side of the building will be buffered by construction of a landscaped berm. All hard surfaces onsite will be buffered by a minimum 10 foot deep landscape planter.*

#### **17.92.90 SCREENING (HEDGES, FENCES, WALLS, BERMS)**

Screening is used where unsightly views or visual conflicts must be obscured or blocked and where privacy and security are desired. Fences and walls used for screening may be constructed of wood, concrete, stone, brick, and wrought iron, or other commonly used fencing/wall materials. Acoustically designed fences and walls are also used where noise pollution requires mitigation.

- A. Height and Opacity. Where landscaping is used for required screening, it shall be at least 6 ft. in height and at least 80 percent opaque, as seen from a perpendicular line of sight, within 2 years following establishment of the primary use of the site.
- B. Chain Link Fencing. A chain link fence with slats shall qualify for screening only if a landscape buffer is also provided in compliance with Section 17.92.00 above.
- C. Height Measurement. The height of hedges, fences, walls, and berm shall be measured from the lowest adjoining finished grade, except where used to comply with screening requirements for parking, loading, storage, and similar areas. In these cases, height shall be measured from the finished grade of such improvements. Screening is not permitted within vision clearance areas.
- D. Berms. Earthen berms up to 6 ft. in height may be used to comply with screening requirements. Slope of berms may not exceed 2:1 and both faces of the slope shall be planted with ground cover, shrubs, and trees.

**Response:** *A four to five foot tall earthen berm with landscaped materials is proposed to be constructed at the Northeast corner of the site to screen proposed parking located along the North elevation of the building. This berm will be constructed and planted per these standards. No fencing is proposed.*

#### **17.92.100 SCREENING OF SERVICE FACILITIES**

Site-obscuring shrubbery or a berm, wall or fence shall be placed along a property line between residential and commercial and industrial zones and around unsightly areas such as trash and recycling areas, gas meters, ground level air conditioning units, disc antennas exceeding 36 inches in diameter and equipment storage or an industrial or commercial use with outside storage of equipment or materials.

**Response:** *All service facilities are proposed to be screened with landscape materials as shown on the Landscape Plan.*

### **17.92.110 OUTDOOR STORAGE**

All outdoor storage areas for commercial, industrial, public and semi-public uses are to be entirely screened by a sight obscuring fence, vegetative materials, or other alternative deemed appropriate by the Director. Exceptions to the preceding requirements include: new or used cars, cycles and trucks (but not including car parts or damaged vehicles); new or used boat sales; recreational vehicle sales; new or used large equipment sales or rentals; manufactured home

*Response: No outdoor storage is proposed.*

## **CHAPTER 17.94 - DRIVE-UP USES**

### **17.94.10 APPLICABILITY**

These regulations govern all drive-up uses in all zoning districts.

*Response: The proposed fueling station is considered a drive-up use.*

### **17.94.20 MINIMUM REQUIREMENTS**

- A. Parking maneuvers shall not occur in the stacking area. The stacking area shall not interfere with safe and efficient access to other parking areas on the site or adjacent properties.
- B. Drive-up aisles and windows must be located a minimum of fifty feet from residential zones to avoid adverse impacts.
- C. All restaurant facilities, except short term food service, providing drive-up service shall provide at least two designated parking spaces immediately beyond the service window or provide other satisfactory methods to allow customers requiring excessive waiting time to receive service while parked.
- D. The grade of the stacking area to the drive-up shall not exceed a slope of twelve percent.
- E. The drive-up shall be designed to provide as much natural ventilation as possible to eliminate the buildup of exhaust gasses.
- F. The sound level of communications systems shall not exceed fifty-five decibels at the property line and shall otherwise comply with provisions of the Sandy Municipal Code regarding sound levels.

*Response: The proposed open fueling canopy is located and designed to provide efficient vehicle maneuvering and stacking in compliance with these standards.*

### **17.94.30 STACKING DISTANCE**

Drive-up window uses shall provide a minimum stacking area clear of the public right-of-way and parking lot aisles from the window serving the vehicles as follows:

- A. Banks. Each lane shall provide a minimum capacity for 5 vehicles.
- B. Restaurants. Each lane shall provide a minimum capacity for 8 vehicles.
- C. Short-Term Food Service. Each lane shall provide a minimum capacity for 3 vehicles. Short Term Food Service is defined as a facility serving espresso, ice cream, or other single-service product. A maximum of one designated parking space located at the end of the stacking area may be substituted for one required stacking space for small convenience food stops only.
- D. Other Drive-up Uses:

1. Automotive Fueling Stations. Each lane shall provide a minimum capacity for 4 vehicles.
2. Other Uses. Each lane shall provide a minimum capacity for 2 to 8 vehicles, as determined through the design review process.

*Response: As shown on the Site Plan, the proposed vehicle fueling station is designed to provide a minimum stacking for four vehicles as required by Section 17.94.30(D)(1).*

## **CHAPTER 17.98 PARKING, LOADING, AND ACCESS REQUIREMENTS**

### **17.98.10 GENERAL PROVISIONS**

- A. Provision and Maintenance. The provision of required off-street parking for motor vehicles and bicycles, and loading facilities for motor vehicles is a continuing obligation of the property owners. Building permits or other permits will only be issued after review and approval of site plans showing location of permanent access, parking and loading facilities.
- B. Unspecified Requirements. Vehicle and bicycle parking requirements for uses not specified in this chapter shall be determined by the Director based upon the requirements of similar specified uses.
- C. New Structure or Use. When a structure is constructed or a new use of land is commenced, on-site vehicle and bicycle parking and loading spaces shall be provided in accordance with Section 17.98.20 below or as otherwise modified through a planned development or specific area plan.

*Response: All of these sections have been reviewed and the proposal addresses these requirements.*

- D. Alteration of Existing Structures. When an existing structure is altered to the extent that the existing use is intensified, on-site vehicle and bicycle parking shall be provided in the amount required for such intensification.
- E. Increased Intensity. When increased intensity requires no more than 2 vehicle spaces, no additional parking facilities shall be required. However, the effects of changes, additions, or enlargements shall be cumulative. When the net effect of one or more changes generates a need for more than two spaces, the additional required spaces shall be provided. Additional spaces shall be required for the intensification but not for the original use.
- F. Change in Use. When an existing structure or use of land is changed in use from one use to another use as listed in Section 17.98.20 below and the vehicle and bicycle parking requirements for each use type are the same; no additional parking shall be required. However, where a change in use results in an intensification of use in terms of number of vehicle and bicycle parking spaces required, additional parking space shall be provided in an amount equal to the difference between the number of spaces required for the existing use and number of spaces required for the more intensive use.

*Response: These sections are not applicable as the proposal is for a new use and building. The existing residential home will be removed.*

G. Time of Completion. Required parking spaces and loading areas shall be improved and available for use prior to issuance of a temporary occupancy and/or final building inspection.

**Response:** *All parking will be constructed prior to temporary or final occupancy.*

H. Inoperative Motor Vehicles. In any residential district, all motor vehicles incapable of movement under their own power or lacking legal registration shall be completely screened from public view.

I. Truck Parking. In residential zoning districts, no overnight parking of trucks or other equipment on wheels or tracks exceeding a 1-ton capacity used in the conduct of a business activity shall be permitted except vehicles and equipment necessary for farming and truck gardening on the premises where such use is conducted.

J. Mixed Uses. In the case of mixed uses, the total required vehicle and bicycle parking shall be the sum of requirements of individual uses computed separately.

K. Conflicting Parking Requirements. When a building or use is planned or constructed in such a manner that more than one standard is applicable, the use that requires the greater number of parking spaces shall govern.

**Response:** *These sections are not applicable.*

L. Availability of Parking Spaces. Required vehicle and bicycle parking spaces shall be unobstructed, available for parking of vehicles and bicycles of residents, customers, patrons, and employees only, and shall not be used for storage of vehicles or materials or for parking of vehicles and bicycles used in conducting the business or use and shall not be used for sale, repair, or servicing of any vehicle or bicycle.

**Response:** *All proposed vehicle and bicycle parking spaces will be available for customers, patrons, and employees only as required.*

N. Location of Required Parking.

1. Off-street vehicle parking required for residential uses, except for residential uses in the Central Business District, shall be provided on the development site of the primary structure. Except where permitted by 17.98.40 below, required parking for all other uses in other districts shall be provided on the same site as the use or upon abutting property.

2. May be utilized in the C-1 Zoning District to meet the minimum parking requirements as specified in Section 17.98.30 (B).

3. Bicycle parking required for all uses in all districts shall be provided on the development site in accordance with Section 17.98.160 below.

**Response:** *All vehicle and bicycle parking will provided onsite.*

P. Fractions. When the sum of the required vehicle and bicycle parking spaces is a fraction of a space (0.5 or more of a space) a full space shall be required.

**Response:** *The calculation of required vehicle and bicycle parking has been rounded according to the requirements in this section.*



Q. Maximum Parking Allowed. Commercial or Industrial zoned properties shall not be permitted to exceed the minimum off-street vehicle parking required by Section 17.98.20 by more than 30 percent.

**Response:** *The proposed 12 vehicle parking spaces exceeds the 10 minimum spaces required by 20 percent in compliance with this section.*

**17.98.20 OFF-STREET PARKING REQUIREMENTS**

A. Off Street Parking Requirements. Off street parking shall conform to the following standards:

1. All square footage measurements are gross square feet of total floor area.
2. 18 lineal inches of bench shall be considered 1 seat.
3. Except as otherwise specified, parking for employees shall be provided based on 1 space per 2 employees for the largest shift in addition to required parking specified in Sections A6-A9 below.
4. Where less than 5 parking spaces are required, then only one bicycle space shall be required except as otherwise modified in Sections 5-9 below.
5. In addition to requirements for residential off street parking, new dwellings shall meet the on-street parking requirements in Section 17.98.200.

**Response:** *The proposal complies with these requirements as applicable.*

8.

Commercial Uses	Number of Parking Spaces	Number of Bicycle Spaces
Grocery Store; Food and Beverage Retail Sales, Convenience Store	1 per 400 sq. ft., plus 1 per 2 employees	5% or 2 whichever is greater
Required Parking	3,069 sq. ft./400 = 7.6 rounded to 8 spaces.	
	Number of employees = 4	
Total Required	8 + 2 = 10 spaces required	17 x .05 = .85 (2 spaces required)
<b>Proposed Parking</b>	<b>12 spaces total (11 standard and one ADA space)</b>	<b>2 spaces proposed</b>

**Response:** *As shown on the table above, based on the size of the convenience store 10 vehicle parking spaces and two bicycle parking spaces are required. This calculation is based on the size of the proposed convenience in addition to four employees anticipated on the largest shift. As shown on the Site Plan, 11 standard parking spaces and one ADA space for total of 12 parking spaces are proposed adjacent to the convenience store. Two bicycle parking spaces are proposed as required.*

**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 two-family dwellings, 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 5 feet shall be provided along the property fronting on a public street. The setback area shall be landscaped as provided in this code.

*Response: No parking is proposed abutting a residential zone and no parking is proposed within a required front or side yard setback area.*

#### **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.

*Response: All parking and maneuvering areas will be surfaced with asphalt.*

- B. **Size of Space.**

1. A standard parking space shall be 9 feet by 18 feet.
2. A compact parking space shall be 8 feet by 16 feet.
3. Handicapped parking spaces shall be 13 feet by 18 feet. 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 35 percent of the parking stalls shall be compact spaces.

*Response: The proposed 11 standard vehicle parking spaces and one ADA spaces are designed in compliance with these standards. No compact parking spaces are proposed.*

- C. **Aisle Width.**

*Response: All proposed parking is designed to be 90 degrees and include a minimum 25 foot aisle.*

#### **17.98.70 ON-SITE CIRCULATION**

- A. Groups of more than three (3) parking spaces shall be permanently striped.
- B. **Backing and Maneuvering.** Except for a single family dwelling or two family dwelling, groups of more than 3 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.

*Response: All proposed parking will be permanently striped and the site has sufficient space so that all vehicles will be able to enter the public right-of-way in a forward manner. Turning templates in the Traffic Study (Exhibit G) for large delivery and fueling trucks show the site has sufficient room to accommodate these vehicles.*

#### **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 ft. 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 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.
- C. When developed property is to be expanded or altered in a manner that significantly affects on-site parking or circulation, both existing and proposed accesses shall be reviewed under the standards in A and B above. As a part of an expansion or alteration approval, the City may require relocation and/or reconstruction of existing accesses not meeting those standards.

*Response: SE Orient Drive is under Clackamas County jurisdiction. The applicant has applied for and received preliminary approval to construct the proposed driveway in the proposed location. A traffic study (Exhibit G) is provided as requested. Turning templates for large delivery and fueling trucks are included in this study.*

#### **17.98.100 DRIVEWAYS**

- A. A driveway to an off-street parking area shall be improved from the public roadway 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 shall have a minimum width of 10 feet.
- C. A driveway for a two-family dwelling shall have a minimum width of 20 feet. A driveway approach must be constructed in accordance with applicable city standards and the entire driveway must be paved with asphalt or concrete.
- D. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of twelve feet for their entire length and width but such clearance may be reduced in parking structures.

- E. No driveway shall traverse a slope in excess of 15 percent at any point along the driveway length.
- F. The location and design of the driveway shall provide for unobstructed sight per the vision clearance requirements. 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.

*Response: The access driveway is proposed to be 68 feet wide with a 40 foot wide throat to facilitate maneuvering by fueling trucks exiting the site onto SE Orient Drive. Turning templates for large delivery and fueling trucks are found in the traffic study for this project (Exhibit G). The proposal complies with the minimum standards in this section.*

#### **17.98.110 VISION CLEARANCE**

- A. Except within the Central Business District, vision clearance areas shall be provided at intersections of all streets and at intersections of driveways and alleys with streets to promote pedestrian, bicycle, and vehicular safety. The extent of vision clearance to be provided shall be determined from standards in Chapter 17.74 and taking into account functional classification of the streets involved, type of traffic control present at the intersection, and designated speed for the streets.
- B. Traffic control devices, streetlights, and utility installations meeting approval by the City Engineer are permitted within vision clearance areas.

*Response: None of these items are within vision clearance areas.*

#### **17.98.120 LANDSCAPING AND SCREENING**

- A. Screening of all parking areas containing 4 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 5-ft. depth of buffer plantings adjacent to the right-of-way.

*Response: The proposal includes 17 parking spaces. All parking spaces are screened along the public right-of-way including a proposed berm to screen spaces located on the North side of the convenience store.*

- B. When parking in a commercial or industrial district adjoins a residential zoning district, a sight-obscuring screen that is at least 80% opaque when viewed horizontally from between 2 and 8 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 3 years after installation.

*Response: All properties adjoining the subject property are zoned for commercial purposes.*

- C. Except for a residential development which has landscaped yards, parking facilities shall include landscaping to cover not less than 10% 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.

**Response:** *The Landscape Plan shows landscaping within and along the edge of all paved areas.*

- 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 5 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.

**Response:** *Five parking spaces are proposed north of the convenience store and six spaces west of the store. A planter is proposed at the Northwest corner of the building separating the two parking bays. Another five parking spaces is proposed along the western parve area north of the proposed garage/recycling enclosure. This parking bay will be screened on three sides with landscape materials.*

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

**Response:** *As shown on the submitted Landscape Plan, all parking area setbacks will be landscaped in compliance with Chapter 17.92.*

- F. Wheel stops, bumper guards, or other methods to protect landscaped areas shall be provided. No vehicle may project over a property line or a public right-of-way. Parking may project over an internal sidewalk, but a minimum clearance of 5 feet for safe pedestrian circulation is required.

**Response:** *Wheel stops are proposed in front of all parking spaces to prevent vehicles from encroaching on the six foot sidewalk adjacent to the convenience store.*

#### **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.

**Response:** *As shown on submitted plans all driving surfaces will be paved with asphalt. The area under the fueling canopy will likely be paved with asphalt.*

#### **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.

**Response:** *A preliminary stormwater management plan is provided as part of the application package. This plan has been designed in accordance with the City of Sandy Stormwater Management requirements. As shown on the submitted Utility Plan (Sheet 5) all roof and parking lot stormwater water will be routed to the*

*proposed stormwater pond. Surfaces under the fueling canopy will be routed through an oil-water separator including a spill control manhole with shut-off valve in case of a gasoline spill.*

#### **17.98.150 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.

*Response: As noted above, the applicant proposes installing new lighting to illuminate the site. All site lighting will be designed and installed in accordance with Chapter 15.30, Dark Sky Ordinance standards.*

#### **17.98.160 BICYCLE PARKING FACILITIES**

Multi-family developments, industrial, commercial and community service uses, transit transfer stations, and park and ride lots shall meet the following standards for bicycle parking facilities. The intent of this section is to provide secure bicycle parking that is visible from a building's primary entrance and convenient to bicyclists.

##### **A. Location.**

1. Bicycle parking shall be located on-site, convenient to primary building entrances, and have direct access to both the public right-of-way and to the main entrance of the principal structure.
2. Bicycle parking areas shall be visible from building interiors where possible.
3. For facilities with multiple buildings or parking lots, bicycle parking shall be located in areas of greatest use and convenience to bicyclists.
4. If the bicycle parking area is located within the vehicle parking area, the bicycle facilities shall be separated from vehicular maneuvering areas by curbing or other barrier to prevent damage to parked bicycles.
5. Curb cuts shall be installed to provide safe, convenient access to bicycle parking areas.

*Response: Two bicycle parking spaces as required are shown on the Site Plan just north of the building entrance.*

##### **B. Bicycle Parking Space Dimensions.**

1. Each required bicycle parking space shall be at least 2 1/2 feet by 6 feet. If covered, vertical clearance of 7 feet must be provided.
2. An access aisle of at least 5 feet wide shall be provided and maintained beside or between each row of bicycle parking. Vertical or upright bicycle storage structures are exempted from the parking space length.

*Response: The two bicycle parking spaces comply with the space dimension requirements of this section.*

##### **C. Security.**

1. Bicycle parking facilities shall offer security in the form of either a lockable enclosure in which the bicycle can be stored or a stationary object (i.e., a “rack”) upon which the bicycle can be located.
2. Racks requiring user-supplied locks shall accommodate both cable and U-shaped locks. Racks shall be designed and installed to permit the frame and both wheels to be secured, with removal of the front wheel, or the frame and one wheel to be secured, if both wheels remain on the bicycle.
3. Bicycle racks shall be securely anchored to the ground or a structure and shall be designed to hold bicycles securely by means of the bicycle frame.
4. All outdoor bicycle parking facilities shall provide adequate shelter from precipitation where possible.

*Response: Proposed bicycle parking includes an anchored rack so that bicycles can be securely locked. These spaces will be provided weather protection by a five foot overhang in this location.*

#### **17.98.190 OFF-STREET LOADING FACILITIES**

- A. The minimum area required for commercial and industrial loading spaces is as follows:
  1. 250 square feet for buildings of 5,000 to 19,999 square feet of gross floor area.
  2. 500 square feet for buildings of 20,000 to 49,999 square feet of gross floor area
  3. 750 square feet for buildings in excess of 50,000 square feet of gross floor area.
- B. The required loading berth shall be not less than 10 feet in width by 35 feet in length and shall have an unobstructed height clearance of 14 feet.
- C. Loading areas shall be screened from public view from public streets and adjacent properties except in industrial districts and shall require the same screening as parking lots.
- D. Sufficient space for turning and maneuvering of vehicles shall be provided on the site in accordance with the standard specifications established by the City Engineer.
- E. Entrances and exits shall be provided at locations approved in accordance with applicable ordinances and statutes.
- F. No off-street loading facilities shall be required where buildings abut a public alley in such a manner that loading operations can be conducted from said alley in accordance with applicable traffic and parking ordinances.

*Response: A separate designated loading is not needed for the proposed use. Fueling unloading will occur at the underground storage tanks and unloading for the convenience store will occur in front of the main entrance during slow customers times. The submitted Traffic Study (Exhibit G) includes turning templates showing how these trucks will be able to safely enter and exit the site. No additional details are required and the proposal complies with these standards.*

#### **CHAPTER 17.102 - URBAN FORESTRY**

##### **17.102.20 - APPLICABILITY**

This chapter applies only to properties within the Sandy Urban Growth Boundary that are greater than one acre including contiguous parcels under the same ownership.

A. General: No person shall cut, harvest, or remove trees 11 inches DBH or greater without first obtaining a permit and demonstrating compliance with this chapter.

1. As a condition of permit issuance, the applicant shall agree to implement required provisions of this chapter and to allow all inspections to be conducted.
2. Tree removal is subject to the provisions of Chapter 15.44, Erosion Control, Chapter 17.56, Hillside Development, and Chapter 17.60 Flood and Slope Hazard.

*Response: The subject property contains 2.32 acres and the standards of this chapter are applicable to the proposed development. The applicant intends removing some of the trees on the property to accommodate development of the project. The proposed tree retention plan (Sheet 2) has been designed in accordance with the standards of this chapter and the provisions in Chapters 15.44, 17.56, and 17.60 as applicable.*

#### **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.

*Response: Sheet 1 of the submitted civil plan set shows the location of all trees on the subject property and Sheet 2 shows trees proposed to be retained. An Arborist report evaluating the size and condition of these trees is included with this submittal. The subject property contains 2.32 acres requiring retention of seven trees, 11 inches and greater DBH ( $2.32 \times 3 = 6.96$  rounded up to 7 trees). The submitted plan indicates that 12 conifer trees are proposed to be retained that are at least 11 inches DBH and in "good" condition and additional conifer in fair condition. This tree is proposed to be retained at the advice of the project Arborist to help protect the other trees from storm damage. The proposed tree retention exceeds the required number of trees by five. All trees proposed to be retained are contained within a cluster along Highway 26 in the Southwest portion of the site.*

B. Tree Protection Area: Except as otherwise determined by the Planning Director, all tree protection measures set forth in this section shall be instituted prior to any development activities and removed only after completion of all construction activity. Tree protection measures are required for land disturbing activities including but not limited to tree removal, clearing, grading, excavation, or demolition work.

1. Trees identified for retention shall be marked with yellow flagging tape and protected by protective barrier fencing placed no less than 10 horizontal feet from the outside edge of the trunk.
2. Required fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade.
3. 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.

*Response: The submitted tree protection plan indicates that retained trees are proposed to be protected in accordance with the requirements of this section.*

#### **17.102.60 - TREE REPLANTING REQUIREMENTS**

1. All areas with exposed soils resulting from tree removal shall be replanted with a ground cover of native species within 30 days of harvest during the active growing season, or by June 1st of the following spring.
2. All areas with exposed soils resulting from tree removal occurring between October 1 and March 31 shall also be covered with straw to minimize erosion.
3. Removal of hazard trees as defined shall be replanted with two native trees of quality nursery stock for every tree removed.
4. Tree Removal allowed within the FSH Overlay District shall be replanted with two native trees of quality nursery stock for every tree removed.
5. Tree Removal not associated with a development plan must be replanted following the provisions of OAR Chapter 629, Division 610, Section 020-060

*Response: The requirements of this section as applicable will be completed with construction of subdivision improvements.*

#### **17.102.70 - VARIANCES**

*Response: The submitted plan is designed in compliance with the standards in this chapter and a variance to these standards is not requested or required.*

#### **CHAPTER 15.30 - DARK SKY ORDINANCE**

15.30.000 Purpose.

The purpose of the Sandy Dark Sky Ordinance is to regulate outdoor lighting in order to reduce or prevent light pollution. This means to the extent reasonably possible the reduction or prevention of glare and light trespass, the conservation of energy, and promotion of safety and security. (Ord. 2002-11)



*Response: All new light fixtures will be designed and installed in accordance with these regulations. A photometric analysis and lighting fixture cut-sheets are currently being designed for the site by a qualified lighting contractor. This information is not ready to be included with the application package and will be submitted as soon as it is available. If this information is not obtained prior to issuance of the completeness check letter, the applicant requests the application be deemed complete and the approval be conditioned to submit information in compliance with this Chapter as part of the building permit submittal process.*

## **V. Conclusion**

The applicant requests design review approval to allow construction of a Space Age Inc. fueling station and convenience store. The subject property currently contains a single family residence with accessory building. These improvements will be removed. The property is zoned C-2, General Commercial and the proposed uses are permitted outright in this zone. Access to the site is proposed directly from SE Orient Drive and an access off SE Crescent Road which will be improved as a cul-de-sac for this purpose. Frontage improvements are proposed along all frontages with the exception of the extension of SE Crescent Street beyond the proposed cul-de-sac. Onsite improvements include construction of a 3,069 square foot convenience store with 12 parking spaces and a 3,240 square foot fueling canopy with 16 fueling positions. Additional improvements include paving, installation of a stormwater detention and water quality facility, landscaping, and lighting.

A Type III Special Variance was approved (File No. 18-036 VAR) for the property on October 31, 2018, to allow the property to be developed without connecting to City water broadband fiber service. In addition, the property is allowed by code not to connect to City sanitary sewer service and storm drainage facilities. The site will be served by an onsite well and septic system and all stormwater will also be managed onsite.

As shown on submitted plans and demonstrated in this narrative the proposal complies with all applicable code sections and the applicant requests this application be approved using the Type II processing procedure.

**Supplemental  
Project Narrative  
for**

**JLP Development  
Space Age Fueling Station**

**15585 SE Orient Drive, Boring, Oregon  
(2S 4E 10, tax lot 4500)**



**Prepared by  
Tracy Brown Planning Consultants, LLC**

**Revised  
July 8, 2019**

## I. Purpose

The purpose of this supplemental narrative is to modify certain items in the previously submitted project narrative and to address additional relevant criteria. Items previously addressed in the original narrative are intended to be replaced by language in the revised narrative.

## II. Application Approval Requests

With revisions made to the plan set, the applicant is now requesting the following approvals:

- Type II design review to construct a Space Age fueling station and convenience store with associated site improvements;
- Type II tree removal (*additional fee required*);
- Type II adjustment to Section 17.90.120(D.1) to decrease the percent of required street frontage from 50% to 40% (*additional fee required*);
- Type II adjustment to Section 17.90.120(D.1) to increase the required street frontage setback from 20 feet to 24 feet (*additional fee required*).

## III. Revised Items Submitted (*new or revised items in bold italics*)

- Land Use Application
- Notification List and Mailing Labels
- Exhibit A—Project Narrative
- Exhibit B—Civil Plans
  - Sheet 1—Cover Sheet and Existing Conditions
  - **Sheet 2 - Tree Retention Plan**
  - **Sheet 3 - Site Plan**
  - **Sheet 4 - Grading and Erosion Control Plan**
  - **Sheet 5 - Utility Plan**
  - **Sheet 6 - Cut-Fill Plan**
- Exhibit C - Architectural Plans
  - **Sheet A101 - Overall Main Floor Plan**
  - **Sheet A161 - Overall Roof Plan**
  - **Sheet A192 - Equipment Plan**
  - **Sheet A220 - Convenience Store West and South Building Elevations**
  - **Sheet A221 - Convenience Store East and North Building Elevations**
  - **Sheet A222 - Convenience Store Exterior Perspective Drawings**
  - **Sheet A223 - Fuel Island Elevations**
  - Sheet A521—Trash Enclosure
- **Exhibit D - Landscape Plan**
- Exhibit E—Septic System Site Plan
  - AdvanTex—Septic Design Details
- Exhibit F—Preliminary Stormwater Report
- Exhibit G—Traffic Impact Study
- Exhibit H—Arborist Report
- Exhibit I—Photometric Analysis (*provided by email*)

- *Exhibit J - Clackamas County Engineer access approval letter*
- *Exhibit K - Clackamas County Fire approved stamped plan*
- *Exhibit L - Revised report from Todd Prager, project Arborist*
- *Exhibit M - Supplemental Project Narrative*

#### **IV. Review of Applicable Approval Criteria**

The following section only addresses applicable review criteria revised or added to the supplemental narrative. Pertinent code provisions are cited below in plain text followed by a response identifying how the proposal complies with this standard in *italics*.

### **CHAPTER 17.90 DESIGN STANDARDS**

#### **17.90.120 GENERAL COMMERCIAL AND INDUSTRIAL (C-2 and I-1) AND NON-RESIDENTIAL USES IN RESIDENTIAL ZONES DESIGN STANDARDS**

##### **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)

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 10-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 ft. For lots with frontage of less than 150 ft. or less, shared access may be required.

*Response: The revised building design now features a primary building entrance on both the South and west elevations. All parking is proposed to be located to the rear and side of the South building elevation and no parking is located within required setbacks or within 10-feet of the public right-of-way.*

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

Intent: To provide building façades, materials and colors consistent with the Sandy Style. For purposes of interpreting the Sandy Style, representative illustrations and photos are provided. (Figures 17.90.120-C, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, 17.90.120-H, and 17.90.120-I; and the Color Palette and representative photos provided in the Appendix E.)

1. Articulation. The Sandy Style includes asymmetrical building forms, which by definition require buildings to be articulated, varied, and provide visual interest. This standard is met by dividing elevations visible from an abutting public street or pedestrian way into smaller areas or planes to minimize the appearance of bulk as follows:

- a. All elevations visible from an abutting public street or pedestrian way shall be divided into distinct planes of no more than 40 lineal feet long to include the following:

**Response:** *The City has determined the North, south, and east elevations of the convenience store require compliance with this section.*

- 1) Wall planes meeting this standard shall include a feature or variation in the wall plane that are those that are entirely separated from other wall planes by a recessed or projecting section of the structure that projects or recedes at least six (6) inches from the adjacent plane, for a length of at least four (4) feet. Changes in plane may include but are not limited to recessed entries, bays, secondary roof forms (e.g., gables, lower roof sheds, dormers and towers), building bases, canopies, awnings, projections, recesses, alcoves, pergolas, porticos, roof overhangs, or other features consistent with the Sandy Style.

**Response:** *This section requires a feature or variation in the wall plane projecting or receding at least six inches for at least four feet. The North building elevation contains a three foot projection/recession about 20 feet long. The South elevation does not contain a change in the wall plain but does include a one foot roof overhang along the entire elevation, stone columns, a gable feature, and entrance door in compliance with this standard. The East elevation has been revised to feature three distinct wall planes each greater than four feet in length with an offset of six inches from the adjoining wall plane. As revised, all applicable building elevations comply with the requirements of this standard.*

- 2) Wall planes shall incorporate at least one visually contrasting and complementary change in materials or changes in texture or patterns, including trim, moldings, or other ornamental devices.

**Response:** *All elevations of the convenience store contain a combination of stone and siding material and all windows are proposed to contain trim or are adjacent to stone accents in compliance with this standard. All wall planes incorporate visually contrasting materials and changes in textures or patterns.*

#### **D. Building Orientation and Entrances**

Intent: To maintain and enhance General Commercial and Industrial streetscapes as public spaces, emphasizing pedestrian-scale and character in new development, consistent with the Sandy Style. (Figures 17.90.120-A, 17.90.120-B, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, and 17.90.120-H) and representative photos in Appendix E.

1. Buildings shall be oriented to a public street or civic space. This standard is met when at least 50 percent of the subject site's street frontage is comprised of building(s) placed within 20 feet of a sidewalk, walkway or civic space and

not more than 20 percent of the off-street parking on a parcel as required by SDC 17.98, tract or area of land is located between a building's front façade and the adjacent street(s).

**Response:** *The subject property contains over 519 feet of frontage along Highway 26. Compliance with this standard requires 259.5 feet (50%) of this frontage to contain buildings within 20 feet of a sidewalk. This standard is applicable to the southern property line which also requires a 20-foot minimum setback. Because of building articulation requirements, only a small percentage of the southern elevation is located within 20 feet of this property line, however, the entire building is within 24 feet of this line. Measured at 24-feet, the proposed building comprises about 4.7% of the property frontage ( $24.17/519.33 = 4.7\%$ ).*

*In order to achieve compliance with this standard, the revised Site Plan now also features a 165-foot long "proposed future building" on the future pad site west of the proposed structures. In addition, with this application the applicant is also requesting approval of a Type II adjustment to this standard to decrease the required street frontage from 50% to 40% and a Type II adjustment to increase the required setback from 20 feet to 24 feet. The justification for these requests is detailed in Chapter 17.66 below.*

4. Buildings located at the intersection of two streets shall use a corner building entrance; where a corner entrance is not practical due to the internal functioning of the building space or due to physical constraints of the site (e.g., topography, accessibility, or similar circumstances), a building entrance must be provided within forty feet of the corner. The building corner must use detailing that emphasizes the corner location and is consistent with the Sandy Style. Examples of acceptable detailing include a rounded or chamfered (beveled) corner, weather protecting canopy, plaza, sculpture, and/or similar pedestrian-oriented features.

**Response:** *The subject property is located at the intersection of Highway 26 and SE Orient Drive. Due to site constraints and the functioning of the proposed convenience store, the primary entrance for the store cannot be located at the Southeast corner of the building closest to the intersection. As an alternative allowed by this standard, the revised building elevations feature a new primary building entrance along the South building elevation within 40 feet of the Southeast building corner. With this feature, the design complies with this section.*

#### **H. Lighting**

Intent: To promote business vitality, public safety and aesthetics through effective outdoor lighting, consistent with the Sandy Style. (Figures 17.90.120-G, 17.90.120-H, and 17.90.120-M)

3. Lighting must be adequate for safety purposes. Walkways and parking lots should be illuminated at 1.5 - 2.0 foot candles.

**Response:** Staff has recently been interpreting this standard to read light levels in this standard (1.5 - 2.0 foot candles) shall be the maximum allowed in parking lots. We believe this to be an incorrect reading of the standard and would be extremely difficult and expensive to achieve for the proposed project. We believe the standard is intended to recommend minimum light levels for safety purposes, not mandate maximum levels allowed. We believe the word “least” is implied. With this the standard would read, “Walkways and parking lots should be illuminated at least 1.5 - 2.0 foot candles. In addition, the standard uses the word “should” which is permissive and does not mandate conformance with this standard.

*Lighting a parking lot at this narrow foot candle range will be very difficult to achieve. Light levels dissipate quickly moving away from the source. As such, light levels of 2.0 foot-candles directly under the fixture will be less than 1.5 foot candles about 15 feet from the fixture. As such, in order to comply another, another fixture will need to be placed close enough to raise the level above 1.5 foot candles but not too close to raise it about 2.0 foot candles. The number of extra fixtures needed to comply as this standard is being interpreted could be significant. The overriding lighting standards are found in Chapter 15.30, Dark Sky Ordinance. These standards specify requirements regarding light trespass both up to the sky and across property lines. The submitted photometric analysis complies with Dark Sky Ordinance standards.*

## **CHAPTER 17.66 - ADJUSTMENTS AND VARIANCES**

### **17.66.30 TYPE II ADJUSTMENTS**

Except in the case of a nonconforming development or use, the Director may grant or deny an adjustment under the Type II procedure if the request involves only the expansion or reduction by not more than 20% of one or more quantifiable provisions of this code.

**Response:** As noted above, the applicant is requesting a Type II adjustment to Section 17.90.120(D.1) to decrease the building street frontage requirement from 50% to 40% and an adjustment to this same section to increase the building setback requirement from 20 feet to 24 feet. Each of the adjustments are reviewed below.

#### **ADJUSTMENT No. 1 - Decrease building frontage from 50% to 40%**

### **17.66.40 TYPE I AND II ADJUSTMENT CRITERIA**

- A. The proposed development will not be contrary to the purposes of this chapter, policies of the Comprehensive Plan, and any other applicable policies and standards adopted by the City;

**Response:** The intent expressed in Section 17.90.12(D) is to “maintain and enhance General Commercial and Industrial streetscapes as public spaces, emphasizing pedestrian-scale and character in new development, consistent with the Sandy Style.” The subject property is located at the intersection of SE Orient Drive and Highway 26. The 519 foot Highway 26 frontage that is the subject of this request is a busy highway section with increasing vehicle speeds from 50 mph

*east of SE Orient to 55 mph west of the subject property. The proposed convenience store and the building pad site are proposed to comprise 40% of this frontage. In addition, the proposed 30-foot wide fueling canopy will be visible from the highway and setback only 12 feet further than the 20-foot setback maximum. Approval of this adjustment will not be contrary to the purposes of code or the policies of the Comprehensive Plan or any other applicable policies and standards. The proposal complies with this criteria.*

- B. The proposed development will not substantially reduce the amount of privacy enjoyed by users of nearby structures when compared to the same development located as specified by this Code;  
**Response:** *The proposal to reduce the area comprised of buildings along Highway 26 will not affect the amount of privacy enjoyed by users of nearby structures. The proposal complies with this criteria.*
- C. The proposed development will not adversely affect existing physical systems and natural systems, such as traffic, drainage, dramatic land forms, or parks; and  
**Response:** *The building frontage standard will have no effect on existing physical systems and natural systems including traffic, drainage, land form or parks. The proposal complies with this criteria.*
- D. Architectural features of the proposed development will be compatible to the design character of existing structures on adjoining properties and on the proposed development site.  
**Response:** *The subject property is isolated from all other commercial development. Approval of an adjustment allowing a reduction of the building frontage requirement is compatible with the design character of existing structures as this area transitions to urban uses. The proposal complies with this criteria.*

**ADJUSTMENT No. 2 - Increase setback from 20 feet to 24 feet**

**17.66.40 TYPE I AND II ADJUSTMENT CRITERIA**

- A. The proposed development will not be contrary to the purposes of this chapter, policies of the Comprehensive Plan, and any other applicable policies and standards adopted by the City;  
**Response:** *The intent expressed in Section 17.90.12(D) is to “maintain and enhance General Commercial and Industrial streetscapes as public spaces, emphasizing pedestrian-scale and character in new development, consistent with the Sandy Style.” The subject property is located at the intersection of SE Orient Drive and Highway 26. The 519 foot Highway 26 frontage that is the subject of this request is a busy highway section where vehicle speeds are increasing from 50 mph east of SE Orient to 55 mph west of the subject property. A portion of the proposed convenience store is located within 20 feet of the South property line as*



required. Because of building articulations requirements also required in Chapter 17.90, the majority of the building will be setback 24 feet from this line. The request to increase the required setback from 20 feet to 24 feet has also been requested for the proposed future building in order to preserve trees located near the South property line. The project Arborist has submitted a revised Arborist report (Exhibit L) indicating this distance is sufficient as a root protection zone for those trees near the future building. Approval of this adjustment will not be contrary to the purposes of code or the policies of the Comprehensive Plan or any other applicable policies and standards. The proposal complies with this criteria.

- B. The proposed development will not substantially reduce the amount of privacy enjoyed by users of nearby structures when compared to the same development located as specified by this Code;

**Response:** *The requested adjustment to increase the required building setback along Highway 26 by four feet will have no effect on the amount of privacy enjoyed by users of nearby structures. The proposal complies with this criteria.*

- C. The proposed development will not adversely affect existing physical systems and natural systems, such as traffic, drainage, dramatic land forms, or parks; and

**Response:** *The requested adjustment to increase the required building setback along Highway 26 by four feet will have no effect on existing physical systems and natural systems including traffic, drainage, land form or parks. The proposal complies with this criteria.*

- D. Architectural features of the proposed development will be compatible to the design character of existing structures on adjoining properties and on the proposed development site.

**Response:** *The subject property is currently isolated from all other commercial development. An increase in the required building setback by four feet will be negligible and will be compatible with the design character of existing structures and future structures as they transition to urban uses. The proposal complies with this criteria.*

## **CHAPTER 17.98 PARKING, LOADING, AND ACCESS REQUIREMENTS**

### **17.98.10 GENERAL PROVISIONS**

- A. Provision and Maintenance. The provision of required off-street parking for motor vehicles and bicycles, and loading facilities for motor vehicles is a continuing obligation of the property owners. Building permits or other permits will only be issued after review and approval of site plans showing location of permanent access, parking and loading facilities.
- B. Unspecified Requirements. Vehicle and bicycle parking requirements for uses not specified in this chapter shall be determined by the Director based upon the requirements of similar specified uses.
- C. New Structure or Use. When a structure is constructed or a new use of land is commenced, on-site vehicle and bicycle parking and loading spaces shall be

provided in accordance with Section 17.98.20 below or as otherwise modified through a planned development or specific area plan.

**Response:** *All of these sections have been reviewed and the proposal addresses these requirements.*

- D. Alteration of Existing Structures. When an existing structure is altered to the extent that the existing use is intensified, on-site vehicle and bicycle parking shall be provided in the amount required for such intensification.
- E. Increased Intensity. When increased intensity requires no more than 2 vehicle spaces, no additional parking facilities shall be required. However, the effects of changes, additions, or enlargements shall be cumulative. When the net effect of one or more changes generates a need for more than two spaces, the additional required spaces shall be provided. Additional spaces shall be required for the intensification but not for the original use.
- F. Change in Use. When an existing structure or use of land is changed in use from one use to another use as listed in Section 17.98.20 below and the vehicle and bicycle parking requirements for each use type are the same; no additional parking shall be required. However, where a change in use results in an intensification of use in terms of number of vehicle and bicycle parking spaces required, additional parking space shall be provided in an amount equal to the difference between the number of spaces required for the existing use and number of spaces required for the more intensive use.

**Response:** *These sections are not applicable as the proposal is for a new use and building. The existing residential home will be removed.*

- G. Time of Completion. Required parking spaces and loading areas shall be improved and available for use prior to issuance of a temporary occupancy and/or final building inspection.

**Response:** *All parking will be constructed prior to temporary or final occupancy.*

- H. Inoperative Motor Vehicles. In any residential district, all motor vehicles incapable of movement under their own power or lacking legal registration shall be completely screened from public view.
- I. Truck Parking. In residential zoning districts, no overnight parking of trucks or other equipment on wheels or tracks exceeding a 1-ton capacity used in the conduct of a business activity shall be permitted except vehicles and equipment necessary for farming and truck gardening on the premises where such use is conducted.
- J. Mixed Uses. In the case of mixed uses, the total required vehicle and bicycle parking shall be the sum of requirements of individual uses computed separately.
- K. Conflicting Parking Requirements. When a building or use is planned or constructed in such a manner that more than one standard is applicable, the use that requires the greater number of parking spaces shall govern.

**Response:** *These sections are not applicable.*

- L. Availability of Parking Spaces. Required vehicle and bicycle parking spaces shall be unobstructed, available for parking of vehicles and bicycles of residents, customers, patrons, and employees only, and shall not be used for storage of vehicles or materials or for parking of vehicles and bicycles used in conducting the business or use and shall not be used for sale, repair, or servicing of any vehicle or bicycle.

**Response:** *All proposed vehicle and bicycle parking spaces will be available for customers, patrons, and employees only as required.*

N. Location of Required Parking.

1. Off-street vehicle parking required for residential uses, except for residential uses in the Central Business District, shall be provided on the development site of the primary structure. Except where permitted by 17.98.40 below, required parking for all other uses in other districts shall be provided on the same site as the use or upon abutting property.
2. May be utilized in the C-1 Zoning District to meet the minimum parking requirements as specified in Section 17.98.30 (B).
3. Bicycle parking required for all uses in all districts shall be provided on the development site in accordance with Section 17.98.160 below.

**Response:** *All vehicle and bicycle parking will provided onsite.*

- P. Fractions. When the sum of the required vehicle and bicycle parking spaces is a fraction of a space (0.5 or more of a space) a full space shall be required.

**Response:** *The calculation of required vehicle and bicycle parking has been rounded according to the requirements in this section.*

- Q. Maximum Parking Allowed. Commercial or Industrial zoned properties shall not be permitted to exceed the minimum off-street vehicle parking required by Section 17.98.20 by more than 30 percent.

**Response:** *The proposed 17 vehicle parking spaces exceeds the 13 minimum spaces required by 30 percent as permitted by this section.*

#### 17.98.20 OFF-STREET PARKING REQUIREMENTS

- A. Off Street Parking Requirements. Off street parking shall conform to the following standards:

1. All square footage measurements are gross square feet of total floor area.
2. 18 lineal inches of bench shall be considered 1 seat.
3. Except as otherwise specified, parking for employees shall be provided based on 1 space per 2 employees for the largest shift in addition to required parking specified in Sections A6-A9 below.
4. Where less than 5 parking spaces are required, then only one bicycle space shall be required except as otherwise modified in Sections 5-9 below.
5. In addition to requirements for residential off street parking, new dwellings shall meet the on-street parking requirements in Section 17.98.200.

**Response:** *The proposal complies with these requirements as applicable.*

8.

Commercial Uses	Number of Parking Spaces	Number of Bicycle Spaces
Grocery Store; Food and Beverage Retail Sales, Convenience Store	1 per 400 sq. ft., plus 1 per 2 employees	5% or 2 whichever is greater
Required Parking	3,069 sq. ft./400 = 7.6 rounded to 8 spaces.	
Employees	Number on employees on largest shift = 9 (9/2 = 4.5 rounded up to 5 spaces)	
Total Parking Required	8 + 5 = 13 spaces required	13 x .05 = .65 (2 spaces required)
Maximum Parking Allowed	13 spaces x .30 = 3.9 (rounded up to 4 spaces). 13 + 4 = 17 spaces maximum	
<b>Proposed Parking</b>	<b>17 spaces total (16 standard and one ADA space)</b>	<b>2 spaces proposed (17 x .05 = .85)</b>

**Response:** As shown in the table above, based on the size of the convenience store 13 vehicle parking spaces and two bicycle parking spaces are required. This calculation is based on the size of the proposed convenience store in addition to nine employees anticipated on the largest shift. As allowed by 17.98.10(Q) the maximum parking cannot exceed 30 percent of the minimum required. The maximum parking based on this formula is 17 spaces. As shown on the Site Plan, the applicant proposes providing 16 standard parking spaces and one ADA space for total of 17 parking spaces. In addition, two bicycle parking spaces are proposed. The proposal complies with this standard.

**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 two-family dwellings, 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 5 feet shall be provided along the property fronting on a public street. The setback area shall be landscaped as provided in this code.

**Response:** No parking is proposed abutting a residential zone and no parking is proposed within a required front or side yard setback area.

### **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.

*Response: All parking and maneuvering areas will be surfaced with asphalt.*

**B. Size of Space.**

1. A standard parking space shall be 9 feet by 18 feet.
2. A compact parking space shall be 8 feet by 16 feet.
3. Handicapped parking spaces shall be 13 feet by 18 feet. 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 35 percent of the parking stalls shall be compact spaces.

*Response: The proposed 16 standard vehicle parking spaces and one ADA spaces are designed in compliance with these standards. No compact parking spaces are proposed.*

**C. Aisle Width.**

*Response: All proposed parking is designed to be 90 degrees and a minimum 25 foot aisle is provided.*

### **17.98.70 ON-SITE CIRCULATION**

- A. Groups of more than three (3) parking spaces shall be permanently striped.
- B. Backing and Maneuvering. Except for a single family dwelling or two family dwelling, groups of more than 3 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.

*Response: All proposed parking will be permanently striped and the site has sufficient space so that all vehicles will be able to enter the public right-of-way in a forward manner. Turning templates in the Traffic Study (Exhibit G) for large delivery and fueling trucks show the site has sufficient room to accommodate these vehicles.*

### **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 ft. 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 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.
- C. When developed property is to be expanded or altered in a manner that significantly affects on-site parking or circulation, both existing and proposed accesses shall be reviewed under the standards in A and B above. As a part of an expansion or alteration approval, the City may require relocation and/or reconstruction of existing accesses not meeting those standards.

*Response: SE Orient Drive is under Clackamas County jurisdiction. The applicant applied for and received approval to construct the proposed driveway in the proposed location (Exhibit J). A traffic study (Exhibit G) is also provided as requested. Turning templates for large delivery and fueling trucks are included in this study.*

#### **17.98.100 DRIVEWAYS**

- A. A driveway to an off-street parking area shall be improved from the public roadway 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 shall have a minimum width of 10 feet.
- C. A driveway for a two-family dwelling shall have a minimum width of 20 feet. A driveway approach must be constructed in accordance with applicable city standards and the entire driveway must be paved with asphalt or concrete.
- D. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of twelve feet for their entire length and width but such clearance may be reduced in parking structures.
- E. No driveway shall traverse a slope in excess of 15 percent at any point along the driveway length.
- F. The location and design of the driveway shall provide for unobstructed sight per the vision clearance requirements. 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.

*Response: The access driveway is proposed to be 68 feet wide with a 40 foot wide throat to facilitate maneuvering by fueling trucks exiting the site onto SE Orient Drive. Turning templates for large delivery and fueling trucks are found in the traffic study for this project (Exhibit G). The proposal complies with the minimum standards in this section.*

**17.98.110 VISION CLEARANCE**

- A. Except within the Central Business District, vision clearance areas shall be provided at intersections of all streets and at intersections of driveways and alleys with streets to promote pedestrian, bicycle, and vehicular safety. The extent of vision clearance to be provided shall be determined from standards in Chapter 17.74 and taking into account functional classification of the streets involved, type of traffic control present at the intersection, and designated speed for the streets.
- B. Traffic control devices, streetlights, and utility installations meeting approval by the City Engineer are permitted within vision clearance areas.

*Response: None of these items are within vision clearance areas.*

**17.98.120 LANDSCAPING AND SCREENING**

- A. Screening of all parking areas containing 4 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 5-ft. depth of buffer plantings adjacent to the right-of-way.

*Response: The proposal includes 17 parking spaces. All parking spaces are screened along the public right-of-way including a proposed berm to screen spaces located on the North side of the convenience store.*

- B. When parking in a commercial or industrial district adjoins a residential zoning district, a sight-obscuring screen that is at least 80% opaque when viewed horizontally from between 2 and 8 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 3 years after installation.

*Response: The property directly west of the subject property is planned and zoned for commercial purposes but until it is annexed it is zoned RRFF-5, a residential zoning in Clackamas County. The Landscaped Plan includes additional landscape materials to screen the proposed development from this property.*

- C. Except for a residential development which has landscaped yards, parking facilities shall include landscaping to cover not less than 10% 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.

*Response: The Landscape Plan shows landscaping within and along the edge of all paved areas.*

- 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 5 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.

**Response:** Five parking spaces are proposed north of the convenience store and six spaces west of the store. A planter is proposed at the Northwest corner of the building separating the two parking bays. Another five parking spaces are proposed west of the fueling canopy. This parking bay will be screened on three sides with landscape materials.

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

**Response:** As shown on the submitted Landscape Plan, all parking area setbacks are landscaped in compliance with Chapter 17.92.

- F. Wheel stops, bumper guards, or other methods to protect landscaped areas shall be provided. No vehicle may project over a property line or a public right-of-way. Parking may project over an internal sidewalk, but a minimum clearance of 5 feet for safe pedestrian circulation is required.

**Response:** Wheel stops are proposed in front of all parking spaces adjacent to the convenience store to prevent vehicles from encroaching on the six foot sidewalk in front of the store.

#### **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.

**Response:** As shown on submitted plans all driving surfaces will be paved with asphalt. The area under the fueling canopy will likely be paved with asphalt.

#### **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.

**Response:** A preliminary stormwater management plan is provided as part of the application package. This plan has been designed in accordance with the City of Sandy Stormwater Management requirements. As shown on the submitted Utility Plan (Sheet 5) all roof and parking lot stormwater water will be routed to the proposed stormwater pond. Surfaces under the fueling canopy will be routed through an oil-water separator including a spill control manhole with shut-off valve in case of a gasoline spill.

#### **17.98.150 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.

**Response:** *As noted above, the applicant proposes installing new lighting to illuminate the site. All site lighting will be designed and installed in accordance with Chapter 15.30, Dark Sky Ordinance standards.*

#### **17.98.160 BICYCLE PARKING FACILITIES**

Multi-family developments, industrial, commercial and community service uses, transit transfer stations, and park and ride lots shall meet the following standards for bicycle parking facilities. The intent of this section is to provide secure bicycle parking that is visible from a building's primary entrance and convenient to bicyclists.

##### **A. Location.**

1. Bicycle parking shall be located on-site, convenient to primary building entrances, and have direct access to both the public right-of-way and to the main entrance of the principal structure.
2. Bicycle parking areas shall be visible from building interiors where possible.
3. For facilities with multiple buildings or parking lots, bicycle parking shall be located in areas of greatest use and convenience to bicyclists.
4. If the bicycle parking area is located within the vehicle parking area, the bicycle facilities shall be separated from vehicular maneuvering areas by curbing or other barrier to prevent damage to parked bicycles.
5. Curb cuts shall be installed to provide safe, convenient access to bicycle parking areas.

**Response:** *Two bicycle parking spaces as required as shown on the Site Plan along the West elevation north of the building entrance.*

##### **B. Bicycle Parking Space Dimensions.**

1. Each required bicycle parking space shall be at least 2 1/2 feet by 6 feet. If covered, vertical clearance of 7 feet must be provided.
2. An access aisle of at least 5 feet wide shall be provided and maintained beside or between each row of bicycle parking. Vertical or upright bicycle storage structures are exempted from the parking space length.

**Response:** *The two bicycle parking spaces comply with the space dimension requirements of this section.*

##### **C. Security.**

1. Bicycle parking facilities shall offer security in the form of either a lockable enclosure in which the bicycle can be stored or a stationary object (i.e., a "rack") upon which the bicycle can be located.
2. Racks requiring user-supplied locks shall accommodate both cable and U-shaped locks. Racks shall be designed and installed to permit the frame and both wheels to be secured, with removal of the front wheel, or the frame and one wheel to be secured, if both wheels remain on the bicycle.
3. Bicycle racks shall be securely anchored to the ground or a structure and shall be designed to hold bicycles securely by means of the bicycle frame.

4. All outdoor bicycle parking facilities shall provide adequate shelter from precipitation where possible.

*Response: Proposed bicycle parking includes an anchored rack so that bicycles can be securely locked. These spaces will be provided with weather protection by a five foot overhang in this location.*

#### **17.98.190 OFF-STREET LOADING FACILITIES**

- A. The minimum area required for commercial and industrial loading spaces is as follows:
  1. 250 square feet for buildings of 5,000 to 19,999 square feet of gross floor area.
  2. 500 square feet for buildings of 20,000 to 49,999 square feet of gross floor area.
  3. 750 square feet for buildings in excess of 50,000 square feet of gross floor area.
- B. The required loading berth shall be not less than 10 feet in width by 35 feet in length and shall have an unobstructed height clearance of 14 feet.
- C. Loading areas shall be screened from public view from public streets and adjacent properties except in industrial districts and shall require the same screening as parking lots.
- D. Sufficient space for turning and maneuvering of vehicles shall be provided on the site in accordance with the standard specifications established by the City Engineer.
- E. Entrances and exits shall be provided at locations approved in accordance with applicable ordinances and statutes.
- F. No off-street loading facilities shall be required where buildings abut a public alley in such a manner that loading operations can be conducted from said alley in accordance with applicable traffic and parking ordinances.

*Response: A separate designated loading area is not needed for the proposed use. Fueling unloading will occur at the underground storage tanks and unloading for the convenience store will occur in front of the main entrance during slow customer times. The submitted Traffic Study (Exhibit G) includes turning templates showing how these trucks will be able to safely enter and exit the site. No additional details are required and the proposal complies with these standards.*

#### **CHAPTER 15.30 - DARK SKY ORDINANCE**

##### **15.30.000 Purpose.**

The purpose of the Sandy Dark Sky Ordinance is to regulate outdoor lighting in order to reduce or prevent light pollution. This means to the extent reasonably possible the reduction or prevention of glare and light trespass, the conservation of energy, and promotion of safety and security. (Ord. 2002-11)

*Response: All new light fixtures will be designed and installed in accordance with these regulations. A photometric analysis and lighting fixture cut-sheets were previously submitted in conformance with these standards.*



# SPACE AGE SERVICE STATION

## DESIGN REVIEW SUBMITTAL

### LEGEND

- (E) PROPERTY LINE
- (E) LOT LINE
- (E) EASEMENT LINE
- (E) 5' GROUND CONTOUR
- (E) 1' GROUND CONTOUR
- (E) BUILDING WALL
- (E) BLDG OH
- (E) WALL
- (E) AC PAVEMENT
- (E) SIDEWALK/CONCRETE
- (E) GRAVEL
- (E) CURB
- (E) FENCE
- (E) 4' OF DITCH
- (E) CULVERT
- (E) WATER LINE
- (E) STORM LINE
- (E) SANITARY LINE
- (E) GAS LINE
- (E) TELEPHONE LINE
- (E) CABLE TV LINE
- (E) UNDERGROUND POWER LINE
- (E) OVERHEAD POWER LINE
- (E) STORM MANHOLE
- (E) CATCH BASIN
- (E) AREA DRAIN
- (E) SANITARY SEWER MANHOLE
- (E) SANITARY SEWER CLEANOUT
- (E) TELEPHONE MANHOLE
- (E) WATER METER
- (E) WATER VALVE
- (E) FIRE HYDRANT
- (E) FIRE DEPARTMENT CONNECTION
- (E) POST INDICATOR VALVE
- (E) MANHOLE
- (E) POWER METER
- (E) TRANSFORMER
- (E) UTILITY VAULT
- (E) JUNCTION BOX
- (E) RISER
- (E) UTILITY RISER, PEDISTAL VAULT, JUNCTION BOX OR TRANSFORMER
- (E) GAS METER
- (E) GAS VALVE
- (E) LIGHT POLE
- (E) UTILITY POLE
- (E) UTILITY POLE W/ LIGHT
- (E) POLE W/ GUY WIRE
- (E) TRAFFIC SIGNAL POLE
- (E) SIGN
- (E) BUSINESS SIGN
- (E) BOLLARD
- (E) OR (P) ADA PARKING
- (E) OR (P) PARKING STRIPING
- (E) MAILBOX
- (E) WELL
- (E) DECIDUOUS TREE TO BE REMOVED
- (E) CONIFEROUS TREE TO BE REMOVED
- (E) DECIDUOUS TREE W/ NUMBER
- (E) CONIFEROUS TREE W/ NUMBER
- (E) SURVEY CONTROL POINT
- (P) LOT LINE
- (P) EASEMENT LINE
- (P) CURB
- (P) SIDEWALK / CONCRETE
- (P) RAMP
- (P) AC
- (P) SAUCUT LINE
- (N) BUILDING LINE
- (N) BUILDING DOOR
- (P) 5' FINISH CONTOUR
- (P) 1' FINISH CONTOUR
- (P) SANITARY LINE
- (P) SANITARY MANHOLE
- (P) CLEANOUT
- (P) STORM LINE
- (P) STORM MANHOLE
- (P) CATCH BASIN

### SURVEYING ABBREVIATIONS

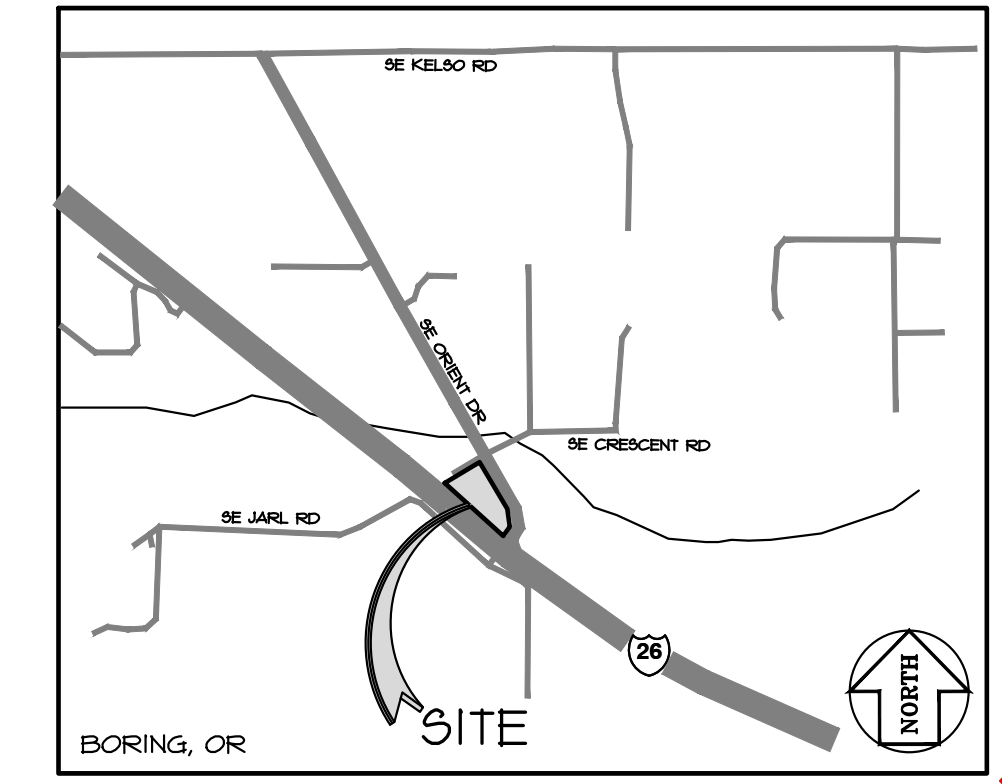
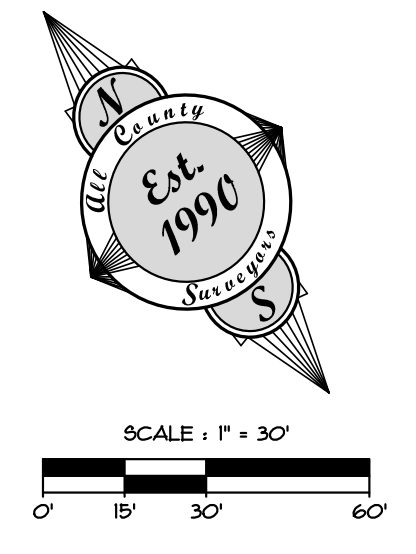
N	NORTH
S	SOUTH
E	EAST
W	WEST
D	DEGREES
M	MINUTES
S	SECONDS
M	MEASURED
R	RECORD INFORMATION PER...
D	PER DEED NO.
E	EASEMENT
M	SURVEY MONUMENT
C	CALC

### GENERAL ABBREVIATIONS

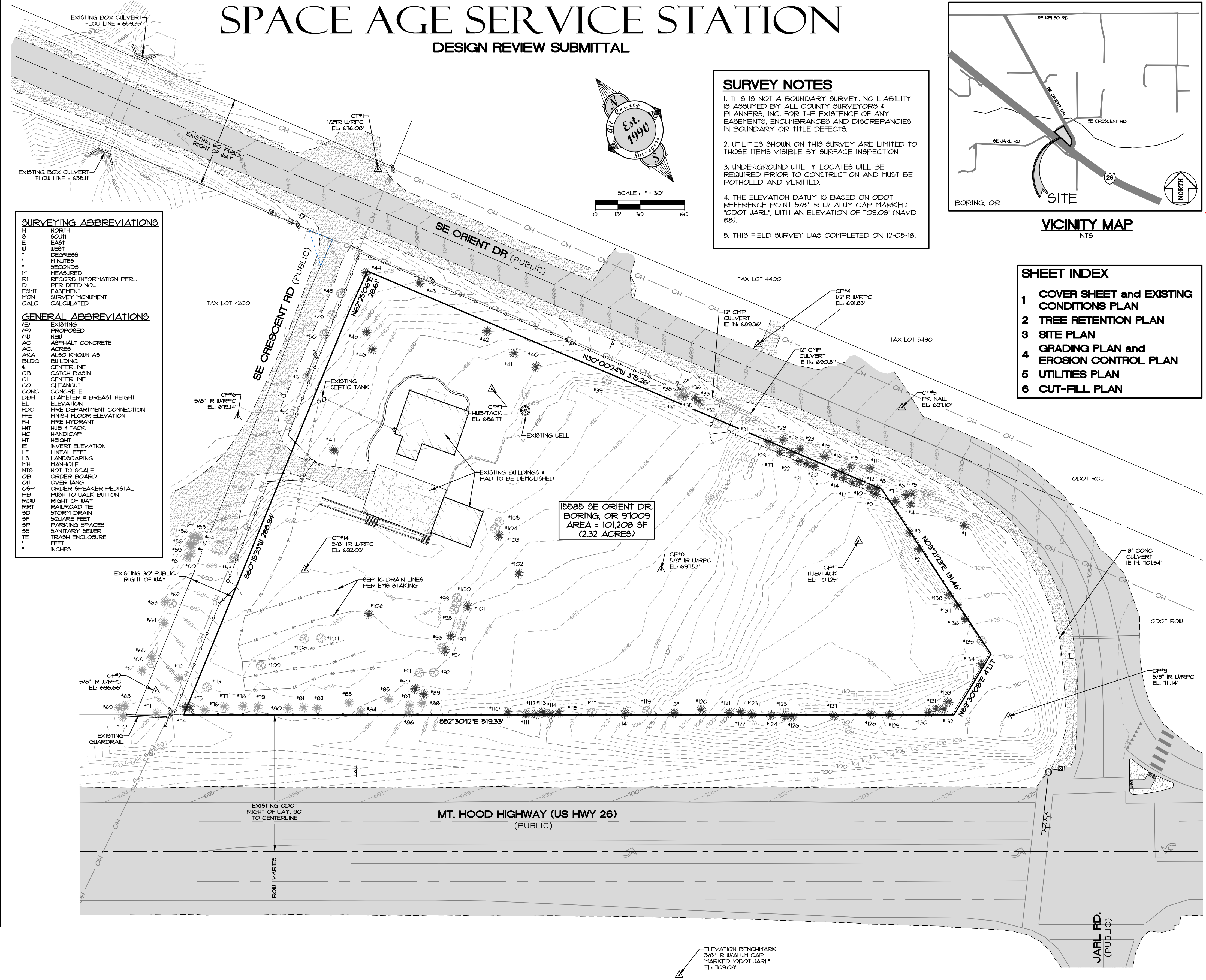
(E)	EXISTING
(P)	PROPOSED
AC	ASPHALT CONCRETE
AC	ACRES
AKA	ALSO KNOWN AS
B	BUILDING
CL	CENTERLINE
CL	CATCH BASIN
CO	CONCRETE
CONC	CONCRETE
DBH	DIAMETER @ BREAST HEIGHT
EL	ELEVATION
FDC	FIRE DEPARTMENT CONNECTION
FTE	FINISH FLOOR ELEVATION
FH	FIRE HYDRANT
HT	HEIGHT
HT	HANDICAP
IE	INVERT ELEVATION
LF	LINEAL FEET
LS	LANDSCAPING
M	MANHOLE
N	NOT TO SCALE
OB	ORDER BOARD
OSP	ORDER SPEAKER PEDISTAL
PB	PUSH TO WALK BUTTON
ROW	RIGHT OF WAY
SD	STORM DRAIN
SF	SQUARE FEET
SP	PARKING SPACES
SS	SANITARY SEWER
TE	TRASH ENCLOSURE
"	FEET
"	INCHES

### SURVEY NOTES

1. THIS IS NOT A BOUNDARY SURVEY. NO LIABILITY IS ASSUMED BY ALL COUNTY SURVEYORS & PLANNERS, INC. FOR THE EXISTENCE OF ANY EASEMENTS, ENCUMBRANCES AND DISCREPANCIES IN BOUNDARY OR TITLE DEFECTS.
2. UTILITIES SHOWN ON THIS SURVEY ARE LIMITED TO THOSE ITEMS VISIBLE BY SURFACE INSPECTION.
3. UNDERGROUND UTILITY LOCATES WILL BE REQUIRED PRIOR TO CONSTRUCTION AND MUST BE POTHOLED AND VERIFIED.
4. THE ELEVATION DATUM IS BASED ON ODOT REFERENCE POINT 5/8" IR W/ ALUM CAP MARKED "ODOT JARL", WITH AN ELEVATION OF 109.08' (NAVD 88).
5. THIS FIELD SURVEY WAS COMPLETED ON 12-05-18.



- ### SHEET INDEX
- 1 COVER SHEET and EXISTING CONDITIONS PLAN
  - 2 TREE RETENTION PLAN
  - 3 SITE PLAN
  - 4 GRADING PLAN and EROSION CONTROL PLAN
  - 5 UTILITES PLAN
  - 6 CUT-FILL PLAN



BY		SHEET
REVISION		1
DATE		OF
		6
NO.		
DESIGNED	RLT/DRR	
DRAWN	DRR	
CHECKED	RLT	
APPROVED	RLT	

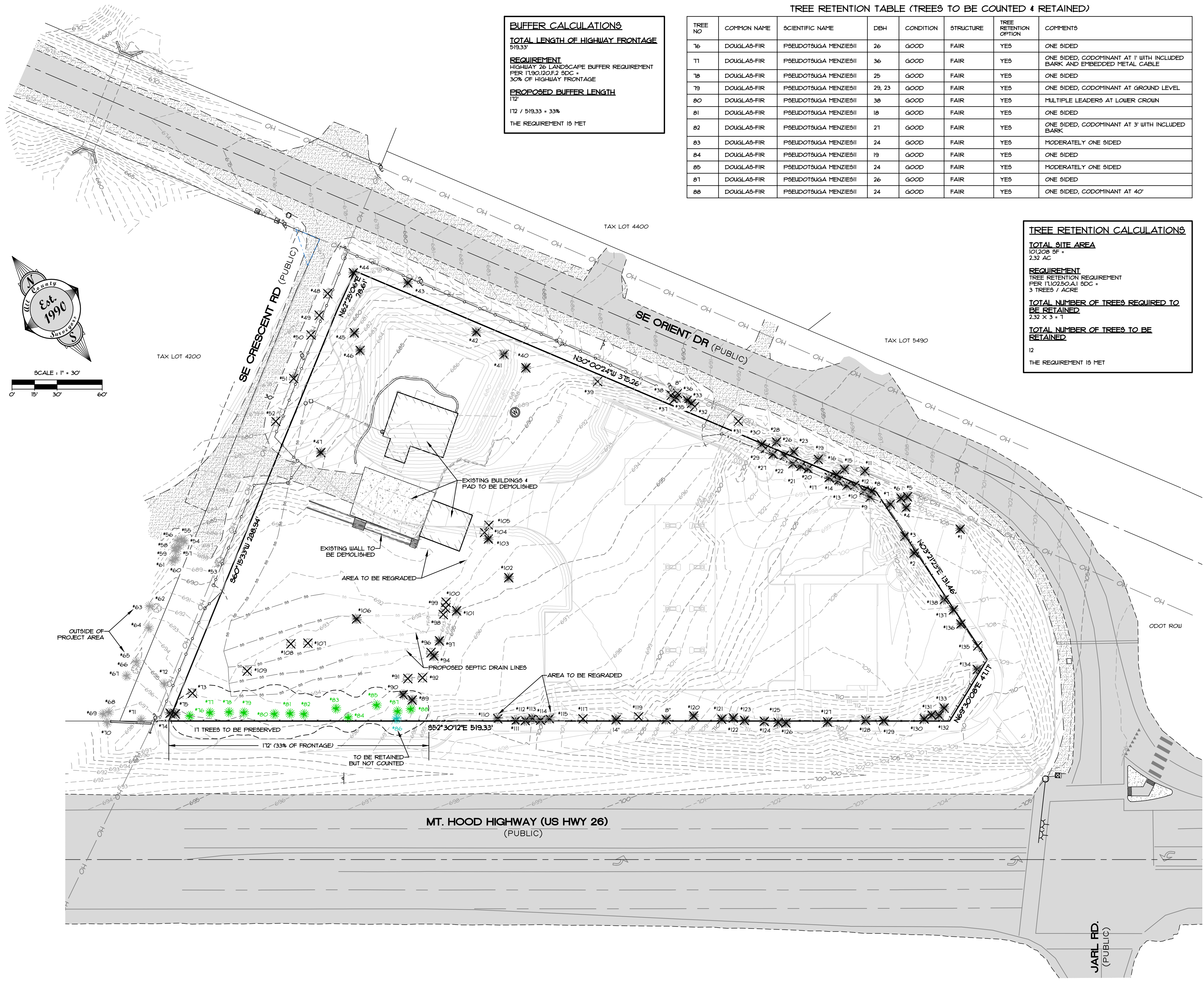
SCALE	VERT. 1" = 40'	LEGAL	
DATE	07-09-19	SECTION	10
FILE	18-126 Planning.dwg	TWP.	25
RANGE			4E

PROJECT: **SPACE AGE SERVICE STATION**  
 COVER SHEET AND EXISTING CONDITIONS PLAN  
 LOCATION: **15585 SE ORIENT DR, SANDY, OR 97055**

**Surveyors & Planners, Inc.**  
 Surveying, Planning and Civil Engineering  
 P.O. Box 955 Sandy, OR 97055  
 Phone: (503) 668-4730  
 Fax: (503) 668-4730  
 DATE OF PLOT: 07/09/19

CLIENT:  
 JIM FLISKA  
 JLP DEVELOPMENT LLC,  
 PO BOX 1429  
 CLACKAMAS OR 97015  
 503-212-3900





**BUFFER CALCULATIONS**  
**TOTAL LENGTH OF HIGHWAY FRONTAGE**  
 519.33'  
**REQUIREMENT**  
 HIGHWAY 26 LANDSCAPE BUFFER REQUIREMENT  
 PER 1130.020.F.2 SDC -  
 30% OF HIGHWAY FRONTAGE  
**PROPOSED BUFFER LENGTH**  
 172'  
 172 / 519.33 = 33%  
 THE REQUIREMENT IS MET

**TREE RETENTION TABLE (TREES TO BE COUNTED & RETAINED)**

TREE NO	COMMON NAME	SCIENTIFIC NAME	DBH	CONDITION	STRUCTURE	TREE RETENTION OPTION	COMMENTS
16	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	GOOD	FAIR	YES	ONE SIDED
17	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	36	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 1' WITH INCLUDED BARK AND EMBEDDED METAL CABLE
18	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	GOOD	FAIR	YES	ONE SIDED
79	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29, 23	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT GROUND LEVEL
80	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	GOOD	FAIR	YES	MULTIPLE LEADERS AT LOWER CROWN
81	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	GOOD	FAIR	YES	ONE SIDED
82	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 3' WITH INCLUDED BARK
83	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	GOOD	FAIR	YES	MODERATELY ONE SIDED
84	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	GOOD	FAIR	YES	ONE SIDED
85	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	GOOD	FAIR	YES	MODERATELY ONE SIDED
87	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	GOOD	FAIR	YES	ONE SIDED
88	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 40'

**TREE RETENTION CALCULATIONS**  
**TOTAL SITE AREA**  
 101,208 SF =  
 2.32 AC  
**REQUIREMENT**  
 TREE RETENTION REQUIREMENT  
 PER 1102.50.A1 SDC -  
 3 TREES / ACRE  
**TOTAL NUMBER OF TREES REQUIRED TO BE RETAINED**  
 2.32 X 3 =  
 7  
**TOTAL NUMBER OF TREES TO BE RETAINED**  
 12  
 THE REQUIREMENT IS MET

BY	DATE	REVISION	SHEET
			2
			OF 6
DESIGNED	DRAWN	CHECKED	APPROVED
RLT/DRR	DRR	RLT	RLT



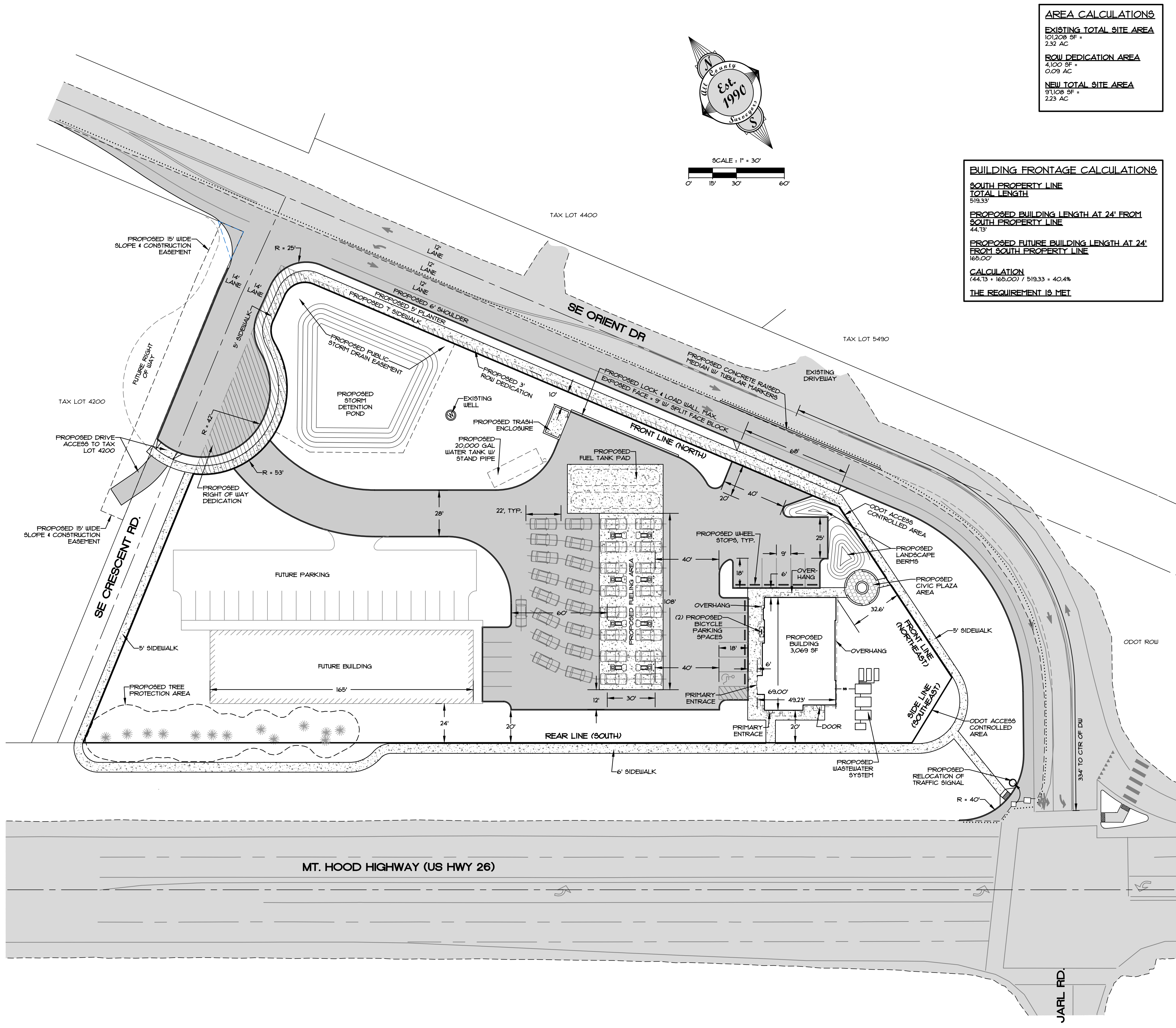
SCALE	VERT. DATE	LEGAL	SECTION	TWP.	RANGE	ZONE
N/A	07-09-19	10	25	4E		
FILE	18-126 Planning.dwg					

**PROJECT:** SPACE AGE SERVICE STATION  
**TREE RETENTION PLAN**  
**LOCATION:** 15585 SE ORIENT DR, SANDY, OR 97055

**Surveyors & Planners, Inc.**  
 Surveying, Planning and  
 Civil Engineering  
 P.O. Box 955 Sandy, OR 97055  
 Phone: (503) 668-4730  
 Fax: (503) 668-4730  
 DATE OF PLOT: 07/09/19

**CLIENT:**  
 JIM FLURKA  
 JLP DEVELOPMENT LLC.  
 PO BOX 1429  
 CLACKAMAS OR 97015  
 503-212-3900





**AREA CALCULATIONS**

<b>EXISTING TOTAL SITE AREA</b>	101,208 SF = 2.32 AC
<b>ROW DEDICATION AREA</b>	4,100 SF = 0.09 AC
<b>NEW TOTAL SITE AREA</b>	97,108 SF = 2.23 AC

**BUILDING FRONTAGE CALCULATIONS**

<b>SOUTH PROPERTY LINE TOTAL LENGTH</b>	519.33'
<b>PROPOSED BUILDING LENGTH AT 24' FROM SOUTH PROPERTY LINE</b>	44.13'
<b>PROPOSED FUTURE BUILDING LENGTH AT 24' FROM SOUTH PROPERTY LINE</b>	165.00'
<b>CALCULATION</b>	$(44.13 + 165.00) / 519.33 = 40.4\%$
<b>THE REQUIREMENT IS MET.</b>	

DATE	NO.	REVISION	BY
DESIGNED: RLT/DRR			SHEET <b>3</b>
DRAWN: DRR			
CHECKED: RLT			OF <b>6</b>
APPROVED: RLT			



SCALE	VERT. 1" = 10'	HORIZ. 1" = 30'
DATE	07-09-19	
FILE	18-126 Planning.dwg	
SECTION	TWP. 10	RANGE 25
LEGAL	4E	

**SPACE AGE SERVICE STATION**  
SITE PLAN

**Surveyors & Planners, Inc.**  
Surveying, Planning and  
Civil Engineering  
P.O. Box 955 Sandy, OR 97055  
Phone: (503) 668-4730  
Fax: (503) 668-4730  
DATE OF PLOT: 07/09/19

CLIENT:  
JIM FLISKA  
JLP DEVELOPMENT LLC.  
PO BOX 1429  
CLACKAMAS OR 97015  
503-212-3900

PROJECT: 15585 SE ORIENT DR, SANDY, OR 97055  
LOCATION:

**PROPOSED CONSTRUCTION**



**EROSION CONTROL NOTES**

OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

THE IMPLEMENTATION OF THESE ESC PLANS AND CONSTRUCTION MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED BY THE LOCAL JURISDICTION, AND VEGETATION/LANDSCAPING IS ESTABLISHED. THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTENANCE AFTER THE PROJECT IS APPROVED UNTIL THE LOTS ARE SOLD.

THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

THE ESC FACILITIES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE.

ALL ADJACENT STREETS SHALL BE KEPT FROM DEBRIS, DIRT AND ROCK. AT ALL TIMES, USE ROCK ENTRANCES FROM ENTERING AND LEAVING THE SITE. ANY DIRT OR DEBRIS LEAVING THE SITE SHALL BE CLEANED UP IMMEDIATELY.

AN EROSION CONTROL INSPECTION IS REQUIRED BEFORE ANY GROUND DISTURBING ACTIVITY IS COMMENCED ON-SITE. ALSO, THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

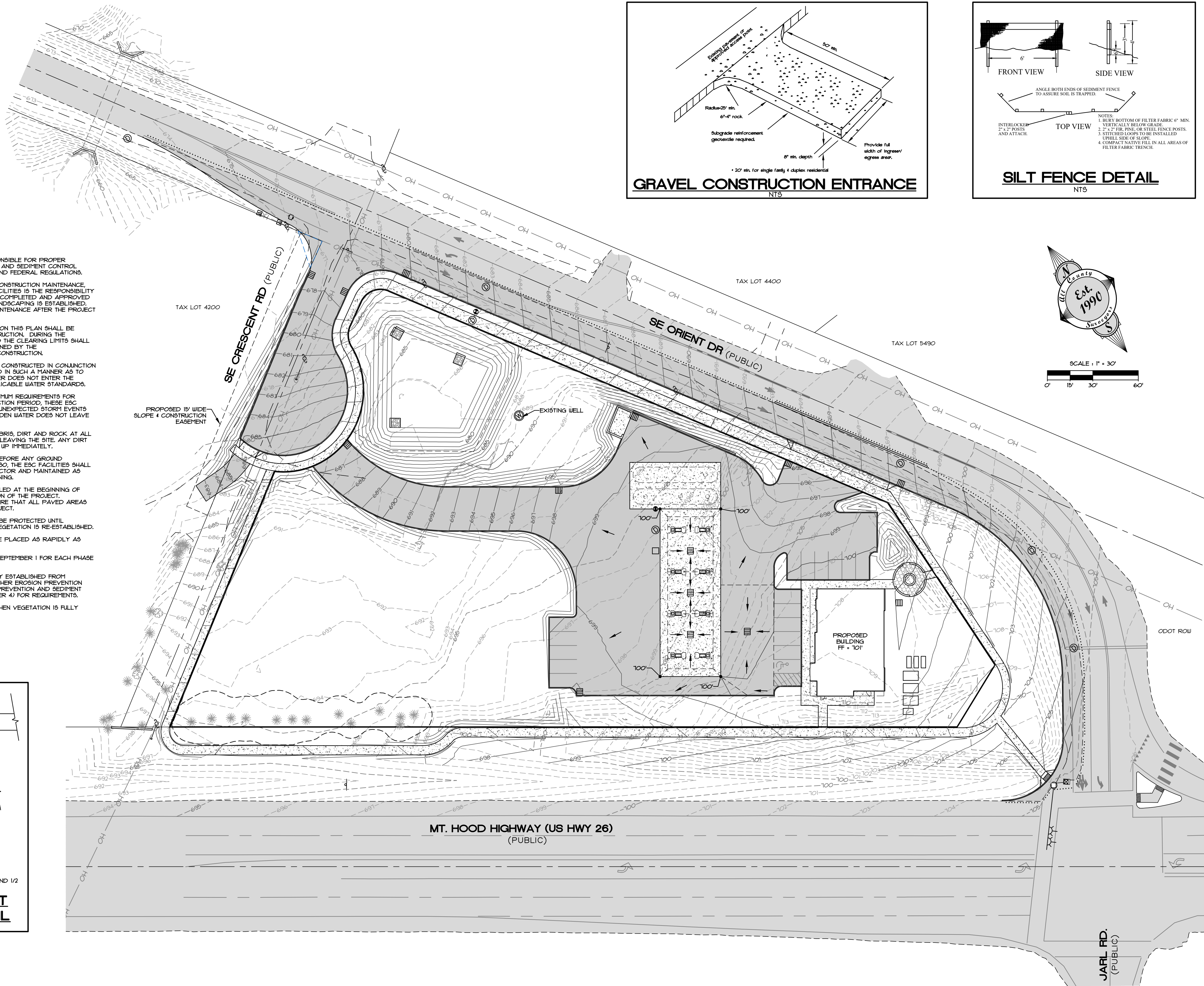
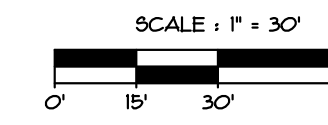
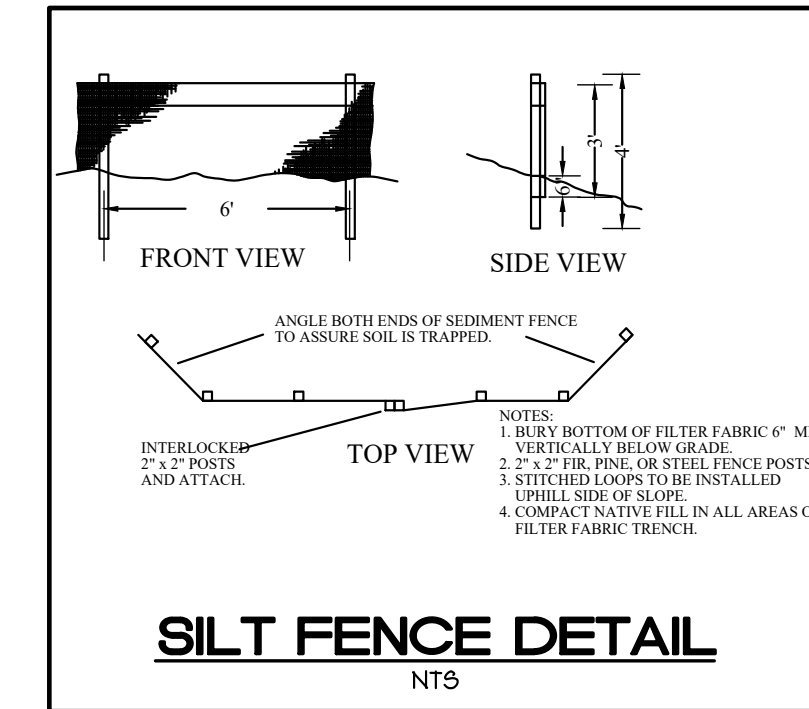
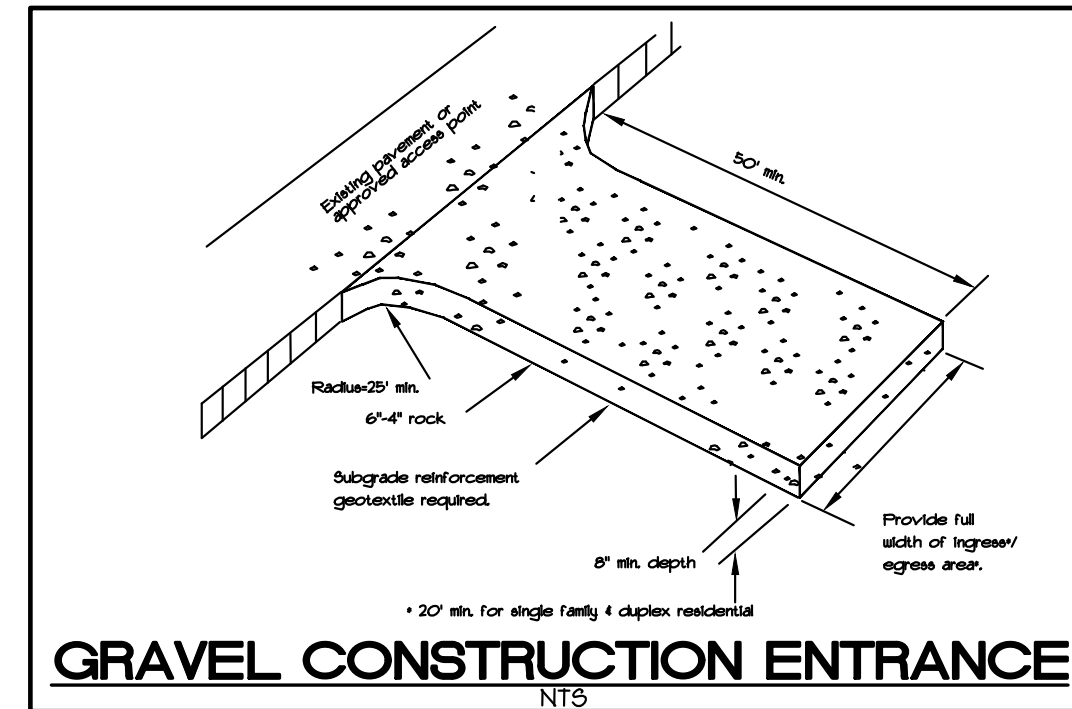
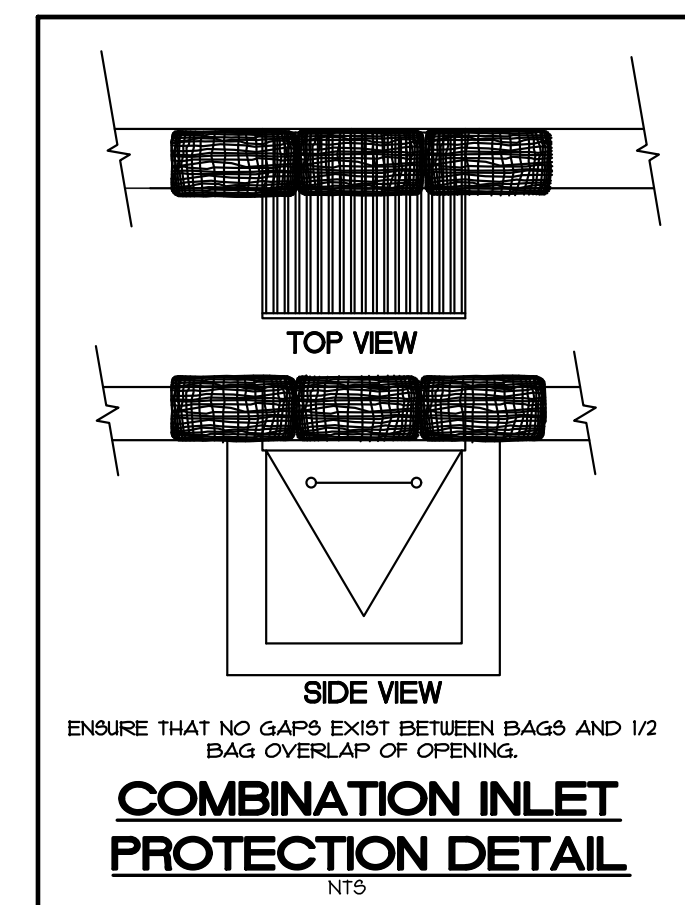
STABILIZED GRAVEL ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

STORM INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED. PAVEMENT SURFACES AND VEGETATION ARE TO BE PLACED AS RAPIDLY AS POSSIBLE.

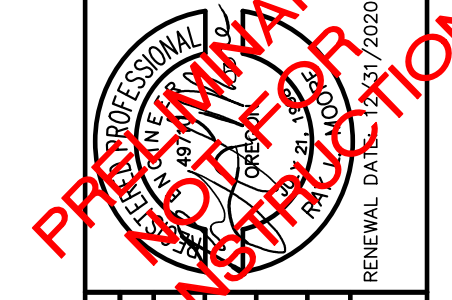
SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1 FOR EACH PHASE OF CONSTRUCTION.

IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY ESTABLISHED FROM OCTOBER 1ST THROUGH APRIL 30TH, THE WET WEATHER EROSION PREVENTION MEASURES WILL BE IN EFFECT. SEE THE EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (CHAPTER 4) FOR REQUIREMENTS.

THE DEVELOPER SHALL REMOVE ESC MEASURES WHEN VEGETATION IS FULLY ESTABLISHED.



BY	DATE	REVISION	SHEET
			4
			OF 6
DESIGNED:	RLT/DRR		
DRAWN:	DRR		
CHECKED:	RLT		
APPROVED:	RLT		



SCALE	VERT. HORIZ.	DATE	FILE	LEGAL	SECTION	TWP.	RANGE	RANGE
1" = 30'	1" = 30'	07-09-19	18-126 Planning.dwg		10	25	4E	4E

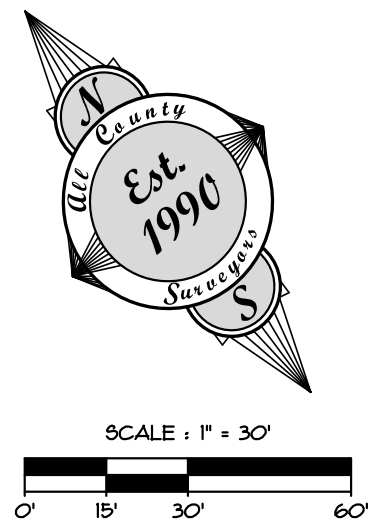
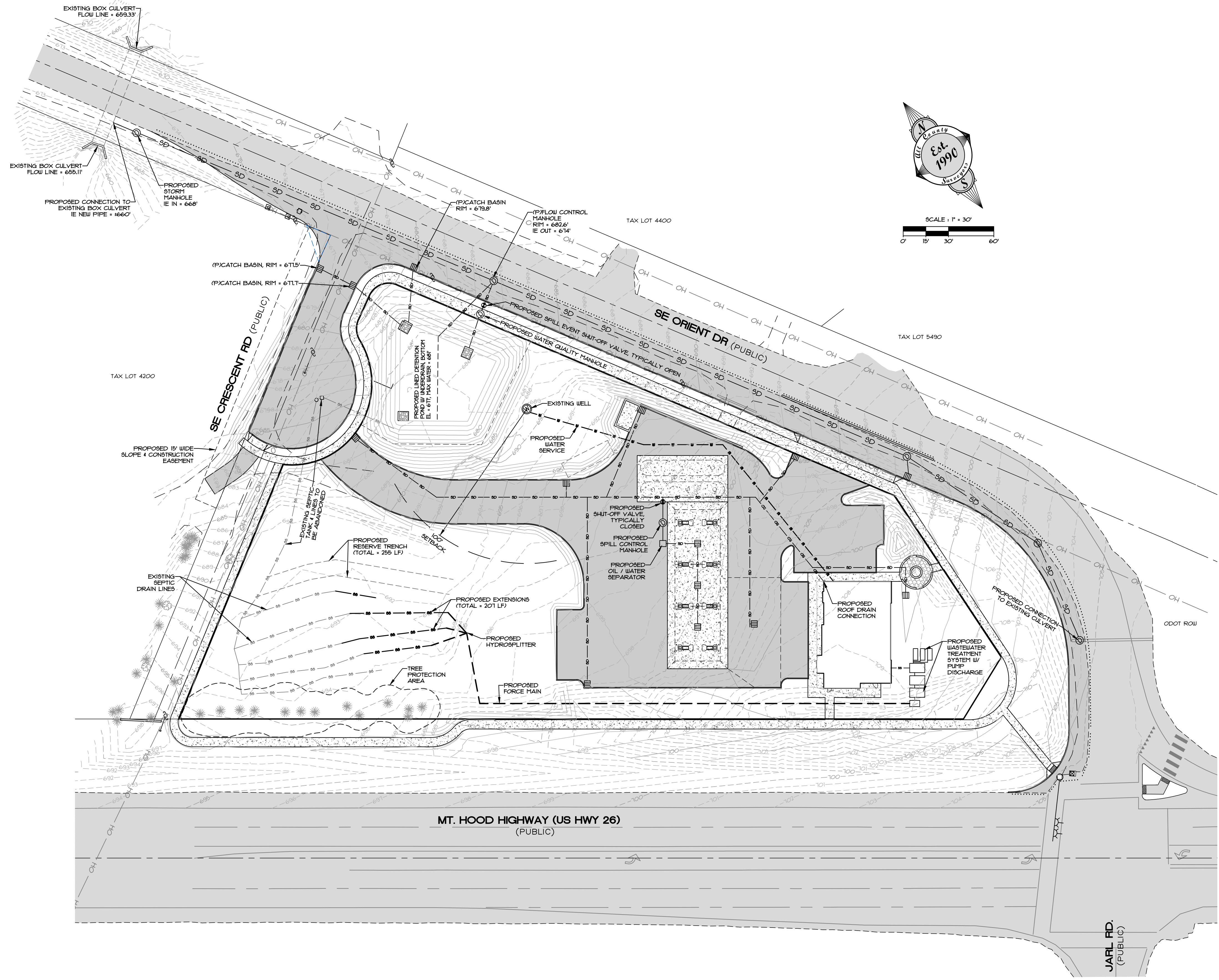
PROJECT: **SPACE AGE SERVICE STATION GRADING PLAN AND EROSION CONTROL PLAN**

LOCATION: **15585 SE ORIENT DR, SANDY, OR 97055**

Surveyors & Planners, Inc.  
 Surveying, Planning and  
 Civil Engineering  
 P.O. Box 955 Sandy, OR 97055  
 Phone: (503) 668-4730  
 Fax: (503) 668-4730  
 DATE OF PLOT: 07/09/19

CLIENT:  
 JIM FLISKA  
 JLP DEVELOPMENT LLC,  
 PO BOX 1429  
 CLACKAMAS OR 97015  
 503-212-3900





DATE	NO.	REVISION	BY	SHEET
				5
				6



SCALE	VERT.	HORIZ.	DATE	FILE	SECTION	TWP.	RANGE	4E
N/A	1" = 8'	1" = 30'	07-09-19	18-126 Planning.dwg	10	25		

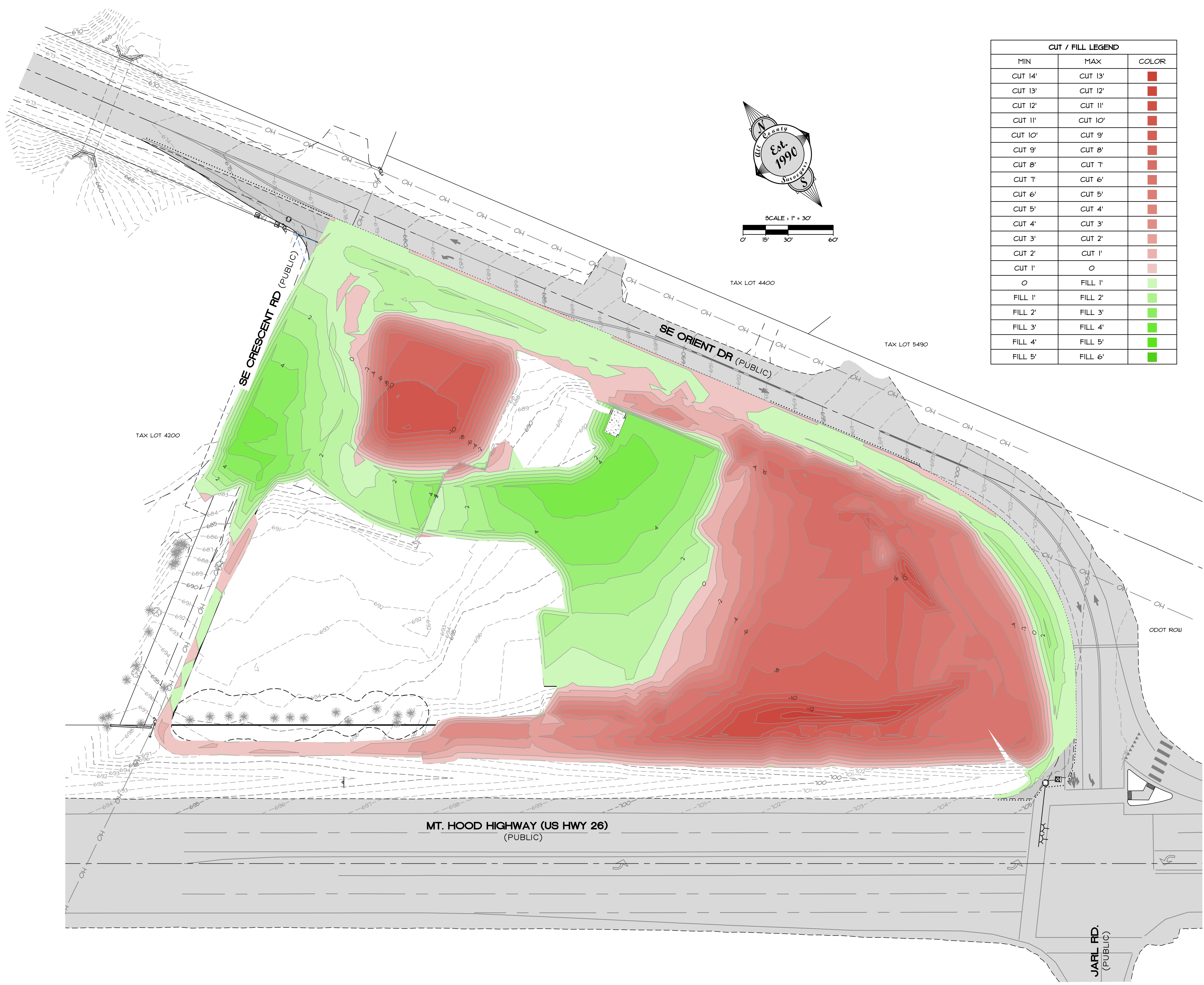
PROJECT: **SPACE AGE SERVICE STATION UTILITIES PLAN**

LOCATION: **15585 SE ORIENT DR, SANDY, OR 97055**

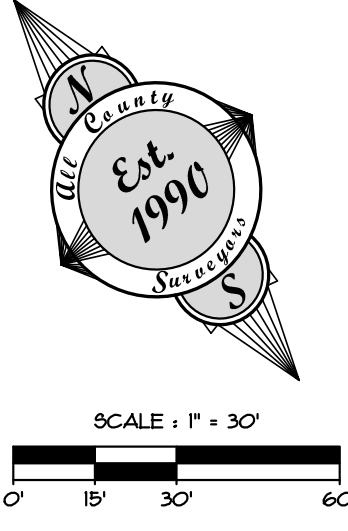
**Surveyors & Planners, Inc.**  
 Surveying, Planning and  
 Civil Engineering  
 P.O. Box 925 Sandy, OR 97055  
 Phone: (503) 668-4730  
 Fax: (503) 668-4730  
 DATE OF PLOT: 07/09/19

CLIENT:  
 JIM FLISKA  
 JLP DEVELOPMENT LLC,  
 PO BOX 1429  
 CLACKAMAS OR 97015  
 503-212-3900





CUT / FILL LEGEND		
MIN	MAX	COLOR
CUT 14'	CUT 13'	Red
CUT 13'	CUT 12'	Red
CUT 12'	CUT 11'	Red
CUT 11'	CUT 10'	Red
CUT 10'	CUT 9'	Red
CUT 9'	CUT 8'	Red
CUT 8'	CUT 7'	Red
CUT 7'	CUT 6'	Red
CUT 6'	CUT 5'	Red
CUT 5'	CUT 4'	Red
CUT 4'	CUT 3'	Red
CUT 3'	CUT 2'	Red
CUT 2'	CUT 1'	Red
CUT 1'	0	Light Red
0	FILL 1'	Light Green
FILL 1'	FILL 2'	Light Green
FILL 2'	FILL 3'	Light Green
FILL 3'	FILL 4'	Light Green
FILL 4'	FILL 5'	Light Green
FILL 5'	FILL 6'	Light Green



SCALE: 1" = 30'  
0' 15' 30' 60'

DATE	NO.	REVISION	BY
DESIGNED: RLT/DRR			SHEET <b>6</b> OF <b>6</b>
DRAWN: DRR			
CHECKED: RLT			
APPROVED: RLT			



SCALE	N/A	VERT. DATE	07-09-19
HORIZ.	1" = 60'	FILE	18/126 Planning.dwg
SECTION	TWP. 10	RANGE	25
LEGAL			4E

**SPACE AGE SERVICE STATION**  
CUT-FILL PLAN

**Surveyors & Planners, Inc.**  
Surveying, Planning and  
Civil Engineering  
P.O. Box 955 Sandy, OR 97055  
Tel: (503) 668-7730  
Fax: (503) 668-4730  
DATE OF PLOT: 07/09/19

CLIENT:  
JIM FLISKA  
JLP DEVELOPMENT LLC,  
PO BOX 1429  
CLACKAMAS OR 97015  
503-212-3900

LOCATION: 15585 SE ORIENT DR, SANDY, OR 97055



**GROUND SURFACE**

SYMBOL	DESCRIPTION	QTY
	PT 404 Native Upland Mix with Color - Seed at rate of 1 lb. per 1,000 sq ft in Fall or Spring	53,354 sf
	Lawn, PT 309 Supreme Mix	2,377 sf
	PT 440 Native Biofilter Mix - Seed at rate of 1 lb. per 1,000 sq ft in Fall or Spring	11,073 sf
	PT 402 Native Riparian Mix - Seed at rate of 1 lb. per 1,000 sq ft in Fall or Spring	5,168 sf
	Planter Bed - Dark brown shredded bark mulch at 3" depth	19,768 sf

**PLANT SCHEDULE**

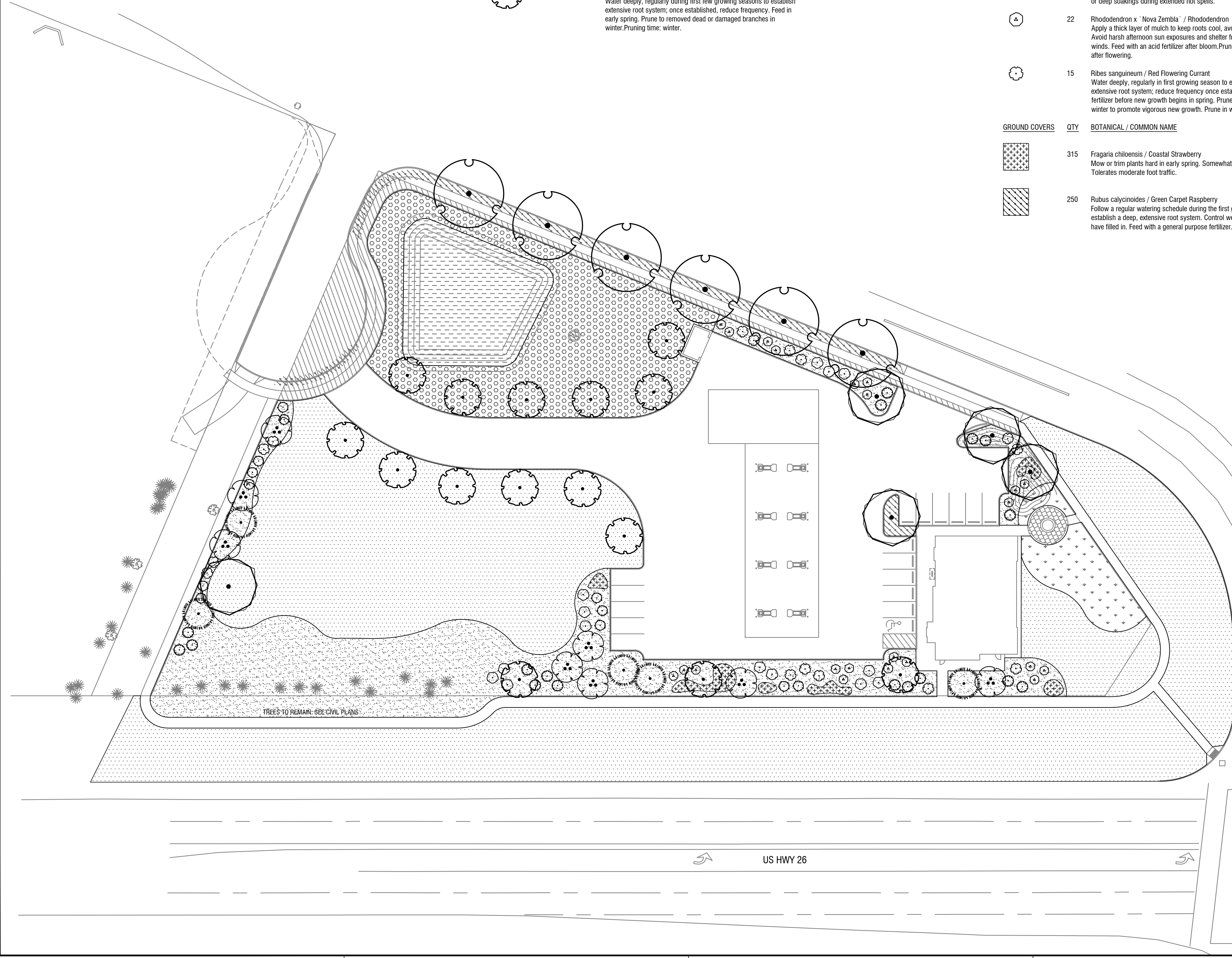
TREES	QTY	BOTANICAL / COMMON NAME	CONT	CAL	SIZE
	5	Calocedrus decurrens / Incense Cedar Water deeply, regularly during the first few growing seasons to establish an extensive root system. Once established, prefers evenly moist soils, but tolerates mild, periodic dry spells. Fertilize before new growth begins in spring.	B & B		5' Height
	6	Cladrasis kentuckea / Yellowwood Water deeply and regularly during first few growing seasons to establish an extensive root system. Once established, reduce frequency; prefers regular moisture but tolerates drier soils. Apply fertilizer before new growth begins in spring.	B & B	1.5"	Cal
	5	Cornus florida 'Cherokee Brave' / Cherokee Brave Dogwood Feed with a general purpose fertilizer before new growth begins in spring. Add a 2 - 4 inch layer of mulch to keep the root zone cool and moist in the summer. Pruning time: prune lightly if needed during dormant season.	B & B	1.5"	Cal
	15	Cornus kousa 'KN 30-8' PP 16309 / Venus Dogwood Water deeply, regularly during first few growing seasons to establish extensive root system; once established, reduce frequency. Feed in early spring. Prune to removed dead or damaged branches in winter. Pruning time: winter.	B & B	1.5"	Cal

SHRUBS	QTY	BOTANICAL / COMMON NAME	CONT
	14	Amelanchier alnifolia 'Regent' / Saskatoon Serviceberry Maintain evenly moist soil during the first growing season to establish root system. Apply a balanced, general purpose fertilizer when new growth begins in spring. Prune annually in late winter to promote vigorous new growth.	3 gal
	17	Arctostaphylos uva-ursi / Massachusetts / Massachusetts Manzanita Does not do well with heavy, wet soils or frequent fertilization. Once established, reduce frequency; tolerates moderate drought. Space 5 to 6 ft. apart as groundcover; closer for faster coverage.	3 gal
	12	Mahonia repens / Creeping Mahonia Space 3 to 4 ft. apart as groundcover; closer for faster coverage. Tolerates dry shade. Apply a controlled-release fertilizer in spring. Spreads along surface by stolons. Pruning time: summer after flowering.	3 gal
	8	Myrica californica / Pacific Wax Myrtle Highly adaptable. Tolerates wet soils if well-drained, and drought conditions when established. Best appearance with regular watering or deep soakings during extended hot spells.	5 gal
	22	Rhododendron x 'Nova Zembla' / Rhododendron Apply a thick layer of mulch to keep roots cool, avoiding the crown. Avoid harsh afternoon sun exposures and shelter from drying winter winds. Feed with an acid fertilizer after bloom. Pruning time: spring after flowering.	3 gal
	15	Ribes sanguineum / Red Flowering Currant Water deeply, regularly in first growing season to establish an extensive root system; reduce frequency once established. Apply fertilizer before new growth begins in spring. Prune annually in late winter to promote vigorous new growth. Prune in winter.	3 gal

GROUND COVERS	QTY	BOTANICAL / COMMON NAME	CONT	SPACING
	315	Fragaria chiloensis / Coastal Strawberry Mow or trim plants hard in early spring. Somewhat drought tolerant. Tolerates moderate foot traffic.	3"-4"	18" o.c.
	250	Rubus calycinoideus / Green Carpet Raspberry Follow a regular watering schedule during the first growing season to establish a deep, extensive root system. Control weeds until the plants have filled in. Feed with a general purpose fertilizer.	3"-4"	36" o.c.

**NOTES**

- Impaction System:  
 • All landscaping shall be irrigated with an automatic system to sustain viable plant life.
- Existing Soil:  
 • Cassidero sily clay loam (0-7% slopes) = 88.6% of site  
 • Cassidero sily clay loam (7-12% slopes) = 10.5% of site  
 • Cotmill sily clay loam (2-6% slopes) = 0.9% of site
- Topsoil:  
 1. Topsoil used in landscaped areas, whether imported, stockpiled, or in place, shall be fertile, loose, friable soil meeting the following criteria:  
 a. Chemical Characteristics:  
 1) Acidity / alkalinity range: pH 5.5 to 8.0  
 2) Soluble Salts: less than 3.0 mmhos/cm  
 3) Sodium Adsorption Ratio (SAR): less than 6.0  
 4) Organic Matter: greater than one percent.  
 b. Physical Characteristics:  
 1) Gradation as defined by USDA triangle of physical characteristics as measured by hydrometer:  
 (a) Sand: 15 to 60 percent  
 (b) Silt: 10 to 60 percent  
 (c) Clay: 5 to 30 percent  
 2) Clean and free from basic minerals and chemicals, noxious weeds, rocks larger than 1/2 inch in any dimension, and other objectionable materials.  
 3) Soil shall not contain more than 2 percent by volume of rocks measuring over 3/32 inch in largest size.  
 c. Fertility Requirements:  
 1) Nitrate-nitrogen ppm > 20  
 2) Phosphorus ppm > 15  
 3) Potassium ppm > 150  
 4) Iron ppm > 10
- Soil Amendments:  
 1. Incorporate following soil amendments into topsoil, either import or stockpiled, used on site. Adjust application rates and acid amendments that shall bring the soil to comply with soil test:  
 a. Acceptable Soil Amendments And Application Rates:  
 1) Sulfur: 0.5 lbs. per 1000 sq. ft.  
 2) Equal as approved by Architect before installation.  
 b. Acceptable Fertilizers And Application Rates:  
 1) Lawn: Phosphorus 1-2 lbs per 1000 sq. ft., Potassium 2 lbs. per 1000 sq. ft., and Nitrogen 2-4 lbs. per 1000 sq. ft.  
 2) Shrubs: Phosphorus 1-2 lbs per 1000 sq. ft., Potassium 2 lbs. per 1000 sq. ft., and Nitrogen 1-2 lbs. per 1000 sq. ft.  
 3) Equal as approved by Architect before installation.  
 c. Acceptable Soil Conditioners And Application Rates:  
 1) Type One Acceptable Products.  
 (a) Soil conditioner that meets the required fertilizer and soil amendments stated above can be used at the discretion of the contractor.



**LANDSCAPED AREAS WITHIN PROPERTY**

SYMBOL	DESCRIPTION	QTY
	PT 404 Native Upland Mix with Color - Seed at rate of 1 lb. per 1,000 sq ft in Fall or Spring	23,803 sf
	Lawn, PT 309 Supreme Mix	2,377 sf
	PT 440 Native Biofilter Mix - Seed at rate of 1 lb. per 1,000 sq ft in Fall or Spring	11,073 sf
	PT 402 Native Riparian Mix - Seed at rate of 1 lb. per 1,000 sq ft in Fall or Spring	5,168 sf
	Planter Bed - Dark brown shredded bark mulch at 3" depth	19,768 sf
	674 sf Fragaria chiloensis / Coastal Strawberry Mow or trim plants hard in early spring. Somewhat drought tolerant. Tolerates moderate foot traffic.	
	466 sf Rubus calycinoideus / Green Carpet Raspberry Follow a regular watering schedule during the first growing season to establish a deep, extensive root system. Control weeds until the plants have filled in. Feed with a general purpose fertilizer.	

**TOTAL LANDSCAPED AREA WITHIN PROPERTY BOUNDARY = 63,329 SF**

**design west | architects**  
 285 SOUTH 300 WEST LOGAN UT 84321  
 350 SOUTH 400 EAST SUITE 304 SLC, UT 84111

**SPACE AGE FUEL**  
 SANDY, OREGON  
 JIM PLUSKA  
 JLB DEVELOPMENT, LLC

**NOT FOR CONSTRUCTION**

MARK	DATE	DESCRIPTION

PROJECT #: 418458  
 DRAWN BY: ALTHOUSE  
 CHECKED BY: HEPPWORTH  
 ISSUED: 07/18/2019

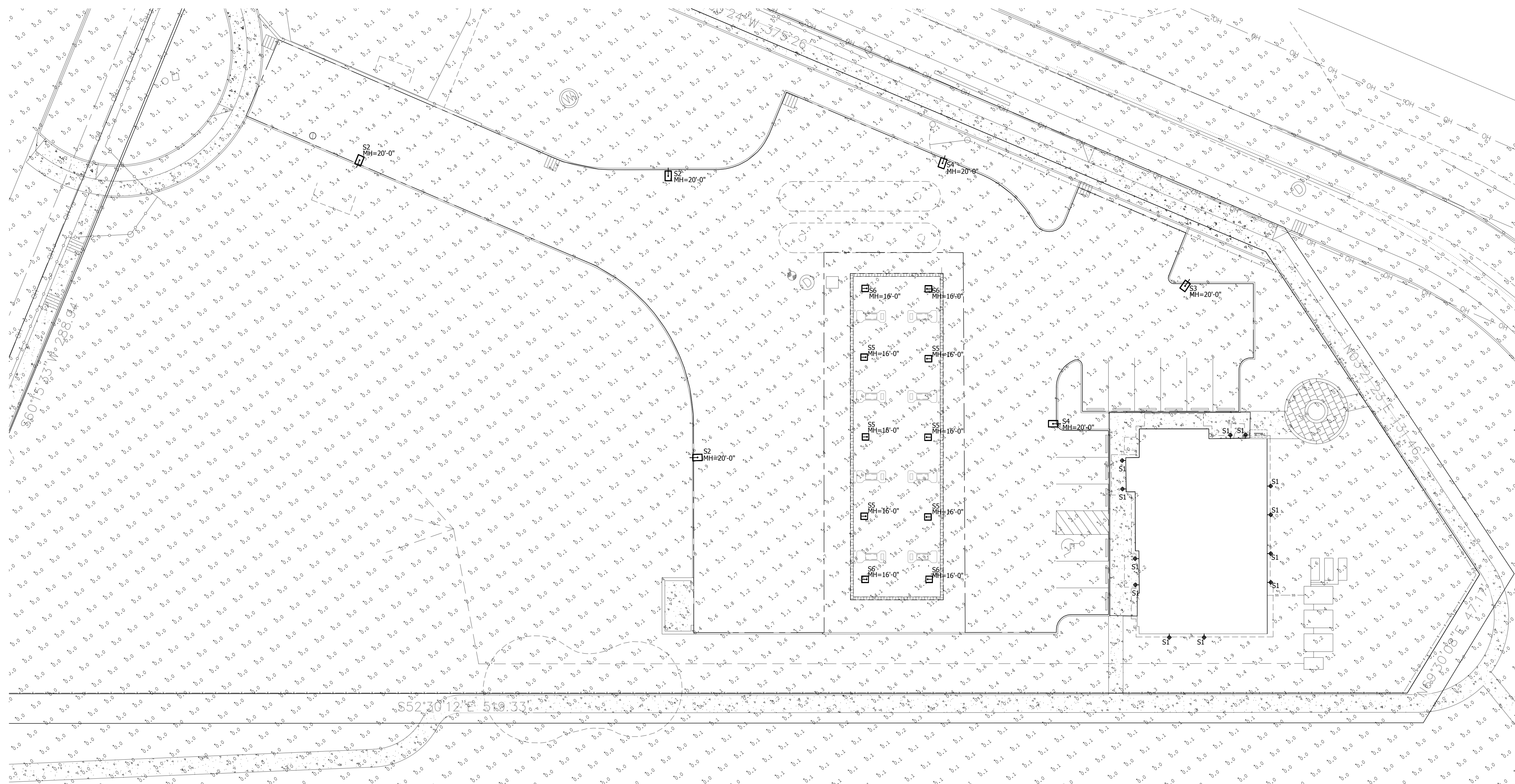
REVIEW SUBMITTAL  
 NOT FOR CONSTRUCTION

LANDSCAPE PLAN

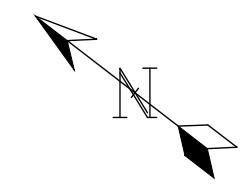
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**GENERAL NOTES**  
 1. REFERENCE ARCHITECTURAL ELEVATION DRAWINGS A220 & A221 FOR BUILDING MOUNTED SCENCE MOUNTING HEIGHTS.



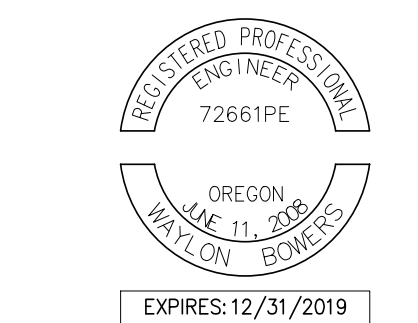
**SITE LIGHTING PHOTOMETRIC ANALYSIS**

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

PRIVATE PARKING & CANOPY LIGHTING PHOTOMETRIC DATA						
AREA OF INTEREST	ILLUMINANCE (FC)					
	AVE.	MAX	MIN	AVE/MIN	MAX/MIN	MAX/AVE
PARKING LOT *AREA INDICATED BY	2.85	9.90	0.30	9.50	33.00	3.47
WALKWAYS & ENTRANCEWAYS *AREA INDICATED BY	4.87	13.20	0.40	12.18	33.00	2.71
FUEL ISLAND *AREA INDICATED BY	19.78	26.6	11.4	1.74	2.33	1.34

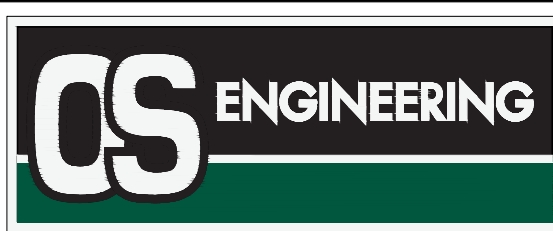
LIGHTING EQUIPMENT SCHEDULE					
TAG#	DESCRIPTION	MANUFACTURER	PART NUMBER	NOTES/ACCESSORIES/OPTIONS	WATTS
S1	EXTERIOR WALL SCENCE	SPJ	SPJ36-04-FINISH-1000-2700K-10W	*VERIFY FINISH CHOICE	10
S2	POLE MOUNT AREA LIGHTING	CREE	OSQ-ADA-* + OSQ-A-2ME-B-40K-UL*PML2	*VERIFY FINISH CHOICE	86
S3	POLE MOUNT AREA LIGHTING	CREE	OSQ-ADA-* + OSQ-A-3ME-B-40K-UL*PML2 + OSQ-BLSMF	*VERIFY FINISH CHOICE	86
S4	POLE MOUNT AREA LIGHTING	CREE	OSQ-ADA-* + OSQ-A-2ME-B-40K-UL*PML2 + OSQ-BLSMF	*VERIFY FINISH CHOICE	86
S5	CANOPY LIGHTING-FUEL ISLAND	LSI	CRUS SM SC LED S5 50 UE WHT	*VERIFY FINISH CHOICE	114
S6	CANOPY LIGHTING-FUEL ISLAND	LSI	CRUS SM SC LED VLW UE WHT	*VERIFY FINISH CHOICE	78.7

**GENERAL EQUIPMENT NOTES**  
 1. ANY COLOR CHOICES IDENTIFIED ARE FOR SUGGESTIVE PURPOSES ONLY. VERIFY COLOR SCHEME AND COLOR CODES PRIOR TO ORDERING.  
 2. REFERENCE MANUFACTURERS SPECIFICATIONS FOR ALL ACCESSORIES/OPTIONS REQUIRED FOR PROPER INSTALLATION AND FUNCTION OF LUMINAIRES.  
 3. FOR SUCCESSFUL IMPLEMENTATION OF THE PROGRAMMABLE MULTI-LEVEL OPTION, A MINIMUM OF ONE HAND HELD REMOTE IS REQUIRED. (XA-SENSREM)



**PERMIT**

0	PERMIT	WTB	05/06/19
---	--------	-----	----------



**VERIFY SCALES**  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY  
**REUSE OF DOCUMENTS**  
 THIS DOCUMENT IS THE PROPERTY OF OLSSON INDUSTRIAL ELECTRIC & ALL SUBSIDIARIES AND CAN NOT BE USED WITHOUT WRITTEN PERMISSION

DSGN: JMB  
 DRN: JMB  
 CKD: WTB  
 APD: WTB

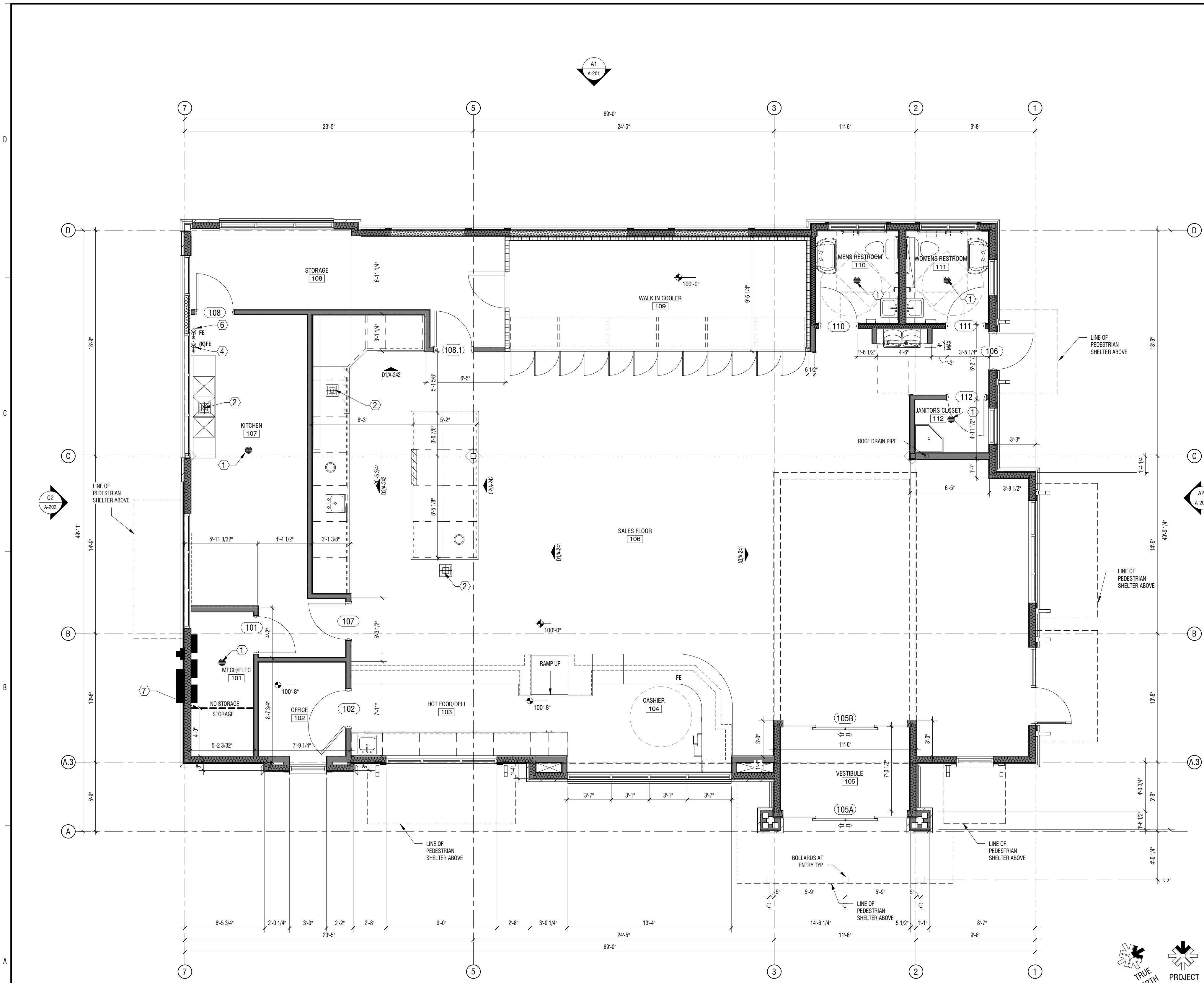
CUSTOMER:  
 SPACE AGE FUELS  
 15585 SE ORIENT DR.  
 SANDY, OREGON

TITLE:  
 SPACE AGE FUELS  
 SITE LIGHTING  
 PHOTOMETRIC ANALYSIS

DRAWING #: E1.0 SHT. 1 of 1 REV SIZE  
 DATE: 05/06/19 PROJECT: B19-0293-EN D



# EXHIBIT E



**A1** OVERALL FLOOR PLAN  
1/4" = 1'-0"

## GENERAL NOTES

- DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS SHALL HAVE PRECEDENCE. LARGER SCALE DRAWINGS SHALL HAVE PRECEDENCE OVER SMALLER SCALE DRAWINGS. THE GENERAL CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY DIMENSION DISCREPANCIES OR CONFLICTS BEFORE PROCEEDING WITH THAT PORTION OF WORK.
- CONTRACTOR SHALL VERIFY LAY-OUT OF STRUCTURAL, MECHANICAL, AND ELECTRICAL.
- ALL INTERIOR DIMENSIONS ARE TO FROM FACE OF STUD / MASONRY. ALL EXTERIOR DIMENSIONS ARE TO FROM FACE OF FOUNDATION. DIMENSIONS MARKED "CL" OR "CL" ARE FROM FACE OF FINISH TO FACE OF FINISH AND SHALL BE MAINTAINED AND CANNOT BE FIELD ADJUSTED WITHOUT PRIOR APPROVAL OF THE ARCHITECT.
- ALL DOOR FRAMES SHALL BE 4" MIN. FROM PERPENDICULAR FINISH OF WALL U.N.O.
- L, J, T, G, E, B = CORNER GUARD, END GUARD. SEE FINISH LEGEND FOR MATERIAL A-191
- BLOCKING TO BE PROVIDED FOR ALL WALL MOUNTED EQUIPMENT
- FE = FIRE EXTINGUISHER
- SEE SCHEDULES FOR DOOR AND WINDOW TYPES, A-571, A-572
- SLAB ELEVATION
- W.F. = WALL TYPES SEE A-511

## KEYED NOTES

NUMBER	DESCRIPTION
1	FLOOR DRAIN
2	FLOOR SINK
4	FIRE EXTINGUISHER TYPE K
6	STANDARD FIRE EXTINGUISHER
7	PAINT DASHED LINE IN RED OR YELLOW TO INDICATE NO STORAGE AND STORAGE AREAS.

**design west | architects**  
255 SOUTH 300 WEST  
795 NORTH 400 WEST  
LOGAN UT 84321  
SALT LAKE CITY UT 84103

**SPACE AGE FUEL CONVENIENCE STORE**  
15595 SE ORIENT DRIVE  
SANDY, OR

NOT FOR CONSTRUCTION

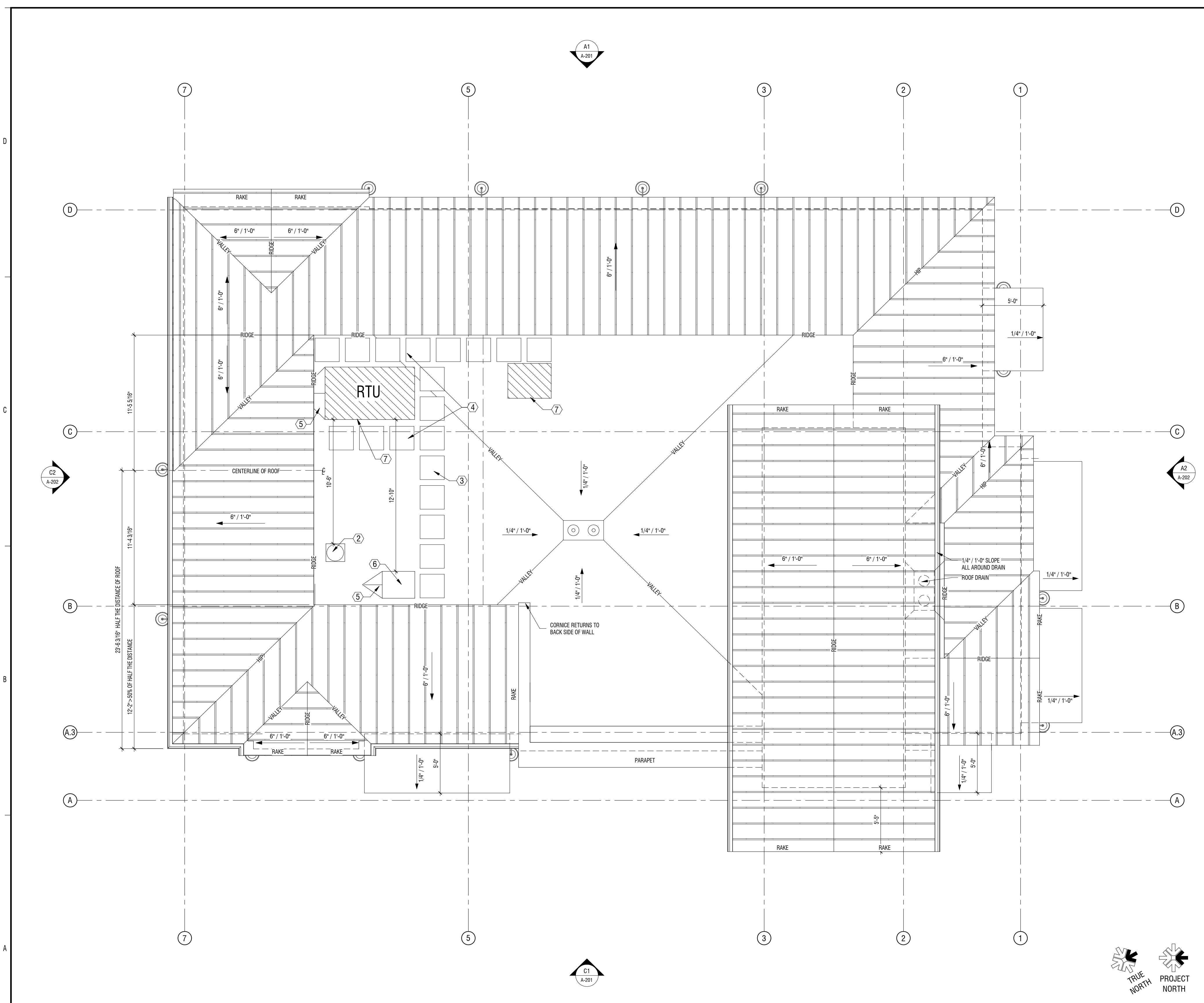
MARK	DATE	DESCRIPTION

PROJECT #: 418458  
DRAWN BY: BEKKER  
CHECKED BY: WILLIAMS  
ISSUED: 4/9/2019

OVERALL MAIN FLOOR PLAN

A-101

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ROOF KEYED NOTES	
Number	Description
2	GREASE EXHAUST FAN COOR W/MECHANICAL
3	2X2 WALKING PADS TYP.
4	WALKING PATH ON SERVICABLE SIDE OF RTU ONLY
5	CRICKET
6	MAKE UP AIR UNIT COOR W/MECHANICAL
7	WALK-IN-COOLER CONDENSING UNIT COOR W/VENDOR

**A1** OVERALL ROOF PLAN  
1/4" = 1'-0"

**design west | architects**  
 255 SOUTH 300 WEST  
 795 NORTH 400 WEST  
 LOGAN UT 84321  
 SALT LAKE CITY UT 84103

**SPACE AGE FUEL CONVENIENCE STORE**  
 15595 SE ORIENT DRIVE  
 SANDY, OR

MARK	DATE	DESCRIPTION

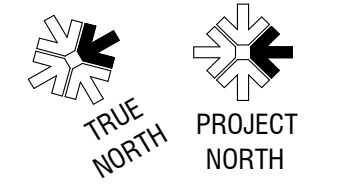
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 DRAWN BY: BEKKER  
 CHECKED BY: WILLIAMS  
 ISSUED: 4/9/2019

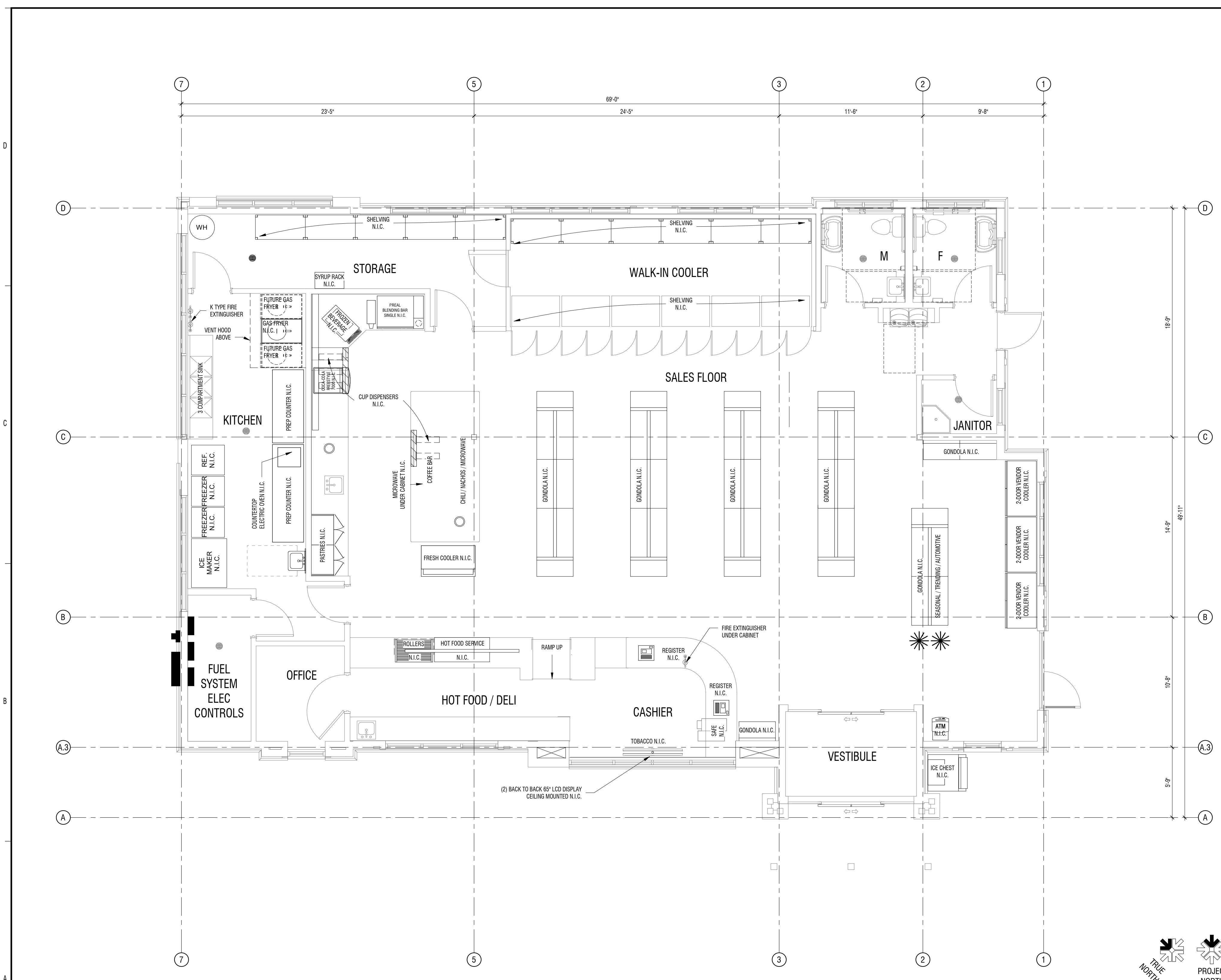
NOT FOR CONSTRUCTION

OVERALL ROOF PLAN

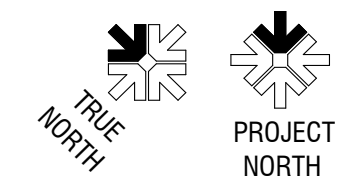
A-161

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**A1** EQUIPMENT PLAN  
1/4" = 1'-0"



NOT FOR CONSTRUCTION

**design west | architects**  
255 SOUTH 300 WEST  
795 NORTH 400 WEST  
SALT LAKE CITY UT 84103

**SPACE AGE FUEL CONVENIENCE STORE**  
15595 SE ORIENT DRIVE  
SANDY, OR

MARK	DATE	DESCRIPTION

PROJECT #: 418458  
DRAWN BY: BEKKER  
CHECKED BY: WILLIAMS  
ISSUED: 4/9/2019

EQUIPMENT LAYOUT PLAN

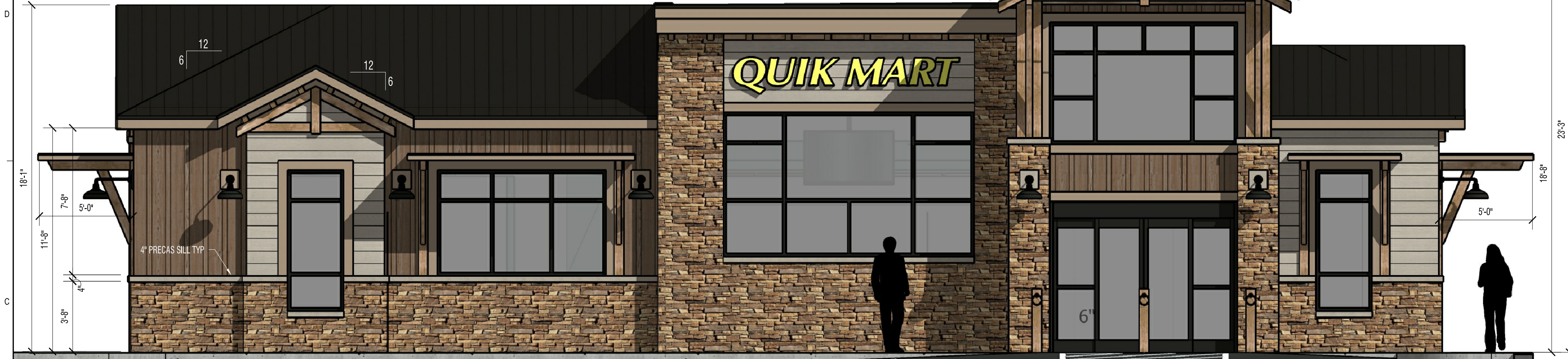
A-192

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**GENERAL NOTES:**

1. ALL ELEVATIONS TO HAVE RED LED STRIP LIGHTING IN SECONDARY FASCIA COVE TO OUTLINE AND RENDER ROOF LINE DUSK TO DAWN.
2. ALL SLOPED ROOF PITCHES 6:12 UNLESS NOTED OTHERWISE.
3. "QUIK MART" SIGNAGE TO BE ELECTRICALLY ILLUMINATED, SURFACE MOUNTED LETTERING - NO RACEWAYS.



NOTE: ALL GLAZING ACTIVE THIS ELEVATION

C1 WEST ELEVATION  
3/8"=1'-0"



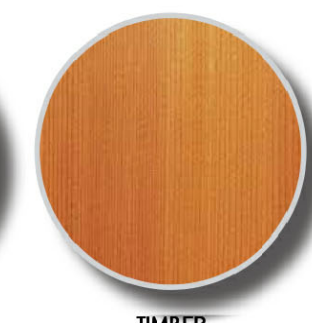
A1 SOUTH ELEVATION  
3/8"=1'-0"



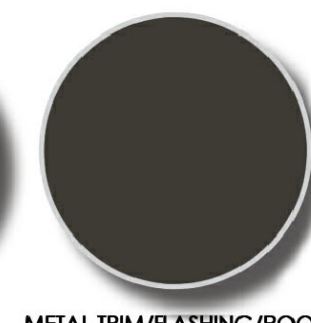
STONE VENEER  
El Dorado Stone / Mountain Lodge - Rustic



BOARD & BATTEN  
LP SmartSide / Mountain Cedar



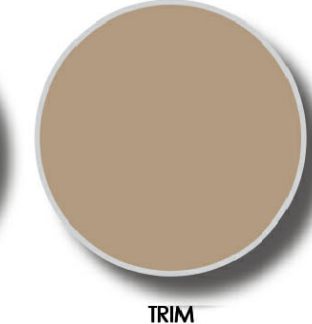
TIMBER  
Red Cedar or Pine



METAL TRIM/FLASHING/ROOF  
Metallion Industries - Dark Brown



LAP SIDING  
LP SmartSide / HCOA - Jewell White\*



TRIM  
HCOA - Hanken\*



WINDOWS/DOORS  
Dark Bronze Anodized Aluminum

\*Historic Colors of America - Colors listed are subject to change based on manufacturer's physical product samples, their available colors, and the closest match to HCOA colors.

A5 COLOR SCHEDULE  
NO SCALE

5 NOT FOR CONSTRUCTION

**design west | architects**  
255 SOUTH 300 WEST LOGAN UT 84321  
795 NORTH 400 WEST SALT LAKE CITY UT 84103

**SPACE AGE FUEL - C-STORE**  
SANDY, OR  
JIM P. LISKA  
JLP DEVELOPMENT, LLC.

MARK	DATE	DESCRIPTION

PROJECT #: 418458  
DRAWN BY: SMW  
CHECKED BY: WILLIAMS  
ISSUED: 6/17/2019

REVIEW SUBMITTAL  
NOT FOR CONSTRUCTION

EXTERIOR ELEVATIONS  
C-STORE

A-220  
© COPYRIGHT DESIGN WEST ARCHITECTS



**GENERAL NOTES:**

1. ALL ELEVATIONS TO HAVE RED LED STRIP LIGHTING IN SECONDARY FASCIA COVE TO OUTLINE AND RENDER ROOF LINE DUSK TO DAWN.
2. ALL SLOPED ROOF PITCHES 6:12 UNLESS NOTED OTHERWISE.
3. "QUIK MART" SIGNAGE TO BE ELECTRICALLY ILLUMINATED, SURFACE MOUNTED LETTERING - NO RACEWAYS.



C1 EAST ELEVATION

3/8"=1'-0"



A1 NORTH ELEVATION

3/8"=1'-0"

**A5 COLOR SCHEDULE**

NO SCALE

STONE VENEER  
El Dorado Stone / Mountain Lodge - Rust

BOARD & BATTEN  
UP SmartSide / Mountain Cedar

TIMBER  
Red Cedar or Pine

METAL TRIM/FLASHING/ROOF  
Metallion Industries - Dark Brown

LAP SIDING  
UP SmartSide / HCOA - Jewell White

TRIM  
HCOA - Hanken

WINDOWS/DOORS  
Dark Bronze Anodized Aluminum

\*Historic Colors of America - Colors listed are subject to change based on manufacturer's physical product samples, their available colors, and the closest match to HCOA colors.

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**design west | architects**  
255 SOUTH 300 WEST LOGAN UT 84321  
795 NORTH 400 WEST SALT LAKE CITY UT 84103

**SPACE AGE FUEL - C-STORE**  
SANDY, OR

JIM P. LISKA  
JLP DEVELOPMENT, LLC.

MARK	DATE	DESCRIPTION

PROJECT #: 418458  
DRAWN BY: SMW  
CHECKED BY: WILLIAMS  
ISSUED: 6/17/2019

REVIEW SUBMITTAL  
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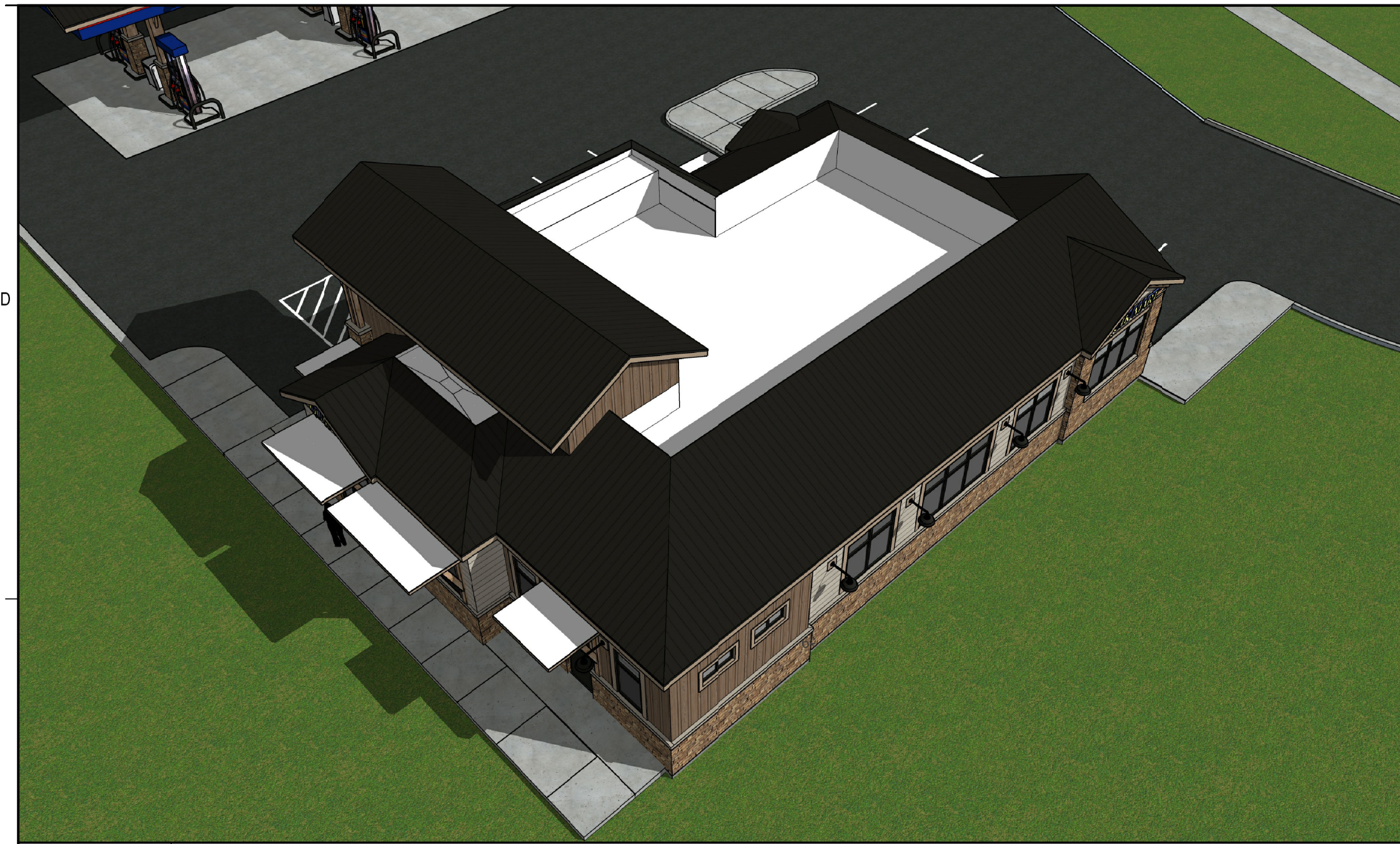
EXTERIOR ELEVATIONS  
C-STORE

A-221

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6/17/19 C:\Users\stephen\Desktop\Space Age Fuel\Space Age Fuel\Review Submittal - Space Age Fuel - Standard\Space Age Fuel - Submittal 1 - Space Age Fuel.dwg





C1 ROOF PERSPECTIVE

NO SCALE LOOKING NORTHWEST



B1 NORTHEAST PERSPECTIVE

NO SCALE



A1 NORTHWEST PERSPECTIVE

NO SCALE



C3 SOUTHEAST PERSPECTIVE

NO SCALE



A3 SOUTH SOUTHWEST PERSPECTIVE

NO SCALE

**design west | architects**  
 255 SOUTH 300 WEST LOGAN UT 84321  
 795 NORTH 400 WEST SALT LAKE CITY UT 84103

**SPACE AGE FUEL - C-STORE**  
 SANDY, OR  
 JIM P. LISKA  
 JLP DEVELOPMENT, LLC.

MARK	DATE	DESCRIPTION

PROJECT #: 418458  
 DRAWN BY: SMW  
 CHECKED BY: WILLIAMS  
 ISSUED: 6/17/2019

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EXTERIOR PERSPECTIVES  
 C-STORE

A-222  
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1

2

3

4



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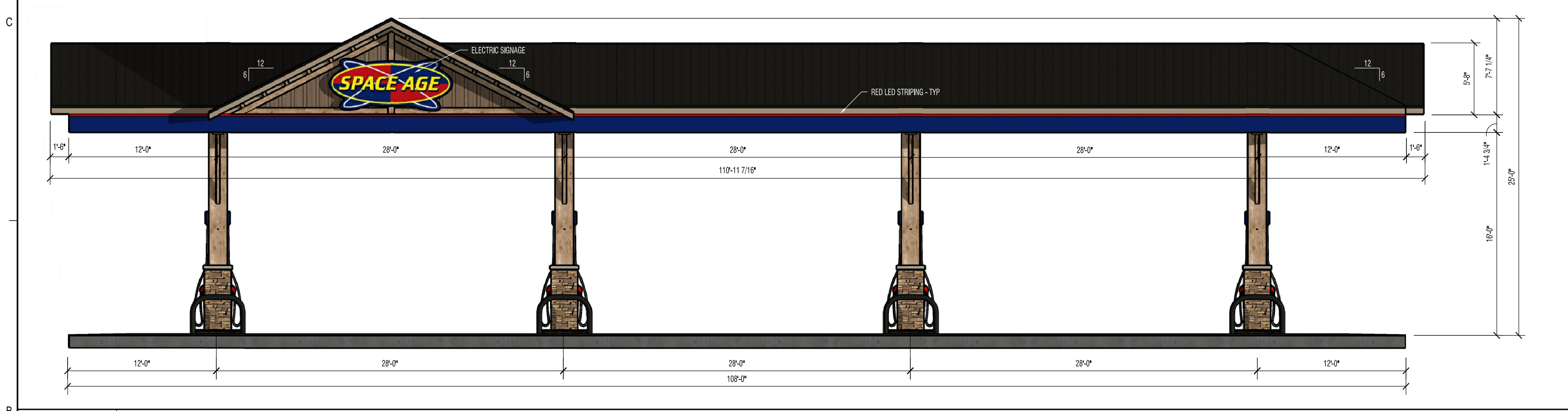
**C1** NORTH AND SOUTH ELEVATION  
3/16"=1'-0"



**C2** SOUTHWEST PERSPECTIVE  
NO SCALE



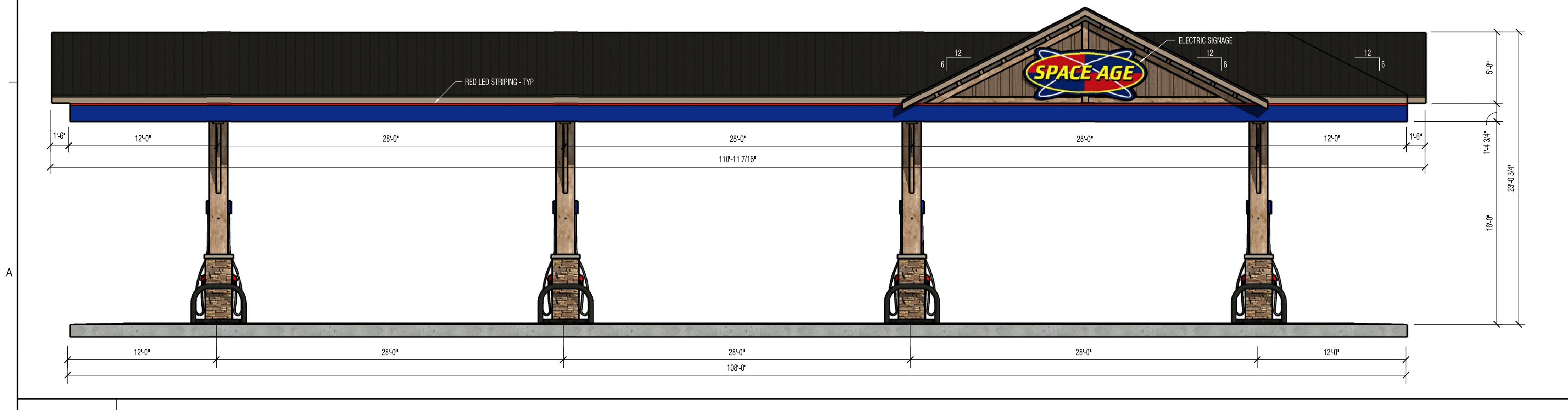
**C4** SOUTH PERSPECTIVE  
NO SCALE



**B1** EAST ELEVATION  
3/16"=1'-0"



**B4** NORTH NORTHWEST PERSPECTIVE  
NO SCALE



**A1** WEST ELEVATION  
3/16"=1'-0"



**A4** WEST PERSPECTIVE  
NO SCALE

**design west | architects**  
255 SOUTH 300 WEST LOGAN UT 84321  
795 NORTH 400 WEST SALT LAKE CITY UT 84103

**SPACE AGE FUEL - C-STORE**  
SANDY, OR  
JIM P. LISKA  
JLP DEVELOPMENT, LLC.

MARK	DATE	DESCRIPTION

PROJECT #: 418458  
DRAWN BY: SMW  
CHECKED BY: WILLIAMS  
ISSUED: 6/17/2019

REVIEW SUBMITTAL  
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EXTERIOR ELEVATIONS  
FUEL ISLAND

A-223  
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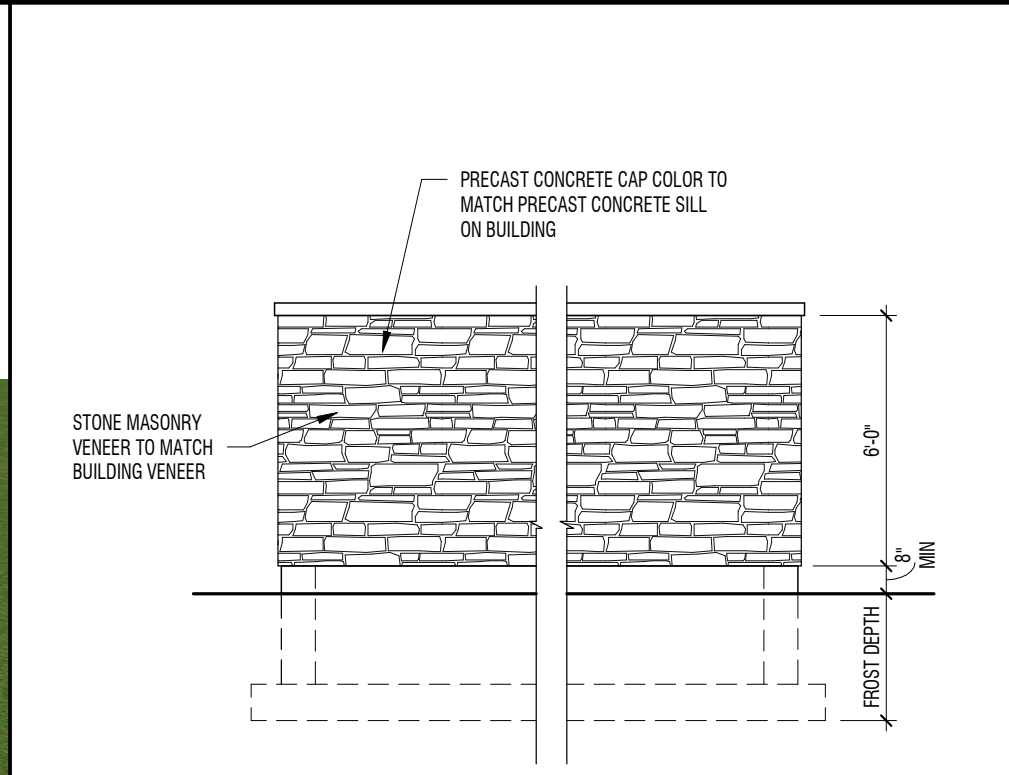
5 NOT FOR CONSTRUCTION





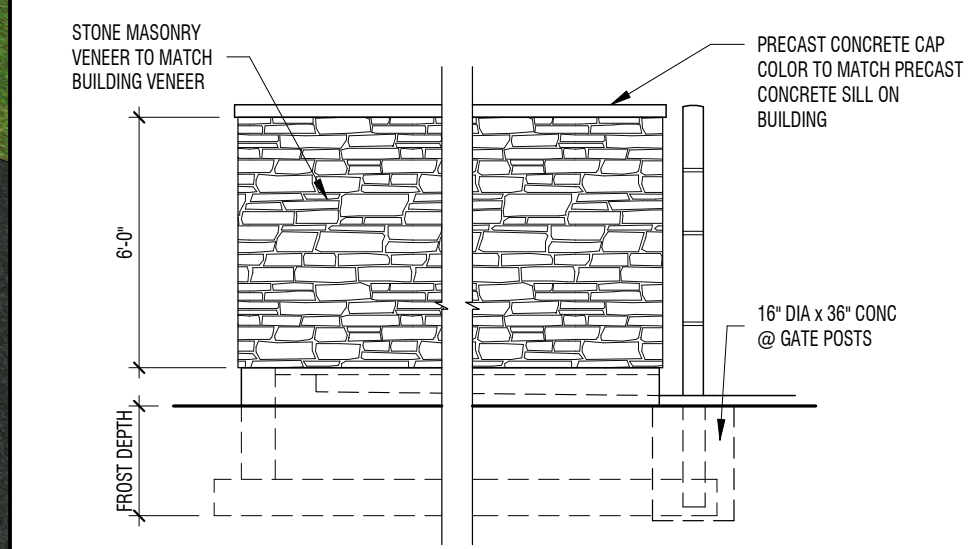
C1 3D PERSPECTIVE

1/16" = 1'-0"



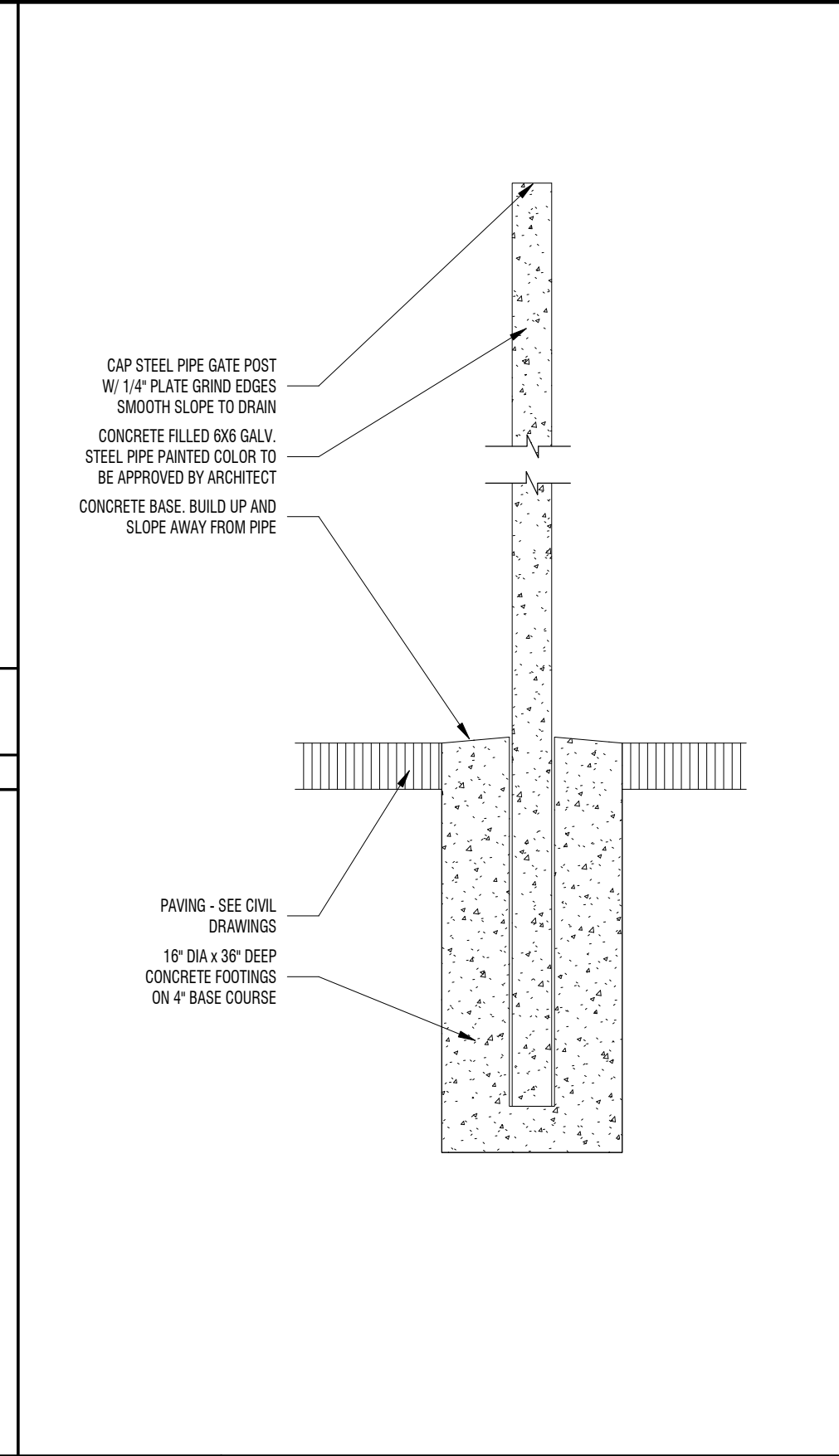
D3 ELEVATION

1/4" = 1'-0"



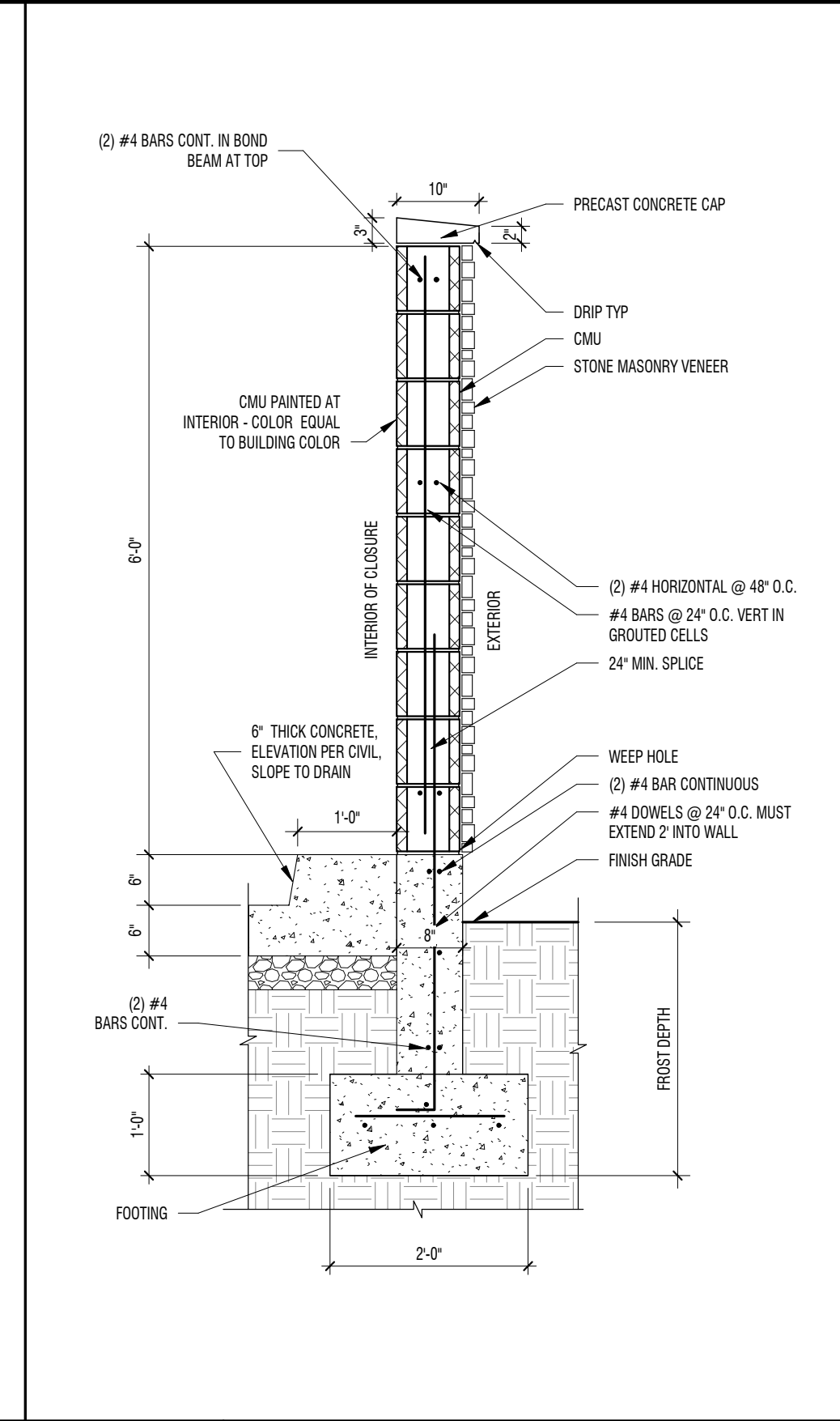
C3 ELEVATION

1/4" = 1'-0"



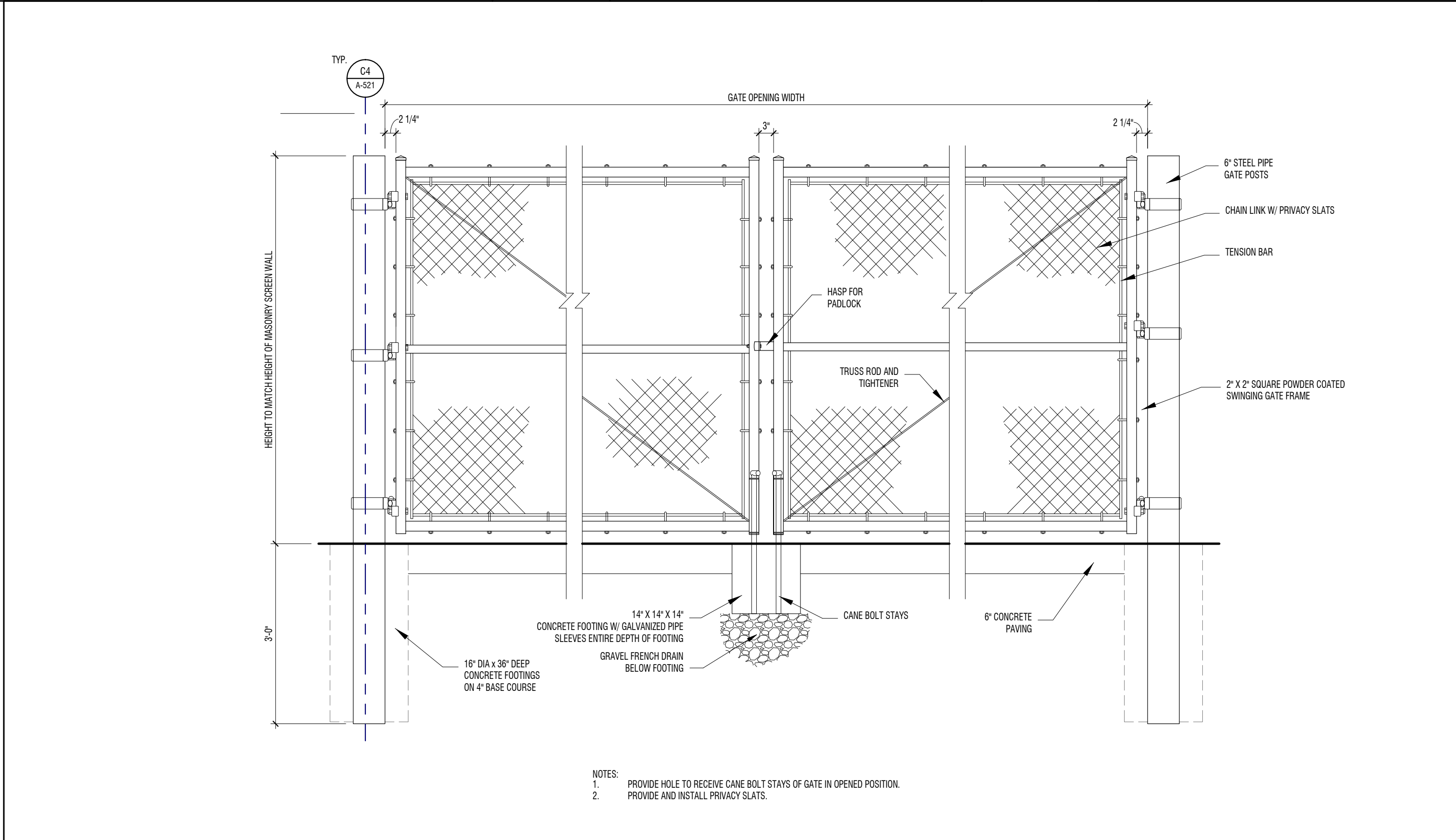
C4 DUMPSTER GATE POST DETAIL

1" = 1'-0"



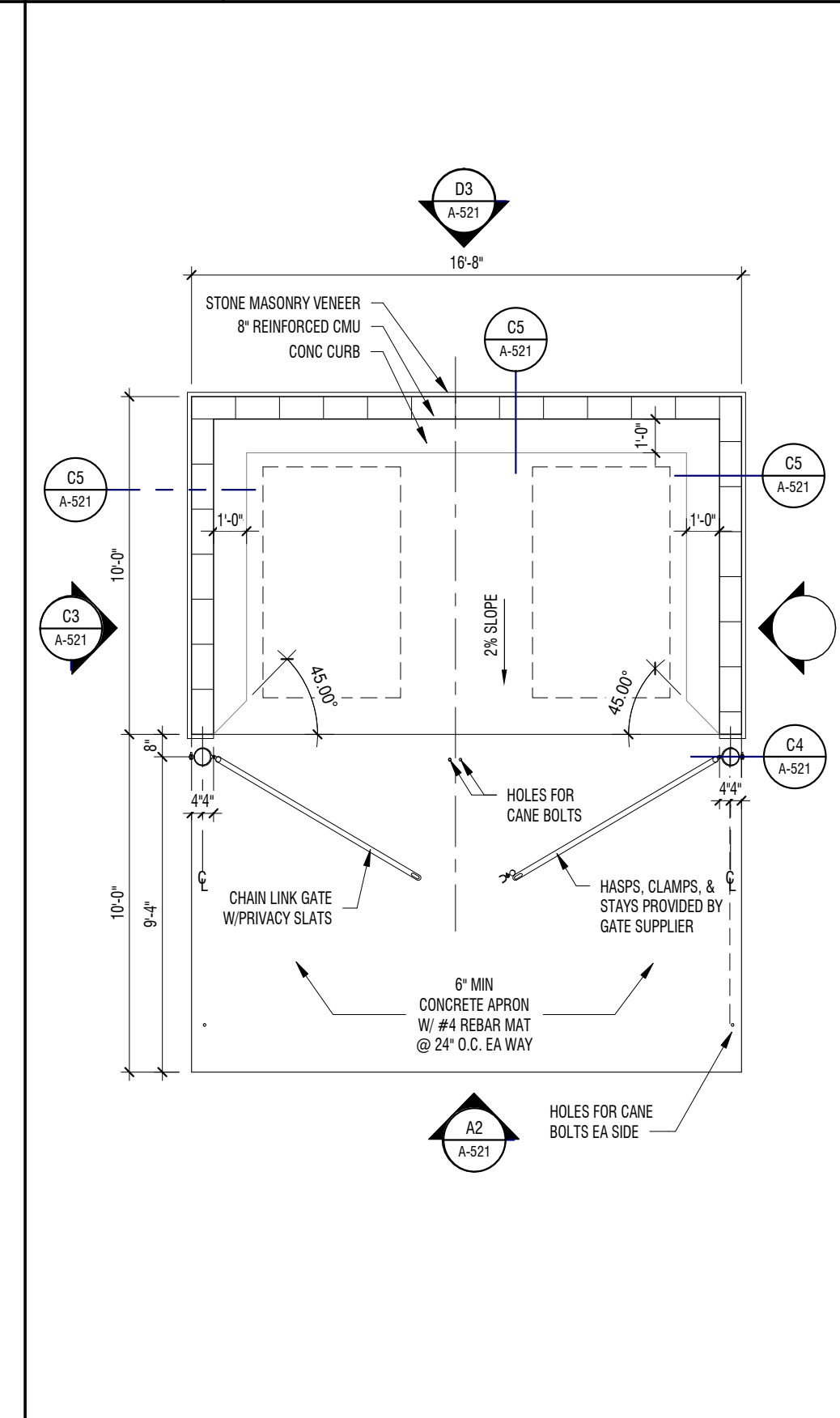
C5 DUMPSTER WALL SECTION

3/4" = 1'-0"



A2 ELEVATION

3/4" = 1'-0"



A5 DUMPSTER PLAN

1/4" = 1'-0"

**design west** architects  
 255 SOUTH 300 WEST  
 755 NORTH 400 WEST  
 LOGAN UT 84321  
 SALT LAKE CITY UT 84103

**SPACE AGE FUEL - C-STORE**  
 SANDY, OR  
 JIM PLUSKA  
 JLP DEVELOPMENT, LLC.

MARK	DATE	DESCRIPTION

PROJECT #: 418458  
 DRAWN BY: BEKKER  
 CHECKED BY: WILLIAMS  
 ISSUED: 3/15/2019

REVIEW SUBMITTAL

NOT FOR CONSTRUCTION

TRASH ENCLOSURE

A-521

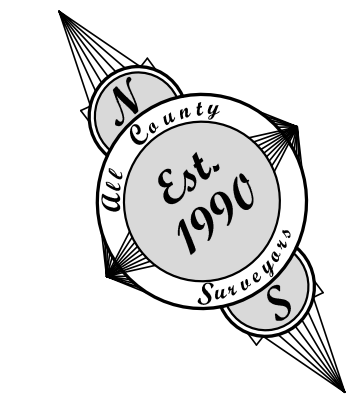
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# EXHIBIT F

AREA CALCULATIONS	
EXISTING TOTAL SITE AREA	101,208 SF ± 2.32 AC
ROW DEDICATION AREA	4,100 SF ± 0.09 AC
NEW TOTAL SITE AREA	97,108 SF ± 2.23 AC



SCALE: 1" = 30'



Clackamas Fire District #1  
Fire Prevention Office

Date: \_\_\_\_\_  
Signed: \_\_\_\_\_

Clackamas Fire is in approval of the use of a 20,000 gallon tank as an alternate water supply for this structure. The location shown on the plans is also approved.  
6-7-2019  
Inspector Matt Amos

REVISION	NO.	DATE	BY

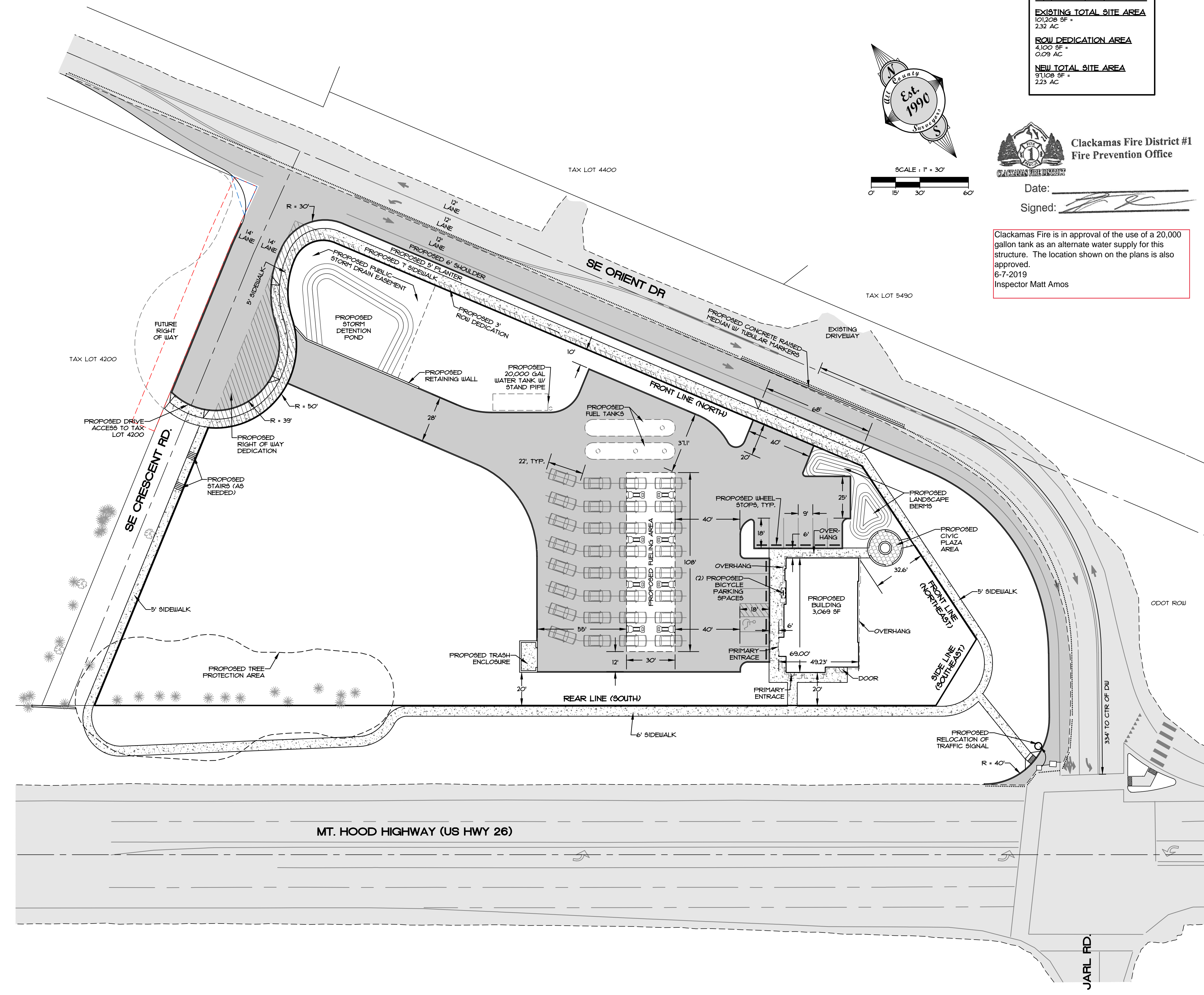


SCALE	VERT. N/A	HORIZ. 1" = 30'	DATE: 06-05-19	FILE: 18-126 Planning.dwg	LEGAL	SECTION	TWP.	RANGE	SECTION	DATE

PROJECT: **SPACE AGE SERVICE STATION**  
SITE PLAN  
LOCATION: **15585 SE ORIENT DR, SANDY, OR 97055**

**Surveyors & Planners, Inc.**  
Surveying, Planning and  
Civil Engineering  
P.O. Box 955 Sandy, OR 97055  
Phone: (503) 668-4730  
Fax: (503) 668-4730  
DATE OF PLOT: 06-05-19

CLIENT:  
JIM FLISKA  
JLP DEVELOPMENT LLC,  
PO BOX 1429  
CLACKAMAS OR 97015  
503-212-3900





**LED SURFACE MOUNT - LEGACY™ (CRUS SM)**



US & Int'l. patents pending.

**HOUSING** - One-piece, die-formed, aluminum housing with powder coated finish. One conduit knockout and four mounting holes. 2x2 housing is formed from zinc-coated steel.

**LEDS** - Features an array of select, mid-power, high brightness, high efficiency LED chips; 5000K color temperature, 70 CRI.

**DRIVE CURRENT** - Choice of Very Low Wattage (VLW), Low Wattage (LW), Super Saver (SS), High Output (HO) or Very High Output (VHO).

**OPTICS / DISTRIBUTION** - Symmetrical, which directs light through a glass lens to provide a uniform distribution of light to vertical and horizontal surfaces.

**OPTICAL UNIT** - Features an ultra-slim 7/8" profile die cast housing, with a standard flat clear or diffused glass lens. Unit is water-resistant, sealed to an IP67 rating. Integral designed heat sink does not trap dirt and grime, ensuring cool running performance over the life of the fixture.

**PRESSURE STABILIZING VENT** - Luminaire assembly incorporates a pressure stabilizing vent breather to prevent seal fatigue and failure.

**DRIVER**- State-of-the-art driver technology superior energy-efficiency and optimum light output. Driver components are fully encased in potting for moisture resistance. Complies with IEC and FCC standards. 0-10 V dimming supplied standard with all drive currents.

**ADAPTOR PANEL** - Die formed galvanized steel, with powder coat finish.

**OPERATING TEMPERATURE** - -40°C to 50°C (-40°F to +122°F)

**ELECTRICAL** - Universal voltage power supply, 120-277 VAC, 50/60 HZ input. Drivers feature two-stage surge protection (including separate surge protection built into electronic driver) meets IEEE C62.41.2-2002, Scenario 1, Location Category C.

**FINISH** - Standard color is white and is finished with LSI's DuraGrip polyester powder coat process. DuraGrip withstands extreme weather changes without cracking or peeling.

**INSTALLATION** - Pre-assembled optical unit and mounting panel attaches to fixture housing via 4 fasteners. Driver is pre-mounted to back of optical assembly.

**SHIPPING WEIGHT** - 35 pounds.

**EXPECTED LIFE** - Minimum 60,000 to 100,000 hours depending upon the ambient temperature of the installation location. See LSI web site for specific guidance.

**WARRANTY** - Limited 5-year warranty.

**PHOTOMETRICS** - Applications layouts are available upon request. Contact LSI Petroleum Lighting or petroleum.apps@lsi-industries.com

**LISTING** - UL listed to UL 1598, UL 8750 and other U.S. and International safety standards. Suitable for wet locations. For a list of the specific products in this series that are DLC listed, please consult the LED Lighting section of our website or the Design Lights website at www.designlights.org.

This product, or selected versions of this product, meet the standards listed below. Please consult factory for your specific requirements.



Project Name \_\_\_\_\_ | Fixture Type \_\_\_\_\_  
 Catalog # \_\_\_\_\_

6/6/17

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 LSI INDUSTRIES INC.

# LED SURFACE MOUNT - LEGACY™ (CRUS SM)

## LUMINAIRE ORDERING INFORMATION

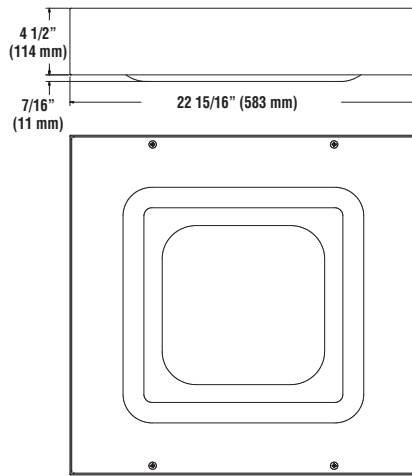
TYPICAL ORDER EXAMPLE: **CRUS SM SC LED VHO 50 UE WHT**

Prefix	Distribution	Light Source	Drive Current	Color Temperature	Input Voltage	Finish	Options
CRUS SM (Surface Mount)	SC - Standard Symmetric	LED	VLW - Very Low Watt LW - Low Watt SS - Super Saver HO - High Output VHO - Very High Output	50 - 5000K	UE - Universal Voltage (120-277V)  347-480 Volt	WHT - White BRZ - Bronze BLK - Black	DFL - Diffused Lens

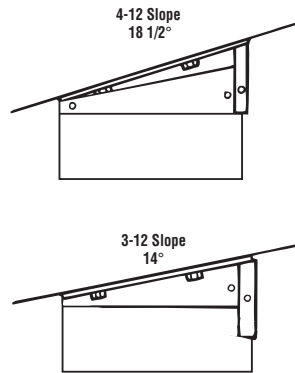
## ACCESSORY ORDERING INFORMATION

Description	Order Number
SSA Slope Surface Adaptor	52152 CLR
2x2 Shallow Housing Only	545376
10' Toggle Cable Hanger	TCH10

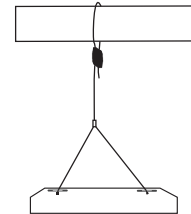
## DIMENSIONS



## SLOPE SURFACE ADAPTOR – SSA ACCESSORY



## TOGGLE CABLE HANGER



## LIGHT OUTPUT - CRUS SM

		Lumens		Watts	LPW	
		SC	AC	SC/AC	SC	AC
Cool White	VLW - Very Low Watt	9055	7632	61	148	125
	LW - Low Watt	10525	8884	74	142	120
	SS - Super Saver	13674	11595	98	140	118
	HO - High Output	18633	15145	132	141	115
	VHO - Very High Output	22418	17262	159	141	109



Project Name \_\_\_\_\_ | Fixture Type \_\_\_\_\_  
Catalog # \_\_\_\_\_

6/6/17  
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LSI INDUSTRIES INC.

## LED SURFACE MOUNT - LEGACY™ (CRUS SM)



US & Int'l. patents pending.

**HOUSING** - One-piece, die-formed, aluminum housing with powder coated finish. One conduit knockout and four mounting holes. 2x2 housing is formed from zinc-coated steel.

**LEDS** - Features an array of select, mid-power, high brightness, high efficiency LED chips; 5000K color temperature, 70 CRI.

**DRIVE CURRENT** - Choice of Very Low Wattage (VLW), Low Wattage (LW), Super Saver (SS), High Output (HO) or Very High Output (VHO).

**OPTICS / DISTRIBUTION** - Symmetrical, which directs light through a glass lens to provide a uniform distribution of light to vertical and horizontal surfaces.

**OPTICAL UNIT** - Features an ultra-slim 7/8" profile die cast housing, with a standard flat clear or diffused glass lens. Unit is water-resistant, sealed to an IP67 rating. Integral designed heat sink does not trap dirt and grime, ensuring cool running performance over the life of the fixture.

**PRESSURE STABILIZING VENT** - Luminaire assembly incorporates a pressure stabilizing vent breather to prevent seal fatigue and failure.

**DRIVER** - State-of-the-art driver technology superior energy-efficiency and optimum light output. Driver components are fully encased in potting for moisture resistance. Complies with IEC and FCC standards. 0-10 V dimming supplied standard with all drive currents.

**ADAPTOR PANEL** - Die formed galvanized steel, with powder coat finish.

**OPERATING TEMPERATURE** - -40°C to 50°C (-40°F to +122°F)

**ELECTRICAL** - Universal voltage power supply, 120-277 VAC, 50/60 HZ input. Drivers feature two-stage surge protection (including separate surge protection built into electronic driver) meets IEEE C62.41.2-2002, Scenario 1, Location Category C.

**FINISH** - Standard color is white and is finished with LSI's DuraGrip polyester powder coat process. DuraGrip withstands extreme weather changes without cracking or peeling.

**INSTALLATION** - Pre-assembled optical unit and mounting panel attaches to fixture housing via 4 fasteners. Driver is pre-mounted to back of optical assembly.

**SHIPPING WEIGHT** - 35 pounds.

**EXPECTED LIFE** - Minimum 60,000 to 100,000 hours depending upon the ambient temperature of the installation location. See LSI web site for specific guidance.

**WARRANTY** - Limited 5-year warranty.

**PHOTOMETRICS** - Applications layouts are available upon request. Contact LSI Petroleum Lighting or [petroleum.apps@lsi-industries.com](mailto:petroleum.apps@lsi-industries.com)

**LISTING** - UL listed to UL 1598, UL 8750 and other U.S. and International safety standards. Suitable for wet locations. For a list of the specific products in this series that are DLC listed, please consult the LED Lighting section of our website or the Design Lights website at [www.designlights.org](http://www.designlights.org).

This product, or selected versions of this product, meet the standards listed below. Please consult factory for your specific requirements.



Project Name \_\_\_\_\_ | Fixture Type \_\_\_\_\_  
 Catalog # \_\_\_\_\_

6/6/17

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 LSI INDUSTRIES INC.

# LED SURFACE MOUNT - LEGACY™ (CRUS SM)

## LUMINAIRE ORDERING INFORMATION

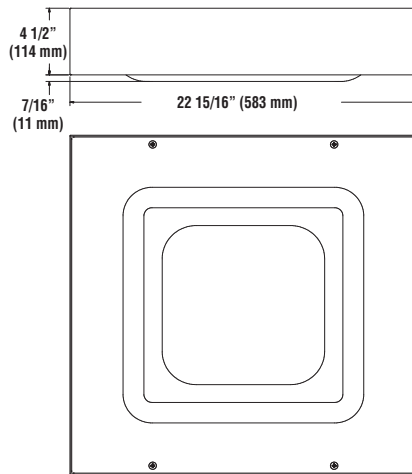
TYPICAL ORDER EXAMPLE: **CRUS SM SC LED VHO 50 UE WHT**

Prefix	Distribution	Light Source	Drive Current	Color Temperature	Input Voltage	Finish	Options
CRUS SM (Surface Mount)	SC - Standard Symmetric	LED	VLW - Very Low Watt LW - Low Watt SS - Super Saver HO - High Output VHO - Very High Output	50 - 5000K	UE - Universal Voltage (120-277V)  347-480 Volt	WHT - White BRZ - Bronze BLK - Black	DFL - Diffused Lens

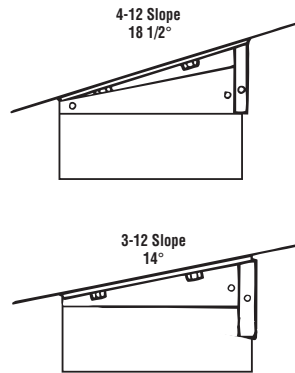
## ACCESSORY ORDERING INFORMATION

Description	Order Number
SSA Slope Surface Adaptor	52152 CLR
2x2 Shallow Housing Only	545376
10' Toggle Cable Hanger	TCH10

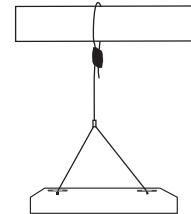
## DIMENSIONS



## SLOPE SURFACE ADAPTOR – SSA ACCESSORY



## TOGGLE CABLE HANGER



## LIGHT OUTPUT - CRUS SM

		Lumens		Watts	LPW	
		SC	AC	SC/AC	SC	AC
Cool White	VLW - Very Low Watt	9055	7632	61	148	125
	LW - Low Watt	10525	8884	74	142	120
	SS - Super Saver	13674	11595	98	140	118
	HO - High Output	18633	15145	132	141	115
	VHO - Very High Output	22418	17262	159	141	109



Project Name \_\_\_\_\_ | Fixture Type \_\_\_\_\_  
Catalog # \_\_\_\_\_

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LSI INDUSTRIES INC.



# OSQ Series

OSQ™ LED Area/Flood Luminaire – Medium

## Product Description

The OSQ™ Area/Flood luminaire blends extreme optical control, advanced thermal management and modern, clean aesthetics. Built to last, the housing is rugged cast aluminum with an integral, weathertight LED driver compartment. Versatile mounting configurations offer simple installation. Its slim, low-profile design minimizes wind load requirements and blends seamlessly into the site providing even, quality illumination. The 'B' Input power designator is a suitable upgrade for HID applications up to 250 Watt, and the 'K' Input power designator is a suitable upgrade for HID applications up to 400 Watt.

**Applications:** Parking lots, walkways, campuses, car dealerships, office complexes, and internal roadways

## Performance Summary

NanoOptic® Precision Delivery Grid™ optic

Assembled in the U.S.A. of U.S. and imported parts

**Initial Delivered Lumens:** Up to 17,291

**Efficacy:** Up to 136 LPW

**CRI:** Minimum 70 CRI (4000K & 5700K; 3000K asymmetric optics); 80 CRI (3000K symmetric optics)

**CCT:** 3000K (+/- 300K), 4000K (+/- 300K), 5700K (+/- 500K)

**Limited Warranty\*:** 10 years on luminaire/10 years on Colorfast DeltaGuard® finish

\* See <http://lighting.cree.com/warranty> for warranty terms

## Accessories

### Field-Installed

#### Backlight Shield

OSQ-BLSMF  
- Front facing optics  
OSQ-BLSMR  
- Rotated optics

#### Hand-Held Remote

XA-SENSREM  
- For successful implementation of the programmable multi-level option, a minimum of one hand-held remote is required

## Ordering Information

Fully assembled luminaire is composed of two components that must be ordered separately:

Example: **Mount:** OSQ-AAV + **Luminaire:** OSQ-A-NM-2ME-B-40K-UL-SV

### Mount (Luminaire must be ordered separately)\*

OSQ-	
OSQ-AA Adjustable Arm OSQ-DA Direct Arm	Color Options: SV Silver BK Black BZ Bronze WH White

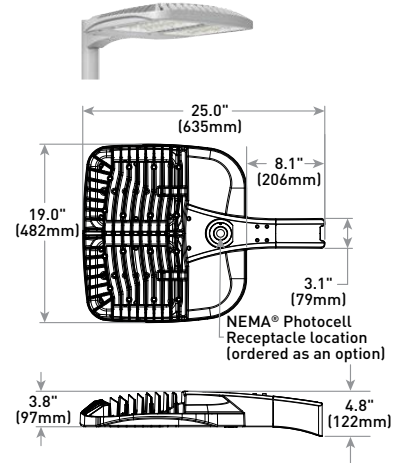
\* Reference EPA and pole configuration suitability data beginning on page 7

### Luminaire (Mount must be ordered separately)

OSQ	A	NM							
Product	Version	Mounting	Optic	Input Power Designator	CCT	Voltage	Color Options	Options	
OSQ	A	NM No Mount	<b>Asymmetric</b> 2ME* Type II Medium 4ME* Type IV Medium 3ME* Type III Medium  <b>Symmetric</b> 5ME Type V Medium 25D 25° Flood 55H Type V Short Flood 40D 40° Flood WSN Wide Sign Flood 60D 60° Flood 15D 15° Flood	B 86W K 130W	30K 3000K 40K 4000K 57K 5700K	UL Universal 120-277V UH Universal 347-480V	BK Black BZ Bronze SV Silver WH White	<b>DIM 0-10V Dimming</b> - Control by others - Refer to <a href="#">Dimming spec sheet</a> for details - Can't exceed wattage of specified input power designator  <b>F Fuse</b> - When code dictates fusing, use time delay fuse - Available for U.S. applications only  <b>ML Multi-Level</b> - Refer to <a href="#">ML spec sheet</a> for details - Available with UL voltage only - Intended for downlight applications at 0° tilt  <b>PML Programmable Multi-Level, up to 40° Mounting Height</b> - Refer to <a href="#">PML spec sheet</a> for details - Intended for downlight applications at 0° tilt	<b>PML2 Programmable Multi-Level, 10-30° Mounting Height</b> - Refer to <a href="#">PML spec sheet</a> for details - Intended for downlight applications at 0° tilt  <b>Q9 Field Adjustable Output</b> - Refer to <a href="#">Field Adjustable Output spec sheet</a> for details  <b>R NEMA® Photocell Receptacle</b> - Intended for downlight applications with maximum 45° tilt - 3-pin receptacle per ANSI C136.10 - Photocell and shorting cap by others  <b>RL Rotate Left</b> - LED and optic are rotated to the left  <b>RR Rotate Right</b> - LED and optic are rotated to the right

\* Available with Backlight Shield when ordered with field-installed accessory (see table above)

## DA Mount



### Weight

26.5 lbs. [12kg]



Rev. Date: V12 10/09/2017

US: [lighting.cree.com](http://lighting.cree.com)

T (800) 236-6800 F (262) 504-5415

Canada: [www.cree.com/canada](http://www.cree.com/canada)



T (800) 473-1234 F (800) 890-7507

OSQ™ LED Area/Flood Luminaire – Medium

**Product Specifications**

**CONSTRUCTION & MATERIALS**

- Slim, low profile design minimizes wind load requirements
- Luminaire housing is rugged die cast aluminum with an integral, weathertight LED driver compartment and high performance heat sink
- Convenient interlocking mounting method on direct arm mount. Mounting adaptor is rugged die cast aluminum and mounts to 3-6" [76-152mm] square or round pole, secured by two 5/16-18 UNC bolts spaced on 2" [51mm] centers
- Mounting for the adjustable arm mount adaptor is rugged die cast aluminum and mounts to 2" [51mm] IP, 2.375" [60mm] O.D. tenon
- Adjustable arm mount can be adjusted 180° in 2.5° increments
- Designed for uplight and downlight applications
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Silver, bronze, black, and white are available
- **Weight:** 26.5 lbs. (12kg)

**ELECTRICAL SYSTEM**

- **Input Voltage:** 120-277V or 347-480V, 50/60Hz, Class 1 drivers
- **Power Factor:** > 0.9 at full load
- **Total Harmonic Distortion:** < 20% at full load
- Integral 10kV surge suppression protection standard
- When code dictates fusing, a slow blow fuse or type C/D breaker should be used to address inrush current
- **10V Source Current:** 0.15mA

**REGULATORY & VOLUNTARY QUALIFICATIONS**

- cULus Listed
- Suitable for wet locations
- Enclosure rated IP66 per IEC 60529 when ordered without R option
- Consult factory for CE Certified products
- Certified to ANSI C136.31-2001, 3G bridge and overpass vibration standards
- 10kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Meets FCC Part 15, Subpart B, Class A standards for conducted and radiated emissions
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- Meets Buy American requirements within ARRA
- DLC and DLC Premium qualified versions available. Some exceptions apply. Please refer to <https://www.designlights.org/search/> for most current information
- RoHS compliant. Consult factory for additional details
- Dark Sky Friendly, IDA Approved when ordered with 30K CCT. Please refer to <http://darksky.org/fsa/fsa-products/> for most current information

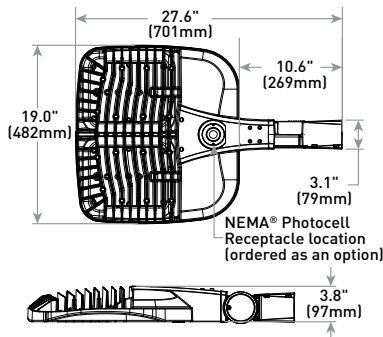
Electrical Data*							
Input Power Designator	System Watts 120-480V	Total Current (A)					
		120V	208V	240V	277V	347V	480V
B	86	0.73	0.43	0.37	0.32	0.25	0.19
K	130	1.09	0.65	0.56	0.49	0.38	0.28

\* Electrical data at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

Recommended OSQ Series Lumen Maintenance Factors (LMF) <sup>1</sup>						
Ambient	Optic	Initial LMF	25K hr Projected <sup>2</sup> LMF	50K hr Projected <sup>2</sup> LMF	75K hr Projected <sup>2</sup> Calculated <sup>3</sup> LMF	100K hr Calculated <sup>3</sup> LMF
5°C (41°F)	Asymmetric	1.04	1.00	0.95	0.91 <sup>3</sup>	0.87
	Symmetric	1.05	1.04	1.04	1.04 <sup>2</sup>	1.04
10°C (50°F)	Asymmetric	1.03	0.99	0.94	0.90 <sup>3</sup>	0.86
	Symmetric	1.04	1.03	1.03	1.03 <sup>2</sup>	1.03
15°C (59°F)	Asymmetric	1.02	0.98	0.93	0.89 <sup>3</sup>	0.86
	Symmetric	1.02	1.02	1.02	1.02 <sup>2</sup>	1.02
20°C (68°F)	Asymmetric	1.01	0.97	0.93	0.89 <sup>3</sup>	0.85
	Symmetric	1.01	1.00	1.00	1.00 <sup>2</sup>	1.00
25°C (77°F)	Asymmetric	1.00	0.96	0.92	0.88 <sup>3</sup>	0.84
	Symmetric	1.00	0.99	0.99	0.99 <sup>2</sup>	0.99

<sup>1</sup> Lumen maintenance values at 25°C (77°F) are calculated per TM-21 based on LM-80 data and in-situ luminaire testing  
<sup>2</sup> In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within six times [6X] the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip  
<sup>3</sup> In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times [6X] the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip

**AA Mount**



Weight
26.5 lbs. (12kg)

US: [lighting.cree.com](http://lighting.cree.com)

T (800) 236-6800 F (262) 504-5415

Canada: [www.cree.com/canada](http://www.cree.com/canada)



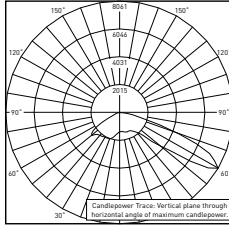
T (800) 473-1234 F (800) 890-7507

OSQ™ LED Area/Flood Luminaire – Medium

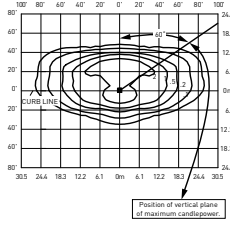
**Photometry**

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: <http://lighting.cree.com/products/outdoor/area/osq-series>

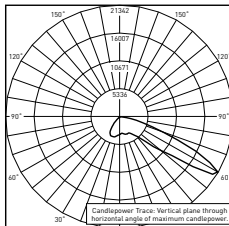
**2ME**



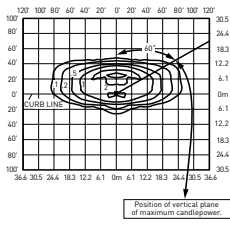
**RESTL Test Report #:** PL08877-001A  
**OSQ-A\*\*-2ME-B-30K-UL**  
**Initial Delivered Lumens:** 10,381



**OSQ-A\*\*-2ME-B-40K-UL**  
**Mounting Height:** 25' (7.6m) A.F.G.  
**Initial Delivered Lumens:** 11,424  
**Initial FC at grade**

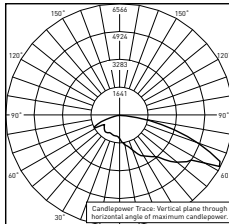


**CESTL Test Report #:** PL07700-001A  
**OSQ-A\*\*-2ME-U-57K-UL w/OSQ-BLSLF**  
**Initial Delivered Lumens:** 22,822

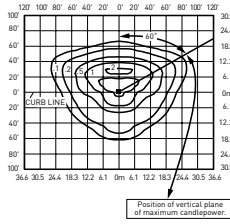


**OSQ-A\*\*-2ME-B-40K-UL w/OSQ-BLSMF**  
**Mounting Height:** 25' (7.6m) A.F.G.  
**Initial Delivered Lumens:** 8,779  
**Initial FC at grade**

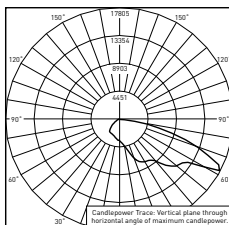
**3ME**



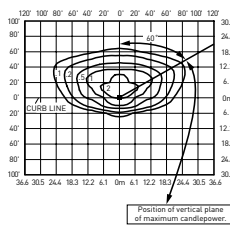
**RESTL Test Report #:** PL08876-001A  
**OSQ-A\*\*-3ME-B-30K-UL**  
**Initial Delivered Lumens:** 10,421



**OSQ-A\*\*-3ME-B-40K-UL**  
**Mounting Height:** 25' (7.6m) A.F.G.  
**Initial Delivered Lumens:** 11,424  
**Initial FC at grade**



**CESTL Test Report #:** PL07699-001A  
**OSQ-A\*\*-3ME-U-57K-UL w/OSQ-BLSLF**  
**Initial Delivered Lumens:** 23,601



**OSQ-A\*\*-3ME-B-40K-UL w/OSQ-BLSMF**  
**Mounting Height:** 25' (7.6m) A.F.G.  
**Initial Delivered Lumens:** 9,019  
**Initial FC at grade**

Type II Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
B	10,738	B2 U0 G2	11,424	B2 U0 G2	11,648	B2 U0 G2
K	16,022	B3 U0 G3	16,959	B3 U0 G3	17,291	B3 U0 G3

\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens  
 \*\* For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt

Type II Medium w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
B	8,251	B2 U0 G2	8,779	B2 U0 G2	8,950	B2 U0 G2
K	12,312	B2 U0 G2	13,032	B2 U0 G2	13,286	B2 U0 G2

\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens  
 \*\* For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt

Type III Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
B	10,738	B3 U0 G3	11,424	B3 U0 G3	11,648	B3 U0 G3
K	16,022	B3 U0 G3	16,959	B3 U0 G3	17,291	B3 U0 G3

\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens  
 \*\* For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt

Type III Medium w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
B	8,477	B1 U0 G2	9,019	B1 U0 G2	9,196	B1 U0 G2
K	12,649	B2 U0 G2	13,389	B2 U0 G2	13,650	B2 U0 G2

\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens  
 \*\* For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt

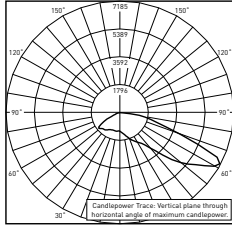


OSQ™ LED Area/Flood Luminaire – Medium

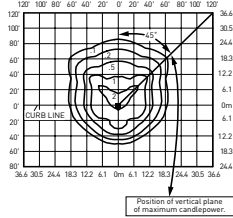
**Photometry**

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: <http://lighting.cree.com/products/outdoor/area/osq-series>

**4ME**



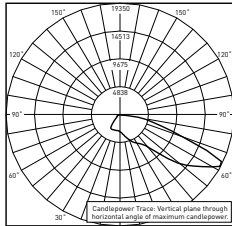
RESTL Test Report #: PL08878-001A  
OSQ-A-4ME-B-40K-UL  
Initial Delivered Lumens: 10,230



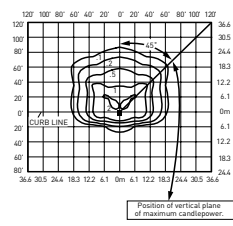
OSQ-A-4ME-B-40K-UL  
Mounting Height: 25' (7.6m) A.F.G.  
Initial Delivered Lumens: 11,424  
Initial FC at grade

Type IV Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
B	10,738	B2 U0 G2	11,424	B2 U0 G2	11,648	B2 U0 G2
K	16,022	B3 U0 G3	16,959	B3 U0 G3	17,291	B3 U0 G3

\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens  
\*\* For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt



CESTL Test Report #: PL07672-001A  
OSQ-A-4ME-U-57K-UL w/OSQ-BLSLF  
Initial Delivered Lumens: 22,793

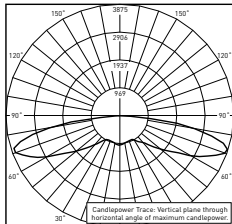


OSQ-A-4ME-U-57K-UL w/OSQ-BLSLF  
Mounting Height: 25' (7.6m) A.F.G.  
Initial Delivered Lumens: 8,779  
Initial FC at grade

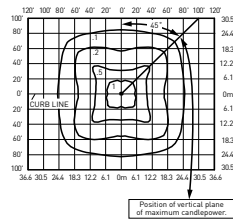
Type IV Medium w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
B	8,251	B1 U0 G2	8,779	B1 U0 G2	8,950	B1 U0 G2
K	12,312	B2 U0 G2	13,032	B2 U0 G2	13,286	B2 U0 G2

\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens  
\*\* For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt

**5ME**



CESTL Test Report #: PL08101-001C  
OSQ-A-5ME-B-40K-UL  
Initial Delivered Lumens: 9,304

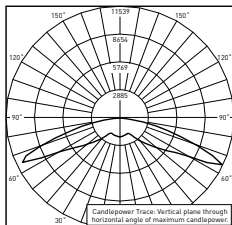


OSQ-A-5ME-B-40K-UL  
Mounting Height: 25' (7.6m) A.F.G.  
Initial Delivered Lumens: 10,867  
Initial FC at grade

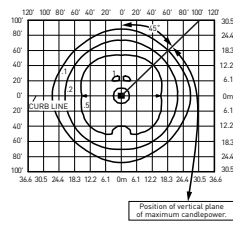
Type V Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
B	9,387	B3 U0 G3	10,867	B4 U0 G4	11,056	B4 U0 G4
K	13,819	B4 U0 G4	15,999	B4 U0 G5	16,277	B4 U0 G5

\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens  
\*\* For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt

**5SH**



CESTL Test Report #: PL0754-001A  
OSQ-A-5SH-U-40K-UL  
Initial Delivered Lumens: 25,679



OSQ-A-5SH-U-40K-UL  
Mounting Height: 25' (7.6m) A.F.G.  
Initial Delivered Lumens: 11,478  
Initial FC at grade

Type V Short Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
B	9,914	B4 U0 G2	11,478	B4 U0 G2	11,678	B4 U0 G2
K	14,595	B4 U0 G3	16,897	B4 U0 G3	17,191	B4 U0 G3

\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens  
\*\* For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: <https://www.ies.org/wp-content/uploads/2017/03/TM-15-11BUGRatingsAddendum.pdf>. Valid with no tilt

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Canada: [www.cree.com/canada](http://www.cree.com/canada)



T (800) 473-1234 F (800) 890-7507

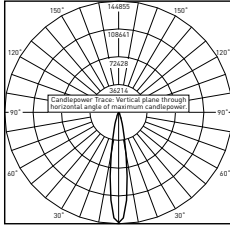


OSQ™ LED Area/Flood Luminaire – Medium

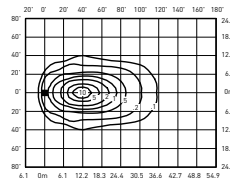
**Photometry**

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: <http://lighting.cree.com/products/outdoor/area/osq-series>

**15D**



CESTL Test Report #: PL07689-001A  
OSQ-A\*\*-15D-U-30K-UL  
Initial Delivered Lumens: 23,254



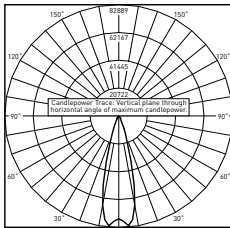
OSQ-A\*\*-15D-B-40K-UL  
Mounting Height: 25' (7.6m) A.F.G., 60° Tilt  
Initial Delivered Lumens: 11,478  
Initial FC at grade

**15° Flood Distribution**

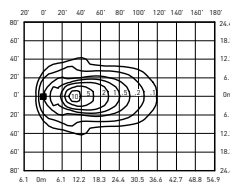
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
B	9,914	11,478	11,678
K	14,595	16,897	17,191

\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens

**25D**



CESTL Test Report #: PL07687-001A  
OSQ-A\*\*-25D-U-30K-UL  
Initial Delivered Lumens: 23,265



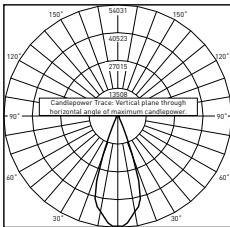
OSQ-A\*\*-25D-B-40K-UL  
Mounting Height: 25' (7.6m) A.F.G., 60° Tilt  
Initial Delivered Lumens: 11,478  
Initial FC at grade

**25° Flood Distribution**

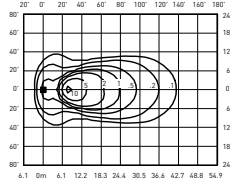
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
B	9,914	11,478	11,678
K	14,595	16,897	17,191

\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens

**40D**



CESTL Test Report #: PL07697-001A  
OSQ-A\*\*-40D-U-30K-UL  
Initial Delivered Lumens: 22,943



OSQ-A\*\*-40D-B-40K-UL  
Mounting Height: 25' (7.6m) A.F.G., 60° Tilt  
Initial Delivered Lumens: 11,478  
Initial FC at grade

**40° Flood Distribution**

Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
B	9,914	11,478	11,678
K	14,595	16,897	17,191

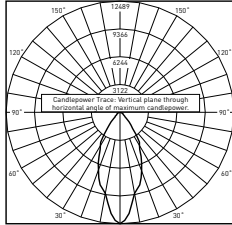
\* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens

OSQ™ LED Area/Flood Luminaire – Medium

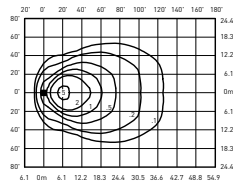
**Photometry**

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: <http://lighting.cree.com/products/outdoor/area/osq-series>

**60D**



CESTL Test Report #: PL08100-001B  
OSQ-A-\*\*-60D-B-30K-UL  
Initial Delivered Lumens: 10,079

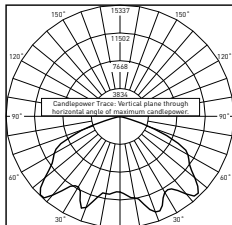


OSQ-A-\*\*-60D-B-40K-UL  
Mounting Height: 25' (7.6m) A.F.G., 60° Tilt  
Initial Delivered Lumens: 11,478  
Initial FC at grade

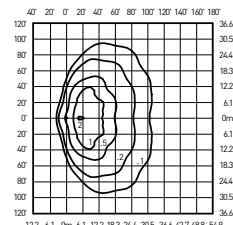
60° Flood Distribution			
Input Power Designator	3000K	4000K	5700K
		Initial Delivered Lumens*	Initial Delivered Lumens*
B	9,914	11,478	11,678
K	14,595	16,897	17,191

\* Initial delivered lumens at 25° C (77° F). Actual production yield may vary between -10 and +10% of initial delivered lumens

**WSN**



CESTL Test Report #: PL07695-001A  
OSQ-A-\*\*-WSN-U-30K-UL  
Initial Delivered Lumens: 23,116









OSQ-A-\*\*-WSN-B-40K-UL  
Mounting Height: 25' (7.6m) A.F.G., 60° Tilt  
Initial Delivered Lumens: 11,478  
Initial FC at grade










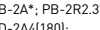



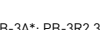
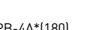

Wide Sign Distribution			
Input Power Designator	3000K	4000K	5700K
		Initial Delivered Lumens*	Initial Delivered Lumens*
B	9,914	11,478	11,678
K	14,595	16,897	17,191

\* Initial delivered lumens at 25° C (77° F). Actual production yield may vary between -10 and +10% of initial delivered lumens

OSQ™ LED Area/Flood Luminaire – Medium

Luminaire EPA

Fixed Arm Mount – OSQ-DA Weight: 26.5 lbs. (12kg)					
Single	2 @ 180°	2 @ 90°	3 @ 90°	3 @ 120°	4 @ 90°
					
0.74	1.48	1.19	1.93	1.63	2.38

Adjustable Arm Mount – OSQ-AA Weight: 26.5 lbs. (12kg)							
Single	2 @ 180°	2 @ 90°	3 @ 90°	3 @ 120°	3 @ 180°	4 @ 180°	4 @ 90°
<b>Tenon Configuration</b> [0°–80° Tilt]; If used with Cree tenons, please add tenon EPA with Luminaire EPA							
							
PB-1A*; PT-1; PW-1A3**	PB-2A*; PB-2R2.375; PD-2A4(180); PT-2(180); PW-2A3**	PB-2A*; PD-2A4(90); PT-2(90)	PB-3A*; PD-3A4(90); PT-3(90)	PB-3A*; PT-3(120)	PB-3A*; PB-3R2.375	PB-4A*(180)	PB-4A*(90); PB-4R2.375; PD-4A4(90); PT-4(90)
<b>0° Tilt</b>							
0.74	1.48	1.19	1.93	1.63	3.33	4.66	2.38
<b>10° Tilt</b>							
0.75	1.48	1.49	2.23	2.15	4.22	5.84	2.98
<b>20° Tilt</b>							
1.12	1.48	1.86	2.60	2.85	5.31	7.32	3.72
<b>30° Tilt</b>							
1.46	1.48	2.20	2.94	3.56	6.34	8.68	4.40
<b>45° Tilt</b>							
1.96	1.96	2.69	3.43	4.54	7.83	10.68	5.38
<b>60° Tilt</b>							
2.33	2.33	3.07	3.81	5.11	8.94	12.16	6.14
<b>70° Tilt</b>							
2.49	2.49	3.23	3.97	5.11	9.43	12.80	6.46
<b>80° Tilt</b>							
2.58	2.58	3.32	4.06	5.11	9.71	13.16	6.64
<b>Tenon Configuration</b> [90° Tilt]; If used with Cree tenons, please add tenon EPA with Luminaire EPA							
							
PB-1A*; PT-1; PW-1A3**	PB-2A*; PB-2R2.375; PD-2A4(180); PT-2(180); PW-2A3**	PB-2A*	PB-3A*	PB-3A*; PT-3(120)	PB-3A*; PB-3R2.375	PB-4A*(180)	PB-4A*(90); PB-4R2.375
<b>90° Tilt</b>							
2.61	2.61	4.44	6.05	5.11	9.79	13.28	10.39

\* Specify pole size: 3 (3'), 4 (4'), 5 (5'), or 6 (6') for single, double or triple luminaire orientation or 4 (4'), 5 (5'), or 6 (6') for quad luminaire orientation  
 \*\* These EPA values must be multiplied by the following ratio: Fixture Mounting Height/Total Pole Height. Specify pole size: 3 (3'), 4 (4'), 5 (5'), or 6 (6')



OSQ™ LED Area/Flood Luminaire – Medium

Tenon EPA

Part Number	EPA
PB-1A*	None
PB-2A*	0.82
PB-3A*	1.52
PB-4A*[180]	2.22
PB-4A*[90]	1.11
PB-2R2.375	0.92
PB-3R2.375	1.62
PB-4R2.375	2.32
PD Series Tenons	0.09
PT Series Tenons	0.10
PW-1A3**	0.47
PW-2A3**	0.94
WM-2	0.08
WM-4	0.25
WM-DM	None

\* Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6") for single, double or triple luminaire orientation or 4 (4"), 5 (5"), or 6 (6") for quad luminaire orientation  
 \*\* These EPA values must be multiplied by the following ratio: Fixture Mounting Height/Total Pole Height. Specify pole size: 3 (3"), 4 (4"), 5 (5"), or 6 (6")

Tenons and Brackets* (must specify color)	
<b>Square Internal Mount Vertical Tenons (Steel)</b> - Mounts to 3-6" (76-152mm) square aluminum or steel poles PB-1A* – Single PB-2A* – 180° Twin PB-3A* – 180° Triple PB-4A*[90] – 90° Quad PB-4A*[180] – 180° Quad	<b>Round External Mount Vertical Tenons (Steel)</b> - Mounts to 2.375" (60mm) O.D. round aluminum or steel poles or tenons PB-2R2.375 – Twin PB-3R2.375 – Triple PB-4R2.375 – Quad
<b>Square Internal Mount Horizontal Tenons (Aluminum)</b> - Mounts to 4" (102mm) square aluminum or steel poles PD-2A4[90] – 90° Twin PD-2A4[180] – 180° Twin PD-3A4[90] – 90° Triple PD-4A4[90] – 90° Quad	<b>Round External Mount Horizontal Tenons (Aluminum)</b> - Mounts to 2.375" (60mm) O.D. round aluminum or steel poles or tenons - Mounts to square pole with PB-1A* tenon PT-1 – Single (Vertical) PT-2[90] – 90° Twin PT-2[180] – 180° Twin PT-3[90] – 90° Triple PT-4[90] – 90° Quad
<b>Wall Mount Brackets</b> - Mounts to wall or roof WM-2 – Horizontal for OSQ-AA mount WM-4 – L-Shape for OSQ-AA mount WM-DM – Plate for OSQ-DA mount	<b>Mid-Pole Bracket</b> - Mounts to square pole PW-1A3** – Single PW-2A3** – Double
	<b>Ground Mount Post</b> - For ground mounted flood luminaires PGM-1 – for OSQ-AA mount

\* Refer to the [Bracket and Tenons spec sheet](#) for more details

Direct Mount Configurations

Compatibility with OSQ-DA Direct Mount Bracket					
Input Power Designator	2 @ 90°	2 @ 180°	3 @ 90°	3 @ 120°	4 @ 90°
<b>3" Square</b>					
B & K	N/A	✓	N/A	N/A	N/A
<b>3" Round</b>					
B & K	N/A	✓	N/A	N/A	N/A
<b>4" Square</b>					
B & K	✓	✓	✓	N/A	✓
<b>4" Round</b>					
B & K	✓	✓	✓	✓	✓
<b>5" Square</b>					
B & K	✓	✓	✓	N/A	✓
<b>5" Round</b>					
B & K	✓	✓	✓	✓	✓
<b>6" Square</b>					
B & K	✓	✓	✓	N/A	✓
<b>6" Round</b>					
B & K	✓	✓	✓	✓	✓

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T (800) 473-1234 F (800) 890-7507



Submitted by The Lighting Project NW

TLP

**Job Name:**  
Space Age Fuel

**Catalog Number:**  
SPJ36-04-FINISH-1000-2700K-10W-120V

Notes: \*Please confirm standard finish\*

**Type:**

**S1**

TLPNW17-6113



Model: **SPJ36-04**

## Forever Bright



### SPECIFICATION FEATURES

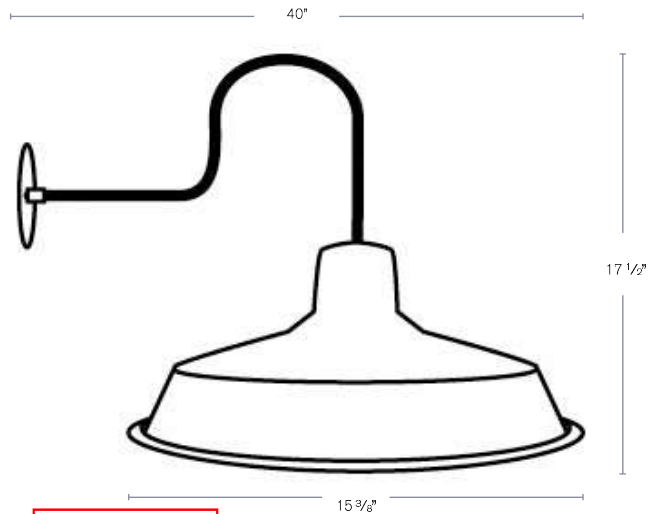
**Finish:** Our naturally etched finishes will withstand the test of time. All finishes are individually treated insuring consistency. Our meticulous application results in a fixture that truly becomes "a one of a kind".

**Electrical:** Available in 120V

**Labels:** ETL Standard Wet Label  
C-ETL

### DESCRIPTION

**Model#:** SPJ36-04  
**Material:** Solid Brass,  
Solid Copper or Aluminum  
**Finish:** Black  
**Electrical:** 120V  
**Engine:** FB-MP1000  
**Lumens:** 1000  
**Color Temp.:** 2700k



please specify



Wet Listed



### ORDERING INFORMATION

Model#	Finishes	Lumens	Color Temp	Wattage	Electrical
SPJ36-04	B	1000	2700K	10W	120V

V = Verde      GM = Gun Metal  
 M = Moss      B = Black  
 AG = Aged Brass      R = Rusty  
 MBR = Matte Bronze      PVDP = PVD Polished  
 RC = Raw Copper      PVDS = PVD Satin

WWW.SPJLIGHTING.COM

Submitted On: Feb 28, 2018

Index Page

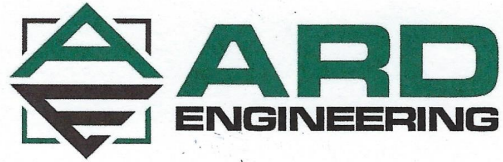


# SANDY SPACE AGE TRAFFIC IMPACT STUDY

SANDY, OREGON



21370 SW Langer Farms Parkway, Suite 142, Sherwood, OR 97140 – (503)862-6960



# SANDY SPACE AGE TRAFFIC IMPACT STUDY

SANDY, OREGON



**PREPARED FOR:**  
Space Age Fuels, Inc.

**PREPARED BY:**  
Michael Ard, PE  
Ard Engineering

**DATE:**  
April 8, 2019

21370 SW Langer Farms Parkway, Suite 142, Sherwood, OR 97140 - (503)862-6960



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## EXECUTIVE SUMMARY

1. A property located in the northwest corner of the intersection of US Highway 26 and SE Orient Drive in Sandy, Oregon is proposed for development with a new fuel station and convenience store. The site will take access via driveways on SE Orient Drive and on SE Crescent Road.
2. Upon completion of proposed development, the subject property is projected to generate a net increase of 76 site trips during the morning peak hour, 98 trips during the evening peak hour, and 1,348 daily trips.
3. Although the subject property has already been annexed into the City of Sandy with C-2 zoning applied, an analysis of the impacts of the recent zone change was required in conjunction with the proposed development. Based on the analysis, the “reasonable worst-case development scenario” is projected to result in a net increase of 187 trips during the morning peak hour, 225 trips during the evening peak hour, and 2,580 daily trips.
4. Based on the operational analysis, the unsignalized study intersections currently operate acceptably and are projected to continue to operate acceptably through 2038 either with or without full development within the subject property. No operational mitigations are necessary or recommended for the unsignalized intersections.
5. The intersection of Highway 26 at SE Orient Drive is currently operating with volume-to-capacity ratios (v/c) exceeding the targets established in the Oregon Highway Plan. Although the proposed development is projected to worsen performance of the intersection, if a southbound left-turn lane is added on SE Orient Drive approaching Highway 26, intersection operation will not be degraded by the proposed development.
6. Crash data for the most recent three years shows no significant crash trends that may be indicative of design deficiencies. No crash mitigations are recommended.
7. Based on the warrant analysis, no new traffic signals are recommended. A northbound left-turn lane is projected to be warranted at the intersection of SE Orient Drive and SE Crescent Road.
8. Intersection sight distance was evaluated for the unsignalized intersections on SE Orient Drive. The existing intersection of Orient Drive at SE Crescent Road was found to have adequate sight distance in both directions. The proposed site access driveway on SE Orient Drive is projected to have inadequate intersection sight distance to the south. Accordingly, it is recommended that turning movements be restricted to right-in, right-out only to eliminate the potential for conflicts with limited sight distance at this location. No other sight distance mitigations are recommended.
9. The change from RRFF-5 to C-2 zoning is projected to result in a significant effect as defined under Oregon’s Transportation Planning Rule. The addition of a second southbound left-turn lane on SE Orient Drive approaching Highway 26 is sufficient to address the impacts of potential site development under the proposed zoning and will therefore satisfy Oregon’s Transportation Planning Rule.



## **PROJECT DESCRIPTION & LOCATION**

### ***INTRODUCTION***

A property located in the northwest corner of the intersection of Highway 26 at SE Orient Drive is proposed for development with a fuel station and convenience store. The site will take access via proposed driveways on SE Crescent Road and SE Orient Drive.

This report addresses the impacts of the proposed development on the surrounding street system. Based on discussions with City of Sandy, Clackamas County and ODOT staff, an operational and safety analysis was conducted for the site access intersections as well as the intersections of SE Orient Drive at SE Crescent Road and Highway 26 at SE Orient Drive.

The purpose of this analysis is to determine whether the surrounding transportation system is capable of safely and efficiently supporting the proposed use and to identify any necessary improvements and mitigations.

### ***SITE LOCATION AND STUDY AREA DESCRIPTION***

The project site has an area of approximately 2.5 acres, which is currently developed with a single-family home. The property is surrounded by a mixture of low-density residential homes and farm/forest properties.

The subject property will take access via one full-access driveway on SE Crescent Road and a restricted right-in, right-out access on SE Orient Drive. The second access is necessary in order to accommodate circulation of fuel trucks within the site.

US Highway 26 (Mt. Hood Highway) is classified by the Oregon Department of Transportation as a Statewide Highway and a Freight Route. It has two through lanes in each direction and a paved center median that accommodates left-turn movements. It has a posted speed limit of 55 mph in the site vicinity.

SE Orient Drive operates under the jurisdiction of Clackamas County and is classified as a Minor Arterial roadway. It has one through lane in each direction and is striped to prohibit passing in the site vicinity. It has a basic rule speed limit of 55 mph.

SE Crescent Road is a gravel, dead-end local street. Under existing conditions, the segment of SE Crescent Road west of SE Orient Drive primarily serves as access for the single-family homes located on and immediately north of the subject property.



## **EXISTING CONDITIONS**

The intersection of SE Orient Drive at SE Crescent Road is a four-way intersection controlled by stop signs on the eastbound and westbound Crescent Road approaches. Each approach has a single shared lane for all turning movements.

The intersection of US Highway 26 at SE Orient Drive is controlled by a traffic signal. The northwest-bound Highway 26 approach has a left-turn lane, two through lanes and a channelized, yield-controlled right-turn lane. The southeast-bound Highway 26 approach has a left-turn lane, two through lanes and a right-turn lane. The southwest-bound Orient Drive approach has a single travel lane for all turning movements. The northeast-bound approach on SE Jarl Road also has a single travel lane for all turning movements. The traffic signal operates with protected left turn displays for the highway approaches and with split phasing on the side-street approaches. Marked crosswalks with pedestrian signals are in place crossing the southwest, northwest and northeast legs of the intersection. The southeast pedestrian crossing is closed.

A vicinity map displaying the project site, vicinity streets, and the study intersections including lane configurations is provided in Figure 1 on page 7.

### ***TRAFFIC COUNT DATA***

Traffic counts were conducted at the study intersections on Tuesday November 6<sup>th</sup>, 2018 from 7:00 to 9:00 AM and from 4:00 PM to 6:00 PM. Data was used from the highest-volume hour during each analysis period.

Since the count data was collected during a non-peak period of the year, the observed traffic volumes were adjusted to account for seasonal traffic variations in order to represent the 30<sup>th</sup>-highest hour design volumes.

US Highway 26 serves both commuter traffic associated primarily with trips between the City of Sandy and the greater Portland Metro area as well as trips traveling to and from Mt. Hood and beyond. These two major highway-user categories would be expected to exhibit very different seasonal variations in travel demands over the course of the year.

In order to determine the portion of traffic attributable to each of the two primary travel types, data from ODOT's 2017 Highway Volume Tables was utilized. Specifically, the data used was collected at ODOT's Automatic Count Data station 03-006, located 0.30 miles east of Camp Creek Road in Rhododendron, Oregon. This site is located on Highway 26 approximately 24 miles east of SE Orient Drive. Although the distance to the ATR station means the data cannot be used directly, it does provide information regarding the variation in traffic volumes traveling to Mt. Hood and beyond during the time of the count data collection as well as during the peak season of the year. Accordingly, this data allows determination of the likely portion of highway traffic that falls into each of the two seasonal variation categories ("commuter" and "recreational summer/winter"), as well as providing information regarding the most appropriate seasonal adjustment factor for the recreational summer/winter traffic.



Based on the data, 5,493 vehicles per day (approximately 550 per hour during the peak hour) travel along Highway 26 to and from Mt. Hood at the Rhododendron permanent count station location during the month of November. This volume represents 22.3 percent of the through traffic volumes measured on Highway 26 at SE Orient Drive. Accordingly, it is expected that no more than 22.3 percent of the trips traveling along Highway 26 in the project vicinity are traveling to and from destinations beyond the Rhododendron count station. Since the remaining 77.7 percent of through traffic volumes on the Highway 26 at SE Orient Drive never reach Mt. Hood, it was assumed that these traffic volumes represent more typical commuter trips traveling between the City of Sandy and the greater Portland Metro area.

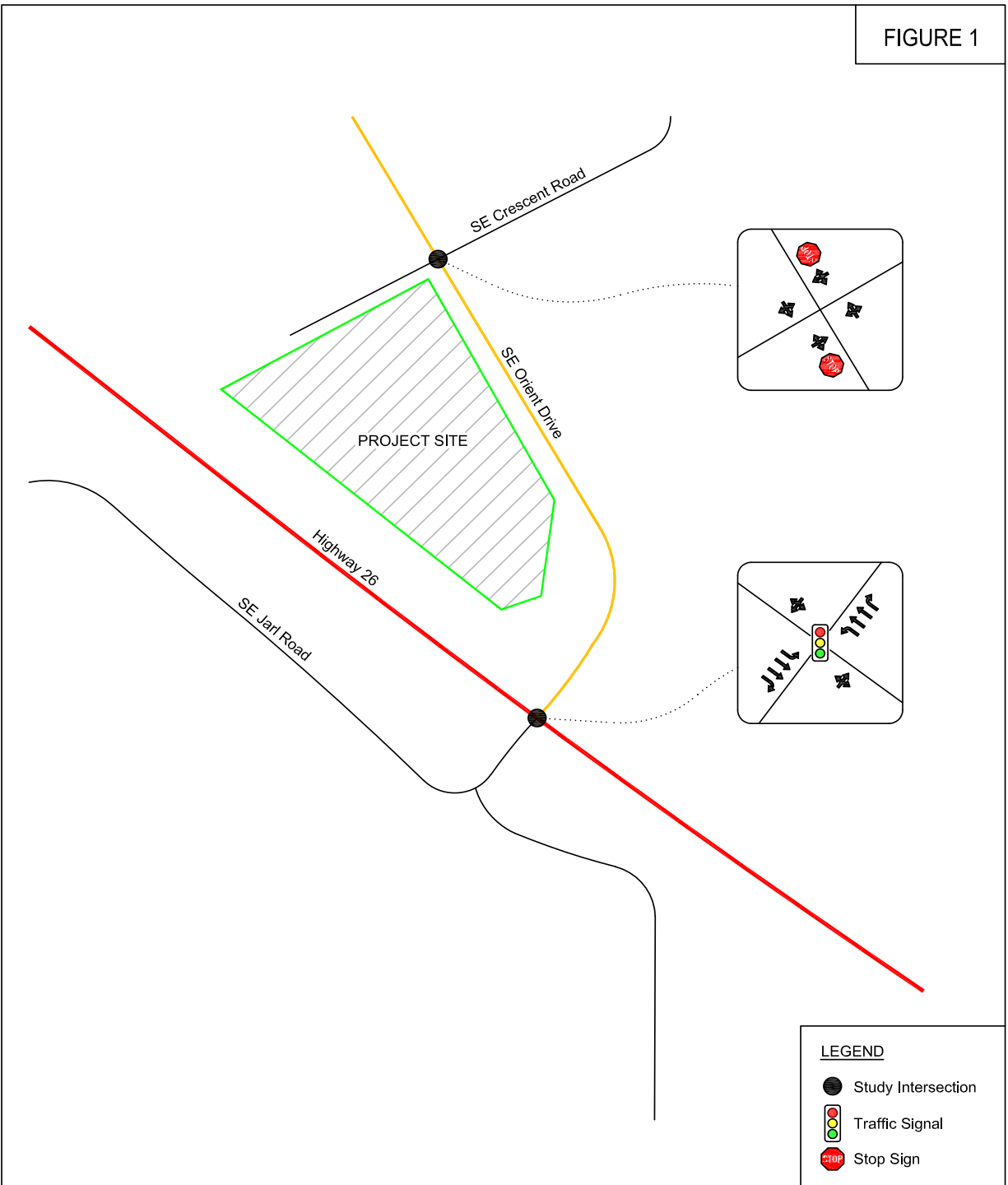
The ODOT data also showed that 11,738 vehicles were measured per day (approximately 1174 per hour during the peak hour) during the peak-season month of August at the ATR station near Rhododendron. This indicates that the seasonal recreational traffic volumes along the Highway 26 corridor experienced a seasonal variation of no more than 6,245 vehicles per day (11,738 vehicles per day in August - 5,493 vehicles per day in November). This equates to roughly 625 vehicles additional vehicles per hour during the peak hour of the peak recreational season. It was assumed that the increased recreational traffic flows are somewhat directional, with 60% traveling eastbound during the morning peak hour and 60% traveling westbound during the evening peak hour.

In order to seasonally adjust the commuter traffic volumes, a seasonal adjustment of 1.06 was applied to the 77.7 percent of through traffic that represents the commuter traffic volumes, resulting in a net adjustment of 1.047 to the total through traffic measured on Highway 26 at SE Orient Drive. Following this adjustment, the anticipated seasonal increase of 625 hourly recreational through trips was added to the through highway volumes. The resulting total traffic volumes represent the anticipated turning-movement volumes for the intersection of Highway 26 at SE Orient Drive during the 30<sup>th</sup>-highest hour.

Figure 2 on page 8 shows the existing 30<sup>th</sup>-highest hour traffic volumes for the morning and evening peak hours at the study intersections.



FIGURE 1




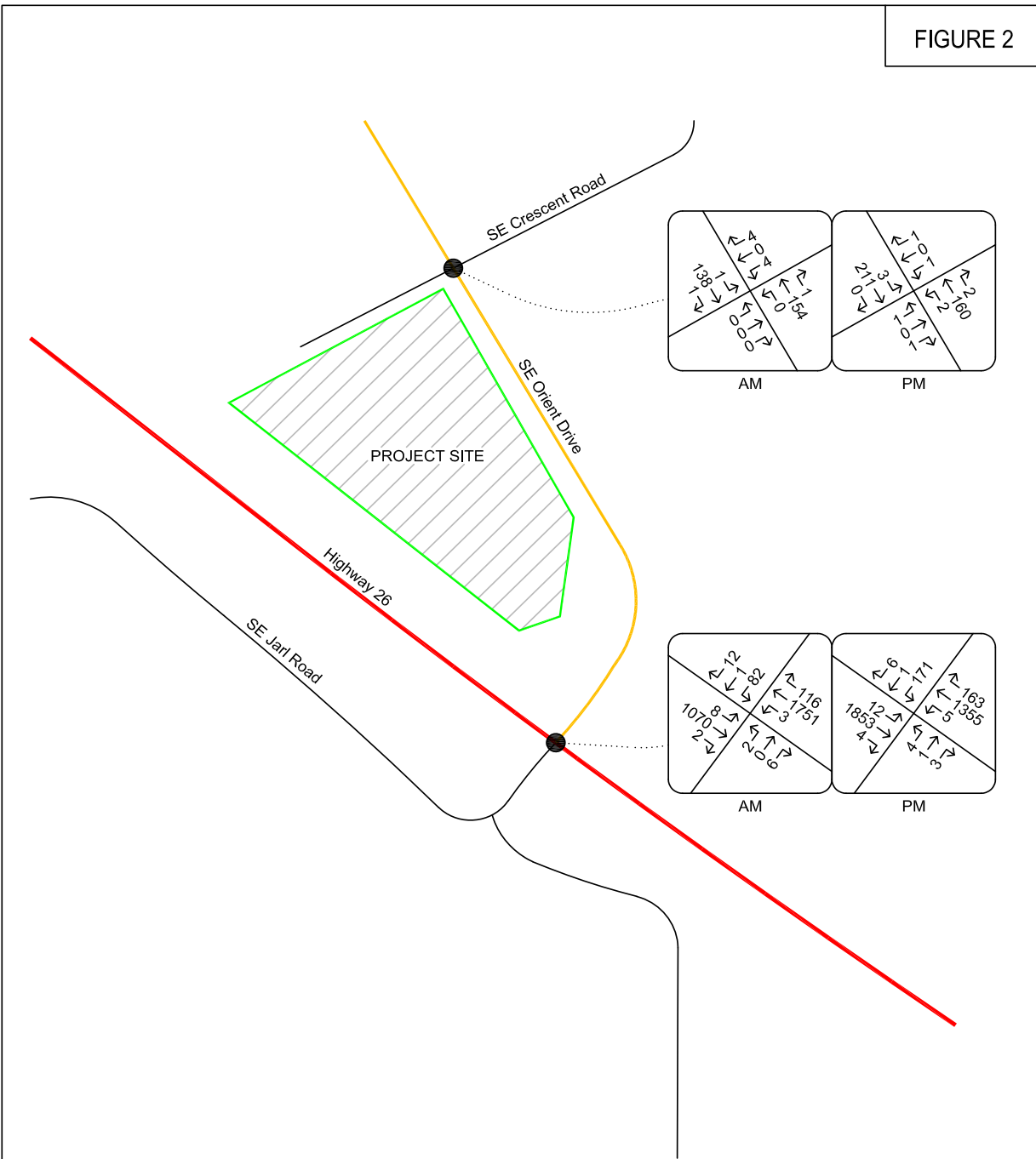
	<p>VICINITY MAP Study Intersections Lane Configurations and Traffic Control</p>	<p>PAGE 7</p>
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FIGURE 2



A calculated seasonal adjustment of 1.30 was applied to the through volumes on Highway 26 to represent 30th-highest hour volumes.

	<p><b>TRAFFIC VOLUMES</b>          2018 Existing 30th-Highest Hour Conditions          Morning and Evening Peak Hours</p>	<p>PAGE 8</p>
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**OPERATIONAL ANALYSIS**

An operational analysis was conducted for the study intersections using Synchro 10 software, with outputs calculated based on the *HIGHWAY CAPACITY MANUAL, 6<sup>th</sup> Edition*. The analysis was conducted for the weekday morning and evening peak hours.

The purpose of the existing conditions analysis is to establish how the study area intersections operate currently and allow for calibration of the operational analysis if required.

The results of the operational analysis are reported based on delay, Level of Service (LOS), and volume-to-capacity ratio (v/c). Delays are reported in seconds. Level of service is reported as a letter grade and can range from A to F, with level of service A representing nearly free-flow conditions and level of service F representing high delays and severe congestion. A report of level of service D generally indicates moderately high but tolerable delays, and typically occurs prior to reaching intersection capacity. For unsignalized intersections, the v/c represents the portion of the available intersection capacity that is being utilized on the worst intersection approach. For signalized intersections, it indicates the portion of the overall intersection capacity that is being used. A v/c ratio of 1.0 would indicate operating at capacity.

The Oregon Department of Transportation requires that the intersection of Highway 26 at SE Orient Drive operate with a v/c ratio of 0.80 or less during the peak hours. Clackamas County requires that the intersection of SE Orient Drive at SE Crescent Road operate at level of service E or better during the peak hours.

A summary of the existing conditions operational analysis is provided in Table 1 below. For the unsignalized intersection of SE Orient Drive at SE Crescent Road the reported delays and levels-of-service represent the approach lane which experiences the highest delays. For the signalized intersection of Highway 26 at SE Orient Drive, the reported delays, levels-of-service and v/c ratios represent the operation of the overall intersection.

Based on the analysis, the study intersections are currently operating with low delays, but the signalized intersection of Highway 26 at SE Orient Drive operates with v/c ratios in excess of 0.80 during both the morning and evening peak hours. Detailed capacity analysis worksheets are provided in the technical appendix.

**Table 1 - Operational Analysis Summary: Existing 30th-Highest Hour Conditions**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c	Delay	LOS	v/c
SE Orient Drive at SE Crescent Road	10.2	B	0.01	10.5	B	0.01
Highway 26 at SE Orient Drive	14.9	B	0.82	22.3	C	0.90



## SITE TRIPS

### Proposed Development

The proposed new development will consist of a fuel station with up to 16 fueling positions and a convenience store with a gross floor area of up to 3,000 square feet. To estimate the number of trips that will be generated by the proposed development, trip rates from the *TRIP GENERATION MANUAL, 10<sup>th</sup> EDITION* were used. Data from land-use code 945, *Gasoline/Service Station with Convenience Market* was used. The trip estimates are based on the number of fueling positions.

The proposed fuel station is projected to attract a significant number of pass-by trips. These trips occur when drivers travel along an adjacent roadway and stop along the way to patronize the site. Although turning movements are added based on the diversion into the site, the traffic volumes on the through street from which they diverted do not increase. It is anticipated that the vast majority of these trips will actually be diverted trips coming from the through traffic traveling along Highway 26. Based on data from the *ITE Trip Generation Handbook, 3<sup>rd</sup> Edition*, 62 percent of site trips during the morning peak hour and 56 percent of site trips during the evening peak hour are projected to be pass-by trips.

A summary of the trip generation calculations is provided in Table 2 below. A detailed trip generation worksheet is also included in the technical appendix.

	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	Total
16 Fueling Positions	102	98	200	114	110	224	3286
-Pass-by Trips (62% AM, 56% PM)	-62	-62	-124	-63	-63	-126	-1938
<b>Net Site Trips</b>	<b>40</b>	<b>36</b>	<b>76</b>	<b>51</b>	<b>47</b>	<b>98</b>	<b>1,348</b>

### Zone Change

In addition to evaluation of the net increase in site trips that is expected upon completion of the proposed fuel station, trip generation calculations were prepared to examine the potential change in site trips based on the “reasonable worst-case development scenario” for the existing and prior zoning. This second analysis was conducted in order to provide the long-range planning analysis required to address Oregon’s Transportation Planning Rule. For the long-range analysis, it was assumed that city water and sewer service will be provided to the site so that a private well and septic drain field will no longer be needed within the property.

Under the prior Clackamas County RRF-5 zoning, the subject property was already fully developed with one single-family home. Under the current City of Sandy C-2 retail/commercial zoning, the property can be developed with a variety of uses including fuel stations, convenience stores, restaurants and kiosks (including fast-food and drive-through facilities), supermarkets, offices (including medical/dental offices), athletic clubs, day care facilities, and more. Based on the usable land area, it was determined that the reasonable worst-case development scenario will include up to





8,750 square feet of additional building area within the site (in addition to the currently-proposed fuel station and convenience store). The added building area would be located on the west side of the north entrance driveway, within the area currently reserved for an on-site septic field. Upon future connection to the city’s sewer system, this facility is expected to be removed and the land can be further developed. The highest trip generation scenario for the added future building area would consist of a 3,750 square foot fast-food restaurant and a 5,000 square foot bank. Although it is not clear that there is sufficient space for these uses to provide drive-through facilities, for a worst-case analysis it was assumed that it will be possible to construct the facilities with drive-through windows.

A summary of the trip generation calculations for the reasonable worst-case development scenario under the approved City of Sandy zoning is provided in Table 3 below. Detailed trip generation calculations are also included in the technical appendix.

**Table 3 - Zone Change Trip Generation Summary**

	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	Total
Fuel Stn. & Conv. Store (16 pos)	102	98	200	114	110	224	3286
-Pass-by Trips (62% AM, 56% PM)	-62	-62	-124	-63	-63	-126	-1938
Fast-Food with Drive Thru (3,750 sf)	77	74	151	64	59	123	1766
-Pass-by Trips (49% AM, 50% PM)	-37	-37	-74	-31	-31	-62	-874
Drive-In Bank (5,000 sf)	28	20	48	51	51	102	500
-Pass-by Trips (29% AM, 35% PM)	-7	-7	-14	-18	-18	-36	-160
<b>Total Site Trips</b>	<b>207</b>	<b>192</b>	<b>399</b>	<b>229</b>	<b>220</b>	<b>449</b>	<b>5552</b>
<b>Pass-By Trips</b>	<b>-106</b>	<b>-106</b>	<b>-212</b>	<b>-112</b>	<b>-112</b>	<b>-224</b>	<b>-2972</b>
<b>Net Site Trips</b>	<b>101</b>	<b>86</b>	<b>187</b>	<b>117</b>	<b>108</b>	<b>225</b>	<b>2,580</b>

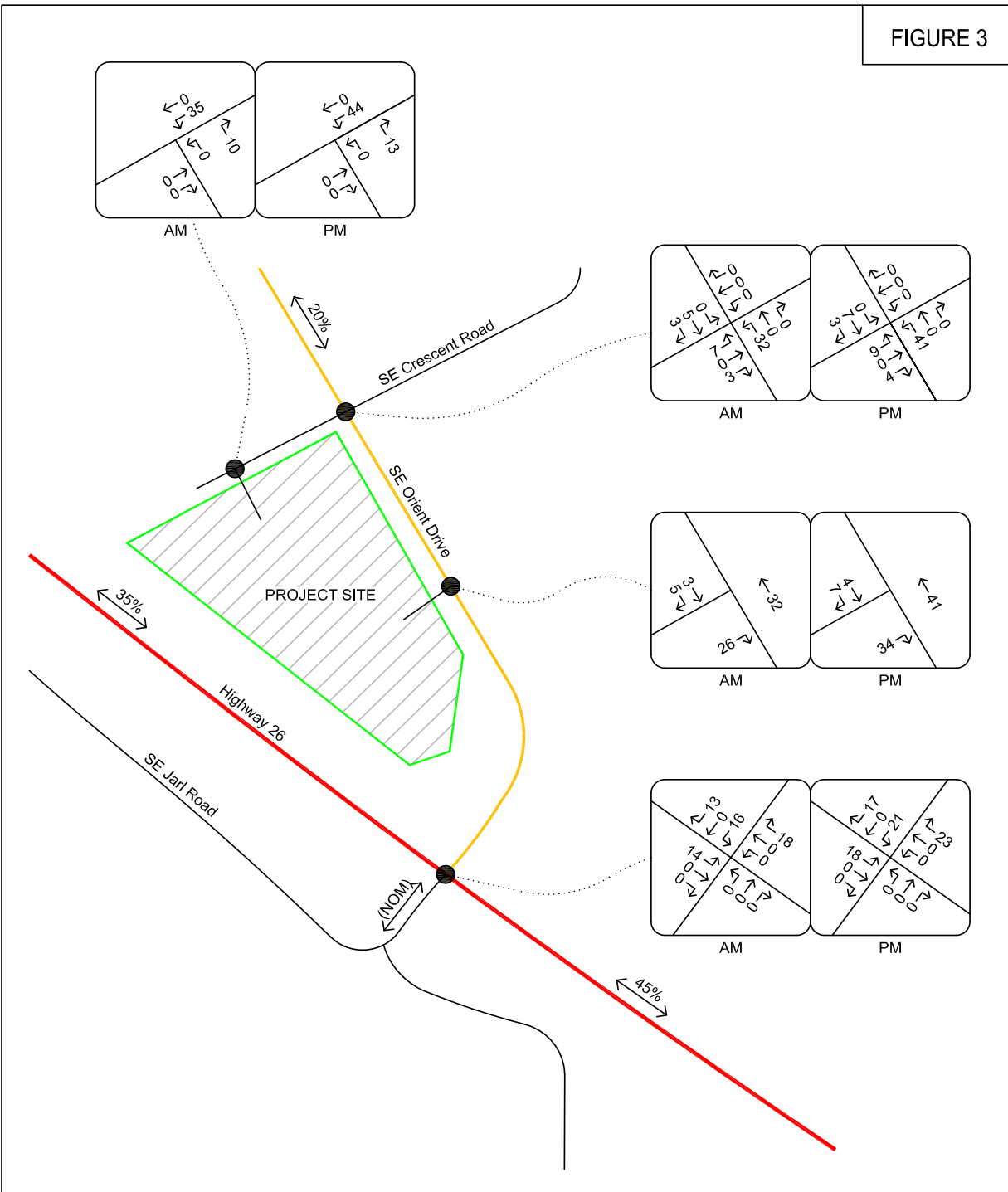
***TRIP DISTRIBUTION***

The directional distribution of primary site trips to and from the project site was estimated based the existing travel patterns in the site vicinity, as well as the locations of likely trip destinations and major transportation routes. Overall, 45 percent of the anticipated primary site trips are projected to travel to and from the southeast on Highway 26, 35 percent are projected to travel to and from the northwest on Highway 26, and the remaining 20 percent of site trips are projected to travel to and from the north on SE Orient Drive.

The trip distribution percentages and trip assignment for the proposed development are shown in Figure 3 on page 12. Pass-by trips associated with the proposed development are shown in Figure 4 on page 13.

The trip distribution and assignment for the “reasonable worst-case scenario” under the C-2 commercial zoning is shown in Figure 5 on page 14. Pass-by trips for this scenario are shown in Figure 6 on page 15.

FIGURE 3



**TRAFFIC VOLUMES**  
 Proposed Development - Primary Site Trips  
 Morning and Evening Peak Hours

FIGURE 4

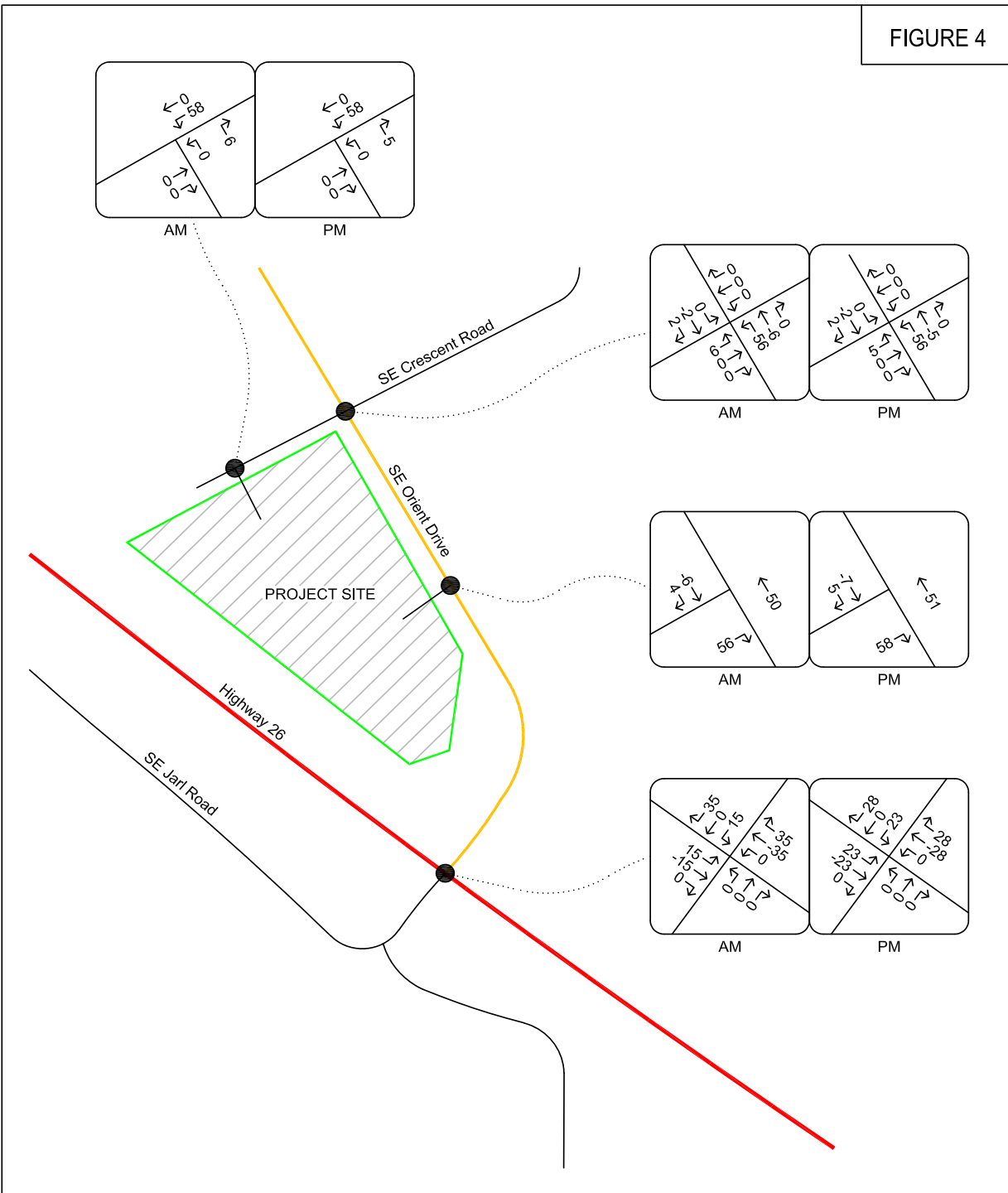
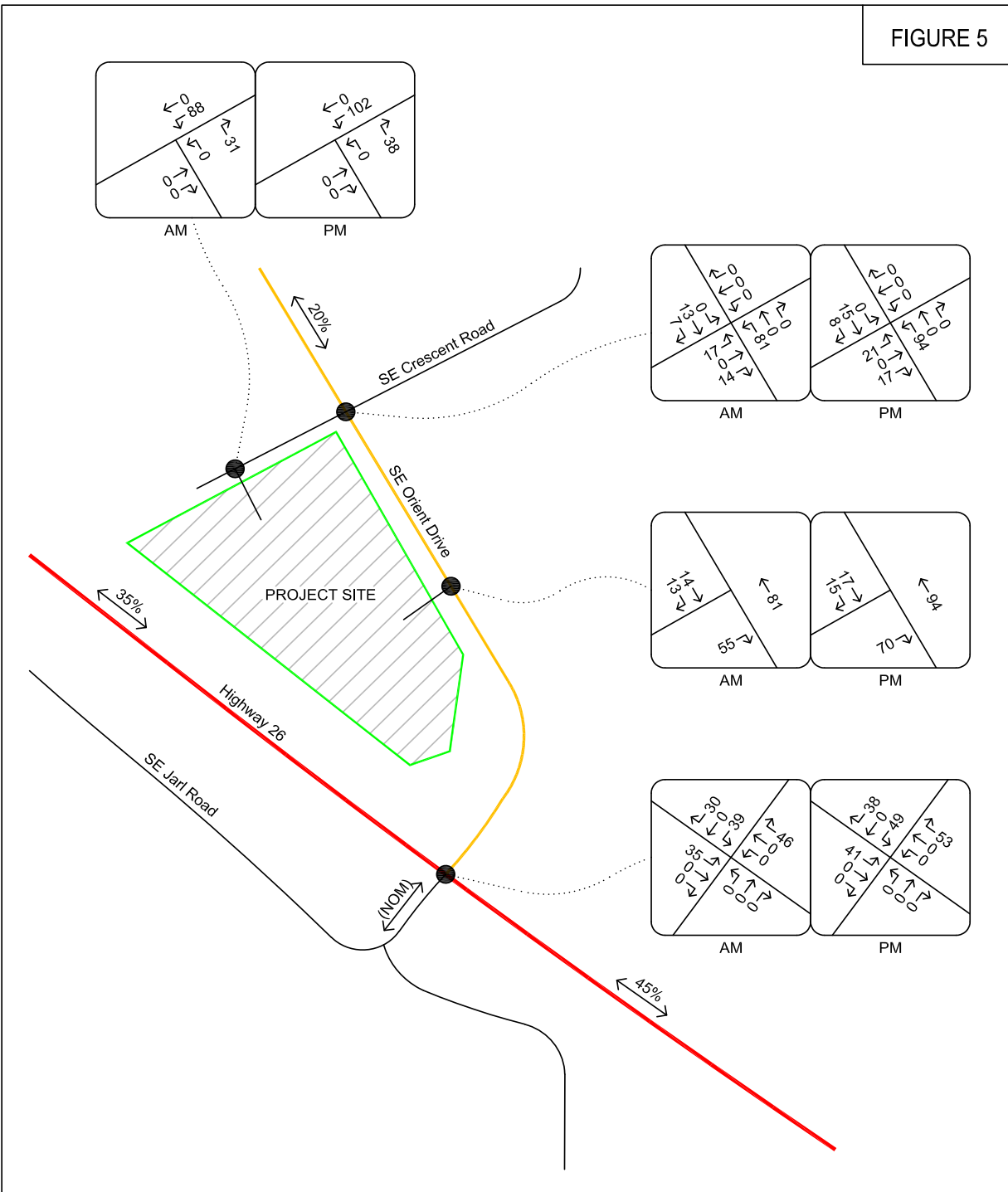


FIGURE 5

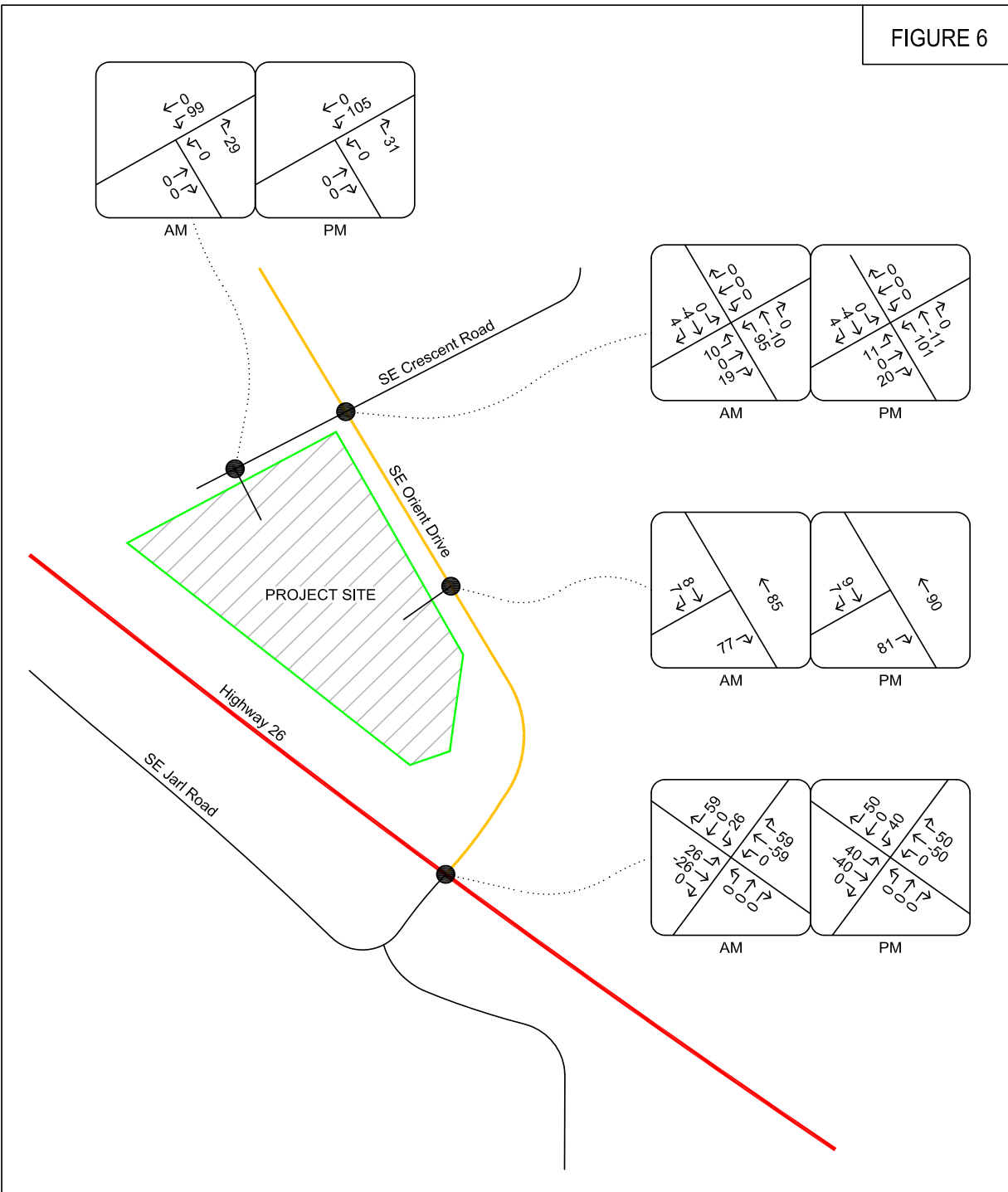


**TRAFFIC VOLUMES**  
 Zone Change - Primary Site Trips  
 Morning and Evening Peak Hours

PAGE  
 14



FIGURE 6



	<p><b>TRAFFIC VOLUMES</b>          Zone Change - Pass-By and Diverted Trips          Morning and Evening Peak Hours</p>	<p>PAGE          15</p>
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## **FUTURE CONDITIONS ANALYSIS**

### ***NEAR-TERM BACKGROUND VOLUMES***

In order to determine the expected impact of site trips on the study area intersections, it is necessary to compare traffic conditions both with and without the addition of the projected traffic from the proposed development. Since the proposed use cannot be constructed and occupied immediately, the comparison is made for future traffic conditions at the time of project completion. It is anticipated that the proposed use will be completed and occupied before the end of 2020. Accordingly, the analysis was conducted for year 2020 traffic conditions.

Prior to adding the projected site trips to the study intersections, the existing traffic volumes were adjusted to account for background traffic growth over time. Background growth is expected to occur regardless of whether or not the proposed mixed-use development is constructed, and accounts for other developments outside the immediate project area.

Based on data from ODOT's Future Volume Tables, Highway 26 carried 29,500 vehicles per day in 2015 at the west city limits of the City of Sandy and is projected to carry 41,400 vehicles per day in the year 2036. This equates to a linear growth rate of 1.92 percent per year. Accordingly, a background growth rate of 1.92 percent per year was applied for two years in order to derive the projected year 2020 background traffic volumes.

Figure 7 on page 17 shows the projected year 2020 background traffic volumes at the study intersections during the morning and evening peak hours.

### ***BACKGROUND VOLUMES PLUS SITE TRIPS***

Peak hour trips calculated to be generated by the proposed development were added to the projected year 2020 background traffic volumes to obtain the year 2020 total traffic volumes following completion of the proposed fuel station.

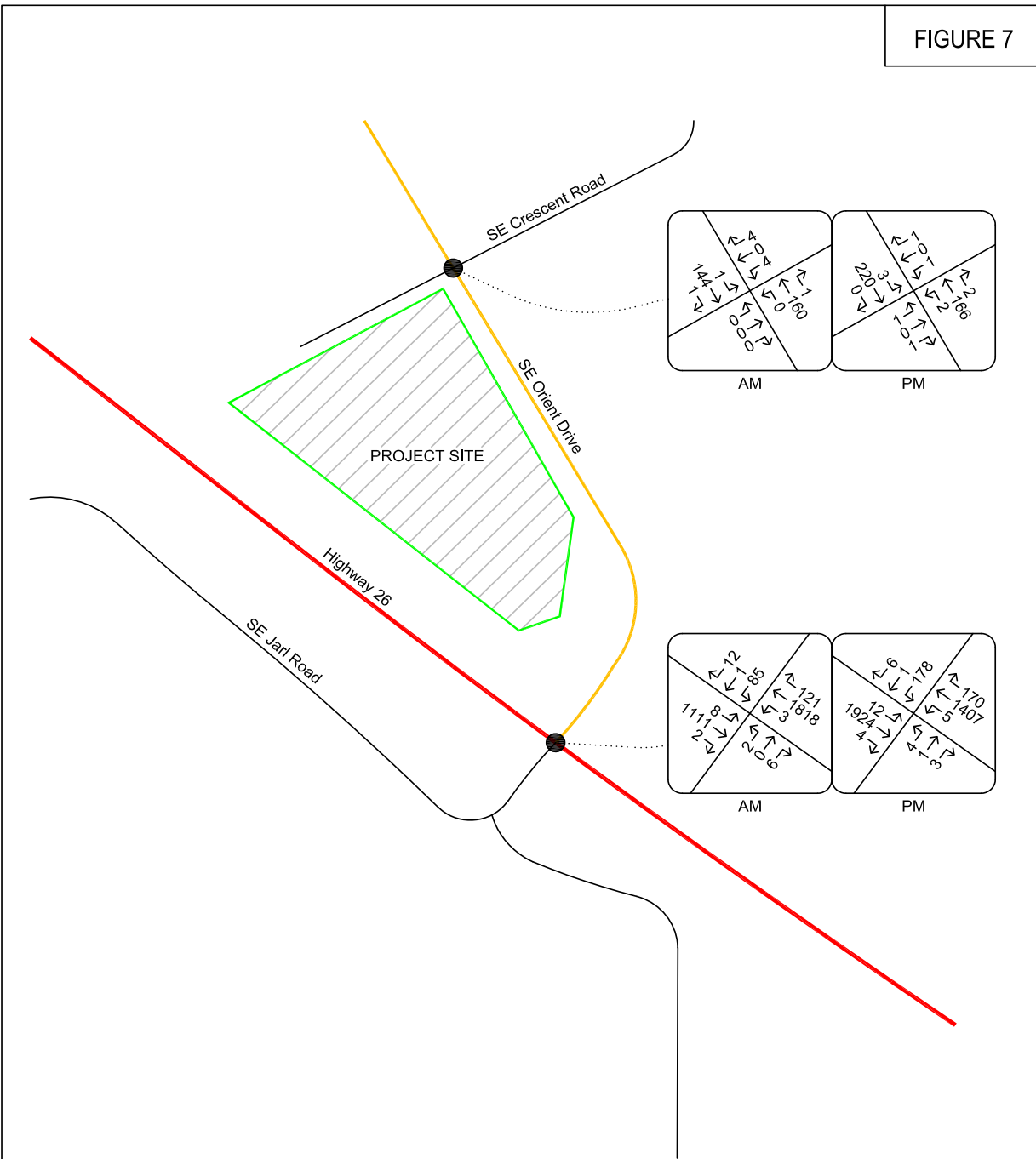
Figure 8 on page 18 shows the projected year 2020 peak hour volumes including both background growth and site trips from the proposed development during the morning and evening peak hours.

### ***PLANNING HORIZON TRAFFIC VOLUMES***

In addition to evaluation of the proposed development at the time of project completion, the potential impacts of the zone change on the subject property were examined for the 20-year planning horizon. In order to determine the projected year 2038 background traffic volumes, the existing traffic volumes were increased using a linear growth rate of 1.92 percent per year.

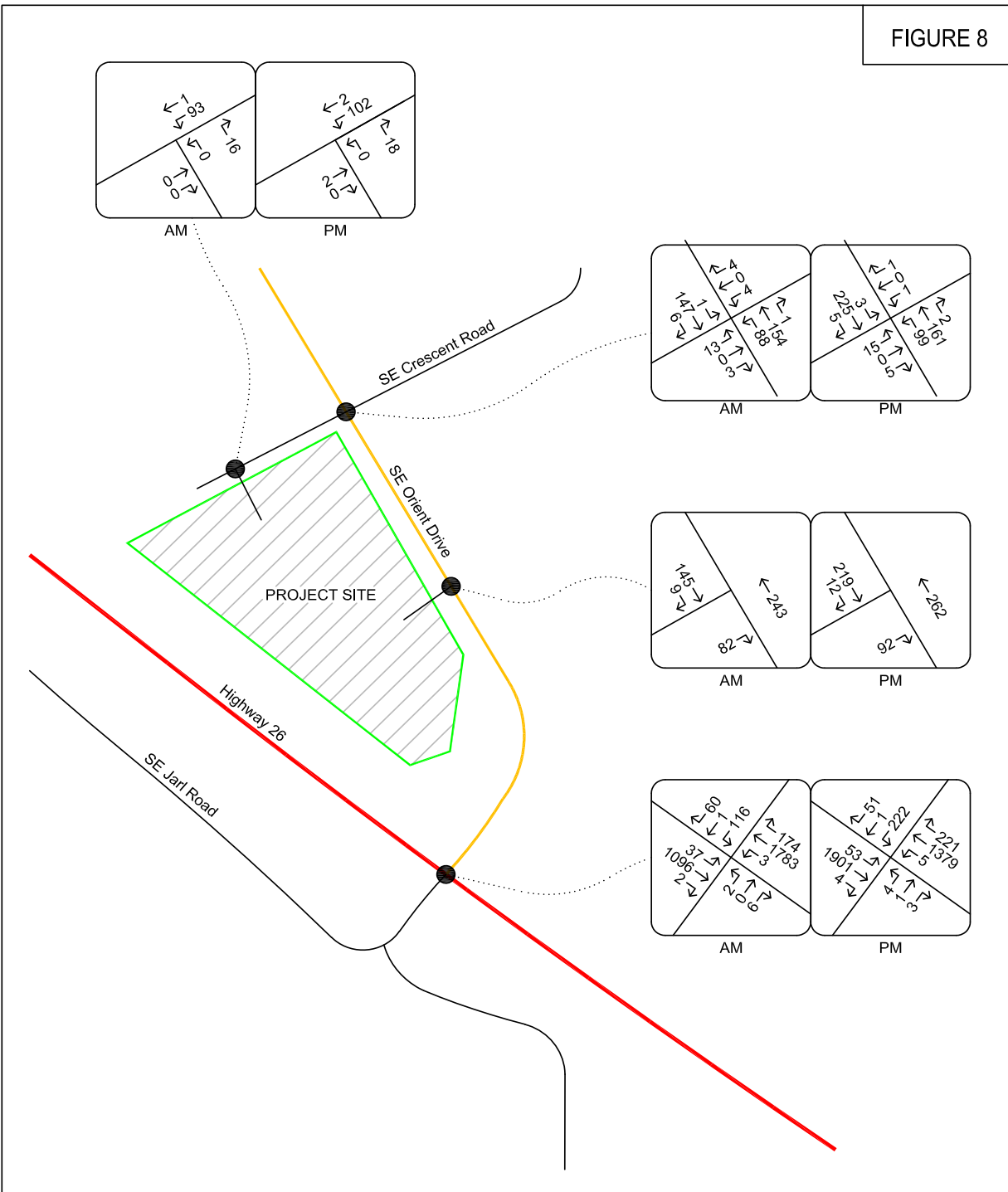
Figure 9 on page 19 shows the projected year 2020 peak hour traffic volumes. Figure 10 on page 20 shows the year 2020 traffic volumes with the addition of potential site trips resulting from the approved zone change on the subject property.

FIGURE 7



Includes two years of highway traffic growth at 1.92 percent per year (linear) in accord with ODOT's Future Volume Table (MP 22.72). A 2.0 percent per year (exponential) growth rate was applied to all other turning movements.

FIGURE 8

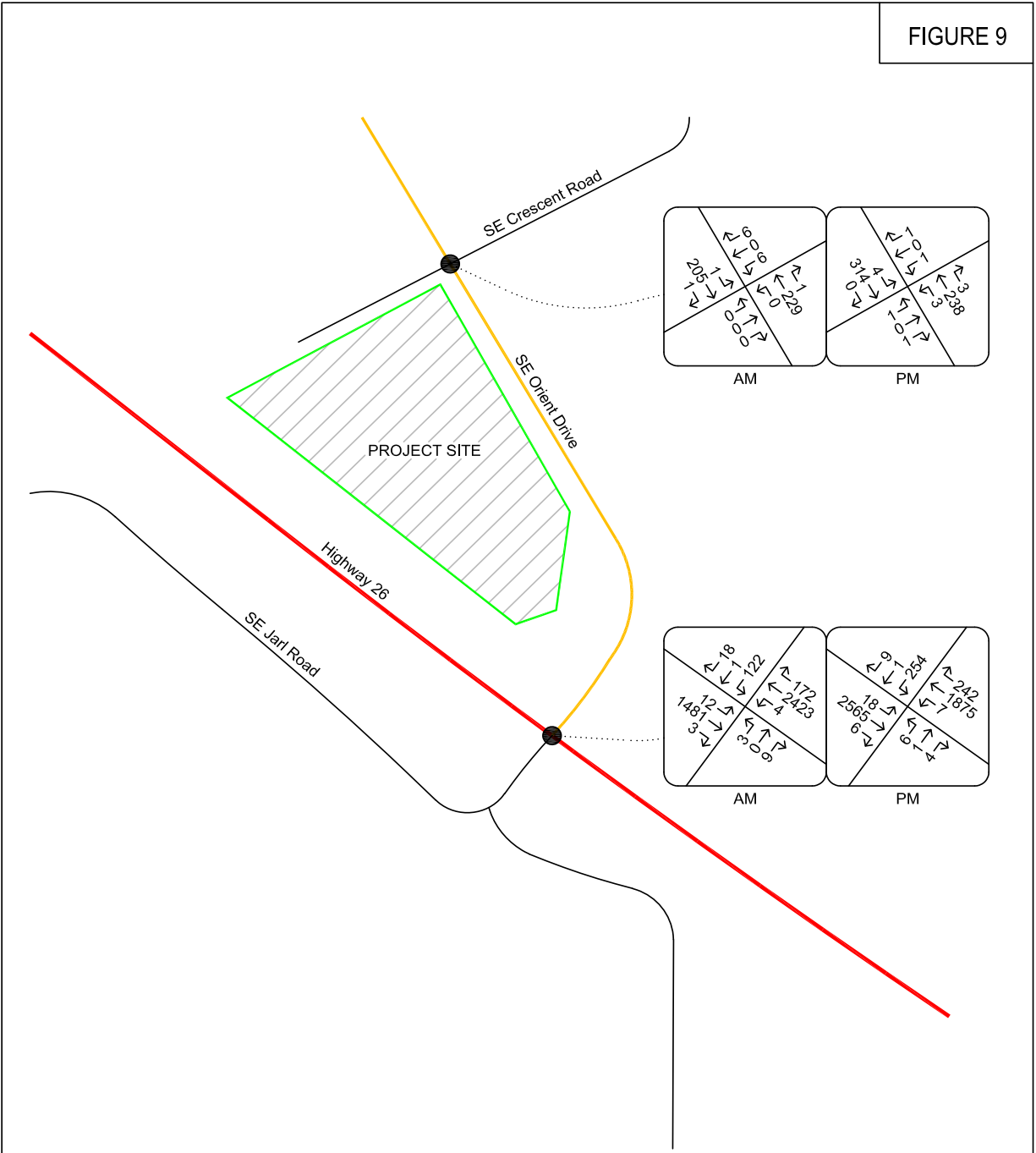


TRAFFIC VOLUMES  
 2020 Background Plus Site Trips  
 Morning and Evening Peak Hours

PAGE  
 18

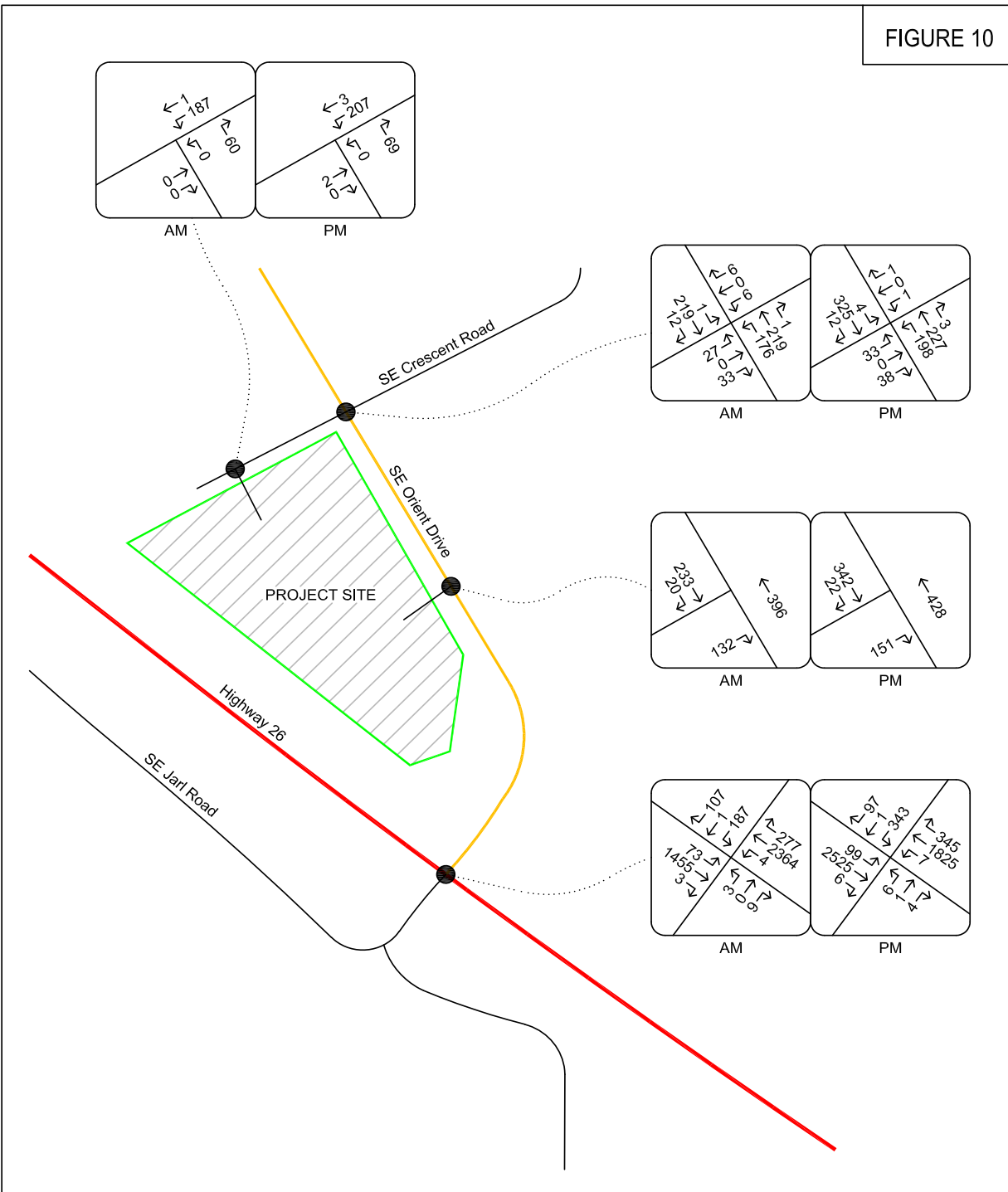


FIGURE 9



Includes 20 years of highway traffic growth at 1.92 percent per year (linear) in accord with ODOT's Future Volume Table (MP 22.72). A 2.0 percent per year (exponential) growth rate was applied to all other turning movements.

FIGURE 10





### OPERATIONAL ANALYSIS

The operational analysis for future traffic conditions was again conducted using Synchro analysis software, with outputs based on the analysis methodologies contained in the *HIGHWAY CAPACITY MANUAL, 6<sup>th</sup> Editions*. The analysis was prepared for the intersections' morning and evening peak hours.

The results of the operational analysis are summarized in Table 4 below. Detailed analysis worksheets are also included in the technical appendix.

**Table 4 - Future Conditions Operational Analysis Summary**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c	Delay	LOS	v/c
<b>SE Orient Drive at SE Crescent Road</b>						
2020 Background Conditions	10.3	B	0.01	10.6	B	0.01
2020 Background plus Site	13.8	B	0.08	14.0	B	0.08
2038 Background Conditions	11.0	B	0.02	12.0	B	0.01
2038 Conditions with C-2 Zoning	16.4	C	0.17	21.6	C	0.26
<b>SE Crescent Road at Site Access</b>						
2020 Background plus Site	8.4	A	0.06	8.4	A	0.07
2038 Conditions with C-2 Zoning	8.5	A	0.13	8.6	A	0.14
<b>SE Orient Drive at Site Access</b>						
2020 Background plus Site	9.5	A	0.10	10.2	B	0.13
2038 Conditions with C-2 Zoning	10.7	B	0.19	12.1	B	0.24
<b>Highway 26 at SE Orient Drive</b>						
2020 Background Conditions	15.7	B	0.85	24.8	C	0.93
2020 Background plus Site	24.0	C	0.91	36.0	D	1.01
2020 Bkgd plus Site Mitigated*	18.9	B	0.85	23.0	C	0.91
2038 Background Conditions	66.4	E	1.09	92.8	F	1.22
2038 Conditions with C-2 Zoning	96.9	F	1.21	132.9	F	1.35
2038 Conditions with C-2 Zoning*	76.6	E	1.13	83.4	F	1.19

\* Includes an added SB approach lane on SE Orient Drive at Highway 26

Based on the results of the operational analysis, the unsignalized study intersections are projected to operate acceptably through year 2038 either with or without the addition of site trips from the proposed development and the underlying zone change.

The intersection of Highway 26 at SE Orient Drive is not projected to meet the performance target established in the Oregon Highway Plan under any of the future analysis scenarios. The proposed development and zone change are also projected to result in further degradation of intersection operation. However, if an exclusive southbound left-turn lane is added to the existing lane that allows all turning movements on the SE Orient Drive approach, intersection operation is projected to be improved as compared to background conditions for both future analysis scenarios. Accordingly, this mitigation is sufficient to offset the impacts of the proposed use as well as the potential operational impacts of the proposed zone change.



### ***QUEUING ANALYSIS***

In addition to the operational analysis, a queuing analysis was conducted to determine an appropriate storage length for the new southbound left-turn lane on SE Orient Drive at Highway 26. The storage length should be sufficient to accommodate the 95<sup>th</sup> percentile queue length for this movement. The 95<sup>th</sup> percentile queue is the length which is exceeded during five percent or less of the peak hour. Queue lengths in excess of the 95<sup>th</sup> percentile occur do not occur with sufficient frequency to allow for cost-effective design.

The queuing analysis was conducted for year 2020 background plus site trips conditions during the morning and evening peak hours. Based on the analysis, the projected 95<sup>th</sup> percentile queue lengths were 97 feet during the morning peak hour and 141 feet during the evening peak hour. Based on these results, it is recommended that the new turn lane have a storage length of at least 150 feet.

The queuing analysis also included projected 95<sup>th</sup> percentile queue lengths for the northbound left-turn lane from SE Orient Drive onto SE Crescent Road. The projected queues for this turning movement were 37 feet during the morning peak hour and 42 feet during the evening peak hour.

### ***SITE CIRCULATION CONSIDERATIONS***

The proposed site plan includes a full-movement access from SE Crescent Road as well as a restricted right-in, right-out access on SE Orient Drive. In order to verify that fuel trucks can efficiently enter, circulate and exit from the site given the proposed access configuration, the swept paths of turning movements for a double-trailer tanker truck matching the dimensions of those used by Space Age Fuel and a large interstate tractor-trailer truck were examined. Based on the analysis, these trucks can efficiently enter, circulate and exit from the site without the need for backing maneuvers and without significant conflicts given the proposed site plan and access configuration.

It should be noted that in addition to the proposed access configuration, a second turning-movement analysis was conducted assuming access is provided exclusively via the driveway on SE Crescent Road (i.e. without any direct access to SE Orient Drive). Based on the analysis, the double-trailer fuel truck could not turn around within the site without running through the southeastern-most fuel pump within the site. This circulation pattern would also require trucks to travel in front of the convenience store and may require significant backing maneuvers which would occur with limited visibility due to the angles of the truck and trailer. Based on this analysis it is recommended that the proposed right-in, right-out access be permitted on SE Orient Drive.

Turning-movement diagrams showing the travel paths of the fuel truck are included in the attached technical appendix.





## **SAFETY ANALYSIS**

### ***CRASH DATA ANALYSIS***

Using data obtained from the Oregon Department of Transportation, a review of the three most recent years of available crash history (from January 2014 through December 2016) was performed for the study intersections. The crash data was evaluated based on the number, type, and severity of collisions, as well as the intersection crash rate. Crash rates allow comparison of relative safety risks at intersections with different lane configurations, volumes, and traffic control devices by accounting for both the number of crashes that occur during the study period and the number of vehicles that traveled through the intersection during that period. Crash rates are calculated using the standard assumption that evening peak hour volumes are approximately 10 percent of the average daily traffic volume at an intersection. The crash rates were compared to statewide crash rates for similar intersection types in order to identify any locations with crash rates in excess of the 90<sup>th</sup> percentile.

The intersection of Highway 26 at SE Orient Drive had 26 reported crashes during the three-year analysis period. These included 16 rear-end collisions, 4 sideswipe-meeting collisions, 3 turning-movement collisions, 2 fixed-object collisions and 1 overturn crash. The crashes resulted in no incapacitating injuries or fatalities. Two crashes resulted in “non-incapacitating injury” and 13 resulted in a “possible injury/complaint of pain”. The crash rate for the intersection was calculated to be 0.398 crashes per million entering vehicles. This is below the 90<sup>th</sup> percentile crash rate of 0.579 crashes per million entering vehicles for rural signalized four-way intersections in the state of Oregon.

The intersection of SE Orient Drive at SE Crescent Road had no reported collisions.

Based on the crash data, no significant safety hazards were identified, and no specific safety mitigations are recommended.

### ***WARRANT ANALYSIS***

Traffic signal and turn-lane warrants were examined for the unsignalized study intersections. Based on the projected traffic volumes, traffic signal warrants are not projected to be met at the unsignalized study intersections for any of the analysis scenarios.

Left-turn lane warrants were examined for the northbound approach on SE Orient Drive to Crescent Road. Left-turn lane warrants are intended to evaluate whether a meaningful safety benefit may be expected if the turning vehicles are provided with a turn lane within the street, allowing left-turning drivers to move out of the through travel lane so that following vehicles may pass without conflicts. Based on the analysis, the proposed development is projected to result in traffic volumes meeting turn-lane warrants for a northbound left-turn lane on SE Orient Drive at SE Crescent Road.

Based on the low volume of turning vehicles and the anticipated turning-movement restrictions at the proposed site access intersections, turn lane warrants are not projected to be met for the site access driveways on SE Orient Drive and SE Crescent Road.



### ***INTERSECTION SIGHT DISTANCE ANALYSIS***

Intersection sight distance was evaluated for the proposed site access on SE Orient Drive as well as the existing intersection of SE Orient Drive at SE Crescent Road. The basic rule speed limit along SE Orient Drive is 55 mph.

In conformance with the requirements of Clackamas County Roadway Standards, intersection sight distance was evaluated using a design speed 5 mph above the posted or regulatory speed limits. Accordingly, a design speed of 60 mph, requiring 665 feet of intersection sight distance was used for vehicles approaching from the north.

Vehicles approaching from the south must negotiate a horizontal curve approximately 200 feet north of Highway 26. The curve has a posted advisory speed of 25 mph. In conformance with Clackamas County Roadway Standards, intersection sight distance to the south was evaluated using a design speed of 10 mph above the posted advisory speed. Based on a design speed of 35 mph, a minimum of 390 feet of intersection sight distance is required to the south.

The available intersection sight distances were measured from a position 14.5 feet behind the edge of the traveled way with a driver's eye height 3.5 feet above the driveway surface to an oncoming driver's eye height of 3.5 feet above the surface of the oncoming travel lane.

From the existing intersection of SE Orient Drive at SE Crescent Road, intersection sight distance was measured to be in excess of 665 feet to the north and 500 feet to the south. Since the available intersection sight distance is in excess of the minimum required in each direction, intersection sight distance was determined to be acceptable at this intersection.

For the proposed site access driveway on SE Orient Drive, existing vegetation within the site frontage currently obstructs sight lines. However, it is projected that upon clearing of the vegetation within the frontage intersection sight distance will be in excess of 665 feet to the north and approximately 290 feet to the south. Intersection sight distance to the south is projected to be limited to less than the desired minimum by the existing horizontal curve in the roadway even with clearing of on-site vegetation.

Based on the detailed analysis, adequate intersection sight distance is available in each direction for the intersection of SE Orient Drive at SE Crescent Road. For the proposed site access on SE Orient Drive, sight distance to the north is projected to be acceptable but sight distance to the south is projected to be less than the minimum required. Accordingly, it is recommended that the proposed site access driveway on SE Orient Drive be restricted to right-in, right-out movements only in order to eliminate the potential for conflicts between vehicles exiting the site and northbound through traffic. No other sight distance mitigations are necessary or recommended.



## TRANSPORTATION PLANNING RULE ANALYSIS

In order to allow the proposed annexation and zone change, the City of Sandy must find that the requirements of Oregon's Transportation Planning Rule (OAR 660-012-0060) are met. This rule provides guidance regarding whether and how the potential transportation impacts of a plan amendment must be mitigated. The relevant portions of the Transportation Planning Rule are quoted below, along with responses specific to the proposed annexation and zone change.

### **660-012-0060**

#### **Plan and Land Use Regulation Amendments**

*(1) If an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) would significantly affect an existing or planned transportation facility, then the local government must put in place measures as provided in section (2) of this rule, unless the amendment is allowed under section (3), (9) or (10) of this rule. A plan or land use regulation amendment significantly affects a transportation facility if it would:*

*(a) Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);*

No changes are proposed to the functional classification of existing or planned transportation facilities.

*(b) Change standards implementing a functional classification system; or*

No changes are proposed to the standards implementing the functional classification system.

*(c) Result in any of the effects listed in paragraphs (A) through (C) of this subsection based on projected conditions measured at the end of the planning period identified in the adopted TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of the amendment may be reduced if the amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment.*

*(A) Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;*

SE Orient Drive is classified by Clackamas County as a Minor Arterial roadway. The volume and type of traffic generated under the reasonable worst-case development scenario is compatible with this functional classification. SE Crescent Road will serve destination trips, providing access to and from the proposed facility. Accordingly, the types and levels of travel and access are consistent with the functional classification of the surrounding transportation facilities.



*(B) Degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or comprehensive plan; or*

*(C) Degrade the performance of an existing or planned transportation facility that is otherwise projected to not meet the performance standards identified in the TSP or comprehensive plan.*

Under the reasonable worst-case development scenario, the proposed annexation and zone change would result in further degradation of a transportation facility that would not otherwise meet the performance standards identified in the Oregon Highway Plan. Specifically, the operation of the signalized intersection of Highway 26 at SE Orient Drive is expected to degrade upon either development with the proposed fuel station and convenience store or with full site development under the proposed zoning.

All other area roadways and intersections are projected to meet the relevant performance standards either with or without the addition of site traffic associated with the “reasonable worst-case development scenario”.

Since the proposed development and zone change will result in a significant effect as defined under Oregon’s Transportation Planning Rule, some form of remedy must be provided in conjunction with the proposed land use action, conforming to the requirements of OAR 660-012-060 (2) as follows:

*(2) If a local government determines that there would be a significant effect, then the local government must ensure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility measured at the end of the planning period identified in the adopted TSP through one or a combination of the remedies listed in (a) through (e) below, unless the amendment meets the balancing test in subsection (2)(e) of this section or qualifies for partial mitigation in section (11) of this rule. A local government using subsection (2)(e), section (3), section (10) or section (11) to approve an amendment recognizes that additional motor vehicle traffic congestion may result and that other facility providers would not be expected to provide additional capacity for motor vehicles in response to this congestion.*

*(a) Adopting measures that demonstrate allowed land uses are consistent with the planned function, capacity, and performance standards of the transportation facility.*

*(b) Amending the TSP or comprehensive plan to provide transportation facilities, improvements or services adequate to support the proposed land uses consistent with the requirements of this division; such amendments shall include a funding plan or mechanism consistent with section (4) or include an amendment to the transportation finance plan so that the facility, improvement, or service will be provided by the end of the planning period.*

*(c) Amending the TSP to modify the planned function, capacity or performance standards of the transportation facility.*





*(d) Providing other measures as a condition of development or through a development agreement or similar funding method, including, but not limited to, transportation system management measures or minor transportation improvements. Local governments shall, as part of the amendment, specify when measures or improvements provided pursuant to this subsection will be provided.*

*(e) Providing improvements that would benefit modes other than the significantly affected mode, improvements to facilities other than the significantly affected facility, or improvements at other locations, if:*

*(A) The provider of the significantly affected facility provides a written statement that the system-wide benefits are sufficient to balance the significant effect, even though the improvements would not result in consistency for all performance standards;*

*(B) The providers of facilities being improved at other locations provide written statements of approval; and*

*(C) The local jurisdictions where facilities are being improved provide written statements of approval.*

In this instance, the proposed development and zone change are accompanied by a recommended improvement consisting of the addition of a new southbound left-turn lane on SE Orient Drive approaching Highway 26. With the addition of this second turn lane, the performance of the intersection is projected to be improved as compared to background conditions without development within the subject property. Accordingly, the proposed mitigation meets the requirements of a minor transportation improvement as described under sub-section (2)(d). Provided that this traffic signal improvement is made a condition of approval, the proposed development and zone change will therefore meet the requirements of Oregon's Transportation Planning Rule.



## CONCLUSIONS

Based on the operational analysis, the unsignalized study intersections currently operate acceptably and are projected to continue to operate acceptably through 2038 either with or without full development within the subject property. No operational mitigations are necessary or recommended for the unsignalized intersections.

The intersection of Highway 26 at SE Orient Drive is currently operating with volume-to-capacity ratios (v/c) exceeding the targets established in the Oregon Highway Plan. Although the proposed development is projected to worsen performance of the intersection, if a southbound left-turn lane is added on SE Orient Drive approaching Highway 26, intersection operation will not be degraded by the proposed development.

Crash data for the most recent three years shows no significant crash trends that may be indicative of design deficiencies. No crash mitigations are recommended.

Based on the warrant analysis, no new traffic signals are recommended. A northbound left-turn lane is projected to be warranted at the intersection of SE Orient Drive and SE Crescent Road.

Intersection sight distance was evaluated for the unsignalized intersections on SE Orient Drive. The existing intersection at SE Crescent Road was found to have adequate sight distance in both directions. The proposed site access driveway on SE Orient Drive is projected to have inadequate intersection sight distance to the south. Accordingly, it is recommended that turning movements be restricted to right-in, right-out only to eliminate the potential for conflicts with limited sight distance at this location. No other sight distance mitigations are recommended.

The change from Clackamas County RRFF-5 to City of Sandy C-2 zoning was determined to result in a significant effect as defined under Oregon's Transportation Planning Rule. In order to mitigate the impacts of the annexation and zone change, a minor transportation improvement is required as a condition of approval for the project. Based on the analysis, the addition of a second southbound left-turn lane on SE Orient Drive approaching Highway 26 is sufficient to address the impacts of potential site development under the proposed zoning and will therefore satisfy Oregon's Transportation Planning Rule.

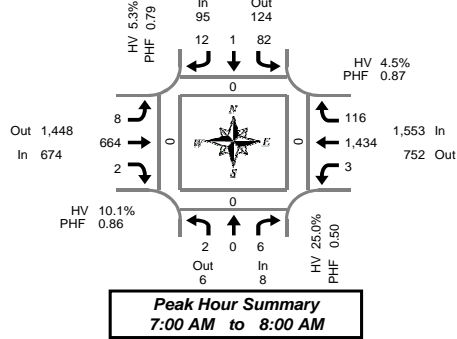


## APPENDIX

# Total Vehicle Summary



Clay Carney  
(603) 833-2740



## SE Orient Dr & Hwy 26

Tuesday, November 06, 2018  
7:00 AM to 9:00 AM

### 5-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk				
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West	
7:00 AM	1	0	0	0	5	0	1	0	0	39	0	0	0	98	8	0	0	152	0	0	0	0
7:05 AM	0	0	0	0	8	0	0	0	0	39	0	0	1	142	11	0	0	201	0	0	0	0
7:10 AM	1	0	2	0	11	0	0	0	2	51	0	0	0	108	12	0	0	187	0	0	0	0
7:15 AM	0	0	0	0	9	0	2	0	1	56	0	0	0	158	8	1	0	234	0	0	0	0
7:20 AM	0	0	0	0	7	0	1	0	0	60	0	0	0	139	10	0	0	217	0	0	0	0
7:25 AM	0	0	0	0	5	0	0	0	2	52	0	0	1	117	11	0	0	188	0	0	0	0
7:30 AM	0	0	0	0	4	1	2	0	1	55	0	0	0	129	10	0	0	202	0	0	0	0
7:35 AM	0	0	0	0	3	0	0	0	1	63	0	0	0	115	8	0	0	190	0	0	0	0
7:40 AM	0	0	0	0	6	0	0	0	0	60	1	0	0	136	18	0	0	221	0	0	0	0
7:45 AM	0	0	2	0	6	0	3	0	0	69	1	0	0	102	6	0	0	189	0	0	0	0
7:50 AM	0	0	0	0	9	0	0	0	0	63	0	0	1	110	6	0	0	189	0	0	0	0
7:55 AM	0	0	2	0	9	0	3	0	1	57	0	0	0	80	8	0	0	160	0	0	0	0
8:00 AM	0	0	0	0	10	0	1	0	1	56	0	0	0	65	12	0	0	145	0	0	0	0
8:05 AM	2	0	2	0	8	0	2	0	0	51	0	0	0	73	7	0	0	145	0	0	0	0
8:10 AM	0	0	1	0	5	0	1	0	1	48	0	0	0	102	8	0	0	166	0	0	0	0
8:15 AM	0	0	0	0	9	0	2	0	1	41	0	0	1	87	7	0	0	148	0	0	0	0
8:20 AM	0	0	0	0	5	0	1	0	2	67	0	0	0	90	15	0	0	180	0	0	0	0
8:25 AM	1	0	0	0	10	0	0	0	0	42	0	0	0	76	12	0	0	141	0	0	0	0
8:30 AM	1	0	0	0	14	0	0	0	0	61	0	0	1	84	20	0	0	181	0	0	0	0
8:35 AM	0	0	0	0	16	0	0	0	0	54	1	0	0	84	14	0	0	169	0	0	0	0
8:40 AM	0	0	0	0	10	0	0	0	0	73	0	0	2	90	14	0	0	189	0	0	0	0
8:45 AM	0	0	0	0	17	0	0	0	2	85	0	0	0	64	13	0	0	181	0	0	0	0
8:50 AM	0	0	1	0	12	0	1	0	0	81	3	0	1	55	18	0	0	172	0	0	0	0
8:55 AM	0	0	1	0	7	0	0	0	0	87	0	0	1	88	12	0	0	176	0	0	0	0
Total Survey	6	0	11	0	205	1	20	0	15	1,390	6	0	9	2,392	268	1	0	4,323	0	0	0	0

### 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk				
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West	
7:00 AM	2	0	2	0	24	0	1	0	2	129	0	0	1	348	31	0	0	540	0	0	0	0
7:15 AM	0	0	0	0	21	0	3	0	3	168	0	0	1	414	29	1	0	639	0	0	0	0
7:30 AM	0	0	0	0	13	1	2	0	2	178	1	0	0	380	36	0	0	613	0	0	0	0
7:45 AM	0	0	4	0	24	0	6	0	1	189	1	0	1	292	20	0	0	538	0	0	0	0
8:00 AM	2	0	3	0	23	0	4	0	2	155	0	0	0	240	27	0	0	456	0	0	0	0
8:15 AM	1	0	0	0	24	0	3	0	3	150	0	0	1	253	34	0	0	469	0	0	0	0
8:30 AM	1	0	0	0	40	0	0	0	0	188	1	0	3	258	48	0	0	539	0	0	0	0
8:45 AM	0	0	2	0	36	0	1	0	2	233	3	0	2	207	43	0	0	529	0	0	0	0
Total Survey	6	0	11	0	205	1	20	0	15	1,390	6	0	9	2,392	268	1	0	4,323	0	0	0	0

### Peak Hour Summary 7:00 AM to 8:00 AM

By Approach	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Total	Pedestrians Crosswalk				
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West	
Volume	8	6	14	0	95	124	219	0	674	1,448	2,122	0	1,553	752	2,305	1	0	2,330	0	0	0	0
%HV	25.0%				5.3%				10.1%				4.5%				6.2%					
PHF	0.50				0.79				0.86				0.87				0.91					

By Movement	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	0	6	8	82	1	12	95	8	664	2	674	3	1,434	116	1,553	2,330
%HV	0.0%	0.0%	33.3%	25.0%	6.1%	0.0%	0.0%	5.3%	12.5%	9.9%	50.0%	10.1%	33.3%	4.4%	5.2%	4.5%	6.2%
PHF	0.25	0.00	0.38	0.50	0.73	0.25	0.50	0.79	0.50	0.86	0.25	0.86	0.75	0.87	0.81	0.87	0.91

### Rolling Hour Summary 7:00 AM to 9:00 AM

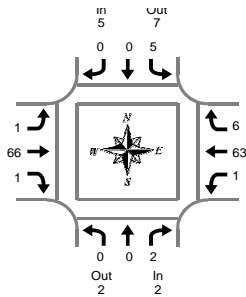
Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk				
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West	
7:00 AM	2	0	6	0	82	1	12	0	8	664	2	0	3	1,434	116	1	0	2,330	0	0	0	0
7:15 AM	2	0	7	0	81	1	15	0	8	690	2	0	2	1,326	112	1	0	2,246	0	0	0	0
7:30 AM	3	0	7	0	84	1	15	0	8	672	2	0	2	1,165	117	0	0	2,076	0	0	0	0
7:45 AM	4	0	7	0	111	0	13	0	6	682	2	0	5	1,043	129	0	0	2,002	0	0	0	0
8:00 AM	4	0	5	0	123	0	8	0	7	726	4	0	6	958	152	0	0	1,993	0	0	0	0



# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



**Peak Hour Summary**  
7:00 AM to 8:00 AM

## SE Orient Dr & Hwy 26

Tuesday, November 06, 2018  
7:00 AM to 9:00 AM

### Heavy Vehicle 5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	2	0	2	1	3	5		
7:05 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	4	4	5	
7:10 AM	0	0	0	0	1	0	0	1	0	5	0	5	0	5	1	6	
7:15 AM	0	0	0	0	0	0	0	0	0	6	0	6	0	6	1	7	
7:20 AM	0	0	0	0	0	0	0	0	0	5	0	5	0	6	0	6	
7:25 AM	0	0	0	0	1	0	0	1	0	4	0	4	0	3	0	3	
7:30 AM	0	0	0	0	0	0	0	0	1	3	0	4	0	11	0	11	
7:35 AM	0	0	0	0	0	0	0	0	0	9	0	9	0	7	1	8	
7:40 AM	0	0	0	0	0	0	0	0	0	8	1	9	0	2	1	3	
7:45 AM	0	0	1	1	1	0	0	1	0	8	0	8	0	11	1	12	
7:50 AM	0	0	0	0	1	0	0	1	0	9	0	9	1	5	0	6	
7:55 AM	0	0	1	1	1	0	0	1	0	6	0	6	0	1	0	1	
8:00 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	2	1	3	
8:05 AM	0	0	0	0	0	0	0	0	0	5	0	5	0	1	0	1	
8:10 AM	0	0	0	0	0	0	0	0	0	6	0	6	0	5	0	5	
8:15 AM	0	0	0	0	0	0	0	0	1	6	0	7	1	3	0	4	
8:20 AM	0	0	0	0	0	0	1	1	0	7	0	7	0	3	0	3	
8:25 AM	1	0	0	1	0	0	0	0	0	3	0	3	0	7	2	9	
8:30 AM	0	0	0	0	1	0	0	1	0	5	0	5	0	2	3	5	
8:35 AM	0	0	0	0	3	0	0	3	0	7	0	7	0	4	1	5	
8:40 AM	0	0	0	0	2	0	0	2	0	7	0	7	0	3	0	3	
8:45 AM	0	0	0	0	3	0	0	3	0	12	0	12	0	1	0	1	
8:50 AM	0	0	0	0	0	0	0	0	0	8	0	8	0	2	3	5	
8:55 AM	0	0	0	0	0	0	0	0	0	11	0	11	0	7	0	7	
Total Survey	1	0	2	3	14	0	1	15	2	146	1	149	2	103	16	121	288

### Heavy Vehicle 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	1	0	0	1	0	8	0	8	0	11	2	13	22
7:15 AM	0	0	0	0	1	0	0	1	0	15	0	15	0	15	1	16	32
7:30 AM	0	0	0	0	0	0	0	0	1	20	1	22	0	20	2	22	44
7:45 AM	0	0	2	2	3	0	0	3	0	23	0	23	1	17	1	19	47
8:00 AM	0	0	0	0	0	0	0	0	0	14	0	14	0	8	1	9	23
8:15 AM	1	0	0	1	0	0	1	1	1	16	0	17	1	13	2	16	35
8:30 AM	0	0	0	0	6	0	0	6	0	19	0	19	0	9	4	13	38
8:45 AM	0	0	0	0	3	0	0	3	0	31	0	31	0	10	3	13	47
Total Survey	1	0	2	3	14	0	1	15	2	146	1	149	2	103	16	121	288

### Heavy Vehicle Peak Hour Summary

7:00 AM to 8:00 AM

By Approach	Northbound SE Orient Dr			Southbound SE Orient Dr			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	2	4	5	7	12	68	63	131	70	73	143	145
PHF	0.25			0.42			0.65			0.76			0.71

By Movement	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	2	2	5	0	0	5	1	66	1	68	1	63	6	70	145
PHF	0.00	0.00	0.25	0.25	0.42	0.00	0.00	0.42	0.25	0.66	0.25	0.65	0.25	0.75	0.50	0.76	0.71

### Heavy Vehicle Rolling Hour Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	2	2	5	0	0	5	1	66	1	68	1	63	6	70	145
7:15 AM	0	0	2	2	4	0	0	4	1	72	1	74	1	60	5	66	146
7:30 AM	1	0	2	3	3	0	1	4	2	73	1	76	2	58	6	66	149
7:45 AM	1	0	2	3	9	0	1	10	1	72	0	73	2	47	8	57	143
8:00 AM	1	0	0	1	9	0	1	10	1	80	0	81	1	40	10	51	143

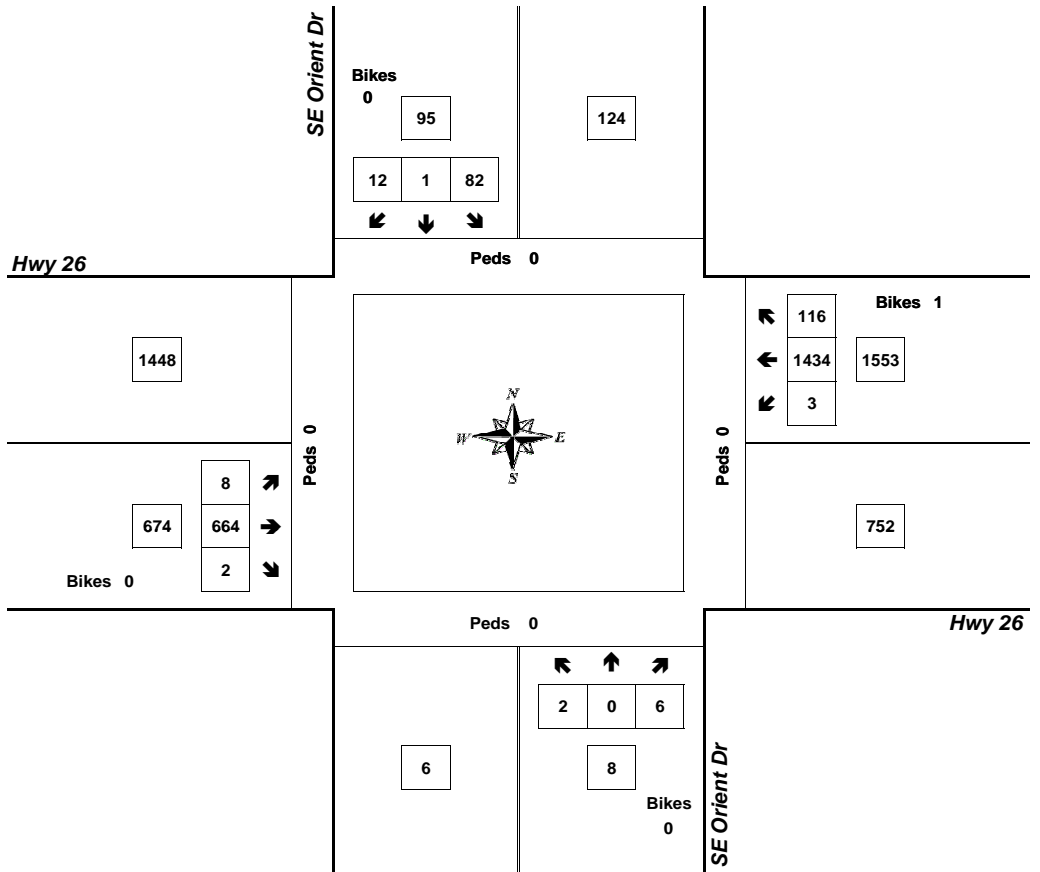
**Peak Hour Summary**



Clay Carney  
(503) 833-2740

**SE Orient Dr & Hwy 26**

7:00 AM to 8:00 AM  
Tuesday, November 06, 2018



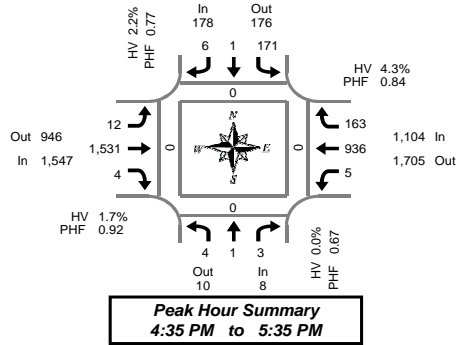
Approach	PHF	HV%	Volume
EB	0.86	10.1%	674
WB	0.87	4.5%	1,553
NB	0.50	25.0%	8
SB	0.79	5.3%	95
<b>Intersection</b>	<b>0.91</b>	<b>6.2%</b>	<b>2,330</b>

Count Period: 7:00 AM to 9:00 AM

**Total Vehicle Summary**



Clay Carney  
(603) 833-2740



**SE Orient Dr & Hwy 26**

Tuesday, November 06, 2018  
4:00 PM to 6:00 PM

**5-Minute Interval Summary**  
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk				
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West	
4:00 PM	1	0	1	0	22	0	1	0	3	100	1	0	0	0	60	7	0	196	1	0	0	0
4:05 PM	2	0	1	0	22	0	0	0	0	135	1	0	0	67	17	0	245	0	0	0	0	
4:10 PM	0	0	1	0	16	0	0	0	2	132	1	0	0	83	6	0	241	0	0	0	0	
4:15 PM	1	0	0	0	15	0	0	0	0	141	0	0	2	75	13	0	247	0	0	0	0	
4:20 PM	0	0	2	0	23	0	0	0	1	111	0	0	0	53	8	0	198	0	0	0	0	
4:25 PM	0	0	0	0	15	0	0	0	0	146	0	0	0	51	13	0	225	0	0	0	0	
4:30 PM	0	0	0	0	15	0	0	0	0	117	0	0	0	67	19	0	218	0	0	0	0	
4:35 PM	0	0	0	0	15	0	0	0	0	135	0	0	0	61	23	0	234	0	0	0	0	
4:40 PM	0	0	0	0	16	0	0	0	0	135	0	0	0	71	12	0	234	0	0	0	0	
4:45 PM	0	1	0	0	21	0	2	0	2	125	0	0	0	78	15	0	244	0	0	0	0	
4:50 PM	0	0	0	0	18	0	1	0	1	109	1	0	0	75	8	0	213	0	0	0	0	
4:55 PM	1	0	0	0	11	0	0	0	3	130	0	0	1	83	17	0	246	0	0	0	0	
5:00 PM	0	0	1	0	10	0	0	0	1	158	1	0	0	87	10	0	268	0	0	0	0	
5:05 PM	0	0	0	0	12	0	0	0	1	100	0	0	0	118	13	0	244	0	0	0	0	
5:10 PM	0	0	1	0	11	1	0	0	2	154	2	0	0	79	11	0	261	0	0	0	0	
5:15 PM	1	0	0	0	13	0	0	0	0	121	0	0	0	63	18	0	216	0	0	0	0	
5:20 PM	1	0	0	0	13	0	2	0	1	120	0	0	0	78	11	0	226	0	0	0	0	
5:25 PM	0	0	1	0	15	0	1	0	0	111	0	0	3	68	11	0	210	0	0	0	0	
5:30 PM	1	0	0	0	16	0	0	0	1	133	0	0	1	75	14	0	241	0	0	0	0	
5:35 PM	0	0	0	0	14	0	0	0	0	120	0	0	1	70	13	0	218	0	0	0	0	
5:40 PM	0	0	0	0	15	0	1	0	2	115	1	0	0	65	14	0	213	0	0	0	0	
5:45 PM	0	0	1	0	17	0	0	0	3	101	0	0	4	66	6	0	198	0	0	0	0	
5:50 PM	0	0	2	0	15	0	1	0	0	111	0	0	0	54	8	0	191	0	0	0	0	
5:55 PM	0	0	1	0	13	0	0	0	0	108	0	0	1	67	10	0	200	0	0	0	0	
Total Survey	8	1	12	0	373	1	9	0	23	2,968	8	0	13	1,714	297	0	5,427	1	0	0	0	

**15-Minute Interval Summary**  
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	3	0	3	0	60	0	1	0	5	367	3	0	0	210	30	0	682	1	0	0	0
4:15 PM	1	0	2	0	53	0	0	0	1	398	0	0	2	179	34	0	670	0	0	0	0
4:30 PM	0	0	0	0	46	0	0	0	0	387	0	0	0	199	54	0	686	0	0	0	0
4:45 PM	1	1	0	0	50	0	3	0	6	364	1	0	1	236	40	0	703	0	0	0	0
5:00 PM	0	0	2	0	33	1	0	0	4	412	3	0	0	284	34	0	773	0	0	0	0
5:15 PM	2	0	1	0	41	0	3	0	1	352	0	0	3	209	40	0	652	0	0	0	0
5:30 PM	1	0	0	0	45	0	1	0	3	368	1	0	2	210	41	0	672	0	0	0	0
5:45 PM	0	0	4	0	45	0	1	0	3	320	0	0	5	187	24	0	589	0	0	0	0
Total Survey	8	1	12	0	373	1	9	0	23	2,968	8	0	13	1,714	297	0	5,427	1	0	0	0

**Peak Hour Summary**  
4:35 PM to 5:35 PM

By Approach	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	8	10	18	0	178	176	354	0	1,547	946	2,493	0	1,104	1,705	2,809	0	2,837	0	0	0	0
%HV	0.0%				2.2%				1.7%				4.3%				2.7%				
PHF	0.67				0.77				0.92				0.84				0.92				

By Movement	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	4	1	3	8	171	1	6	178	12	1,531	4	1,547	5	936	163	1,104	2,837
%HV	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	2.2%	0.0%	1.8%	0.0%	1.7%	0.0%	4.6%	2.5%	4.3%	2.7%
PHF	0.50	0.25	0.38	0.67	0.78	0.25	0.50	0.77	0.50	0.93	0.33	0.92	0.31	0.81	0.82	0.84	0.92

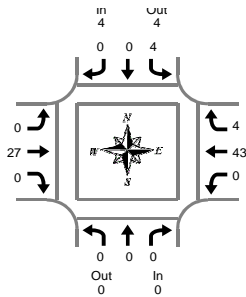
**Rolling Hour Summary**  
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	5	1	5	0	209	0	4	0	12	1,516	4	0	3	824	158	0	2,741	1	0	0	0
4:15 PM	2	1	4	0	182	1	3	0	11	1,561	4	0	3	898	162	0	2,832	1	0	0	0
4:30 PM	3	1	3	0	170	1	6	0	11	1,515	4	0	4	928	168	0	2,814	0	0	0	0
4:45 PM	4	1	3	0	169	1	7	0	14	1,496	5	0	6	939	155	0	2,800	0	0	0	0
5:00 PM	3	0	7	0	164	1	5	0	11	1,452	4	0	10	890	139	0	2,686	0	0	0	0

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



Out 43  
In 27

**Peak Hour Summary**  
4:35 PM to 5:35 PM

## SE Orient Dr & Hwy 26

Tuesday, November 06, 2018  
4:00 PM to 6:00 PM

### Heavy Vehicle 5-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	1	0	0	1	0	5	1	6	0	6	0	6	14
4:05 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	7	0	7	9
4:10 PM	0	0	0	0	0	0	0	0	0	5	0	5	0	5	0	5	10
4:15 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	6
4:20 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
4:25 PM	0	0	0	0	1	0	0	1	0	7	0	7	0	6	0	6	14
4:30 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	6
4:35 PM	0	0	0	0	0	0	0	0	0	4	0	4	0	4	1	5	9
4:40 PM	0	0	0	0	1	0	0	1	0	4	0	4	0	5	0	5	10
4:45 PM	0	0	0	0	1	0	0	1	0	2	0	2	0	1	2	3	6
4:50 PM	0	0	0	0	1	0	0	1	0	3	0	3	0	4	0	4	8
4:55 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	3	0	3	4
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	4
5:10 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	7	0	7	9
5:15 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	6	0	6	9
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	5	5
5:25 PM	0	0	0	0	1	0	0	1	0	2	0	2	0	2	0	2	5
5:30 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	6
5:35 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	1	3	4
5:40 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	5	0	5	7
5:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
5:50 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5
5:55 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	4	0	4	5
Total Survey	0	0	1	1	6	0	0	6	0	62	1	63	0	89	5	94	164

### Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	1	0	0	1	0	12	1	13	0	18	0	18	33
4:15 PM	0	0	0	0	1	0	0	1	0	11	0	11	0	11	0	11	23
4:30 PM	0	0	0	0	1	0	0	1	0	11	0	11	0	12	1	13	25
4:45 PM	0	0	0	0	2	0	0	2	0	8	0	8	0	5	2	7	17
5:00 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	14	0	14	17
5:15 PM	0	0	0	0	1	0	0	1	0	5	0	5	0	12	1	13	19
5:30 PM	0	0	0	0	0	0	0	0	0	6	0	6	0	10	1	11	17
5:45 PM	0	0	0	0	0	0	0	0	0	6	0	6	0	7	0	7	13
Total Survey	0	0	1	1	6	0	0	6	0	62	1	63	0	89	5	94	164

### Heavy Vehicle Peak Hour Summary 4:35 PM to 5:35 PM

By Approach	Northbound SE Orient Dr			Southbound SE Orient Dr			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	4	4	8	27	43	70	47	31	78	78
PHF	0.00			0.33			0.68			0.65			0.78

By Movement	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	4	0	0	4	0	27	0	27	0	43	4	47	78
PHF	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.33	0.00	0.68	0.00	0.68	0.00	0.63	0.33	0.65	0.78

### Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	5	0	0	5	0	42	1	43	0	46	3	49	98
4:15 PM	0	0	0	0	4	0	0	4	0	33	0	33	0	42	3	45	82
4:30 PM	0	0	0	0	4	0	0	4	0	27	0	27	0	43	4	47	78
4:45 PM	0	0	0	0	3	0	0	3	0	22	0	22	0	41	4	45	70
5:00 PM	0	0	0	0	1	0	0	1	0	20	0	20	0	43	2	45	66



**Peak Hour Summary**

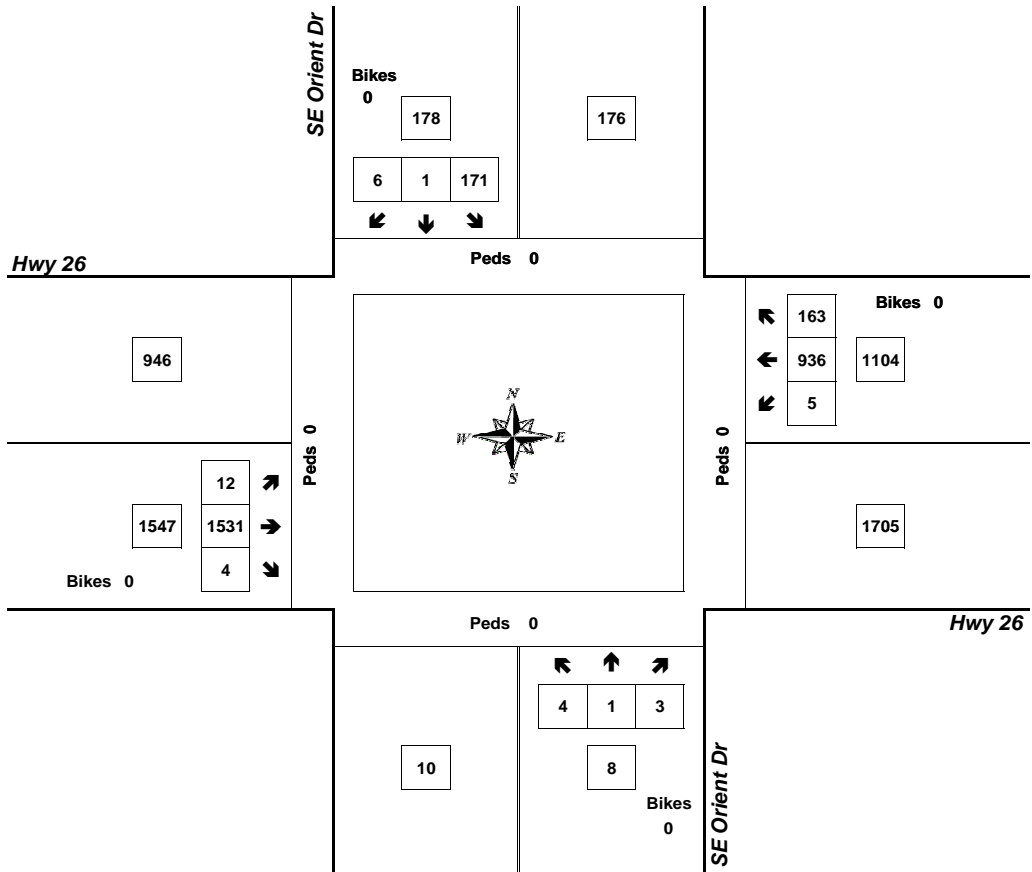


Clay Carney  
(503) 833-2740

**SE Orient Dr & Hwy 26**

4:35 PM to 5:35 PM

Tuesday, November 06, 2018



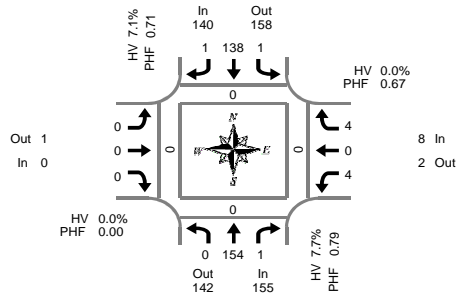
Approach	PHF	HV%	Volume
EB	0.92	1.7%	1,547
WB	0.84	4.3%	1,104
NB	0.67	0.0%	8
SB	0.77	2.2%	178
<b>Intersection</b>	<b>0.92</b>	<b>2.7%</b>	<b>2,837</b>

Count Period: 4:00 PM to 6:00 PM

**Total Vehicle Summary**



Clay Carney  
(603) 833-2740



**SE Orient Dr & SE Crescent Rd**

Tuesday, November 06, 2018  
7:00 AM to 9:00 AM

**Peak Hour Summary  
8:00 AM to 9:00 AM**

**5-Minute Interval Summary  
7:00 AM to 9:00 AM**

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	8	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	12	0	0	0	11	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
7:10 AM	1	11	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	12	0	0	0	10	0	0	0	0	2	0	0	0	0	0	0	0	0	0	
7:20 AM	0	9	0	0	0	6	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
7:25 AM	0	14	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 AM	0	10	0	0	0	7	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
7:35 AM	1	9	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:40 AM	0	18	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45 AM	0	6	0	0	0	8	0	0	0	1	0	0	0	0	1	0	0	0	0	0	
7:50 AM	0	6	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:55 AM	0	9	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 AM	0	13	0	0	0	9	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
8:05 AM	0	7	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:10 AM	0	8	0	0	0	7	1	0	0	0	0	0	0	1	1	0	0	0	0	0	
8:15 AM	0	10	0	0	0	9	0	0	0	0	0	0	1	0	1	0	0	0	0	0	
8:20 AM	0	16	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:25 AM	0	14	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:30 AM	0	19	0	0	0	15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
8:35 AM	0	11	0	0	1	16	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
8:40 AM	0	14	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:45 AM	0	13	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:50 AM	0	17	0	0	0	12	0	0	0	0	0	2	0	1	0	0	0	0	0	0	
8:55 AM	0	12	1	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Survey	2	278	1	0	2	230	2	1	1	0	4	0	4	0	6	0	0	0	0	0	

**15-Minute Interval Summary  
7:00 AM to 9:00 AM**

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	1	31	0	0	1	22	1	0	1	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	35	0	0	0	22	0	0	0	0	3	0	0	0	0	0	0	0	0	0	
7:30 AM	1	37	0	0	0	15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
7:45 AM	0	21	0	0	0	33	0	0	0	1	0	0	0	1	0	0	0	0	0	0	
8:00 AM	0	28	0	0	0	24	1	0	0	0	0	0	0	2	0	0	0	0	0	0	
8:15 AM	0	40	0	0	0	27	0	0	0	0	0	1	0	1	0	0	0	0	0	0	
8:30 AM	0	44	0	0	1	48	0	1	0	0	0	1	0	0	0	0	0	0	0	0	
8:45 AM	0	42	1	0	0	39	0	0	0	0	0	2	0	1	0	0	0	0	0	0	
Total Survey	2	278	1	0	2	230	2	1	1	0	4	0	4	0	6	0	0	0	0	0	

**Peak Hour Summary  
8:00 AM to 9:00 AM**

By Approach	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	155	142	297	0	140	158	298	1	0	1	1	0	8	2	10	0	0	0	0	0	
%HV	7.7%				7.1%				0.0%				0.0%				7.3%				
PHF	0.79				0.71				0.00				0.67				0.81				

By Movement	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	154	1	155	1	138	1	140	0	0	0	0	4	0	4	8	303
%HV	0.0%	7.8%	0.0%	7.7%	0.0%	7.2%	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.67	7.3%
PHF	0.00	0.79	0.25	0.79	0.25	0.72	0.25	0.71	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.67	0.81

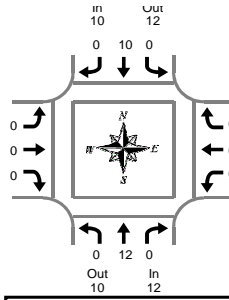
**Rolling Hour Summary  
7:00 AM to 9:00 AM**

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	2	124	0	0	1	92	1	0	1	0	0	0	0	0	2	0	0	0	0	0	
7:15 AM	1	121	0	0	0	94	1	0	0	0	4	0	0	0	4	0	0	0	0	0	
7:30 AM	1	126	0	0	0	99	1	0	0	0	1	0	1	0	5	0	0	0	0	0	
7:45 AM	0	133	0	0	1	132	1	1	0	0	1	0	2	0	4	0	0	0	0	0	
8:00 AM	0	154	1	0	1	138	1	1	0	0	0	0	4	0	4	0	0	0	0	0	

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



Out 0  
In 0

**Peak Hour Summary**  
8:00 AM to 9:00 AM

## SE Orient Dr & SE Crescent Rd

Tuesday, November 06, 2018  
7:00 AM to 9:00 AM

### Heavy Vehicle 5-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
7:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:35 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:40 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	2
7:50 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	2
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:20 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1
8:25 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	4	0	4	0	1	0	1	0	0	0	0	0	0	0	0	0	5
8:35 AM	0	1	0	1	0	4	0	4	0	0	0	0	0	0	0	0	0	5
8:40 AM	0	1	0	1	0	4	0	4	0	0	0	0	0	0	0	0	0	5
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:50 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	19	0	19	0	14	0	14	0	0	0	0	0	0	0	0	0	33

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
7:00 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	2
7:30 AM	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	0	1	0	1	0	3	0	3	0	0	0	0	0	0	0	0	0	4
8:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	3	0	3	0	1	0	1	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	6	0	6	0	9	0	9	0	0	0	0	0	0	0	0	0	15
8:45 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Survey	0	19	0	19	0	14	0	14	0	0	0	0	0	0	0	0	0	33

### Heavy Vehicle Peak Hour Summary 8:00 AM to 9:00 AM

By Approach	Northbound SE Orient Dr			Southbound SE Orient Dr			Eastbound SE Crescent Rd			Westbound SE Crescent Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	12	10	22	10	12	22	0	0	0	0	0	0	22
PHF	0.43			0.28			0.00			0.00			0.37

By Movement	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
Volume	0	12	0	12	0	10	0	10	0	0	0	0	0	0	0	0	0	22
PHF	0.00	0.43	0.00	0.43	0.00	0.28	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
7:00 AM	0	7	0	7	0	4	0	4	0	0	0	0	0	0	0	0	0	11
7:15 AM	0	6	0	6	0	4	0	4	0	0	0	0	0	0	0	0	0	10
7:30 AM	0	8	0	8	0	4	0	4	0	0	0	0	0	0	0	0	0	12
7:45 AM	0	11	0	11	0	13	0	13	0	0	0	0	0	0	0	0	0	24
8:00 AM	0	12	0	12	0	10	0	10	0	0	0	0	0	0	0	0	0	22

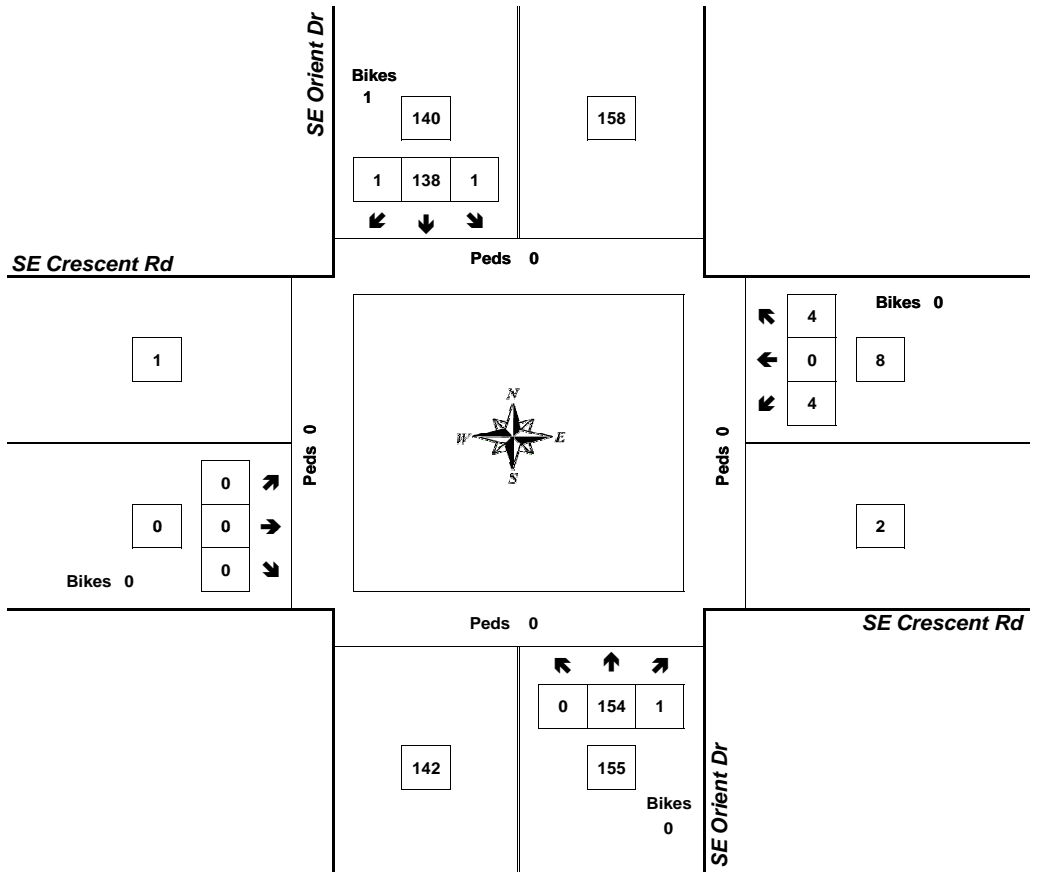
**Peak Hour Summary**



Clay Carney  
(503) 833-2740

**SE Orient Dr & SE Crescent Rd**

8:00 AM to 9:00 AM  
Tuesday, November 06, 2018



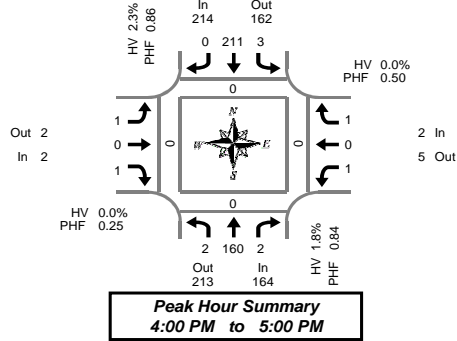
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.67	0.0%	8
NB	0.79	7.7%	155
SB	0.71	7.1%	140
<b>Intersection</b>	<b>0.81</b>	<b>7.3%</b>	<b>303</b>

Count Period: 7:00 AM to 9:00 AM

# Total Vehicle Summary



Clay Carney  
(603) 833-2740



## SE Orient Dr & SE Crescent Rd

Tuesday, November 06, 2018  
4:00 PM to 6:00 PM

### 5-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	9	1	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	2	15	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	6	1	0	0	16	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0
4:15 PM	0	12	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	9	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	17	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	12	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:35 PM	0	16	0	0	1	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	15	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	18	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	10	0	0	2	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	21	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	11	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:05 PM	0	11	2	0	0	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
5:10 PM	1	12	1	0	2	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	18	0	0	0	14	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:20 PM	0	10	1	0	0	12	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
5:25 PM	0	10	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	14	1	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	12	1	0	1	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	1	16	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	9	0	0	0	19	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5:50 PM	0	8	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	10	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	4	301	8	0	6	378	0	0	1	0	3	0	2	0	2	0	0	0	0	0	0

### 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	2	30	2	0	0	62	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0
4:15 PM	0	38	0	0	0	53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	43	0	0	1	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	49	0	0	2	51	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5:00 PM	1	34	3	0	2	35	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	38	1	0	0	42	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
5:30 PM	1	42	2	0	1	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	27	0	0	0	49	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Total Survey	4	301	8	0	6	378	0	0	1	0	3	0	2	0	2	0	0	0	0	0	0

### Peak Hour Summary 4:00 PM to 5:00 PM

By Approach	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	164	213	377	0	214	162	376	0	2	2	4	0	2	5	7	0	382	0	0	0	0
%HV	1.8%				2.3%				0.0%				0.0%				2.1%				
PHF	0.84				0.86				0.25				0.50				0.93				

By Movement	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	160	2	164	3	211	0	214	1	0	1	2	1	0	1	2	382
%HV	0.0%	1.9%	0.0%	1.8%	0.0%	2.4%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%
PHF	0.25	0.82	0.25	0.84	0.38	0.85	0.00	0.86	0.25	0.00	0.25	0.25	0.25	0.00	0.25	0.50	0.93

### Rolling Hour Summary 4:00 PM to 6:00 PM

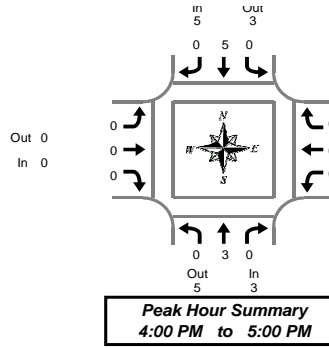
Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	2	160	2	0	3	211	0	0	1	0	1	0	1	0	1	0	382	0	0	0	0
4:15 PM	1	164	3	0	5	184	0	0	1	0	1	0	0	0	1	0	359	0	0	0	0
4:30 PM	1	164	4	0	5	173	0	0	0	0	2	0	1	0	1	0	351	0	0	0	0
4:45 PM	2	163	6	0	5	169	0	0	0	0	2	0	1	0	1	0	349	0	0	0	0
5:00 PM	2	141	6	0	3	167	0	0	0	0	2	0	1	0	1	0	323	0	0	0	0



# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## SE Orient Dr & SE Crescent Rd

Tuesday, November 06, 2018  
4:00 PM to 6:00 PM

**Peak Hour Summary**  
4:00 PM to 5:00 PM

### Heavy Vehicle 5-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:35 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:40 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	2	0	2	0	1	0	1	0	0	0	0	0	0	0	0	0	3
4:50 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:20 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	2
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	5	0	5	0	6	0	6	0	0	0	0	0	0	0	0	0	11

### Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
4:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	5	0	5	0	6	0	6	0	0	0	0	0	0	0	0	0	11

### Heavy Vehicle Peak Hour Summary 4:00 PM to 5:00 PM

By Approach	Northbound SE Orient Dr			Southbound SE Orient Dr			Eastbound SE Crescent Rd			Westbound SE Crescent Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	5	8	5	3	8	0	0	0	0	0	0	8
PHF	0.25			0.42			0.00			0.00			0.40

By Movement	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
Volume	0	3	0	3	0	5	0	5	0	0	0	0	0	0	0	0	0	8
PHF	0.00	0.25	0.00	0.25	0.00	0.42	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40

### Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Orient Dr				Southbound SE Orient Dr				Eastbound SE Crescent Rd				Westbound SE Crescent Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
4:00 PM	0	3	0	3	0	5	0	5	0	0	0	0	0	0	0	0	0	8
4:15 PM	0	3	0	3	0	4	0	4	0	0	0	0	0	0	0	0	0	7
4:30 PM	0	4	0	4	0	4	0	4	0	0	0	0	0	0	0	0	0	8
4:45 PM	0	4	0	4	0	3	0	3	0	0	0	0	0	0	0	0	0	7
5:00 PM	0	2	0	2	0	1	0	1	0	0	0	0	0	0	0	0	0	3

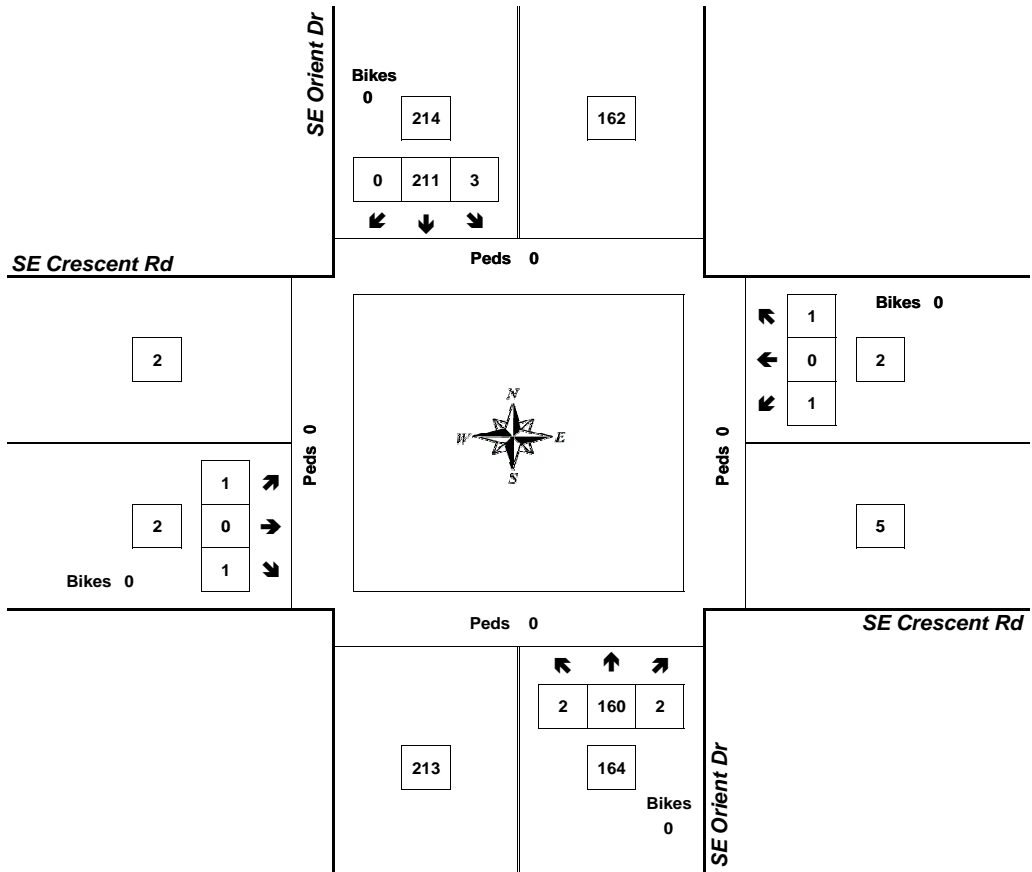
**Peak Hour Summary**



Clay Carney  
(503) 833-2740

**SE Orient Dr & SE Crescent Rd**

4:00 PM to 5:00 PM  
Tuesday, November 06, 2018



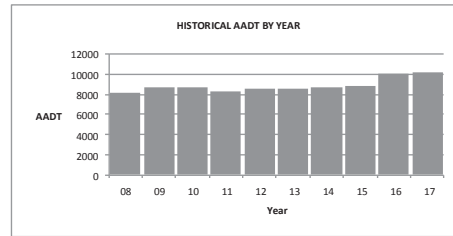
Approach	PHF	HV%	Volume
EB	0.25	0.0%	2
WB	0.50	0.0%	2
NB	0.84	1.8%	164
SB	0.86	2.3%	214
<b>Intersection</b>	<b>0.93</b>	<b>2.1%</b>	<b>382</b>

Count Period: 4:00 PM to 6:00 PM

<b>Location:</b>	US26; MP 46.38; MT. HOOD HIGHWAY NO. 26; 0.30 mile east of Camp Creek Rd	<b>Site Name:</b>	Rhododendron (03-006)
	(USFS 28)		<b>Installed:</b>

**HISTORICAL TRAFFIC DATA**

Year	AADT	Percent of AADT				
		Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2008	8162	233	22.9	20.1	19.1	18.2
2009	8737	197	22.3	19.6	18.4	17.8
2010	8714	207	21.6	19.8	18.9	18.5
2011	8330	214	24.7	20.0	18.6	18.1
2012	8480	227	24.0	21.0	20.2	19.4
2013	8527	213	23.4	21.1	20.3	19.1
2014	8652	216	23.2	21.1	20.3	19.2
2015	8861	242	21.4	20.3	19.4	18.7
2016	10071	208	22.9	19.6	18.8	17.9
2017	10223	200	19.9	19.1	18.1	17.5



**2017 TRAFFIC DATA**

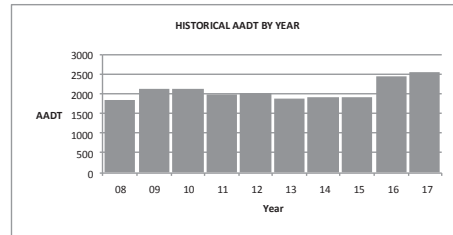
	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	6744	66	9080	89
February	6533	64	9496	93
March	6763	66	9337	91
April	6166	60	8675	85
May	7675	75	9598	94
June	8568	84	10695	105
July	11291	110	13874	136
August	11738	115	13623	133
September	11300	111	12734	125
October	6589	64	8087	79
November	5493	54	7313	72
December	8753	86	10161	99

For Vehicle Classification data near your project, please go to the following web page:  
[https://www.oregon.gov/ODOT/Data/Documents/TVT\\_2017.xlsx](https://www.oregon.gov/ODOT/Data/Documents/TVT_2017.xlsx)

<b>Location:</b>	OR35; MP 57.79; MT. HOOD HIGHWAY NO. 26; 0.02 mile east of Warm Springs Highway No. 53 (US26)	<b>Site Name:</b>	Mt. Hood Meadows (03-007)
			<b>Installed:</b>

**HISTORICAL TRAFFIC DATA**

Year	AADT	Percent of AADT				
		Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2008	1854	398	56.8	44.2	39.9	36.1
2009	2130	***	***	***	***	***
2010	2145	374	49.2	39.5	34.8	33.2
2011	1976	476	79.2	49.1	45.0	39.1
2012	2023	452	65.4	43.4	40.3	37.7
2013	1868	427	68.1	48.7	42.0	37.1
2014	1908	400	60.0	41.9	37.4	33.6
2015	1931	393	50.4	38.6	34.4	32.6
2016	2455	366	55.9	38.3	33.1	31.2
2017	2565	340	52.1	37.7	32.5	31.3



**2017 TRAFFIC DATA**

	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	2449	95	3616	141
February	1978	77	3362	131
March	1781	69	2833	110
April	1116	44	2050	80
May	1202	47	1609	63
June	1794	70	2070	81
July	2405	94	2837	111
August	2302	90	2614	102
September	3956	154	3993	156
October	1387	54	1614	63
November	768	30	1156	45
December	2499	97	2966	116

For Vehicle Classification data near your project, please go to the following web page:  
[https://www.oregon.gov/ODOT/Data/Documents/TVT\\_2017.xlsx](https://www.oregon.gov/ODOT/Data/Documents/TVT_2017.xlsx)

SEASONAL TREND TABLE (Updated: 8/1/2018)															
TREND	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec	Seasonal Trend Peak Period Factor
INTERSTATE URBANIZED	0.9240	0.9042	0.9115	0.9189	0.9374	0.9558	0.9568	0.9657	0.9535	0.9512	0.9825	0.9738	0.9924	1.0109	0.9042
INTERSTATE NONURBANIZED	0.9201	0.8735	0.8557	0.8379	0.8295	0.8211	0.8945	1.0880	1.0900	1.0120	1.0458	1.0796	1.1313	1.1830	0.8211
COMMUTER	0.9016	0.8910	0.9014	0.9119	0.9020	0.8921	0.9074	0.9228	0.9193	0.9158	0.9372	0.9588	0.9845	1.0104	0.8910
COASTAL DESTINATION	0.9791	0.9377	0.8842	0.8306	0.8299	0.8293	0.8275	0.9257	0.9610	1.0363	1.1041	1.1718	1.1809	1.1900	0.8293
COASTAL DESTINATION ROUTE	1.0080	0.9399	0.8492	0.7584	0.7570	0.7556	0.8301	0.9045	1.0155	1.1265	1.2128	1.2992	1.3215	1.3438	0.7556
AGRICULTURE	0.9827	0.8915	0.8529	0.8142	0.7179	0.6215	0.7163	0.8110	0.8614	0.9116	1.0105	1.1093	1.2415	1.3737	0.6215
RECREATIONAL SUMMER	0.9061	0.8230	0.7650	0.7071	0.7124	0.7177	0.9130	1.1082	1.4413	1.7744	1.6928	1.6112	1.6401	1.6690	0.7071
RECREATIONAL SUMMER WINTER	1.2325	1.0844	0.9631	0.8419	0.8674	0.8929	0.9274	0.9619	1.3267	1.6914	1.9522	2.2130	1.6835	1.1541	0.8419
RECREATIONAL WINTER	1.7518	1.4298	1.2481	1.0665	1.0903	1.1142	0.8813	0.6484	1.2488	1.8493	2.5945	3.3398	2.1613	0.9828	0.6484
SUMMER	0.9095	0.8774	0.8570	0.8366	0.8182	0.7997	0.8529	0.9060	0.9353	0.9645	1.0144	1.0643	1.1024	1.1406	0.7997
SUMMER < 2500	0.8570	0.8268	0.8134	0.7999	0.7782	0.7565	0.8144	0.8723	0.8868	0.9013	0.9618	1.0223	1.0984	1.1745	0.7565

\*Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.

\*Grey shading indicates months were seasonal factor is greater than 30%

**Commuter Adjustment: (per Seasonal Trend Table)**

1-Nov	15-Nov	Per Day	6-Nov	Adjustment
0.9372	0.9586	0.0076	0.9448	<b>1.06043</b>

**Measured (November) Highway Traffic Volumes**

Highway Traffic	Recreational	Commuter
1104 WB	216 WB	888 WB
1705 EB	334 EB	1371 EB
2809 Total	550 Total*	2259 Total

**Projected 30th-Highest Hour (August) Traffic Volumes**

Highway Traffic	Recreational	Commuter
1402 WB	461 WB	941 WB
2166 EB	713 EB	1453 EB
3568 Total	1174 Total*	2394 Total

\*Recreational traffic volumes from data for ATR station 03-006.

**1.270 Overall Seasonal Adjustment**

(Projected summer peak total volume divided by measured November total volume)

HCM 6th TWSC  
1: SE Orient Drive & SE Crescent Road























12/02/2018

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	0	0	1	4	0	4	0	154	1	1	138	1
Future Vol, veh/h	0	0	1	4	0	4	0	154	1	1	138	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	7	7	7
Mvmt Flow	0	0	1	5	0	5	0	190	1	1	170	1
Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	366	364	171	364	364	191	171	0	0	191	0	0
Stage 1	173	173	-	191	191	-	-	-	-	-	-	-
Stage 2	193	191	-	173	173	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	590	564	873	592	564	851	1376	-	-	1353	-	-
Stage 1	829	756	-	811	742	-	-	-	-	-	-	-
Stage 2	809	742	-	829	756	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	586	563	873	591	563	851	1376	-	-	1353	-	-
Mov Cap-2 Maneuver	586	563	-	591	563	-	-	-	-	-	-	-
Stage 1	829	755	-	811	742	-	-	-	-	-	-	-
Stage 2	804	742	-	827	755	-	-	-	-	-	-	-
Approach	EB		WB		NB			SB				
HCM Control Delay, s	9.1		10.2		0			0.1				
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1376	-	-	873	698	1353	-	-				
HCM Lane V/C Ratio	-	-	-	0.001	0.014	0.001	-	-				
HCM Control Delay (s)	0	-	-	9.1	10.2	7.7	0	-				
HCM Lane LOS	A	-	-	A	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-				



HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

12/02/2018

													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations		 			 								
Traffic Volume (vph)	8	1070	2	3	1751	116	2	0	6	82	1	12	
Future Volume (vph)	8	1070	2	3	1751	116	2	0	6	82	1	12	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00		
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85		0.90			0.98		
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.96		
Satd. Flow (prot)	1511	3023	1352	1583	3167	1417		1239			1571		
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.96		
Satd. Flow (perm)	1511	3023	1352	1583	3167	1417		1239			1571		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	9	1176	2	3	1924	127	2	0	7	90	1	13	
RTOR Reduction (vph)	0	0	1	0	0	38	0	9	0	0	4	0	
Lane Group Flow (vph)	9	1176	1	3	1924	89	0	0	0	0	100	0	
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases			6			2							
Actuated Green, G (s)	0.9	78.7	78.7	0.9	78.7	78.7		1.0			11.9		
Effective Green, g (s)	0.9	78.7	78.7	0.9	78.7	78.7		1.0			11.9		
Actuated g/C Ratio	0.01	0.70	0.70	0.01	0.70	0.70		0.01			0.11		
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0		
Lane Grp Cap (vph)	12	2124	950	12	2225	995		11			166		
v/s Ratio Prot	c0.01	0.39		0.00	c0.61			c0.00			c0.06		
v/s Ratio Perm			0.00			0.06							
v/c Ratio	0.75	0.55	0.00	0.25	0.86	0.09		0.01			0.60		
Uniform Delay, d1	55.4	8.1	5.0	55.2	12.6	5.3		55.0			47.8		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00		
Incremental Delay, d2	128.3	0.3	0.0	10.7	3.8	0.0		0.3			5.7		
Delay (s)	183.7	8.4	5.0	65.9	16.4	5.3		55.3			53.5		
Level of Service	F	A	A	E	B	A		E			D		
Approach Delay (s)		9.7			15.8			55.3			53.5		
Approach LOS		A			B			E			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			14.9									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.82										
Actuated Cycle Length (s)			112.0									Sum of lost time (s)	19.5
Intersection Capacity Utilization			73.8%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													






















HCM 6th TWSC  
1: SE Orient Drive & SE Crescent Road

12/02/2018

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	1	0	1	1	0	1	2	160	2	3	211	0
Future Vol, veh/h	1	0	1	1	0	1	2	160	2	3	211	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	1	0	1	2	172	2	3	227	0
Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	411	411	227	411	410	173	227	0	0	174	0	0
Stage 1	233	233	-	177	177	-	-	-	-	-	-	-
Stage 2	178	178	-	234	233	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	551	531	812	551	531	871	1341	-	-	1403	-	-
Stage 1	770	712	-	825	753	-	-	-	-	-	-	-
Stage 2	824	752	-	769	712	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	549	529	812	549	529	871	1341	-	-	1403	-	-
Mov Cap-2 Maneuver	549	529	-	549	529	-	-	-	-	-	-	-
Stage 1	768	711	-	823	751	-	-	-	-	-	-	-
Stage 2	821	750	-	766	711	-	-	-	-	-	-	-
Approach	EB		WB		NB			SB				
HCM Control Delay, s	10.5		10.4		0.1			0.1				
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1341	-	-	655	673	1403	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.003	0.003	0.002	-	-				
HCM Control Delay (s)	7.7	0	-	10.5	10.4	7.6	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-				

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

12/02/2018

														
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR		
Lane Configurations														
Traffic Volume (vph)	12	1853	4	5	1355	163	4	1	3	171	1	6		
Future Volume (vph)	12	1853	4	5	1355	163	4	1	3	171	1	6		
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750		
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00			
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85		0.95			1.00			
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.95			
Satd. Flow (prot)	1630	3260	1458	1599	3197	1430		1589			1629			
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.95			
Satd. Flow (perm)	1630	3260	1458	1599	3197	1430		1589			1629			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	13	2014	4	5	1473	177	4	1	3	186	1	7		
RTOR Reduction (vph)	0	0	1	0	0	59	0	3	0	0	1	0		
Lane Group Flow (vph)	13	2014	3	5	1473	118	0	5	0	0	193	0		
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA			
Protected Phases	1	6		5	2		4	4		8	8			
Permitted Phases			6			2								
Actuated Green, G (s)	0.9	75.9	75.9	0.9	75.9	75.9		1.0			16.5			
Effective Green, g (s)	0.9	75.9	75.9	0.9	75.9	75.9		1.0			16.5			
Actuated g/C Ratio	0.01	0.67	0.67	0.01	0.67	0.67		0.01			0.14			
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0			
Lane Grp Cap (vph)	12	2174	972	12	2132	953		13			236			
v/s Ratio Prot	c0.01	c0.62		0.00	0.46			c0.00			c0.12			
v/s Ratio Perm			0.00			0.08								
v/c Ratio	1.08	0.93	0.00	0.42	0.69	0.12		0.39			0.82			
Uniform Delay, d1	56.4	16.5	6.3	56.2	11.7	6.9		56.1			47.2			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00			
Incremental Delay, d2	289.8	7.4	0.0	21.8	1.0	0.1		18.0			19.3			
Delay (s)	346.3	23.9	6.3	78.0	12.7	6.9		74.1			66.5			
Level of Service	F	C	A	E	B	A		E			E			
Approach Delay (s)		26.0			12.3			74.1			66.5			
Approach LOS		C			B			E			E			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			22.3									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.90											
Actuated Cycle Length (s)			113.8								19.5			
Intersection Capacity Utilization			81.8%										ICU Level of Service	D
Analysis Period (min)			15											
c	Critical Lane Group													

# Trip Generation Calculation Worksheet



Land Use Description: Gasoline/Service Station w/ Conv. Market  
 ITE Land Use Code: 945  
 Independent Variable: Vehicle Fueling Positions  
 Quantity: 16 Fueling Positions

## Summary of ITE Trip Generation Data

### **AM Peak Hour of Adjacent Street Traffic**

Trip Rate: 12.47 trips per ksf  
 Directional Distribution: 51% Entering 49% Exiting

### **PM Peak Hour of Adjacent Street Traffic**

Trip Rate: 13.99 trips per ksf  
 Directional Distribution: 51% Entering 49% Exiting

### **Total Weekday Traffic**

Trip Rate: 205.36 trips per ksf  
 Directional Distribution: 50% Entering 50% Exiting

## Site Trip Generation Calculations

16 Fueling Positions

	Entering	Exiting	Total
AM Peak Hour	102	98	200
PM Peak Hour	114	110	224
Weekday	1643	1643	3286

Data Source: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers, 2017

# Trip Generation Calculation Worksheet



Land Use Description: Fast-Food Restaurant with Drive-Through  
 ITE Land Use Code: 934  
 Independent Variable: Gross Floor Area  
 Quantity: 3.750 Thousand Square Feet

## Summary of ITE Trip Generation Data

### **AM Peak Hour of Adjacent Street Traffic**

Trip Rate: 40.19 trips per ksf  
 Directional Distribution: 51% Entering 49% Exiting

### **PM Peak Hour of Adjacent Street Traffic**

Trip Rate: 32.67 trips per ksf  
 Directional Distribution: 52% Entering 48% Exiting

### **Total Weekday Traffic**

Trip Rate: 470.95 trips per ksf  
 Directional Distribution: 50% Entering 50% Exiting

## Site Trip Generation Calculations

3.8 ksf Fast-Food Restaurant w/ Drive Thru

	Entering	Exiting	Total
AM Peak Hour	77	74	151
PM Peak Hour	64	59	123
Weekday	883	883	1766

Data Source: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers, 2017



# Trip Generation Calculation Worksheet



Land Use Description: Drive-In Bank  
 ITE Land Use Code: 912  
 Independent Variable: Gross Floor Area  
 Quantity: 5.00      Thousand Square Feet

## Summary of ITE Trip Generation Data

### **AM Peak Hour of Adjacent Street Traffic**

Trip Rate:                    9.50 trips per ksf  
 Directional Distribution:        58% Entering                    42% Exiting

### **PM Peak Hour of Adjacent Street Traffic**

Trip Rate:                    20.45 trips per ksf  
 Directional Distribution:        50% Entering                    50% Exiting

### **Total Weekday Traffic**

Trip Rate:                    100.03 trips per ksf  
 Directional Distribution:        50% Entering                    50% Exiting

## Site Trip Generation Calculations

5.00 ksf Drive-In Bank

	Entering	Exiting	Total
AM Peak Hour	28	20	48
PM Peak Hour	51	51	102
Weekday	250	250	500

Data Source: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers, 2017

HWY	MP	DIR	HS	Location	2014	2015	2016	2036	RSQ
026	0.85	1		On the east side of Ross Island Bridge, 0.77 mile east of Pacific Highway West (OR99W) Overcrossing		62900		69400	MODEL
026	1.08	1		0.07 mile east of Pacific Highway East Overcrossing (OR99E)		54900		59300	MODEL
026	1.17	1		0.02 mile east of S.E. 8th Avenue		43200		46200	MODEL
026	1.36	1		0.04 mile east of S.E. Milwaukie Avenue		40200		43100	MODEL
026	1.79	1		0.02 mile west of S.E. 21st Avenue		33200		34800	MODEL
026	1.83	1		0.02 mile east of S.E. 21st Avenue		34300		36000	MODEL
026	2.09	1		0.02 mile east of S.E. 26th Avenue		31200		32500	MODEL
026	2.89	1		0.02 mile west of S.E. Cesar E Chavez Boulevard		32500		33900	MODEL
026	2.93	1		0.02 mile east of S.E. Cesar E Chavez Boulevard		32400		32900	MODEL
026	3.23	1		0.02 mile east of S.E. 45th Avenue		37200		37800	MODEL
026	3.41	1		0.05 mile west of S.E. Foster Road		42400		43100	MODEL
026	3.55	1		0.02 mile west of S.E. 52nd Avenue		21900		26600	MODEL
026	3.59	1		0.02 mile east of S.E. 52nd Avenue		25900		29200	MODEL
026	4.06	1		0.02 mile east of S.E. 62nd Avenue		26000		28700	MODEL
026	4.56	1		0.02 mile east of S.E. 72nd Avenue		26400		30900	MODEL
026	5.02	1		0.02 mile west of Cascade Highway North (OR213)		26600		31500	MODEL
026	5.16	1		0.05 mile west of S.E. 84th Avenue		25900		28300	MODEL
026	5.67	1		0.07 mile west of East Portland Freeway (I-205)		35500		38700	MODEL
026	5.82	1		0.08 mile east of East Portland Freeway (I-205)		19900		20700	MODEL
026	6.69	1		0.02 mile west of S.E. 112th Avenue		18000		19300	MODEL
026	6.73	1		0.02 mile east of S.E. 112th Avenue		18100		19500	MODEL
026	7.19	1		0.02 mile west of S.E. 122nd Avenue		18100		19300	MODEL
026	7.23	1		0.02 mile east of S.E. 122nd Avenue		19500		21400	MODEL
026	7.92	1		0.02 mile east of S.E. 136th Avenue		19100		23000	MODEL
026	8.34	1		0.02 mile west of S.E. 144th Avenue		18700		22500	MODEL
026	8.42	1		0.02 mile east of S.E. 145th Avenue		18000		21700	MODEL
026	9.37	1		0.02 mile east of S.E. 164th Avenue		17800		22400	MODEL
026	9.96	1		Avenue		22400		23200	MODEL
026	14.36	1		Gresham Automatic Traffic Recorder, Sta. 26-003, 0.18 mile southeast of SE Powell Valley Road		32100		41200	MODEL
026	14.80	1		0.05 mile south of S.E. Palmquist Road		26300		33300	MODEL
026	18.30	1		0.05 mile northwest of S.E. Haley Road		23100		33400	MODEL
026	19.24	1		0.30 mile northwest of Clackamas-Boring Highway (OR212)		22900		33100	MODEL
026	20.60	1		0.50 mile northwest of S.E. Kelso Road		29000		41500	MODEL
026	21.40	1		0.30 mile southeast of S.E. Kelso Road		32600		45700	MODEL
026	22.72	1		0.02 mile northwest of S.E. 362nd Drive, west city limits of Sandy		29500		41400	MODEL
026	23.85	1		0.02 mile west of Bluff Road		30100		42600	MODEL
026	23.89	1		0.02 mile east of Bluff Road		15100		21600	MODEL
026	24.02	1		0.02 mile west of Beers Avenue		15100		21600	MODEL
026	24.35	1		0.05 mile west of Eagle Creek-Sandy Highway (OR211)		14800		21600	MODEL
026	24.42	1		0.02 mile east of Eagle Creek-Sandy Highway (OR211)		12000		17100	MODEL
026	24.59	1		0.02 mile west of Ten Eyck Road		11200		16000	MODEL
026	23.89	2	W	0.02 mile east of Bluff Road		15200		21300	MODEL
026	24.04	2	W	0.02 mile west of Beers Avenue		15200		21300	MODEL
026	24.36	2	W	0.05 mile west of Eagle Creek-Sandy Highway (OR211)		14500		20700	MODEL
026	24.40	2	W	0.02 mile east of Eagle Creek-Sandy Highway (OR211)		12100		16900	MODEL
026	24.61	2	W	0.02 mile west of Ten Eyck Road		11700		16400	MODEL
026	25.10	1		0.02 mile west of Langensand Road		18000		25400	MODEL
026	25.66	1		0.10 mile east of Vista Loop Drive		19700		27600	MODEL
026	26.76	1		0.10 mile west of S.E. Firwood Road		23500		32900	MODEL
026	26.93	1		0.07 mile east of S.E. Firwood Road		19000		26900	MODEL
026	29.66	1		0.23 mile west of Wagoner Loop Drive (East Jct.)		17000		24100	MODEL
026	34.87	1		0.10 mile west of E. Sleepy Hollow Drive		19100		27300	MODEL
026	35.07	1		0.10 mile east of E. Sleepy Hollow Drive		15000		21500	MODEL
026	38.54	1		0.10 mile west of E. Brightwood Loop Road (East Jct.)		15000		19600	0.6283
026	41.19	1		0.02 mile west of Vine Maple Drive		11400		13700	0.0911
026	46.38	1		Rhododendron Automatic Traffic Recorder, Sta. 03-006, 0.30 mile east of Camp Creek Road (USFS 28)		8900		10200	0.3399
026	52.78	1		0.10 mile west of road to Government Camp (West jct.)		9000		14100	0.8127
026	54.13	1		0.10 mile west of Timberline Highway		8600		11300	0.7827
026	56.00	1		0.50 mile west of Warm Springs Highway (US26)		7000		11300	0.6508
026	57.79	1		Mt. Hood Meadows Automatic Traffic Recorder, Sta. 03-007, 0.02 mile east of Warm Springs Highway No. 53 (US26)		1900		2500	0.3363
026	70.64	1		0.10 mile south of Lookout Mountain Loop Road		1000		1400	0.0382

HCM 6th TWSC  
1: SE Orient Drive & SE Crescent Road

12/02/2018

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	1	4	0	4	0	160	1	1	144	1
Future Vol, veh/h	0	0	1	4	0	4	0	160	1	1	144	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	7	7	7
Mvmt Flow	0	0	1	5	0	5	0	198	1	1	178	1























Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	382	380	179	380	380	199	179	0	0	199	0	0
Stage 1	181	181	-	199	199	-	-	-	-	-	-	-
Stage 2	201	199	-	181	181	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	576	552	864	578	552	842	1367	-	-	1344	-	-
Stage 1	821	750	-	803	736	-	-	-	-	-	-	-
Stage 2	801	736	-	821	750	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	572	551	864	577	551	842	1367	-	-	1344	-	-
Mov Cap-2 Maneuver	572	551	-	577	551	-	-	-	-	-	-	-
Stage 1	821	749	-	803	736	-	-	-	-	-	-	-
Stage 2	796	736	-	819	749	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	10.3	0	0.1
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1367	-	-	864	685	1344	-	-
HCM Lane V/C Ratio	-	-	-	0.001	0.014	0.001	-	-
HCM Control Delay (s)	0	-	-	9.2	10.3	7.7	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

12/02/2018

													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations		 			 								
Traffic Volume (vph)	8	1111	2	3	1818	121	2	0	6	85	1	12	
Future Volume (vph)	8	1111	2	3	1818	121	2	0	6	85	1	12	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00		
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85		0.90			0.98		
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.96		
Satd. Flow (prot)	1511	3023	1352	1583	3167	1417		1239			1571		
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.96		
Satd. Flow (perm)	1511	3023	1352	1583	3167	1417		1239			1571		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	9	1221	2	3	1998	133	2	0	7	93	1	13	
RTOR Reduction (vph)	0	0	1	0	0	38	0	9	0	0	4	0	
Lane Group Flow (vph)	9	1221	1	3	1998	95	0	0	0	0	103	0	
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases			6			2							
Actuated Green, G (s)	0.9	82.1	82.1	0.9	82.1	82.1		0.6			12.2		
Effective Green, g (s)	0.9	82.1	82.1	0.9	82.1	82.1		0.6			12.2		
Actuated g/C Ratio	0.01	0.71	0.71	0.01	0.71	0.71		0.01			0.11		
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0		
Lane Grp Cap (vph)	11	2152	962	12	2255	1008		6			166		
v/s Ratio Prot	c0.01	0.40		0.00	c0.63			c0.00			c0.07		
v/s Ratio Perm			0.00			0.07							
v/c Ratio	0.82	0.57	0.00	0.25	0.89	0.09		0.01			0.62		
Uniform Delay, d1	57.1	8.0	4.8	56.9	13.0	5.1		57.1			49.3		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00		
Incremental Delay, d2	167.9	0.3	0.0	10.7	4.6	0.0		0.5			6.7		
Delay (s)	225.0	8.4	4.8	67.5	17.6	5.2		57.6			56.0		
Level of Service	F	A	A	E	B	A		E			E		
Approach Delay (s)		9.9			16.8			57.6			56.0		
Approach LOS		A			B			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			15.7									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.85										
Actuated Cycle Length (s)			115.3									Sum of lost time (s)	19.5
Intersection Capacity Utilization			75.9%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM 6th TWSC  
1: SE Orient Drive & SE Crescent Road

12/02/2018

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	1	1	0	1	2	166	2	3	220	0
Future Vol, veh/h	1	0	1	1	0	1	2	166	2	3	220	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	1	0	1	2	178	2	3	237	0

Major/Minor	Minor2	Minor1		Major1		Major2						
Conflicting Flow All	427	427	237	427	426	179	237	0	0	180	0	0
Stage 1	243	243	-	183	183	-	-	-	-	-	-	-
Stage 2	184	184	-	244	243	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	538	520	802	538	520	864	1330	-	-	1396	-	-
Stage 1	761	705	-	819	748	-	-	-	-	-	-	-
Stage 2	818	747	-	760	705	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	536	518	802	536	518	864	1330	-	-	1396	-	-
Mov Cap-2 Maneuver	536	518	-	536	518	-	-	-	-	-	-	-
Stage 1	759	704	-	817	747	-	-	-	-	-	-	-
Stage 2	815	746	-	757	704	-	-	-	-	-	-	-






















Approach	EB	WB	NB	SB
HCM Control Delay, s	10.6	10.5	0.1	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1330	-	-	643	662	1396	-	-
HCM Lane V/C Ratio	0.002	-	-	0.003	0.003	0.002	-	-
HCM Control Delay (s)	7.7	0	-	10.6	10.5	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-



HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

12/02/2018

														
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR		
Lane Configurations														
Traffic Volume (vph)	12	1924	4	5	1407	170	4	1	3	178	1	6		
Future Volume (vph)	12	1924	4	5	1407	170	4	1	3	178	1	6		
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750		
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00			
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85		0.95			1.00			
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.95			
Satd. Flow (prot)	1630	3260	1458	1599	3197	1430		1589			1629			
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.95			
Satd. Flow (perm)	1630	3260	1458	1599	3197	1430		1589			1629			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	13	2091	4	5	1529	185	4	1	3	193	1	7		
RTOR Reduction (vph)	0	0	1	0	0	61	0	3	0	0	1	0		
Lane Group Flow (vph)	13	2091	3	5	1529	124	0	5	0	0	200	0		
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA			
Protected Phases	1	6		5	2		4	4		8	8			
Permitted Phases			6			2								
Actuated Green, G (s)	0.9	77.5	77.5	0.9	77.5	77.5		0.6			16.9			
Effective Green, g (s)	0.9	77.5	77.5	0.9	77.5	77.5		0.6			16.9			
Actuated g/C Ratio	0.01	0.67	0.67	0.01	0.67	0.67		0.01			0.15			
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0			
Lane Grp Cap (vph)	12	2189	979	12	2147	960		8			238			
v/s Ratio Prot	c0.01	c0.64		0.00	0.48			c0.00			c0.12			
v/s Ratio Perm			0.00			0.09								
v/c Ratio	1.08	0.96	0.00	0.42	0.71	0.13		0.63			0.84			
Uniform Delay, d1	57.2	17.4	6.2	57.0	11.9	6.8		57.3			47.9			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00			
Incremental Delay, d2	289.8	10.6	0.0	21.8	1.1	0.1		98.3			22.6			
Delay (s)	347.1	27.9	6.2	78.8	13.1	6.9		155.6			70.6			
Level of Service	F	C	A	E	B	A		F			E			
Approach Delay (s)		29.9			12.6			155.6			70.6			
Approach LOS		C			B			F			E			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			24.8									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.93											
Actuated Cycle Length (s)			115.4								19.5		Sum of lost time (s)	
Intersection Capacity Utilization			84.3%										ICU Level of Service	E
Analysis Period (min)			15											
c Critical Lane Group														

HCM 6th TWSC  
1: SE Orient Drive & SE Crescent Road

03/26/2019

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	13	0	3	4	0	4	88	154	1	1	147	6
Future Vol, veh/h	13	0	3	4	0	4	88	154	1	1	147	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	7	7	7
Mvmt Flow	16	0	4	5	0	5	109	190	1	1	181	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	598	596	185	598	599	191	188	0	0	191	0	0
Stage 1	187	187	-	409	409	-	-	-	-	-	-	-
Stage 2	411	409	-	189	190	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	414	417	857	414	415	851	1357	-	-	1353	-	-
Stage 1	815	745	-	619	596	-	-	-	-	-	-	-
Stage 2	618	596	-	813	743	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	383	379	857	383	377	851	1357	-	-	1353	-	-
Mov Cap-2 Maneuver	383	379	-	383	377	-	-	-	-	-	-	-
Stage 1	742	744	-	563	542	-	-	-	-	-	-	-
Stage 2	559	542	-	809	742	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	11.9	2.9	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1357	-	-	427	528	1353	-	-
HCM Lane V/C Ratio	0.08	-	-	0.046	0.019	0.001	-	-
HCM Control Delay (s)	7.9	0	-	13.8	11.9	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	0.1	0	-	-

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

03/26/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	37	1096	2	3	1783	174	2	0	6	116	1	60	
Future Volume (vph)	37	1096	2	3	1783	174	2	0	6	116	1	60	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00		
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85		0.90			0.95		
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.97		
Satd. Flow (prot)	1511	3023	1352	1583	3167	1417		1239			1540		
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.97		
Satd. Flow (perm)	1511	3023	1352	1583	3167	1417		1239			1540		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	41	1204	2	3	1959	191	2	0	7	127	1	66	
RTOR Reduction (vph)	0	0	1	0	0	65	0	9	0	0	16	0	
Lane Group Flow (vph)	41	1204	1	3	1959	126	0	0	0	0	178	0	
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases			6			2							
Actuated Green, G (s)	3.9	81.7	81.7	0.9	78.7	78.7		0.7			16.3		
Effective Green, g (s)	3.9	81.7	81.7	0.9	78.7	78.7		0.7			16.3		
Actuated g/C Ratio	0.03	0.69	0.69	0.01	0.66	0.66		0.01			0.14		
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0		
Lane Grp Cap (vph)	49	2073	927	11	2092	936		7			210		
v/s Ratio Prot	c0.03	c0.40		0.00	c0.62			c0.00			c0.12		
v/s Ratio Perm			0.00			0.09							
v/c Ratio	0.84	0.58	0.00	0.27	0.94	0.13		0.01			0.85		
Uniform Delay, d1	57.3	9.8	5.9	58.8	18.0	7.5		58.9			50.2		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00		
Incremental Delay, d2	70.1	0.4	0.0	13.0	8.6	0.1		0.4			26.0		
Delay (s)	127.4	10.2	5.9	71.8	26.6	7.6		59.3			76.3		
Level of Service	F	B	A	E	C	A		E			E		
Approach Delay (s)		14.0			25.0			59.3			76.3		
Approach LOS		B			C			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			24.0									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.91										
Actuated Cycle Length (s)			119.1									Sum of lost time (s)	19.5
Intersection Capacity Utilization			79.9%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM 6th TWSC  
3: Site Access & SE Crescent Road

03/26/2019

Intersection						
Int Delay, s/veh	7.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	0	0	93	1	0	16
Future Vol, veh/h	0	0	93	1	0	16
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	101	1	0	17
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1	0	204	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	203	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	784	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	831	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1622	-	735	1084
Mov Cap-2 Maneuver	-	-	-	-	735	-
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	831	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	7.3	8.4			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1084	-	-	1622	-	
HCM Lane V/C Ratio	0.016	-	-	0.062	-	
HCM Control Delay (s)	8.4	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0.2	-	

HCM 6th TWSC  
4: SE Orient Drive & Site Access

03/26/2019

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑		↑	↑	
Traffic Vol, veh/h	0	82	0	243	145	9
Future Vol, veh/h	0	82	0	243	145	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	0	89	0	264	158	10
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	163	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	882	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	882	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.5	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 882		-	-		
HCM Lane V/C Ratio	- 0.101		-	-		
HCM Control Delay (s)	- 9.5		-	-		
HCM Lane LOS	- A		-	-		
HCM 95th %tile Q(veh)	- 0.3		-	-		



HCM 6th TWSC  
1: SE Orient Drive & SE Crescent Road

03/26/2019

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕		↕			↕			↕			
Traffic Vol, veh/h	15	0	5	1	0	1	99	161	2	3	225	5
Future Vol, veh/h	15	0	5	1	0	1	99	161	2	3	225	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	0	5	1	0	1	106	173	2	3	242	5
Major/Minor	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	638	638	245	639	639	174	247	0	0	175	0	0
Stage 1	251	251	-	386	386	-	-	-	-	-	-	-
Stage 2	387	387	-	253	253	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	389	394	794	389	394	869	1319	-	-	1401	-	-
Stage 1	753	699	-	637	610	-	-	-	-	-	-	-
Stage 2	637	610	-	751	698	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	361	358	794	359	358	869	1319	-	-	1401	-	-
Mov Cap-2 Maneuver	361	358	-	359	358	-	-	-	-	-	-	-
Stage 1	686	698	-	580	556	-	-	-	-	-	-	-
Stage 2	580	556	-	744	697	-	-	-	-	-	-	-
Approach	EB	WB			NB			SB				
HCM Control Delay, s	14.1	12.1			3			0.1				
HCM LOS	B	B										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1319	-	-	418	508	1401	-	-				
HCM Lane V/C Ratio	0.081	-	-	0.051	0.004	0.002	-	-				
HCM Control Delay (s)	8	0	-	14.1	12.1	7.6	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.3	-	-	0.2	0	0	-	-				

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

03/26/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖	↗	↘	↙	↕	↖	↗	↘	↙	↕	↖	↗
Traffic Volume (vph)	53	1901	4	5	1379	221	4	1	3	222	1	51
Future Volume (vph)	53	1901	4	5	1379	221	4	1	3	222	1	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.98	0.98	0.98	0.98	0.96	0.96
Satd. Flow (prot)	1630	3260	1458	1599	3197	1430	1589	1589	1589	1589	1608	1608
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.98	0.98	0.98	0.98	0.96	0.96
Satd. Flow (perm)	1630	3260	1458	1599	3197	1430	1589	1589	1589	1589	1608	1608
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	2066	4	5	1499	240	4	1	3	241	1	55
RTOR Reduction (vph)	0	0	1	0	0	97	0	3	0	0	7	0
Lane Group Flow (vph)	58	2066	3	5	1499	143	0	5	0	0	290	0
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Split	NA	Split	NA
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases			6			2						
Actuated Green, G (s)	5.7	72.7	72.7	0.9	67.9	67.9	0.6	0.6	0.6	0.6	20.6	20.6
Effective Green, g (s)	5.7	72.7	72.7	0.9	67.9	67.9	0.6	0.6	0.6	0.6	20.6	20.6
Actuated g/C Ratio	0.05	0.64	0.64	0.01	0.59	0.59	0.01	0.01	0.01	0.01	0.18	0.18
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	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	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	81	2073	927	12	1899	849	8	8	8	8	289	289
v/s Ratio Prot	c0.04	c0.63		0.00	0.47		c0.00	c0.00	c0.00	c0.00	c0.18	c0.18
v/s Ratio Perm			0.00			0.10						
v/c Ratio	0.72	1.00	0.00	0.42	0.79	0.17	0.63	0.63	0.63	0.63	1.00	1.00
Uniform Delay, d1	53.5	20.7	7.6	56.4	17.7	10.5	56.7	56.7	56.7	56.7	46.8	46.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.8	18.8	0.0	21.8	2.3	0.1	98.3	98.3	98.3	98.3	54.2	54.2
Delay (s)	79.3	39.5	7.6	78.2	20.0	10.6	155.0	155.0	155.0	155.0	101.1	101.1
Level of Service	E	D	A	E	B	B	F	F	F	F	F	F
Approach Delay (s)		40.5			18.9		155.0	155.0	155.0	155.0	101.1	101.1
Approach LOS		D			B		F	F	F	F	F	F
<b>Intersection Summary</b>												
HCM 2000 Control Delay			36.0				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			114.3				Sum of lost time (s)			19.5		
Intersection Capacity Utilization			89.3%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC  
3: Site Access & SE Crescent Road

03/26/2019

Intersection						
Int Delay, s/veh	7.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Vol, veh/h	2	0	102	2	0	18
Future Vol, veh/h	2	0	102	2	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	0	111	2	0	20
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	2	0	226	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	224	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1620	-	762	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	813	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1620	-	709	1082
Mov Cap-2 Maneuver	-	-	-	-	709	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	813	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	7.2	8.4			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1082	-	-	1620	-	
HCM Lane V/C Ratio	0.018	-	-	0.068	-	
HCM Control Delay (s)	8.4	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-	


























HCM 6th TWSC  
4: SE Orient Drive & Site Access

03/26/2019

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑		↑	↑	
Traffic Vol, veh/h	0	92	0	262	219	12
Future Vol, veh/h	0	92	0	262	219	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	100	0	285	238	13
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	245	-	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.22	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.318	-	-	-	
Pot Cap-1 Maneuver	0	794	0	-	-	
Stage 1	0	-	0	-	-	
Stage 2	0	-	0	-	-	
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	794	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	10.2	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	794	-	-		
HCM Lane V/C Ratio	-	0.126	-	-		
HCM Control Delay (s)	-	10.2	-	-		
HCM Lane LOS	-	B	-	-		
HCM 95th %tile Q(veh)	-	0.4	-	-		

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26























03/26/2019

													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations		 			 			 			 		
Traffic Volume (vph)	37	1096	2	3	1783	174	2	0	6	116	1	60	
Future Volume (vph)	37	1096	2	3	1783	174	2	0	6	116	1	60	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5		4.5	4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		0.95	0.95		
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85		0.90		1.00	0.89		
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.99		
Satd. Flow (prot)	1511	3023	1352	1583	3167	1417		1239		1504	1397		
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.99		
Satd. Flow (perm)	1511	3023	1352	1583	3167	1417		1239		1504	1397		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	41	1204	2	3	1959	191	2	0	7	127	1	66	
RTOR Reduction (vph)	0	0	1	0	0	61	0	9	0	0	59	0	
Lane Group Flow (vph)	41	1204	1	3	1959	130	0	0	0	100	35	0	
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases			6			2							
Actuated Green, G (s)	3.9	81.1	81.1	0.9	78.1	78.1		0.6		12.3	12.3		
Effective Green, g (s)	3.9	81.1	81.1	0.9	78.1	78.1		0.6		12.3	12.3		
Actuated g/C Ratio	0.03	0.71	0.71	0.01	0.68	0.68		0.01		0.11	0.11		
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5		4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0		
Lane Grp Cap (vph)	51	2143	958	12	2162	967		6		161	150		
v/s Ratio Prot	c0.03	c0.40		0.00	c0.62			c0.00		c0.07	0.03		
v/s Ratio Perm			0.00			0.09							
v/c Ratio	0.80	0.56	0.00	0.25	0.91	0.13		0.01		0.62	0.23		
Uniform Delay, d1	54.9	8.1	4.9	56.4	15.1	6.3		56.6		48.8	46.7		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	59.0	0.3	0.0	10.7	5.9	0.1		0.5		7.2	0.8		
Delay (s)	113.8	8.4	4.9	67.1	21.0	6.4		57.1		56.1	47.5		
Level of Service	F	A	A	E	C	A		E		E	D		
Approach Delay (s)		11.9			19.8			57.1			51.9		
Approach LOS		B			B			E			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			18.9									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.85										
Actuated Cycle Length (s)			114.4									Sum of lost time (s)	19.5
Intersection Capacity Utilization			74.4%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													



HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

03/26/2019

													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	53	1901	4	5	1379	221	4	1	3	222	1	51	
Future Volume (vph)	53	1901	4	5	1379	221	4	1	3	222	1	51	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5		4.5	4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		0.95	0.95		
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85		0.95		1.00	0.94		
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	0.97		
Satd. Flow (prot)	1630	3260	1458	1599	3197	1430		1589		1548	1491		
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	0.97		
Satd. Flow (perm)	1630	3260	1458	1599	3197	1430		1589		1548	1491		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	58	2066	4	5	1499	240	4	1	3	241	1	55	
RTOR Reduction (vph)	0	0	1	0	0	87	0	3	0	0	19	0	
Lane Group Flow (vph)	58	2066	3	5	1499	153	0	5	0	152	126	0	
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases			6			2							
Actuated Green, G (s)	5.7	76.1	76.1	0.9	71.3	71.3		0.6		14.7	14.7		
Effective Green, g (s)	5.7	76.1	76.1	0.9	71.3	71.3		0.6		14.7	14.7		
Actuated g/C Ratio	0.05	0.68	0.68	0.01	0.64	0.64		0.01		0.13	0.13		
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5		4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0		
Lane Grp Cap (vph)	83	2219	992	12	2038	911		8		203	196		
v/s Ratio Prot	c0.04	c0.63		0.00	0.47			c0.00		c0.10	0.08		
v/s Ratio Perm			0.00			0.11							
v/c Ratio	0.70	0.93	0.00	0.42	0.74	0.17		0.63		0.75	0.64		
Uniform Delay, d1	52.2	15.6	5.7	55.2	13.8	8.2		55.5		46.8	46.1		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	22.6	7.8	0.0	21.8	1.4	0.1		98.3		14.0	7.0		
Delay (s)	74.8	23.3	5.7	77.0	15.2	8.3		153.8		60.8	53.1		
Level of Service	E	C	A	E	B	A		F		E	D		
Approach Delay (s)		24.7			14.5			153.8			57.0		
Approach LOS		C			B			F			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			23.0									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.91										
Actuated Cycle Length (s)			111.8									Sum of lost time (s)	19.5
Intersection Capacity Utilization			78.9%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM 6th TWSC  
1: SE Orient Drive & SE Crescent Road

12/03/2018

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	0	0	1	6	0	6	0	229	1	1	205	1
Future Vol, veh/h	0	0	1	6	0	6	0	229	1	1	205	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	7	7	7
Mvmt Flow	0	0	1	7	0	7	0	249	1	1	223	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	479	476	224	476	476	250	224	0	0	250	0	0
Stage 1	226	226	-	250	250	-	-	-	-	-	-	-
Stage 2	253	250	-	226	226	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	497	488	815	499	488	789	1316	-	-	1287	-	-
Stage 1	777	717	-	754	700	-	-	-	-	-	-	-
Stage 2	751	700	-	777	717	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	493	488	815	498	488	789	1316	-	-	1287	-	-
Mov Cap-2 Maneuver	493	488	-	498	488	-	-	-	-	-	-	-
Stage 1	777	716	-	754	700	-	-	-	-	-	-	-
Stage 2	745	700	-	775	716	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	11	0	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1316	-	-	815	611	1287	-	-
HCM Lane V/C Ratio	-	-	-	0.001	0.021	0.001	-	-
HCM Control Delay (s)	0	-	-	9.4	11	7.8	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

12/03/2018

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR		
Lane Configurations														
Traffic Volume (vph)	12	1481	3	4	2423	172	3	0	9	122	1	18		
Future Volume (vph)	12	1481	3	4	2423	172	3	0	9	122	1	18		
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750		
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00			
Flt	1.00	1.00	0.85	1.00	1.00	0.85		0.90			0.98			
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.96			
Satd. Flow (prot)	1511	3023	1352	1583	3167	1417		1243			1570			
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.96			
Satd. Flow (perm)	1511	3023	1352	1583	3167	1417		1243			1570			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Adj. Flow (vph)	13	1559	3	4	2551	181	3	0	9	128	1	19		
RTOR Reduction (vph)	0	0	1	0	0	57	0	12	0	0	4	0		
Lane Group Flow (vph)	13	1559	2	4	2551	124	0	0	0	0	144	0		
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA			
Protected Phases	1	6		5	2		4	4		8	8			
Permitted Phases			6			2								
Actuated Green, G (s)	1.9	81.5	81.5	0.9	80.5	80.5		1.3			14.4			
Effective Green, g (s)	1.9	81.5	81.5	0.9	80.5	80.5		1.3			14.4			
Actuated g/C Ratio	0.02	0.69	0.69	0.01	0.68	0.68		0.01			0.12			
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0			
Lane Grp Cap (vph)	24	2095	936	12	2167	969		13			192			
v/s Ratio Prot	c0.01	0.52		0.00	c0.81			c0.00			c0.09			
v/s Ratio Perm			0.00			0.09								
v/c Ratio	0.54	0.74	0.00	0.33	1.18	0.13		0.01			0.75			
Uniform Delay, d1	57.4	11.4	5.5	58.1	18.5	6.4		57.5			49.8			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00			
Incremental Delay, d2	22.7	1.5	0.0	15.7	84.9	0.1		0.3			14.7			
Delay (s)	80.1	12.9	5.6	73.7	103.5	6.5		57.8			64.5			
Level of Service	F	B	A	E	F	A		E			E			
Approach Delay (s)		13.5			97.0			57.8			64.5			
Approach LOS		B			F			E			E			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			66.4									HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio			1.09											
Actuated Cycle Length (s)			117.6								19.5		Sum of lost time (s)	
Intersection Capacity Utilization			96.7%										ICU Level of Service	F
Analysis Period (min)			15											
c Critical Lane Group														

HCM 6th TWSC  
1: SE Orient Drive & SE Crescent Road

12/03/2018

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	1	1	0	1	3	238	3	4	314	0
Future Vol, veh/h	1	0	1	1	0	1	3	238	3	4	314	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	1	0	1	3	256	3	4	338	0






















Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	610	611	338	611	610	258	338	0	0	259	0	0
Stage 1	346	346	-	264	264	-	-	-	-	-	-	-
Stage 2	264	265	-	347	346	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	407	409	704	406	409	781	1221	-	-	1306	-	-
Stage 1	670	635	-	741	690	-	-	-	-	-	-	-
Stage 2	741	689	-	669	635	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	404	406	704	403	406	781	1221	-	-	1306	-	-
Mov Cap-2 Maneuver	404	406	-	403	406	-	-	-	-	-	-	-
Stage 1	668	632	-	739	688	-	-	-	-	-	-	-
Stage 2	738	687	-	665	632	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	11.8	0.1	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1221	-	-	513	532	1306	-	-
HCM Lane V/C Ratio	0.003	-	-	0.004	0.004	0.003	-	-
HCM Control Delay (s)	8	0	-	12	11.8	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

12/03/2018

													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	18	2565	6	7	1875	242	6	1	4	254	1	9	
Future Volume (vph)	18	2565	6	7	1875	242	6	1	4	254	1	9	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00		
Flt	1.00	1.00	0.85	1.00	1.00	0.85		0.95			1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97			0.95		
Satd. Flow (prot)	1630	3260	1458	1599	3197	1430		1588			1630		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97			0.95		
Satd. Flow (perm)	1630	3260	1458	1599	3197	1430		1588			1630		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	19	2700	6	7	1974	255	6	1	4	267	1	9	
RTOR Reduction (vph)	0	0	2	0	0	90	0	4	0	0	1	0	
Lane Group Flow (vph)	19	2700	4	7	1974	165	0	7	0	0	276	0	
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases			6			2							
Actuated Green, G (s)	1.8	76.4	76.4	0.9	75.5	75.5		1.3			18.6		
Effective Green, g (s)	1.8	76.4	76.4	0.9	75.5	75.5		1.3			18.6		
Actuated g/C Ratio	0.02	0.65	0.65	0.01	0.65	0.65		0.01			0.16		
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0		
Lane Grp Cap (vph)	25	2134	954	12	2068	925		17			259		
v/s Ratio Prot	c0.01	c0.83		0.00	0.62			c0.00			c0.17		
v/s Ratio Perm			0.00			0.12							
v/c Ratio	0.76	1.27	0.00	0.58	0.95	0.18		0.41			1.07		
Uniform Delay, d1	57.2	20.1	7.0	57.7	19.0	8.2		57.3			49.0		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00		
Incremental Delay, d2	81.2	123.2	0.0	56.2	11.0	0.1		15.6			74.5		
Delay (s)	138.4	143.4	7.0	113.9	30.0	8.3		72.9			123.6		
Level of Service	F	F	A	F	C	A		E			F		
Approach Delay (s)		143.1			27.8			72.9			123.6		
Approach LOS		F			C			E			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			92.8									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.22										
Actuated Cycle Length (s)			116.7									Sum of lost time (s)	19.5
Intersection Capacity Utilization			108.3%									ICU Level of Service	G
Analysis Period (min)			15										
c	Critical Lane Group												



HCM 6th TWSC  
1: SE Orient Drive & SE Crescent Road

03/26/2019

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	0	33	6	0	6	176	219	1	1	219	12
Future Vol, veh/h	27	0	33	6	0	6	176	219	1	1	219	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	7	7	7
Mvmt Flow	29	0	36	7	0	7	191	238	1	1	238	13

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	871	868	245	886	874	239	251	0	0	239	0	0
Stage 1	247	247	-	621	621	-	-	-	-	-	-	-
Stage 2	624	621	-	265	253	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	271	290	794	265	288	800	1286	-	-	1299	-	-
Stage 1	757	702	-	475	479	-	-	-	-	-	-	-
Stage 2	473	479	-	740	698	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	233	240	794	220	238	800	1286	-	-	1299	-	-
Mov Cap-2 Maneuver	233	240	-	220	238	-	-	-	-	-	-	-
Stage 1	628	701	-	394	397	-	-	-	-	-	-	-
Stage 2	389	397	-	706	697	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.4	15.8	3.7	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1286	-	-	381	345	1299	-	-
HCM Lane V/C Ratio	0.149	-	-	0.171	0.038	0.001	-	-
HCM Control Delay (s)	8.3	0	-	16.4	15.8	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.6	0.1	0	-	-

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

03/26/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR		
Lane Configurations														
Traffic Volume (vph)	73	1455	3	4	2364	277	3	0	9	187	1	107		
Future Volume (vph)	73	1455	3	4	2364	277	3	0	9	187	1	107		
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750		
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00			
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85		0.90			0.95			
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.97			
Satd. Flow (prot)	1511	3023	1352	1583	3167	1417		1243			1536			
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.97			
Satd. Flow (perm)	1511	3023	1352	1583	3167	1417		1243			1536			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Adj. Flow (vph)	77	1532	3	4	2488	292	3	0	9	197	1	113		
RTOR Reduction (vph)	0	0	1	0	0	110	0	12	0	0	17	0		
Lane Group Flow (vph)	77	1532	2	4	2488	182	0	0	0	0	294	0		
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA			
Protected Phases	1	6		5	2		4	4		8	8			
Permitted Phases			6			2								
Actuated Green, G (s)	5.5	80.3	80.3	1.0	75.8	75.8		1.3			19.5			
Effective Green, g (s)	5.5	80.3	80.3	1.0	75.8	75.8		1.3			19.5			
Actuated g/C Ratio	0.05	0.66	0.66	0.01	0.62	0.62		0.01			0.16			
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0			
Lane Grp Cap (vph)	68	1996	892	13	1974	883		13			246			
v/s Ratio Prot	c0.05	c0.51		0.00	c0.79			c0.00			c0.19			
v/s Ratio Perm			0.00			0.13								
v/c Ratio	1.13	0.77	0.00	0.31	1.26	0.21		0.01			1.20			
Uniform Delay, d1	58.0	14.2	7.0	60.0	22.9	9.9		59.5			51.0			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00			
Incremental Delay, d2	149.7	1.8	0.0	13.0	121.4	0.1		0.3			120.8			
Delay (s)	207.7	16.0	7.0	73.0	144.3	10.0		59.8			171.8			
Level of Service	F	B	A	E	F	B		E			F			
Approach Delay (s)		25.2			130.1			59.8			171.8			
Approach LOS		C			F			E			F			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			96.9									HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio			1.21											
Actuated Cycle Length (s)			121.6								19.5		Sum of lost time (s)	
Intersection Capacity Utilization			104.8%										ICU Level of Service	G
Analysis Period (min)			15											
c	Critical Lane Group													

HCM 6th TWSC  
3: Site Access & SE Crescent Road

03/26/2019

Intersection						
Int Delay, s/veh	7.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Vol, veh/h	0	0	187	1	0	60
Future Vol, veh/h	0	0	187	1	0	60
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	203	1	0	65
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1	0	408	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	407	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	599	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	672	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1622	-	524	1084
Mov Cap-2 Maneuver	-	-	-	-	524	-
Stage 1	-	-	-	-	894	-
Stage 2	-	-	-	-	672	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	7.5	8.5			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1084	-	-	1622	-	
HCM Lane V/C Ratio	0.06	-	-	0.125	-	
HCM Control Delay (s)	8.5	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0.4	-	

HCM 6th TWSC  
4: SE Orient Drive & Site Access

03/26/2019

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↗	↖
Traffic Vol, veh/h	0	132	0	396	233	20
Future Vol, veh/h	0	132	0	396	233	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	143	0	430	253	22
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	264	-	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.22	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.318	-	-	-	
Pot Cap-1 Maneuver	0	775	0	-	-	
Stage 1	0	-	0	-	-	
Stage 2	0	-	0	-	-	
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	775	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	10.7	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 775		-	-		
HCM Lane V/C Ratio	- 0.185		-	-		
HCM Control Delay (s)	- 10.7		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 0.7		-	-		

HCM 2010 TWSC  
1: SE Orient Drive & SE Crescent Road

03/26/2019

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	33	0	38	1	0	1	198	227	3	4	325	12
Future Vol, veh/h	33	0	38	1	0	1	198	227	3	4	325	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	0	41	1	0	1	213	244	3	4	349	13

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1036	1037	356	1056	1042	246	362	0	0	247	0	0
Stage 1	364	364	-	672	672	-	-	-	-	-	-	-
Stage 2	672	673	-	384	370	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	210	231	688	203	230	793	1197	-	-	1319	-	-
Stage 1	655	624	-	445	454	-	-	-	-	-	-	-
Stage 2	445	454	-	639	620	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	176	183	688	160	182	793	1197	-	-	1319	-	-
Mov Cap-2 Maneuver	176	183	-	160	182	-	-	-	-	-	-	-
Stage 1	520	622	-	353	360	-	-	-	-	-	-	-
Stage 2	353	360	-	599	618	-	-	-	-	-	-	-





















Approach	EB	WB	NB	SB
HCM Control Delay, s	21.6	18.6	4	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1197	-	-	293	266	1319	-	-
HCM Lane V/C Ratio	0.178	-	-	0.261	0.008	0.003	-	-
HCM Control Delay (s)	8.7	0	-	21.6	18.6	7.7	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.6	-	-	1	0	0	-	-



HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

03/26/2019

														
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR		
Lane Configurations														
Traffic Volume (vph)	99	2525	6	7	1825	345	6	1	4	343	1	97		
Future Volume (vph)	99	2525	6	7	1825	345	6	1	4	343	1	97		
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750		
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00			
Fr't	1.00	1.00	0.85	1.00	1.00	0.85		0.95			0.97			
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97			0.96			
Satd. Flow (prot)	1630	3260	1458	1599	3197	1430		1588			1602			
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97			0.96			
Satd. Flow (perm)	1630	3260	1458	1599	3197	1430		1588			1602			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Adj. Flow (vph)	104	2658	6	7	1921	363	6	1	4	361	1	102		
RTOR Reduction (vph)	0	0	2	0	0	158	0	4	0	0	9	0		
Lane Group Flow (vph)	104	2658	4	7	1921	205	0	7	0	0	455	0		
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA			
Protected Phases	1	6		5	2		4	4		8	8			
Permitted Phases			6			2								
Actuated Green, G (s)	6.5	74.3	74.3	1.0	68.8	68.8		1.3			25.5			
Effective Green, g (s)	6.5	74.3	74.3	1.0	68.8	68.8		1.3			25.5			
Actuated g/C Ratio	0.05	0.61	0.61	0.01	0.57	0.57		0.01			0.21			
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5			4.5			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0			
Lane Grp Cap (vph)	87	1991	890	13	1808	809		16			335			
v/s Ratio Prot	c0.06	c0.82		0.00	0.60			c0.00			c0.28			
v/s Ratio Perm			0.00			0.14								
v/c Ratio	1.20	1.34	0.00	0.54	1.06	0.25		0.44			1.36			
Uniform Delay, d1	57.5	23.6	9.2	60.1	26.4	13.4		59.8			48.0			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00			
Incremental Delay, d2	158.3	154.3	0.0	36.8	40.0	0.2		18.2			179.9			
Delay (s)	215.8	177.9	9.2	96.8	66.4	13.6		77.9			227.9			
Level of Service	F	F	A	F	E	B		E			F			
Approach Delay (s)		179.0			58.1			77.9			227.9			
Approach LOS		F			E			E			F			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			132.9									HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio			1.35											
Actuated Cycle Length (s)			121.6								19.5		Sum of lost time (s)	
Intersection Capacity Utilization			126.2%										ICU Level of Service	H
Analysis Period (min)			15											
c Critical Lane Group														

HCM 2010 TWSC  
 3: Site Access & SE Crescent Road

03/26/2019

Intersection						
Int Delay, s/veh	7.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Vol, veh/h	2	0	207	3	0	69
Future Vol, veh/h	2	0	207	3	0	69
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	0	225	3	0	75
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	2	0	455	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	453	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1620	-	563	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	640	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1620	-	485	1082
Mov Cap-2 Maneuver	-	-	-	-	485	-
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	640	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	7.5	8.6			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1082	-	-	1620	-	
HCM Lane V/C Ratio	0.069	-	-	0.139	-	
HCM Control Delay (s)	8.6	-	-	7.6	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0.5	-	

HCM 2010 TWSC  
4: SE Orient Drive & Site Access

03/26/2019

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↗	↖
Traffic Vol, veh/h	0	151	0	428	342	22
Future Vol, veh/h	0	151	0	428	342	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	162	0	460	368	24
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	380	-	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.22	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.318	-	-	-	
Pot Cap-1 Maneuver	0	667	0	-	-	
Stage 1	0	-	0	-	-	
Stage 2	0	-	0	-	-	
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	667	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	12.1	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	667	-	-		
HCM Lane V/C Ratio	-	0.243	-	-		
HCM Control Delay (s)	-	12.1	-	-		
HCM Lane LOS	-	B	-	-		
HCM 95th %tile Q(veh)	-	1	-	-		























HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

03/26/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	73	1455	3	4	2364	277	3	0	9	187	1	107	
Future Volume (vph)	73	1455	3	4	2364	277	3	0	9	187	1	107	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5		4.5	4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		0.95	0.95		
Fr't	1.00	1.00	0.85	1.00	1.00	0.85		0.90		1.00	0.89		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.99		
Satd. Flow (prot)	1511	3023	1352	1583	3167	1417		1243		1504	1387		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	0.99		
Satd. Flow (perm)	1511	3023	1352	1583	3167	1417		1243		1504	1387		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	77	1532	3	4	2488	292	3	0	9	197	1	113	
RTOR Reduction (vph)	0	0	1	0	0	103	0	12	0	0	96	0	
Lane Group Flow (vph)	77	1532	2	4	2488	189	0	0	0	162	53	0	
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases			6			2							
Actuated Green, G (s)	5.5	81.9	81.9	0.9	77.3	77.3		1.3		15.8	15.8		
Effective Green, g (s)	5.5	81.9	81.9	0.9	77.3	77.3		1.3		15.8	15.8		
Actuated g/C Ratio	0.05	0.69	0.69	0.01	0.65	0.65		0.01		0.13	0.13		
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5		4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0		
Lane Grp Cap (vph)	69	2073	927	11	2050	917		13		199	183		
v/s Ratio Prot	c0.05	0.51		0.00	c0.79			c0.00		c0.11	0.04		
v/s Ratio Perm			0.00			0.13							
v/c Ratio	1.12	0.74	0.00	0.36	1.21	0.21		0.01		0.81	0.29		
Uniform Delay, d1	57.0	11.9	5.9	59.0	21.1	8.6		58.4		50.4	46.7		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	143.5	1.4	0.0	19.3	100.9	0.1		0.3		21.9	0.9		
Delay (s)	200.4	13.4	5.9	78.2	121.9	8.7		58.7		72.2	47.6		
Level of Service	F	B	A	E	F	A		E		E	D		
Approach Delay (s)		22.3			110.0			58.7			60.4		
Approach LOS		C			F			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			76.6									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.13										
Actuated Cycle Length (s)			119.4									Sum of lost time (s)	19.5
Intersection Capacity Utilization			95.6%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

03/26/2019

													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	99	2525	6	7	1825	345		6	1	4	343	1	97
Future Volume (vph)	99	2525	6	7	1825	345		6	1	4	343	1	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5		4.5	4.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		0.95	0.95		
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85		0.95		1.00	0.93		
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	0.97		
Satd. Flow (prot)	1630	3260	1458	1599	3197	1430		1588		1548	1479		
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	0.97		
Satd. Flow (perm)	1630	3260	1458	1599	3197	1430		1588		1548	1479		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	104	2658	6	7	1921	363	6	1	4	361	1	102	
RTOR Reduction (vph)	0	0	2	0	0	141	0	4	0	0	25	0	
Lane Group Flow (vph)	104	2658	4	7	1921	222	0	7	0	238	201	0	
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases			6			2							
Actuated Green, G (s)	8.3	81.8	81.8	1.0	74.5	74.5		1.3		18.0	18.0		
Effective Green, g (s)	8.3	81.8	81.8	1.0	74.5	74.5		1.3		18.0	18.0		
Actuated g/C Ratio	0.07	0.67	0.67	0.01	0.61	0.61		0.01		0.15	0.15		
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0		4.5		4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0		3.0	3.0		
Lane Grp Cap (vph)	111	2192	980	13	1958	876		16		229	218		
v/s Ratio Prot	c0.06	c0.82		0.00	0.60			c0.00		c0.15	0.14		
v/s Ratio Perm			0.00			0.16							
v/c Ratio	0.94	1.21	0.00	0.54	0.98	0.25		0.44		1.04	0.92		
Uniform Delay, d1	56.4	19.9	6.5	60.1	22.9	10.8		59.8		51.8	51.1		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	65.0	100.1	0.0	36.8	16.0	0.2		18.2		70.1	40.1		
Delay (s)	121.4	120.0	6.5	96.8	38.9	11.0		77.9		121.9	91.2		
Level of Service	F	F	A	F	D	B		E		F	F		
Approach Delay (s)		119.8			34.6			77.9			107.0		
Approach LOS		F			C			E			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			83.4									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.19										
Actuated Cycle Length (s)			121.6									Sum of lost time (s)	19.5
Intersection Capacity Utilization			111.9%									ICU Level of Service	H
Analysis Period (min)			15										
c Critical Lane Group													



Queuing and Blocking Report  
 2020 Background plus Site AM Peak Hour

01/12/2019

Intersection: 1: SE Orient Drive & SE Crescent Road

Movement	EB	WB	NB
Directions Served	LTR	LTR	L
Maximum Queue (ft)	35	34	49
Average Queue (ft)	13	8	11
95th Queue (ft)	38	29	37
Link Distance (ft)	137	309	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			150
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: SE Jarl Road/SE Orient Drive & Highway 26

Movement	SE	SE	SE	SE	NW	NW	NW	NE	SW	SW	B7
Directions Served	L	T	T	R	L	T	T	LTR	L	LTR	T
Maximum Queue (ft)	107	159	143	7	27	313	288	44	117	147	3
Average Queue (ft)	34	73	51	0	2	166	142	7	50	71	0
95th Queue (ft)	80	135	112	4	14	273	256	29	97	130	0
Link Distance (ft)		978	978			1069	1069	250	122	122	233
Upstream Blk Time (%)									0	2	
Queuing Penalty (veh)									0	2	
Storage Bay Dist (ft)	475			100	500						
Storage Blk Time (%)				1							
Queuing Penalty (veh)				0							

Intersection: 3: Site Access & SE Crescent Road

Movement	NB
Directions Served	LR
Maximum Queue (ft)	38
Average Queue (ft)	14
95th Queue (ft)	39
Link Distance (ft)	120
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report  
2020 Background plus Site AM Peak Hour

01/12/2019

Intersection: 4: SE Orient Drive & Site Access

Movement	EB
Directions Served	R
Maximum Queue (ft)	71
Average Queue (ft)	33
95th Queue (ft)	58
Link Distance (ft)	77
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 2

Queuing and Blocking Report  
 2020 Background plus Site PM Peak Hour

01/12/2019

Intersection: 1: SE Orient Drive & SE Crescent Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	LTR
Maximum Queue (ft)	39	20	50	5
Average Queue (ft)	17	2	15	0
95th Queue (ft)	42	12	42	4
Link Distance (ft)	158	308		227
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			150	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: SE Jarl Road/SE Orient Drive & Highway 26

Movement	SE	SE	SE	SE	NW	NW	NW	NE	SW	SW	B7
Directions Served	L	T	T	R	L	T	T	LTR	L	LTR	T
Maximum Queue (ft)	99	325	294	33	31	327	308	24	159	165	20
Average Queue (ft)	41	157	139	1	4	165	128	6	87	93	1
95th Queue (ft)	86	266	251	18	19	264	236	20	141	152	11
Link Distance (ft)		978	978			1069	1069	250	123	123	226
Upstream Blk Time (%)									1	4	
Queuing Penalty (veh)									2	6	
Storage Bay Dist (ft)	475			100	500						
Storage Blk Time (%)			9				0				
Queuing Penalty (veh)			0				0				

Intersection: 3: Site Access & SE Crescent Road

Movement	NB
Directions Served	LR
Maximum Queue (ft)	38
Average Queue (ft)	15
95th Queue (ft)	39
Link Distance (ft)	113
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report  
2020 Background plus Site PM Peak Hour

01/12/2019

Intersection: 4: SE Orient Drive & Site Access

Movement	EB
Directions Served	R
Maximum Queue (ft)	72
Average Queue (ft)	33
95th Queue (ft)	59
Link Distance (ft)	65
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 9

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

Highway 026 ALL ROAD TYPES, MP 22.13 to 22.23 01/01/2014 to 12/31/2016, Both Add and Non-Add mileage

1 - 5 of 26 Crash records shown.

SR#	P	R	S	D	DATE	COUNTY	RD	FC	CONTR	RD	CHAR	INT-TYPE	INT-REL	OFFED	WTHR	CRASH	SPCL USE	TRLR	QTY	MOVE	FROM	TO	PH	TYPE	SVRTY	E	X	RES	LOC	ACT	EVENT	CAUSE						
04537	N	N	N	N	10/03/2016	CLACKAMAS	STRAIGHT	04	002600100800	UN	UN	CROSS	TRF SIGNAL	N	WET	REAR	S-1STOP	01	NONE	9	N/A	N-E	01	DRVR	NONE	00	UNK	UNK	000	000	00	00						
NONE	N	N	N	N	3P	SANDY UA	04	002600100800	002600100800	UN	UN	(NONE)	TRF SIGNAL	N	DAY	POD	PSNGR CAR	NONE	02	NONE	9	N/A	N-E	01	DRVR	NONE	00	UNK	UNK	011	000	00						
N	N	N	N	N	45 24 32.85	-122 18 7.46	04	002600100800	002600100800	04	04	(04)	TRF SIGNAL	N	DAY	POD	PSNGR CAR	NONE	02	NONE	9	N/A	N-E	01	DRVR	NONE	00	UNK	UNK	000	000	00						
05880	N	N	N	N	12/14/2016	CLACKAMAS	INTER	06	002600100800	N	N	CROSS	TRF SIGNAL	N	SNOW	ANGI-STP	01	NONE	9	TURN-R	01	DRVR	NONE	00	UNK	UNK	000	000	000	000	00	00	00					
NONE	N	N	N	N	WE	SANDY UA	06	002600100800	002600100800	N	N	1	TRF SIGNAL	N	ICE	TURN	N/A	NONE	01	DRVR	NONE	00	UNK	UNK	000	000	000	000	000	000	000	000	00					
N	N	N	N	N	45 24 32.2	-122 18 6.3	06	002600100800	002600100800	06	06	1	TRF SIGNAL	N	DUSK	POD	PSNGR CAR	NONE	02	NONE	9	N/A	N-S	01	DRVR	NONE	00	UNK	UNK	000	000	000	000	00				
05048	Y	N	N	N	12/14/2014	CLACKAMAS	INTER	05	002600100800	N	Y	CROSS	TRF SIGNAL	N	CLR	FIX OBJ	01	NONE	0	STRTHT	01	DRVR	INJC	13	M	OR-Y	OR-25	016,047,081	026	055	00	00	00	16,01				
STATE	N	N	N	N	SU	SANDY UA	05	002600100800	002600100800	N	N	1	TRF SIGNAL	N	DRY	FIX	NW-SE	NONE	01	DRVR	NONE	00	UNK	UNK	000	000	000	000	000	000	000	000	000	00				
N	N	N	N	N	8A	-122 18 6.3	05	002600100800	002600100800	05	05	1	TRF SIGNAL	N	DAY	INJ	PSNGR CAR	NONE	01	DRVR	NONE	00	UNK	UNK	000	000	000	000	000	000	000	000	000	000	00			
03811	N	N	N	N	09/28/2014	CLACKAMAS	INTER	06	002600100800	N	N	CROSS	TRF SIGNAL	N	CLR	S-1STOP	01	NONE	0	STRTHT	01	DRVR	INJC	62	F	OR-Y	OR-25	026	000	000	000	000	000	000	29			
NONE	N	N	N	N	SU	SANDY UA	06	002600100800	002600100800	N	N	1	TRF SIGNAL	N	DRY	REAR	SE-NW	NONE	01	DRVR	NONE	00	UNK	UNK	000	000	000	000	000	000	000	000	000	000	000	29		
N	N	N	N	N	8A	-122 18 6.3	06	002600100800	002600100800	06	06	1	TRF SIGNAL	N	DAY	INJ	PSNGR CAR	NONE	02	NONE	0	STOP	NONE	00	F	UNK	OR-25	000	000	000	000	000	000	000	000	000		
N	N	N	N	N	45 24 32.2	-122 18 6.3	06	002600100800	002600100800	06	06	1	TRF SIGNAL	N	DAY	INJ	PSNGR CAR	NONE	02	NONE	0	STOP	NONE	00	F	UNK	OR-25	000	000	000	000	000	000	000	000	000		
05033	N	N	N	N	11/28/2015	CLACKAMAS	INTER	06	002600100800	N	N	CROSS	TRF SIGNAL	N	CLR	S-1STOP	01	NONE	0	STRTHT	01	DRVR	NONE	17	F	OR-Y	OR-25	000	000	000	000	000	000	000	29			
NONE	N	N	N	N	SA	SANDY UA	06	002600100800	002600100800	N	N	1	TRF SIGNAL	N	DRY	REAR	SE-NW	NONE	01	DRVR	NONE	81	F	OR-Y	OR-25	026	000	000	000	000	000	000	000	000	000	000		
N	N	N	N	N	12P	-122 18 6.3	06	002600100800	002600100800	06	06	1	TRF SIGNAL	N	DAY	POD	PSNGR CAR	NONE	02	NONE	0	STOP	NONE	00	F	UNK	OR-25	000	000	000	000	000	000	000	000	000	000	
N	N	N	N	N	45 24 32.2	-122 18 6.3	06	002600100800	002600100800	06	06	1	TRF SIGNAL	N	DAY	POD	PSNGR CAR	NONE	02	NONE	0	STOP	NONE	00	F	UNK	OR-25	000	000	000	000	000	000	000	000	000	000	
03729	N	N	N	N	08/15/2016	CLACKAMAS	INTER	06	002600100800	N	N	CROSS	TRF SIGNAL	N	CLR	S-1STOP	01	NONE	0	STRTHT	01	DRVR	NONE	38	M	OR-Y	OR-25	026	000	000	000	000	000	000	000	29		
NONE	N	N	N	N	NO	SANDY UA	06	002600100800	002600100800	N	N	1	TRF SIGNAL	N	DRY	REAR	SE-NW	NONE	01	DRVR	NONE	38	M	OR-Y	OR-25	026	000	000	000	000	000	000	000	000	000	000	000	
N	N	N	N	N	10A	-122 18 6.3	06	002600100800	002600100800	06	06	1	TRF SIGNAL	N	DAY	INJ	PSNGR CAR	NONE	02	NONE	0	STOP	NONE	00	F	UNK	OR-25	000	000	000	000	000	000	000	000	000	000	
N	N	N	N	N	45 24 32.2	-122 18 6.3	06	002600100800	002600100800	06	06	1	TRF SIGNAL	N	DAY	INJ	PSNGR CAR	NONE	02	NONE	0	STOP	NONE	00	F	UNK	OR-25	000	000	000	000	000	000	000	000	000	000	000
N	N	N	N	N	45 24 32.2	-122 18 6.3	06	002600100800	002600100800	06	06	1	TRF SIGNAL	N	DAY	INJ	PSNGR CAR	NONE	02	NONE	0	STOP	NONE	00	F	UNK	OR-25	000	000	000	000	000	000	000	000	000	000	000

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submission of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.



OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

Highway 026 ALL ROAD TYPES, MP 22.13 to 22.23 01/01/2014 to 12/31/2016, Both Add and Non-Add mileage

6 - 11 of 26 Crash records shown.

SR#	P	R	S	D	DATE	COUNTY	RD#	FC	CONNE	RD	CHAR	INT-TYPE	INT-REL	OFFED	WTHR	CRASH	SPCL USE	TRLR	QTY	MOVE	PH	TYPE	SVRTY	A	S	E	LICNS	PED	ACT	EVENT	CAUSE			
NO	RPT	STATE	TIME	TYPE	TIME	AREA	MILENT	STREET	STREET	LOCN	LOCN	LEGS	CONTL	DRVRY	LIGHT	SVRTY	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW	SE-NW			
05056	N	N	N	N	11/01/2016	CLACKAMAS	1	14		INTER	W	CROSS	N	N	CLR	S-1STOP	01	NONE	9	STRGHT	01	DRVR	NONE	00	UNK	UNK	000	000	00	00	16,29			
NONE					2P	SANDY UA	22.15			06	0	0	TRF SIGNAL	N	DRY	REAR	N/A			N-E														
N					45 24 32.2	-122 18 6.3	002600100800																											
01300	N	N	N	N	04/04/2014	CLACKAMAS	1	02		INTER	NH	CROSS	N	N	CLD	S-1STOP	01	NONE	0	STRGHT	01	DRVR	NONE	00	M	OR-Y	026	000	00	07				
NONE					11A		22.15			06	1	UNKNOWN	N	N	WET	REAR	UNKNOWN			NW-SE														
N					45 24 32.2	-122 18 6.3	002600100800																											
02521	N	N	N	N	07/01/2014	CLACKAMAS	1	02		INTER	NH	CROSS	N	N	CLR	S-1STOP	01	NONE	0	STRGHT	01	DRVR	NONE	57	M	OTH-Y	000	000	00	00				
NONE					1P		22.15			06	1	UNKNOWN	N	N	DRY	REAR	UNKNOWN			NW-SE														
N					45 24 32.2	-122 18 6.3	002600100800																											
03433	N	N	N	N	08/24/2015	CLACKAMAS	1	14		INTER	NH	CROSS	N	N	CLR	S-1STOP	01	NONE	0	STRGHT	01	DRVR	NONE	48	M	NONE	026	052	025	29,32,16				
STATE					8A	SANDY UA	22.15			06	1	TRF SIGNAL	N	N	DRY	REAR	UNKNOWN			NW-SE														
N					45 24 32.2	-122 18 6.3	002600100800																											
01132	N	N	N	N	03/31/2015	CLACKAMAS	1	14		INTER	NH	CROSS	N	N	CLR	S-1STOP	01	NONE	0	STRGHT	01	DRVR	NONE	26	M	OR-Y	000	000	00	00				
NONE					11P	SANDY UA	22.15			06	1	TRF SIGNAL	N	N	DRY	REAR	UNKNOWN			NW-SE														
N					45 24 32.2	-122 18 6.3	002600100800																											
01846	N	N	N	N	05/15/2015	CLACKAMAS	1	14		INTER	NH	CROSS	N	N	RAIN	S-STRGHT	01	NONE	0	STRGHT	01	DRVR	NONE	00	UNK	UNK	042	000	00	29				
NONE					FR	SANDY UA	22.15			06	1	TRF SIGNAL	N	N	WET	REAR	UNKNOWN			NW-SE														
N					45 24 32.2	-122 18 6.3	002600100800																											

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CONTINUOUS SYSTEM CRASH LISTING

Highway 026 ALL ROAD TYPES, MP 22.13 to 22.23 01/01/2014 to 12/31/2016, Both Add and Non-Add mileage

12 - 17 of 26 Crash records shown.

CD	STATE	DATE	TIME	COUNTY	STREET	RD	INT-TYPE	OFFD	WHR	CRASH	SPCL USE	TRLR QTY	MOV	PH	INJ	A	S	E	LOC	RES	LOC	ACT	EVENT	CAUSE
046	WT	HOOD																						
04189	N	N	N	09/12/2016	CLACKAMAS	1 14	CROSS	N	CLR	S-1STOP	01	NONE	STRTGHT	01	DRVR	NONE	52	M	OR-Y	OR<25			000	00
NONE						MN 0			DRY	REAR		PRVTE	NW-SE											00
N						22.15	1	TRF SIGNAL	N	DAY	INJ	PSNGR CAR	NW-SE	01	DRVR	INJC	25	M	OR-Y	OR<25	026		000	29
N						002600100800			DAY	INJ		PSNGR CAR	NW-SE											00
N						45 24 32.2						02	NONE	0	STOP									00
												RENTL	NW-SE	01	DRVR	NONE	00	Unk	Unk				011	00
												TRUCK												00
04837	N	N	N	11/09/2015	CLACKAMAS	1 14	CROSS	N	CLR	ANGL-OTH	01	NONE	STRTGHT	01	DRVR	NONE	52	M	OR-Y	OR<25			000	00
STATE						MN 0			DRY	TURN		PRVTE	SE-NW											00
N						22.15	1	TRF SIGNAL	N	DAY	INJ	PSNGR CAR	NW-SE	01	DRVR	INJC	21	F	OR-Y	OR<25	000		000	00
N						002600100800			DAY	INJ		PSNGR CAR	NW-SE											00
N						45 24 32.2						02	NONE	0	TURN-L									00
												PSNGR CAR	NE-SE	01	DRVR	NONE	37	M	OTH-Y	R-RES	020		000	04
												PSNGR CAR												00
00577	N	N	N	02/10/2015	CLACKAMAS	1 14	CROSS	N	CLD	ANGL-OTH	01	NONE	STRTGHT	01	DRVR	NONE	00	M	Unk					00
STATE						MN 0			DRY	TURN		PSNGR CAR	SE-NW											00
N						22.15	1	TRF SIGNAL	N	DARK	PO	PSNGR CAR	UNKN	01	DRVR	NONE	00	M	Unk					00
N						002600100800			DAY	PO		PSNGR CAR	NE-SE	01	DRVR	NONE	33	M	OR-Y	OR<25	020		000	04
N						45 24 32.2						02	NONE	0	TURN-L									00
												PSNGR CAR	NE-SE	01	DRVR	NONE	33	M	OR-Y	OR<25	000		000	00
03930	N	N	N	10/05/2014	CLACKAMAS	1 02	CROSS	N	CLR	S-1STOP	01	NONE	STRTGHT	01	DRVR	NONE	62	M	OR-Y	OR<25				29
STATE						MN 0			DRY	REAR		PRVTE	E-N											00
N						22.17	(04)	UNKNOWN	N	DAY	PO	PSNGR CAR	E-N	01	DRVR	NONE	73	Unk	OR-Y	OR<25	026		000	29
N						002600100800			DAY	PO		PSNGR CAR	E-N											00
N						45 24 31.68						02	NONE	0	STOP									00
												PSNGR CAR	E-N	01	DRVR	NONE	62	M	OR-Y	OR<25	000		011	00
												PSNGR CAR												00
02228	N	N	N	05/17/2016	CLACKAMAS	1 14	CROSS	N	CLD	S-1STOP	01	NONE	STRTGHT	01	DRVR	NONE	57	M	OR-Y	OR<25				29
STATE						MN 0			DRY	REAR		PRVTE	E-N											00
N						22.18	(04)	UNKNOWN	N	DAY	INJ	PSNGR CAR	E-N	01	DRVR	INJC	57	M	OR-Y	OR<25	026		000	00
N						45 24 31.42			DAY	INJ		PSNGR CAR	E-N											29
N						002600100800						02	NONE	0	STOP									00
												PSNGR CAR	E-N	01	DRVR	INJC	68	M	OR-Y	OR<25	000		011	013
												PSNGR CAR	E-N											00
												03	NONE	0	STOP									00
												PSNGR CAR	E-N	01	DRVR	INJC	45	M	OR-Y	OR<25	000		022	00
												PSNGR CAR												00

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

Highway 026 ALL ROAD TYPES, MP 22.13 to 22.23 01/01/2014 to 12/31/2016, Both Add and Non-Add mileage

18 - 21 of 26 Crash records shown.

SR#	P	R	S	D	DATE	COUNTY	RD FC	CONTR	RD CHAR	INT-TYPE	INT-REL	OFFED	WTHR	CRASH	SPCL USE	TRLR QTY	MOVE	PH TYPE	INJ SVRTY	A S	E L	LOC	RES	LOC	ACT	CAUSE	
INVEST	E A	U C	O D	DAY	CITY	URBAN AREA	COMPNT	FIRST STREET	DIRECT	(MEDIUM)	TRAF-	DRVBY	DRY	CLR	CRASH	OWNER	FROM	SVRTY	INJ	G E	X RES	LOC	ERROR	EVENT	CAUSE		
UNLOC?	D C	S L	K LAT		LONG	AREA	MILENT	ERS	LOCTN	(LANES)	CONTL	DRY	DRY	CLR	CRASH	VAR TYPE	TO	TYPE	SVRTY	E X	RES	LOC	ERROR	EVENT	CAUSE		
05822	N	N	N	N	12/14/2016	CLACKAMAS	1	14	STRGHT	(NONE)	N	N	N	N	S-1STOP	01	NONE	9	01	DRVR	NONE	00	UNK	UNK	000	000	29
N	N	N	N	N	4P	SANDY UA	22.18		UN	(NONE)	TRF SIGNAL	N	DRY	REAR	N/A	N/A	E -N	01	DRVR	NONE	00	UNK	UNK	000	000	00	
N	N	N	N	N	45 24 31.42	-122 18 4.77		002600100500	05	(04)		N	DUSK	FRD			STOP	02	DRVR	NONE	00	UNK	UNK	000	000	00	
04218	N	N	N	N	10/13/2015	CLACKAMAS	1	14	STRGHT	(NONE)	N	N	N	N	S-STRGHT	01	NONE	0	01	DRVR	NONE	23	M	OR-Y	016,043,042	038	27,07
N	N	N	N	N	TU	SANDY UA	22.20		UN	(NONE)	UNKNOWN	N	DRY	REAR			E -N	01	DRVR	NONE	00	UNK	UNK	000	000	00	
N	N	N	N	N	45 24 30.79	-122 18 3.5		002600100500	06	(04)		N	DAY	INT			STOP	02	DRVR	INJC	49	M	OR-Y	000	000	00	
04686	N	N	N	N	11/08/2015	CLACKAMAS	1	14	STRGHT	(NONE)	N	N	N	N	S-1STOP	01	NONE	0	01	DRVR	NONE	24	M	OR-Y	026	000	29
N	N	N	N	N	SU	SANDY UA	22.22		UN	(NONE)	UNKNOWN	N	WET	REAR			E -N	01	DRVR	NONE	24	M	OR-Y	026	000	29	
N	N	N	N	N	4P	SANDY UA	45 24 30.16	-122 18 2.24	05	(04)		N	DUSK	INT			STOP	02	DRVR	NONE	34	F	OR-Y	000	000	00	
02680	N	N	N	N	07/13/2014	CLACKAMAS	1	09	CURVE	(NONE)	N	N	N	N	O-STRGHT	01	NONE	0	01	DRVR	NONE	17	F	OR-Y	080,079	000	10
N	N	N	N	N	SU	SANDY UA	22.16		UN	(NONE)	UNKNOWN	N	WET	SS-M			RE-SH	01	DRVR	INJC	17	F	OR-Y	080,079	000	10	
N	N	N	N	N	11A	SANDY UA	45 24 33.73	-122 18 4.93	04	(02)		N	DAY	INT			RE-SH	01	DRVR	INJC	19	M	OR-Y	000	000	00	
00037	Y	N	N	N	01/03/2016	CLACKAMAS	1	16	STRGHT	(NONE)	Y	N	N	N	O-1STOP	01	NONE	0	01	DRVR	NONE	27	M	OR-Y	047,080	017	01
N	N	N	N	N	SU	SANDY UA	22.17		UN	(NONE)	TRF SIGNAL	N	ICE	SS-M			SH-NE	01	DRVR	NONE	27	M	OR-Y	047,080	017	01	
N	N	N	N	N	9A	SANDY UA	45 24 33.18	-122 18 5.28	03	(02)		N	DAY	INT			SH-NE	01	DRVR	NONE	27	M	OR-Y	047,080	017	01	
N	N	N	N	N	45 24 33.18	-122 18 5.28		0026A0100500				N	DAY	INT			SH-NE	01	DRVR	NONE	27	M	OR-Y	047,080	017	01	

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

Highway 026 ALL ROAD TYPES, MP 22.13 to 22.23 01/01/2014 to 12/31/2016, Both Add and Non-Add mileage

22 - 26 of 26 Crash records shown.

SER#	P	R	S	N	D	DATE	COUNTY	CITY	RD#	FC	CONDR	RD	CHAR	INT-TYPE	INT-REL	OFFED	WHR	CRASH	SPCL USE	TRLR	QTY	MOVE	FROM	PH	INJ	A	S	LOC	RES	LOC	ERRR	ACT	EVENT	CAUSE				
Y	N	N	N	N	Y	FR	LA	LONG	COMPNT	MILEPNT	LEGS	STREET	DIRCT	(MEDIAN)	TRAF-	DRVY	LIGHT	SURTY	USE	TYPE	OWNER	TO	TYPE	SVRTY	E	X	RES	LOC	ERRR	ACT	EVENT	CAUSE						
00139	Y	N	N	N	01/08/2016	CLACKAMAS			1	16																												
						FR			0																													
						12A	SANDY UA	-122 18 5.28	22.17																													
						45 24 33.18			0026A0100500																													
01323	Y	N	N	N	03/20/2016	CLACKAMAS			1	16																												
						FR			0																													
						5P	SANDY UA	-122 18 5.28	22.17																													
						45 24 33.18			0026A0100500																													
05886	N	N	N	12/15/2016	CLACKAMAS				1	16																												
						FR			0																													
						12P	SANDY UA	-122 18 5.28	22.17																													
						45 24 33.18			0026A0100500																													
01169	N	N	N	04/03/2015	CLACKAMAS				1	16																												
						FR			0																													
						1A	SANDY UA	-122 18 5.28	22.17																													
						45 24 33.18			0026A0100500																													

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## Left-Turn Lane Warrant Analysis (ODOT Methodology)



Project Name: Sandy Space Age

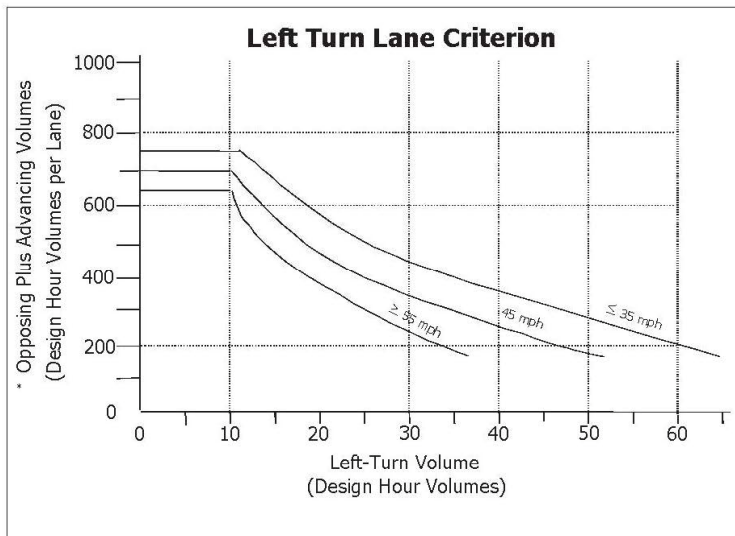
Approach: Northbound Orient Drive at Crescent Road

Scenario: 2020 Background Plus Site Trips

Number of Advancing Lanes: 1  
 Number of Opposing Lanes: 1  
 Major-Street Design Speed: 55 mph

	AM Volume	PM Volume
Advancing Volume for Design Hour:	243	262
Opposing Volume for Design Hour:	154	233
Design Hour Volume Per Lane:	397	495
Number of Left Turns per Hour:	88	99
Left-turn lane warrants satisfied?	<b>YES</b>	<b>YES</b>

**Exhibit 7-1 Left Turn Lane Criterion (TTI)**



\* (Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)





21370 SW Langer Farms Pkwy  
Suite 142, Sherwood, OR 97140



**Technical Memorandum**

**To:** Ken Kent, Clackamas County  
**From:** Michael Ard, PE  
**Date:** March 5, 2019  
**Re:** Sandy Space Age Site Access – Request for Modification to Clackamas County Road Standards

This memorandum is written to provide information related to our request for modification to the Clackamas County Roadway Standards for a proposed site access that will serve the proposed Space Age fuel station on the west side of SE Orient Drive north of Oregon Highway 26 in Sandy, Oregon.

The subject property is located on the west side of SE Orient Drive south of SE Crescent Road and north of Highway 26 within the city limits of the City of Sandy. A detailed traffic impact study was also prepared for the project; however, this supplemental memorandum provides additional information and analysis related to the request for a right-in, right-out access on SE Orient Drive, which is classified by Clackamas County as a Minor Arterial roadway.

***REASON FOR REQUEST AND DESCRIPTION OF REQUEST***

SE Orient Drive is classified by Clackamas County as a Minor Arterial and has a basic rule speed limit of 55 mph. Clackamas County Roadway Standards require that access shall generally be provided from streets with lower functional classification except where Engineering determines that safety dictates an alternative access scenario. County standards also prohibit access to a Minor Arterial within 300 feet of an existing traffic signal.

In this instance, the subject property has frontage on both SE Orient Drive (Minor Arterial) and SE Crescent Road (Local Street). Accordingly, access is required to be taken via SE Crescent Drive. However, due to the nature of the proposed use and the size of the vehicles that will utilize the site, a second point of access is needed for safe circulation.

Based on the trip generation calculations (as reported in the Traffic Impact Study dated January 14, 2019), the proposed fuel station and convenience store are projected to result in 3,286 total daily site trips. Notably, for developments without alternative access to a lower-classification roadway, Clackamas County's Roadway Standards allow up to two points of access for developments serving between 2,500 and 5,000 vehicles per day (Section 220.9 Table 2-4). Thus, the county has recognized that the needs of developments of this scale may exceed what can reasonably be accommodated with a single point of access.

In order to maximize access to the lower-classification roadway at the north side of the site, the proposed site plan includes a full-movement access on SE Crescent Road. However, this single point of access will



not adequately serve the needs of large trucks circulating within the site. Specifically, due to the nature of the development which includes a fuel station and convenience store, it is necessary to accommodate the vehicles that will deliver fuel and goods for sale within the store. Based on analysis of the turning movements associated with fuel trucks and tractor-trailers, the site cannot safely accommodate these vehicles turning around within the site to return to SE Crescent Road for egress. Specifically, trucks delivering fuel for the station would be expected to trailer through the fuel pumps (in addition to passing through areas where cars are expected to park while fueling) when attempting to turn around within the site. Large tractor-trailer trucks delivering food, beverages and other goods for sale have even more difficulty making the required turn-around maneuver. Additionally, large trucks attempting to exit the site via the driveway on SE Crescent Road to SE Orient Drive southbound would be expected to trailer through the on-site water-quality facility. Accordingly, two points of access will be needed to safely serve the proposed development. Diagrams showing attempted turn-around maneuvers by these design vehicles are included in the attached technical appendix.

Prior to considering a direct access to SE Orient Drive, it is appropriate to determine whether two points of access can reasonably be provided on the lower-classification street. SE Crescent Road is a local street extending west from SE Orient Drive toward Oregon Highway 26. The local street is not intended or expected to ever intersect the state highway due to the potential safety and operational impacts of additional access to this high-speed and high-volume state highway facility. Accordingly, SE Crescent Road is limited to acting as a short dead-end street.

The proposed development includes two necessary features that further constrain access to the site. These consist of a water-quality facility on the south side of SE Crescent Road immediately west of SE Orient Drive and a septic field on the south side of the Crescent Drive right-of way adjacent to Highway 26. Both facilities are necessary in order to develop the site.

In addition to the on-site constraints affecting access via SE Crescent Road, operational and safety concerns arise if an access is located too close to SE Orient Drive. As trucks exit the site and turn from SE Crescent Road onto SE Orient Drive, they either must travel across both lanes on SE Crescent Drive or trailer well off the surface of the roadway and through the on-site water quality facility. With sufficient separation between the access driveway and SE Orient Drive the impacts of trailering are reduced. However, providing this increased separation between the driveway and SE Orient Drive makes it infeasible to provide a second driveway on SE Crescent Road. Without relocation of the driveway trucks could not reasonably trailer through the water quality facility and this would obstruct all traffic on SE Crescent Road. Given the relatively high site traffic volumes, such obstructions are likely to lead to occasional queues on SE Orient Drive as vehicles wait to turn toward the project site, impacting the flow of through traffic along the Minor Arterial.



Based on examination of the limitations of potential access onto SE Crescent Road, only one driveway is recommended on this local street. Notably, if the single point of access is not used for exiting trucks the turning radii are increased since entering vehicles utilize the outside lanes and trailering is minimized. Trucks entering the site can wait within the turn lane on SE Orient Drive for SE Crescent Road to clear prior to entering.

Since adding a second driveway on SE Crescent Drive is not feasible, the necessary second site access is proposed to be located on SE Orient Drive. This design approach has a secondary benefit in reducing the potential for conflicts between trucks and passenger vehicles exiting the site, since most vehicles would be expected to exit directly via the right-out driveway onto SE Orient Drive. In order to limit the safety and operational impacts of the proposed second access, it is designed to be located more than 300 feet from the signalized intersection of Highway 26 at SE Orient Drive and outside the projected 95<sup>th</sup> percentile queue length, as well as more than 300 feet from the public intersection of SE Orient Drive at SE Crescent Road. The proposed second access would be restricted to right-in, right-out only in order to accommodate the necessary turning movements for large trucks without creating additional conflicts. An additional diagram showing circulation of the critical WB67 truck into, within and out from the site using the proposed access configuration is also included in the attached technical appendix. This movement is easily made without the need for backing maneuvers within the site, and without conflicts in the areas in front of the convenience store and at vehicle fueling positions.

Given the limited area of the project site and the need to provide for on-site parking and circulation, the proposed access to SE Orient Drive also requires a variance to Clackamas County throat length standards. For typical driveways, Clackamas County requires a minimum throat length of 20 feet; however, for driveways accommodating trucks a minimum throat length of 50 feet is requested.

In this instance, the 20-foot throat length is achievable, but a 50-foot throat length would obstruct access and thereby eliminate the south parking area along the east side of the proposed convenience store and obstruct the movement of trucks and passenger vehicles through the site. A diagram showing extension of the throat length to 50 feet is included in the attached appendix. The diagram shows that the extended throat would result in a narrow navigable neck between the edge of the driveway throat and the nearest fuel pump which would be difficult for passenger vehicles to navigate, and impossible for trucks with trailers to navigate. High numbers of truck trips are not anticipated at the site (approximately one per day); however, it is essential that these vehicles be able to safely navigate to and from the site. Given the significant detrimental impacts associated with construction of a 50-foot throat length and the minimal volume of truck trips using the access, a modification is requested to permit a 20-foot throat length for the driveway on SE Orient Drive.



### ***COMPARISONS***

The intent of restricting access to Minor Arterial roadways is to decrease the number of conflict points on higher-volume and higher-speed roadways to improve safety and efficiency. In this instance the concerns regarding through vehicle speeds and conflicts at the second proposed access location are reduced in two ways. First, the access is located near a horizontal curve and signalized intersection, both of which limit the expected speeds of through vehicles to less than the 55-mph basic rule speed for the roadway. Second, since the proposed access is limited to right-in, right-out only, the number and type of potential conflicts is reduced to one diverging conflict for vehicles turning from SE Orient Drive into the site access and one merging conflict for vehicles exiting the site onto SE Orient Drive. The restriction of the driveway to right-in, right-out only is proposed to be enforced by channelization of the driveway movements.

Meeting the county's access requirements would mean taking access exclusively via SE Crescent Road, resulting in all site traffic traveling through the unrestricted intersection of SE Orient Drive at SE Crescent Road. This would in turn require entering trucks to turn around within the site, exiting again via SE Crescent Road. These turning movements cannot reasonably be accommodated within the site without resulting in conflicts between the vehicle trailers and the fixed fuel pump positions within the site, as well as conflicts on SE Crescent Road that may impact through traffic on SE Orient Drive. Although it is possible that the turning movements shown may be improved slightly by allowing trucks to make multi-point turns within the site, this would result in large trucks with articulated trailers limiting visibility backing directly in front of the convenience store, where frequent conflicts are expected with pedestrians, fueling vehicles and vehicles utilizing parking in front of the convenience store. Truck backing maneuvers would be expected to result in significantly increased safety risks and are therefore not recommended.

As an alternative to requiring all access to be taken via SE Crescent Road, allowing a right-in, right-out access onto SE Orient Drive south of SE Crescent Road would allow large trucks to enter the site via SE Crescent Road and exit directly onto SE Orient Drive. Adequate sight lines are projected to be available at both points of access to meet AASHTO intersection sight distance requirements, and the resulting ingress, circulation and egress patterns for large trucks do not require tricky maneuvering or backing maneuvers within the site.

Based on these factors, the proposed modification to allow direct access to SE Orient Drive is projected to maintain the performance, function and safety of SE Orient Drive while accommodating safe and efficient movement for vehicles and pedestrians within the project site.

As described previously, the proposed modification to allow a 20-foot throat length for the access on SE Orient Drive is necessary to provide a functional site plan that allows both passenger vehicles and trucks to circulate within and depart the site safely and efficiently. The design avoids the need for backing maneuvers



Sandy Space Age Modification Request  
March 5, 2019  
Page 5 of 5

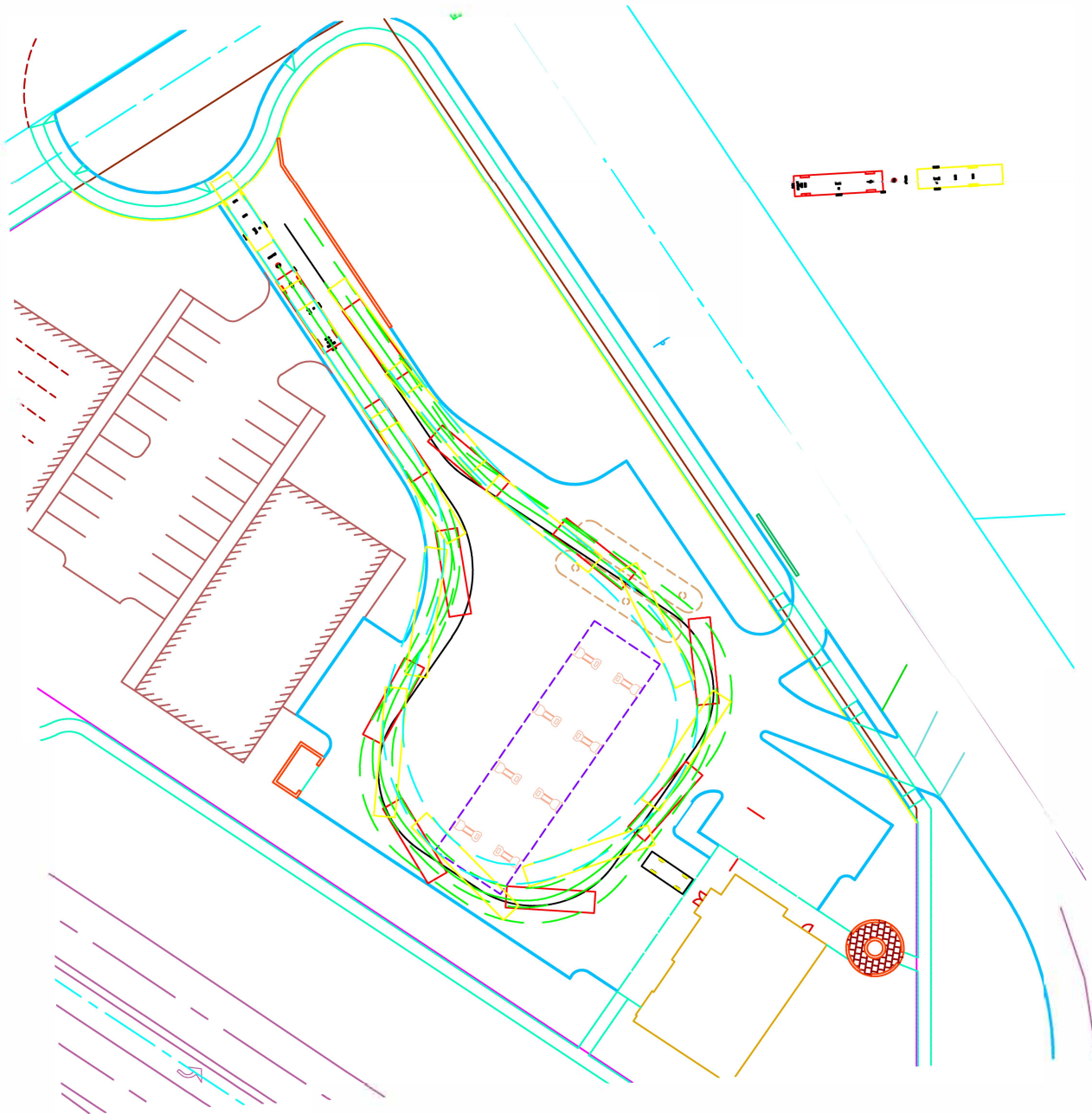
by trucks with trailers within the site, and the turning-movement diagrams show that large vehicles can safely accomplish the required turning movements.

Based on the review of the County's access requirements and the detailed examination of site needs, it is anticipated that the County may grant a modification to the adopted standards, finding that "a minor change to a standard is required to address a specific design or construction problem which, if not enacted, will result in an undue hardship."

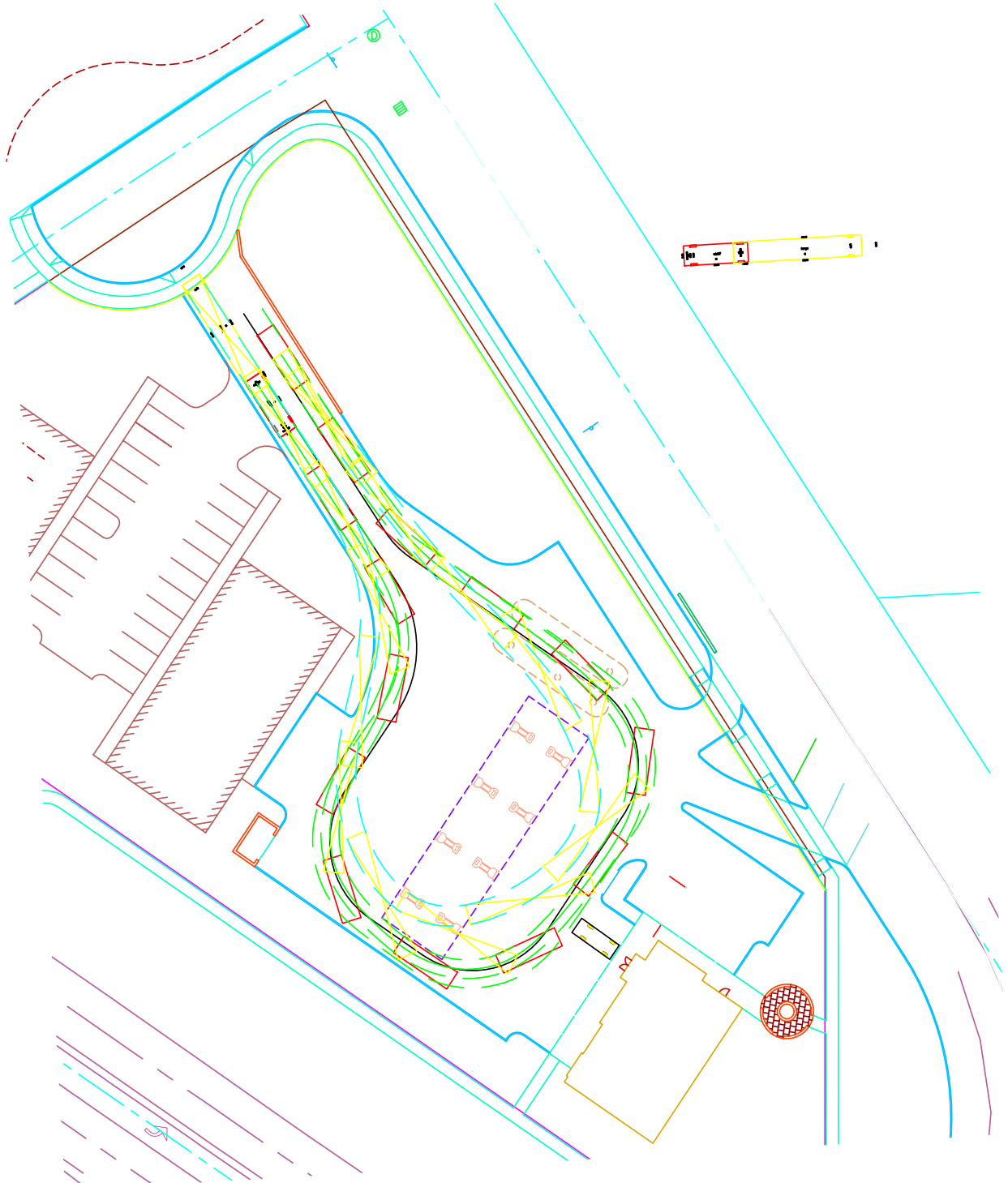
If you have any questions regarding this proposed modification or require any additional information, please feel free to contact me at 503-537-8511 or [mike.ard@gmail.com](mailto:mike.ard@gmail.com) at any time.



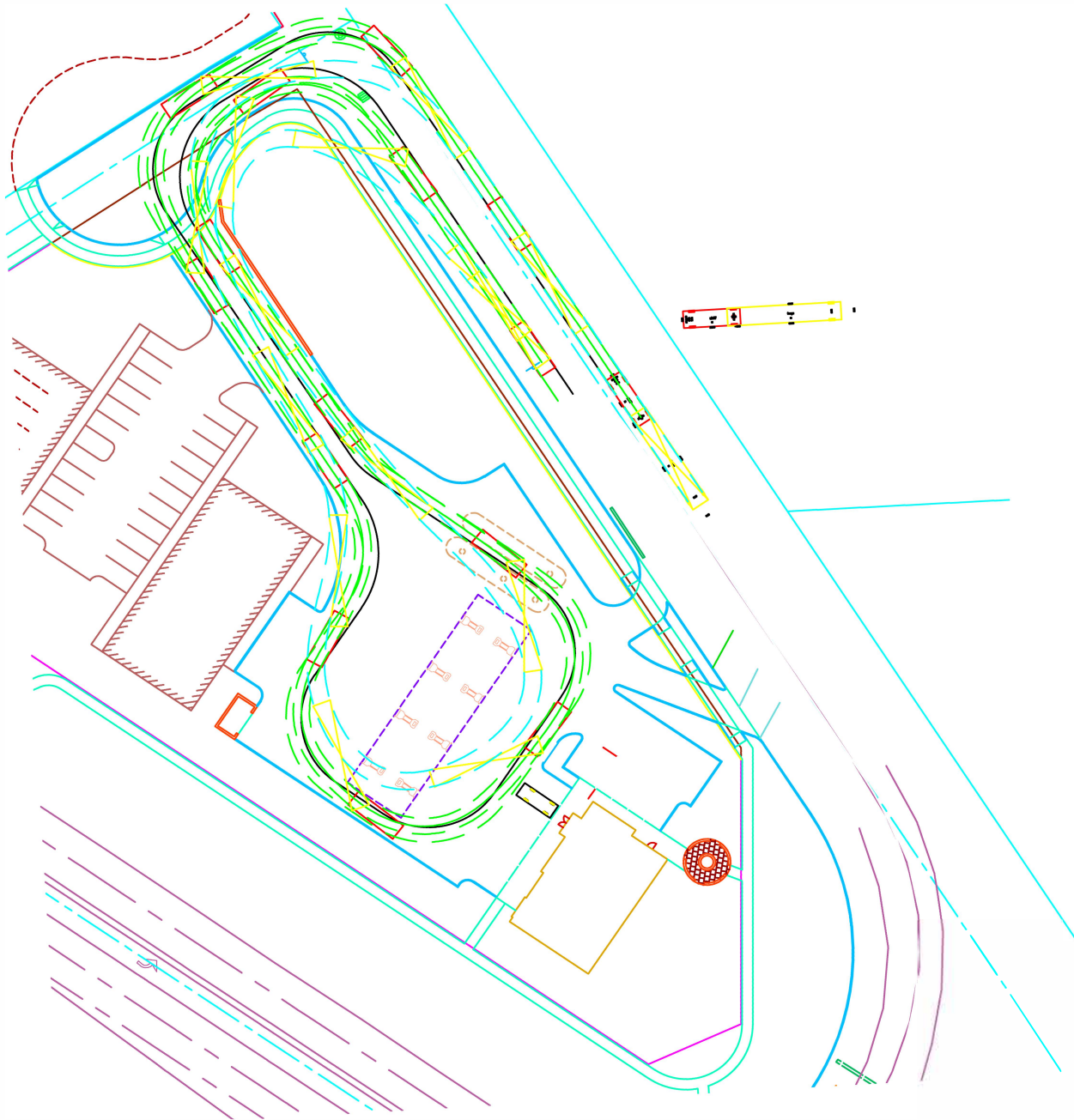
Space Age Fuel Truck and Trailer Turn-Around Within Site



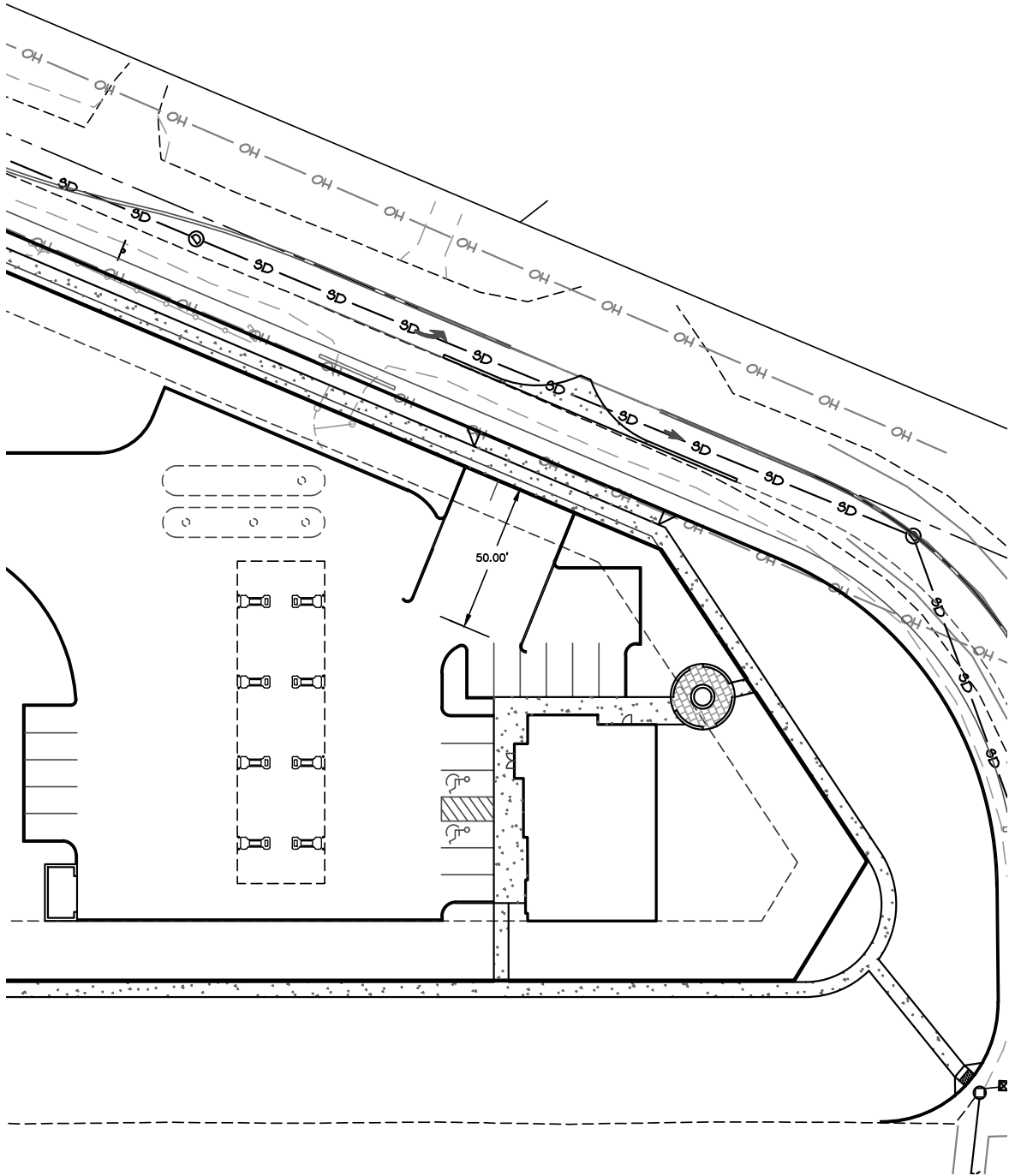
# WB-67 Turn-Around Within Site

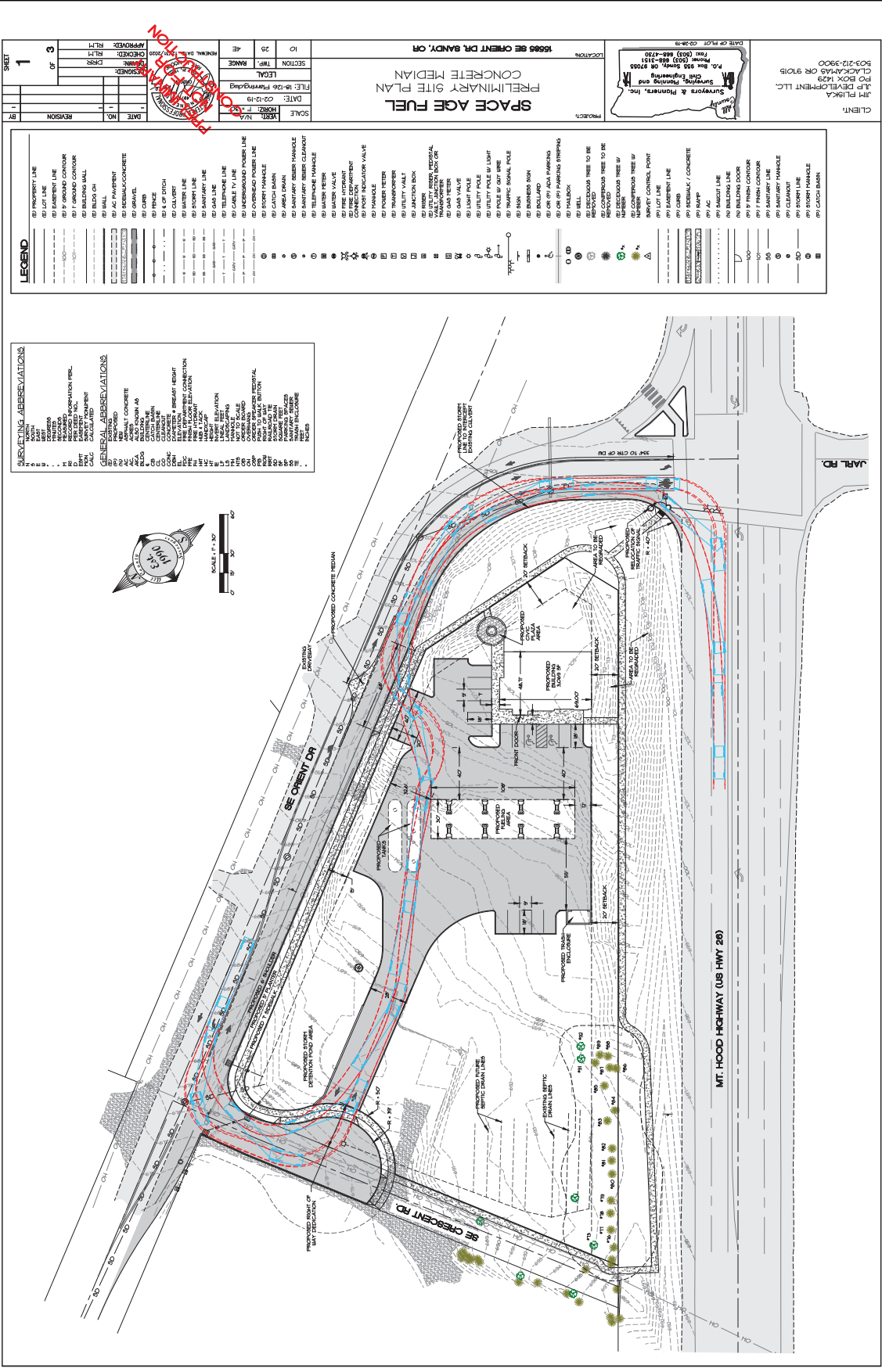


WB-67 Full Ingress, Turn-Around and Egress  
w/ Single Point of Access from Crescent Rd.



Driveway w/ 50' Throat Length





**LEGEND**

01	PROPERTY LINE
02	LOT LINE
03	ADJACENT LOT LINE
04	ADJACENT CONTOUR
05	ADJACENT CONTOUR
06	ADJACENT CONTOUR
07	ADJACENT CONTOUR
08	ADJACENT CONTOUR
09	ADJACENT CONTOUR
10	ADJACENT CONTOUR
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**GENERAL ABBREVIATIONS**

1	ADJACENT CONTOUR
2	ADJACENT CONTOUR
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100	ADJACENT CONTOUR

**CLIENTS:** JIM P. LUKA, J.P. DEVELOPMENT, LLC, 503-272-3900, CLACKAMAS OR 97105

**PROJECT:** SPACE AGE FUEL, PRELIMINARY SITE PLAN, CONCRETE MEDIAN, 15885 SE CRESENT DR, SANDY, OR

**DATE:** 02-19-19

**SCALE:** 1" = 30'

**SECTION:** 25

**DATE:** 02-19-19

**PROJECT:** SURVEYORS & PLANNERS, INC., 1000 SW 5th Ave, Suite 200, Portland, OR 97204, 503-228-3333



**SHEET 1**

NO.	DATE	REVISION
1		





**TERAGAN**  
**& ASSOCIATES, INC.**  
ARBORICULTURAL CONSULTANTS

**MEMORANDUM**

**DATE:** June 18, 2019  
**TO:** Dave Reichert (All County Surveyors & Planners)  
**FROM:** Todd Prager, RCA #597, ISA Board Certified Master Arborist  
**RE:** Tree Protection for Space Age Project

---

**Summary**

This memorandum provides a tree assessment, removal, and protection recommendations for the trees at the proposed Space Age project development.

**Background**

JLP Development Inc. is proposing to construct the Space Age development at 15585 SE Orient Drive in Sandy, Oregon. The site plan with existing trees is provide in Attachment 1 and the proposed site plan with retained trees is provided in Attachment 2.

The assignment requested of our firm for this project was as follows:

1. Provide an assessment of the existing trees;
2. Provide recommendations for tree removal and retention based on the proposed site improvements; and
3. Provide protection recommendations for the trees to be retained.

**Tree Assessment**

On November 8, 2018, I completed my assessment of the existing trees. The complete inventory data is provided in the tree inventory spreadsheet in Attachment 3. The data provided for each tree includes the tree number, species (common and scientific names), trunk diameter (DBH), tree health condition, tree structural condition, whether the tree meets the requirements to be a retention tree per Code Section 17.102.50-3, and pertinent comments. The tree numbers in the tree inventory in Attachment 3 correspond to the tree numbers on the site plan in Attachment 1.

---

*Teragan & Associates, Inc.*  
3145 Westview Circle • Lake Oswego, OR 97034  
Phone: 971.295.4835 • Fax: 503.697.1976  
Email: [todd@teragan.com](mailto:todd@teragan.com) • Website: [teragan.com](http://teragan.com)

### Proposed Tree Removal

A typical critical root zone encompasses a radius around a tree that is .5 feet per inch of DBH. For example, a tree with a 24-inch DBH would have a minimum protection radius of 12 feet. However, this standard may need to be adjusted on a case by case basis due to tree health, root distribution, species tolerance, whether the tree will be impacted on multiple sides, the specific development proposed, and other factors.

Based on the proposed construction and grading, all trees on the property except for trees 76 through 88 will be removed. Protection recommendations for the trees to be retained are provided in the next section of this report.

### Tree Protection Recommendations

The following recommendations apply to the trees to be retained:

- **Protection Fencing:** Establish tree protection fencing in the locations shown in Attachment 1. The intent of the tree protection fencing is to protect at least the critical root zone radius around each tree to be retained of .5 feet per inch of DBH (e.g. 12-foot radius around a 24-inch tree).
- **Directional Felling:** Fell the trees to be removed away from the trees to be retained so they do not contact or otherwise damage the trunks or branches of the trees to be retained. No vehicles or heavy equipment should be permitted within the tree protection zone during tree removal operations.
- **Stump Removal:** The stumps of trees 73, 74, 75, 89, 90, and 109 should be flush cut and retained in place or carefully surface ground to protect the soil and root systems of the trees to be retained.
- **Install Modified Pavement Profiles to Protect Tree Root Systems:** The proposed sidewalk in the tree protection zone needs to be constructed using a modified pavement profile under arborist supervision as shown in Figure 1.

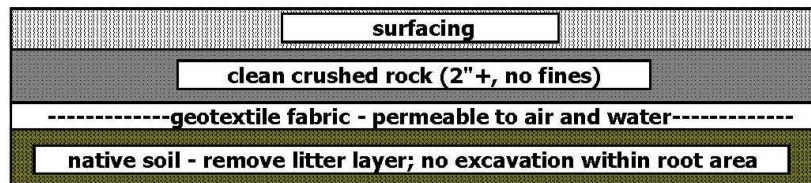


Figure 1. Sample profile for areas within Critical Root Zones. Depth of rock is dependent on grading. Technique based on best management practices.

- **Protect Crowns of Trees:** The crowns of the trees may extend beyond the tree protection fencing. Care will need to be taken to not contact or otherwise damage the crowns of the trees during construction activities. If pruning is required, it shall be the minimum amount needed to achieve the required clearance in accordance with ANSI A300 pruning standards.
- **Temporary Construction Access:** Place steel plates over a six inch layer of wood chips (or other approved method) to limit soil compaction while allowing for construction access in the tree protection zone for work on the future building.
- **Sediment Fencing:** Sediment fencing shall be installed outside the protection zones of the trees to be retained to minimize root disturbances. If erosion

control is required inside the protection zones, straw wattles shall be used on the soil surface.

Attachment 4 includes additional recommendations to adequately protect the trees during construction.

### **Conclusion**

All trees on the property except for trees 76 through 88 will be removed for construction of the Space Age project. The trees to be retained will be adequately protected by adhering to the recommendations in this report.

Please contact me if you have questions, concerns, or need any additional information.

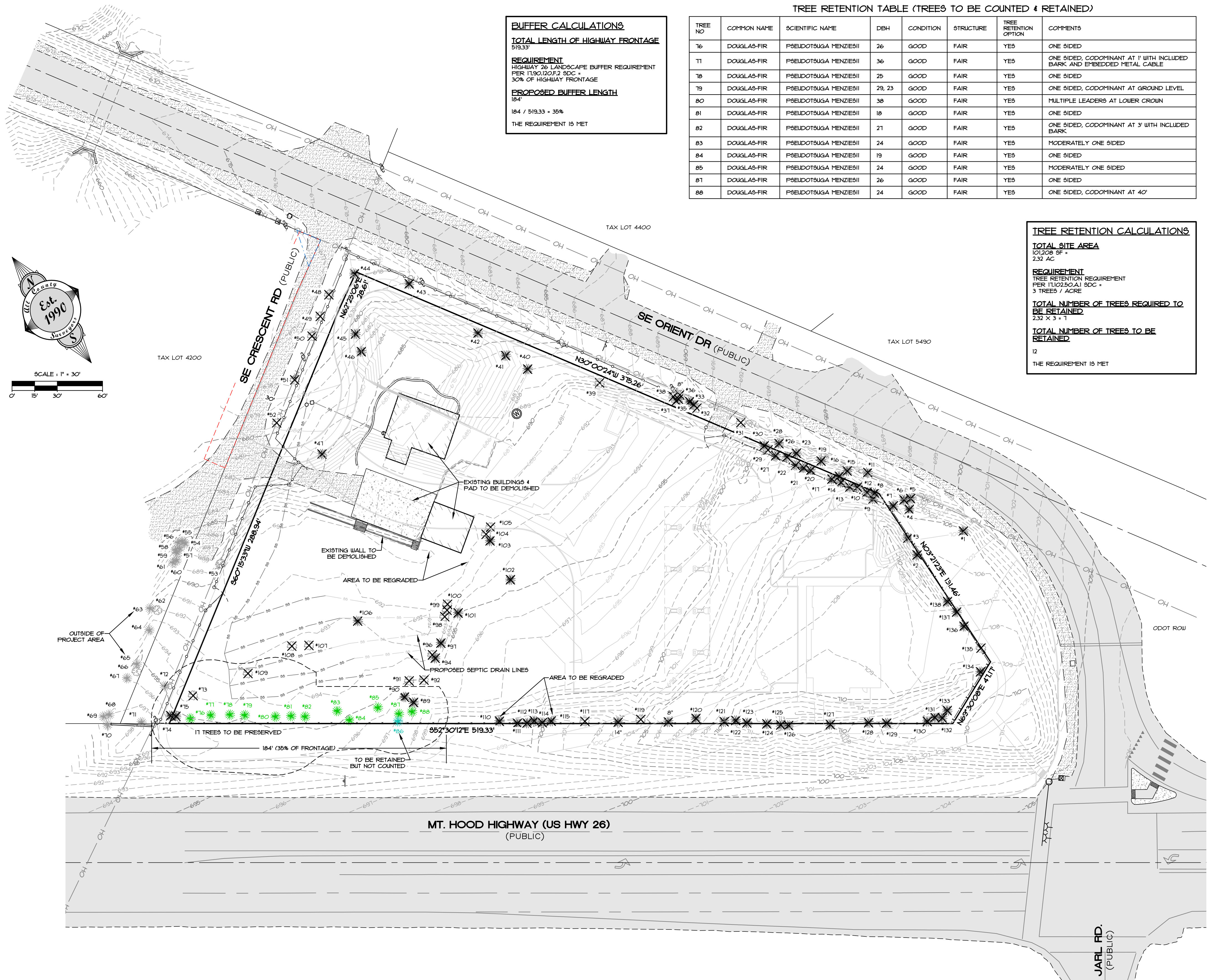
Sincerely,



Todd Prager  
*ASCA Registered Consulting Arborist #597*  
*ISA Board Certified Master Arborist, WE-6723B*  
*ISA Qualified Tree Risk Assessor*  
*AICP, American Planning Association*

Attachment 1:	Site Survey with Existing Tree Locations
Attachment 2:	Site Plan with Retained Tree Locations
Attachment 3:	Tree Inventory
Attachment 4:	Additional Tree Protection Recommendations
Attachment 5:	Assumptions and Limiting Conditions



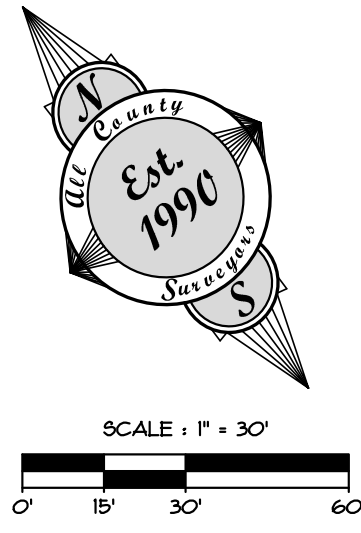


**BUFFER CALCULATIONS**  
**TOTAL LENGTH OF HIGHWAY FRONTAGE**  
 519.33'  
**REQUIREMENT**  
 HIGHWAY 26 LANDSCAPE BUFFER REQUIREMENT  
 PER 1130.020.F.2 SDC -  
 30% OF HIGHWAY FRONTAGE  
**PROPOSED BUFFER LENGTH**  
 184'  
 184 / 519.33 = 35%  
 THE REQUIREMENT IS MET

**TREE RETENTION TABLE (TREES TO BE COUNTED & RETAINED)**

TREE NO	COMMON NAME	SCIENTIFIC NAME	DBH	CONDITION	STRUCTURE	TREE RETENTION OPTION	COMMENTS
16	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	GOOD	FAIR	YES	ONE SIDED
17	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	36	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 1' WITH INCLUDED BARK AND EMBEDDED METAL CABLE
18	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	GOOD	FAIR	YES	ONE SIDED
79	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29, 23	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT GROUND LEVEL
80	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	GOOD	FAIR	YES	MULTIPLE LEADERS AT LOWER CROWN
81	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	GOOD	FAIR	YES	ONE SIDED
82	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 3' WITH INCLUDED BARK
83	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	GOOD	FAIR	YES	MODERATELY ONE SIDED
84	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	GOOD	FAIR	YES	ONE SIDED
85	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	GOOD	FAIR	YES	MODERATELY ONE SIDED
87	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	GOOD	FAIR	YES	ONE SIDED
88	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 40'

**TREE RETENTION CALCULATIONS**  
**TOTAL SITE AREA**  
 101,208 SF =  
 2.32 AC  
**REQUIREMENT**  
 TREE RETENTION REQUIREMENT  
 PER 1102.50.A1 SDC -  
 3 TREES / ACRE  
**TOTAL NUMBER OF TREES REQUIRED TO BE RETAINED**  
 2.32 X 3 =  
**TOTAL NUMBER OF TREES TO BE RETAINED**  
 12  
 THE REQUIREMENT IS MET



BY	DATE	REVISION	SHEET
			2
			OF 6
DESIGNED	DRAWN	CHECKED	APPROVED
RLT/DRR	DRR	RLT	RLT



**SPACE AGE SERVICE STATION**  
**TREE RETENTION PLAN**

**Surveyors & Planners, Inc.**  
 Surveying, Planning and  
 Civil Engineering  
 P.O. Box 955 Sandy, OR 97055  
 Phone: (503) 668-4730  
 Fax: (503) 668-4730  
 DATE OF PLOT: 06/18/19

**CLIENT:**  
 JIM FLURKA  
 JLP DEVELOPMENT LLC.  
 PO BOX 1429  
 CLACKAMAS OR 97015  
 503-212-3900

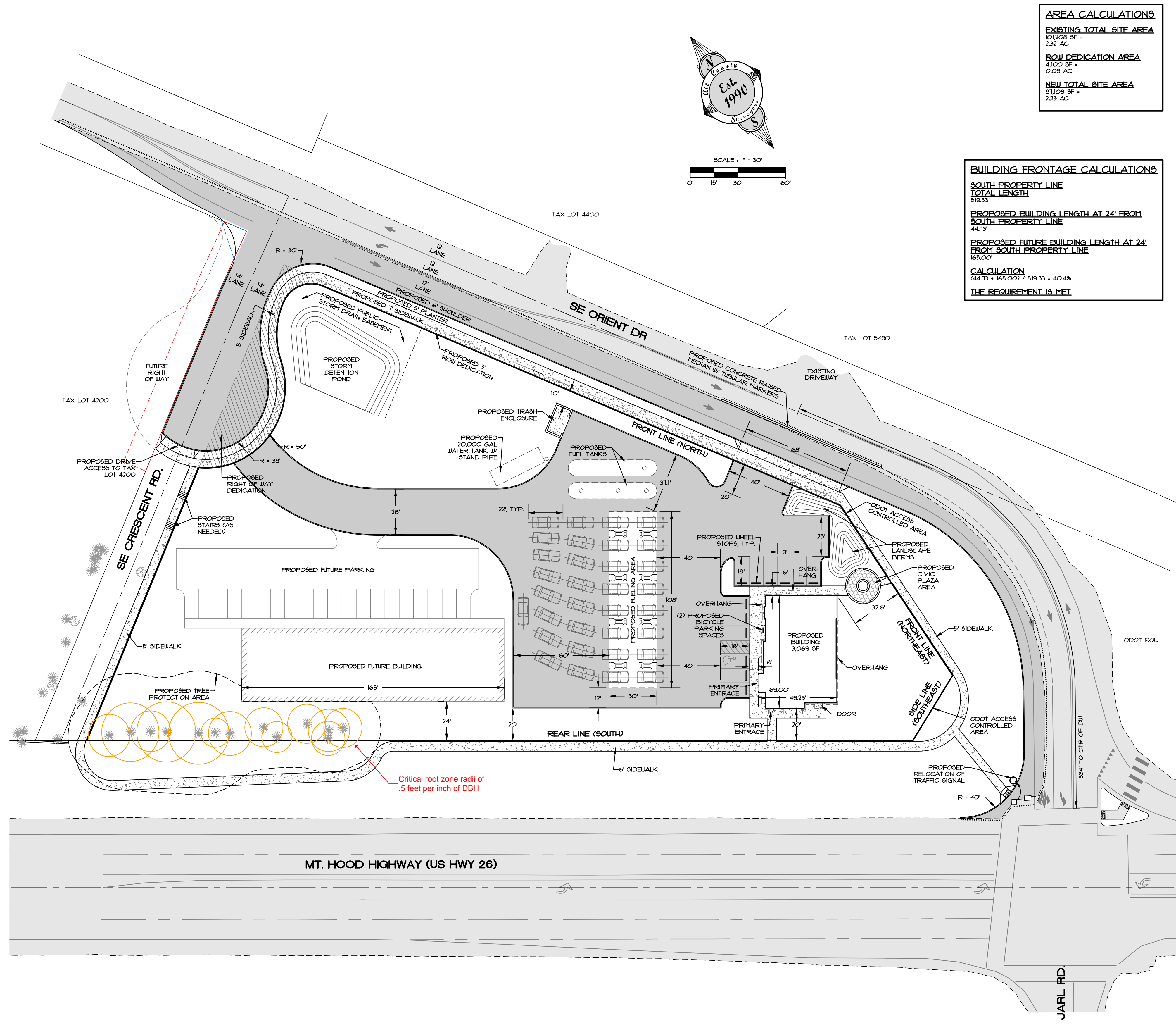
PROJECT: 15585 SE ORIENT DR, SANDY, OR 97055  
 LOCATION:

Attachment 1

PROPOSED CONSTRUCTION







AREA CALCULATIONS	
EXISTING TOTAL SITE AREA	101,208 SF = 2.32 AC
ROW DEDICATION AREA	4,100 SF = 0.09 AC
NEW TOTAL SITE AREA	97,108 SF = 2.23 AC

BUILDING FRONTAGE CALCULATIONS	
SOUTH PROPERTY LINE TOTAL LENGTH	519.33'
PROPOSED BUILDING LENGTH AT 24' FROM SOUTH PROPERTY LINE	44.13'
PROPOSED FUTURE BUILDING LENGTH AT 24' FROM SOUTH PROPERTY LINE	165.00'
CALCULATION	$(44.13 + 165.00) / 519.33 = 40.4\%$
THE REQUIREMENT IS MET.	

DATE	NO.	REVISION	BY



SCALE	VERT. SCALE	HORIZ. SCALE	DATE	FILE	SECTION	TWP.	RANGE	LEGAL
	N/A	1" = 30'	06-18-19	18-126 Planning.dwg	10	25	4E	

PROJECT: **SPACE AGE SERVICE STATION SITE PLAN**

LOCATION: **15585 SE ORIENT DR, SANDY, OR 97055**

**Surveyors & Planners, Inc.**  
Surveying, Planning and Engineering  
P.O. Box 955 Sandy, OR 97055  
Tel: (503) 668-4730  
Fax: (503) 668-4730  
DATE OF PLOT: 06-18-19

CLIENT:  
JIM FLISKA  
JLP DEVELOPMENT LLC,  
P.O. BOX 1429  
CLACKAMAS OR 97015  
503-212-3900

Attachment 2



Attachment 3

Tree No	Common Name	Scientific Name	DBH <sup>1</sup>	Condition <sup>2</sup>	Structure <sup>2</sup>	Tree Retention Option <sup>3</sup>	Comments
1	Douglas-fir	<i>Pseudotsuga menziesii</i>	42	good	good	YES	
2	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	good	fair	YES	moderately one sided
3	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	good	good	YES	
4	Douglas-fir	<i>Pseudotsuga menziesii</i>	8	fair	fair	YES	excessive competition due to overstocking
5	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	fair	fair	YES	excessive competition due to overstocking
6	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	fair	fair	YES	excessive competition due to overstocking
7	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	fair	fair	YES	excessive competition due to overstocking
8	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	fair	fair	YES	excessive competition due to overstocking
9	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	fair	fair	YES	excessive competition due to overstocking
10	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	fair	fair	YES	codominant at 1', excessive competition due to overstocking
11	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	good	fair	YES	one sided
12	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	fair	fair	YES	excessive competition due to overstocking
13	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	fair	fair	YES	excessive competition due to overstocking
14	Douglas-fir	<i>Pseudotsuga menziesii</i>	15	fair	fair	YES	codominant at 1', excessive competition due to overstocking
15	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	good	fair	YES	one sided
16	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	fair	fair	YES	excessive competition due to overstocking
17	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	fair	fair	YES	excessive competition due to overstocking
18	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	fair	fair	YES	excessive competition due to overstocking
19	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	fair	fair	YES	excessive competition due to overstocking
20	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	fair	fair	YES	excessive competition due to overstocking
21	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	fair	fair	YES	excessive competition due to overstocking
22	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	fair	fair	YES	excessive competition due to overstocking
23	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	fair	fair	YES	excessive competition due to overstocking
24	Douglas-fir	<i>Pseudotsuga menziesii</i>	8	fair	fair	YES	excessive competition due to overstocking
25	red alder	<i>Alnus rubra</i>	14	fair	poor	YES	multiple leaders with included bark, excessive competition due to overstocking
26	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	fair	fair	YES	excessive competition due to overstocking
27	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	fair	fair	YES	excessive competition due to overstocking
28	Douglas-fir	<i>Pseudotsuga menziesii</i>	18	good	fair	YES	moderately one sided

Teragan Associates, Inc.  
3145 Westview Circle • Lake Oswego, OR 97034  
Phone: 971.295.4835 • Fax: 503.697.1976  
Email: todd@teragan.com • Website: teragan.com



Attachment 3

Tree No	Common Name	Scientific Name	DBH <sup>1</sup>	Condition <sup>2</sup>	Structure <sup>2</sup>	Tree Retention Option <sup>3</sup>	Comments
29	bigleaf maple	<i>Acer macrophyllum</i>	18	fair	fair	YES	one sided, codominant at 3' with included bark
30	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	fair	fair	YES	excessive competition due to overstocking
31	red alder	<i>Alnus rubra</i>	11,10,8	fair	poor	YES	multiple leaders at ground level, decay present in stems
32	black cottonwood	<i>Populus trichocarpa</i>	13	good	fair	YES	one sided
33	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	fair	fair	YES	excessive competition due to overstocking
34	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	fair	fair	YES	excessive competition due to overstocking
35	Douglas-fir	<i>Pseudotsuga menziesii</i>	8	fair	fair	YES	excessive competition due to overstocking
36	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	fair	fair	YES	excessive competition due to overstocking
37	red alder	<i>Alnus rubra</i>	12	fair	poor	YES	multiple leaders with included bark, excessive competition due to overstocking
38	red alder	<i>Alnus rubra</i>	9	fair	poor	YES	multiple leaders with included bark, excessive competition due to overstocking
39	red alder	<i>Alnus rubra</i>	15	fair	good	YES	moderately thin crown
40	Douglas-fir	<i>Pseudotsuga menziesii</i>	67	good	fair	YES	multiple leaders at 1'
41	Douglas-fir	<i>Pseudotsuga menziesii</i>	45	good	fair	YES	moderately one sided
42	Douglas-fir	<i>Pseudotsuga menziesii</i>	54	good	fair	YES	moderately one sided
43	Douglas-fir	<i>Pseudotsuga menziesii</i>	47	good	fair	YES	codominant at 35'
44	western red cedar	<i>Thuja plicata</i>	36	good	fair	YES	significant ivy growth on trunk, multiple leaders at 25'
45	western red cedar	<i>Thuja plicata</i>	17	good	fair	YES	multiple leaders at 2'
46	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	good	good	YES	
47	Douglas-fir	<i>Pseudotsuga menziesii</i>	54	good	good	YES	
48	ornamental cherry	<i>Prunus sp.</i>	9	fair	fair	YES	headed for overhead utilities
49	ornamental cherry	<i>Prunus sp.</i>	16	fair	fair	YES	headed for overhead utilities
50	ornamental cherry	<i>Prunus sp.</i>	11	fair	fair	YES	headed for overhead utilities
51	ornamental cherry	<i>Prunus sp.</i>	14	fair	fair	YES	headed for overhead utilities
52	ornamental cherry	<i>Prunus sp.</i>	12	fair	fair	YES	headed for overhead utilities
53	ornamental cherry	<i>Prunus sp.</i>	14	fair	fair	YES	headed for overhead utilities
54	Douglas-fir	<i>Pseudotsuga menziesii</i>	23	good	fair	YES	one sided

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Phone: 971.295.4835 • Fax: 503.697.1976  
Email: todd@teragan.com • Website: teragan.com



Attachment 3

Tree No	Common Name	Scientific Name	DBH <sup>1</sup>	Condition <sup>2</sup>	Structure <sup>2</sup>	Tree Retention Option <sup>3</sup>	Comments
55	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	fair	poor	YES	overtopped by adjacent trees
56	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	good	fair	YES	one sided
57	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	good	fair	YES	one sided
58	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	fair	poor	YES	overtopped by adjacent trees
59	Douglas-fir	<i>Pseudotsuga menziesii</i>	18	good	fair	YES	one sided
60	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	good	fair	YES	one sided
61	Douglas-fir	<i>Pseudotsuga menziesii</i>	20	good	fair	YES	one sided
62	bigleaf maple	<i>Acer macrophyllum</i>	18	fair	fair	YES	one sided, multiple leaders
63	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	fair	fair	YES	overtopped by adjacent trees
64	Douglas-fir	<i>Pseudotsuga menziesii</i>	44	good	fair	YES	one sided, codominant at 2'
65	Douglas-fir	<i>Pseudotsuga menziesii</i>	27	good	fair	YES	one sided, codominant at 4' with included bark
66	sweet cherry	<i>Prunus avium</i>	12	poor	poor	YES	suppressed
67	Douglas-fir	<i>Pseudotsuga menziesii</i>	17	good	fair	YES	one sided
68	Douglas-fir	<i>Pseudotsuga menziesii</i>	27	good	fair	YES	one sided
69	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	fair	fair	YES	overtopped by adjacent trees
70	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	fair	fair	YES	overtopped by adjacent trees
71	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	poor	poor	YES	topped for overhead utilities
72	Douglas-fir	<i>Pseudotsuga menziesii</i>	17	poor	poor	YES	topped for overhead utilities
73	red alder	<i>Alnus rubra</i>	21	very poor	very poor	YES	extensive dieback and decay
74	Douglas-fir	<i>Pseudotsuga menziesii</i>	17	poor	poor	YES	topped for overhead utilities
75	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	poor	poor	YES	topped for overhead utilities
76	Douglas-fir	<i>Pseudotsuga menziesii</i>	26	good	fair	YES	one sided
77	Douglas-fir	<i>Pseudotsuga menziesii</i>	36	good	fair	YES	one sided, codominant at 1' with included bark and embedded metal cable
78	Douglas-fir	<i>Pseudotsuga menziesii</i>	25	good	fair	YES	one sided
79	Douglas-fir	<i>Pseudotsuga menziesii</i>	29,23	good	fair	YES	one sided, codominant at ground level
80	Douglas-fir	<i>Pseudotsuga menziesii</i>	38	good	fair	YES	multiple leaders at lower crown
81	Douglas-fir	<i>Pseudotsuga menziesii</i>	18	good	fair	YES	one sided
82	Douglas-fir	<i>Pseudotsuga menziesii</i>	27	good	fair	YES	one sided, codominant at 3' with included bark

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Attachment 3

Tree No	Common Name	Scientific Name	DBH <sup>1</sup>	Condition <sup>2</sup>	Structure <sup>2</sup>	Tree Retention Option <sup>3</sup>	Comments
83	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	good	fair	YES	moderately one sided
84	Douglas-fir	<i>Pseudotsuga menziesii</i>	19	good	fair	YES	one sided
85	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	good	fair	YES	moderately one sided
86	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	fair	fair	YES	one sided, overtopped by adjacent trees
87	Douglas-fir	<i>Pseudotsuga menziesii</i>	26	good	fair	YES	one sided
88	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	good	fair	YES	one sided, codominant at 40'
89	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	fair	fair	YES	one sided, overtopped by adjacent trees
90	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	fair	fair	YES	one sided, overtopped by adjacent trees
91	red alder	<i>Alnus rubra</i>	12,11	very poor	very poor	YES	extensive dieback and decay
92	red alder	<i>Alnus rubra</i>	16	fair	fair	YES	one sided, moderately thin crown
93	sweet cherry	<i>Prunus avium</i>	16	good	fair	YES	one sided
94	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	fair	fair	YES	one sided, overtopped by adjacent trees
95	Douglas-fir	<i>Pseudotsuga menziesii</i>	16,13	poor	poor	YES	codominant at ground level, dieback and decay
96	n/a	n/a	n/a	n/a	n/a	NO	not used
97	Douglas-fir	<i>Pseudotsuga menziesii</i>	20	good	good	YES	
98	red alder	<i>Alnus rubra</i>	13	fair	fair	YES	one sided
99	red alder	<i>Alnus rubra</i>	17	fair	fair	YES	one sided
100	red alder	<i>Alnus rubra</i>	12	poor	poor	YES	significant decay in mid trunk
101	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	good	fair	YES	moderately one sided
102	western red cedar	<i>Thuja plicata</i>	20	good	fair	YES	codominant at 2' with included bark
103	Douglas-fir	<i>Pseudotsuga menziesii</i>	27	good	good	YES	
104	red alder	<i>Alnus rubra</i>	16,9	poor	poor	YES	overtopped by adjacent trees, dieback and decay, codominant at ground level with included bark
105	red alder	<i>Alnus rubra</i>	16	poor	poor	YES	history of branch failure
106	Douglas-fir	<i>Pseudotsuga menziesii</i>	31	good	fair	YES	codominant at 20' with included bark
107	sweet cherry	<i>Prunus avium</i>	18	poor	poor	YES	multiple leaders with decay
108	sweet cherry	<i>Prunus avium</i>	21	poor	poor	YES	multiple leaders with decay

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Attachment 3

Tree No	Common Name	Scientific Name	DBH <sup>1</sup>	Condition <sup>2</sup>	Structure <sup>2</sup>	Tree Retention Option <sup>3</sup>	Comments
109	sweet cherry	<i>Prunus avium</i>	11	poor	poor	YES	multiple leaders with decay
110	Douglas-fir	<i>Pseudotsuga menziesii</i>	18	good	fair	YES	moderately one sided
111	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	good	fair	YES	moderately one sided
112	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	good	fair	YES	moderately one sided
113	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	good	fair	YES	moderately one sided
114	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	fair	fair	YES	excessive competition
115	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	good	fair	YES	moderately one sided, codominant at 20'
116	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	good	fair	YES	one sided
117	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	good	fair	YES	one sided
118	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	good	fair	YES	moderately one sided
119	sweet cherry	<i>Prunus avium</i>	18	fair	fair	YES	multiple leaders
120	Douglas-fir	<i>Pseudotsuga menziesii</i>	34	good	good	YES	
121	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	good	fair	YES	one sided
122	Douglas-fir	<i>Pseudotsuga menziesii</i>	18	good	fair	YES	one sided
123	Douglas-fir	<i>Pseudotsuga menziesii</i>	20	good	fair	YES	one sided
124	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	good	fair	YES	one sided
125	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	good	fair	YES	one sided
126	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	good	fair	YES	one sided
127	Douglas-fir	<i>Pseudotsuga menziesii</i>	12,12	good	fair	YES	codominant at ground level
128	Douglas-fir	<i>Pseudotsuga menziesii</i>	22	good	fair	YES	codominant at 20'
129	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	good	fair	YES	moderately one sided
130	Douglas-fir	<i>Pseudotsuga menziesii</i>	32	good	good	YES	
131	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	fair	poor	YES	overtopped by adjacent trees

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Attachment 3

Tree No	Common Name	Scientific Name	DBH <sup>1</sup>	Condition <sup>2</sup>	Structure <sup>2</sup>	Tree Retention Option <sup>3</sup>	Comments
132	Douglas-fir	<i>Pseudotsuga menziesii</i>	18	good	fair	YES	one sided
133	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	good	fair	YES	one sided
134	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	good	good	YES	
135	sweet cherry	<i>Prunus avium</i>	14,12, 6	fair	fair	YES	multiple leaders at ground level
136	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	good	fair	YES	moderately one sided
137	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	good	fair	YES	one sided
138	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	good	fair	YES	one sided

<sup>1</sup>DBH is the trunk diameter in inches measured in accordance with International Society of Arboriculture standards.

<sup>2</sup>Condition and Structure ratings range from very poor, poor, fair, to good.

<sup>3</sup>Tree meets the requirements to be a Retention Tree Per 17.102.50-3. Trees proposed for retention shall be healthy and likely to grow to maturity.

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## **Attachment 4 Tree Protection Recommendations**

### Before Construction Begins

1. Notify all contractors of tree protection procedures. For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection.
  - a. Hold a tree protection meeting with all contractors to explain the goals of tree protection.
  - c. Have all contractors sign memoranda of understanding regarding the goals of tree protection. The memoranda should include a penalty for violating the tree protection plan. The penalty should equal the resulting fines issued by the local jurisdiction plus the appraised value of the tree(s) within the violated tree protection zone per the current Trunk Formula Method as outlined in the current edition of the *Guide for Plant Appraisal* by the Council of Tree & Landscape Appraisers. The penalty should be paid to the owner of the property.
2. Fencing
  - a. Trees to remain on site should be protected by installation of tree protection fencing as shown in Attachment 2.
  - b. The fencing should be put in place before the ground is cleared in order to protect the trees and the soil around the trees from disturbances.
  - c. Fencing should be established by the project arborist based on the needs of the trees to be protected and to facilitate construction.
  - d. Fencing should consist of 6-foot high steel fencing on concrete blocks or 6-foot metal fencing secured to the ground with 8-foot metal posts placed no farther than ten feet apart to prevent it from being moved by contractors, sagging, or falling down.
  - e. Fencing should remain in the position that is established by the project arborist and not be moved without approval from the project arborist until final project approval.
3. Signage
  - a. All tree protection fencing should have signage as follows so that all contractors understand the purpose of the fencing:

#### **TREE PROTECTION ZONE**

**DO NOT REMOVE OR ADJUST THE LOCATION OF THIS  
TREE PROTECTION FENCING  
UNAUTHORIZED ENCROACHMENT MAY RESULT IN FINES**

Please contact the project arborist if alterations to the location of the tree protection fencing are necessary.

Todd Prager, Project Arborist, Teragan & Associates, 971-295-4835

- b. Signage should be placed every 75-feet or less.

---

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### During Construction

1. Protection Guidelines Within the Tree Protection Zones:
  - a. No new buildings; grade change or cut and fill, during or after construction; new impervious surfaces; or utility or drainage field placement should be allowed within the tree protection zones.
  - b. No traffic should be allowed within the tree protection zones. This includes but is not limited to vehicle, heavy equipment, or even repeated foot traffic.
  - c. No storage of materials including but not limiting to soil, construction material, or waste from the site should be permitted within the tree protection zones. Waste includes but is not limited to concrete wash out, gasoline, diesel, paint, cleaner, thinners, etc.
  - d. Construction trailers should not to be parked/placed within the tree protection zones.
  - e. No vehicles should be allowed to park within the tree protection zones.
  - f. No other activities should be allowed that will cause soil compaction within the tree protection zones.
2. The trees should be protected from any cutting, skinning or breaking of branches, trunks or woody roots.
3. The project arborist should be notified prior to the cutting of woody roots from trees that are to be retained to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots should be immediately covered with soil or mulch to prevent them from drying out.
4. Trees that have woody roots cut should be provided supplemental water during the summer months.
5. Any necessary passage of utilities through the tree protection zones should be by means of tunneling under woody roots by hand digging or boring with oversight by the project arborist.
6. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

### After Construction

1. Carefully landscape the areas within the tree protection zones. Do not allow trenching for irrigation or other utilities within the tree protection zones.
2. Carefully plant new plants within the tree protection zones. Avoid cutting the woody roots of trees that are retained.
3. Do not install permanent irrigation within the tree protection zones unless it is drip irrigation to support a specific planting or the irrigation is approved by the project arborist.
4. Provide adequate drainage within the tree protection zones and do not alter soil hydrology significantly from existing conditions for the trees to be retained.
5. Provide for the ongoing inspection and treatment of insect and disease populations that are capable of damaging the retained trees and plants.
6. The retained trees may need to be fertilized if recommended by the project arborist.
7. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

**Attachment 5**  
**Assumptions and Limiting Conditions**

1. Any legal description provided to the consultant is assumed to be correct. The information provided by JLP Development Inc. and their consultants was the basis of the information provided in this report.
2. It is assumed that this property is not in violation of any codes, statutes, ordinances, or other governmental regulations.
3. The consultant is not responsible for information gathered from others involved in various activities pertaining to this project. Care has been taken to obtain information from reliable sources.
4. Loss or alteration of any part of this delivered report invalidates the entire report.
5. Drawings and information contained in this report may not be to scale and are intended to be used as display points of reference only.
6. The consultant's role is only to make recommendations. Inaction on the part of those receiving the report is not the responsibility of the consultant.
7. The purpose of this report is to:
  - Provide an assessment of the existing trees;
  - Provide recommendations for tree removal and retention based on the proposed site improvements; and
  - Provide protection recommendations for the trees to be retained.

# Space Age Service Station

Convenience Store and Fuel

## Preliminary Stormwater Report

April, 2019

Prepared for:

JLP Development LLC  
Jim Pliska  
P.O. Box 1429  
Clackamas, OR 97015  
503-212-3900  
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Prepared by:

Ray Moore, P.E., P.L.S.  
Dave Reichert, L.S.I.T.  
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Phone: 503-668-3151  
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Job No. 18-126



RENEWAL DATE: 12/31/2020





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Analysis, Data, and Detention Pond Design	Appendix C
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Water Quality Details	Appendix E
USDA Custom Soil Resource Report	Appendix F

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## **Project Summary**

### **Purpose**

The purpose of this analysis is to

1. Describe existing and proposed site conditions for a proposed service station and convenience store.
2. Provide detention calculations for the 2-yr, 5-yr, 10-yr, and 25-yr storm events.
3. Describe water quality methodology.

### **Project Location and Description**

JLP Development LLC proposes to construct a Space Age service station and convenience store at 15585 SE Orient Dr., Sandy, OR 97055 (Tax Lot 4500, Map 24E10). The site is at the northwest corner of Orient Drive and Highway 26 and it is also fronted on the northwest side by SE Crescent Rd. The site consists of grass, shrubs, trees, has an existing house, garage, concrete pad, and gravel driveway. See Appendix A, Vicinity Map.

The site slopes to the northwest with slopes ranging from 4% to 17%. The study area includes the entirety of Tax Lot 4500, a portion of the adjacent Highway 26 right-of-way, half of Orient Drive along the site frontage, and the portion of Crescent Road within the area to be improved.

### **Proposed Improvements**

The proposed stormwater management system is designed to treat and detain stormwater from the 2, 5, 10 and 25 year storm events to pre-development conditions, as defined in the City of Portland Stormwater Management Manual and in the City of Sandy Municipal Code.

A new public storm main will be constructed in Orient Drive which will intercept the existing ODOT culvert at the east end of the project and convey private and public stormwater northwesterly to an existing box culvert. A new public detention pond will be constructed on site in a public easement together with a new flow control manhole in Orient Drive. Public storm drain manholes and catch basins will also be constructed in Orient Drive and Crescent Road to manage the public stormwater.

New private onsite catch basins and piping will be installed to convey private stormwater to the public lined detention pond. Also, onsite water quality measures will be constructed per the City of Portland Source Control Manual specifications for fuel dispensing facilities. Finally, a public water quality manhole will be installed downstream of the public detention pond. (See attached drawings).

The following calculations demonstrate that the total post-developed release rates from all of the design storm events will not exceed the pre-developed rates as required by the code, and that the water quality measures are more than sufficient to treat the stormwater per the applicable standards.

## Hydrograph Parameters

### Rainfall

The rainfall distribution numbers were taken from the City of Sandy Stormwater Website (<http://www.ci.sandy.or.us/Stormwater/>)

Storm Recurrence Interval	Rainfall (inches)
2 year	3.50
5 year	4.50
10 year	4.80
25 year	5.50

### Soils

Soil Type 15B—Cazedero silty clay loam, 0 to 7 percent slopes (Soil Group C)

Soil Type 15C—Cazedero silty clay loam, 7 to 12 percent slopes (Soil Group C)

The soil data is per the USDA's Web Soil Survey. The post-development soil is assumed to be the same as pre-development. (see Appendix F)

### Areas

Pre-developed area calculations are based on existing conditions. Post-developed area calculations are based on proposed designs of street widening, curbs, walkways, parking areas, etc

See Appendix B for sketches that include areas and descriptions.

Pre-Developed	
Total Area	3.38 ac
Impervious Area	0.52 ac
Pervious Area	2.86 ac
Post-Developed	
Total Area	3.38 ac
Impervious Area	1.66 ac
Pervious Area	1.72 ac



## Curve Numbers

Curve Numbers are taken from the 2016 City of Portland Stormwater Management Manual.

See Appendix D.

Description	Curve Number	Land Use Description
Pre-Developed Pervious Areas	76	Wood-Grass Combination
Post-Developed Pervious Areas	74	Lawns "Good Condition"
Impervious Areas	98	Buildings, AC, Sidewalks, etc.

## Time of Concentration

The time of concentration ( $T_c$ ) for the Pre-Developed condition was calculated using the equations and spreadsheets in the attached Appendices.

A time of concentration ( $T_c$ ) of 5 minutes was assumed for the Post-Developed condition.

Times of Concentration	
Pre-Developed	30.6 minutes
Post-Developed	5 minutes

## Hydrograph Modeling Results

Hydrographs for the drainage basins were determined using a spreadsheet based on the King County, Washington Hydrograph Program, version 4.21B, which uses the Santa Barbara Urban Hydrograph (SBUH) method.

See Appendix C

Performance Year	Pre-Developed Outflow (cfs)	Developed Outflow (cfs)	Proposed Release Rates (cfs)	Reduction in outflow from Pre-Developed to Proposed
25	1.92	3.61	1.89	2%
10	1.53	3.01	1.51	1%
5	1.37	2.76	1.32	4%
2	0.86	1.95	0.86	0%

As shown above, the proposed detention pond is oversized since the outflows have been reduced for all design storms.

## Detention Sizing Results

### Summary

The Post-Development flows are routed through the detention pond. The proposed detention pond has been designed so that the Post-Development release rates do not exceed the Pre-Developed rates for the 2-year, 5-year, 10-year, and 25-year storm events per the City of Sandy public Works Design Standards. See Detention System Summary in Appendix C.

With a proposed storage volume of 4,289 cubic feet and a depth of 2 feet, the proposed detention pond is more than adequately sized since it reduces the outflow for 3 out of the 4 design storms.

Our recommendation is that the pond be lined due its proximity to the existing drinking water well. The pond will then be designed with a perforated underdrain pipe to prevent permanent ponding below the discharge elevation.

### Orifice Tables

The orifices in the flow control manhole were designed to release the Post-Development Peak-Q's at or below the Pre-Developed Peak-Q's. See Detention System Summary in Appendix C.

Orifice	Dia. (Inches)	Height (feet)
Bottom	4.25	0.00
Top	3.98	3.00

## **Water Quality Design**

A water quality system has been designed to meet the requirements of the City and the requirements of the City of Portland Source Control Manual (SCM). The fueling area will be covered and the fueling area pavement will be isolated. Also, the fueling area stormwater will be routed through an oil/water separator, a spill control manhole, a shut-off valve, the lined detention pond, a CDS manhole, and finally a spill event shut off valve prior to entering the flow control manhole. See attached drawings.

### **Source Control Requirements**

Pursuit of Section 1.8.2 (SCM) the fueling area will be covered with a canopy with 5' minimum overhangs.

Also per Section 1.8.2 (SCM) the fueling area stormwater will be hydraulically isolated from the rest of the site. This stormwater will then be collected and for routed to an American Petroleum Type oil/water separator per SC-101 (see Appendix E).

Next, the stormwater will be routed to a Spill Control Manhole per SC-100 (see Appendix E). This is in addition to the oil/water separator and therefore above and beyond the minimum requirements of Section 1.8.2 (SCM).

Next, a shut-off valve will be installed downstream of the Spill Control Manhole and will be kept closed, and opened only to allow incidental drainage activities.

Next, the Approved Receiving System (Discharge Point) per the Definitions Section (SCM) will be the lined public stormwater detention pond.

From the pond, the stormwater will receive additional treatment via a CDS manhole (see next section) and finally pass through a spill event shut off valve per Section 1.8.2 (SCM) prior to entering the flow control manhole. This valve will typically be open and will only be shut during a spill event.

Per Section 1.4.6 (SCM) informational signage will be installed to ensure good housekeeping and to provide emergency response measures. Also, per Section 1.4.8.1 an O&M Plan for the source control facilities will be submitted with the Engineering Drawings.

### **CDS Storm Water Treatment Device**

A CDS manhole by Contech Stormwater Solutions is proposed to meet the City's requirement for water quality for the site. The developed impervious area includes AC pavement, sidewalks, and roofs. The Post-Developed impervious area is 1.72 ac.

The flow (Q) from this runoff was calculated using the rational method ( $Q=ciA$ ) where:

Q = flow (cfs)

C = runoff coefficient = 0.90 for Pavement and Roofs

I = Intensity = 0.2 inches per hour (City of Sandy Water Quality Storm for an "on-line facility")

A = Impervious Area

$$Q = (0.90) \times (0.2) \times (1.72) = 0.31 \text{ cfs}$$

The Contech Stormwater Solutions Treatment Device Model CDS2015-4-C has a treatment capacity of 0.7 cfs. Therefore, the water quality manhole shown in Appendix F will be sufficient for the site.

## **Stormwater Management Conclusion**

In accordance with the City of Sandy requirements, on-site detention has been designed to maintain existing downstream storm water runoff characteristics. The entirety of the post-developed site will drain to a new detention pond and control manhole. These calculations demonstrate that the pond is more than adequately sized.

The water quality system meets City requirements and exceeds SCM requirements for stormwater treatment.



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Appendix A  
Vicinity Map

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# SPACE AGE VICINITY MAP



*All County*  
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Appendix B

Stormwater Management Sketches

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# SPACE AGE STORMWATER MANAGEMENT

PRE-DEVELOPED CONDITION

PRE-DEVELOPED CONDITION		
TOTAL AREA	3.38 AC	
IMPERVIOUS AREA	0.52 AC	
PERVIOUS AREA	2.86 AC	
TIME OF CONCENTRATION	30.6 MIN	



SCALE : 1" = 60'

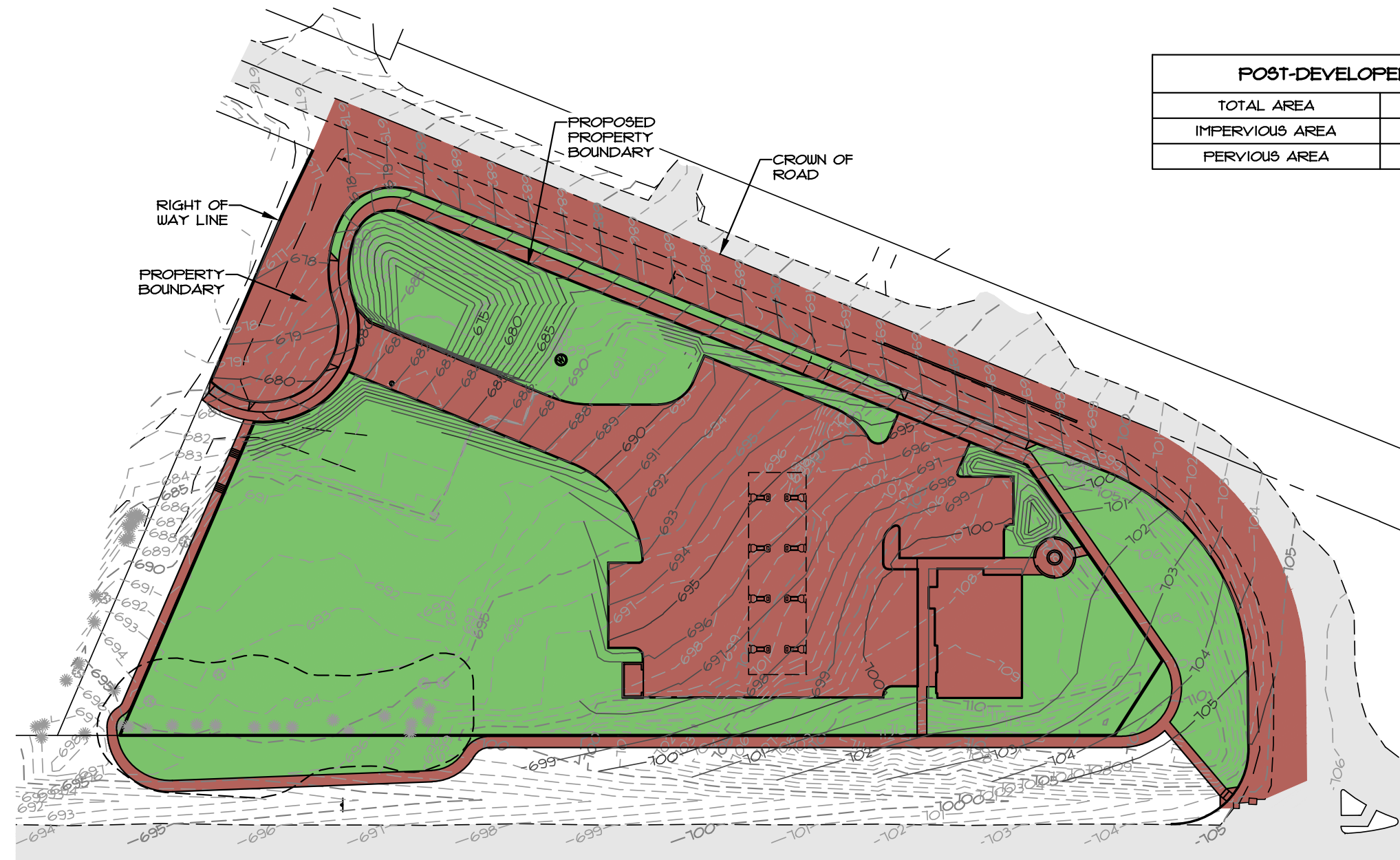
**All County Surveyors & Planners, Inc.**  
 Surveying, Planning and Civil Engineering  
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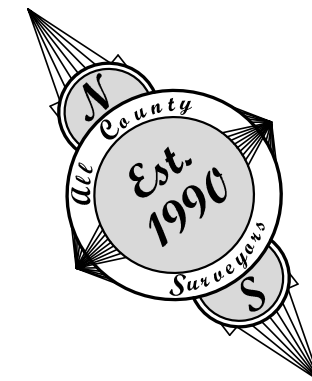
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# SPACE AGE STORMWATER MANAGEMENT

POST-DEVELOPED CONDITION



POST-DEVELOPED CONDITION		
TOTAL AREA	3.38 AC	
IMPERVIOUS AREA	1.66 AC	
PERVIOUS AREA	1.72 AC	



SCALE : 1" = 60'

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Appendix C

Analysis, Data, and Detention Pond Design

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**Project Name:** Space Age  
**Detention System Summary**

Job # 18-126  
 Date: 3/30/2019

Note: The detention system design is based on the King County Model "Facility Design Routine".

**1) Detention Facility Design Input:**

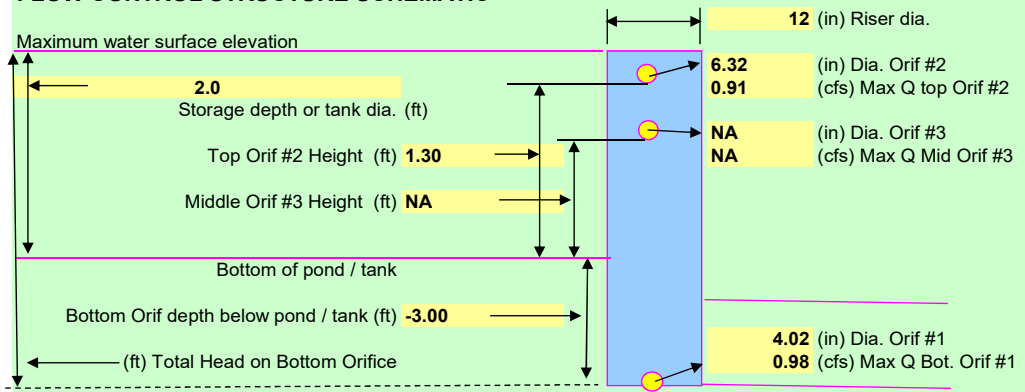
2) Type of facility:	USER	
3) Pond side slopes:	2 NA in USER mode	
<b>4) Pond storage depth:</b>	<b>2 ft (from bottom of pond to overflow)</b>	
5) Vertical permeability:	0 min/in	
6) Number of orifices:	2	
7) Riser dia. =>	12 in	
8) Orifice coefficient:	0.62 (typically 0.62)	
9) IE - bottom orifice:	-3 ft (distance below bottom of pond - Negative #)	
10) Max Q Bottom Orif. #1	0.98 cfs	
11) Top Orif #2 Height =	1.3 ft	
12) Max Q Mid Orif. #3	0.00 cfs	Orifice not being used
13) Mid Orif #3 Height =	0.00 ft	Orifice not being used

**Detention Facility Design Results:**

Performance year	Developed Inflow cfs	Pre-Developed Outflow cfs	Actual Outflow cfs	Peak Stage ft	Storage cf
25	3.61	1.92	<b>1.89</b>	2.00	4,289
10	3.01	1.53	<b>1.51</b>	1.58	3,309
5	2.76	1.37	<b>1.32</b>	1.43	2,962
2	1.95	0.86	<b>0.86</b>	0.83	1,606
Required Storage =====					4,289

Total Q =	Bottom Orif. 0.98	Middle Orif. 0.00	Top Orif. 0.91	Optional Weir Design (for top orifice)
Head (ft) =	5.00	0.00	0.70	0.74 La (ft)
Dist. from bottom of pond (ft) =	-3.00	NA	1.30	85.24 < deg.
Orif. Dia. (in) =	4.02	0.00	6.32	Weir is an option

**FLOW CONTROL STRUCTURE SCHEMATIC**



**Project Name:** Space Age

## Detention Facility Type

Job # 18-126  
Date: 3/30/2019

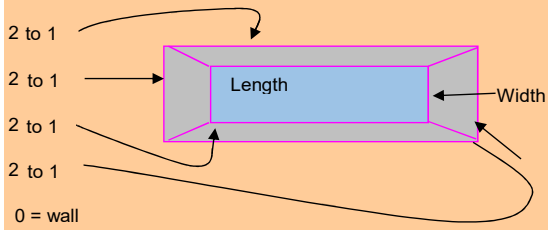
### Detention Facility Type:

#### USER

L = NA ft  
W = NA ft  
D = 2.0 ft  
Pond Area = NA sf

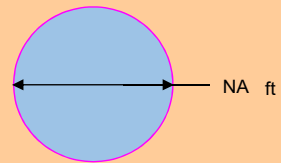
#### DETENTION POND

NA



#### DETENTION TANK

NA



#### USER DEFINED POND

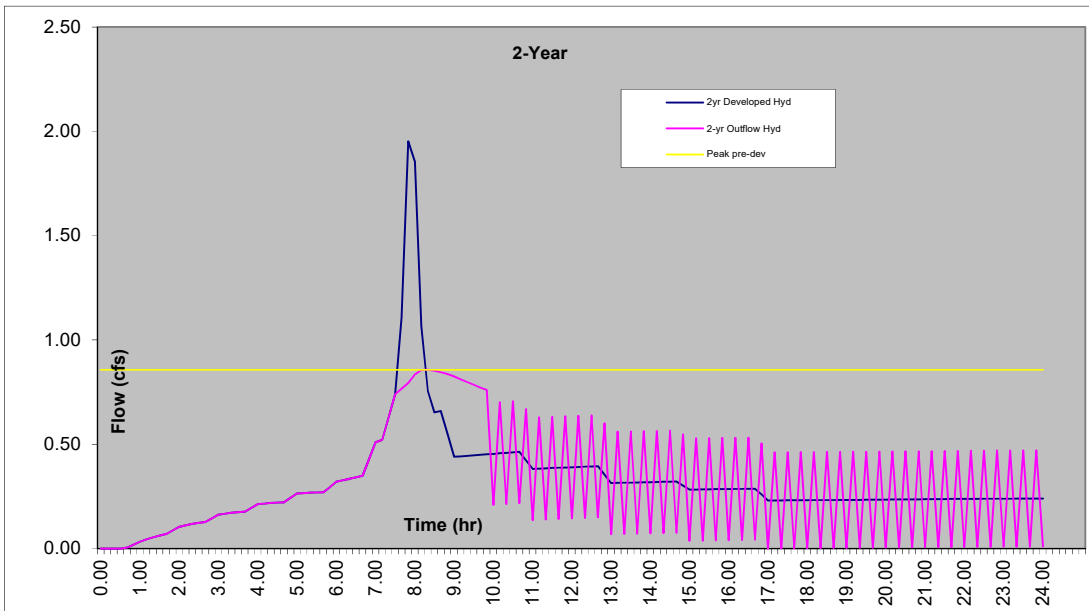
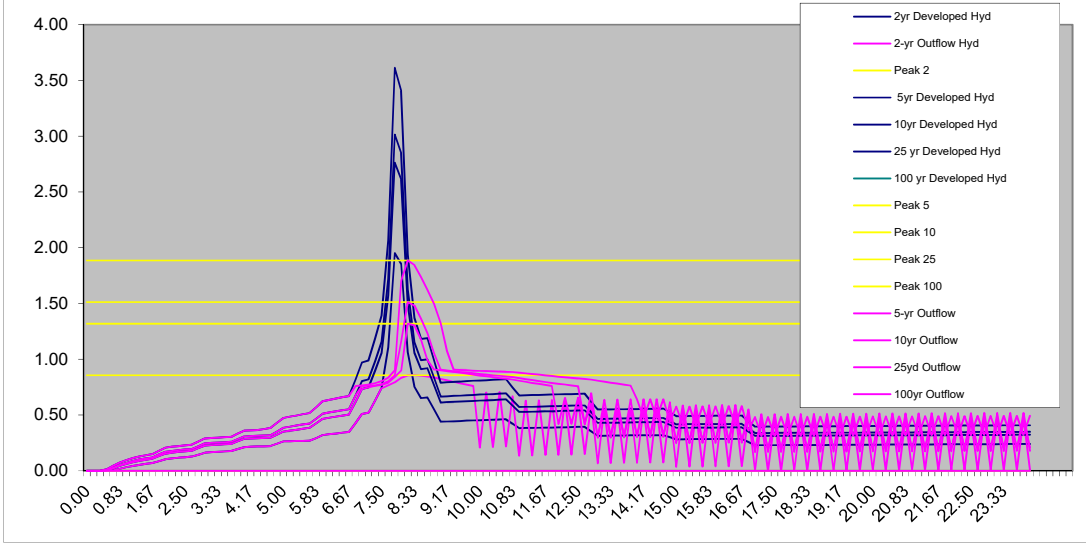
##### Pond Geometry

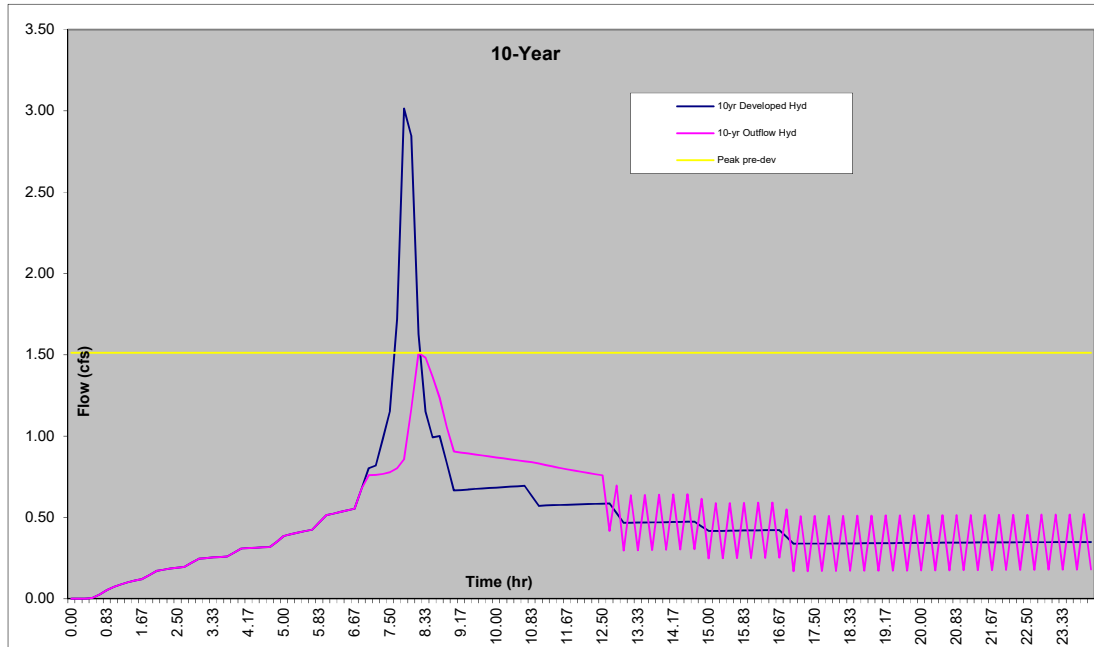
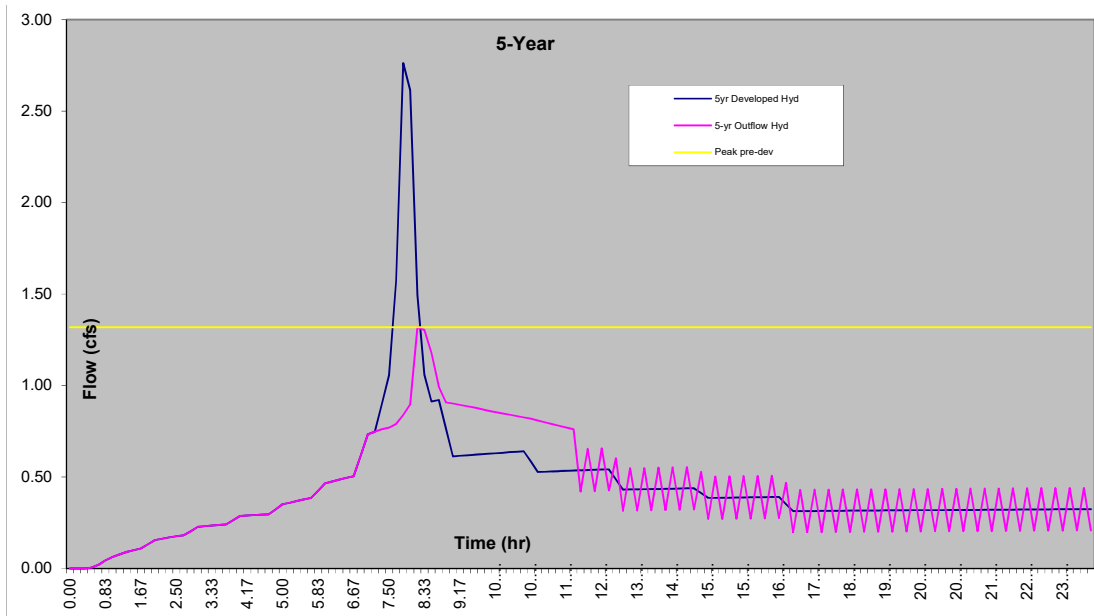
Stage (ft)	Area (sf)
0	1,740
1	2,140
2	2,560
3	3,560
4	4,560
5	5,560
6	6,560
7	7,560
8	8,560
9	9,560
10	10,560
11	11,560
12	12,560
13	13,560
14	14,560
15	15,560

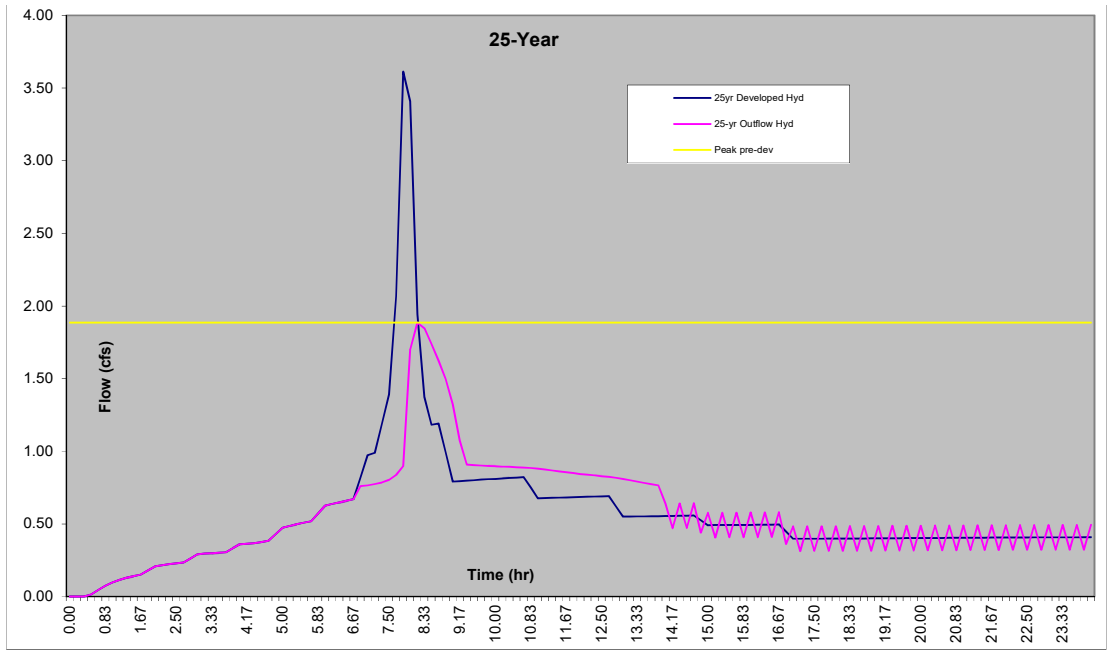




All Storm Hydrographs Routed Through The Detention Facility







**Project Name: Space Age  
Hydrograph Analysis Summary**

Job # 18-126  
Date: 3/30/2019

Rainfall (year)	Rainfall (inches)
2	3.50
5	4.50
10	4.80
25	5.50

Pre-Developed	
<b>Pervious</b>	
Area =	2.86 acres
CN =	76 na
<b>Impervious</b>	
Area =	0.52 acres
CN =	98 na
Tc =	30.5862 min
Total A =	3.38 acres

Developed	
<b>Pervious</b>	
Area =	1.72 acres
CN =	74 na
<b>Impervious</b>	
Area =	1.66 acres
CN =	98 na
Tc =	5 min
Total A =	3.38 acres

Note: The hydrographs shown are based on the S.C.S. Type - 1A, 24 hour storm using the SBUH method based on the King County Model.

Pre-Developed Hydrographs					
Year	=====	2	5	10	25
Qpeak	cfs =>	0.86	1.37	1.53	1.92
Volume	cf =>	20,275	30,069	33,138	40,474
Tpeak	min =>	480	480	480	480
Tpeak	hr =>	8.00	8.00	8.00	8.00
Hydrograph Name=>		2	5	10	25
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00
30	0.50	0.00	0.00	0.00	0.00
40	0.67	0.00	0.00	0.00	0.00
50	0.83	0.00	0.01	0.01	0.01
60	1.00	0.00	0.01	0.01	0.02
70	1.17	0.01	0.01	0.02	0.02
80	1.33	0.01	0.02	0.02	0.03
90	1.50	0.01	0.02	0.02	0.03
100	1.67	0.02	0.03	0.03	0.04
110	1.83	0.02	0.03	0.03	0.04
120	2.00	0.02	0.04	0.04	0.05
130	2.17	0.03	0.04	0.04	0.05
140	2.33	0.03	0.04	0.05	0.06
150	2.50	0.03	0.05	0.05	0.06
160	2.67	0.03	0.05	0.05	0.07
170	2.83	0.04	0.05	0.06	0.07
180	3.00	0.04	0.06	0.06	0.08
190	3.17	0.04	0.06	0.07	0.08
200	3.33	0.05	0.07	0.07	0.08
210	3.50	0.05	0.07	0.07	0.09
220	3.67	0.05	0.07	0.08	0.09
230	3.83	0.05	0.07	0.08	0.09
240	4.00	0.06	0.08	0.08	0.10
250	4.17	0.06	0.08	0.09	0.11
260	4.33	0.06	0.08	0.09	0.12
270	4.50	0.06	0.09	0.09	0.13
280	4.67	0.07	0.09	0.10	0.14
290	4.83	0.07	0.10	0.11	0.16
300	5.00	0.07	0.11	0.13	0.18
310	5.17	0.08	0.12	0.14	0.20
320	5.33	0.08	0.13	0.16	0.22
330	5.50	0.08	0.15	0.17	0.24
340	5.67	0.08	0.16	0.19	0.26
350	5.83	0.09	0.18	0.21	0.28
360	6.00	0.10	0.20	0.23	0.31
370	6.17	0.11	0.22	0.25	0.34
380	6.33	0.13	0.24	0.27	0.37
390	6.50	0.14	0.25	0.29	0.39
400	6.67	0.15	0.27	0.31	0.41
410	6.83	0.17	0.30	0.35	0.46
420	7.00	0.20	0.35	0.40	0.53
430	7.17	0.23	0.39	0.45	0.58
440	7.33	0.27	0.46	0.52	0.67
450	7.50	0.32	0.54	0.61	0.78
460	7.67	0.43	0.71	0.80	1.02
470	7.83	0.68	1.10	1.24	1.56
480	8.00	0.86	1.37	1.53	1.92
490	8.17	0.84	1.33	1.48	1.85
500	8.33	0.76	1.20	1.33	1.66
510	8.50	0.69	1.07	1.19	1.48
520	8.67	0.64	0.99	1.10	1.36

Developed Hydrographs					
Year	=====	2	5	10	25
Qpeak	cfs =>	1.95	2.76	3.01	3.61
Volume	cf =>	27,414	37,994	41,255	48,982
Tpeak	min =>	470	470	470	470
Tpeak	hr =>	7.83	7.83	7.83	7.83
Hydrograph Name=>		2	5	10	25
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00
30	0.50	0.00	0.00	0.01	0.01
40	0.67	0.01	0.02	0.03	0.04
50	0.83	0.02	0.04	0.05	0.07
60	1.00	0.03	0.06	0.07	0.10
70	1.17	0.04	0.08	0.09	0.11
80	1.33	0.05	0.09	0.10	0.13
90	1.50	0.06	0.10	0.11	0.14
100	1.67	0.07	0.11	0.12	0.15
110	1.83	0.09	0.13	0.15	0.18
120	2.00	0.10	0.16	0.17	0.21
130	2.17	0.11	0.16	0.18	0.22
140	2.33	0.12	0.17	0.19	0.22
150	2.50	0.12	0.18	0.19	0.23
160	2.67	0.13	0.18	0.20	0.23
170	2.83	0.15	0.20	0.22	0.26
180	3.00	0.16	0.23	0.25	0.29
190	3.17	0.17	0.23	0.25	0.29
200	3.33	0.17	0.23	0.25	0.30
210	3.50	0.17	0.24	0.26	0.30
220	3.67	0.18	0.24	0.26	0.30
230	3.83	0.20	0.26	0.28	0.33
240	4.00	0.21	0.29	0.31	0.36
250	4.17	0.22	0.29	0.31	0.36
260	4.33	0.22	0.29	0.31	0.37
270	4.50	0.22	0.29	0.32	0.37
280	4.67	0.22	0.30	0.32	0.38
290	4.83	0.24	0.32	0.35	0.43
300	5.00	0.26	0.35	0.39	0.47
310	5.17	0.27	0.36	0.40	0.49
320	5.33	0.27	0.37	0.41	0.50
330	5.50	0.27	0.38	0.42	0.51
340	5.67	0.27	0.39	0.42	0.52
350	5.83	0.29	0.43	0.47	0.57
360	6.00	0.32	0.47	0.51	0.62
370	6.17	0.33	0.48	0.52	0.64
380	6.33	0.34	0.49	0.53	0.65
390	6.50	0.34	0.50	0.54	0.66
400	6.67	0.35	0.50	0.55	0.67
410	6.83	0.43	0.62	0.68	0.82
420	7.00	0.51	0.73	0.80	0.97
430	7.17	0.52	0.75	0.82	0.99
440	7.33	0.63	0.90	0.99	1.19
450	7.50	0.74	1.06	1.16	1.39
460	7.67	1.11	1.57	1.72	2.07
470	7.83	1.95	2.76	3.01	3.61
480	8.00	1.85	2.61	2.85	3.41
490	8.17	1.06	1.49	1.63	1.94
500	8.33	0.76	1.06	1.15	1.37
510	8.50	0.65	0.91	0.99	1.18
520	8.67	0.66	0.92	1.00	1.19

Pre-Developed Hydrographs					
Year	=====	2	5	10	25
Qpeak	cfs =>	0.86	1.37	1.53	1.92
Volume	cf =>	20,275	30,069	33,138	40,474
Tpeak	min =>	480	480	480	480
Tpeak	hr =>	8.00	8.00	8.00	8.00
Hydrograph Name=>		2	5	10	25
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)
530	8.83	0.58	0.89	0.99	1.22
540	9.00	0.51	0.78	0.87	1.07
550	9.17	0.47	0.71	0.79	0.97
560	9.33	0.43	0.66	0.73	0.90
570	9.50	0.41	0.62	0.69	0.84
580	9.67	0.40	0.60	0.66	0.81
590	9.83	0.39	0.58	0.64	0.78
600	10.00	0.38	0.57	0.63	0.77
610	10.17	0.38	0.56	0.62	0.76
620	10.33	0.38	0.56	0.62	0.75
630	10.50	0.38	0.56	0.61	0.75
640	10.67	0.38	0.56	0.61	0.75
650	10.83	0.37	0.55	0.60	0.73
660	11.00	0.35	0.52	0.57	0.70
670	11.17	0.34	0.51	0.56	0.67
680	11.33	0.34	0.50	0.54	0.66
690	11.50	0.33	0.49	0.54	0.65
700	11.67	0.33	0.48	0.53	0.64
710	11.83	0.33	0.48	0.53	0.64
720	12.00	0.33	0.48	0.53	0.63
730	12.17	0.33	0.48	0.53	0.63
740	12.33	0.33	0.48	0.53	0.63
750	12.50	0.33	0.48	0.53	0.63
760	12.67	0.33	0.48	0.53	0.64
770	12.83	0.32	0.47	0.51	0.62
780	13.00	0.31	0.45	0.49	0.59
790	13.17	0.30	0.43	0.47	0.57
800	13.33	0.29	0.42	0.46	0.55
810	13.50	0.29	0.41	0.45	0.54
820	13.67	0.28	0.41	0.44	0.53
830	13.83	0.28	0.40	0.44	0.53
840	14.00	0.28	0.40	0.44	0.52
850	14.17	0.28	0.40	0.44	0.52
860	14.33	0.28	0.40	0.43	0.52
870	14.50	0.28	0.40	0.43	0.52
880	14.67	0.28	0.40	0.43	0.52
890	14.83	0.27	0.39	0.43	0.51
900	15.00	0.27	0.38	0.42	0.50
910	15.17	0.26	0.37	0.41	0.49
920	15.33	0.26	0.37	0.40	0.48
930	15.50	0.25	0.36	0.40	0.47
940	15.67	0.25	0.36	0.39	0.47
950	15.83	0.25	0.36	0.39	0.47
960	16.00	0.25	0.36	0.39	0.47
970	16.17	0.25	0.36	0.39	0.47
980	16.33	0.25	0.36	0.39	0.47
990	16.50	0.25	0.36	0.39	0.47
1000	16.67	0.25	0.36	0.39	0.47
1010	16.83	0.25	0.35	0.38	0.45
1020	17.00	0.23	0.33	0.36	0.43
1030	17.17	0.23	0.32	0.35	0.41
1040	17.33	0.22	0.31	0.34	0.40
1050	17.50	0.22	0.31	0.33	0.40
1060	17.67	0.21	0.30	0.33	0.39
1070	17.83	0.21	0.30	0.32	0.39
1080	18.00	0.21	0.30	0.32	0.38
1090	18.17	0.21	0.29	0.32	0.38
1100	18.33	0.21	0.29	0.32	0.38
1110	18.50	0.21	0.29	0.32	0.38
1120	18.67	0.21	0.29	0.32	0.38
1130	18.83	0.21	0.29	0.32	0.38
1140	19.00	0.21	0.29	0.32	0.38
1150	19.17	0.21	0.29	0.32	0.38
1160	19.33	0.21	0.29	0.32	0.38
1170	19.50	0.21	0.29	0.32	0.38
1180	19.67	0.21	0.29	0.32	0.38
1190	19.83	0.21	0.29	0.32	0.38
1200	20.00	0.21	0.30	0.32	0.38
1210	20.17	0.21	0.30	0.32	0.38
1220	20.33	0.21	0.30	0.32	0.38
1230	20.50	0.21	0.30	0.32	0.38

Developed Hydrographs				
	2	5	10	25
	1.95	2.76	3.01	3.61
Volume	27,414	37,994	41,255	48,982
Tpeak	470	470	470	470
Tpeak	7.83	7.83	7.83	7.83
Hydrograph Name=>	2	5	10	25
Time	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)
530	0.55	0.77	0.83	0.99
540	0.44	0.61	0.67	0.79
550	0.44	0.62	0.67	0.79
560	0.44	0.62	0.67	0.80
570	0.45	0.62	0.68	0.80
580	0.45	0.62	0.68	0.80
590	0.45	0.63	0.68	0.81
600	0.45	0.63	0.68	0.81
610	0.46	0.63	0.69	0.81
620	0.46	0.64	0.69	0.82
630	0.46	0.64	0.69	0.82
640	0.46	0.64	0.69	0.82
650	0.42	0.58	0.63	0.75
660	0.38	0.53	0.57	0.68
670	0.38	0.53	0.57	0.68
680	0.38	0.53	0.57	0.68
690	0.39	0.53	0.58	0.68
700	0.39	0.53	0.58	0.68
710	0.39	0.54	0.58	0.68
720	0.39	0.54	0.58	0.69
730	0.39	0.54	0.58	0.69
740	0.39	0.54	0.58	0.69
750	0.39	0.54	0.59	0.69
760	0.39	0.54	0.59	0.69
770	0.35	0.49	0.53	0.62
780	0.31	0.43	0.47	0.55
790	0.31	0.43	0.47	0.55
800	0.32	0.43	0.47	0.55
810	0.32	0.43	0.47	0.55
820	0.32	0.43	0.47	0.55
830	0.32	0.43	0.47	0.55
840	0.32	0.44	0.47	0.55
850	0.32	0.44	0.47	0.56
860	0.32	0.44	0.47	0.56
870	0.32	0.44	0.47	0.56
880	0.32	0.44	0.47	0.56
890	0.30	0.41	0.45	0.52
900	0.28	0.39	0.42	0.49
910	0.28	0.39	0.42	0.49
920	0.28	0.39	0.42	0.49
930	0.28	0.39	0.42	0.49
940	0.28	0.39	0.42	0.49
950	0.29	0.39	0.42	0.49
960	0.29	0.39	0.42	0.49
970	0.29	0.39	0.42	0.49
980	0.29	0.39	0.42	0.49
990	0.29	0.39	0.42	0.50
1000	0.29	0.39	0.42	0.50
1010	0.26	0.35	0.38	0.45
1020	0.23	0.31	0.34	0.40
1030	0.23	0.31	0.34	0.40
1040	0.23	0.31	0.34	0.40
1050	0.23	0.31	0.34	0.40
1060	0.23	0.31	0.34	0.40
1070	0.23	0.31	0.34	0.40
1080	0.23	0.32	0.34	0.40
1090	0.23	0.32	0.34	0.40
1100	0.23	0.32	0.34	0.40
1110	0.23	0.32	0.34	0.40
1120	0.23	0.32	0.34	0.40
1130	0.23	0.32	0.34	0.40
1140	0.23	0.32	0.34	0.40
1150	0.23	0.32	0.34	0.40
1160	0.23	0.32	0.34	0.40
1170	0.23	0.32	0.34	0.40
1180	0.23	0.32	0.34	0.40
1190	0.23	0.32	0.34	0.40
1200	0.24	0.32	0.34	0.40
1210	0.24	0.32	0.34	0.40
1220	0.24	0.32	0.34	0.40
1230	0.24	0.32	0.34	0.40

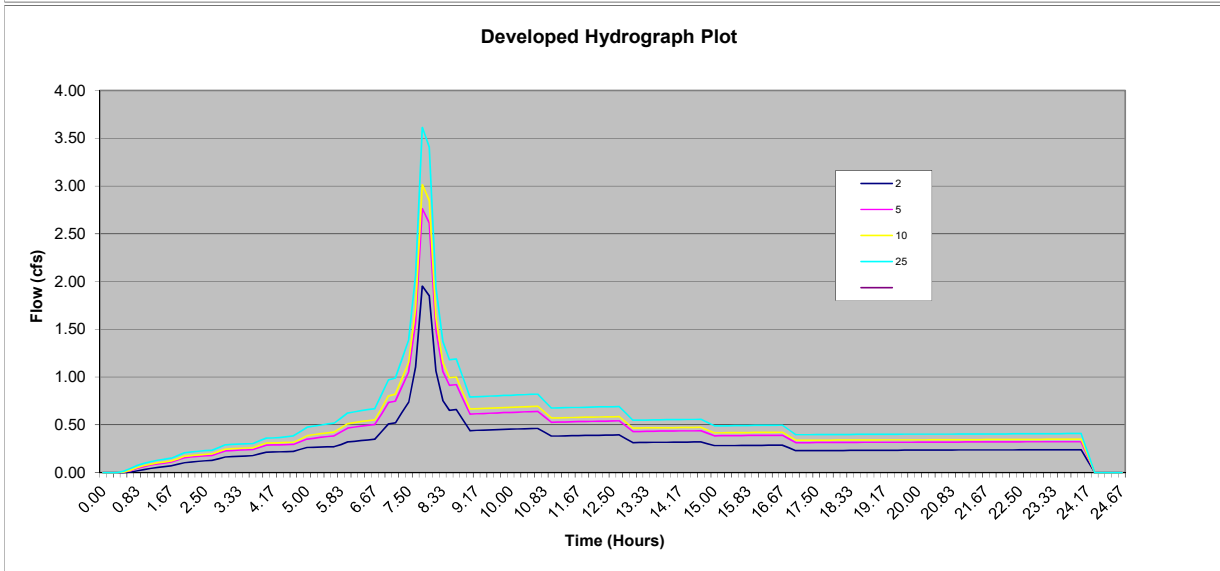
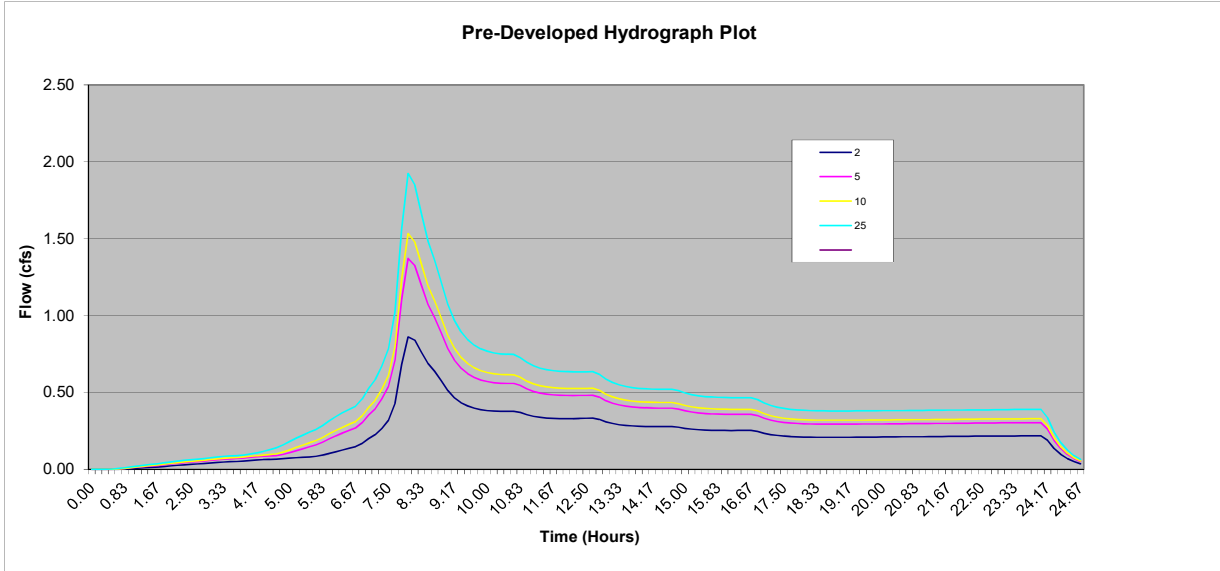
Pre-Developed Hydrographs					
Year	=====	2	5	10	25
Qpeak	cfs =>	0.86	1.37	1.53	1.92
Volume	cf =>	20,275	30,069	33,138	40,474
Tpeak	min =>	480	480	480	480
Tpeak	hr =>	8.00	8.00	8.00	8.00
Hydrograph Name=>		2	5	10	25
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)
1240	20.67	0.21	0.30	0.32	0.38
1250	20.83	0.21	0.30	0.32	0.38
1260	21.00	0.21	0.30	0.32	0.38
1270	21.17	0.21	0.30	0.32	0.38
1280	21.33	0.21	0.30	0.32	0.38
1290	21.50	0.21	0.30	0.32	0.38
1300	21.67	0.21	0.30	0.32	0.38
1310	21.83	0.21	0.30	0.33	0.39
1320	22.00	0.21	0.30	0.33	0.39
1330	22.17	0.21	0.30	0.33	0.39
1340	22.33	0.22	0.30	0.33	0.39
1350	22.50	0.22	0.30	0.33	0.39
1360	22.67	0.22	0.30	0.33	0.39
1370	22.83	0.22	0.30	0.33	0.39
1380	23.00	0.22	0.30	0.33	0.39
1390	23.17	0.22	0.30	0.33	0.39
1400	23.33	0.22	0.30	0.33	0.39
1410	23.50	0.22	0.30	0.33	0.39
1420	23.67	0.22	0.30	0.33	0.39
1430	23.83	0.22	0.30	0.33	0.39
1440	24.00	0.22	0.30	0.33	0.39
1450	24.17	0.19	0.26	0.28	0.34
1460	24.33	0.14	0.19	0.20	0.24
1470	24.50	0.10	0.14	0.15	0.17
1480	24.67	0.07	0.10	0.11	0.12
1490	24.67	0.05	0.07	0.08	0.09
1500	24.67	0.04	0.05	0.05	0.06

Developed Hydrographs				
	2	5	10	25
	1.95	2.76	3.01	3.61
Volume	27,414	37,994	41,255	48,982
Tpeak	470	470	470	470
Tpeak	7.83	7.83	7.83	7.83
Hydrograph Name=>	2	5	10	25
Time	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)
	0.24	0.32	0.34	0.40
	0.24	0.32	0.34	0.40
	0.24	0.32	0.35	0.40
	0.24	0.32	0.35	0.40
	0.24	0.32	0.35	0.40
	0.24	0.32	0.35	0.40
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.24	0.32	0.35	0.41
	0.12	0.16	0.17	0.20
	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00



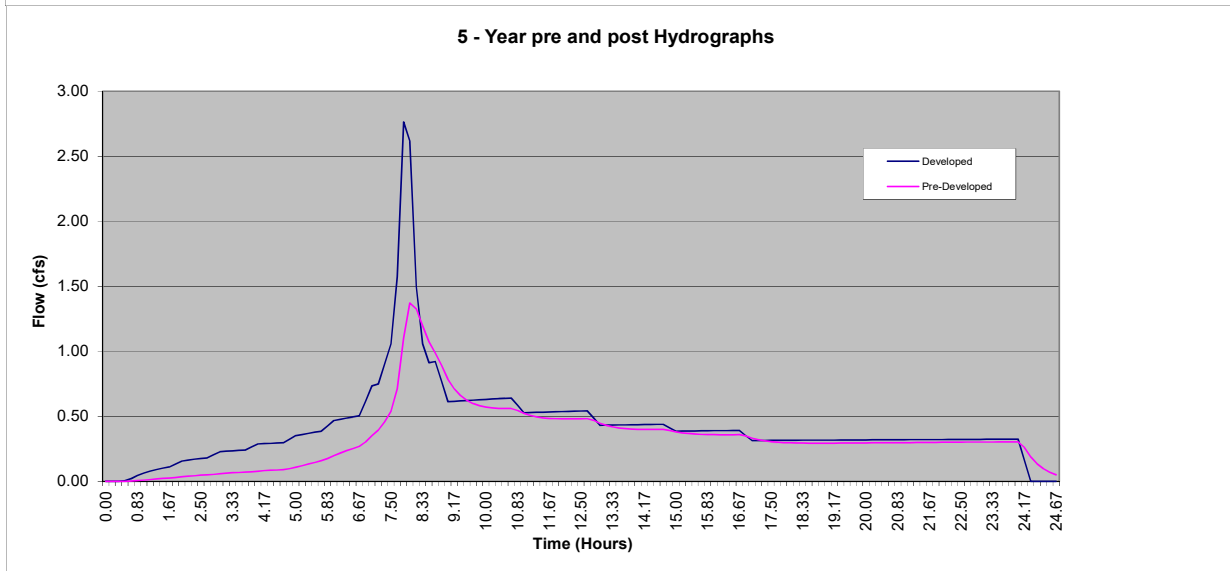
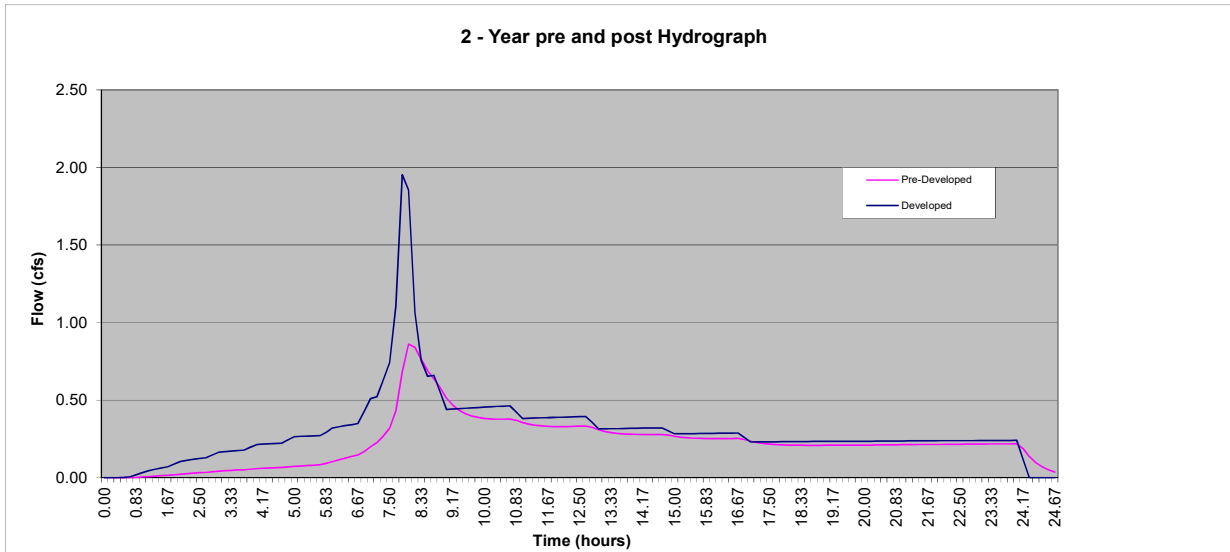
Pre-Developed Hydrographs					
Year	=====	2	5	10	25
Qpeak	cfs =>	0.86	1.37	1.53	1.92
Volume	cf =>	20,275	30,069	33,138	40,474
Tpeak	min =>	480	480	480	480
Tpeak	hr =>	8.00	8.00	8.00	8.00
Hydrograph Name=>		2	5	10	25
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs				
	2	5	10	25
Qpeak	1.95	2.76	3.01	3.61
Volume	27,414	37,994	41,255	48,982
Tpeak	470	470	470	470
Tpeak	7.83	7.83	7.83	7.83
Hydrograph Name=>	2	5	10	25
Time	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)



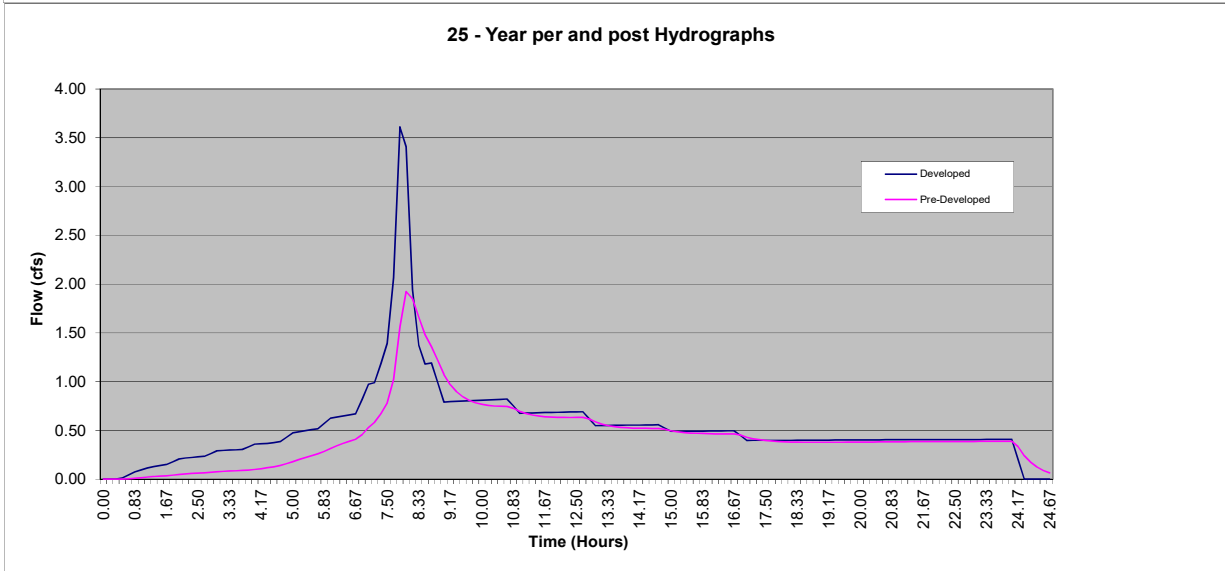
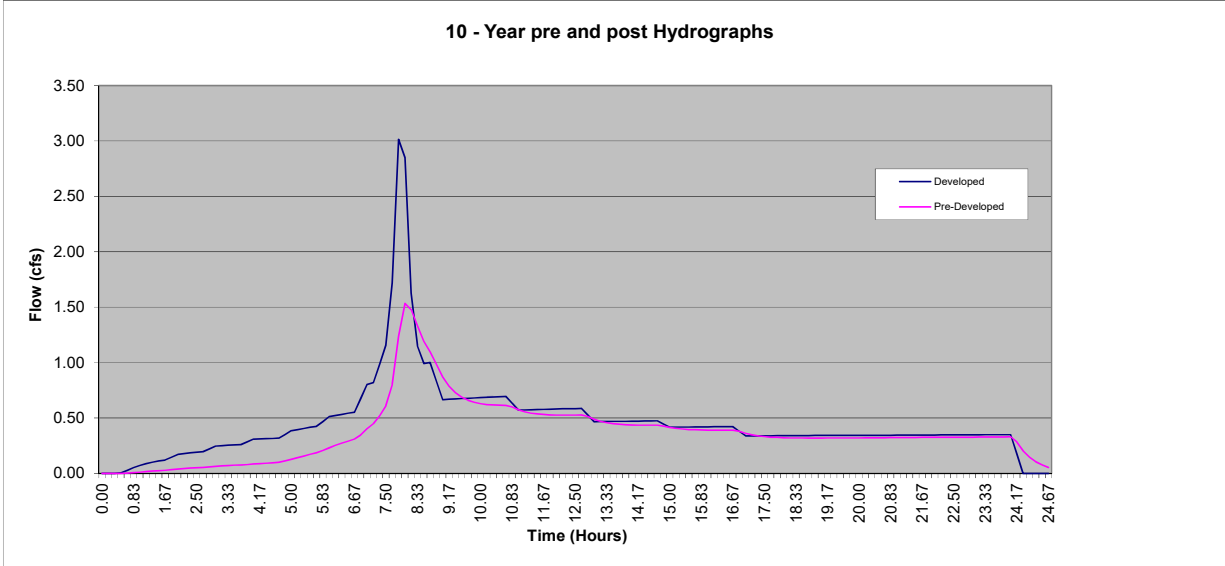
Pre-Developed Hydrographs					
Year	=====>	2	5	10	25
Qpeak	cfs =>	0.86	1.37	1.53	1.92
Volume	cf =>	20,275	30,069	33,138	40,474
Tpeak	min =>	480	480	480	480
Tpeak	hr =>	8.00	8.00	8.00	8.00
Hydrograph Name=>		2	5	10	25
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs				
	2	5	10	25
	1.95	2.76	3.01	3.61
	27,414	37,994	41,255	48,982
	470	470	470	470
	7.83	7.83	7.83	7.83
	2	5	10	25
	Hyd	Hyd	Hyd	Hyd
	(cfs)	(cfs)	(cfs)	(cfs)



		Pre-Developed Hydrographs			
Year	=====>	2	5	10	25
Qpeak	cfs =>	0.86	1.37	1.53	1.92
Volume	cf =>	20,275	30,069	33,138	40,474
Tpeak	min =>	480	480	480	480
Tpeak	hr =>	8.00	8.00	8.00	8.00
Hydrograph Name=>		2	5	10	25
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)

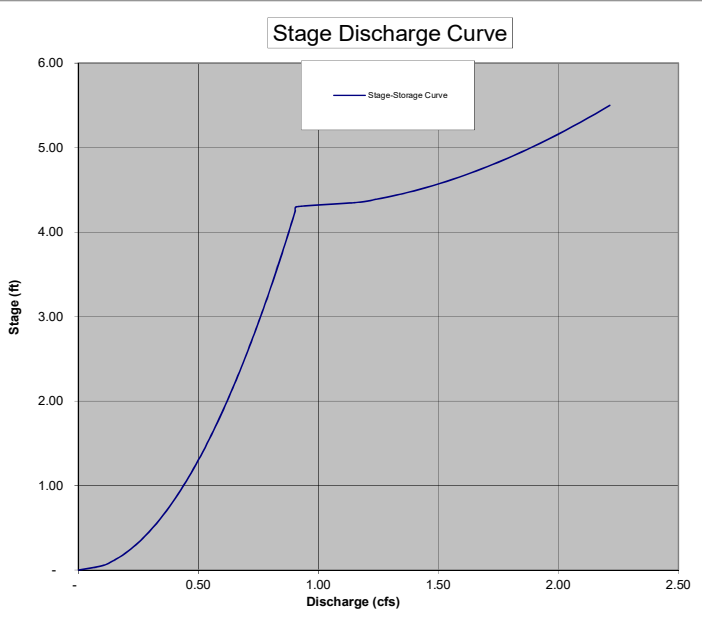
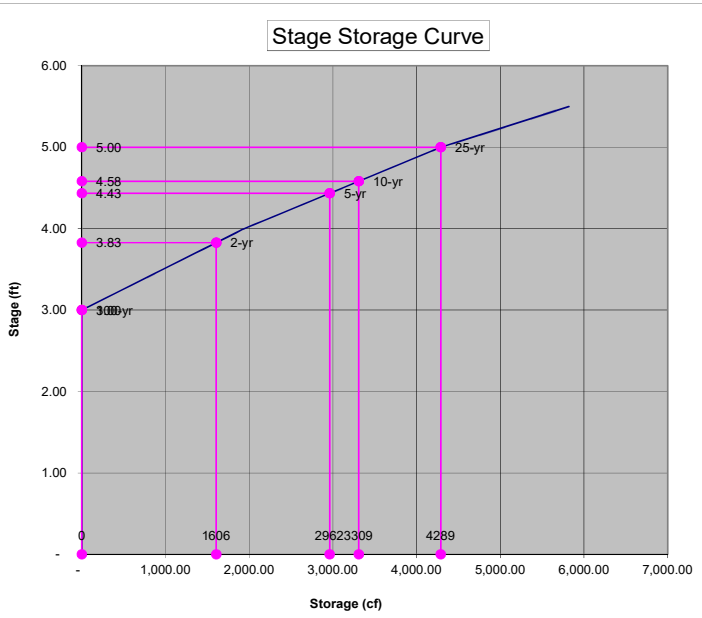
		Developed Hydrographs			
Year	=====>	2	5	10	25
Qpeak	cfs =>	1.95	2.76	3.01	3.61
Volume	cf =>	27,414	37,994	41,255	48,982
Tpeak	min =>	470	470	470	470
Tpeak	hr =>	7.83	7.83	7.83	7.83
Hydrograph Name=>		2	5	10	25
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)



**Project Name: Space Age**  
**Stage Storage Summary**

Job # 18-126  
 Date: 3/30/2019

Stage ft	Storage cf	Discharge cfs
-	-	-
0.05	-	0.10
0.10	-	0.14
0.15	-	0.17
0.20	-	0.20
0.25	-	0.22
0.30	-	0.24
0.35	-	0.26
0.40	-	0.28
0.45	-	0.29
0.50	-	0.31
0.55	-	0.33
0.60	-	0.34
0.65	-	0.35
0.70	-	0.37
0.75	-	0.38
0.80	-	0.39
0.85	-	0.40
0.90	-	0.42
0.95	-	0.43
1.00	-	0.44
1.05	-	0.45
1.10	-	0.46
1.15	-	0.47
1.20	-	0.48
1.25	-	0.49
1.30	-	0.50
1.35	-	0.51
1.40	-	0.52
1.45	-	0.53
1.50	-	0.54
1.55	-	0.55
1.60	-	0.55
1.65	-	0.56
1.70	-	0.57
1.75	-	0.58
1.80	-	0.59
1.85	-	0.60
1.90	-	0.60
1.95	-	0.61
2.00	-	0.62
2.05	-	0.63
2.10	-	0.64
2.15	-	0.64
2.20	-	0.65
2.25	-	0.66
2.30	-	0.66
2.35	-	0.67
2.40	-	0.68
2.45	-	0.69
2.50	-	0.69
2.55	-	0.70
2.60	-	0.71
2.65	-	0.71
2.70	-	0.72
2.75	-	0.73
2.80	-	0.73
2.85	-	0.74
2.90	-	0.75
2.95	-	0.75
3.00	-	0.76
3.05	97.00	0.77
3.10	194.00	0.77
3.15	291.00	0.78
3.20	388.00	0.78
3.25	485.00	0.79



Stage ft	Storage cf	Discharge cfs
3.30	582.00	0.80
3.35	679.00	0.80
3.40	776.00	0.81
3.45	873.00	0.81
3.50	970.00	0.82
3.55	1,067.00	0.83
3.60	1,164.00	0.83
3.65	1,261.00	0.84
3.70	1,358.00	0.84
3.75	1,455.00	0.85
3.80	1,552.00	0.85
3.85	1,649.00	0.86
3.90	1,746.00	0.87
3.95	1,843.00	0.87
4.00	1,940.00	0.88
4.05	2,037.50	0.88
4.10	2,135.00	0.89
4.15	2,232.50	0.89
4.20	2,330.00	0.90
4.25	2,427.50	0.90
4.30	2,525.00	0.91
4.35	2,622.50	1.16
4.40	2,720.00	1.26
4.45	2,817.50	1.34
4.50	2,915.00	1.41
4.55	3,012.50	1.48
4.60	3,110.00	1.53
4.65	3,207.50	1.59
4.70	3,305.00	1.64
4.75	3,402.50	1.68
4.80	3,500.00	1.73
4.85	3,597.50	1.77
4.90	3,695.00	1.81
4.95	3,792.50	1.85
5.00	3,890.00	1.89
5.05	3,987.50	1.92
5.10	4,085.00	1.96
5.15	4,182.50	1.99
5.20	4,280.00	2.03
5.25	4,377.50	2.06
5.30	4,475.00	2.09
5.35	4,572.50	2.12
5.40	4,670.00	2.15
5.45	4,767.50	2.18
5.50	4,865.00	2.21

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Appendix D

Standard Formulas, Coefficients, and Values

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**Table C-2  
RUNOFF CURVE NUMBERS**

**Runoff curve numbers for urban areas\***

<b>Cover description</b>		<b>Curve numbers for hydrologic soil group</b>			
<b>Cover type and hydrologic condition</b>	<b>Average percent impervious area</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Open space (lawns, parks, golf courses, cemeteries, etc.):					
Poor condition (grass cover <50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82

**Runoff curve numbers for other agricultural lands\***

<b>Cover description</b>		<b>Curve numbers for hydrologic soil group</b>			
<b>Cover type</b>	<b>Hydrologic condition</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Pasture, grassland, or range-continuous forage for grazing					
<50% ground cover or heavily grazed with no mulch	Poor	68	79	86	89
50 to 75% ground cover and not heavily grazed	Fair	49	69	79	84
>75% ground cover and lightly or only occasionally grazed	Good	39	61	74	80
Meadow-continuous grass, protected from grazing and generally mowed for hay	-	30	58	71	78
Brush--weed-grass mixture with brush as the major element					
<50% ground cover	Poor	48	67	77	83
50 to 75% ground cover	Fair	35	56	70	77
>75% ground cover	Good	30	48	65	73
Woods-grass combination (orchard or tree farm)					
	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79

**Runoff curve numbers for other agricultural lands\***

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Woods					
Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.	Poor	45	66	77	83
Woods are grazed but not burned, and some forest litter covers the soil.	Fair	36	60	73	79
Woods are protected from grazing, and litter and brush adequately cover the soil.	Good	30	55	70	77

**Runoff curve numbers for Simplified Approaches\*\***

Cover description		Curve numbers for hydrologic soil group			
Simplified Approaches	Hydrologic condition	A	B	C	D
Eco-roof	Good	n/a	61	n/a	n/a
Roof Garden	Good	n/a	48	n/a	n/a
Contained Planter Box	Good	n/a	48	n/a	n/a
Infiltration & Flow-Through Planter Box	Good	n/a	48	n/a	n/a
Pervious Pavement	-	76	85	89	n/a
Trees					
New and/or Existing Evergreen	-	36	60	73	79
New and/or Existing Deciduous	-	36	60	73	79

n/a - Does not apply, as design criteria for the relevant mitigation measures do not include the use of this soil type.

\*Soil Conservation Service, *Urban Hydrology for Small Watersheds*, Technical Release 55, pp. 2.5-2.8, June 1986.

\*\*CNs of various cover types were assigned to the Proposed Simplified Approaches with similar cover types as follows:

Eco-roof – assumed grass in good condition with soil type B.

Roof Garden – assumed brush-weed-grass mixture with >75% ground cover and soil type B.

Contained Planter Box – assumed brush-weed-grass mixture with >75% ground cover and soil type B.

Infiltration & Flow-Through Planter Box – assumed brush-weed-grass mixture with >75% ground cover and soil type B.

Pervious Pavement – assumed gravel.

Trees – assumed woods with fair hydrologic conditions.

**Note: To determine hydrologic soil type, consult local USDA Soil Conservation Service Soil Survey.**

## COEFFICIENTS

$N_s =$  = Manning's coefficient (sheet flow)  
n values are for sheet flow only

### Design Value

- 0.011 Concrete or asphalt
- 0.010 Bare soil
- 0.020 Graveled surface
- 0.020 Bare clay - loam (eroded)
- 0.150 Grass (short prairie)
- 0.240 Grass (dense lawn)
- 0.410 Grass (bermuda)
- 0.400 Woods (light underbrush)
- 0.800 Woods (dense underbrush)

$k =$  = time of concentration velocity factor (ft/s)

### Design Value

- 3 Forest with heavy ground cover and meadows (n=0.10)
- 5 Brushy ground with some trees (n=0.060)
- 8 Fallow or cultivation (n=0.040)
- 9 High grass (n=0.035)
- 11 Short grass, pasture or lawns (n=0.030)
- 13 Nearly bare ground (n=0.025)
- 27 Paved and gravel areas (n=0.012)

$n =$  = Manning's coefficient (channel)

### Design Value

#### CONSTRUCTED CHANNELS

##### A. Earth, straight and uniform

- 0.018 Earth (straight and uniform)
- 0.025 Gravel (straight and uniform)
- 0.027 Grass (with weeds)

##### B. Earth, winding and sluggish

- 0.025 Earth (no vegetation)
- 0.030 Grass (some weeds)
- 0.035 Dense weeds (deep channel)
- 0.030 Earth (rubble bottom and sides)
- 0.035 Stony bottom and weedy banks
- 0.040 Cobble bottom with clean sides

##### C. Rock lined

- 0.035 Smooth and uniform
- 0.040 Jagged and irregular

##### D. Channels not maintained (weeds and brush uncut)

- 0.050 Dense weeds (high as flow depth)
- 0.050 Clean bottom (brush on sides)
- 0.100 Dense brush (high stage)
- 0.200 Water quality swales (mowed regulary)

#### NATURAL STREAMS

- 0.029 Clean (straight no pools)
- 0.035 Clean (straight no pools with weeds and stones)
- 0.039 Clean (winding pools )
- 0.042 Clean (winding pools weeds and stones)
- 0.052 Clean (winding pools weeds and large stones)
- 0.065 Weedy (sluggish with deep pools)
- 0.112 Very weedy (sluggish with deep pools)

## Standard formulas used for the Time of Concentration Calculations

### Overland Flow (max 300' total)

$$\frac{(0.42)[(Ns)(L)]^{0.8}}{(P_2)^{0.5}(S_0)^{0.4}}$$

Tc	= time of concentration for less than 300' of travel (minutes)
Ns	= sheet flow Manning's effective roughness coefficient
L	= flow length (ft)
P2	= 2-year, 24 hour rainfall (in)
So	= slope of hydraulic grade line (land slope, ft/ft)

### Shallow Concentrated Flow (after initial 300')

$$T = \frac{L}{(60)(k\sqrt{S_0})}$$

T	= travel time for sheet flow (min)
L	= flow length (ft)
So	= slope of hydraulic grade line (land slope, ft/ft)
k	= time of concentration velocity factor (ft/s)

### Flow in Swales

$$Q = (1.486/n) \times A \times R^{2/3} \times S^{1/2} \text{ (Manning's Equation)}$$

Tc	= time of concentration for gutter flow (minutes)
A	= area of flow (sf)
R	= hydraulic radius (ft)
Ls	= side slope
Q	= quantity of flow (ft <sup>3</sup> /sec)
V	= average velocity of flow (ft/sec)
L	= length of flow
Ve	= vertical length of side slope
Ho	= horizontal length of side slope
Bw	= base width (in)
D	= depth (in)
S	= slope (ft/ft)
n	= Manning's n

### Flow in gutters

$$V = \frac{1.12}{n} (S)^{0.5} (Sx)^{.67} (T)^{0.67}$$

Tc	= time of concentration for gutter flow (minutes)
V	= average velocity of flow (ft/sec)
Q	= quantity of flow (ft <sup>3</sup> /sec)
S	= street longitudinal slope (ft/ft)
Sx	= street cross slope (ft/ft)
T	= total width of flow in the gutter (ft)
n	= sheet flow Manning's (pavement = 0.018)
L	= Length of flow (ft)

### Flow in pipes

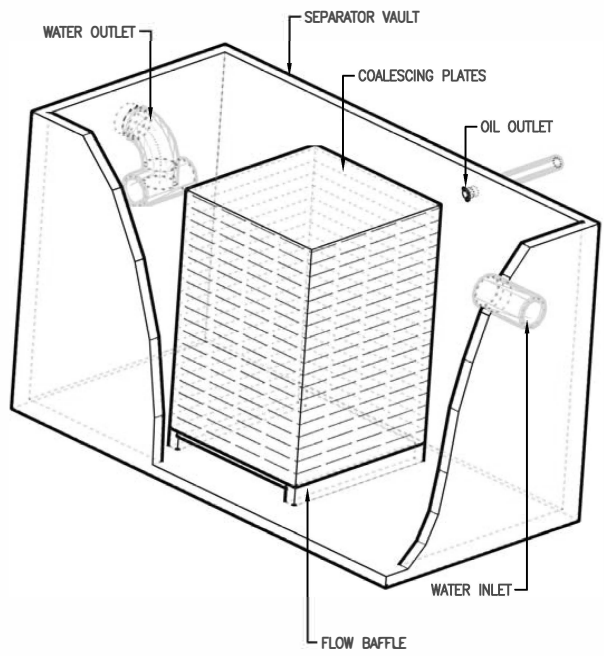
Mannings Equation

Tc	= time of concentration in pipe (minutes)
V	= calculated velocity pipe full (ft/sec)
Q	= quantity of flow (ft <sup>3</sup> /sec)
n	= Manning's n
D	= pipe Diameter (in)
S	= slope (ft/ft)
L	= length of pipe

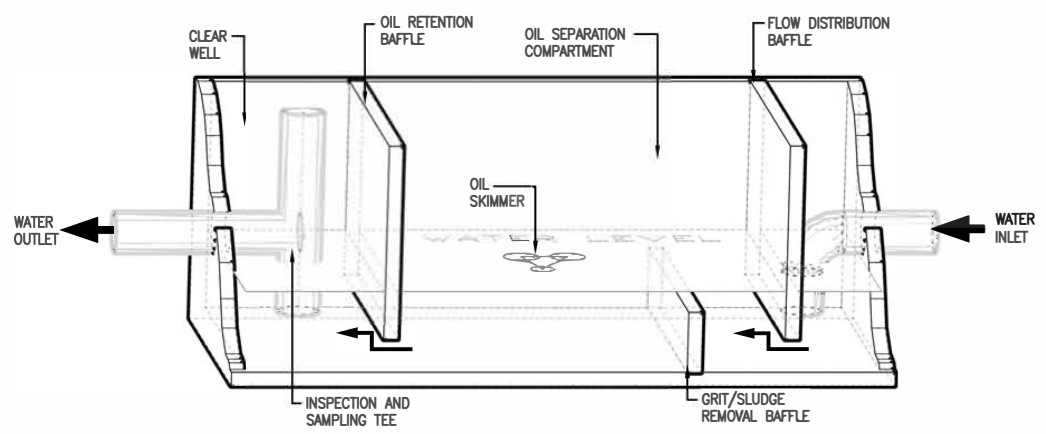


Appendix F  
Water Quality Details

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COALESCING PLATE (CP) SEPARATOR



AMERICAN PETROLEUM TYPE (API) SEPARATOR

SOURCE CONTROL MANUAL SUPPLEMENTAL DETAILS



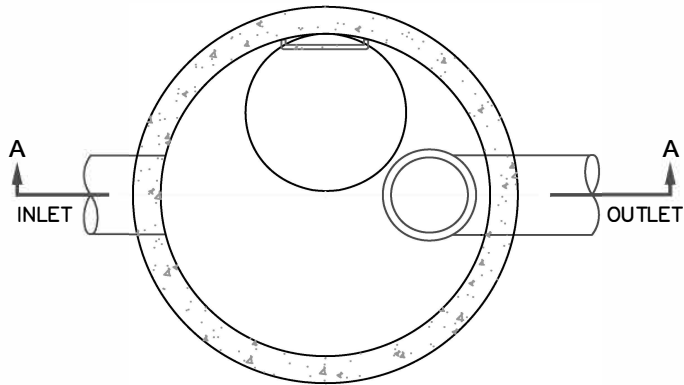
Bureau of Environmental Services

- Supplemental Details -  
**Oil-Water Separators**  
 Source Control

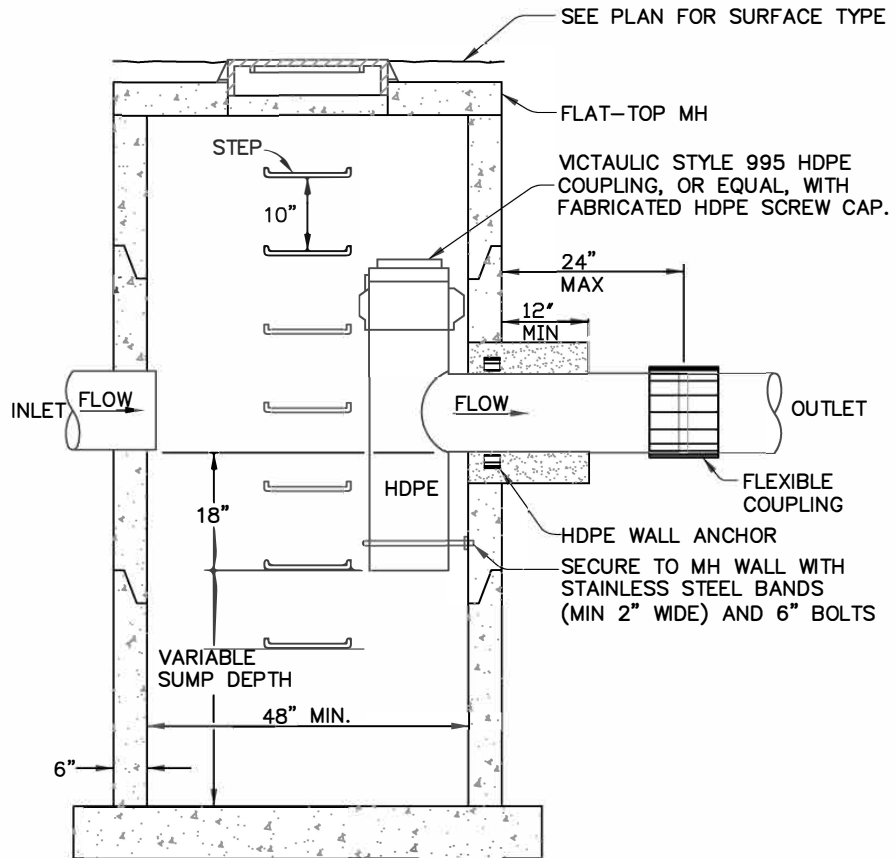
NUMBER

**SC-101**

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PLAN



- DRAWING NOT TO SCALE -

SOURCE CONTROL MANUAL SUPPLEMENTAL DETAILS

- Supplemental Details -  
**Spill Control Manhole**  
 Source Control

NUMBER

**SC-100**



Bureau of Environmental Services



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Pollution Control

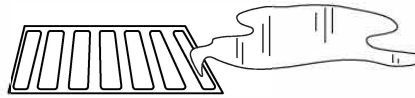
# IN THE EVENT OF A SPILL

USE Safety Precautions

- Wear protective gear
- Keep vehicles and people out of spill
- Contain materials with the spill kit
  - 1) Seal off drains
  - 2) Berm to contain the spill
  - 3) Clean up with absorbent materials

- ① Turn off valve located at \_\_\_\_\_  
(your location, ie: NE corner of parking lot)
- ② CALL: Supervisor @ 503 XXX-XXXX  
and Environmental Services  
Emergency Spill Response  
@ 503 823-7180

**SAMPLE**



Pollution Control

# IN THE EVENT OF A SPILL

- ① Turn off valve located at \_\_\_\_\_  
(your location, ie: NE corner of parking lot)
- ② CALL: Supervisor @ 503 XXX-XXXX  
and Environmental Services  
Emergency Spill Response  
@ 503 823-7180

USE Safety Precautions

- Wear protective gear
- Keep vehicles and people out of spill
- Contain materials with the spill kit
  - 1) Seal off drains
  - 2) Berm to contain the spill
  - 3) Clean up with absorbent materials

**SAMPLE**

- DRAWING NOT TO SCALE -

## SOURCE CONTROL MANUAL SUPPLEMENTAL DETAILS

- Supplemental Details -

### Spill Control Sign Examples

Source Control

NUMBER

SC-103



Bureau of Environmental Services



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Appendix G

USDA Custom Soil Resource Report

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United States  
Department of  
Agriculture

NRCS

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for Clackamas County Area, Oregon



April 2, 2019

# Preface

---

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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## How Soil Surveys Are Made

---

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

## Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

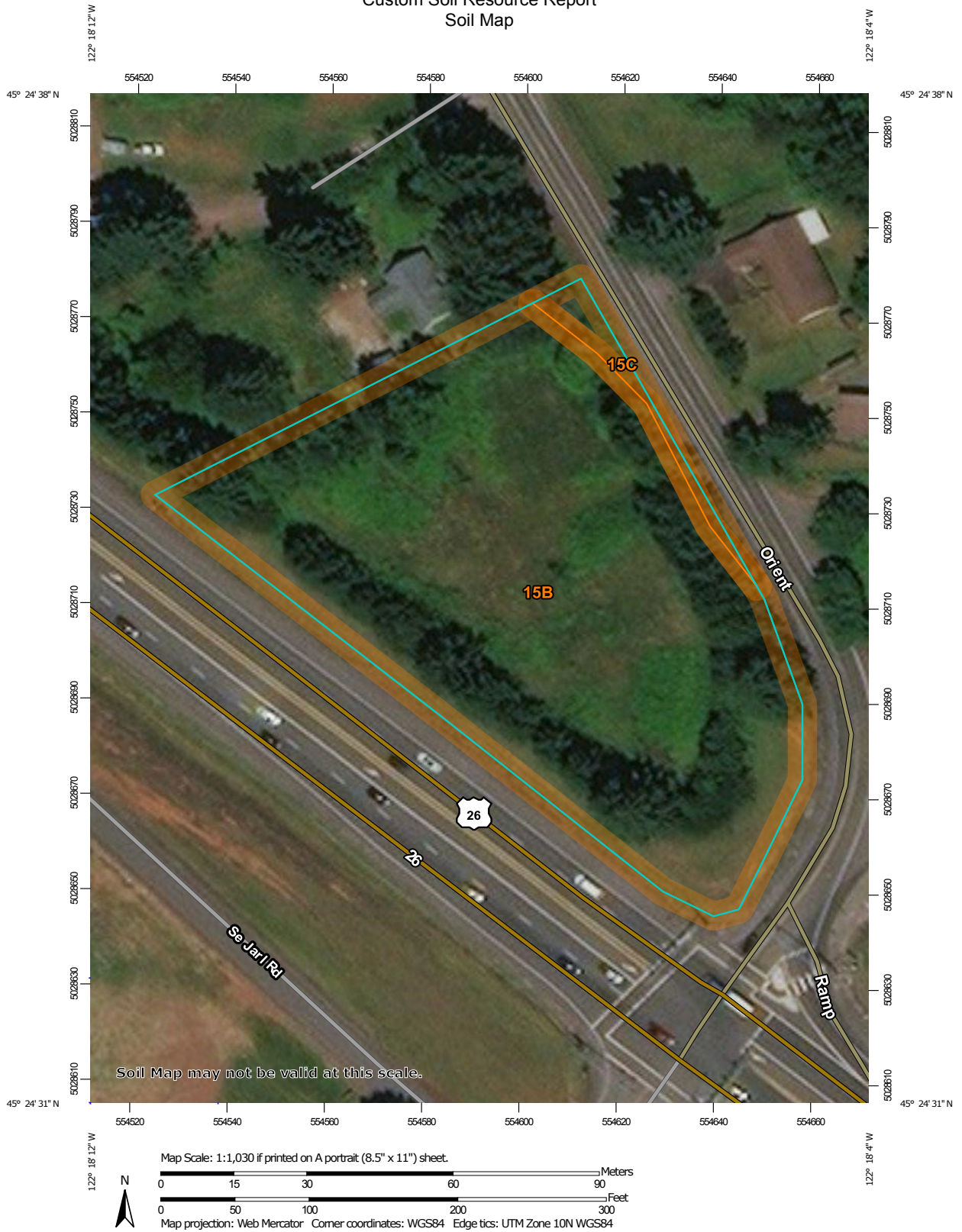
## Soil Map

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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.







































Custom Soil Resource Report  
Soil Map



## Custom Soil Resource Report

### MAP LEGEND

<b>Area of Interest (AOI)</b>		 Spoil Area	
 Area of Interest (AOI)		 Stony Spot	
<b>Soils</b>		 Very Stony Spot	
 Soil Map Unit Polygons		 Wet Spot	
 Soil Map Unit Lines		 Other	
 Soil Map Unit Points		 Special Line Features	
<b>Special Point Features</b>		<b>Water Features</b>	
 Blowout		 Streams and Canals	
 Borrow Pit		<b>Transportation</b>	
 Clay Spot		 Rails	
 Closed Depression		 Interstate Highways	
 Gravel Pit		 US Routes	
 Gravelly Spot		 Major Roads	
 Landfill		 Local Roads	
 Lava Flow		<b>Background</b>	
 Marsh or swamp		 Aerial Photography	
 Mine or Quarry			
 Miscellaneous Water			
 Perennial Water			
 Rock Outcrop			
 Saline Spot			
 Sandy Spot			
 Severely Eroded Spot			
 Sinkhole			
 Slide or Slip			
 Sodic Spot			

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon  
 Survey Area Data: Version 14, Sep 18, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 2, 2015—Sep 21, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
15B	Cazadero silty clay loam, 0 to 7 percent slopes	2.1	97.4%
15C	Cazadero silty clay loam, 7 to 12 percent slopes	0.1	2.6%
<b>Totals for Area of Interest</b>		<b>2.2</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

## Custom Soil Resource Report

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Clackamas County Area, Oregon

### 15B—Cazadero silty clay loam, 0 to 7 percent slopes

#### Map Unit Setting

*National map unit symbol:* 223c  
*Elevation:* 300 to 900 feet  
*Mean annual precipitation:* 48 to 85 inches  
*Mean annual air temperature:* 50 to 52 degrees F  
*Frost-free period:* 140 to 200 days  
*Farmland classification:* Farmland of statewide importance

#### Map Unit Composition

*Cazadero and similar soils:* 85 percent  
*Minor components:* 2 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Cazadero

##### Setting

*Landform:* Terraces  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Old mixed alluvium

##### Typical profile

*H1 - 0 to 21 inches:* silty clay loam  
*H2 - 21 to 75 inches:* clay

##### Properties and qualities

*Slope:* 0 to 7 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water storage in profile:* Moderate (about 8.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2e  
*Hydrologic Soil Group:* C  
*Forage suitability group:* Well drained < 15% Slopes (G002XY002OR)  
*Hydric soil rating:* No

#### Minor Components

##### Borges

*Percent of map unit:* 2 percent  
*Landform:* Depressions on terraces, hillslopes  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Base slope, tread  
*Down-slope shape:* Linear

Custom Soil Resource Report

*Across-slope shape:* Linear  
*Hydric soil rating:* Yes

**15C—Cazadero silty clay loam, 7 to 12 percent slopes**

**Map Unit Setting**

*National map unit symbol:* 223d  
*Elevation:* 600 to 900 feet  
*Mean annual precipitation:* 60 to 85 inches  
*Mean annual air temperature:* 50 to 52 degrees F  
*Frost-free period:* 140 to 200 days  
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Cazadero and similar soils:* 80 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Cazadero**

**Setting**

*Landform:* Terraces  
*Landform position (three-dimensional):* Riser  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Old mixed alluvium

**Typical profile**

*H1 - 0 to 21 inches:* silty clay loam  
*H2 - 21 to 75 inches:* clay

**Properties and qualities**

*Slope:* 7 to 12 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water storage in profile:* Moderate (about 8.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3e  
*Hydrologic Soil Group:* C  
*Forage suitability group:* Well drained < 15% Slopes (G002XY002OR)  
*Hydric soil rating:* No



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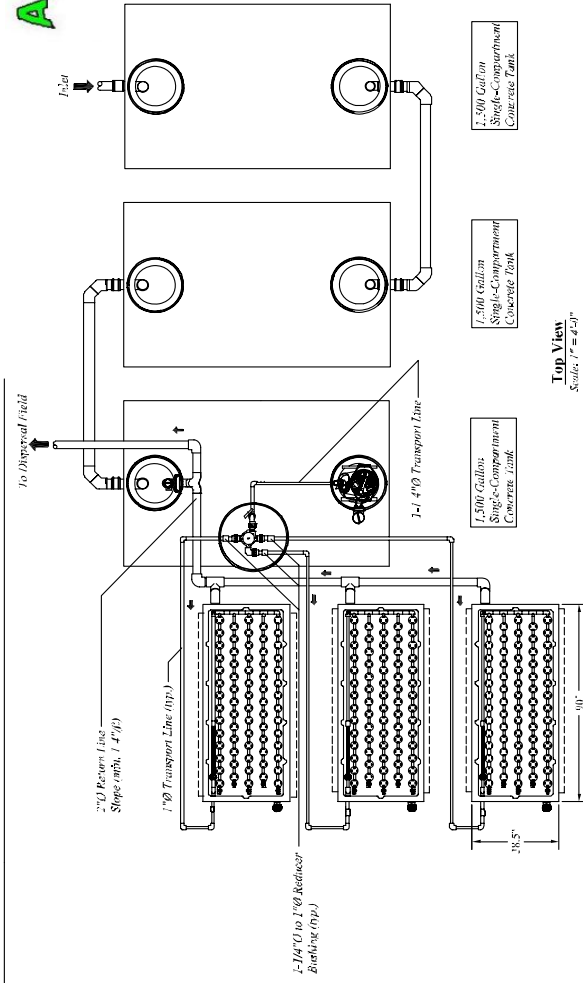
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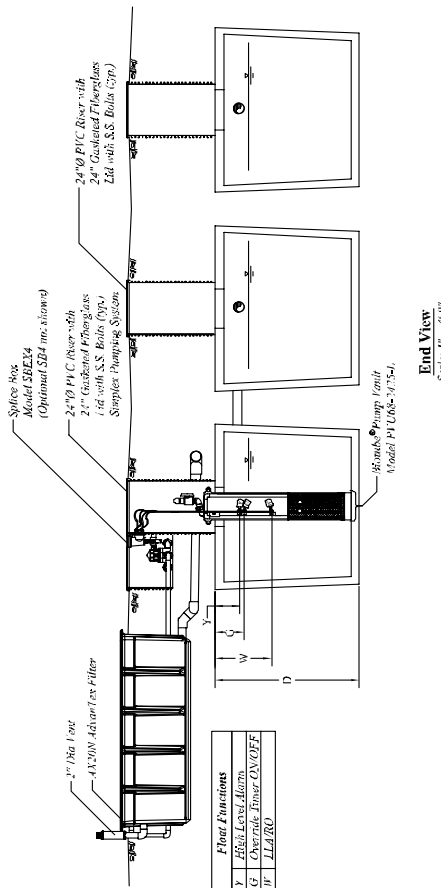
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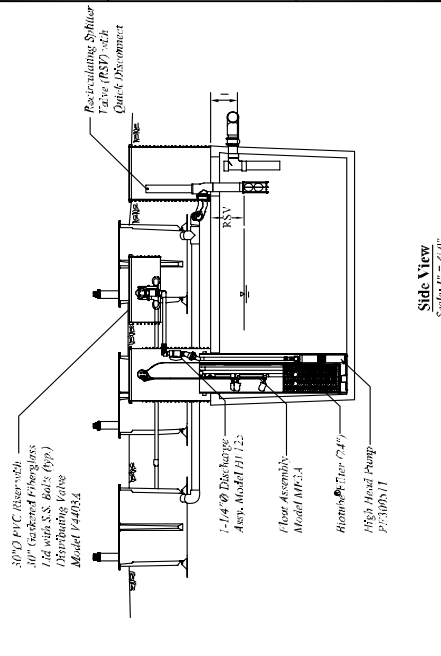
# AdvanTex® AX20N 3 Pod Mode 1A w/Concrete Tank



**Top View**  
Scale: 1" = 4'-0"



**End View**  
Scale: 1" = 4'-0"



**Side View**  
Scale: 1" = 4'-0"

Tank	Volume	Height	Length	Width	Weight	RSV
Material	Gal.	ft.	ft.	ft.	lbs.	ft <sup>3</sup>
W/Frame in Concrete	1,500 Gal.	11"	61.5"	3"	22'	15'
Riser and Backwash	1,500 Gal.	11"	60.5"	3"	22'	15'
Water Control Pvc	1,500 Gal.	10"	64"	2.2"	24'	14'
1,500 Gallon Pod in Concrete	1,500 Gal.	10"	68"	2.2"	24'	14'
1,500 Gallon Pod	1,500 Gal.	10"	68"	2.2"	24'	14'

**Design Notes**  
 Expected Flows  
 • Q<sub>max</sub> = 1,500 gpd  
 1 P to 9 Backrooms  
 Expected Influent Quality  
 Grease & Oil: 20 mg/L  
 BOD: 150 mg/L  
 TSS: 40 mg/L  
 TKN: 65 mg/L  
 Typical Effluent Quality  
 BOD: < 10 mg/L  
 TSS: < 10 mg/L  
 TN: < 25 mg/L

**Approved by DEQ**  
 9/14/2007

**AdvanTex® AX20N 3 Pod Mode 1A**

Drawn By: CHRIS JORDAN  
 Approved By: DAREEN SHMIE  
 Date: 8/2/07  
 Revision: A-04  
 Scale: 1" = 4'-0"

© 2005 Omnic Systems & Inc  
 5,980 746-5,531, 694-5,480, 561  
 5,492 635-6,372, 137-5,360, 596  
 U.S. Patents-4,939,223

**EXHIBIT K**

EXHIBIT L



DAN JOHNSON  
DIRECTOR

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

DEVELOPMENT SERVICES BUILDING

150 BEAVERCREEK ROAD OREGON CITY, OR 97045

June 5, 2019

Michael Ard  
21370 SW Langer Farms Pkwy, Suite 142  
Sherwood, OR 97140

**RE:** Design Modification request for Space Age Fuel Station,  
SE Orient Drive, T2S., R4E., Section 10, Tax Lots 4500

Dear Michael,

Clackamas County Engineering staff has reviewed the submitted Design Modification request materials, consisting of Design Modification narrative, and site plan drawings. We have the following comments:

**Decision:**

Development Engineering staff are in agreement with the proposed modification request and approve this request to allow driveway access on SE Orient Drive, and a reduced driveway throat depth of 20 feet.

**Facts and Findings:**

- 1) This design modification request proposes driveway access on SE Orient Drive, a minor arterial roadway. The subject property has access to a lower functional classification roadway, SE Crescent Road. Typically, access is only allowed to a minor arterial when access to a lower functional classification roadway is not available.
- 2) As noted in the modification request, based on limitations on the site, including a water quality facility, on-site circulation of fuel trucks in combination with passenger vehicles, without access to SE Orient Drive would require two driveways onto SE Crescent Road. With the limited extent of SE Crescent Road, larger vehicles exiting the site would need to utilize the entire road and would potentially limit turning movements from SE Orient Drive onto SE Crescent Road.
- 3) The applicant has noted that based on Roadway Standards Section 220.9, through a modification, the ADT for the proposed fuel station and convenience store warrant a second access.

- 4) The applicant has included turning diagrams showing that right-in/right-out turning movements at the proposed SE Orient Drive driveway are feasible. The county requires that turning restrictions are accomplished by medians. The applicant has provided a plan including a median on SE Orient Drive. The specific design of the median and any turn pocket in SE Orient Drive for property access on the easterly side of SE Orient Drive is not approved by this modification and will be addressed through land use review and permitting for the proposed development.
- 5) Roadway Standards, Section 330 specifies that driveway throats accessed by trucks with trailers provide a driveway throat length of 50 feet. The proposal to reduce the throat length to 20 feet is acceptable, based on the limited number of trucks using the site, and based on trucks only using the driveway to exit the site.
- 6) Traffic Engineering staff finds that the modification request is in compliance with Roadway Standards subsection 170.1.2d and should be approved. This is based on Traffic Engineering staff's evaluation of the design modification request, with staff judging that the proposed modification will fully meet the requirements for safety, function, appearance and maintainability, based upon sound engineering and technical judgment.

Please contact me via email at [kenken@co.clackamas.or.us](mailto:kenken@co.clackamas.or.us) or by phone at 503-742-4673 if you have any questions.

Sincerely,



Kenneth Kent  
Senior Planner, Development Engineering



EXHIBIT M

Emily Meharg <emeharg@ci.sandy.or.us>

---

**Clackamas County Onsite Wastewater comments on 19-012 Space Age Fueling Station**

2 messages

---

**Englebert, Erik** <EEnglebert@clackamas.us>  
To: "emeharg@ci.sandy.or.us" <emeharg@ci.sandy.or.us>

Wed, Aug 14, 2019 at 3:31 PM

Hello,

At this time, we have not received an application for a Septic Permit or Site Evaluation for the proposed use, and thus cannot offer comment on whether the system will be adequate.

It does appear that they have a design consultant on board which is great news, as this system will likely require stamped plans for approval.

Let me know if I can answer any other questions on this.

Best,

**Erik Englebert, REHS**

Supervisor, Senior Soil Scientist

Clackamas County Onsite Wastewater Systems Program

[150 Beaver Creek Rd](#)

[Oregon, City, OR 97045](#)

[eenglebert@clackamas.us](mailto:eenglebert@clackamas.us)

---

**Emily Meharg** <emeharg@ci.sandy.or.us>  
To: "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>, Mike Walker <mwalker@ci.sandy.or.us>

Wed, Aug 14, 2019 at 5:05 PM

FYI

[Quoted text hidden]





EXHIBIT N

Emily Meharg <emeharg@ci.sandy.or.us>

---

**File 19-012 DR**

1 message

---

**MW** <mwalker@ci.sandy.or.us>  
To: Emily Meharg <emeharg@ci.sandy.or.us>

Fri, Aug 16, 2019 at 10:52 AM

Emily:

This site does not have access to City utilities, will connect to the County's stormwater system and take access via a Clackamas County road and front on an ODOT highway so my comments are very limited.

1. Complete frontage improvements including streetlighting, curbs, sidewalks and planter per Sections 15.20 and 17.84 Sandy Municipal Code on all site roadway frontages, including Crescent Ln.

Hassan will provide you with a review of the stormwater management plan.

Let me know if you have any questions.

--

Mike Walker

Director of Public Works

City of Sandy

39250 Pioneer Blvd.

Sandy, OR 97055

503-489-2162 V

503-668-8714 F

[www.ci.sandy.or.us](http://www.ci.sandy.or.us)

EXHIBIT O



Emily Meharg <emeharg@ci.sandy.or.us>

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**Space Age fueling Station**

1 message

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**Hassan Ibrahim** <hai@curran-mcleod.com>  
To: Emily Meharg <emeharg@ci.sandy.or.us>  
Cc: MW <mwalker@ci.sandy.or.us>

Mon, Aug 19, 2019 at 10:43 AM

Hi Emily,

Here are my comments:

1. The CDS Manhole water quality doesn't appear to meet the 2016 City of Portland SWMM as adopted by the City of Sandy.
2. Input from ODOT is required on Mt Hood Hwy and particularly at the intersection with SE Crescent Street and impacts on the existing traffic signal function and performance and lane configuration.
3. Half street improvement on SE Orient Dr is required along the entire site frontage to minor arterial standards to include signing and striping plans.
4. All on-site hydrology and hydraulics under the canopy/fueling area shall meet the requirements of DEQ for water quality.
5. All sidewalks and ADA ramps must comply with the most current ADA requirements. An ADA ramp shall be installed at the corner of SE Orient Drive and SE Crescent Rd.
6. The proposed cul-de-sac shall be designed to include plan and profile as part of this development to assure grades will be met.

Regards,

-----  
Hassan Ibrahim, P.E.  
CURRAN-McLEOD, INC.  
6655 SW Hampton St, Ste. 210  
Portland, OR 97223  
Tel: 503-684-3478  
Fax: 503-624-8247  
Cell: 503-807-2737  
email: [hai@curran-mcleod.com](mailto:hai@curran-mcleod.com)



Emily Meharg <emeharg@ci.sandy.or.us>

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## Space Age Gas Station Notice

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Amos, Matt <Matt.Amos@clackamasfire.com>  
To: "emeharg@ci.sandy.or.us" <emeharg@ci.sandy.or.us>

Tue, Sep 10, 2019 at 8:37 AM

Good morning Emily,

Clackamas Fire has no issue with the property having a Highway 26 address even without access from Highway 26. Our planning, and response will be adjusted with notes if it becomes an issue in the future. Please let me know if there is anything else you need from me for this approval.

Thank you,

Matt Amos

Fire Inspector | Fire Prevention

direct: 503.742.2661

main: 503.742.2600



*To Safely Protect & Preserve  
Life & Property*

**CLACKAMAS FIRE DISTRICT #1**  
[www.clackamasfire.com](http://www.clackamasfire.com)

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**From:** Olson, Shawn <shawn.olson@ClackamasFire.com>

**Sent:** Monday, September 9, 2019 4:09 PM

**To:** Amos, Matt <[Matt.Amos@clackamasfire.com](mailto:Matt.Amos@clackamasfire.com)>

**Subject:** FW: Space Age Gas Station Notice

Mathew, please review and kick comments back. Thank you, Shawn

Shawn Olson

Battalion Chief-Fire Marshal

Ph: 503-742-2663

main: 503.742.2600



*To Safely Protect & Preserve  
Life & Property*

**CLACKAMAS FIRE DISTRICT #1**

[www.clackamasfire.com](http://www.clackamasfire.com)

**From:** Emily Meharg <[emeharg@ci.sandy.or.us](mailto:emeharg@ci.sandy.or.us)>  
**Sent:** Monday, September 9, 2019 3:29 PM  
**To:** Olson, Shawn <[shawn.olson@ClackamasFire.com](mailto:shawn.olson@ClackamasFire.com)>  
**Cc:** Kelly O'Neill Jr. <[koneill@ci.sandy.or.us](mailto:koneill@ci.sandy.or.us)>  
**Subject:** Re: Space Age Gas Station Notice

Hi Shawn,

I believe that we previously noticed Sandy Fire during the pre-application phase for this project, but were informed that it's in Clackamas Fire's jurisdiction, not Sandy's. At that time, we received a letter from you (attached). With submittal of the current land use application request, the applicant submitted the attached Fire Plan that was approved by Matt Amos from Clackamas Fire District #1. Should the packet of materials we sent you have been sent to Matt Amos instead? If so, can you pass them along for comments? If you are the one who would typically comment, you can submit a similar letter to the one submitted at the pre-app stage; we just need an official comment tied to the actual land use application based on the materials submitted. We would also like your feedback on the address question.

Thanks,

Emily

On Mon, Sep 9, 2019 at 6:47 AM Olson, Shawn <[shawn.olson@clackamasfire.com](mailto:shawn.olson@clackamasfire.com)> wrote:

Good Morning Emily,

This is in Sandy Fire District's area. Please reach out to FM Don Patty at Sandy Fire for review.

Thank you,

Shawn Olson

Battalion Chief-Fire Marshal

Ph: 503-742-2663

main: 503.742.2600



To Safely Protect & Preserve  
Life & Property

**CLACKAMAS FIRE DISTRICT #1**  
www.clackamasfire.com

**From:** Emily Meharg <emeharg@ci.sandy.or.us>  
**Sent:** Friday, September 6, 2019 8:34 AM  
**To:** Olson, Shawn <shawn.olson@ClackamasFire.com>  
**Cc:** Kelly O'Neill Jr. <koneill@ci.sandy.or.us>  
**Subject:** Re: Space Age Gas Station Notice

Hi Shawn,

I wanted to follow up to see if you are planning to submit comments on the Space Age gas station proposal in Sandy. We would really appreciate receiving comments from the Fire District in general as well as feedback on the address question below.

Thank you,  
Emily

On Mon, Aug 19, 2019 at 2:15 PM Emily Meharg <emeharg@ci.sandy.or.us> wrote:

Hi Shawn,

We sent you notice for a proposed Space Age gas station at 15585 Orient Drive in Sandy last week so hopefully you have received the hard copies in the mail. In your comments, can you please include the Fire District's stance on whether you would support re-addressing the property to have a Highway 26 address? The City's code favors having the front lot line on Highway 26, which would require either driveway access to the highway (which ODOT won't allow), or a Highway 26 address. However, we're not sure if a highway 26 address without access from highway 26 would be acceptable for emergency services purposes.

Thanks,  
Emily

This e-mail is a public record of the City of Sandy and is subject to the State of Oregon Retention Schedule and may be subject to public disclosure under the Oregon Public Records Law. This e-mail, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please send a reply e-mail to let the sender know of the error and destroy all copies of the original message.

[Quoted text hidden]

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**2 attachments**

**Space Age Fuel Station-Orient Drive\_FIRE.pdf**

 208K

 **FIRE APPROVAL - 18-126 Planning 06-05-19 sheet 3.pdf**  
640K





EXHIBIT Q

Emily Meharg <emeharg@ci.sandy.or.us>

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**Space Age Fueling Station (File No. 19-012 DR/ADJ/TREE)**

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**Kristine Hendrix** <Kristine.Hendrix@pgn.com>  
To: "emeharg@ci.sandy.or.us" <emeharg@ci.sandy.or.us>

Wed, Sep 11, 2019 at 3:47 PM

We have reviewed the notice of land use decision for the above address and found no conflict.

When the developer is ready to start the project please have them call PGE Service Coordination's at 503-323-6700.

**Thank you,**

**Kristine Hendrix** | Sr. Design Coordinator


Work Hours 6:30 am to 4:00 pm M – TH & 6:30 am to 10:30 am Fri

Portland General Electric

[1705 NE Burnside, Gresham, OR 97030](#)

| 📞: (503) 669-5214 | 📠: (503) 669-5229 | ✉️ [kristine.hendrix@pgn.com](mailto:kristine.hendrix@pgn.com)

---

 **City of Sandy - 15585 SE Orient Dr.docx**  
929K



15585 SE Orient Dr., Boring, OR 97009  
 - PGE shows no conflict in the area.

**REPLINGER & ASSOCIATES LLC**  
TRANSPORTATION ENGINEERING

September 26, 2019

Ms. Emily Meharg  
City of Sandy  
39250 Pioneer Blvd.  
Sandy, OR 97055

**SUBJECT: REVIEW OF TRANSPORTATION IMPACT STUDY – SANDY SPACE AGE**

Dear Emily:

In response to your request, I have reviewed materials submitted in support of the Sandy Space Age fueling station and convenience market. The materials consisted of the site plan, the Transportation Impact Study (TIS) for the Sandy Space Age (undated), the Clackamas County comment letter dated June 5, 2019, and a Technical Memorandum dated September 16, 2019. The TIS and September 16, 2019 Technical Memorandum were prepared under the direction of Michael Ard, PE of Ard Engineering.

The original TIS provides an analysis of the impact of the proposed development and the impact of full build-out of the site under city zoning. The Technical Memorandum provides additional analysis related to full build-out of the site and mitigation necessary to show compliance with the Transportation Planning Rule (TPR) in 2038.

The TIS describes a proposal to construct a 16-pump fueling station with a convenience market of up to 3000 square feet. The site is north quadrant of the intersection of Highway 26 and SE Orient Drive. The proposed access is via SE Crescent Road and SE Orient Drive. The SE Crescent Road access would allow inbound and outbound movements; the SE Orient Drive access would be restricted to right-in, right-out access.

**Overall**

I find the TIS as supplemented by the September 16, 2019 Technical Memorandum addresses the city's requirements and provides an adequate basis to evaluate impacts of the proposed development.

**Comments**

1. **Study Area.** The study addresses the appropriate intersections. It includes analyses of:
  - Highway 26 at SE Orient Drive
  - SE Orient Drive at SE Crescent Road
  - Site Access at SE Crescent Road
  - Site Access at SE Orient Drive

- 2. Traffic Counts.** The AM and PM peak hour traffic counts were conducted on November 6, 2018 at the study area intersections. The engineer adjusted the November traffic counts to account for seasonal variations. The engineer used a combination approach to account for seasonal variation of recreational traffic and separately for commuter traffic. The methodology appears consistent with the procedures defined by the Oregon Department of Transportation (ODOT). The adjusted counts appear reasonable.
- 3. Trip Generation.** The TIS uses trip generation for 16-pump fueling station with a convenience store (land use code 945) from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*. The engineer calculates that the station/store would produce 200 total AM peak hour trips; 224 total PM peak hour trips; and 3286 total daily trips. Pass-by trips are estimated to account for a majority of trips. Pass-by trip percentages of 62 percent during the AM peak and 56 percent during the PM peak were applied. The result is a net trip increase of 76 AM peak hour trips; 98 PM peak hour trips; and 1348 daily trips. The engineer estimated that most of the pass-by trips would be drawn from Highway 26. The calculation of trips generated by the station/store appears reasonable.
- 4. Trip Distribution.** The TIS provided information about trip distribution from the site. The engineer assumed 45 percent of the traffic would travel to and from the southeast on Highway 26; 35 percent would travel to and from the northwest on Highway 26; and 20 percent would travel to and from the north on SE Orient Drive. The trip distribution seems reasonable.
- 5. Traffic Growth.** The TIS uses a 1.92 percent annual increase for Highway 26 based on projected volumes at the west boundary of Sandy. For other facilities it uses a 2.0 percent annual growth rated background traffic growth. These assumptions account for future traffic and appear reasonable.
- 6. Analysis.** Traffic volumes were calculated for the intersections cited in #1, above. Intersection level-of-service (LOS) and the volume-to-capacity (v/c) ratio were provided. The stop-controlled intersection of Orient/Crescent and the site access points are calculated to operate acceptably under existing conditions and all development scenarios. The engineer calculates that the Highway 26/SE Orient Drive intersection currently fails to meet applicable ODOT performance standards given the classification of Highway 26. Development is calculated to cause further degradation of the intersection's performance with the v/c ratio rising from its current value of 0.85 in the AM peak hour and 0.93 in the PM peak hour. The intersection is not calculated to meet ODOT performance targets with any development scenario.

To mitigate for the development, the engineer calculates that the addition of a left-turn lane for southbound SE Orient Drive at Highway 26 significantly improves the performance of the intersection. With this mitigation, the v/c ratio improves to match the current

Ms. Emily Meharg  
September 26, 2019  
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performance in the AM peak hour and is calculated to be slightly better than existing conditions during the PM peak hour. The engineer also provided calculations to determine the appropriate length of the left-turn lane to provide adequate storage.

The engineer also analyzed the intersection of SE Orient Drive/SE Crescent Road and determined that a left- turn lane for northbound SE Orient Drive was warranted.

To mitigate for the proposed development (the fueling station and convenience market), the engineer recommends the following mitigation measures: the addition of a left-turn lane on SE Orient Drive at Highway 26; the modification of the traffic signals at SE Orient Drive at Highway 26 to accommodate the additional lane; widening SE Orient Drive between Highway 26 and SE Crescent Road to include turn lanes at each intersection. I concur with these recommendations to mitigate for the added traffic from the development.

7. **Crash Information.** The TIA provides information on crashes for the most recent available three-year period (2014 through 2016). For the three-year period, 26 crashes were reported at Highway 26/SE Orient Drive. The engineer reports that 16 were rear-end crashes. Others included side-swipe, turning movement, and fixed-object, and overturn crashes. There were no fatalities or major injuries; most were property damage only. The calculated crash rate was 0.398 crashes per million entering vehicles, which is below the 90<sup>th</sup> percentile crash rate for similar facilities.

There were no reported collisions at the intersection of SE Orient Drive and SE Crescent Road.

The engineer identified no significant safety hazards and did not recommend specific safety mitigations. I concur.

8. **Site Plan and Access.** The site plan provides for two access points: an all movement access on SE Crescent Road; and a right-in, right-out access on SE Orient Drive. The TIS provides an explanation of the need for two access points and their location based on the topography of the site and turning movements required by fuel trucks. Several schematics are included showing different access alternatives with truck templates overlaid on the site. The Clackamas County comment letter indicates approval of the design modification request for an access to SE Orient Drive. The County further specifies that the right-in, right-out access to SE Orient Drive be restricted by the use of raised medians.

An additional modification approved by the County is allowing a 20-foot throat length for the driveway access to SE Orient Drive rather than the standard 50-foot throat length.

The access proposal seems to be appropriate given the constraints of the site and has been accepted by the County. The County's letter notes that the specific design of the new

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roadway and median on SE Orient Drive will need County approval through the land use process. Further coordination and approvals by the County and, potentially, by ODOT will be required.

**9. *Sight Distance.*** The engineer analyzed sight distance at the intersection of SE Orient Drive and SE Crescent Road and at the proposed site access on SE Orient Drive. The engineer followed the standards for sight distance specified by Clackamas County. For the intersection of SE Orient Drive and SE Crescent Road, sight distance was measured to be in excess of the minimum in both directions. For the proposed site access on SE Orient Drive, sight distance is limited by vegetation, which will be removed, and by the presence of a curve between the site and Highway 26. Restricting the movements at the proposed site access to right-in, right-out eliminates the conflicts with northbound traffic on SE Orient Drive and makes the sight distance limitations irrelevant. Sight distance to the north exceeds minimum requirements. The only mitigation needed for sight distance is the restriction to right-in, right-out for the site access on SE Orient Drive, which is what is proposed.

**10. *Left-Turn Lane and Signal Warrants.*** The engineer analyzed the intersections of SE Orient Drive and SE Crescent Road for signals and for left-turn lanes using standard methods based on traffic volumes, travel speeds, and lanes. He concluded signals are not warranted, but a left-turn lane is warranted for northbound SE Orient Drive. I concur with the need for a northbound left-turn lane at this location.

**11. *Transportation Planning Rule (OAR 660-012-0060) Analysis.*** The engineer conducted an analysis of the potential development of the site using a "reasonable worst case" development scenario under City of Sandy C-2 retail/commercial zoning. The engineer assumed that a fast food restaurant and a drive-in bank could be added to the site in addition to the proposed fueling station/convenience store currently proposed. Using this development scenario, the site was calculated to generate 187 AM net new peak hour trips; 225 net new PM peak hour trips; and 2580 net new daily trips.

The engineer analyzed the performance of the subject intersections for 2038 background conditions; 2038 with the "reasonable worst case" development scenario; and the 2038 "reasonable worst case" development scenario with the mitigation proposed with the project (a left-turn lane for the southbound SE Orient Drive approach). All 2038 traffic scenarios were calculated to exceed the target v/c ratio specified in the Oregon Highway Plan. With the proposed mitigation (the left-turn lane), performance improved significantly. With mitigation, the AM peak hour is predicted to be slightly worse than the 2038 background scenario, while the PM peak hour is predicted to be better than the 2038 background scenario.

To show compliance with the Transportation Planning Rule, the "reasonable worst case" development scenario must be mitigated such that predicted operations are no worse than



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the background conditions. The TIS has demonstrated that proposed mitigation meets this performance level for the PM peak hour in 2038, but not for the AM peak hour.

As described above, the September 16, 2019 Technical Memorandum provides additional documentation to illustrate mitigation measures to demonstrate compliance with the TPR during the AM peak hour in 2038 with the full build-out of the site with City of Sandy C-2 zoning. To offset the predicted performance of the intersection of Highway 26 and SE Orient Drive during the AM peak hour, the engineer demonstrates that an additional right-turn lane on the southbound approach of SE Orient Drive allows the intersection to operate no worse than the 2038 background condition during the AM peak hour with full-buildout of the site. The resulting configuration of the southbound approach of SE Orient Drive would consist of three lanes: a left-turn lane; a left-turn, through lane; and a right turn lane.

The engineer indicates the development and rezoning does not propose changes to the functional classification system; and the levels and types of traffic are consistent with the functional classification system of nearby facilities. I concur.

To mitigate for the rezoning and full development of the site under City of Sandy C-2 zoning (e.g. a fast-food restaurant and a drive-in bank *in addition to* the proposed fueling station and convenience market in the initial development), the applicant needs commit to mitigation measures including three lanes for the southbound approach of SE Orient Drive at Highway 26; traffic signal modifications and related improvements acceptable to ODOT as a condition of approval to allow the development and zone change to be found to be consistent with the Transportation Planning Rule. The applicant has proposed that this mitigation be tied to future development. I concur with this proposal.

**12. Conclusions and Recommendations.** The engineer provides detailed proposals to allow the fueling station/convenience market to proceed. These include: constructing a left-turn lane on southbound SE Orient Drive at Highway 26 with accompanying signal modifications; providing a left-turn lane on northbound SE Orient Drive at SE Crescent Road; and constructing a three-lane section for SE Orient Drive between Highway 26 and SE Crescent Road with a raised median to restrict driveway movements at the site to right-in, right-out. He concludes that the left-turn lane added to the southbound Orient Drive approach to Highway 26 improves performance to offset the additional traffic from the development. Further he concludes that the traffic operations and safety will be acceptable at the unsignalized locations with the specified mitigation measures. I concur with his conclusions and with his proposed mitigation measures.

To show that a zone change to City of Sandy C-2 zoning is consistent with the Transportation Planning Rule, the applicant needs to commit to additional mitigation. This mitigation is not required to offset the impact of the current development proposal (fueling station and convenience market), but should be a condition of approval for any development beyond the current proposal (a fueling station and convenience market). The

Ms. Emily Meharg  
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applicant needs to provide mitigation measures acceptable to ODOT showing that with the "reasonable worst case" development scenario under C-2 zoning will be no worse than the 2038 background conditions for both the AM and PM peak hours. With this commitment to implement these measures as conditions of approval, the rezoning can be shown to be consistent with the Transportation Planning Rule.

### **Conclusion and Recommendations**

Based on the information provided by the applicant, I find the TIS meets City requirements.

I recommend that the following be made conditions of approval in connection for the initial phase of the development (the fueling station and convenience market):

- The applicant constructs a left-turn lane on southbound SE Orient Drive at Highway 26 with accompanying signal modifications according to ODOT specifications and requirements;
- The applicant constructs a left-turn lane on northbound SE Orient Drive at SE Crescent Road according to Clackamas County specifications and requirements and to ODOT specifications and requirements if any section of SE Orient Drive falls within ODOT jurisdiction;
- The applicant constructs a three-lane section for SE Orient Drive from Highway 26 to north of SE Crescent Road with a raised median to restrict driveway movements at the site to right-in, right-out according to Clackamas County specifications and requirements and to ODOT specifications and requirements if any section of SE Orient Drive falls within ODOT jurisdiction.
- The applicant dedicates any additional right-of-way adjacent to Highway 26 and SE Orient Drive if necessary to assure that an additional southbound lane can be provided on SE Orient Drive at Highway 26.

For any development beyond that currently proposed, I recommend the following conditions of approval:

- The applicant constructs a right-turn lane on southbound SE Orient Drive at Highway 26 (this will result in three lanes for the southbound SE Orient Drive approach) with accompanying signal modifications according to ODOT specifications and requirements such that the intersection will operate at no worse than 2038 background conditions during both the AM and PM peak hours under full build-out of the site under City of Sandy C-2 zoning.

If the applicant seeks to modify these conditions of approval due to changes in conditions or standards, the applicant will need to demonstrate compliance with the Transportation Planning Rule. Such compliance will need to include an analysis of the year associated with the most recently adopted City of Sandy Transportation System Plan.

Ms. Emily Meharg  
September 26, 2019  
Page 7

If you have any questions or need any further information concerning this review, please contact me at [replinger-associates@comcast.net](mailto:replinger-associates@comcast.net).

Sincerely,



John Replinger, PE  
Principal

SandySpaceAgeTIA092619



## EXHIBIT S

**DAN JOHNSON**  
DIRECTOR

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

DEVELOPMENT SERVICES BUILDING

150 BEAVERCREEK ROAD OREGON CITY, OR 97045

### MEMORANDUM

TO: City of Sandy, Planning Department  
FROM: Kenneth Kent, Clackamas County Engineering, Senior Planner  
DATE: September 24, 2019  
RE: 19-012 - Space Age Fueling Station, 15585 SE Orient Drive  
24E10 04500

This office has the following comments pertaining to this proposal:

1. The proposed land use application for a fueling station and convenience store is located within the City of Sandy. The project site abuts the east side of SE Orient Drive, south side of SE Crescent Road, and the west side of Highway 26. SE Orient Drive is a County maintained minor arterial roadway. SE Crescent Road is a non-maintained local road under the jurisdiction of Clackamas County. Highway 26 is under the jurisdiction of the Oregon Department of Transportation (ODOT). Based on this, access and improvements along the frontage of the project site on SE Orient Drive and SE Crescent Road require approval by Clackamas County.
2. Design and permitting to ODOT standards will be required for improvements within the right-of-way of Highway 26 and the portion of SE Orient Drive under ODOT's jurisdiction.
3. Access is proposed from SE Crescent Road and SE Orient Drive. County standards limit access onto arterial roadways, requiring that access is taken from lower functional classification roads when available. During the pre-application process for the proposed development, the county indicated that all access to the site would be limited to SE Crescent Road. The applicant requested a Design Modification to the County Roadway Standards to allow driveway access onto SE Orient Drive.
4. A Design Modification was approved on June 5, 2019 allowing a driveway onto SE Orient Drive, primarily to address on-site circulation challenges relating to fuel delivery trucks. Subsequent to the Design Modification, a traffic study was prepared resulting in the need for construction of a southbound left turn lane at the SE Orient Drive/Highway 26 intersection and a left turn lane on SE Orient Drive onto SE Crescent Road. As a result, the proposal includes two southbound travel lanes adjacent to the proposed site driveway. Although, the original proposal considered for the Design Modification included a right-in, right-out driveway, based on the on-site circulation in the vicinity of this driveway, particularly when trucks would be on-site, and the limited throat depth, the driveway will be limited to right-out turning movements only. With the additional lane width available on SE Orient Drive, the angle of the driveway approach can be lessened. It will still be necessary to channelize the approach limiting the ability to make right turns into the site. The applicant will be required

P. 503.742.4400

F. 503.742.4272

WWW.CLACKAMAS.US

to provide turning templates demonstrating the angle and width of the driveway is the minimum necessary to accommodate truck access from the site onto SE Orient Drive, using both travel lanes.

5. Where there are restricted turning movements for a driveway, the county's standard is median control. The applicant's proposal includes a median between the two southbound travel lanes to allow for a left-in and left-out for the existing driveway serving the undeveloped property (Tax Lot 24E10 05490 and 05400) on the east side of SE Orient Drive. For this location, a median will only be permitted at the center of the roadway rather than between southbound travel lanes. Based on the limited use of the existing driveway on the east side of SE Orient Drive, it does not warrant providing full access at this time.
6. The proposed lane transition of southbound SE Orient Drive to accommodate the northbound left turn lane at SE Crescent Drive appears to require additional length to meet Roadway Standards Section 250.6.4, based on a design speed of 55 MPH.

### **CONCLUSION**

Although the County does not have land use jurisdiction over the proposed site development, the County does have jurisdiction over access to and improvements along the frontage of SE Orient Drive.

If the City of Sandy approves the request, the following conditions of approval are recommended. If the applicant is advised to or chooses to modify the proposal in terms of access location and/or design following the preparation of these comments this office requests an opportunity to review and comment on such changes prior to a decision being made.

1. All frontage improvements in, or adjacent to Clackamas County right-of-way, shall be in compliance with *Clackamas County Roadway Standards*. Frontage improvements in, or adjacent to State of Oregon right-of-way, shall be in compliance with Oregon Department of Transportation standards.
2. The applicant shall dedicate additional right-of-way along the entire site frontage of SE Orient Drive and SE Crescent Road as necessary to accommodate the required frontage improvements, providing a minimum of 6 inches behind the sidewalk.
3. Written approval shall be obtained from ODOT, in the form of a permit, for access and improvements within the Highway 26 right-of-way and the portion of SE Orient Drive under ODOT's jurisdiction.
4. Minimum improvements on the SE Orient Drive frontage consistent with *Clackamas County's Roadway Standards* include, but are not limited to, up to a one half-street improvement, including:
  - a. Up to a minimum 30-foot wide, one half-street improvement shall be constructed along the entire site frontage to arterial roadway standards, per Clackamas County Roadway Standards Standard Drawing C100. As necessary, additional paved width shall be provided for the proposed second left turn lane at the intersection with Highway 26 and the northbound left from SE Orient Road to SE Crescent Road.

- b. Lane transitions shall be provided per Roadway Standards Section 250.6.4 based on a 55 MPH design speed.
  - c. A minimum 1.5-foot wide concrete center median shall be constructed on SE Orient Drive, centered on the site driveway, extending a minimum of 40 feet beyond the north and south edge of the driveway. A minimum shy distance of 1.0 foot shall be provided from the median and travel lane
  - d. Standard curb, or curb and gutter if curblin slope is less than one percent.
  - e. Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.
  - f. A minimum 7-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. If the sidewalk does not connect to sidewalk on adjacent property, the end of the sidewalk shall require the construction of a concrete ramp, adjacent to the end of the sidewalk, providing a transition from the new sidewalk to the edge of the pavement. The ramps shall meet ADA guidelines.
  - g. A minimum 28-foot wide concrete driveway approach shall be constructed, per Standard Drawing D650, and shall be limited to right-out turning movements only. A wider driveway is acceptable with demonstration of the need with truck turning templates. The driveway approach and on-site curbs shall be channelized to limit right-turns into the driveway. The angle of the driveway shall be no more than necessary to accommodate truck turning and shall be demonstrated by turning templates based on anticipated vehicles. A signage plan shall be provided indicating the access restriction.
  - h. A striping plan for SE Orient Drive shall be provided. The northbound left turn lane queue storage at SE Crescent Road shall be the minimum as recommended in the project traffic study by Ard Engineering, dated April 8, 2019.
  - i. Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.
5. Minimum improvements on the SE Crescent Road frontage consistent with *Clackamas County's Roadway Standards* include, but are not limited to, up to a half-street improvement, including:
- a. Dedicate public right-of-way as needed to accommodate the required frontage improvements.
  - b. A minimum total paved width of 20 feet, with a structural section for a commercial local roadway, per Clackamas County Roadway Standards Standard Drawing C100.
  - c. Standard curb, or curb and gutter if curblin slope is less than one percent.



- d. Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.
  - e. A minimum 5-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. Dual curb ramps shall be constructed per ODOT Standard Drawing (RD755, RD756 and RD757) at the SE Crescent Road intersection with SE Orient Drive.
  - f. A minimum 28-foot wide concrete driveway approach shall be constructed, per Standard Drawing D650. A wider driveway is acceptable with demonstration of the need with truck turning templates.
  - g. Provide adequate intersection sight distance per Section 240 of the Clackamas County Roadway Standards.
  - h. Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.
  - i. Prior to issuance of a Development and start of construction activities, off-site construction easements shall be obtained.
6. Prior to commencement of site work, a Development Permit is required and must be obtained from Clackamas County for all work performed in the road right-of-way. A Utility Placement Permit is required for any utility work within the public right-of-way, per Chapter 7 of the Roadway Standards. When there are multiple utility service trenches in the road, the trench repairs will grind and inlay the top 2" of the pavement restoration to include a minimum 12" tee beyond the furthest trench, and to combine multiple trenches into one surface repair.



# Oregon

Kate Brown, Governor

**EXHIBIT T**  
**Department of Transportation**  
Region 1 Headquarters  
123 NW Flanders Street  
Portland, Oregon 97209  
(503) 731.8200  
FAX (503) 731.8259

September 26, 2019

ODOT #8605

## ODOT Response

<b>Project Name:</b> Space Age Fueling Station	<b>Applicant:</b> Jim Pliska, JLP Development
<b>Jurisdiction:</b> City of Sandy	<b>Jurisdiction Case #:</b> 19-012 DR/ADJ/TREE
<b>Site Address:</b> 15585 SE Orient Drive, Sandy, OR 97055	<b>Legal Description:</b> 02S 04E 10 <b>Tax Lot(s):</b> 04500
<b>State Highway:</b> US 26	<b>Mileposts:</b> <u>22.13</u>

The site of this proposed land use action is adjacent to the intersection of US 26/Orient Dr. ODOT has permitting authority for this facility and an interest in ensuring that this proposed land use is compatible with its safe and efficient operation. **Please direct the applicant to the District Contact indicated below to determine permit requirements and obtain application information.**

### COMMENTS/FINDINGS

The ODOT mobility target for the US 26/Orient Dr. intersection is 0.90 volume to capacity ratio (v/c). ODOT reviewed the Technical Memorandum prepared by ARD Engineering dated September 16, 2019 regarding the Sandy Space Age Mitigation Analysis Update. The analysis included the 2020 background conditions plus the proposed development (phase 1 gas station and convenience store) with two mitigation alternatives. The first mitigation alternative includes one additional southbound approach lane on SE Orient Dr. at US 26. This mitigation results in a v/c ratio of 0.91. The second mitigation alternative includes an additional two southbound approach lanes on SE Orient Dr. This mitigation results in a v/c ratio of 0.89 v/c. The applicant will meet ODOT's mobility target in the year of opening (2020) only when the second alternative is constructed (addition of two lanes on Orient Dr. for a total of three southbound lanes). ODOT is recommending that the second mitigation alternative which includes adding two southbound approach lanes on SE Orient Dr. at US 26 be required at this time.

Part of SE Orient Dr. is within ODOT jurisdiction. The site plan shows a 5ft sidewalk and the ODOT standard is 6ft. Therefore, the applicant is required to build a 6ft sidewalk within ODOT right of way.

The site plan shows a single ADA ramp at the intersection. ODOT standard is for two ADA ramps. Therefore, the applicant is required to build two ADA ramps. The proposed location of the traffic signal may need to be relocated to accommodate the required two ADA ramps. The proposed signal pole relocation requires a signal modification approval from ODOT Region 1 Traffic. It may take up to four months to process the signal modification.

The applicant proposes to remove several mature trees within the ODOT right of way along the property line. The applicant must replace the trees that are removed at a 2 to 1 ratio. The trees shall be located 36ft from the edge of the travel lane. Please contact Magnus Bernhardt, ODOT Landscape Architect at 503.731.8283 or [Magnus.U.BERNHARDT@odot.state.or.us](mailto:Magnus.U.BERNHARDT@odot.state.or.us) to discuss type of tree species and location.

All alterations within the State highway right of way are subject to the ODOT Highway Design Manual (HDM) standards. Alterations along the State highway but outside of ODOT right-of-way may also be subject to ODOT review pending its potential impact to safe operation of the highway. If proposed alterations deviate from ODOT standards a Design Exception Request must be prepared by a licensed engineer for review by ODOT Technical Services. Preparation of a Design Exception request does not guarantee its ultimate approval. Until more detailed plans have been reviewed, ODOT cannot make a determination whether design elements will require a Design Exception.

Note: Design Exception Requests may take up to 3 months to process.

All ODOT permits and approvals must reach 100% plans before the District Contact will sign-off on a local jurisdiction building permit, or other necessary requirement prior to construction.

#### **ODOT RECOMMENDED LOCAL CONDITIONS OF APPROVAL**

##### Orient Dr./US 26 Intersection.

- Add two southbound approach lanes on Orient Dr. at the US 26 interchange for a total of three southbound lanes.
- Relocate the signal pole to accommodate the additional southbound lanes and the two ADA ramps at the intersection.

##### Frontage Improvements

- Curb, sidewalk, cross walk ramps shall be constructed as necessary to be consistent with local, ODOT and ADA standards.

##### Permits and Agreements to Work in State Right of Way

- An ODOT Miscellaneous Permit must be obtained for all work in the highway right of way. When the total value of improvements within the ODOT right of way is estimated to be \$100,000 or more, an agreement with ODOT is required to address the transfer of ownership of the improvement to ODOT. An Intergovernmental Agreement (IGA) is required for agreements involving local governments and a Cooperative Improvement Agreement (CIA) is required for private sector agreements. The agreement shall address the work standards that must be followed, maintenance responsibilities, and compliance with ORS 276.071, which includes State of Oregon prevailing wage requirements.

Note: If a CIA is required, it may take up to **6 months** to process.

- The applicant shall replace trees within the ODOT right of way as determined by ODOT. The applicant must obtain an ODOT permit to place trees in the state right of way. Tree spacing and design must be consistent with the ODOT Highway Design Manual section 4.2.6 ([http://www.oregon.gov/ODOT/Engineering/Documents\\_RoadwayEng/HDM\\_04-Cross-Sections.pdf](http://www.oregon.gov/ODOT/Engineering/Documents_RoadwayEng/HDM_04-Cross-Sections.pdf)).
- An ODOT Miscellaneous Permit is required for connection to state highway drainage facilities. Connection will only be considered if the site's drainage naturally enters ODOT right of way. The applicant must provide ODOT District with a preliminary drainage plan showing impacts to the highway right of way.

A drainage study prepared by an Oregon Registered Professional Engineer is usually required by ODOT if:

1. Total peak runoff entering the highway right of way is greater than 1.77 cubic feet per second; or
2. The improvements create an increase of the impervious surface area greater than 10,758 square feet.

**ADVISORY INFORMATION**

Signs:

- Private signs are not permitted in the state highway right of way (ORS 377.700-377.840).

**Please send a copy of the Notice of Decision including conditions of approval to:**

ODOT Region 1 Planning  
Development Review  
123 NW Flanders St  
Portland, OR 97209

[ODOT\\_R1\\_DevRev@odot.state.or.us](mailto:ODOT_R1_DevRev@odot.state.or.us)

Development Review Planner: Marah Danielson	503.731.8258, marah.b.danielson@odot.state.or.us
Traffic Contact: Avi Tayar, P.E.	503.731.8221 Abraham.tayar@odot.state.or.us
District Contact: Loretta Kieffer	503.667.7441 Loretta.l.kieffer@odot.state.or.us

COMMENT SHEET for File No. 19-012 DR/ADJ/TREE:

I have looked at the preliminary plan for the traffic changes on Quest Dr in connection with Space Age Fuel development. We were not notified regarding any of these changes. Can they do this? I am surprised as these changes will affect us daily. WE LIVE HERE!! This is our home!! The concrete barrier will not allow us <sup>to enter</sup> Quest Dr south bound to Hwy 26 and into Sandy. There is no easy way for us to approach Hwy 26 east or west bound. Our mail and other deliveries will be affected as well. Anyone coming south on Quest Dr. will not be able to enter our driveway. There is a lot of traffic on Quest Dr during certain parts of the day. Often it is backed up to Crescent Dr and beyond. There are school buses stopping to let children on and off the bus on Quest & Crescent. Will this be safe?

If we should decide to develop over

Robert & Patricia Whitlock 503-668-4821  
 Your Name Phone Number

15600 S.E. Quest Dr. Boring 97009  
 Address

**APPLICABLE CRITERIA:** Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.22 Notices; 17.30 Zoning Districts; 17.44 General Commercial (C-2); 17.66 Adjustments and Variances; 17.74 Accessory Development; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.84 Improvements Required with Development; 17.90 Design Standards; 17.92 Landscaping and Screening; 17.94 Drive-Up Uses; 17.98 Parking, Loading, and Access; 17.102 Urban Forestry; and, 15.30 Dark Sky.

RECEIVED

AUG 26 2019

property one day the road barrier will make any development less desirable. This is not acceptable. This will need to be ~~compensated~~ compensated for.

The City gave Space Age Fuel a variance for the use of a private well and septic tank to proceed with this development. We will expect the same consideration from the City in the event that we want to develop this property.

We will be disturbed by the noise and all the headlights and other lighting. Hopefully there will be a solution for this.

I am very disappointed in the City of Sandy in the manner this is being handled due to the lack of information regarding this development. There have been questions asked with no answers. This has eroded the trust a lot of us have in how the City is being run.

RECEIVED

AUG 26 2019

CITY OF SANDY



RECEIVED

AUG 26 2019

COMMENT SHEET for File No. 19-012 DR/ADJ/TREE:

Can get more info on street size of <sup>CITY OF SANDY</sup> Crescent now. County shows 20<sup>ft</sup> there 28 feet.

How are drains tied in case of over flowing detention pond.

Any other -

- Conserving

Also amount of traffic backing up in front of Crescent Rd.

~~How~~ how are trip counts monitoring

Can ~~the~~ culdasc be turned into their property

Johnathon Nolen

Your Name

503-706-9060

Phone Number

34935 SE Crescent Rd. Boring, OR 97009

Address

APPLICABLE CRITERIA: Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.22 Notices; 17.30 Zoning Districts; 17.44 General Commercial (C-2); 17.66 Adjustments and Variances; 17.74 Accessory Development; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.84 Improvements Required with Development; 17.90 Design Standards; 17.92 Landscaping and Screening; 17.94 Drive-Up Uses; 17.98 Parking, Loading, and Access; 17.102 Urban Forestry; and, 15.30 Dark Sky.



## CERTIFIED ARBORIST REPORT

August 27, 2019

**Emily Meharg**

VIA: Email to [emeharg@ci.sandy.or.us](mailto:emeharg@ci.sandy.or.us)

This report has been prepared when conducting a drive by site visit on and subsequent inventory and professional opinion for the existing trees located at 15585 SE Orient Drive in Sandy, Oregon.

As the techniques and terminology of the Arboriculture industry are continuously evolving, we have provided some brief descriptions to assist with the review and understanding of this report.

This report was completed, reviewed and approved by the undersigned Certified Arborist and owner of Earth Care Designs, LLC dba Oregon Tree Care.

Po Box 13068  
Portland . OR 97213

503.929.9437 o  
503.905.0605 f

[damien@oregontreecare.com](mailto:damien@oregontreecare.com)  
[oregontreecare.com](http://oregontreecare.com)

Certified Arborist PN-6405A

Damien Carré

Certified Arborist, ISA# PN-6405A  
Certified Tree Risk Assessor, CTRA  
1717



Pacific Northwest Chapter  
International Society of Arboriculture

## **TERMINOLOGY**

**Air Spade:** The Air Spade is an attachment added to the terminal end of an air compressor hose. The compressed air is directed into the soil, fracturing the soil and exposing the roots below the soil surface. This method is low-impact and does not damage structural roots.

**Root Protection zone (RPZ):** Portion of the root system that is the minimum necessary to maintain vitality or stability of the tree. Encroachment or damage to the root protection zone will put the tree at risk of failure.

**Pruning:** The act of sawing or cutting branches from a living tree generally involving thinning, deadwood removal and weight reduction to improve the overall health of a tree. The species and size/age of the tree will determine the proper amount of reduction and type of cuts performed.

**Vigor:** A measure of the increase in plant growth or foliage volume through time after planting .

## **SITE REVIEW**

Site visit was conducted on August 16<sup>th</sup> 2019. The site review consisted of a visual ground assessment of the existing trees; measurements, identification and inventory have been done by Teragan Associates. At the time of the site visit, all trees over 11"DBH (diameter at breast height) were numbered and tagged by Teragan.

Included in this report along with a professional opinion is my recommendations to preserve the remaining trees onsite by following the ISA tree protection guidelines.

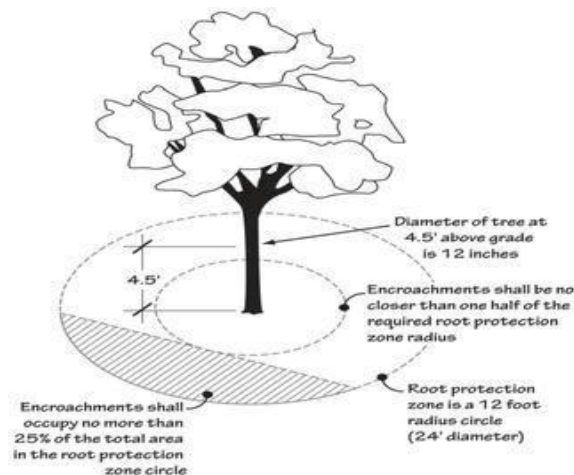
## CONSTRUCTION PHASE TREE PROTECTION

All trees excluding numbers 76 through 88 will be removed according to site plans. Page 5 in the report prepared by Teragan proposes a Critical root zone radius of .5" per inch per foot DBH. Recommend Teragan provides a reason and or explanation why this method is half of the standard formula.

All remaining trees over 11" DBH should meet the City of Sandy preservation guidelines with less than 25% encroachment into the RPZ of trees unless otherwise noted. Protective fencing should be installed and will remain in place consistent with the one foot per inch diameter formula, unless otherwise noted.

The Prescriptive Path method of tree protection establishes a root protection zone (see diagram) and blocks this zone from construction activities. The prescriptive path calls for the root protection zone to have a 1-foot radius from the center of the trunk per inch of tree diameter. For example, a 12-inch diameter tree would require a 12-foot radius root protection zone.

The root protection fencing must be a minimum of 6-foot high chain link fence secured with 8-foot metal posts, at the edge of the root protection zone. Existing structures and/or existing secured fencing at least 3.5 feet tall can serve as the required protective fencing. Place the yellow sign marked 'Tree Root Protection Zone' prominently on the fence designating the root protection zone and describing the penalties for violation. Install the fence before any ground-disturbing activities take place, including clearing, grading, or construction. Keep the fence in place until final inspection.



### *Performance Path:*

Due to the location of trees 76-88 on the property, this alternative approach to the prescriptive path may be necessary to allow reasonable access for the planned construction activities. It is recommended that air spading be conducted as a low-impact approach to inspect the roots in areas where the RPZ may be compromised. Root pruning can be completed while roots are exposed, as needed, to help minimize damage during future construction activities. This approach can also determine if the amount of potential root loss is significant to the overall health and structural integrity of the tree; thus, removal of the tree may be recommended.

### **REMOVING TREES WITHIN THE RPZ OF PROTECTED TREES:**

There shall be no Heavy Duty equipment or materials within the RPZ of the tree, unless otherwise specified. Tree removal methods should be done to minimize any impact and or avoid compromising adjacent trees structural integrity and or vigor.

No Heavy Duty equipment or materials within the RPZ of the tree. No excavation of soil shall be done within the trees RPZ without Arborist supervision, demolition should be done by hand to minimize compaction of soil and tree roots.

Any trees that may have significant encroachment into the RPZ, and its root system should be examined prior to any excavation within the RPZ. A Certified Arborist must be on site to monitor and/or perform any root pruning that may be deemed necessary. Recommend Air Spading.

It is always recommended to Air Spade prior to any excavation. A Certified Arborist must be on site to monitor and/or perform any root pruning that may be deemed necessary.

**AIRSPADING AND ROOTPRUNING:** If, during construction, root pruning is required due to exposed or severed roots, the following process should be followed to prevent further damage. It is highly recommended that a Certified Arborist supervise and/or complete the root pruning.

Additionally, pruning of the tree branches may be necessary to help compensate for any root loss.

- Air spading is a less invasive option available
- Do not use an excavator to pull or cut roots
- By hand, dig out and around the exposed or severed root prior to cutting
- Only use tree pruning tools with sharpened blades to provide a clean cut
- Tree pruning to compensate for potential root loss may be recommended before root pruning

**CERTIFIED ARBORIST ON SITE:** It is highly recommended to have a Certified Arborist on site when construction activities could cause root exposure or is within the RPZ of the tree.

**ANNUAL MONITORING:** All preserved trees should be monitored annually for changes and/or signs of stress after construction activities are completed.

- END -

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### Limits of Assignment

Unless stated otherwise: 1) Information contained in this report covers only those trees that were examined and reflects the condition of those trees at the time of inspection; and 2) The inspection is limited to visual examination of the subject trees without dissection, probing, or coring unless explicitly specified. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

### Methods

We used a Visual Tree Assessment (VTA) method to evaluate tree health and structure. VTA is based on the outward indications of tree stress and growth, as indicated by the formation of new tree parts, the shape of the new wood and the amount of live tissue. Trees adapt to current and past stress by growing wood to support themselves in an upright condition. This type of assessment is facilitated by our personal knowledge of tree growth as it relates to structural integrity.

### Assumptions & Limiting Conditions

1. Consultant assumes that any legal description provided to Consultant is correct and that title to property is good and marketable. Consultant assumes no responsibility for legal matters. Consultant assumes all property appraised or evaluated is free and clear, and is under responsible ownership and competent management.
2. Consultant assumes that the property and its use do not violate applicable codes, ordinances, statutes or regulations.
3. Although Consultant has taken care to obtain all information from reliable sources and to verify the data insofar as possible, Consultant does not guarantee and is not responsible for the accuracy of information provided by others.
4. Client may not require Consultant to testify or attend court by reason of any report unless mutually satisfactory contractual arrangements are made, including payment of an additional fee for such Services.
5. Unless otherwise required by law, possession of this report does not imply right of publication or use for any purpose by any person other than the person to whom it is addressed, without the prior express written consent of the Consultant.



6. Unless otherwise required by law, no part of this report shall be conveyed by any person, including the Client, the public through advertising, public relations, news, sales or other media without the Consultant's prior express written consent.

7. This report and any values expressed herein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event or upon any finding to be reported.

8. Sketches, drawings and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by Consultant as to the sufficiency or accuracy of the information.

9. Unless otherwise agreed, (1) information contained in this report covers only the items examined and reflects the condition of the those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, climbing, or coring. Consultant makes no warranty or guarantee, express or implied that the problems or deficiencies of the plans or property in question may not arise in the future.

10. Loss or alteration of any part of this Agreement invalidates the entire report.

- END -



21370 SW Langer Farms Pkwy  
Suite 142, Sherwood, OR 97140



EXPIRES: 12/31/19

## Technical Memorandum

**To:** Jim Pliska, Space Age Fuels  
**From:** Michael Ard, PE  
**Date:** September 16, 2019  
**Re:** Sandy Space Age – Mitigation Analysis Update

Upon review of the Sandy Space Age Traffic Impact Study dated June 4, 2019, City of Sandy and ODOT staff requested additional information regarding mitigation for the impacts of the proposed development. Although the property has already been annexed into the City of Sandy and appropriate zoning has already been applied, at the time of the annexation the required long-range analysis which would address Oregon's Transportation Planning Rule was not conducted. Accordingly, this long-range analysis was required in conjunction with the proposed development. The questions regarding project impacts focused on operation at the year 2038 planning horizon.

This supplemental analysis was written to provide a discussion of whether the previously proposed mitigation adequately addresses the impacts of the proposed project as well as to provide an operational analysis update that examines another potential mitigation solution.

### Discussion of Adequacy of Proposed Mitigation

Based on the analysis provided in the June 4, 2019 study, it was recommended that a second southbound lane be provided on Orient Drive approaching Highway 26. With the added lane in place, the southbound Orient Drive approach would have a dedicated left-turn lane in addition to a shared left/through/right lane. This would allow vehicles to make left turns from both lanes, resulting in a dramatic reduction in the time required to serve the high-volume southbound left-turn movement.

Based on the operational analysis, this mitigation is projected to result in operation of the intersection that is similar to or better than background conditions for the year 2020. It is also projected to result in improved operation under year 2038 evening peak hour conditions. However, operation during the year 2038 morning peak hour is projected to be slightly worse with maximum development of the property than it would have been under the prior county zoning.

In assessing impacts at the planning horizon, it is important to consider the purpose and requirements of the long-range planning analysis. The City of Sandy has an obligation to maintain a Transportation System Plan (TSP) that accommodates anticipated growth in the city and seeks to provide adequate transportation infrastructure well into the future. When a property is annexed into the city and new zoning is applied, additional trips that were not considered in the city's TSP could cause negative impacts on the transportation system and result in the need for additional mitigation. As a result, any application that may impact operation at the planning horizon is required to provide an analysis of the impacted area over the planning



horizon and suggest mitigation as needed to ensure that the transportation system either meets the performance standards or that operation is not degraded by approval of the application.

For the long-range planning analysis the city's TSP focuses solely on operation during the evening peak hour. ODOT's operational standards are based on a seasonally adjusted evening peak hour which is intended to represent "30<sup>th</sup>-highest-hour" conditions. In other words, if traffic volumes were measured for the study intersection(s) over the entire year and the hourly volumes were ranked in order, ODOT would not require analysis for the 29 highest-volume hours but would require analysis during the 30<sup>th</sup>-highest hour. Since traffic volumes are typically higher during the evening peak hour, the 30<sup>th</sup>-highest hour nearly always occurs during the evening peak hour. Although seasonal adjustments are typically also taken for morning peak hour operations in order to maintain consistency regarding seasonal traffic variations in the operational analysis, the morning peak hour analysis does not correspond to "30<sup>th</sup>-highest hour" conditions.

Based on the measured traffic count data for the intersection of Highway 26 at Orient Drive as well as the projected future volumes, the evening peak hour volumes will be higher than those experienced during the morning peak hour. As such, the "30<sup>th</sup>-highest hour" conditions for the intersection of Highway 26 at Orient Drive were confirmed to occur during the evening peak hour.

In determining whether a plan amendment would significantly affect an existing or planned transportation facility, Oregon's Transportation Planning Rule focuses on "projected conditions measured at the end of the planning period identified in the adopted TSP." We believe that the terms "projected conditions" and "planning period" here refer to both the planning horizon year and the analysis hour identified in the TSP, which is the 30<sup>th</sup>-highest hour. As such, our Transportation Planning Rule analysis similarly focused on operation (and mitigation) for the evening peak hour under year 2038 conditions.

Examination of the proposed mitigation reveals that it is sufficient to ensure operation of the intersection of Highway 26 at Orient Drive is improved during the planning horizon design hour when compared to background conditions with development under the prior county RRFF-5 zoning. The analysis also confirmed that the highest v/c ratio occurs during this design hour. As such, we believe that the mitigation proposed meets the requirements of Oregon's Transportation Planning Rule for the already-completed annexation and zone change. Consequently, further mitigation was not proposed.

We recognize that the proposed mitigation would result in some degradation of performance during the morning peak hour at the year 2038 planning horizon. However, operation of the intersection is projected to be better during the morning peak hour than during the evening peak hour, thus confirming that the evening peak hour was the critical period for analysis. Overall, intersection operation is materially improved with the suggested mitigation since the highest projected v/c ratio is decreased from 1.22 under background conditions to just 1.19 with the proposed mitigation. The background v/c ratio of 1.22 will not be exceeded during any analysis periods with approval of the proposed development and concurrent implementation of the proposed mitigation.



We are not aware of a specific precedent which would demonstrate whether separate mitigation is or is not required for morning peak hour conditions at the planning horizon. Although we believe that the sole focus by the city and ODOT on the critical evening peak hour demonstrates that the morning peak hour is not considered to be the design hour and is not a critical period for which operational standards should independently apply at the planning horizon, it is also not clear that the Oregon’s Transportation Planning Rule cannot independently apply to all potential analysis periods. As such, we have prepared a supplemental operational analysis to determine what mitigation would be necessary to ensure that intersection performance is not degraded under either morning or evening peak hour conditions.

In order to improve operation during the morning peak hour, the most efficient mitigation plan that can reasonably be implemented in conjunction with the proposed development would consist of the addition of two southbound lanes on Orient Drive as it approaches Highway 26. The three lanes would consist of a dedicated left-turn lane, a shared left/through lane and a dedicated right-turn lane. The revised version of Table 4 provided below shows the operational analysis results associated with this potential mitigation plan in lieu of the dedicated left-turn lane mitigation option. Detailed operational analysis worksheets for this new mitigation alternative are included in the attached technical appendix.

**Table 4 - Future Conditions Operational Analysis Summary**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c	Delay	LOS	v/c
<b>SE Orient Drive at SE Crescent Road</b>						
2020 Background Conditions	10.3	B	0.01	10.6	B	0.01
2020 Background plus Site	13.8	B	0.08	14.0	B	0.08
2038 Background Conditions	11.0	B	0.02	12.0	B	0.01
2038 Conditions with C-2 Zoning	16.4	C	0.17	21.6	C	0.26
<b>SE Crescent Road at Site Access</b>						
2020 Background plus Site	8.4	A	0.06	8.4	A	0.07
2038 Conditions with C-2 Zoning	8.5	A	0.13	8.6	A	0.14
<b>SE Orient Drive at Site Access</b>						
2020 Background plus Site	9.5	A	0.10	10.2	B	0.13
2038 Conditions with C-2 Zoning	10.7	B	0.19	12.1	B	0.24
<b>Highway 26 at SE Orient Drive</b>						
2020 Background Conditions	15.7	B	0.85	25.0	C	0.93
2020 Background plus Site	24.0	C	0.91	36.4	D	1.01
2020 Bkgd plus Site Mitigated*	18.9	B	0.85	23.1	C	0.91
2020 Bkgd plus Site Mitigated**	15.8	B	0.83	21.0	C	0.89
2038 Background Conditions	66.4	E	1.09	93.7	F	1.22
2038 Conditions with C-2 Zoning	96.9	F	1.21	133.7	F	1.35
2038 Conditions with C-2 Zoning*	76.7	E	1.13	84.1	F	1.19
2038 Conditions with C-2 Zoning**	65.8	E	1.08	75.6	E	1.15

\* Includes an added SB approach lane on SE Orient Drive at Highway 26  
 \*\* Includes two added southbound approach lanes on SE Orient Drive at Highway 26



***QUEUING ANALYSIS***

In order to determine the appropriate length of the added turn lane on Orient Drive at Highway 26, an updated queuing analysis was conducted. Based on the results of the SimTraffic queuing analysis, the projected 95<sup>th</sup> percentile queue lengths for the left-turn lane were 107 feet during the morning peak hour and 129 feet during the evening peak hour. The projected 95<sup>th</sup> percentile queue lengths for the right-turn lane were 89 feet during the morning peak hour and 75 feet during the evening peak hour.

Based on the queuing analysis, it is recommended that a minimum of 150 feet of storage be provided for the added left-turn lane and a minimum of 100 feet of storage should be provided for the right turn lane.

***PHASING ANALYSIS***

The subject property currently does not have connections to city water and sewer. A large portion of the site will therefore not be available for immediate development, since it will serve as a septic field until city services are connected to the site in the future. Accordingly, the development will occur in two distinct phases with the first phase consisting of the fuel station and convenience store which will be constructed immediately, and the second phase consisting of additional retail development will be constructed only after city sewer can be connected to the site. It is anticipated that it may be many years before this connection is made.

Since the development potential of the site is currently constrained, an additional analysis was undertaken to determine whether the proposed mitigation (a single added southbound left-turn lane) is sufficient to offset the impacts of the actual development currently proposed as measured at the year 2038 planning horizon. Based on the analysis, the proposed mitigation is sufficient. Accordingly, if any additional mitigation is requested for potential impacts from phase 2 development, it is recommended that these improvements be deferred until additional development beyond the fuel station and convenience store is proposed within the site. A summary of the year 2038 operational analysis with only the fuel station and convenience store is provided in the table below. A turning-movement diagram showing the year 2038 Phase 1 traffic volumes and detailed operational analysis worksheets for this scenario are included in the attached technical appendix.

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c	Delay	LOS	v/c
Highway 26 at SE Orient Drive						
2038 Background Conditions	66.4	E	1.09	93.7	F	1.22
2038 Background Plus Phase 1	94.6	F	1.16	113.6	F	1.28
2038 Background Plus Phase 1*	70.2	E	1.09	77.8	E	1.16

\* Includes an added SB approach lane on SE Orient Drive at Highway 26



### *CONCLUSIONS*

Based on the analysis, we believe that the mitigation previously proposed in the June 4, 2019 traffic impact study is sufficient to address the impacts of the proposed development. However, if it is determined that additional mitigation is required to address the potential impacts from the already-completed annexation and zone change during the year 2038 morning peak hour, providing a dedicated southbound left-turn lane, a shared left-through lane, and a dedicated right-turn lane on the Orient Drive approach to Highway 26 would result in improved operation as compared to background conditions for all analysis scenarios. If this alternative mitigation is required, it is recommended that the dedicated left-turn lane have a length of at least 150 feet and the dedicated right-turn lane have a length of at least 100 feet. It is further recommended that construction of the additional right-turn lane be required in conjunction with Phase 2 of site development, since this lane will not be needed to mitigate the impacts of the currently-proposed fuel station and convenience store.

If you have any questions regarding this analysis, please feel free to contact me at any time.



## Appendix

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

09/12/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↔	↔↔		↔	↔↔	↔		↔		↔	↔	↔
Traffic Volume (vph)	37	1096	2	3	1783	174	2	0	6	116	1	60
Future Volume (vph)	37	1096	2	3	1783	174	2	0	6	116	1	60
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Fr't	1.00	1.00		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)	1511	3022		1583	3167	1417		1239		1504	1509	1417
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (perm)	1511	3022		1583	3167	1417		1239		1504	1509	1417
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	41	1204	2	3	1959	191	2	0	7	127	1	66
RTOR Reduction (vph)	0	0	0	0	0	56	0	9	0	0	0	61
Lane Group Flow (vph)	41	1206	0	3	1959	135	0	0	0	63	65	5
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases						2						8
Actuated Green, G (s)	3.8	81.2		0.9	78.3	78.3		0.6		8.3	8.3	8.3
Effective Green, g (s)	3.8	81.2		0.9	78.3	78.3		0.6		8.3	8.3	8.3
Actuated g/C Ratio	0.03	0.73		0.01	0.71	0.71		0.01		0.08	0.08	0.08
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	51	2220		12	2244	1004		6		112	113	106
v/s Ratio Prot	c0.03	c0.40		0.00	c0.62			c0.00		0.04	c0.04	
v/s Ratio Perm						0.10						0.00
v/c Ratio	0.80	0.54		0.25	0.87	0.13		0.01		0.56	0.58	0.05
Uniform Delay, d1	53.0	6.5		54.5	12.3	5.2		54.7		49.3	49.4	47.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	59.0	0.3		10.7	4.1	0.1		0.5		6.3	6.9	0.2
Delay (s)	112.0	6.7		65.1	16.4	5.2		55.2		55.7	56.3	47.6
Level of Service	F	A		E	B	A		E		E	E	D
Approach Delay (s)		10.2			15.5			55.2			53.1	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.5	Sum of lost time (s)	19.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26






















09/12/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	53	1901	4	5	1379	221	4	1	3	222	1	51
Future Volume (vph)	53	1901	4	5	1379	221	4	1	3	222	1	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Fr't	1.00	1.00		1.00	1.00	0.85		0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.95	1.00
Satd. Flow (prot)	1630	3259		1599	3197	1430		1589		1548	1553	1458
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.95	1.00
Satd. Flow (perm)	1630	3259		1599	3197	1430		1589		1548	1553	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	2066	4	5	1499	240	4	1	3	241	1	55
RTOR Reduction (vph)	0	0	0	0	0	84	0	3	0	0	0	49
Lane Group Flow (vph)	58	2070	0	5	1499	156	0	5	0	120	122	6
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases						2						8
Actuated Green, G (s)	5.8	77.4		0.9	72.5	72.5		0.6		13.1	13.1	13.1
Effective Green, g (s)	5.8	77.4		0.9	72.5	72.5		0.6		13.1	13.1	13.1
Actuated g/C Ratio	0.05	0.69		0.01	0.65	0.65		0.01		0.12	0.12	0.12
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	84	2262		12	2078	929		8		181	182	171
v/s Ratio Prot	c0.04	c0.64		0.00	0.47			c0.00		0.08	c0.08	
v/s Ratio Perm						0.11						0.00
v/c Ratio	0.69	0.92		0.42	0.72	0.17		0.63		0.66	0.67	0.04
Uniform Delay, d1	52.0	14.3		55.0	12.8	7.7		55.3		47.1	47.1	43.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	21.7	6.3		21.8	1.3	0.1		98.3		8.8	9.3	0.1
Delay (s)	73.6	20.6		76.8	14.1	7.7		153.6		55.9	56.4	43.7
Level of Service	E	C		E	B	A		F		E	E	D
Approach Delay (s)		22.0			13.4			153.6			53.9	
Approach LOS		C			B			F			D	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	111.5	Sum of lost time (s)	19.5
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			






















HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

09/12/2019

													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	73	1455	3	4	2364	277	3	0	9	187	1	107	
Future Volume (vph)	73	1455	3	4	2364	277	3	0	9	187	1	107	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00	
Fr't	1.00	1.00		1.00	1.00	0.85		0.90		1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00	
Satd. Flow (prot)	1511	3022		1583	3167	1417		1243		1504	1509	1417	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00	
Satd. Flow (perm)	1511	3022		1583	3167	1417		1243		1504	1509	1417	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	77	1532	3	4	2488	292	3	0	9	197	1	113	
RTOR Reduction (vph)	0	0	0	0	0	97	0	12	0	0	0	99	
Lane Group Flow (vph)	77	1535	0	4	2488	195	0	0	0	98	100	14	
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%	
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm	
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases						2						8	
Actuated Green, G (s)	5.5	82.7		0.9	78.1	78.1		1.3		12.5	12.5	12.5	
Effective Green, g (s)	5.5	82.7		0.9	78.1	78.1		1.3		12.5	12.5	12.5	
Actuated g/C Ratio	0.05	0.71		0.01	0.67	0.67		0.01		0.11	0.11	0.11	
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	71	2137		12	2115	946		13		160	161	151	
v/s Ratio Prot	c0.05	0.51		0.00	c0.79			c0.00		0.07	c0.07		
v/s Ratio Perm						0.14						0.01	
v/c Ratio	1.08	0.72		0.33	1.18	0.21		0.01		0.61	0.62	0.09	
Uniform Delay, d1	55.7	10.2		57.7	19.4	7.5		57.2		49.9	49.9	47.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	131.9	1.2		15.7	84.7	0.1		0.3		6.8	7.2	0.3	
Delay (s)	187.6	11.4		73.4	104.1	7.6		57.5		56.7	57.2	47.3	
Level of Service	F	B		E	F	A		E		E	E	D	
Approach Delay (s)		19.8			93.9			57.5			53.4		
Approach LOS		B			F			E			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			65.8									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.08										
Actuated Cycle Length (s)			116.9									Sum of lost time (s)	19.5
Intersection Capacity Utilization			94.0%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

09/12/2019

													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	99	2525	6	7	1825	345	6	1	4	343	1	97	
Future Volume (vph)	99	2525	6	7	1825	345	6	1	4	343	1	97	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00	
Fr't	1.00	1.00		1.00	1.00	0.85		0.95		1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.95	1.00	
Satd. Flow (prot)	1630	3259		1599	3197	1430		1588		1548	1553	1458	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.95	1.00	
Satd. Flow (perm)	1630	3259		1599	3197	1430		1588		1548	1553	1458	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	104	2658	6	7	1921	363	6	1	4	361	1	102	
RTOR Reduction (vph)	0	0	0	0	0	138	0	4	0	0	0	88	
Lane Group Flow (vph)	104	2664	0	7	1921	225	0	7	0	180	182	14	
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%	
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	Perm	
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases						2						8	
Actuated Green, G (s)	8.3	81.9		0.9	74.5	74.5		1.3		16.4	16.4	16.4	
Effective Green, g (s)	8.3	81.9		0.9	74.5	74.5		1.3		16.4	16.4	16.4	
Actuated g/C Ratio	0.07	0.68		0.01	0.62	0.62		0.01		0.14	0.14	0.14	
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	112	2224		11	1984	887		17		211	212	199	
v/s Ratio Prot	c0.06	c0.82		0.00	0.60			c0.00		0.12	c0.12		
v/s Ratio Perm						0.16						0.01	
v/c Ratio	0.93	1.20		0.64	0.97	0.25		0.41		0.85	0.86	0.07	
Uniform Delay, d1	55.6	19.0		59.4	21.6	10.2		59.0		50.6	50.7	45.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	62.1	93.7		81.7	13.4	0.2		15.6		26.8	27.4	0.1	
Delay (s)	117.7	112.7		141.1	35.0	10.4		74.5		77.4	78.0	45.3	
Level of Service	F	F		F	D	B		E		E	E	D	
Approach Delay (s)		112.9			31.4			74.5			70.6		
Approach LOS		F			C			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			75.6									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.15										
Actuated Cycle Length (s)			120.0							19.5			
Intersection Capacity Utilization			109.5%										H
Analysis Period (min)			15										
c Critical Lane Group													

Queuing and Blocking Report  
 2020 Bkgd plus Site AM Peak Hour Mitigated

09/12/2019

Intersection: 1: SE Orient Drive & SE Crescent Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	LTR
Maximum Queue (ft)	39	35	60	12
Average Queue (ft)	12	7	11	0
95th Queue (ft)	38	29	41	7
Link Distance (ft)	137	309		227
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: SE Jarl Road/SE Orient Drive & Highway 26

Movement	SE	SE	SE	NW	NW	NW	NE	SW	SW	SW
Directions Served	L	T	TR	L	T	T	LTR	L	LT	R
Maximum Queue (ft)	102	178	190	29	381	484	56	131	109	112
Average Queue (ft)	35	79	49	3	196	169	10	53	46	42
95th Queue (ft)	82	144	119	17	332	342	40	107	90	89
Link Distance (ft)		965	965		1069	1069	263	114	114	114
Upstream Blk Time (%)								1	0	0
Queuing Penalty (veh)								1	0	0
Storage Bay Dist (ft)	475	500								
Storage Blk Time (%)					0	0				
Queuing Penalty (veh)					0	0				

Intersection: 3: Site Access & SE Crescent Road

Movement	NB
Directions Served	LR
Maximum Queue (ft)	34
Average Queue (ft)	11
95th Queue (ft)	37
Link Distance (ft)	120
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	



Queuing and Blocking Report  
2020 Bkgd plus Site AM Peak Hour Mitigated

09/12/2019

Intersection: 4: SE Orient Drive & Site Access

Movement	EB
Directions Served	R
Maximum Queue (ft)	72
Average Queue (ft)	33
95th Queue (ft)	60
Link Distance (ft)	61
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 1

Queuing and Blocking Report  
 2020 Bkgd plus Site PM Peak Hour Mitigated

09/12/2019

Intersection: 1: SE Orient Drive & SE Crescent Road

Movement	EB	WB	SB	NW	NW
Directions Served	LTR	LTR	<LR	L	R>
Maximum Queue (ft)	52	31	44	51	3
Average Queue (ft)	15	3	11	9	0
95th Queue (ft)	43	16	38	35	3
Link Distance (ft)	158	304	226		199
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: SE Jarl Road/SE Orient Drive & Highway 26

Movement	SE	SE	SE	NW	NW	NW	NE	SW	SW	SW
Directions Served	L	T	TR	L	T	T	LTR	L	LT	R
Maximum Queue (ft)	109	362	352	38	347	304	38	147	159	95
Average Queue (ft)	44	162	139	3	187	150	9	79	79	35
95th Queue (ft)	91	287	277	20	303	263	33	129	141	75
Link Distance (ft)		968	968		1068	1068	263	217	217	217
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	475	500								
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 3: Site Access & SE Crescent Road

Movement	NB
Directions Served	LR
Maximum Queue (ft)	34
Average Queue (ft)	13
95th Queue (ft)	40
Link Distance (ft)	113
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report  
2020 Bkgd plus Site PM Peak Hour Mitigated

09/12/2019

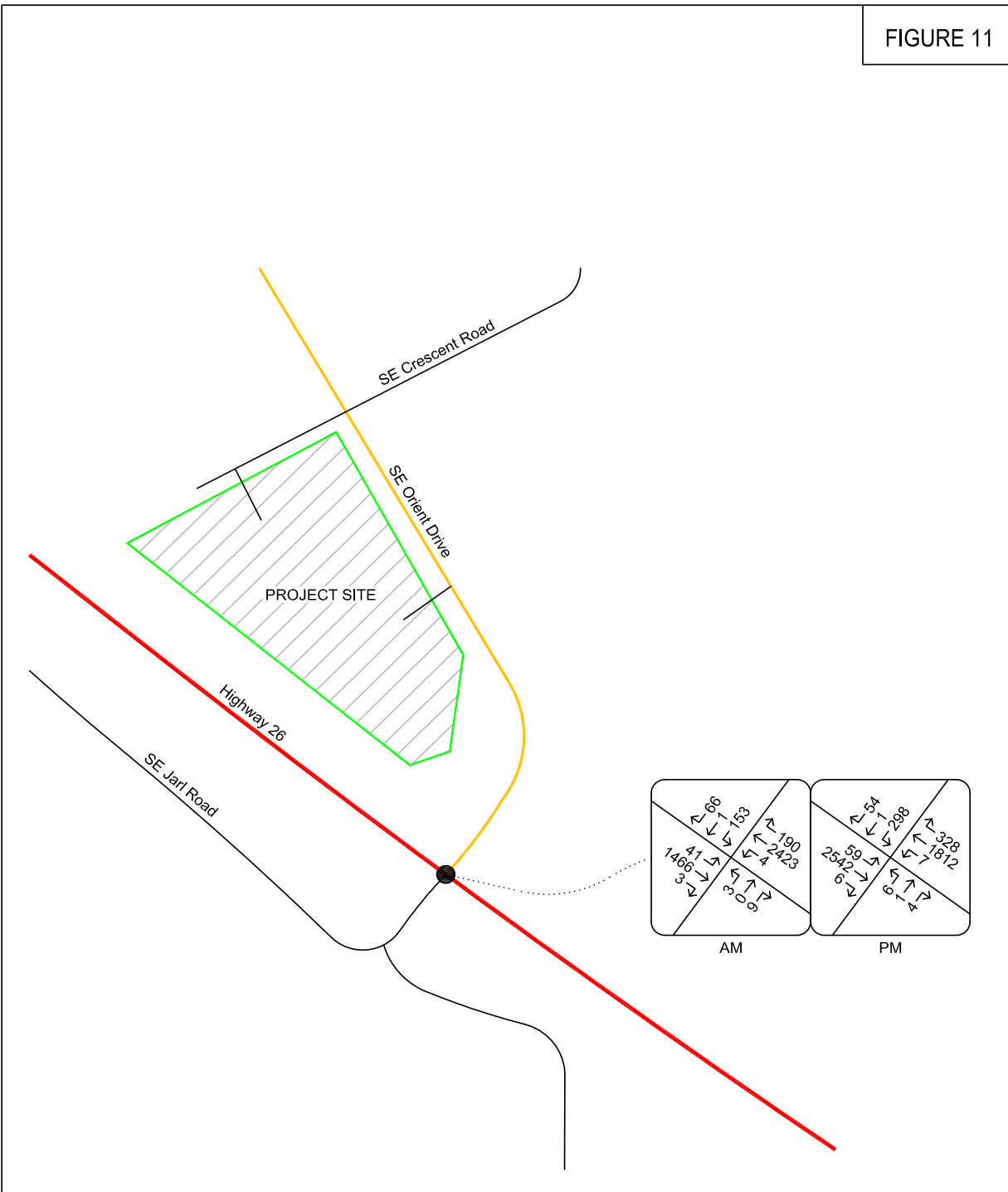
Intersection: 4: SE Orient Drive & Site Access

Movement	EB
Directions Served	R
Maximum Queue (ft)	81
Average Queue (ft)	38
95th Queue (ft)	66
Link Distance (ft)	53
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

FIGURE 11



TRAFFIC VOLUMES  
 2038 Background plus Proposed Fuel Station  
 Morning and Evening Peak Hours

PAGE  
 APP10

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

09/16/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	41	1466	3	4	2423	190	3	0	9	153	1	66	
Future Volume (vph)	41	1466	3	4	2423	190	3	0	9	153	1	66	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		4.5			4.5		
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00		
Fr't	1.00	1.00		1.00	1.00	0.85		0.90			0.96		
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.97		
Satd. Flow (prot)	1511	3022		1583	3167	1417		1243			1546		
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.97		
Satd. Flow (perm)	1511	3022		1583	3167	1417		1243			1546		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	43	1543	3	4	2551	200	3	0	9	161	1	69	
RTOR Reduction (vph)	0	0	0	0	0	70	0	12	0	0	13	0	
Lane Group Flow (vph)	43	1546	0	4	2551	130	0	0	0	0	218	0	
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%	
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases						2							
Actuated Green, G (s)	4.0	81.5		1.0	78.5	78.5		1.3			17.9		
Effective Green, g (s)	4.0	81.5		1.0	78.5	78.5		1.3			17.9		
Actuated g/C Ratio	0.03	0.67		0.01	0.65	0.65		0.01			0.15		
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0		4.5			4.5		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0		
Lane Grp Cap (vph)	49	2032		13	2051	917		13			228		
v/s Ratio Prot	c0.03	c0.51		0.00	c0.81			c0.00			c0.14		
v/s Ratio Perm						0.09							
v/c Ratio	0.88	0.76		0.31	1.24	0.14		0.01			0.96		
Uniform Delay, d1	58.4	13.3		59.8	21.4	8.3		59.3			51.3		
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00		
Incremental Delay, d2	83.1	1.7		13.0	114.0	0.1		0.3			47.1		
Delay (s)	141.5	15.0		72.8	135.4	8.4		59.6			98.4		
Level of Service	F	B		E	F	A		E			F		
Approach Delay (s)		18.5			126.0			59.6			98.4		
Approach LOS		B			F			E			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			87.2									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.16										
Actuated Cycle Length (s)			121.2									Sum of lost time (s)	19.5
Intersection Capacity Utilization			101.8%									ICU Level of Service	G
Analysis Period (min)			15										
c Critical Lane Group													

HCM 6th Signalized Intersection Summary  
 2: SE Jarl Road/SE Orient Drive & Highway 26

09/16/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	41	1466	3	4	2423	190	3	0	9	153	1	66
Future Volume (veh/h)	41	1466	3	4	2423	190	3	0	9	153	1	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1614	1614	1614	1682	1682	1682	1409	1409	1409	1682	1682	1682
Adj Flow Rate, veh/h	43	1543	3	4	2551	0	3	0	9	161	1	69
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	10	10	10	5	5	5	25	25	25	5	5	5
Cap, veh/h	52	2083	4	8	2028		3	0	9	166	1	71
Arrive On Green	0.03	0.66	0.66	0.01	0.63	0.00	0.01	0.00	0.01	0.15	0.15	0.15
Sat Flow, veh/h	1537	3139	6	1602	3195	1425	307	0	921	1077	7	461
Grp Volume(v), veh/h	43	753	793	4	2551	0	12	0	0	231	0	0
Grp Sat Flow(s),veh/h/ln	1537	1533	1612	1602	1598	1425	1228	0	0	1545	0	0
Q Serve(g_s), s	3.2	37.9	37.9	0.3	74.0	0.0	1.1	0.0	0.0	17.3	0.0	0.0
Cycle Q Clear(g_c), s	3.2	37.9	37.9	0.3	74.0	0.0	1.1	0.0	0.0	17.3	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.25		0.75	0.70		0.30
Lane Grp Cap(c), veh/h	52	1017	1070	8	2028		12	0	0	239	0	0
V/C Ratio(X)	0.83	0.74	0.74	0.48	1.26		1.01	0.00	0.00	0.97	0.00	0.00
Avail Cap(c_a), veh/h	66	1017	1070	69	2028		37	0	0	239	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	56.0	13.0	13.0	57.8	21.3	0.0	57.7	0.0	0.0	49.0	0.0	0.0
Incr Delay (d2), s/veh	47.2	2.9	2.8	37.0	120.1	0.0	124.6	0.0	0.0	49.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	11.0	11.6	0.2	55.6	0.0	0.8	0.0	0.0	9.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	103.1	15.9	15.8	94.9	141.4	0.0	182.3	0.0	0.0	98.2	0.0	0.0
LnGrp LOS	F	B	B	F	F		F	A	A	F	A	A
Approach Vol, veh/h		1589			2555	A		12			231	
Approach Delay, s/veh		18.2			141.3			182.3			98.2	
Approach LOS		B			F			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	80.0		5.6	5.1	83.3		22.5				
Change Period (Y+Rc), s	4.5	6.0		4.5	4.5	6.0		4.5				
Max Green Setting (Gmax), s	5.0	74.0		3.5	5.0	74.0		18.0				
Max Q Clear Time (g_c+I1), s	5.2	76.0		3.1	2.3	39.9		19.3				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	12.3		0.0				

Intersection Summary

HCM 6th Ctrl Delay	94.6
HCM 6th LOS	F

Notes

Unsignalized Delay for [NWR] is excluded from calculations of the approach delay and intersection delay.



HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

09/16/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	59	2542	6	7	1812	328	6	1	4	298	1	54	
Future Volume (vph)	59	2542	6	7	1812	328	6	1	4	298	1	54	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		4.5			4.5		
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00		
Fr't	1.00	1.00		1.00	1.00	0.85		0.95			0.98		
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97			0.96		
Satd. Flow (prot)	1630	3259		1599	3197	1430		1588			1612		
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97			0.96		
Satd. Flow (perm)	1630	3259		1599	3197	1430		1588			1612		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	62	2676	6	7	1907	345	6	1	4	314	1	57	
RTOR Reduction (vph)	0	0	0	0	0	137	0	4	0	0	6	0	
Lane Group Flow (vph)	62	2682	0	7	1907	208	0	7	0	0	366	0	
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%	
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases						2							
Actuated Green, G (s)	5.1	77.3		1.0	73.2	73.2		1.3			22.5		
Effective Green, g (s)	5.1	77.3		1.0	73.2	73.2		1.3			22.5		
Actuated g/C Ratio	0.04	0.64		0.01	0.60	0.60		0.01			0.19		
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0		4.5			4.5		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0		
Lane Grp Cap (vph)	68	2071		13	1924	860		16			298		
v/s Ratio Prot	c0.04	c0.82		0.00	0.60			c0.00			c0.23		
v/s Ratio Perm						0.15							
v/c Ratio	0.91	1.30		0.54	0.99	0.24		0.44			1.23		
Uniform Delay, d1	58.0	22.1		60.1	23.9	11.3		59.8			49.5		
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00		
Incremental Delay, d2	78.6	136.5		36.8	18.4	0.1		18.2			129.0		
Delay (s)	136.6	158.6		96.8	42.3	11.4		77.9			178.6		
Level of Service	F	F		F	D	B		E			F		
Approach Delay (s)		158.1			37.7			77.9			178.6		
Approach LOS		F			D			E			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			108.9									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.28										
Actuated Cycle Length (s)			121.6									Sum of lost time (s)	19.5
Intersection Capacity Utilization			113.5%									ICU Level of Service	H
Analysis Period (min)			15										
c Critical Lane Group													

HCM 6th Signalized Intersection Summary  
 2: SE Jarl Road/SE Orient Drive & Highway 26

09/16/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	59	2542	6	7	1812	328	6	1	4	298	1	54
Future Volume (veh/h)	59	2542	6	7	1812	328	6	1	4	298	1	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723	1695	1695	1695	1723	1723	1723	1723	1723	1723
Adj Flow Rate, veh/h	62	2676	6	7	1907	0	6	1	4	314	1	57
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	4	4	4	2	2	2	2	2	2
Cap, veh/h	71	2094	5	14	1902		8	1	5	260	1	47
Arrive On Green	0.04	0.63	0.63	0.01	0.59	0.00	0.01	0.01	0.01	0.19	0.19	0.19
Sat Flow, veh/h	1641	3350	8	1615	3221	1437	860	143	573	1359	4	247
Grp Volume(v), veh/h	62	1307	1375	7	1907	0	11	0	0	372	0	0
Grp Sat Flow(s),veh/h/ln	1641	1637	1721	1615	1611	1437	1577	0	0	1610	0	0
Q Serve(g_s), s	4.4	73.5	73.5	0.5	69.4	0.0	0.8	0.0	0.0	22.5	0.0	0.0
Cycle Q Clear(g_c), s	4.4	73.5	73.5	0.5	69.4	0.0	0.8	0.0	0.0	22.5	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.55		0.36	0.84		0.15
Lane Grp Cap(c), veh/h	71	1023	1076	14	1902		14	0	0	308	0	0
V/C Ratio(X)	0.87	1.28	1.28	0.50	1.00		0.78	0.00	0.00	1.21	0.00	0.00
Avail Cap(c_a), veh/h	71	1023	1076	69	1902		47	0	0	308	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	55.9	22.0	22.0	58.0	24.1	0.0	58.1	0.0	0.0	47.5	0.0	0.0
Incr Delay (d2), s/veh	64.5	132.4	132.5	24.8	21.3	0.0	59.8	0.0	0.0	119.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	60.1	63.2	0.3	27.4	0.0	0.6	0.0	0.0	19.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	120.4	154.5	154.5	82.9	45.4	0.0	118.0	0.0	0.0	167.2	0.0	0.0
LnGrp LOS	F	F	F	F	F		F	A	A	F	A	A
Approach Vol, veh/h		2744			1914	A		11				372
Approach Delay, s/veh		153.7			45.5			118.0				167.2
Approach LOS		F			D			F				F
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	75.4		5.6	5.5	79.5		27.0				
Change Period (Y+Rc), s	4.5	6.0		4.5	4.5	6.0		4.5				
Max Green Setting (Gmax), s	5.1	69.4		3.5	5.0	69.5		22.5				
Max Q Clear Time (g_c+I1), s	6.4	71.4		2.8	2.5	75.5		24.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	113.6
HCM 6th LOS	F

Notes

Unsignalized Delay for [NWR] is excluded from calculations of the approach delay and intersection delay.





















HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

09/16/2019

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	41	1466	3	4	2423	190	3	0	9	153	1	66	
Future Volume (vph)	41	1466	3	4	2423	190	3	0	9	153	1	66	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5		
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95		
Fr't	1.00	1.00		1.00	1.00	0.85		0.90		1.00	0.91		
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.98		
Satd. Flow (prot)	1511	3022		1583	3167	1417		1243		1504	1411		
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.98		
Satd. Flow (perm)	1511	3022		1583	3167	1417		1243		1504	1411		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	43	1543	3	4	2551	200	3	0	9	161	1	69	
RTOR Reduction (vph)	0	0	0	0	0	65	0	12	0	0	50	0	
Lane Group Flow (vph)	43	1546	0	4	2551	135	0	0	0	119	62	0	
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	25%	25%	25%	5%	5%	5%	
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases						2							
Actuated Green, G (s)	4.0	83.1		0.9	80.0	80.0		1.3		13.6	13.6		
Effective Green, g (s)	4.0	83.1		0.9	80.0	80.0		1.3		13.6	13.6		
Actuated g/C Ratio	0.03	0.70		0.01	0.68	0.68		0.01		0.11	0.11		
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0		
Lane Grp Cap (vph)	51	2121		12	2139	957		13		172	162		
v/s Ratio Prot	c0.03	c0.51		0.00	c0.81			c0.00		c0.08	0.04		
v/s Ratio Perm						0.10							
v/c Ratio	0.84	0.73		0.33	1.19	0.14		0.01		0.69	0.38		
Uniform Delay, d1	56.9	10.8		58.5	19.2	6.9		57.9		50.4	48.5		
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	70.6	1.3		15.7	91.6	0.1		0.3		11.4	1.5		
Delay (s)	127.5	12.1		74.1	110.8	7.0		58.2		61.8	50.0		
Level of Service	F	B		E	F	A		E		E	D		
Approach Delay (s)		15.2			103.2			58.2			56.1		
Approach LOS		B			F			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			70.2									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.09										
Actuated Cycle Length (s)			118.4									Sum of lost time (s)	19.5
Intersection Capacity Utilization			95.0%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 2: SE Jarl Road/SE Orient Drive & Highway 26

09/16/2019

													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Volume (vph)	59	2542	6	7	1812	328	6	1	4	298	1	54	
Future Volume (vph)	59	2542	6	7	1812	328	6	1	4	298	1	54	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5		
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95		
Fr't	1.00	1.00		1.00	1.00	0.85		0.95		1.00	0.95		
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.97		
Satd. Flow (prot)	1630	3259		1599	3197	1430		1588		1548	1503		
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.97		
Satd. Flow (perm)	1630	3259		1599	3197	1430		1588		1548	1503		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	62	2676	6	7	1907	345	6	1	4	314	1	57	
RTOR Reduction (vph)	0	0	0	0	0	126	0	4	0	0	14	0	
Lane Group Flow (vph)	62	2682	0	7	1907	219	0	7	0	188	170	0	
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	2%	2%	2%	
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	1	6		5	2		4	4		8	8		
Permitted Phases						2							
Actuated Green, G (s)	5.6	80.0		0.9	75.3	75.3		1.3		16.7	16.7		
Effective Green, g (s)	5.6	80.0		0.9	75.3	75.3		1.3		16.7	16.7		
Actuated g/C Ratio	0.05	0.68		0.01	0.64	0.64		0.01		0.14	0.14		
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0		4.5		4.5	4.5		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0		
Lane Grp Cap (vph)	77	2202		12	2033	909		17		218	211		
v/s Ratio Prot	c0.04	c0.82		0.00	0.60			c0.00		c0.12	0.11		
v/s Ratio Perm						0.15							
v/c Ratio	0.81	1.22		0.58	0.94	0.24		0.41		0.86	0.81		
Uniform Delay, d1	55.9	19.2		58.6	19.4	9.3		58.2		49.7	49.3		
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	43.8	102.5		56.2	9.0	0.1		15.6		27.7	19.8		
Delay (s)	99.7	121.7		114.8	28.4	9.4		73.7		77.5	69.0		
Level of Service	F	F		F	C	A		E		E	E		
Approach Delay (s)		121.2			25.8			73.7			73.3		
Approach LOS		F			C			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			77.8									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.16										
Actuated Cycle Length (s)			118.4									Sum of lost time (s)	19.5
Intersection Capacity Utilization			101.3%									ICU Level of Service	G
Analysis Period (min)			15										
c Critical Lane Group													



**NOTICE OF INTENT TO APPEAL**

(Please print or type the information below)

File No.	Date of Decision:
Date Notice of Decision Mailed:	Date Appeal Filed:
Appeal Filed within 12 calendar days of Written Decision: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Application Complete: <input type="checkbox"/> Yes <input type="checkbox"/> No	Appeal Fee: \$ _____ Receipt No. _____
Scheduled for review before the <input type="checkbox"/> Planning Commission <input type="checkbox"/> City Council	
Date Set for Appeal Hearing: _____	

Name of Appellant: \_\_\_\_\_ Phone Number \_\_\_\_\_

Address: \_\_\_\_\_  
(city/state/zip)

Legal Description of Property under Appeal: T2S R\_\_E Section \_\_\_\_\_ TL \_\_\_\_\_

**Basis for Standing to Appeal:**

- Submitted written evidence during the initial review
- Testified orally at the hearing
- Participated through \_\_\_\_\_

**Grounds for the Appeal:** Attach separate page(s) stating the grounds for the appeal. The appeal must be based upon issues raised during the decision-making process or hearing. You must identify the issue with sufficient information so that the reviewing body understands under what criteria within the Sandy Development Code, the Comprehensive Plan, or Statewide Land Use Goals you are appealing.

**Relevant Code Sections:** Attach separate page(s) listing the relevant code sections, which relate to the appeal application.

**Please note:**

- If the notice fails to conform to the above requirements or is not actually received by the city (delivered to the city manager, planning director, city recorder or their staff) within the timelines specified, the appeal is void and shall be dismissed.
- An appeal stays an approval until resolution of the appeal.

## EXHIBIT Z

### APPEAL OF TYPE II LAND USE DECISION FILE NO. 19-012 DR/ADJ/TREE SPACE AGE FUELING STATION (November 4, 2019)

#### Introduction

The property owner and applicant JLP Development is filing this Notice of Intent to Appeal appealing certain conditions contained in the Findings of Fact and Final Order for File No. 19-012 issued by the City of Sandy, dated October 22, 2019. The applicant was pleased to receive the Director's decision approving this application. While the majority of the 54 Conditions, many of which contain multiple parts, are acceptable to the applicant, he feels some of the Conditions contained in the Final Order are unwarranted and will be fundamentally detrimental to the economic viability of his business.

#### Background

The subject application was deemed complete by the City of Sandy on August 6, 2019, and the 120-day processing deadline for the project is December 4, 2019. The Final Order, Finding #1 incorrectly identifies the 120 day processing deadline as December 6, 2019.

The applicant and his consultant team worked very hard to design the project in compliance with all Development Code standards identified during the pre-application conference and contained in the incompleteness letter issued by the City dated, May 9, 2019. This letter identified the following code items needing to be addressed by the applicant either by submitting a revised building design or applying for a code deviation or special variance to the standard as applicable.

- Deviation to Section 17.90.120(A.3) regarding the location of parking relative to the primary entrance;
- Special Variance to Section 17.90.120(B.1) regarding building articulation of the east building elevation;
- Special Variance to Section 17.90.120(D.1) to the 50% building orientation/ frontage standard; and a
- Special Variance to Section 17.90.120(D.4) requiring a corner building entrance.

The applicant directed the consultant team to revise the plans as necessary so the application did not need any deviations or special variances and could be processed as a Type II application.

**Changes to the Design** - As a result a number of changes were made to the building design including:

- A second functional primary entrance was added to the South Building Elevation to ensure the design complied with parking location and corner entrance standards;



- The East Building Elevation was divided into three distinct wall planes featuring changes in materials separated by a six-inch offset in compliance with code; and
- A future building was identified on the western portion of the site to satisfy the building orientation/frontage requirement. Due to site constraints this proposal required a request for two Type II Adjustments to satisfy the requirements of this standard.

**Conditions Subject of this Appeal** - The applicant is appealing only specific Conditions contained in the Final Order. These Conditions are generally grouped into two categories: those related to tree protection and those related to building design. The following Conditions are the subject of this appeal:

1. Condition A.1 - bullet points 5 and 6
2. Condition A.2 - bullet points 1, 5, and 6
3. Condition A.4 - bullet points 1, 2, and 3
4. Condition B4
5. Condition C.3
6. Condition D.4
7. Condition E.9

**Additional Tree Retention** - Several Conditions require the applicant to retain six more trees (#110 - #115) in addition to the 12 trees proposed to be retained. This group of Douglas fir trees are located about 70 feet east of the 12 retained trees. The applicant has two concerns with retaining additional trees: 1) additional tree retention will restrict the visibility of the primary functions on the site (fueling station and convenience store) and, 2) retaining these trees with the City recommended tree protection zone may require construction of a wall and add additional construction costs to an already costly project. Per the requirements of Chapter 17.102, Urban Forestry, the 2.32 acre site requires retention of seven trees. The proposal to retain 12 trees already exceeds this requirement. We intend to submit additional Engineering information to illustrate the construction problems associated with retaining these trees.

**Tree Protection Zone** - Several of the Conditions impose a new tree root protection zone recommended by the City Arborist not included in City Code. The applicant submitted an Arborist Report with the land use application prepared by Todd Prager, a Certified Master Arborist with Teragan & Associates, Inc.. The purpose of this work was to provide an assessment of existing trees, make recommendations for tree removal and retention based on the proposed site improvements, and provide protection recommendations for trees proposed to be retained. This work included a tree inventory spreadsheet evaluating the species, diameter, tree health condition, and tree structural condition of each tree on the site. Because of extensive grading required to develop the site, all trees are proposed to be removed with the exception of Tree #76-88, located along Highway 26 as shown on submitted plans. The report also recommended that retained trees be protected by a critical root zone with a radius of .5 feet per inch DBH.

The Final Order indicates the City contracted with Damien Carre' of Oregon Tree Care to evaluate the recommendations contained in the Project Arborist's report. In this report, Mr. Carre' indicates he had visited the site to assess the inventory prepared by Teragan Associates. No issues with this work were identified. Under the "Construction Phase Tree Protection" section of this report, Mr. Carre' confirmed that all trees except numbers 76 through 88 will be removed as shown on the site plans. Page 3 of this report contains the following language, "*Page 5 in the report prepared by Teragan Associates proposes a Critical root zone radius of .5" per inch per foot DBH. Recommend Teragan provide a reason and or explanation why this method is half of the standard formula.*"

Finding #113 of the Final Order discusses the City's rationale for requiring a tree protection area of 1-foot per 1-inch DBH included in several conditions. This Finding cites three organizations who recommend "typical critical root zone" of 1 foot/inch DBH as justification for requiring a greater standard than recommended by the Project Arborist.

As noted above, the City's Arborist recommended the Project Arborist explain why he is proposing a reduced root protection zone. An addendum to the original report prepared by Mr. Prager is included as Attachment A to address this recommendation. This report demonstrates that the proposed root protection zone for retained trees will adequately protect these trees in accordance with the prescriptive path standards recommended by the City's Third Party Arborist.

Building Design - Three Conditions require the applicant to make changes to the building design. Two of these Conditions require the building to be redesigned to include additional clear vision windows and one requires removal of the proposed LED band around the fueling canopy and convenience store. These Conditions are reviewed in detail below.

Review of Appealed Conditions - This section provides a review of each of the Conditions that are the subject of this appeal. In addition to these Conditions the applicant is also appealing all Finding(s) in the Final Order associated with these Conditions. Each of the appealed Conditions from the Final Order are listed below in ***bold italics*** followed by a response in regular text.

1. **Condition A.1 - bullet points 5 and 6**

- ***Detail the proposed future building set back outside of the critical root zone (defined as 1 foot per 1 inch DBH or 5 feet beyond dripline) of the 12 trees proposed for retention as well as the six (6) additional trees that shall be retained (Trees # 110-115).***

**Response:** As noted above, the applicant is opposed to retaining additional trees (Trees # 110-115) due to reduced visibility and additional cost. In addition, the Project Arborist has prepared an addendum to his tree protection recommendations providing additional justification as requested by the City's

third party Arborist. This information demonstrates how the proposed root protection zone is sufficient to protect retained trees. Finding #111 of the Final Order discusses the City's justification for requiring retention of six additional trees and the extension of the landscape buffer along Highway 26. One reason given is because the future building is not proposed to be constructed at this time. Another reason given is additional tree retention achieves the goals of the Green Corridor Agreement. A final reason in this Finding cites Section 17.92.10(C), "trees should be preserved to the greatest extent practicable."

The applicant believes there are a number of problems with this Finding including: 1) proposed tree retention is based on the current development proposal to construct a convenience store and fueling station, given site constraints and development considerations, not a future building, 2) the Green Corridor Agreement cited is not applicable to the subject property, because as stated in this agreement, it is "for the purpose of preserving the rural character of the area between the Metro UGB and the Sandy Urban Reserve". The subject property is within the Sandy Urban Reserve boundary and this agreement is not applicable to the subject property, and 3) additional tree retention will block visibility of the proposed development, potentially harming the viability of the business, and causing unnecessary expense.

- ***Detail extension of the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go.***

**Response:** As noted above, the applicant is opposed to retaining additional trees along the Highway 26 frontage. Section 17.90.120(F) requires, "Parcels abutting Highway 26 shall provide a landscape buffer comprising not less than 30 percent of the highway frontage, to a depth of not less than 20 feet. Within the buffer existing trees shall be preserved to the extent practicable." The proposal includes retention of 13 existing trees within an area comprising about 33% of this site's highway frontage in compliance with this standard. In addition, as shown on the Landscape Plan, the applicant proposes planting the remainder of this frontage to contain a mixture of trees, shrubs, and groundcover species, including several evergreen and deciduous trees, as required. Findings #66 and #111 cite the Green Corridor Agreement with Clackamas County as justification for requiring retention of additional trees in this area. As noted above, Staff is incorrectly applying the Green Corridor Agreement to the subject property as it is applicable only to properties outside the city's Urban Reserve. The agreement is included as Attachment B.

**2. Condition A.2 - bullet points 1, 5, and 6**

- ***Detail 10 large street trees or 17 medium street trees along the Highway 26 frontage of the site. The applicant shall submit details on the proposed street tree species and locations for staff review and approval. The applicant shall obtain a permit from ODOT to place trees within the highway right-of-way.***

**Response:** The applicant is not necessarily opposed to this condition but wants to make sure required street trees can also be counted as mitigation trees required ODOT as agreed to in recent emails between the City, ODOT, and All County Engineers. The applicant requests this Condition be modified to detail this agreement.

- ***Detail retention of trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115). The applicant shall retain an arborist on-site for any construction activity within the critical root zone of 1 foot per 1 inch DBH or 5 feet beyond the dripline of the retained trees.***

**Response:** This Condition is similar to similar conditions discussed above. As such, the applicant is opposed to retaining additional trees along the highway and providing the blanket root protection zone stated in this Condition. The applicant does not object to the portion of the Condition requiring an Arborist be present to observe all development work in the vicinity of the root protection zone for retained trees.

- ***Detail the Highway 26 sidewalk as far away from the trunks of the retained trees as possible without intruding on ODOT's clear zone; the applicant shall work with ODOT and the City of Sandy Planning Division staff to determine an appropriate location for the relocated sidewalk. The applicant shall retain an arborist on-site for any construction activity within the critical root zone of 1 foot per 1 inch DBH or 5 feet beyond the dripline of the retained trees.***

**Response:** The Project Arborist's addendum report addresses the details of the sidewalk along Highway 26. This report recommends this facility be constructed at the top of the slope rather than further down the slope as instructed by this Condition. This report also specifies a construction profile for this facility to minimize root damage. The information in this addendum shows that moving the sidewalk down the slope will potentially impact the roots of these trees far greater than if the sidewalk is constructed as proposed.

**3. Condition A.4 - bullet points 1, 2, and 3**

- ***Remove the proposed LED striping on the roofline of the gas pump facility and the convenience store.***

**Response:** The proposed LED band is intended to add visual interest similar to a painted color band as allowed with certain parameters by Section 17.90.120(B.4.b). The LED band is similar to what has been installed on the canopies of the Leather's, Shell and Arco stations in downtown Sandy. It should be noted the canopies of the Shell and Arco stations, replaced in the last few years, after adoption of the Sandy Style standards, were approved to contain LED bands. We believe staff has incorrectly considered the lighted band as "a strongly thematic architectural style associated with some chain commercial establishments" that is discouraged by Code. The applicant believes the lighted band instead complements and enhances the building aesthetic and architectural styling of the Sandy Style design and should be approved.

- ***Update the north and/or east elevations of the proposed convenience store to detail at least one active window in the storage and/or kitchen area.***

**Response:** The applicant's Architect is developing additional information to address this Condition. In general, the furnishing requirements and internal function of the convenience store is not conducive to providing clear glass for entire windows except on the West elevation. It is because of these limitations only the upper portion of these windows contain clear glass. The applicant is not opposed to approval of a Special Variance to this requirement if it is deemed necessary.

- ***Update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance.***

**Response:** The applicant's Architect is also working to provide additional information to address this Condition. In general, the layout and design of the interior of the convenience store is not conducive to providing clear glass along the entire south elevation. As noted above, the building design was changed to include a second primary entrance on the South elevation. This elevation is about 80 feet from the North westbound travel lane of Highway 26 which has a speed limit of 45 mph, increasing to 55 mph just past the site. The applicant believes the functionality of providing clear glass windows is marginal. As shown on the building elevations this elevations contains five windows segments and a service door east of the entrance. All of these openings feature clear glass at the top. The applicant is not opposed to approval of a Special Variance to this requirement if it is deemed necessary.

**4. Condition B.4**

- 4. ***Install tree fencing at the standard critical root zone of one foot per inch DBH or 5 feet beyond the dripline; the tree protection fencing shall be 6 foot high chain link or no-jump horse fencing and shall have a sign that clearly marks the area as a Tree Protection Zone.***

**Response:** The applicant's primary concern with this item is the Condition doesn't acknowledge approval of a modified root protection zone proposed by the Project Architect. The applicant requests the wording of the Condition be changed to require tree protection fencing at the root protection zone specified by the Project Arborist in Attachment A.

**5. Condition C.3**

- 3. ***Record a tree protection covenant specifying protection of the 12 retention trees and Trees #110-115 limiting removal without submittal of an Arborist's Report and City approval. This document shall include a sketch identifying the retention trees and Trees #110-115 the critical root zone around the retention trees and Trees # 110-115 detailed at 1 foot per 1 inch DBH.***

**Response:** As noted above, the applicant requests this Condition be modified to eliminate the requirement to protect Trees #110-115 and the root protection specified in this Condition be modified to require a zone as detailed by the Project Arborist in Attachment A.

**6. Condition D.4**

- 4. *The last sentence of this Condition that reads, “In addition, the applicant shall obtain a letter of credit in the amount of \$500 per tree to cover replacement and establishment of the right-of-way trees should a right-of-way tree die within 3 years.”***

**Response:** The applicant is opposed to this Condition due to the cost it requires. As shown on Landscape Plan and additional street trees imposed by the Final Order, the site will include an estimated 20-30 street trees. Based on this number of trees, the applicant would be required to provide a letter of credit of \$10,000 - \$15,000 and hold this amount for three years. Finding #80 addresses the requirements of Section 17.92.30, Required Tree Plantings. A review of this section does not find language requiring a financial guarantee as included in this Condition. The applicant finds this requirement to be extremely burdensome especially given the soil preparation, planting, and inspection requirements conditioned in the Final Order. In addition, the applicant doesn't believe it is fair to require such a sum of money to be set aside, to guarantee potential tree replacement.

Section 17.92.140, Guarantee, details landscape guarantee requirements. The Final Order does not address this section. This section contains the following language, *“all landscape materials and workmanship shall be guaranteed by the installer and/or developer for a period of time not to exceed two years.”* There is nothing in this section requiring an applicant to provide a financial guarantee and the guarantee period specified in this section is two years, not three years as stated in this Condition. The Final Order does not contain an explanation for this Condition. The applicant requests this Condition be modified eliminating the required financial guarantee and the three year guarantee timeline.

**7. Condition E.9**

- 9. *The applicant shall follow all recommendations of the third-party arborist report with respect to air spading, root pruning, and any work within the critical root zone.***

**Response:** The applicant is not opposed to this Condition assuming all Conditions regarding the root protection zone are modified specifying a zone prescribed by the Project Arborist in Attachment A.

**Conclusion**

The property owner and applicant JLP Development are filing this Notice of Intent to Appeal appealing certain conditions contained in the Findings of Fact and Final Order for File No. 19-012. As indicated above, the applicant was pleased to receive the



Director's decision approving this application, however, he believes certain Conditions contained in the Final Order will be fundamentally detrimental to the economic viability of his business unless they are changed. For this reason, the applicant has submitted this appeal, appealing the following Conditions:

1. Condition A.1 - bullet points 5 and 6
2. Condition A.2 - bullet points 1, 5, and 6
3. Condition A.4 - bullet points 1, 2, and 3
4. Condition B4
5. Condition C.3
6. Condition D.4
7. Condition E.9

This document is primarily intended to identify the items that are the subject of the applicant's appeal. The applicant reserves the right to submit additional documents in support of the appeal both before and during the Planning Commission hearing as necessary.

**Attachments**

- A. Tree Protection Addendum (Teragan & Associates, 11/3/19)
- B. 2011 Green Corridor Agreement



**TERAGAN**  
**& ASSOCIATES, INC.**  
ARBORICULTURAL CONSULTANTS

**MEMORANDUM**

**DATE:** November 3, 2019  
**TO:** Dave Reichert (All County Surveyors & Planners)  
**FROM:** Todd Prager, RCA #597, ISA Board Certified Master Arborist  
**RE:** Tree Protection Addendum for Space Age Project

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**Summary**

This memorandum provides additional information about the tree protection plan for trees 76 through 88 at the proposed Space Age development.

**Background**

JLP Development Inc. is proposing to construct the Space Age development at 15585 SE Orient Drive in Sandy, Oregon.

Teragan & Associates, Inc. provided a tree plan dated June 18, 2019 with recommendations for tree removal and retention based on the proposed site improvements. Protection recommendations were also provided for the trees to be retained.

The City of Sandy reviewed the report with the assistance of a third party arborist. The third party arborist report dated August 27, 2019 included the following comments and recommendations:

1. Provide an explanation of the recommended critical root protection zone radius of .5 feet per inch of DBH; and
2. Provide a prescriptive root protection zone radius of 1 foot per inch of DBH with no more than 25 percent disturbance within that area for the trees to be retained unless otherwise noted.

The purpose of this report is to provide an explanation and response to the information in the third party arborist report.

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*Teragan & Associates, Inc.*  
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Phone: 971.295.4835 • Fax: 503.697.1976  
Email: [todd@teragan.com](mailto:todd@teragan.com) • Website: [teragan.com](http://teragan.com)

### Critical Root Protection Zone

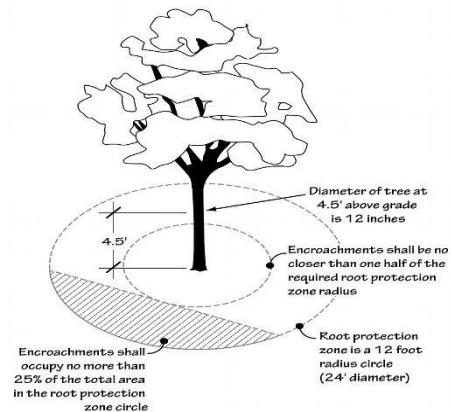
In my June 18, 2019 report, I stated the following:

"A typical critical root zone encompasses a radius around a tree that is .5 feet per inch of DBH. For example, a tree with a 24-inch DBH would have a minimum protection radius of 12 feet. However, this standard may need to be adjusted on a case by case basis due to tree health, root distribution, species tolerance, whether the tree will be impacted on multiple sides, the specific development proposed, and other factors."

Published research indicates an extreme minimum structural root protection setback of three times (3x) the DBH<sup>1</sup> may be adequate when impacts are limited to one side of a tree. However, a minimum structural root protection setback of .5 feet per inch of DBH is more typical<sup>2</sup> and is typically utilized by our firm to factor in a margin of safety. The statement from my June 18, 2019 report was intended to describe the typical minimum setback for structural root removal to protect the structural stability of trees.

In addition to protecting structural roots, it is important to protect the fine root system that provides water and nutrients to the tree. Published research indicates that 33 to 50 percent of the fine root system of healthy trees can be removed without serious effects.<sup>3,4,5</sup> The standard recommendation of our firm is to limit removal of fine roots to no more than 25 percent to factor in a margin of safety for items such as tree health and uneven root distribution.

Taken together, our firm's typical minimum recommended critical structural root removal setback is .5 feet per inch of DBH and the typical maximum overall fine root disturbance is 25 percent.<sup>6</sup> This typical recommendation is consistent with the recommendations in the third party arborist report and City of Portland prescriptive path standards which are illustrated in Figure 1.



**Figure 1: Third party arborist/City of Portland standard root protection zone**

<sup>1</sup> Smiley, E.T., B.R. Fraedrich, and N. Hendrickson. 2002. *Tree Risk Management*. Charlotte, N.C: Bartlett Tree Research Laboratories.

<sup>2</sup> Costello, L.R., and K.S. Jones. 2003. *Reducing Infrastructure Damage by Tree Roots: A Compendium of Strategies*. Cohasset, CA: Western Chapter of the International Society of Arboriculture.

<sup>3</sup> Zimmerman, M.H., and C.L. Brown. 1971. *Trees, Structure and Function*. New York: Springer-Verlag.

<sup>4</sup> Perry, T.O. 1982. The Ecology of Tree Roots and the Practical Significance Thereof. *J. Arboriculture* 8:197-211.

<sup>5</sup> Helliwell, D.R. 1985. *Trees on Development Sites*. Romsey, England: Arboriculture Assn.

<sup>6</sup> The 25 percent maximum root zone disturbance is within an overall estimated root zone of 1 foot per inch of DBH.

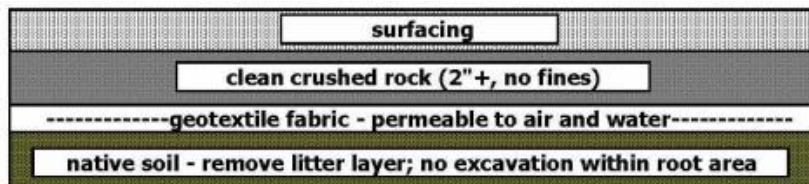
In summary, the intent of the critical root protection zone setback described in my June 18, 2019 report was to identify the minimum setback needed to protect the structural stability of the retained trees. At the same time, the overall tree protection plan was designed to ensure no more than 25 percent of the tree root zones were disturbed. The application of these recommendations is consistent with the recommendations in the third party arborist report. The analysis in the next section of this report demonstrates how these standards have been met.

### Proposed Root Protection Zones

The third party arborist report requested a prescriptive root protection zone radius of 1 foot per inch of DBH with no more than 25 percent disturbance within that area for the trees to be retained unless otherwise noted. Figure 1 was provided by the third party arborist to illustrate the recommendations. Note that an alternative to the prescriptive root protection zone is permitted in the third party arborist report if measures are implemented to minimize the impacts.

Attachment 1 includes the proposed site plan with tree locations and proposed improvements. For each tree to be retained, the overall root zone radius of 1 foot per inch of DBH is shown in green with the critical minimum root protection zone shown in orange.

I worked with the project team to ensure the future building is outside the critical root zones of the trees to be retained. We also adjusted the sidewalk location as far from the trees as possible while minimizing grading. Note that the proposed sidewalk location is at the top of a bank where it can be constructed using a modified pavement profile to minimize root disturbance (see Figure 2 for modified pavement profile). If the sidewalk were shifted further south, it would require more root/soil disturbance and grading to construct it on a steep slope. Also, the sidewalk cannot be constructed within the clear zone of Highway 26.



**Figure 2:** Sample profile for areas within root protection zones. Depth of rock is dependent on grading. Technique based on best management practices.

Even though the modified pavement profile minimizes fine root disturbance, we will consider the rooting area beneath the sidewalk as disturbed. In addition, the area beneath the proposed future building is also considered an area of lost/disturbed roots. The site plan in Attachment 1 includes the area of disturbed roots for each of the trees to be retained. Table 1 includes the percent root disturbance for each of the retained trees.

As shown in Attachment 1 and Table 1, the percent root disturbance for each of the retained trees meets the prescriptive path standards recommended by the third party arborist. Also, the critical structural roots of the retained trees will be protected by siting the building outside the critical root zones of each of the retained trees.

**Table 1: Root Disturbance of Retained Trees**

Tree #	DBH	Root Zone Area	Root Zone Disturbance	% Sidewalk Impacts	% Building Impacts	Total % Impacts
76	26"	2121 ft <sup>2</sup>	444 ft <sup>2</sup>	21%	0%	21%
77	36"	4071 ft <sup>2</sup>	661 ft <sup>2</sup>	16%	0%	16%
78	25"	1961 ft <sup>2</sup>	77 ft <sup>2</sup>	4%	0%	4%
79	29,23"	4300 ft <sup>2</sup>	486 ft <sup>2</sup>	7%	1%	8%
80	38"	4536 ft <sup>2</sup>	620 ft <sup>2</sup>	9%	5%	14%
81	18"	1017 ft <sup>2</sup>	0 ft <sup>2</sup>	0%	0%	0%
82	27"	2287 ft <sup>2</sup>	346 ft <sup>2</sup>	8%	7%	15%
83	24"	1807 ft <sup>2</sup>	200 ft <sup>2</sup>	1%	10%	11%
84	19"	1133 ft <sup>2</sup>	17 ft <sup>2</sup>	2%	0%	2%
85	24"	1807 ft <sup>2</sup>	283 ft <sup>2</sup>	0%	16%	16%
86	21"	1384 ft <sup>2</sup>	113 ft <sup>2</sup>	8%	0%	8%
87	26"	2121 ft <sup>2</sup>	344 ft <sup>2</sup>	7%	9%	16%
88	24"	1807 ft <sup>2</sup>	226 ft <sup>2</sup>	2%	11%	13%

While the proposed disturbance meets the prescriptive path standards, it will be necessary to implement the additional protection recommendations in the Teragan and third party arborist reports. This will include placing tree protection fencing initially at the edge of the root protection zone as shown in Attachment 1 until construction occurs under project arborist supervision. Also, the edge of the future building foundation could be air spaded to locate and prune roots under arborist supervision. The additional recommendations in the June 18, 2019 Teragan report shall continue to apply.

**Conclusion**

This report provides additional information about the intent of the critical root protection setback recommended in the June 18, 2019 Teragan report. This report also demonstrates the trees to be retained will be adequately protected in accordance with prescriptive path standards recommended by the third party arborist.

Please contact me if you have questions, concerns, or need any additional information.

Sincerely,



Todd Prager  
ASCA Registered Consulting Arborist #597  
ISA Board Certified Master Arborist, WE-6723B  
ISA Qualified Tree Risk Assessor  
AICP, American Planning Association

---

Teragan & Associates, Inc.  
3145 Westview Circle • Lake Oswego, OR 97034  
Phone: 971.295.4835 • Fax: 503.697.1976  
Email: todd@teragan.com • Website: teragan.com

Attachment 1: Site Plan with Retained Trees, Tree Impacts, and Tree Protection

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*Teragan & Associates, Inc.*  
3145 Westview Circle • Lake Oswego, OR 97034  
Phone: 971.295.4835 • Fax: 503.697.1976  
Email: [todd@teragan.com](mailto:todd@teragan.com) • Website: [teragan.com](http://teragan.com)



# Attachment 1

### EROSION CONTROL NOTES

OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

THE IMPLEMENTATION OF THESE ESC PLANS AND CONSTRUCTION MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED BY THE LOCAL JURISDICTION, AND VEGETATION/LANDSCAPING IS ESTABLISHED. THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTENANCE AFTER THE PROJECT IS APPROVED UNTIL THE LOTS ARE SOLD.

THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

THE ESC FACILITIES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE.

ALL ADJACENT STREETS SHALL BE KEPT FROM DEBRIS, DIRT AND ROCK. AT ALL TIMES, USE ROCK ENTRANCES FROM ENTERING AND LEAVING THE SITE. ANY DIRT OR DEBRIS LEAVING THE SITE SHALL BE CLEANED UP IMMEDIATELY.

AN EROSION CONTROL INSPECTION IS REQUIRED BEFORE ANY GROUND DISTURBING ACTIVITY IS COMMENCED ON-SITE. ALSO, THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

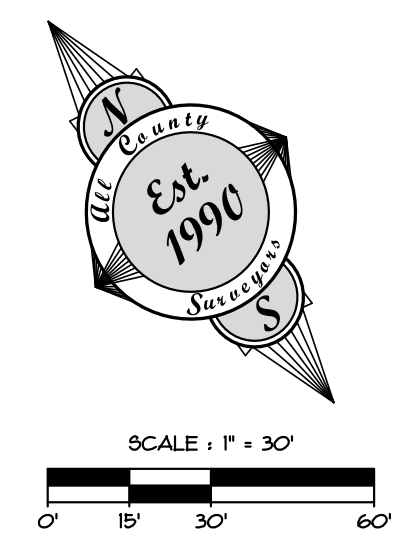
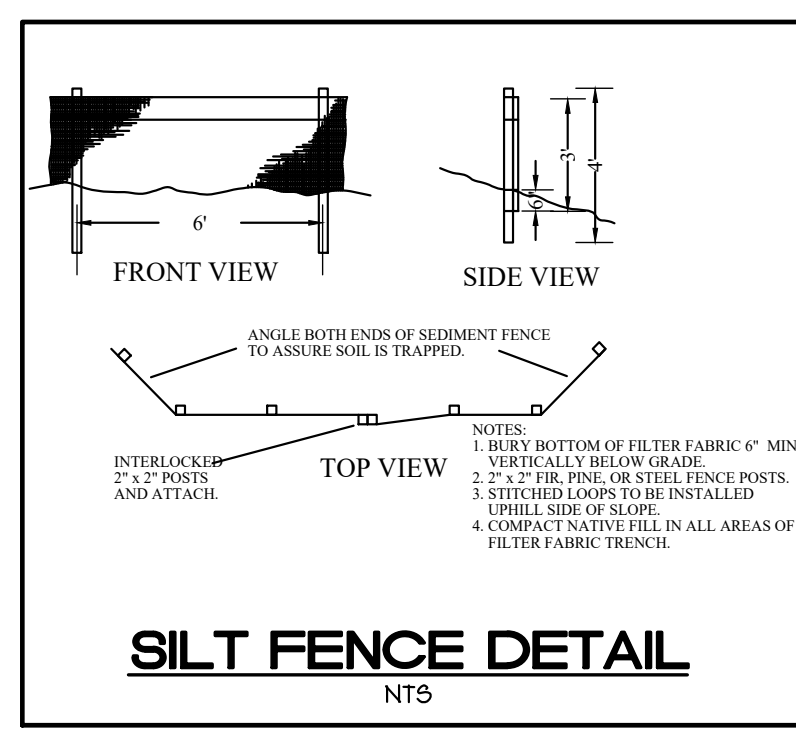
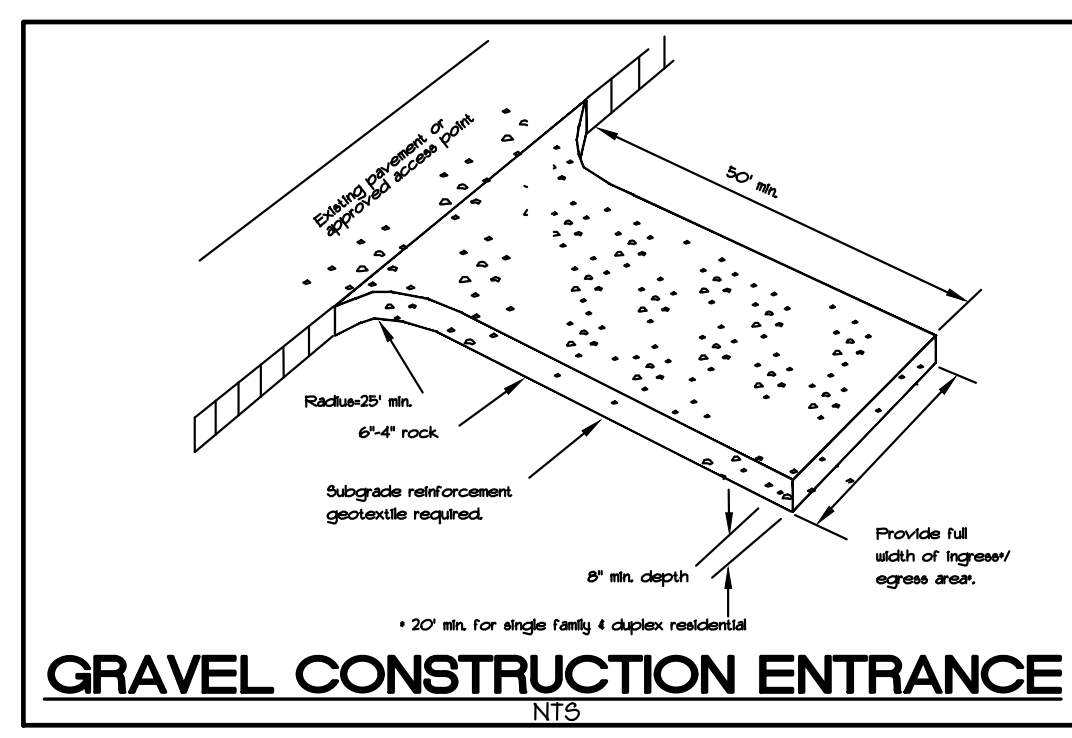
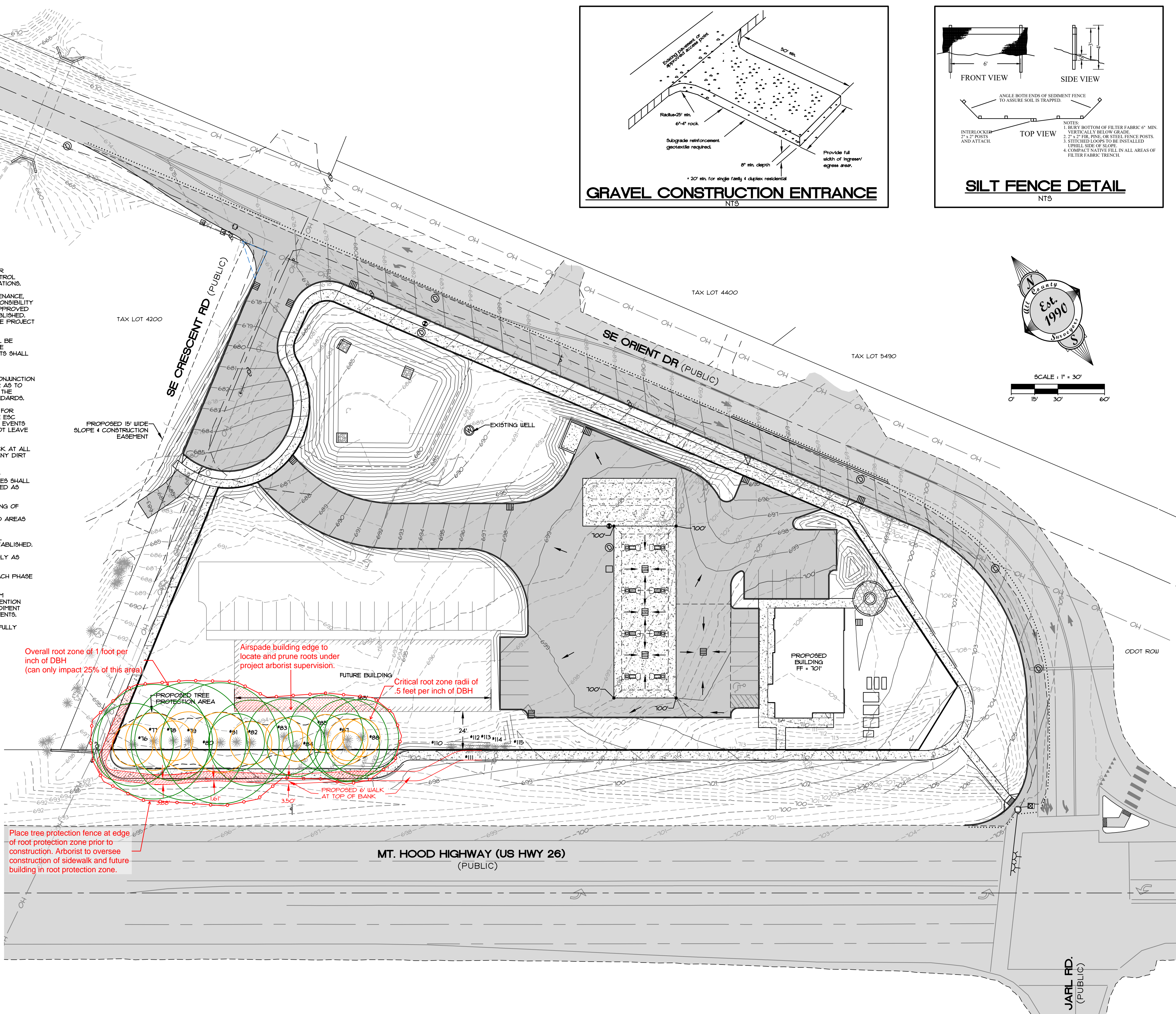
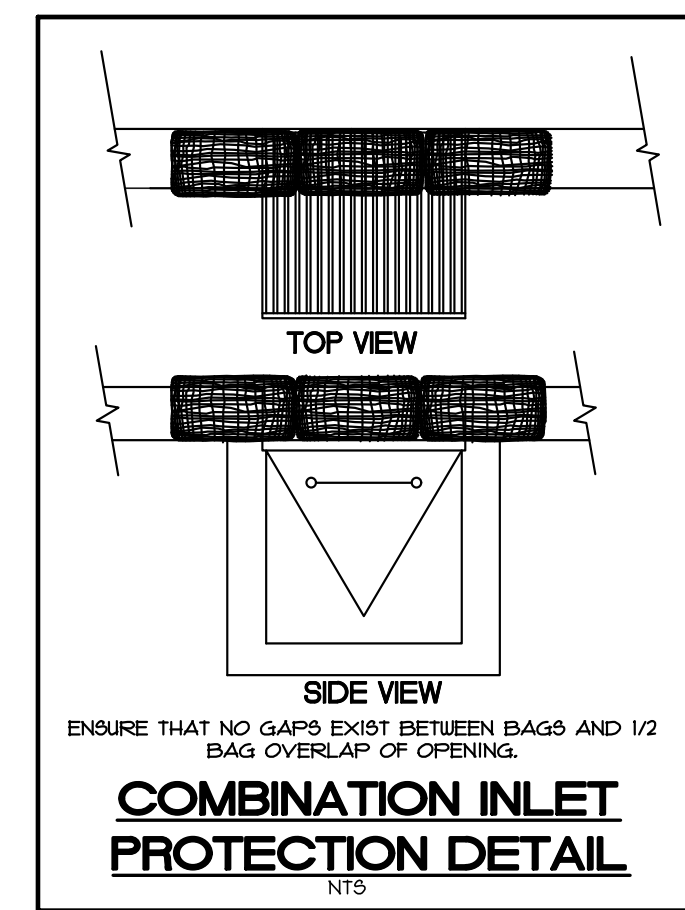
STABILIZED GRAVEL ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

STORM INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED. PAVEMENT SURFACES AND VEGETATION ARE TO BE PLACED AS RAPIDLY AS POSSIBLE.

SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1 FOR EACH PHASE OF CONSTRUCTION.

IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY ESTABLISHED FROM OCTOBER 1ST THROUGH APRIL 30TH, THE WET WEATHER EROSION PREVENTION MEASURES WILL BE IN EFFECT. SEE THE EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (CHAPTER 4) FOR REQUIREMENTS.

THE DEVELOPER SHALL REMOVE ESC MEASURES WHEN VEGETATION IS FULLY ESTABLISHED.



BY	REVISION	SHEET
		4
DATE	NO.	OF
		6
DESIGNED	DRS	RLT/DRS
CHECKED	DRS	RLT
APPROVED	RLT	RLT

SCALE	VERT. HORIZ.	DATE	FILE	LEGAL	SECTION	TWP.	RANGE	4E
1" = 30'	1" = 30'	07-30-19	18-126 Planning.dwg		10	25		

PROJECT: **SPACE AGE SERVICE STATION GRADING PLAN AND EROSION CONTROL PLAN**

LOCATION: **15585 SE ORIENT DR, SANDY, OR 97055**

**Surveyors & Planners, Inc.**  
Surveying, Planning and Civil Engineering  
P.O. Box 955 Sandy, OR 97055  
Phone: (503) 668-4730  
Fax: (503) 668-4730  
DATE OF PLOT: 07/30/19

CLIENT:  
JIM FLISKA  
JLP DEVELOPMENT LLC,  
PO BOX 1429  
CLACKAMAS OR 97015  
503-212-3900

**PROPOSED CONSTRUCTION**



EXHIBIT BB

INTERGOVERNMENTAL AGREEMENT ON  
HIGHWAY 26 CORRIDOR  
AMONG CITY OF SANDY, CLACKAMAS COUNTY,  
METRO

This Agreement is entered into by and between the City of Sandy ("City"), Clackamas County ("County") and Metro ("Metro") (collectively, the "Parties") pursuant to ORS 190.003 to 190.110, which allows units of government to enter into agreements for the performance of any or all functions and activities which such units have authority to perform.

RECITALS

WHEREAS, The Portland metropolitan region and neighboring cities outside Metro's jurisdictional boundaries are expected to experience substantial population and employment growth by the year 2060; and

WHEREAS, Anticipated urban growth and development in the Metro area will affect neighboring cities outside Metro's jurisdictional boundaries, and anticipated urban growth and development in the neighboring cities will affect jurisdictions within Metro's boundaries; and

WHEREAS, The City wishes to maintain its own identity, separate and distinct from the metropolitan area; and

WHEREAS, Metro and the County share the City's desire to maintain a separation between the City and the metropolitan area; and

WHEREAS, Highway 26 eastbound between the cities of Gresham and Sandy is the gateway to the Mount Hood recreational area, a nationally-recognized scenic and recreational resource; and

WHEREAS, pursuant to Senate Bill 1011 (2007) County and Metro have adopted both Urban and Rural Reserves in and around the Highway 26 Corridor between Gresham and Sandy; and

WHEREAS, the County, City and Metro previously entered into an Intergovernmental Agreement (the Green Corridor/Rural Reserve Agreement) for the purpose of preserving the rural character of the area between the Metro UGB and the Sandy Urban Reserve; and

WHEREAS, The City, the County and Metro are interested in preserving and protecting the visual character of the Highway 26 Corridor as it passes through the area subject to this Agreement; and

NOW, THEREFORE, the City, the County and Metro agree as follows:

Clackanomah Management IGA

Page 1 of 5

## **AGREEMENT**

### **I. Purpose**

The Parties agree that they are mutually interested in and will work together to:

- A. Preserve the distinct and unique identities of the City and the metropolitan area by maintaining a separation between the City and the metropolitan area.
- B. Preserve and protect the rural and natural resource character and values of Rural Reserve areas along the corridor that separate the City from the metropolitan area.
- C. Establish a plan to protect the unique visual character of the Highway 26 Corridor.

### **II. Definitions**

- A. "Highway 26 Corridor" means the area along State Highway 26 between the cities of Gresham and Sandy.
- B. "Clackanomah Urban Reserve" means Urban Reserve Areas 1D and 1F as designated in Metro's Regional Framework Plan, and shown on Exhibit A hereto.

### **III. Pre-Development Buffering**

The Parties:

A. Intend that urban development along the Highway 26 Corridor shall be screened from the Highway in a fashion that reasonably retains the rural visual character of the corridor. The parties agree that a 50-foot wide buffer containing a thick screen of evergreen trees will achieve this goal.

The County and the City:

B. Will work together in good faith to establish buffers in advance of urban development, either within the existing highway right of way or through the acquisition of appropriate easements on private land adjacent to the highway.

C. If one or more owners of real property within the Highway 26 Corridor grants an appropriate easement(s), will establish a vegetated buffer within the easement(s) consistent with the terms of this Agreement.

D. Where an affected property owner is willing to grant an easement(s), will seek funding to establish evergreen plantings within the buffer. Funds provided by any of the Parties for the buffer may be reimbursed through fees paid by future development in the urban reserve area.

E. If an affected property owner does not grant an appropriate easement to establish the buffer, will discuss alternative methods and or incentives to obtain the necessary easements.

#### **IV. Concept Planning for Clackanomah Urban Reserves.**

A. The Parties recognize that the addition of any portion of the Clackanomah Urban Reserve into the Urban Growth Boundary will be preceded by and conditioned upon development of a concept plan by the appropriate local governments pursuant to Title 11 of the Metro's Urban Growth Management Functional Plan. The Parties further recognize that the concept planning process is a collaborative process between the jurisdiction that will ultimately provide services to the Clackanomah Urban Reserve and other affected jurisdictions, including the Parties. Metro's regulations do not prescribe a precise outcome to the concept planning process.

B. Prior to approving an amendment to the UGB to add any portion of the Clackanomah Urban Reserve, Metro shall determine that the appropriate city or the County has complied with the provisions of Title 11 for any portion of the Clackanomah Urban Reserve. The Parties will strive to ensure that the concept plan calls for the following in land use regulations adopted following addition to the UGB:

- a. Prior to approval of any commercial, industrial or urban-level residential development in the concept plan area, parcels located within the Clackanomah Urban Reserve and abutting Highway 26 shall provide a vegetated buffer screen along the entire highway frontage, to a depth of 50 feet where such a buffer can be imposed as a condition of development. Within the buffer area existing trees shall be preserved to the greatest extent possible. New evergreen trees at least eight feet in height at planting and capable of growing to at least 30 feet in height shall be planted at a density that will create a visual screen within five years. This provision shall not apply to the development of roads, utilities, or other public facilities;
- b. Appropriate limitations on signs oriented to Highway 26 except where required for reasons of public safety;
- c. Achievement of the principles relating to the Clackanomah Urban Reserves set forth in Exhibit B of the Intergovernmental Agreement between Metro and Clackamas County to Adopt Urban and Rural Reserves, attached to this Agreement; and
- d. Orientation of commercial retail development toward the interior of the Clackanomah Urban Reserves and away from the Highway 26 Corridor.

As used above, "strive to ensure" means the Parties will individually and collectively use their best efforts.

C. Metro will require that provisions in the concept plan that implement paragraphs IV.B.a through d of this Agreement be adopted into the comprehensive plan and land use regulations of the County or the city responsible for urban planning in the portion, or both.

#### **V. Notice and Coordination Responsibilities**

A. The County shall provide the City and Metro with notice and an opportunity to comment at least 30 days prior to the first scheduled public hearing on plan amendments or zone changes within the Clackanomah Urban Reserve.

B. The County shall provide the City, Metro and ODOT with notice and an opportunity to comment at least 15 days prior to administrative action on any development applications (including, but not limited to, conditional use permits and design review) within the Clackanomah Urban Reserve.

C. The County shall provide the City and Metro with notice and an opportunity to comment on any proposed concept plan for any portion of the Clackanomah Urban Reserve.

D. In order to fulfill the cooperative planning provisions of this agreement the City, County and Metro shall provide each other with needed data, maps, and other information in hard copy or digital form in a timely manner without charge.

#### **VI. Amendments to this Agreement**

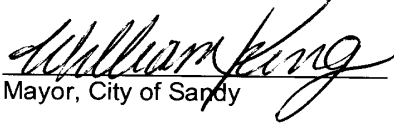
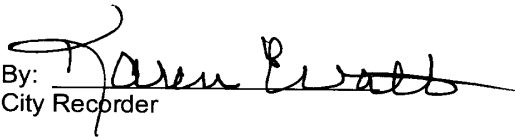
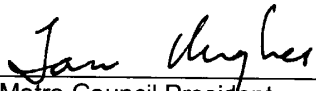
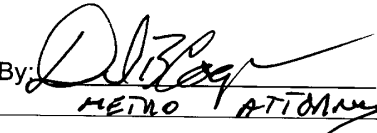
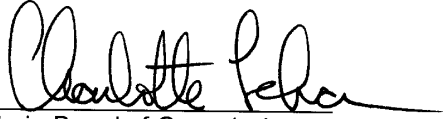
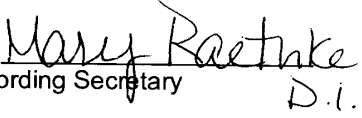
This Agreement may be amended in writing by the concurrence of all three Parties. The terms of this agreement may be reviewed at the time that the Parties adopt modifications to related agreements.

#### **VII. Effectiveness and Termination**

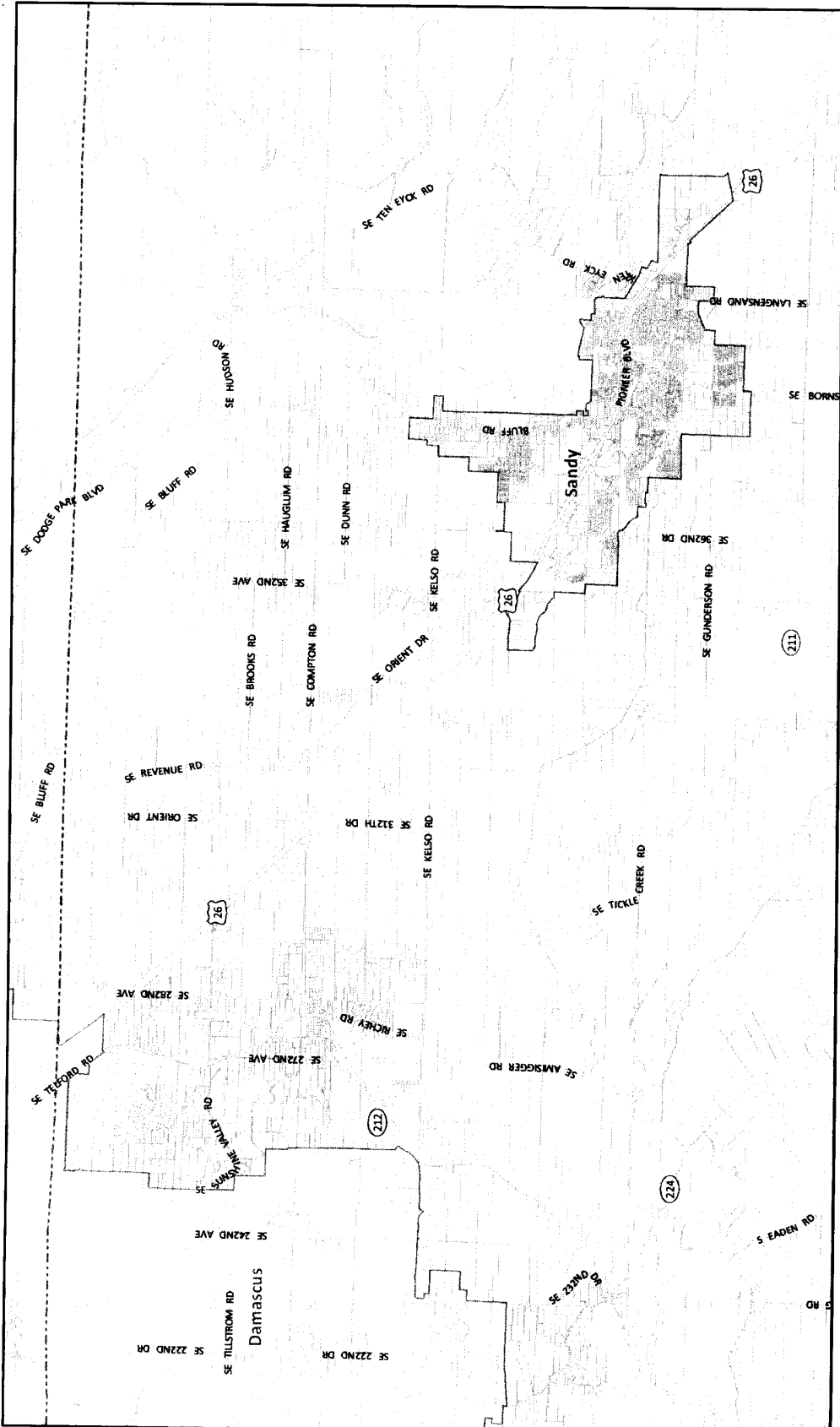
A. This agreement will be effective upon acknowledgement of the designation by Metro of urban reserves in Clackamas County pursuant to ORS 195.145(1)(b) and a final decision on any appeal of the acknowledgement. This agreement shall continue until terminated by any of the Parties, following a written explanation for the proposed termination and consultation with the other Parties, by written notice from the Party. The agreement shall terminate 60 days following receipt of the notice by the other Parties.

**VIII. Severability**

If any section, clause or phrase of this agreement is invalidated by any court of competent jurisdiction, any and all remaining parts of the agreement shall be severed from the invalid parts and shall remain in full force and effect.

<p><b>CITY OF SANDY</b></p> <p> Mayor, City of Sandy</p> <p>ATTEST:</p> <p>By:  City Recorder</p> <p><b>METRO</b></p> <p> Metro Council President 12/13/11</p> <p>ATTEST:</p> <p>By:  METRO ATTORNEY</p>	<p><b>CLACKAMAS COUNTY</b></p> <p>Approved this <sup>20</sup>13<sup>th</sup> day of <b>October, 2011.</b></p> <p> Chair, Board of Commissioners</p> <p>ATTEST:</p> <p>By:  Recording Secretary D.I.</p>
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**Intergovernmental Agreement Area**  
City of Sandy, Clackamas County, Metro and Oregon Department of Transportation  
October, 2011 DRAFT

0 0.25 0.5 1 miles

**Metro** | Making a great place

The information on this map was derived from digital databases on Metro's GIS. Care was taken in the preparation of this map to ensure the accuracy of the information. Metro does not warrant, guarantee, or accept responsibility for errors, omissions, or positional accuracy. There are no warranties, expressed or implied, in this map. Metro is not responsible for any errors or omissions. Metro reserves the right to modify this map at any time without notice. For a particular purpose, accompanying this product. However, modification of any error are appreciated.

**EXHIBIT A**

**EXHIBIT B**  
**PRINCIPLES FOR CONCEPT PLANNING OF URBAN RESERVES**

1. Except for Areas 4A, 4C, and 4D concept planning for specific, enumerated Urban Reserves on the Urban and Rural Reserves map may occur separately and at different times. Concept planning for Areas 4A, 4C, and 4D must be coordinated so that Area 4C (Borland Road) is planned and developed as the town center serving the vast majority of Area 4A (North Stafford) and Area 4D (South Stafford).
2. A concept plan for any Urban Reserve area must be approved by the county, the city or cities who will govern the area and Metro, with ample opportunities for public involvement, including recognized citizen involvement entities, such as community planning organizations, hamlets and neighborhood associations. Concept plans will recognize community-based planning efforts such as the Stafford Hamlet Values & Vision Statement.
3. The following cities shall be invited to participate in concept planning of the following Urban Reserves:
  - Areas 1D and 1F (Clackanomah) – Damascus, Gresham and Sandy
  - Area 3C (Newell Creek Canyon/Holly Lane) – Oregon City
  - Area 4A and 4B (North Stafford Area) – Tualatin, Lake Oswego and West Linn
  - Area 4C (Borland Road ) - Tualatin, Lake Oswego and West Linn
  - Area 4D (South Stafford) - Tualatin, Lake Oswego, West Linn, and Wilsonville
4. Concept plans shall provide that any area added to the UGB shall be governed by one or more of the following cities, or a new city, with preferences to the following:
  - Areas 1D and 1F (Clackanomah) – Damascus and Gresham
  - Area 3C (Newell Creek Canyon/Holly Lane) – Oregon City
  - Area 4A and 4B (North Stafford Area) – Tualatin, Lake Oswego and West Linn
  - Area 4C (Borland Road ) - Tualatin, Lake Oswego and West Linn
  - Area 4D (South Stafford) - Tualatin, Lake Oswego, West Linn, and Wilsonville
5. Concept planning for Urban Reserve areas that are suitable for industrial and other employment uses – such as portions of Clackanomah and the Borland Road area - will recognize the need to provide jobs in this part of the region, and that the areas were brought into the Urban Reserves principally meet those needs.
6. Concept planning for Urban Reserve areas that are suitable for a mix of urban uses – such as the Borland Road area – will ensure the areas are developed with the opportunity to provide employment and mixed- use centers with housing at higher densities and intense employment at higher floor-to-area ratios, and will include designs for a walkable, transit-supportive development pattern.

7. Concept planning shall recognize environmental and topographic constraints and habitat areas, such as the buttes in the Clackanomah area, Newell Creek Canyon in Urban Reserve Area 3C and the riparian areas along creeks in the North Stafford Area, recognizing that these areas include important natural features, and sensitive areas that may not be appropriate for urban development. Concept planning will reduce housing and employment capacity expectations accordingly
8. Concept planning for the portion of the Clackanomah area along Highway 26 will recognize the need to provide and protect a view corridor considering, among other things, landscaping, signage and building orientation. Metro and Clackamas County also recognize the need to work with the City of Sandy to revise the existing intergovernmental agreement among the parties.



Emily Meharg <emeharg@ci.sandy.or.us>

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**Re: 18-126 Space Age Fuel Station ODOT # 8605**

11 messages

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**Ray Moore** <raym@allcountysurveyors.com>

Tue, Oct 29, 2019 at 4:23 PM

To: "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>, Emily Meharg <emeharg@ci.sandy.or.us>

Cc: Jim Pliska <jimpliska@spaceagefuel.com>, Tracy Brown <tbrownplan@gmail.com>, Dave Reichert <dave@allcountysurveyors.com>, DANIELSON Marah B <Marah.B.DANIELSON@odot.state.or.us>, Magnus Bernhardt <Magnus.U.BERNHARDT@odot.state.or.us>

Hi Kelly. See below. The question is can we count the new street trees that we will be planting in the ODOT ROW as "mitigation trees" It sounds like ODOT does not care and it is up to you.

Please let me know.

Thanks,

Ray Moore, PE, PLS  
All County Surveyors & Planners, Inc.  
PO Box 955, Sandy, OR 97055  
Phone: 503-668-3151  
Fax: 503-668-4730  
email: [raym@allcountysurveyors.com](mailto:raym@allcountysurveyors.com)

**From:** BERNHARDT Magnus U

**Sent:** Tuesday, October 29, 2019 4:09 PM

**To:** Ray Moore

**Cc:** Jim Pliska ; Tracy Brown ; Dave Reichert ; DANIELSON Marah B

**Subject:** RE: 18-126 Space Age Fuel Station ODOT # 8605

Hi Ray,

Yes, we would like the 5 trees shown (#s 1,4,5,6,7) to be mitigated at 2:1. Please also verify that trees #124, #126 and #127 are not on ODOT ROW. I would defer to the City on whether the mitigated trees can be counted toward the new street trees. Also, Marah Danielson, ODOT Planner for this project, is contacting the City on where they would like the mitigation trees.

Thank you,

**Magnus Bernhardt**

**ODOT Region One – Natural Resource Specialist - Landscape Architect**

123 NW Flanders Street  
Portland, Oregon 97209  
503.731.8283

---

**From:** Ray Moore <raym@allcountysurveyors.com>

**Sent:** Monday, October 28, 2019 3:56 PM

**To:** BERNHARDT Magnus U <Magnus.U.BERNHARDT@odot.state.or.us>

**Cc:** Jim Pliska <jimpliska@spaceagefuel.com>; Tracy Brown <tbrownplan@gmail.com>; Dave Reichert

<[dave@allcountysurveyors.com](mailto:dave@allcountysurveyors.com)>

**Subject:** 18-126 Space Age Fuel Station ODOT # 8605

Hi Magnus thanks for taking my call. As requested I have attached the sketch showing the 5 trees that will be removed from the ODOT ROW. All of the trees adjacent to Highway 26 (see image below) are on the private property line. They are not "within" the ODOT ROW.

- 1) Do we need to mitigate for the 5 trees shown in the sketch? They are technically in the ODOT ROW but are physically located along SE Orient Drive.
- 2) If we do have to mitigate for the 5 trees, can we count the new street trees the City will require us to plant in the ROW?

Thanks,



Ray Moore, PE, PLS  
All County Surveyors & Planners, Inc.  
PO Box 955, Sandy, OR 97055  
Phone: 503-668-3151

Fax: 503-668-4730  
email: raym@allcountysurveyors.com

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**Ray Moore** <raym@allcountysurveyors.com> Tue, Oct 29, 2019 at 4:28 PM  
To: BERNHARDT Magnus U <Magnus.U.BERNHARDT@odot.state.or.us>  
Cc: Jim Pliska <jimpliska@spaceagefuel.com>, Tracy Brown <tbrownplan@gmail.com>, Dave Reichert <dave@allcountysurveyors.com>, DANIELSON Marah B <Marah.B.DANIELSON@odot.state.or.us>, "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>, Emily Meharg <emeharg@ci.sandy.or.us>

Thanks Magnus. I will go out and re-tie trees 124, 126 and 127, and see if they are "on-line" or entirely in the right-of-way. I will let you know. If they are on-line I am assuming that we do not need to mitigate for them. Is that correct?  
[Quoted text hidden]

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**Kelly O'Neill Jr.** <koneill@ci.sandy.or.us> Tue, Oct 29, 2019 at 4:31 PM  
To: Ray Moore <raym@allcountysurveyors.com>  
Cc: Emily Meharg <emeharg@ci.sandy.or.us>, Jim Pliska <jimpliska@spaceagefuel.com>, Tracy Brown <tbrownplan@gmail.com>, Dave Reichert <dave@allcountysurveyors.com>, DANIELSON Marah B <Marah.B.DANIELSON@odot.state.or.us>, Magnus Bernhardt <Magnus.U.BERNHARDT@odot.state.or.us>

Ray,

Please send us what you are proposing and we will review.

Thanks -Kelly  
[Quoted text hidden]

--  
Kelly O'Neill Jr.  
Development Services Director

City of Sandy  
Development Services Department  
39250 Pioneer Blvd  
Sandy, OR 97055  
(503) 489-2163  
[koneill@ci.sandy.or.us](mailto:koneill@ci.sandy.or.us)

---

**Ray Moore** <raym@allcountysurveyors.com> Tue, Oct 29, 2019 at 4:40 PM  
To: "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>  
Cc: Emily Meharg <emeharg@ci.sandy.or.us>, Jim Pliska <jimpliska@spaceagefuel.com>, Tracy Brown <tbrownplan@gmail.com>, Dave Reichert <dave@allcountysurveyors.com>, DANIELSON Marah B <Marah.B.DANIELSON@odot.state.or.us>, Magnus Bernhardt <Magnus.U.BERNHARDT@odot.state.or.us>

Hi Kelly. Just to document our call, you are fine with counting the required street trees as mitigation trees.

Thanks!

Ray Moore, PE, PLS  
All County Surveyors & Planners, Inc.  
PO Box 955, Sandy, OR 97055  
Phone: 503-668-3151  
Fax: 503-668-4730  
email: [raym@allcountysurveyors.com](mailto:raym@allcountysurveyors.com)

[Quoted text hidden]  
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**Kelly O'Neill Jr.** <koneill@ci.sandy.or.us>

Tue, Oct 29, 2019 at 4:44 PM

To: Ray Moore <raym@allcountysurveyors.com>

Cc: Emily Meharg <emeharg@ci.sandy.or.us>, Jim Pliska <jimpliska@spaceagefuel.com>, Tracy Brown <tbrownplan@gmail.com>, Dave Reichert <dave@allcountysurveyors.com>, DANIELSON Marah B <Marah.B.DANIELSON@odot.state.or.us>, Magnus Bernhardt <Magnus.U.BERNHARDT@odot.state.or.us>

Yes, that is correct Ray.

[Quoted text hidden]

---

**Kelly O'Neill Jr.** <koneill@ci.sandy.or.us>

Tue, Oct 29, 2019 at 4:48 PM

To: Ray Moore <raym@allcountysurveyors.com>

Cc: Emily Meharg <emeharg@ci.sandy.or.us>, Jim Pliska <jimpliska@spaceagefuel.com>, Tracy Brown <tbrownplan@gmail.com>, Dave Reichert <dave@allcountysurveyors.com>, DANIELSON Marah B <Marah.B.DANIELSON@odot.state.or.us>, Magnus Bernhardt <Magnus.U.BERNHARDT@odot.state.or.us>

This is for ODOT (Magnus) to hopefully answer. Does ODOT's mitigation requirements specify if the trees have to be conifer, evergreen, native, etc.?

[Quoted text hidden]

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**DANIELSON Marah B** <Marah.B.DANIELSON@odot.state.or.us>

Tue, Oct 29, 2019 at 5:33 PM

To: "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>, Ray Moore <raym@allcountysurveyors.com>

Cc: Emily Meharg <emeharg@ci.sandy.or.us>, Jim Pliska <jimpliska@spaceagefuel.com>, Tracy Brown <tbrownplan@gmail.com>, Dave Reichert <dave@allcountysurveyors.com>, BERNHARDT Magnus U <Magnus.U.BERNHARDT@odot.state.or.us>

From talking with Emily, I was under the impression that the city wanted trees along the US 26 frontage. So far the five trees that are shown to be in ODOT right of way are on Orient Dr. Does the city want the mitigated trees to be along the US 26 frontage? I think Magnus is also trying to get clarification on whether trees #124, #126 and #127 are in ODOT right of way. If the city has a preference for type of tree, I'm sure Magnus can take that into consideration.

Marah Danielson, Senior Planner

ODOT R1 Development Review Program

(503) 731-8258

[marah.b.danielson@odot.state.or.us](mailto:marah.b.danielson@odot.state.or.us)

[Quoted text hidden]

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**BERNHARDT Magnus U** <Magnus.U.BERNHARDT@odot.state.or.us>

Tue, Oct 29, 2019 at 5:35 PM

To: DANIELSON Marah B <Marah.B.DANIELSON@odot.state.or.us>, "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>, Ray Moore <raym@allcountysurveyors.com>

Cc: Emily Meharg <emeharg@ci.sandy.or.us>, Jim Pliska <jimpliska@spaceagefuel.com>, Tracy Brown <tbrownplan@gmail.com>, Dave Reichert <dave@allcountysurveyors.com>

The tree species can be what the City wants within reason considering type, size and location.

Thank you,

**Magnus Bernhardt**

**ODOT Region One – Natural Resource Specialist - Landscape Architect**

123 NW Flanders Street

Portland, Oregon 97209

503.731.8283

[Quoted text hidden]

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**Kelly O'Neill Jr.** <koneill@ci.sandy.or.us>

Tue, Oct 29, 2019 at 6:57 PM

To: BERNHARDT Magnus U <Magnus.U.BERNHARDT@odot.state.or.us>

Cc: DANIELSON Marah B <Marah.B.DANIELSON@odot.state.or.us>, Ray Moore <raym@allcountysurveyors.com>, Emily Meharg <emeharg@ci.sandy.or.us>, Jim Pliska <jimpliska@spaceagefuel.com>, Tracy Brown <tbrownplan@gmail.com>, Dave Reichert <dave@allcountysurveyors.com>

Marah - Yes, the City Municipal Code wants street trees along HWY 26 and Orient Drive. We would like trees that can grow to a larger size along HWY 26.

Ray - Please propose some street tree species for our review.

Thanks everyone.

[Quoted text hidden]



image001.png  
620K

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**Tracy Brown** <tbrownplan@gmail.com>

Wed, Oct 30, 2019 at 9:46 AM

To: "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>

Cc: BERNHARDT Magnus U <Magnus.U.BERNHARDT@odot.state.or.us>, DANIELSON Marah B <Marah.B.DANIELSON@odot.state.or.us>, Ray Moore <raym@allcountysurveyors.com>, Emily Meharg <emeharg@ci.sandy.or.us>, Jim Pliska <jimpliska@spaceagefuel.com>, Dave Reichert <Dave@allcountysurveyors.com>

Are you able to tell us what tree species is going in at the new Tractor Store? Does Armstrong Maple work?

Sent from my iPhone

On Oct 29, 2019, at 7:01 PM, Kelly O'Neill Jr. <koneill@ci.sandy.or.us> wrote:

[Quoted text hidden]

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**BERNHARDT Magnus U** <Magnus.U.BERNHARDT@odot.state.or.us>

Wed, Oct 30, 2019 at 9:57 AM

To: Tracy Brown <tbrownplan@gmail.com>, "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>

Cc: DANIELSON Marah B <Marah.B.DANIELSON@odot.state.or.us>, Ray Moore <raym@allcountysurveyors.com>, Emily Meharg <emeharg@ci.sandy.or.us>, Jim Pliska <jimpliska@spaceagefuel.com>, Dave Reichert <Dave@allcountysurveyors.com>

Considering the context and space I would recommend larger trees. The corridor currently has native trees and a forested feel. Does the City and ODOT want to give this intersection a more suburban feel with street trees space on center or "street trees" grouped as native trees? I recommend the client provide a site plan with a street tree proposal we can comment on.

Thank you,

**Magnus Bernhardt**\_\_\_\_\_

**ODOT Region One – Natural Resource Specialist - Landscape Architect**

123 NW Flanders Street

Portland, Oregon 97209

503.731.8283

[Quoted text hidden]

## EXHIBIT DD

**Supplemental Narrative No. 1  
APPEAL OF TYPE II LAND USE DECISION  
FILE NO. 19-012 DR/ADJ/TREE  
SPACE AGE FUELING STATION  
(November 11, 2019)**

### **Introduction**

The applicant JLP Development filed a Notice of Intent to Appeal on November 4, 2019 appealing certain conditions contained in the Findings of Fact and Final Order for File No. 19-012 issued by the City of Sandy, dated October 22, 2019. When the appeal materials were submitted, the applicant was still working with the Project Architect to provide additional information regarding the three Conditions related to the building design.

**Review of Appealed Conditions** - This section provides additional facts for the three Conditions on the building design that are the subject of this appeal. Each of these Conditions are listed below in *bold italics* followed by a response in regular text.

#### **Condition A.4 - bullet points 1, 2, and 3**

- ***Remove the proposed LED striping on the roofline of the gas pump facility and the convenience store.***

**Response:** As noted in the original submittal, the proposed LED band is intended to add visual interest similar to a painted color band as allowed by Section 17.90.120(B.4.b). The LED band proposed on the fueling canopy is also similar to what is installed on the canopies of the Leather's, Shell and Arco stations in downtown Sandy. It should be noted the canopies of the Shell and Arco fueling stations were replaced in the last few years, after adoption of the Sandy Style standards. These canopies were approved to include LED lighted bands similar to what is proposed. The proposed lighting is also not much different than permanent decorative ("holiday") lighting that is displayed on a number of businesses throughout the year in Sandy.

The LED fixtures proposed for the convenience store will be installed in an exterior cove and will not be visible except when viewed directly below the fixture (See Attachment A). This band is intended to light the fascia with a downward wash at night, and as described by the Project Architect, this light provided by these fixtures will help to define the profile of the roof at night. He also noted the proposed LED band on the fueling canopy could be designed in a similar fashion if this was desirable.

Findings 29 and 68 of the Final Order discuss the proposed LED lighting and contain a Condition requiring removal from both the fueling canopy and convenience store. These Findings cite Section 17.90.00(D.9) as the primary reason for this Condition. As stated in this section, "*Strongly thematic architectural styles, forms, color, materials, and/or detailing that do not conform to Sandy Style, including some forms of franchise architectural styles associated with some chain commercial establishments*" are not compatible with Sandy Style.

The incompleteness letter dated May 9, 2019, contained the following language, “As a heads up, red LED lighting outlining the building and gas pump area conflicts with Section 15.32.080(J) of the Sandy Municipal code, which does not allow ‘attention attracting devices’”.

The applicant disagrees with both of these interpretations. It should be noted that the proposed lighting on the convenience store will only be visible at night and the lighting band installed on the fueling will appear as a red color band during the day as allowed by code. The applicant believes it is a stretch to consider red LED lighting incompatible with Section 17.90.00(D.9), “a strongly thematic architectural style” since this same type of lighting is included on three other fueling canopies. The building as proposed is designed to comply with all code standards including roof pitch, pedestrian covers, entrances, etc., and the applicant has not requested any special variances, which is common with most other recent applications, with this application.

In addition, the applicant believes proposed LED lighting should also not be considered an “attention attracting device similar to flags, balloons, windsocks, pennants, streamer, valances, spinners, spirals, and other wind-activated devices including propellers” as prohibited by Section 15.32.080(J) of the Sign Code. The proposed LED lighting does not have movement or is it intended as an attention device, but rather it has been included to add interest to and complement the building’s design.

The Project Architect updated the building elevations for the fueling canopy and convenience store to include a General Note specifying the percentage of each building elevation containing LED lighting (See Attachments B, C, and D. Section 17.90.120(B.4.b) allows high intensity primary colors such as is proposed with this lighting to be used but the color band cannot exceed one percent of the surface of any elevation. As shown on the plan notes, all elevations comply with this standard. The proposed 1-inch LED lighting strip on each elevation of the fueling canopy constitutes .99% of the East and west elevations and .75% of the North and south elevations. All elevations of the convenience store also comply with this standard.

As discussed in this review, the applicant has shown the proposal complies with the intent of the Sandy Style design standards and is not “a strongly thematic architecture style” or is it prohibited by the Chapter 15.32, Sign Code. From the beginning of this project the applicant directed his Architect and project team to design a building in compliance with applicable code standards. As such, no code deviations or special variances to these standards were needed. The applicant believes the proposed lighting should be considered a complementary design feature that has been added to enhance the building’s aesthetic and architectural styling during nighttime hours and can be approved.

- ***Update the north and/or east elevations of the proposed convenience store to detail at least one active window in the storage and/or kitchen area.***

**Response:** Findings 65 and 69 of the Final Order discuss this aspect of the design and impose the above Condition. In general, the furnishing requirements and internal function of the convenience store limits the location where clear glass windows can be installed. For this reason all windows on the West elevation are proposed to contain clear glass over the entire window. The majority of other windows are proposed to only contain clear glass in the upper portion of the window and a non-reflective opaque spandrel panel will be installed in the lower section. As shown on the Equipment Layout Plan for the convenience store (Attachment E), the interior of the store is very tight given the quantity of equipment and functional needs of this space. The applicant's Architect worked extremely hard balancing the interior equipment needs of the convenience store with the need to provide as much clear glass as possible. The applicant doesn't believe it is reasonable to require removal of necessary equipment in order to install additional clear windows.

Given these facts the applicant requests the Planning Commission approve the design as submitted and delete this Condition. If the Commission deems it necessary in order to approve the design, the applicant is not opposed to approval of a Special Variance.

- ***Update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance.***

**Response:** Findings 65, 69, and 70 of the Final Order address this aspect of the design and impose the above Condition. Although it is not clear in the Condition's wording, a fair read of this Condition is that the City is requiring all windows to the right of the primary entrance to be "active" windows. However, the last sentence of Finding 70 clarifies which windows are being referenced in the Condition with the following language, "*The lower section of the windows into the janitor's closet and women's restroom may remain spandrel windows as proposed.*" The applicant appreciates the clarifying language but prefers this language be included in the Condition to avoid confusion later.

The applicant's Architect provided additional information to address this Condition. In general, the layout and design of the interior of the convenience store is not conducive to providing clear glass for any of the windows along the this elevation as conditioned. As noted above, the building design was significantly changed to include a second primary entrance on the South elevation. This change caused several vendor coolers to be eliminated and the remaining coolers proposed along the south elevation are essential to the viability of the business.



The Equipment Layout Plan (Attachment E) shows that the three windows along this elevation to the right of entrance door will be blocked by three 2-door coolers. As shown on Attachment B, all of these windows are proposed to include clear glass in the upper portion. As noted above, the Project Architect has worked very hard to provide a functional design for the applicant. Unless the Planning Commission prefers these clear glass windows allow the back of these coolers to be viewed, the applicant does not believe there is any other option to what is proposed. The applicant doesn't believe it is reasonable to require the relocation or removal of these coolers to accommodate clear glass windows.

Another factor in this discussion is the validity of requiring clear glass windows along this elevation given the distance the building is from the street. It is true the building will be adjacent to a new sidewalk constructed with the Highway 26 right-of-way, it is unlikely this sidewalk will receive much use. In addition, the South elevation of the store is located about 80 feet from the Northern westbound travel lane of Highway 26. This section has a speed limit of 45 mph, increasing to 55 mph just west of the site. The applicant believes the functionality of providing clear glass windows to allow viewing into the building along the South elevation is marginal.

The Project Architect is recommending the spandrel glass color used for these windows be selected to soften the appearance of this glass. Spandrel glass is often a dark color or black. The Project Architect is recommending using spandrel glass in light gray color with a blue hue to provide a contrasting color between the glass and the bronze anodized aluminum frames so the elevation doesn't appear seamless from frame to glass to frame.

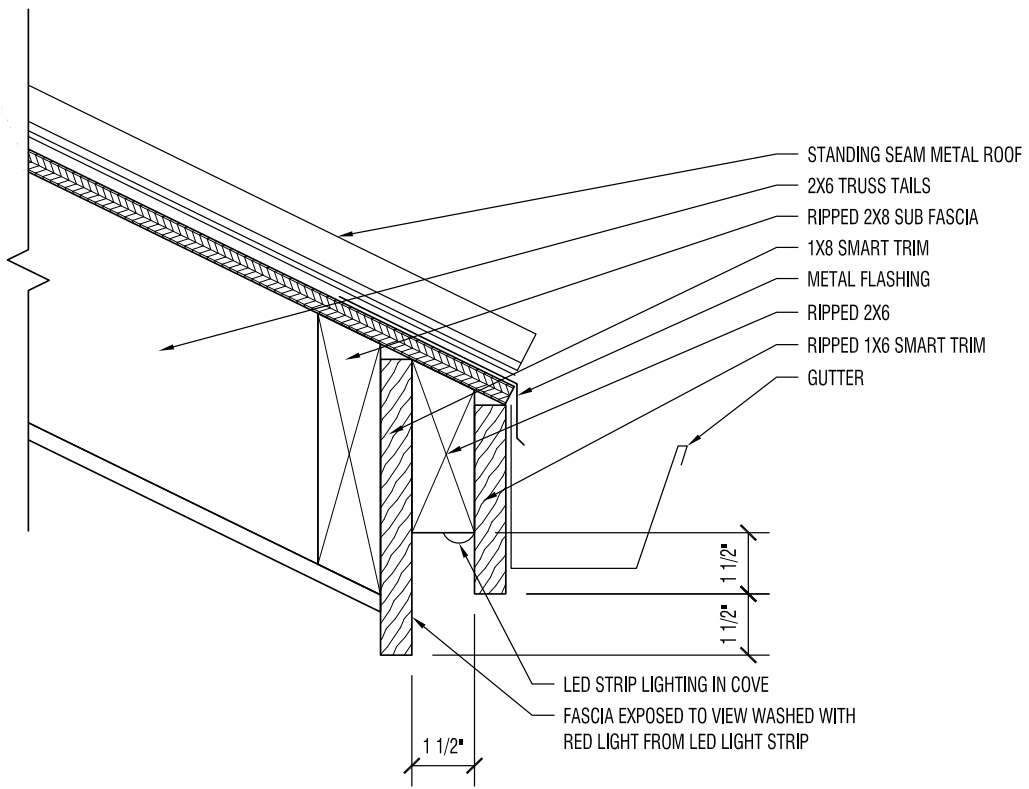
Given these facts the applicant requests the Planning Commission approve the design as submitted and remove this Condition. If it deemed necessary by the Commission, the applicant is not opposed to approval of a Special Variance to this requirement.

### **Conclusion**

The property owner and applicant JLP Development filed this Notice of Intent to Appeal appealing certain conditions contained in the Findings of Fact and Final Order for File No. 19-012 on November 4, 2019. This document is intended to supplemental the document submitted with the appeal regarding three Conditions related to the building design. As described above, the applicant believes the proposal complies with all code requirements and requests these Conditions be removed.

### **Attachments**

- A. Convenience Store LED Lighting Band Location
- B. Convenience Store West and South Elevations
- C. Convenience Store East and North elevations
- D. Fueling Canopy Elevations
- E. Convenience Store Equipment Layout Plan





**GENERAL NOTES:**

1. ALL ELEVATIONS TO HAVE RED LED STRIP LIGHTING IN SECONDARY FASCIA COVE TO OUTLINE AND RENDER 1 1/2" OF FASCIA DUSK TO DAWN. THIS ELEVATION AREA = 1,316.8 SF. ALLOWED 1% OR 13.17 SF. ACTUAL AREA OF FASCIA TO BE ILLUMINATED = 9.83 AT 1 1/2" WIDE.
2. ALL SLOPED ROOF PITCHES 6:12 UNLESS NOTED OTHERWISE.
3. "QUIK MART" SIGNAGE TO BE ELECTRICALLY ILLUMINATED, SURFACE MOUNTED LETTERING - NO RACEWAYS.

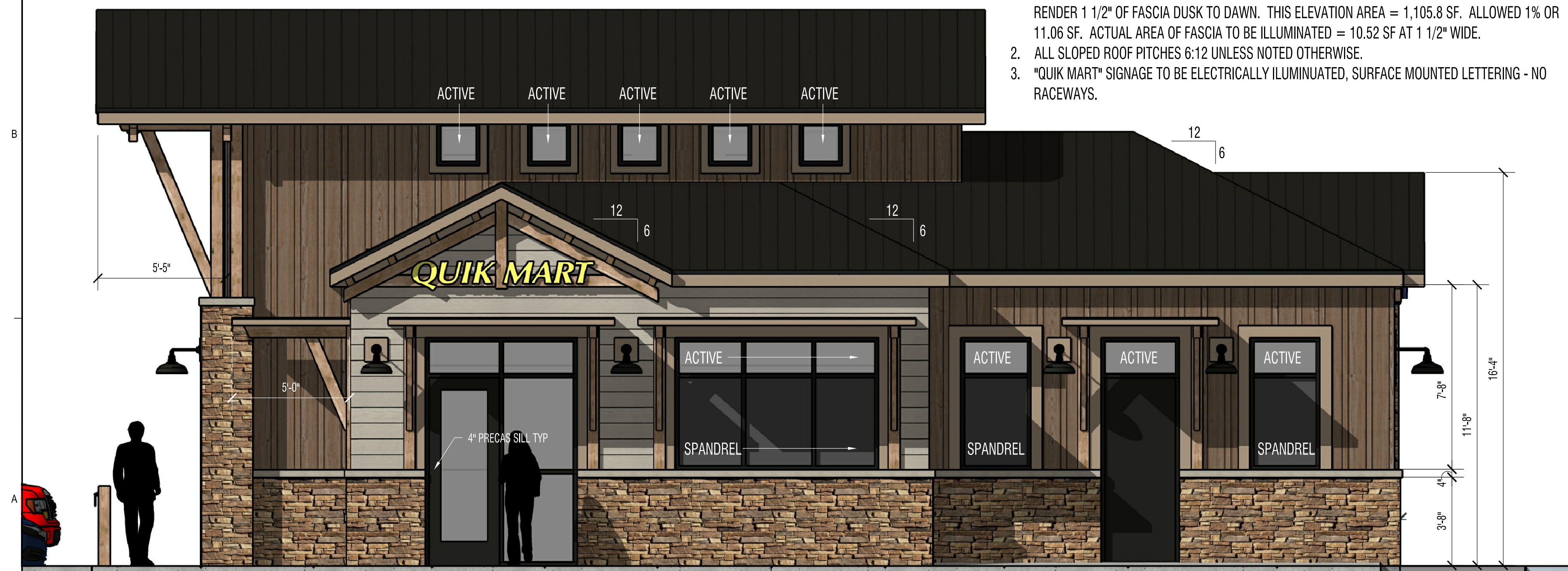


C1 WEST ELEVATION

3/8"=1'-0"

NOTE: ALL GLAZING ACTIVE THIS ELEVATION

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**GENERAL NOTES:**

1. ALL ELEVATIONS TO HAVE RED LED STRIP LIGHTING IN SECONDARY FASCIA COVE TO OUTLINE AND RENDER 1 1/2" OF FASCIA DUSK TO DAWN. THIS ELEVATION AREA = 1,105.8 SF. ALLOWED 1% OR 11.06 SF. ACTUAL AREA OF FASCIA TO BE ILLUMINATED = 10.52 SF AT 1 1/2" WIDE.
2. ALL SLOPED ROOF PITCHES 6:12 UNLESS NOTED OTHERWISE.
3. "QUIK MART" SIGNAGE TO BE ELECTRICALLY ILLUMINATED, SURFACE MOUNTED LETTERING - NO RACEWAYS.

A1 SOUTH ELEVATION

3/8"=1'-0"

**STONE VENEER**  
Eldorado Stone / Mountain Lodge - Russell

**BOARD & BATTEN**  
LP SmartSide / Mountain Cedar

**TIMBER**  
Red Cedar or Pine

**METAL TRIM/FLASHING/ROOF**  
Metalation Industries - Dark Brown

**LAP SIDING**  
LP SmartSide / HCOA - Jewell White\*

**TRIM**  
HCOA - Nonikew\*

**WINDOWS/DOORS**  
Dark Bronze Anodized Aluminum

\*Historic Colors of America - Colors listed are subject to change based on manufacturer's physical product samples, their available colors, and the closest match to HCOA colors.

A5 COLOR SCHEDULE

NO SCALE

5 NOT FOR CONSTRUCTION

**design west | architects**

255 SOUTH 300 WEST LOGAN UT 84321  
795 NORTH 400 WEST SALT LAKE CITY UT 84103

**SPACE AGE FUEL - C-STORE**  
SANDY, OR

JIM PULSKA  
J/P DEVELOPMENT, LLC.

MARK: \_\_\_\_\_  
DATE: \_\_\_\_\_

PROJECT #: 418458  
DRAWN BY: SMW  
CHECKED BY: WILLIAMS  
ISSUED: 6/17/2019

REVIEW SUBMITTAL  
NOT FOR CONSTRUCTION

EXTERIOR ELEVATIONS  
C-STORE

A-220

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- GENERAL NOTES:
1. ALL ELEVATIONS TO HAVE RED LED STRIP LIGHTING IN SECONDARY FASCIA COVE TO OUTLINE AND RENDER 1 1/2" OF FASCIA DUSK TO DAWN. THIS ELEVATION AREA = 1,316.8 SF. ALLOWED 1% OR 13.17 SF. ACTUAL AREA OF FASCIA TO BE ILLUMINATED = 11.47 SF AT 1 1/2" WIDE.
  2. ALL SLOPED ROOF PITCHES 6:12 UNLESS NOTED OTHERWISE.
  3. "QUIK MART" SIGNAGE TO BE ELECTRICALLY ILLUMINATED, SURFACE MOUNTED LETTERING - NO RACEWAYS.

C1 EAST ELEVATION  
3/8"=1'-0"



- GENERAL NOTES:
1. ALL ELEVATIONS TO HAVE RED LED STRIP LIGHTING IN SECONDARY FASCIA COVE TO OUTLINE AND RENDER 2" OF FASCIA DUSK TO DAWN. THIS ELEVATION AREA = 1,105.8 SF. ALLOWED 1% OR 11.06 SF. ACTUAL AREA OF FASCIA TO BE ILLUMINATED = 11.98 SF AT 1 1/2" WIDE.
  2. ALL SLOPED ROOF PITCHES 6:12 UNLESS NOTED OTHERWISE.
  3. "QUIK MART" SIGNAGE TO BE ELECTRICALLY ILLUMINATED, SURFACE MOUNTED LETTERING - NO RACEWAYS.

A1 NORTH ELEVATION  
3/8"=1'-0"

**A5 COLOR SCHEDULE**

NO SCALE

5 NOT FOR CONSTRUCTION

STONE VENEER  
Elkorado Stone / Mountain Lodge - Russet

BOARD & BATTEN  
LP SmartSide / Mountain Cedar

TIMBER  
Red Cedar or Pine

METAL TRIM/FLASHING/ROOF  
Metalation Industries - Dark Brown

LAP SIDING  
LP SmartSide / HCOA - Jewell White

TRIM  
HCOA - Nankless

WINDOWS/DOORS  
Dark Bronze Anodized Aluminum

\*Metallic Colors of America - Colors listed are subject to change based on manufacturer's physical product samples, their available colors, and the closest match to HCOA colors.

**design west | architects**  
255 SOUTH 300 WEST LOGAN UT 84321  
795 NORTH 400 WEST SALT LAKE CITY UT 84103

**SPACE AGE FUEL - C-STORE**  
SANDY, OR  
JIM PULSKA  
JLP DEVELOPMENT, LLC.

MARK	DATE	DESCRIPTION

PROJECT #: 418458  
DRAWN BY: SMW  
CHECKED BY: WILLIAMS  
ISSUED: 6/17/2019

REVIEW SUBMITTAL  
NOT FOR CONSTRUCTION

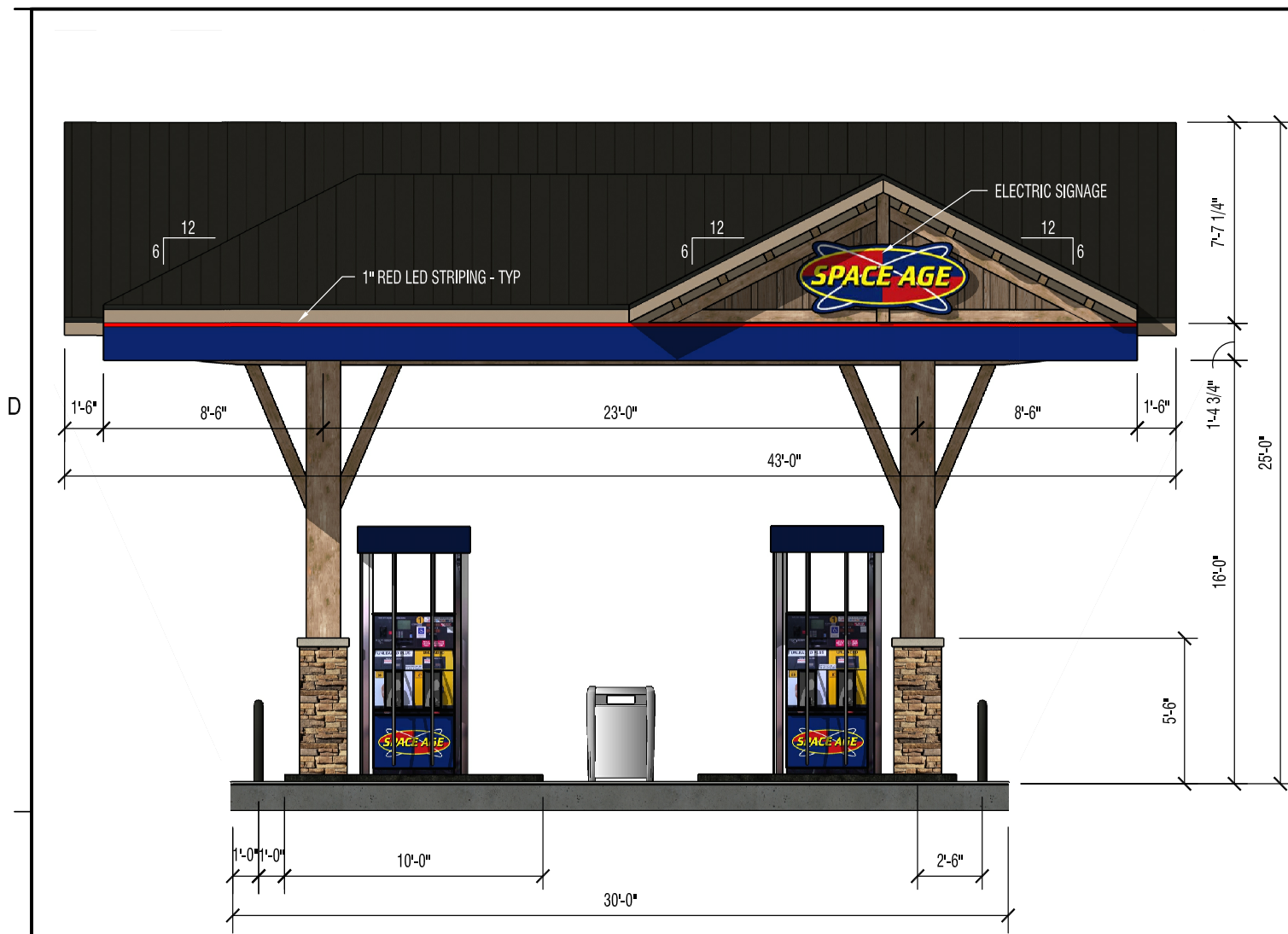
EXTERIOR ELEVATIONS  
C-STORE

A-221

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C1 NORTH AND SOUTH ELEVATION

3/16"=1'-0"

GENERAL CANOPY NOTES:  
 1. ALL ELEVATIONS TO HAVE 1" RED LED STRIP LIGHTING ON A HORIZONTAL BAND ON THE FULL PERIMETER OF THE CANOPY. THE AREA OF THE 1" BAND ON ALL ELEVATIONS IS LESS THAN 1% OF THE TOTAL AREA OF EACH ELEVATION. 50% AND 75% RESPECTIVE OF THE LONG AND SHORT ELEVATIONS.  
 2. ALL SLOPED ROOF PITCHES 6:12 UNLESS NOTED OTHERWISE.  
 3. "SPACE AGE" SIGNAGE TO BE ELECTRICALLY ILLUMINATED.



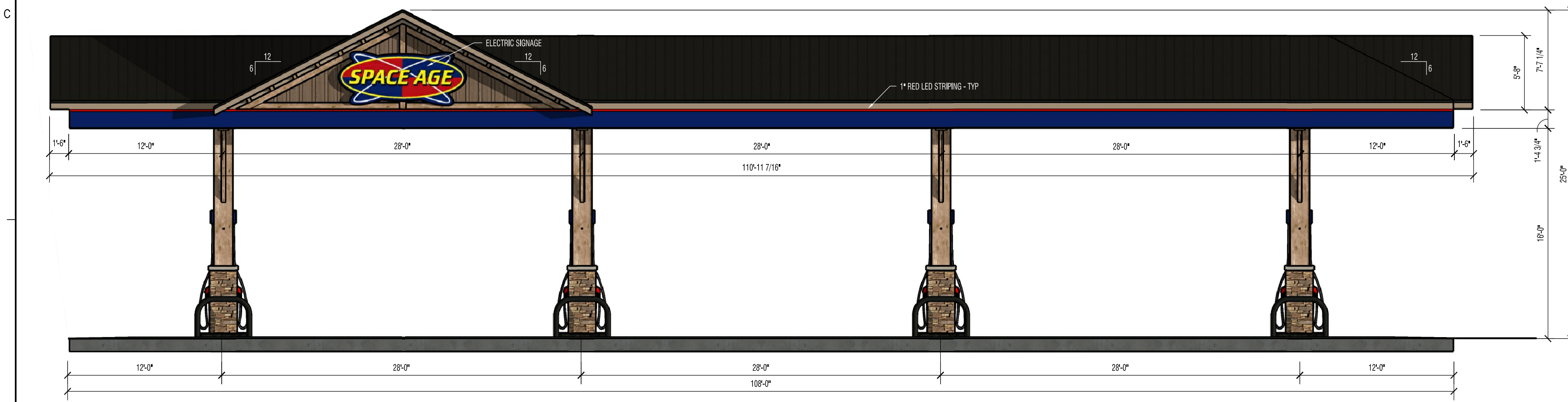
C2 SOUTHWEST PERSPECTIVE

NO SCALE



C4 SOUTH PERSPECTIVE

NO SCALE



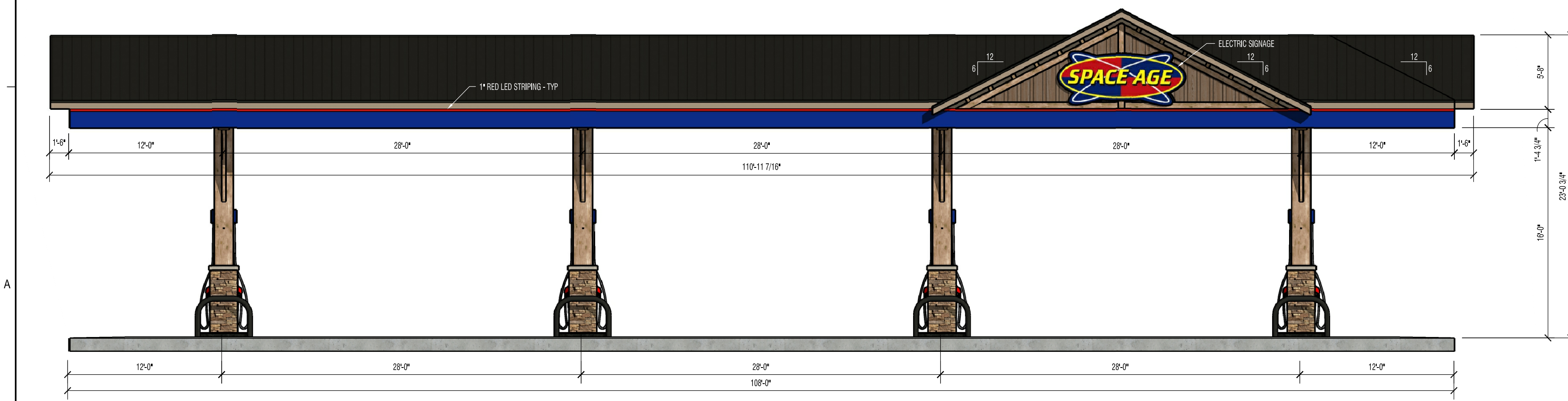
B1 EAST ELEVATION

3/16"=1'-0"



B4 NORTH NORTHWEST PERSPECTIVE

NO SCALE



A1 WEST ELEVATION

3/16"=1'-0"



A4 NORTH AND SOUTH ELEVATION

3/16"=1'-0"

**design west | architects**  
 255 SOUTH 300 WEST LOGAN UT 84321  
 795 NORTH 400 WEST SALT LAKE CITY UT 84103

**SPACE AGE FUEL - C-STORE**  
 SANDY, OR  
 JIM PLUSKA  
 JLP DEVELOPMENT, LLC.

MARK	DATE	DESCRIPTION

PROJECT #: 418458  
 DRAWN BY: SMW  
 CHECKED BY: WILLIAMS  
 ISSUED: 6/17/2019

REVIEW SUBMITTAL  
 NOT FOR CONSTRUCTION

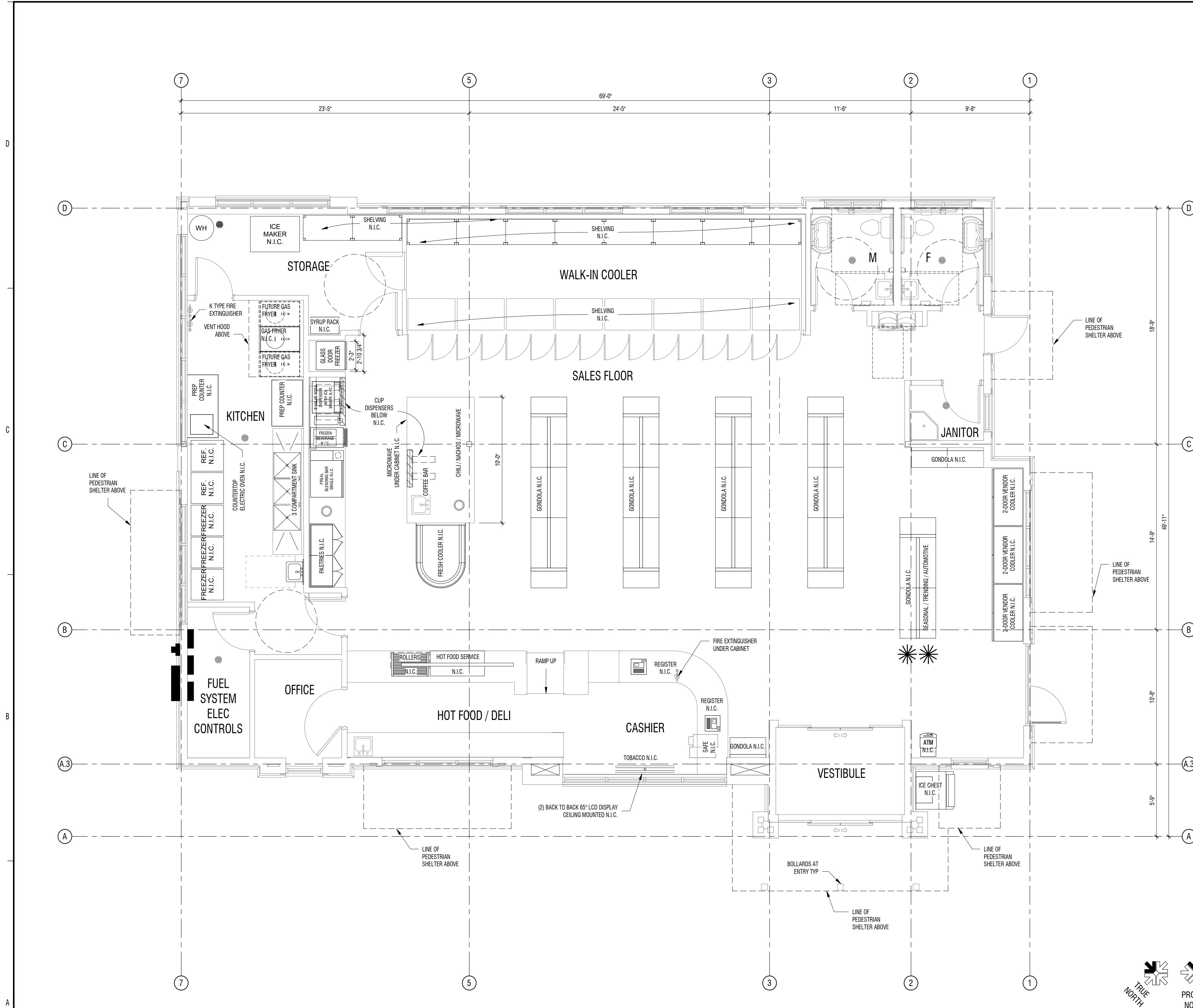
EXTERIOR ELEVATIONS  
 FUEL ISLAND

A-223

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5 NOT FOR CONSTRUCTION





**A1** EQUIPMENT PLAN  
1/4" = 1'-0"

**design west** | architects  
255 SOUTH 300 WEST  
755 NORTH 400 WEST  
LOGAN UT 84321  
SALT LAKE CITY UT 84103

**SPACE AGE FUEL CONVENIENCE STORE**  
15565 SE ORIENT DRIVE  
SANDY, OR

MARK	DATE	DESCRIPTION

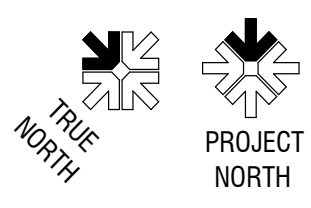
PROJECT #: 418458  
DRAWN BY: BEKKER  
CHECKED BY: WILLIAMS  
ISSUED: 4/9/2019

**NOT FOR CONSTRUCTION**

EQUIPMENT LAYOUT PLAN

A-192

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**FINDINGS OF FACT and FINAL ORDER**  
**TYPE II DECISION**

**DATE:** October 22, 2019

**FILE NO.:** 19-012 DR/ADJ/TREE

**PROJECT NAME:** Space Age Fueling Station

**APPLICANT/OWNER:** JLP Development

**LEGAL DESCRIPTION:** T2S R4E Section 10, Tax Lot 4500

The above-referenced proposal was reviewed concurrently as a Type II Design Review with Adjustments and Tree Removal. The following Findings of Fact are adopted supporting approval of the plan in accordance with Chapter 17 of the Sandy Municipal Code.

**EXHIBITS:**

**Applicant's Submittals:**

- A. Land Use Application
- B. Project Narrative (April 2019)
- C. Supplemental Project Narrative (July 8, 2019)
- D. Civil Plan Set
  - Sheet 1 – Cover Sheet and Existing Conditions Plan
  - Sheet 2 – Tree Retention Plan
  - Sheet 3 – Site Plan
  - Sheet 4 – Grading Plan and Erosion Control Plan
  - Sheet 5 – Utilities Plan
  - Sheet 6 – Cut-Fill Plan
  - Sheet L-101 – Landscape Plan
  - Sheet E.01 – Site Lighting Photometric Analysis
- E. Architectural Plan Set and Elevations
  - Sheet A-101 – Overall Main Floor Plan
  - Sheet A-161 – Overall Roof Plan
  - Sheet A-192 – Equipment Layout Plan
  - Sheet A-220 – Exterior Elevations (West and South)
  - Sheet A-221 – Exterior Elevations (East and North)
  - Sheet A-222 – Exterior Perspectives C-Store
  - Sheet A-223 – Exterior Perspectives Fuel Island
  - Sheet A-521 – Trash Enclosure
- F. Fire Plan Approval

- G. Lighting Cut Sheets
- H. Traffic Impact Study
- I. Arborist Report
- J. Preliminary Stormwater Report
- K. DEQ Approval
- L. Letter from Clackamas County Department of Transportation and Development

**Agency Comments:**

- M. Clackamas County Onsite Wastewater Systems Program Supervisor (August 14, 2019)
- N. Public Works Director (August 16, 2019)
- O. City Engineer (August 19, 2019)
- P. Clackamas Fire District #1 (September 10, 2019)
- Q. PGE (September 11, 2019)
- R. City Transportation Engineer (September 26, 2019)
- S. Clackamas County Engineering (September 24, 2019)
- T. ODOT (September 26, 2019)

**Public Comments:**

- U. Robert and Patricia Whitlock (August 26, 2019)
- V. Johnathon Nolen (August 26, 2019)

**Additional Documents Submitted by Staff:**

- W. Third-party Arborist Report

**Additional Documents Submitted by the Applicant's Transportation Engineer:**

- X. Technical Memorandum (September 16, 2019)

**FINDINGS OF FACT**

**General**

1. These findings are based on the applicant's submittal received on April 15, 2019 and additional information received on May 7, 2019, July 11, 2019, and July 30, 2019. The application was deemed complete on August 6, 2019 and the 120-day deadline is December 6, 2019. A supplemental Technical Memorandum was submitted by the applicant's Traffic Engineer on September 16, 2019 (Exhibit X). Updated comments in response to the supplemental Technical Memorandum were received from the City Transportation Engineer on September 26, 2019 (Exhibit R), Clackamas County Engineering on September 24, 2019 (Exhibit S), and ODOT on September 26, 2019 (Exhibit T). This additional information from the applicant's Traffic Engineer resulted in multiple meetings with the City Traffic Engineer and ODOT and led to additional processing time. On October 17, 2019, staff sent the applicant draft conditions at the applicant's request. On October 20 and 21, 2019, staff received comments back from the applicant. This also led to additional processing time.
2. This final order is based upon the Exhibits listed above, as well as agency comments and public testimony.

3. The subject site is approximately 2.5 acres. The site is located north of Highway 26, south and west of Orient Drive, and east of Crescent Road.
4. The parcel has a Comprehensive Plan Map designation of Commercial and a Zoning Map designation of C-2, General Commercial.
5. JLP Development (Jim Pliska) submitted an application for a 16-pump vehicle fueling station (Space Age) at 15585 SE Orient Drive. The development includes a 3,100 square foot convenience store and is located on a 2.5-acre site. The site is proposed to be accessed from Orient Drive and Crescent Road with no direct access from HWY 26. The proposed development includes removal of trees from the subject property and adjacent rights-of-way. A Type III Special Variance was approved (File No. 18-036 VAR) for the property on October 31, 2018 to allow the property to be developed without connecting to City water and broadband fiber service (SandyNet). In addition, the property is allowed to connect to onsite sanitary sewer service and storm drainage facilities rather than city services. The site will be served by an onsite well and septic system and all stormwater will be managed onsite.

The applicant is requesting the following two (2) adjustments to the Sandy Municipal Code:

- Type II adjustment to Section 17.90.120(D.1) to decrease the percent of required street frontage from 50 percent to 40 percent.
  - Type II adjustment to Section 17.90.120(D.1) to increase the required street frontage setback from 20 feet to 24 feet.
6. Notification of the proposed application was mailed to affected agencies on August 12, 2019 and to property owners within 300 feet of the subject property on August 13, 2019.
  7. Agency comments were received from the Clackamas County Onsite Wastewater Systems Program Supervisor, Public Works Director, City Engineer, Clackamas Fire District #1, PGE, City Transportation Engineer, Clackamas County Engineering, and ODOT.
  8. Two written public comments were received. Robert and Patricia Whitlock (Exhibit U) at 15600 Orient Drive expressed concerns about access to/from their property to Orient Drive. They're also concerned about traffic and safety for children getting on/off the school bus at Orient Drive and Crescent Road. Johnathon Nolen (Exhibit V) at 34935 Crescent Road had questions about the dimensions of Crescent Road, how the trip counts were conducted, and where the overflow from the stormwater detention pond would go. He also has concerns about traffic backing up on Orient Drive and blocking the entrance to Crescent Road. He wants to know if the cul-de-sac could be built entirely on the applicant's property.

#### 17.44 – C-2 General Commercial

9. Section 17.44.10 lists uses permitted outright in the C-2 zone. Retail businesses, including automotive fueling stations and convenience stores in buildings with less than 60,000 square feet, are permitted outright. The proposal includes a 16-pump vehicle fueling station and one building that is approximately 3,100 square feet, with an additional future building footprint identified on the site plan (Exhibit D, Sheet 3).

10. Section 17.44.30(A) contains development standards for buildings in the C-2 zone. To determine the front lot line, the Definitions section of the code (Chapter 17.10) states: “In the case of a corner lot, the front line shall be determined by orientation of the structure based on at least two of the following factors: location of the front door, location of the driveway, or legal street address.” Currently, the property has an Orient Drive address. The proposal includes a front door facing Highway 26 and two proposed driveways, one accessing Crescent Road and a second accessing Orient Drive. Based on the definition of front lot line, Orient Drive would be the front lot line of the subject property (legal street address and location of the driveway). However, based on the submitted site layout, it would make more sense for Highway 26 to be considered the front lot line as Highway 26 is the activated frontage with no parking located between the proposed buildings and the Highway 26 right-of-way and no retaining wall in the front yard. In order for Highway 26 to be considered the front yard, it would need either a driveway or legal street address, in addition to a front door, which is proposed. **The applicant shall update the address of the site to be addressed from Highway 26.** Staff contacted Clackamas Fire District #1 to verify that changing the address to Highway 26 without a Highway 26 driveway access wouldn’t be an issue. Clackamas Fire District #1 stated they have no issue with the property having a Highway 26 address even without access from Highway 26 (Exhibit P). With the conditioned change of address to Highway 26, Highway 26 is considered the front yard for the purposes of this review. **The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours as the location of the front door along the Highway 26 frontage is necessary to consider the Highway 26 frontage the front lot line.** The proposed Space Age convenience store is located 20 feet from the property line along Highway 26. The applicant’s submittal indicates the landscaping represents 62.6 percent of the site in compliance with these standards. The maximum height of the building is 23 feet 3 inches and the maximum height of the pump area structure is 25 feet, both of which are less than the 45 feet allowed by this section.

#### 17.74 – Accessory Development

11. Section 17.74.40(B) contains height requirements for fences and retaining walls in commercial and industrial zones. The subject property is zoned General Commercial (C-2). The applicant is proposing one (1) retaining wall along the north edge of the site adjacent to Orient Drive, which is the rear yard. The proposed wall is a lock and load wall with split face block that varies in exposed height from 1.5 feet to 4.1 feet with a five foot tall fence on top. **The applicant shall propose an appropriate architectural treatment for the wall for staff review and approval.** The maximum combined height of the retaining wall and fence is 9.1 feet, which exceeds the 8 foot maximum for retaining walls/fences in the rear yards of commercial properties. **The applicant shall do one of the following:**

- **Reduce the combined height of the retaining wall and fence to 8 feet or less.**
- **Set the fence back at least 5 feet from the top of the retaining wall to create a break between the wall and the fence.**
- **Apply for a Special Variance to allow a maximum 9.1 foot tall retaining wall and fence in the rear yard.**

#### 17.80 – Additional Setbacks

12. Chapter 17.80 requires any structure located on arterial or collector streets to have a minimum 20-foot setback measured from the property line. The subject property has frontage

on Highway 26, which is a major arterial, and on Orient Drive, which is a County arterial/collector. **All structures on the subject property shall be constructed to comply with the standards of Section 17.80.20. All structures shall maintain a minimum 20-foot setback from the Highway 26 and Orient Drive public rights-of-way.** The Site Plan (Exhibit D, Sheet 3) depicts the proposed building at 20 feet from the Highway 26 right-of-way and 56 feet from the Orient Drive right-of-way.

17.84 – Improvements Required with Development

13. Section 17.84.20 specifies the timing of improvements. **All required improvements shall be installed or financially guaranteed prior to final occupancy of the Space Age fueling station.**
14. Section 17.84.30(A) requires setback sidewalks with a minimum width of six feet along arterial streets such as Highway 26 and Orient Drive. The Site Plan (Exhibit D, Sheet 3) indicates the applicant will install 6 foot wide sidewalks along Highway 26 and 5-7 foot sidewalks along the Orient Drive frontages of the site. Both Highway 26 and Orient Drive are arterial streets; therefore, the minimum sidewalk width is 6 feet per Section 17.84.30(A.2). The standard sidewalk width for sidewalks on ODOT arterials is 6 feet and the standard sidewalk width for sidewalks on Clackamas County arterials is 7 feet. **The applicant shall update the plan set to detail 6 foot wide sidewalks along the Highway 26 frontage and 7 foot wide sidewalks along the Orient Drive frontage of the site.** Per the City Engineer (Exhibit O), **all sidewalks and ADA ramps shall comply with the most current ADA requirements. An ADA ramp shall be installed at the corner of SE Orient Drive and SE Crescent Road. The applicant shall contact the ODOT District Contact (Loretta Kieffer, 503-667-7441) to determine permit requirements and obtain application information. If a design exception is required for street trees the applicant shall adjust the location of the sidewalk to allow street trees that meet ODOT's minimum clear zone criteria and/or apply for a design exception. There appears to be sufficient right-of-way to meet ODOT's clear zone criteria. Any costs for a design exception shall be paid by the applicant.** ODOT (Exhibit T) states that the site plan shows a single ADA ramp at the intersection of Highway 26 and Orient Drive but the ODOT standard is for two ADA ramps. **The applicant shall update the plan set to detail two ADA ramps at the intersection of Highway 26 and Orient Drive.**
15. Section 17.84.30(B) requires the provision of safe and convenient pedestrian and bicyclist facilities that strive to minimize travel distance to the extent practicable in conjunction with new development within and between new subdivisions, planned developments, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks. The applicant proposes to install a six foot wide sidewalk along Highway 26 and a 5-7 foot wide sidewalk along Orient Drive. **The applicant shall update the plan set to detail 6 foot wide sidewalks along the Highway 26 frontage and 7 foot wide sidewalks along the Orient Drive frontage of the site.** The proposal also includes a 6 foot wide walkway connecting the sidewalk on Highway 26 to both entrances of the proposed Space Age convenience store. On September 9, 2019 staff conducted site visits to four different Space Age gas stations and noticed multiple obstructions placed in the walkway adjacent to the front door of the convenience store, including ice chests, fire wood, trash cans, newspaper boxes, and propane tanks. Per Section

17.84.30(B.4.a), **the applicant shall maintain a minimum 5 foot wide walkway free of obstructions along the north, west, and south building elevations, including the connection to Highway 26.**

16. Section 17.84.40 requires sites located along existing or future transit routes to incorporate bus pull-outs and/or shelters in the site design. The subject property is located along Highway 26, which is an existing transit route. The Transit Director did not submit any comments.
17. The subject development required preparation of a Traffic Impact Study in compliance with the requirements of Section 17.84.50. The applicant submitted a Transportation Impact Study (TIS) prepared by Mike Ard, dated April 8, 2019 (Exhibit H) and a supplemental Technical Memorandum dated September 16, 2019 (Exhibit X). The analysis predicts 76 morning peak hour trips, 98 evening peak hour trips, and 1,348 daily trips. Per the TIS, “although the subject property has already been annexed into the City of Sandy with C-2 zoning applied, an analysis of the impacts of the recent zone change was required in conjunction with the proposed development. Based on the analysis, the ‘reasonable worst-case development scenario’ is projected to result in a new increase of 187 trips during the morning peak hour, 225 trips during the evening peak hour, and 2,580 daily trips.” The TIS and Technical memorandum were reviewed by the City’s Transportation Engineer (Exhibit R), Clackamas County Engineering (Exhibit S), and the Oregon Department of Transportation (Exhibit T).

The primary conclusions from the TIS include the following:

- Based on the operational analysis, the unsignalized study intersections currently operate acceptably and are projected to continue to operate acceptable through 2038 either with or without full development within the subject property. No operational mitigations are necessary or recommended for the unsignalized intersections.
- The intersection of Highway 26 and SE Orient Drive is currently operating with volume-to-capacity ratios (V/C) exceeding the targets established in the Oregon Highway Plan. Although the proposed development is projected to worsen performance of the intersection, if a southbound left-turn lane is added on SE Orient Drive approaching Highway 26, intersection operation will not be degraded by the proposed development.
- Crash data for the most recent three years shows no significant crash trends that may be indicative of design deficiencies. No crash mitigations are recommended.
- Based on the warrant analysis, no new traffic signals are recommended. A northbound left-turn lane is projected to be warranted at the intersection of SE Orient Drive and SE Crescent Road.
- Intersection sight distance was evaluated for the unsignalized intersections on SE Orient Drive. The existing intersection of Orient Drive at SE Crescent Road was found to have adequate sight distance in both directions. The proposed site access driveway on SE Orient Drive is projected to have inadequate intersection sight distance to the south. Accordingly, it is recommended that turning movements be restricted to right-in, right-out only to eliminate the potential for conflicts with limited sight distance at this location. No other sight distance mitigations are recommended.
- The change from RRFF-5 to C-2 zoning is projected to result in a significant effect as defined under Oregon’s Transportation Planning Rule. The addition of a second



southbound left-turn lane on SE Orient Drive approaching Highway 26 is sufficient to address the impacts of potential site development under the proposed zoning and will therefore satisfy Oregon's Transportation Planning Rule.

18. A comment letter regarding the submitted Traffic Impact Study and Technical Memorandum was submitted by the City Transportation Engineer (Exhibit R). The City Transportation Engineer concurs with the TIS conclusions and finds that the TIS and Technical Memorandum address City requirements. The City Transportation Engineer states: "To mitigate for the proposed development (the fueling station and convenience market), the [applicant's] engineer recommends the following mitigation measures: the addition of a left-turn lane on SE orient Drive at Highway 26; the modification of the traffic signals at SE Orient Drive at Highway 26 to accommodate the additional lane; widening SE Orient Drive between Highway 26 and SE Crescent Road to include turn lanes at each intersection." The City's Transportation Engineer concurs with the recommendations to mitigate for the added traffic from the development.

The City's Transportation Engineer states: "the September 16, 2019 Technical Memorandum provides additional documentation to illustrate mitigation measures to demonstrate compliance with the TPR during the AM peak hour in 2038 with the full build-out of the site with City of Sandy C-2 zoning. To offset the predicted performance of the intersection of Highway 26 and SE Orient Drive during the AM peak hour, the engineer demonstrates that an additional right-turn lane on the southbound approach of SE Orient Drive allows the intersection to operate no worse than the 2038 background condition during the AM peak hour with full-buildout of the site. The resulting configuration of the southbound approach of SE Orient Drive would consist of three lanes: a left-turn lane; a left-turn, through lane; and a right turn lane... To mitigate for the rezoning and full development of the site under City of Sandy C-2 zoning (e.g. a fast-food restaurant and a drive-in bank *in addition* to the proposed fueling station and convenience market in the initial development), the applicant needs commit [sic] to mitigation measures including three lanes for the southbound approach of SE Orient Drive at Highway 26; traffic signal modifications and related improvements acceptable to ODOT as a condition of approval to allow the development and zone change to be found to be consistent with the Transportation Planning Rule." The City Transportation Engineer concludes: "To show that a zone change to City of Sandy C-2 zoning is consistent with the Transportation Planning Rule, the applicant needs to commit to additional mitigation. This mitigation is not required to offset the impact of the current development proposal (fueling station and convenience market), but should be a condition of approval for any development beyond the current proposal. The applicant needs to provide mitigation measures acceptable to ODOT showing that with the 'reasonable worst case' development scenario under C-2 zoning will be no worse than the 2038 background conditions for both the AM and PM peak hours. With this commitment to implement these measures as conditions of approval, the rezoning can be shown to be consistent with the Transportation Planning Rule."

The City Transportation Engineer recommends the following conditions of approval for the initial phase of the development (the fueling station and convenience market):

- **The applicant shall construct a left-turn lane on southbound SE Orient Drive at Highway 26 with accompanying signal modifications according to ODOT specifications and requirements.**
- **The applicant shall construct a left-turn lane on northbound SE Orient Drive at SE Crescent Road according to Clackamas County specifications and requirements and to ODOT specifications and requirements if any section of SE Orient Drive falls within ODOT jurisdiction.**
- **The applicant shall construct a three-lane section for SE Orient Drive from Highway 26 to north of SE Crescent Road with a raised median to restrict driveway movements at the site to right-in, right-out according to Clackamas County specifications and requirements and to ODOT specifications and requirements if any section of SE Orient Drive falls within ODOT jurisdiction.**
- **The applicant shall dedicate any additional right-of-way adjacent to Highway 26 and SE Orient Drive if necessary to assure that an additional southbound lane can be provided on SE Orient Drive at Highway 26.**

The City Transportation Engineer recommends the following conditions of approval for any development beyond the 3,100 square foot convenience store and Space Age fueling station:

- **The applicant shall construct a right-turn lane on southbound SE Orient Drive at Highway 26 (this will result in three lanes for the southbound SE Orient Drive approach) with accompanying signal modifications according to ODOT specifications and requirements such that the intersection will operate at no worse than 2038 background conditions during both the AM and PM peak hours under full build-out of the site under City of Sandy C-2 zoning.**

If the applicant seeks to modify these conditions of approval due to changes in conditions or standards, the applicant will need to demonstrate compliance with the Transportation Planning Rule. Such compliance will need to include an analysis of the year associated with the most recently adopted City of Sandy Transportation System Plan.

19. A comment letter regarding the proposal was submitted by Clackamas County Engineering (Exhibit S). Clackamas County states “The proposed lane transition of southbound SE Orient Drive to accommodate the northbound left turn lane at SE Crescent Drive appears to require additional length to meet Roadway Standards Section 250.6.4, based on a design speed of 55 MPH.” Clackamas County recommends the following conditions of approval:

- **All frontage improvements in, or adjacent to Clackamas County right-of-way, shall be in compliance with Clackamas County Roadway Standards. Frontage improvements in, or adjacent to State of Oregon right-of-way, shall be in compliance with Oregon Department of Transportation standards.**
- **The applicant shall dedicate additional right-of-way along the entire site frontage of SE Orient Drive and SE Crescent Road as necessary to accommodate the required frontage improvements, providing a minimum of 6 inches behind the sidewalk.**

- **Written approval shall be obtained from ODOT, in the form of a permit, for access and improvements within the Highway 26 right-of-way and the portion of SE Orient Drive under ODOT's jurisdiction.**
- **Minimum improvements on the SE Orient Drive frontage consistent with Clackamas County's Roadway Standards include, but are not limited to, up to a one half-street improvement, including:**
  - **Up to a minimum 30-foot wide, one half-street improvement shall be constructed along the entire site frontage to arterial roadway standards, per Clackamas County Roadway Standards Standard Drawing C100. As necessary, additional paved width shall be provided for the proposed second left turn lane at the intersection with Highway 26 and the northbound left from SE Orient Road to SE Crescent Road.**
  - **Lane transitions shall be provided per Roadway Standards Section 250.6.4 based on a 55 MPH design speed.**
  - **A minimum 1.5-foot wide concrete center median shall be constructed on SE Orient Drive, centered on the site driveway, extending a minimum of 40 feet beyond the north and south edge of the driveway. A minimum shy distance of 1.0 foot shall be provided from the median and travel lane.**  
The applicant's proposal includes a median between the two southbound travel lanes to allow for a left-in and left-out for the existing driveway serving the undeveloped property (Tax Lot 24E10 05490 and 05400) on the east side of SE Orient Drive. For this location, a median will only be permitted at the center of the roadway rather than between southbound travel lanes. Based on the limited use of the existing driveway on the east side of SE Orient Drive, it does not warrant providing full access at this time.
  - **Standard curb, or curb and gutter if curb line slope is less than one percent.**
  - **Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.**
  - **A minimum 7-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. If the sidewalk does not connect to sidewalk on adjacent property, the end of the sidewalk shall require the construction of a concrete ramp, adjacent to the end of the sidewalk, providing a transition from the new sidewalk to the edge of the pavement. The ramps shall meet ADA guidelines.**
  - **A minimum 28-foot wide concrete driveway approach shall be constructed, per Standard Drawing D650, and shall be limited to right-out turning movements only. A wider driveway is acceptable with demonstration of the need with truck turning templates. The driveway approach and on-site curbs shall be channelized to limit right-turns into**

**the driveway. The angle of the driveway shall be no more than necessary to accommodate truck turning and shall be demonstrated by turning templates based on anticipated vehicles. A signage plan shall be provided indicating the access restriction.**

- **A striping plan for SE Orient Drive shall be provided. The northbound left turn lane queue storage at SE Crescent Road shall be the minimum as recommended in the project traffic study by Ard Engineering, dated April 8, 2019.**
- **Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.**
- **Minimum improvements on the SE Crescent Road frontage consistent with Clackamas County's Roadway Standards include, but are not limited to, up to a half-street improvement, including:**
  - **Dedicate public right-of-way as needed to accommodate the required frontage improvements.**
  - **A minimum total paved width of 20 feet, with a structural section for a commercial local roadway, per Clackamas County Roadway Standards Standard Drawing C100.**
  - **Standard curb, or curb and gutter if curb line slope is less than one percent.**
  - **Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.**
  - **A minimum 5-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. Dual curb ramps shall be constructed per ODOT Standard Drawing (RD755, RD756 and RD757) at the SE Crescent Road intersection with SE Orient Drive.**
  - **A minimum 28-foot wide concrete driveway approach shall be constructed, per Standard Drawing D650. A wider driveway is acceptable with demonstration of the need with truck turning templates.**
  - **Provide adequate intersection sight distance per Section 240 of the Clackamas County Roadway Standards.**
  - **Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.**
  - **Prior to issuance of a Development Permit and start of construction activities, off-site construction easements shall be obtained.**

- **Prior to commencement of site work, a Development Permit is required and must be obtained from Clackamas County for all work performed in the road right-of-way. A Utility Placement Permit is required for any utility work within the public right-of-way, per Chapter 7 of the Roadway Standards. When there are multiple utility service trenches in the road, the trench repairs will grind and inlay the top 2” of the pavement restoration to include a minimum 12” tee beyond the furthest trench, and to combine multiple trenches into one surface repair.**

**If the applicant is advised to or chooses to modify the proposal in terms of access location and/or design following the preparation of these comments the applicant shall give the Clackamas County Engineering office an opportunity to review and comment on such changes prior to a decision being made.**

20. A comment letter regarding the proposal was submitted by ODOT (Exhibit T). ODOT recommends that the applicant be required to add two southbound lanes on Orient Drive (for a total of three southbound lanes) with this proposed development. As discussed in Finding #18, the applicant’s TIS finds that the addition of one southbound lane on Orient Drive will suffice to mitigate the effects of the current proposal (fueling station and convenience store); the addition of a second southbound lane will become necessary at future build-out. The City’s Transportation Engineer concurs with the findings in the TIS, thus, staff is only requiring the addition of one southbound lane at this time, as proposed. However, **the applicant shall update the plan set to ensure all site modifications (e.g., sidewalks, relocated signal pole, etc.) are located appropriately in anticipation of the addition of the second additional southbound lane in the future.**
21. Section 17.84.50(D) requires sites to provide access from a public street improved to City standards. The site contains frontage on Highway 26, Orient Drive, and Crescent Road. Per the Public Works Director (Exhibit N), **complete frontage improvements including streetlighting, curbs, sidewalks, and planter strips per Chapter 15.20 and Chapter 17.84 of the Sandy Municipal Code shall be required on all site roadway frontages, including Crescent Road. Per the City Engineer (Exhibit O), half street improvements on SE Orient Drive shall be required along the entire site frontage to minor arterial standards to include signing and striping plans. Input from ODOT shall be required on Highway 26, particularly at the intersection with SE Orient Drive, and on the impacts on the existing traffic signal function and performance and lane configuration. The proposed cul-de-sac shall be designed to include plan and profile as part of this development to assure grades will be met.**
22. Section 17.84.60 contains specifications for public facility extensions. A Type III Special Variance was approved (File No. 18-036 VAR) for the property on October 31, 2018 to allow the property to be developed without connecting to City water and broadband fiber service (SandyNet). In addition, the property is allowed to connect to onsite sanitary sewer service and storm drainage facilities rather than city services. The site will be served by an onsite well and septic system and all stormwater will be managed onsite. Per the City Engineer (Exhibit O), the CDS Manhole water quality doesn’t appear to meet the 2016 City of Portland SWMM as adopted by the City of Sandy. **All on-site hydrology and hydraulics**

**under the canopy/fueling area shall comply with the requirements of Section 13.18 of the Sandy Municipal Code and shall provide the components explained in the City of Portland Stormwater Management Manual (oil/water separator, spill control manhole, closed shut-off valve). In addition to these, the applicant shall install an impermeable liner in the pond and an emergency shut-off valve (normally open) down stream. In the case of a spill this valve could be closed. The applicant shall submit concurrence from Clackamas County to make sure they approve any potential fuel spill being routed to a stormwater pond that discharges to their roadside storm drain system.**

23. Section 17.84.70 contains requirements regarding public improvement procedures. **The applicant shall confer with Clackamas Fire District #1 to determine the number and location of on-site fire hydrants necessary to comply with the requirements of the Clackamas Fire District Fire Marshal. The applicant shall follow all Clackamas Fire District requirements.**
24. Section 17.84.80 contains specifications for franchise utility installations. Municipal Code 15.20.030(B) states the following regarding undergrounding of utilities: “No building permit shall be issued for remodeling, alteration or addition to any building or structure when the estimated cost of the remodeling, alteration or addition exceeds twenty percent of the value of the building or structure before such remodeling, alteration or addition is commenced on any lot which is not served by underground utilities, unless the applicant agrees to construct equipment and related facilities to accept and receive all underground utility lines which shall serve the building or structure, including but not limited to those required for all electric, communication and cable TV services in conjunction with the construction activity related to the building permit.” **The applicant shall place all onsite (including extensions from the poles in the right-of-way) overhead electrical and communications wires underground in conformance with Section 15.20.** Private utility services will be submitted for review and approval by service providers and City staff in association with construction plans, and all utility lines will be extended to the perimeter of the site. **All franchise utilities shall be installed underground and in conformance with City standards.** On September 9, 2019, staff visited four Space Age gas stations and noticed multiple security cameras. At the Happy Valley Space Age, there was an overhead wire running from the roof of the convenience store to a security camera on top of a light pole. **The applicant shall not run any wires overhead.** PGE submitted a comment (Exhibit Q) stating they did not find any conflicts related to the project and that the developer should call PGE’s service coordination when they are ready to start the project. **The applicant shall call PGE’s Service Coordination at 503-323-6700 when they are ready to start the project.**
25. Section 17.84.100 contains provisions for mail delivery facilities. **Mail delivery facilities shall be provided by the applicant in conformance with 17.84.100 and the standards of the USPS. The applicant shall submit a mail delivery plan to the City and USPS for review and approval prior to installation of the mail delivery facility.**

17.90 – Design Standards

26. The applicant proposes construction of a new building within the C-2 zoning district. As such the application is subject to the provisions of Chapter 17.90, Design Standards.



27. Section 17.90.00 contains the intent of the design standards. In implementing these standards, the reviewing body shall refer to the listed objectives in evaluating Design Review requests.
28. Section 17.90.00(C) lists guiding principles of the Sandy Style, including protecting and enhancing Sandy's tree canopy, particularly along the Highway 26 Landscape Management Corridor (17.90.00(C.2)). The required landscape management corridor along Highway 26 will be discussed in further detail in Section 17.90.120(F) of this document.
29. Section 17.90.00(D) lists elements incompatible with the Sandy Style. The reviewing body may deny, or require modifications to, a project with any of the items contained in Section 17.90.00(D). "Strongly thematic architectural styles, forms, colors, materials, and/or detailing that do not conform to the Sandy Style, including some forms of franchise architectural styles associated with some chain commercial establishments" are considered to be incompatible with the Sandy Style per Section 17.90.00(D.9). The applicant is proposing red LED striping along the roofline of the gas pump facility and the convenience store, which does not conform to the Sandy Style. **The applicant shall update the elevations to remove the proposed LED striping.**
30. 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.**
31. Because the subject property is located in the C-2 zoning district the application was reviewed for compliance with the provisions of Section 17.90.120.
32. Section 17.90.120(A)(1) requires that all lots abut or have cross access to a dedicated public street. The subject property abuts Highway 26, Orient Drive, and Crescent Road.
33. Section 17.90.120(A)(3) requires off-street parking to be located to the rear or side of buildings with no portion of the parking lot located within required setbacks or within 10-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 linear ft. For lots with frontage of less than 150 ft. or less, shared access may be required. The proposed parking area is located on the north and west sides of the proposed building and outside of the 20 foot required setback from Highway 26. Access to the parking area will be from the two proposed driveways on Orient Drive and Crescent Road.
34. Section 17.90.120(A)(5) requires 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. The Site Plan (Exhibit D, Sheet 3) details a six foot wide walkway along the north, west, and south sides of the proposed convenience store building that connects to the parking north and west of the building as well as to the Highway 26 sidewalk. However, there are an additional five parking spaces west of the fuel pumps that are not connected to the walkway; the site plan does not detail pavement markings on asphalt areas where pedestrians are proposed to cross from the western parking to the building. At the time of development of the future building, there will be a walkway between the future building and the parking west of the fuel pumps, which will connect to the Highway 26 sidewalk and, thus, will provide a seamless pedestrian route from the parking to the

convenience store building. **The applicant shall do one of the following: update the plan set to detail pavement markings that connect the walkway to the parking west of the fuel pumps, or install a walkway that connects the parking spaces to the Highway 26 sidewalk. If the applicant chooses pavement markings, the pavement markings shall be painted periodically as lines become faded. If the applicant chooses to install a walkway, the walkway shall be located such that it has the least impact on retention trees while still providing a connection between the parking spaces and the Highway 26 sidewalk.**

35. Section (A)(7) requires walkways connecting from the public street sidewalk to the building entrance(s) to be provided. 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). The proposal includes a six foot wide walkway along the north, west, and south facades of the proposed convenience store building. The proposed walkway connects to the proposed civic space northeast of the convenience store building as well as the proposed six foot wide sidewalk on Highway 26. The site plan does not show a connection between the future building and the sidewalk along Highway 26. **The applicant shall update the plan set to detail a six foot wide walkway connecting a front door on the south side of the future building to the Highway 26 sidewalk. The applicant shall also update the plan set to show the walkway extending around to the south side entrance of the proposed future building. To minimize impact on retention trees, the proposed entrance to the future building along Highway 26 shall be located at the southeast corner of the building.**
36. Section (A)(8) requires connection to adjacent properties. Where openings occur between buildings adjacent to Highway 26, pedestrian walkways should connect the street sidewalk to any internal parking areas and building entrances. The proposal contains two buildings along Highway 26. The site plan details a walkway connecting the convenience store to the Highway 26 sidewalk; however, there is no proposed walkway connecting the convenience store to the future building. This connection could be accomplished by connecting the future building to the Highway 26 sidewalk. **The applicant shall update the plan set to detail a six foot wide walkway connecting a front door on the south side of the future building to the Highway 26 sidewalk.**
37. Section (A)(11) requires free-standing buildings to be connected to one another with a seamless pedestrian network that provides access to building entrances and adjacent civic spaces. The proposal includes the convenience store as well as a future building. The site plan details a walkway connecting the convenience store to the Highway 26 sidewalk; however, there is no proposed walkway connecting the convenience store to the future building. This connection could be accomplished by connecting the future building to the Highway 26 sidewalk as stated in Section (A)(8), above.
38. Section 17.90.120(B)(1) requires that buildings be articulated, varied and provide visual interest. The subject property abuts Highway 26, Orient Drive, and Crescent Road. All four elevations of the proposed convenience store building will be visible from a public street. Proposed building articulations include gabled and shed roof elements covering entrances and faux window elements.
39. Section 17.90.120(B.1.a) requires that all elevations visible from an abutting public street or pedestrian walkway shall be divided into distinct planes of not more than 40 lineal feet. All

four elevations exceed 40 linear feet and, therefore, require a variation in the wall plane that includes a recessing or projecting section that projects or recedes at least six inches from the adjacent plan for a length of at least four feet. The submitted elevations (Exhibit E, Sheets A220-222) detail a projection/recession along the east, west, and south elevations, and a shed roof pedestrian shelter overhang feature along the north elevation in compliance with this section.

40. Section 17.90.120 (B.1.a.2) requires wall planes to incorporate at least one visually contrasting and complementary change in materials or texture or patterns. All four elevations contain a mix of siding materials including stone veneer, horizontal lap siding, and vertical board and batten siding in conformance with this section.
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 primary entrance for the proposed convenience store building is located on the west elevation and has a covered entry way that extends five feet five inches (5'5"). The plan set details an additional 5 foot deep pedestrian shelter over the secondary entryway along Highway 26 as well as a 5 foot deep pedestrian shelter over the service door on the south elevation.
42. Section 17.90.120(B.3.a) requires all buildings on the same site be architecturally unified. There is one building proposed for the subject property as well as the fueling pump structure; both will contain "Sandy Style" elements such as gabled roofs, heavy timber framing, and a stone base. **At the time of future development, the future building shall be designed to meet the Sandy Style requirements and shall be architecturally unified with the other building and structure on the site.**
43. Section 17.90.120(B.3.b) requires that at least 36 inches of a buildings base contains stone on the sides of the building visible from the public street. The proposed building has a three foot - eight inch (3'8") stone base on all four elevations. The north, east, and west elevations contain sections with additional stone that extends up to the roof fascia. The proposed stone base is Mountain Lodge - Russet by Eldorado Stone, which is a cultured fieldstone similar to stone used on other approved Sandy Style buildings. The stone base is proposed on the supporting columns of the fuel pump structure as well.
44. Section 17.90.120(B.3.d) specifies approved building materials and states that siding shall consist of wood, composite-wood (e.g., concrete fiberboard, panels, or shingles), stone, brick, split-faced or rusticated concrete block, concrete form liner, or a combination of these materials. The proposed siding for the convenience store includes a mix of composite-wood, board and batten, and stone. The pump area structure also includes matching stone on the supporting columns and vertical board and batten under the gabled roofs on each elevation.
45. Section 17.90.120(B.3.d.1) states that where wood siding is used, it shall consist of horizontal (e.g., lap, v-groove, or tongue-and-groove) siding, vertical (board and batten) siding, shingles, or combinations thereof. Vertical grooved (i.e., T1-11) sheet siding and similar materials are prohibited. The proposed vertical wood siding is Mountain Cedar board

and batten by LP Smartside. The convenience store building also includes horizontal lap siding.

46. Section 17.90.120(B.3.d.2) states that where board and batten siding is used, battens shall be a minimum of 2-inches wide by 1-inch deep and spaced 24 inches apart or closer; rough-sawn boards (specialty panel) are preferred over panels having a resin overlay. Per the submitted narrative (Exhibit B), the proposed vertical board and batten siding has battens that are 3-inches wide and spaced 12 inches apart in compliance with this standard.
47. Section 17.90.120(B.3.d.3) states that where masonry siding is used, it shall consist of brick, stone, or rusticated concrete block, and must incorporate decorative patterns over not less than 15 percent of every elevation where it is used. Examples of decorative patterns include multi-toned masonry units, such as brick, stone, or cast stone, in layered or geometric patterns or split-faced concrete block to simulate rusticated stone-type construction. Changes in pattern should be used to accentuate breaks in building stories, corners, windows, structural bays, and building tops (e.g., parapets where flat roofs are allowed). The proposal includes Mountain Ledge – Russet stone veneer by Eldorado Stone on both the convenience store building and the pump station.
48. Section 17.90.120(B.3.e) requires building elevations facing a public street to incorporate at least three (3) of the features from the list in Section 17.90.120(B.3.e). The north, east, and south elevations of the proposed convenience store building face public streets. The north, south, and east elevations incorporate heavy timbers, a metal canopy, a gabled roof, and a stone base.
49. Section 17.90.120(B.3.f) specifies that materials required on elevations visible from an abutting public street must turn the building corner and incorporate appropriate transitions onto elevations not requiring these materials for a distance of not less than four (4) feet. A stone base is proposed along the entirety of all four elevations.
50. Section 17.90.120(B.4) requires exterior building colors to include warm earth tones that conform to the Color Palette in Chapter 17.90, Appendix C. The submitted building elevations and Color Schedule (Exhibit E, Sheets A-220 and A-221) detail the vertical board and batten as “Mountain Cedar” and the horizontal lap siding as “Jewett White” with a “Nankeen” trim. Both Jewett White and Nankeen conform to the Color Palette in Appendix C. Mountain Cedar is not on the color palette. **The applicant shall either submit additional information demonstrating that Mountain Cedar is a wood stain or update the Color Schedule with an approved color for the vertical board and batten.**
51. Section 17.90.120(C.1) requires that primary roof forms on buildings with a span of 50-feet or less contain a minimum roof pitch of 6:12. The proposed building span is less than 50 feet so the building is required to be constructed with a pitched roof; however, the applicant is requesting an exception to the pitched roof requirement, which is discussed in Section 17.90.120(C.8). All sloped roof forms are designed with a 6:12 pitch.

52. Section 17.90.120(C.3) states that, when practicable, buildings shall be oriented so the gable end of the roof faces the abutting street. Each elevation includes at least one gabled roof feature.
53. Section 17.90.120(C.5) states that visible roof materials must be wood shingle or architectural grade composition shingle, slate, or concrete tile. The proposed roof is a “Dark Brown” metal roof by Metallion Industries. Dark Brown is on the City of Sandy approved metal roof color palette.
54. Section 17.90.120(C.6) states that all roof and wall-mounted mechanical, electrical, communications, and service equipment, including satellite dishes and vent pipes, shall be screened from view from all adjacent public rights-of-way and civic spaces by parapets, walls or by other approved means. The submitted elevations (Exhibit E, Sheets A-220 and A-221) do not show any rooftop equipment. The applicant did not submit line of sight analysis for the rooftop equipment. **The applicant shall submit line of sight analysis for the rooftop equipment prior to submitting building permits. All proposed rooftop equipment shall be screened from view from all adjacent public rights-of-way and civic spaces.**
55. Section 17.90.120(C.8) contains standards for exceptions to pitched roofs. Based on the internal function of the building, the reviewing body may allow an alternative roof form. The proposed convenience store building includes a kitchen and a walk-in cooler, which require a rooftop condensing unit and a rooftop grease vent; thus, an alternative roof form may be allowed. Section 17.90.120(C.8.a.1) requires the applied pitch roof on a building with a span of less than 50 feet to extend at least 50 percent of the distance from the eave to the ridge as if it had been constructed as a pitched roof. The proposed convenience store building has a span of 49 feet 11 inches. Per the submitted narrative (Exhibit B) the applied pitch roof extends 6 feet from the eave, which is at least 50 percent of the distance from the eave to the ridge if it had been constructed as a pitched roof. The submitted roof plan (Exhibit E, Sheet A-161) details 23 feet 6 3/16-inches as half the distance of the roof, and details the roof pitch length at 12 feet 2 inches, which is greater than half the distance.
56. Section 17.90.120(D) contains standards related to building orientation and entrances. Section 17.90.120(D.1) states that buildings shall be oriented to a public street or civic space and that at least 50 percent of the subject site’s street frontage is comprised of building(s). The proposed convenience store building contains frontage on Highway 26 and Orient Drive. The building is proposed at 49.23 feet in length (including the entry vestibule on the west elevation) and the Highway 26 frontage of the subject property is 517 feet. Thus, the building comprises 9.5 percent of the site’s frontage, which is much less than the requirement of 50 percent of the site’s frontage. The applicant is proposing an additional future building footprint as part of the proposal; however, the applicant is not proposing to construct this building at this time nor did the applicant provide staff with an estimated timeframe for construction. The future building is proposed to be 165 feet in length. The proposed convenience store and future building are 214.23 feet total, which is 41.4 percent of the Highway 26 frontage. The applicant is requesting a Type II Adjustment to Section 17.90.120(D.1) to allow the buildings to comprise less than 50 percent of the site’s Highway 26 frontage. The requested building frontage adjustment will be discussed further in Chapter 17.66 of this document.

57. Section 17.90.120(D.1) also states that buildings shall be located within 20 feet of a sidewalk, walkway, or civic space. The convenience store is proposed to be located 20 feet from the proposed sidewalk along Highway 26. The future building is proposed to be located 24 feet from the proposed sidewalk along Highway 26. The applicant is requesting a Type II Adjustment to Section 17.90.120(D.1) to allow the proposed future building to be located greater than 20 feet from the adjacent sidewalk. The requested building setback adjustment will be discussed further in Chapter 17.66 of this document.
58. Section 17.90.120(D.2) states that where parking is placed between a front façade and a street, a landscaped berm and/or architectural features, such as a knee wall, colonnade, arbor, trellis and/or similar device, shall be placed behind the sidewalk to partially screen the parking area from the sidewalk. The partial screen shall be designed to achieve at least 50 percent opacity at the time of installation, with openings for walkways connecting to the building's primary entrance. The proposal does not include parking between the building and the Highway 26 frontage. The applicant is proposing two landscape berms between the parking located to the north of the building and Orient Drive. Each berm is proposed to contain one tree (a Cherokee Brave dogwood) and a mix of groundcover and shrubs (red flowering currant and Massachusetts manzanita). The easternmost berm is also proposed to contain rhododendron 'Nova Zembla' and coastal strawberry.
59. Section 17.90.120(D.3) states that ground floor spaces shall face a public street or civic space and shall be connected to it by a direct pedestrian route (i.e., avoid out-of-direction travel). The proposal includes a pedestrian walkway connecting the Highway 26 sidewalk to the proposed convenience store. **The applicant shall update the plan set to detail a six foot wide walkway connecting a front door on the south side of the future building to the Highway 26 sidewalk.**
60. Section 17.90.120(D.4) states that buildings located at the intersection of two streets shall use a corner building entrance, or provide an entrance within 40 feet of the corner. The proposed convenience store building is located at the intersection of Highway 26 and Orient Drive. The applicant is proposing a primary entrance on the south elevation within 40 feet of the southeast corner of the building. **The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours; the primary entrance on the south elevation shall not be a faux entrance.**
61. Section 17.90.120(D.5) states that for structures greater than 40,000 gross square feet, there shall be at least two (2) clearly articulated public entrances on the structure; at least one such entrance shall be visible from a public street and connected to that street by a pedestrian sidewalk or walkway. The proposed building is less than 40,000 square feet and the proposal includes a pedestrian walkway connecting the Highway 26 sidewalk to the proposed entries on the south and west elevations.
62. Section 17.90.120(D.7) states that buildings shall provide at least one (1) elevation where the pedestrian environment is "activated." An elevation is "activated" when it meets the window transparency requirements in subsection 17.90.120(E), below, and contains a public entrance with a pedestrian shelter extending at least five (5) feet over an adjacent sidewalk, walkway or civic space. Per the narrative (Exhibit B), the "activated" frontage is the west elevation facing the fueling station. The proposed design for the west elevation includes multiple ground level



windows as well as a two tiered window/front entrance under the gabled entry with 5 foot overhang. The west elevation is adjacent to a proposed walkway. An analysis of the window requirement is in Section 17.90.120(E) of this document.

63. Section 17.90.120(D.8) states that primary entrances must be architecturally emphasized, visible from the public right-of-way, and sheltered with a canopy, overhang, or portico with a depth of at least five (5) feet. Architectural emphasis should be provided by a gabled shelter where practical, consistent with the Sandy Style. Detailing around the base of the building, such as stonework, benches or art, should also be used to emphasize an entrance. The proposed entrance on the south elevation and will include a gable roofed entry featuring heavy timbers. The proposal also includes stonework along the entirety of the building.
64. 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. All four elevations include windows so that all sides of the building relate to one another in compliance with this section. The north, south, and east elevations primarily contain spandrel window treatments while the west elevation primarily contains active windows. The applicant's narrative (Exhibit B) identifies the west elevation as the "activated" elevation and states that the west elevation is 1090 square feet with 362 square feet of clear vision windows and doors resulting in 32.2 percent of the elevation. This complies with the 30 percent minimum window coverage standard for buildings up to 10,000 square feet.
65. Section 17.90.120(E.4) prohibits darkly tinted windows, mirrored windows, and similar windows adjacent to street sidewalks, civic spaces, and walkways. The applicant is proposing active windows on the west elevation, facing the fuel station; however, the applicant is proposing primarily spandrel windows on the north, south, and east elevations. The north and south elevations are adjacent to walkways, the south and east elevations are adjacent to street sidewalks, and the civic space is located at the northeast corner of the building. **The applicant shall update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance.** The windows into the janitor's closet and women's restroom may remain spandrel windows. **The applicant shall update the north and/or east elevations of the proposed convenience store to detail at least one active window in the storage and/or kitchen area in order to provide at least one active window adjacent to the north walkway or civic space.**
66. The intent of Section 17.90.120(F) is to promote business vitality, public safety and aesthetics through effective landscaping and streetscape design, 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. Section 17.90.120(F.2) states that parcels abutting Highway 26 shall provide a landscape buffer comprising not less than 30 percent of the highway frontage, to a depth of not less than 20 feet. Section 17.90.120(F.3) contains a list of species approved for the landscape buffer. The subject property abuts Highway 26 and, therefore, is required to provide a landscape buffer comprising not less than 30 percent of the highway frontage to a depth of not less than 20 feet. There is an existing Green Corridor Agreement with

Clackamas County that protects existing trees along the Highway 26 side of the site that extends along the entire property. The applicant is proposing to retain existing trees in a 172 foot section along Highway 26 (33 percent of the Highway 26 frontage) to meet the 30 percent landscape buffer requirement. All trees within the remaining 67 percent of the green corridor are proposed to be removed. Because the future building is not proposed to be built at this time, **the applicant shall extend the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go and shall retain trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115).** Trees 110 through 115 are in good or fair condition and can be retained per the applicant's arborist. This will help achieve the goals of the Green Corridor Agreement by maintaining existing vegetation and trees. This will also help the proposal meet the intent of the Sandy Style to "protect and enhance Sandy's tree canopy, particularly along the Highway 26 Landscape Management Corridor" (Section 17.90.00(C.2)). In addition, protecting additional trees within the Green Corridor along Highway 26 will result in the proposal having a lesser degree of "excessive tree removal and/or grading that may harm existing vegetation within a designated landscape conservation area," which is identified as an element incompatible with the Sandy Style (Section 17.90.00(D.1)). Based on the proposed Landscape Plan (Exhibit D, Sheet L-101), the applicant is proposing to re-plant a portion of the Highway 26 frontage with a mix of vegetation from the list in Section 17.90.120(F.3) including incense cedar, dogwood, pacific wax myrtle, serviceberry, red flowering currant, rhododendron, manzanita, and coastal strawberry.

67. Section 17.90.120(G) contains standards for civic spaces within developments. The intent of civic space is to connect buildings to the public realm and create comfortable and attractive gathering places and outdoor seating areas for customers and the public. The code requires 3 percent of the building area be developed as civic space and in no instance have an area less than 64 square feet. The proposed building is 3,069 square feet and the proposed pump structure is 4,320 square feet for a total of 7,389 square feet. Therefore, the required civic space is 222 square feet. The submitted Site Plan (Exhibit D, Sheet 3) details a circular plaza area to the northeast of the proposed convenience store. The circular civic space is 22 feet in diameter, which is 380 square feet in compliance with the code. The narrative (Exhibit B) indicates that the civic space will include pedestrian scale lighting and seating, at a minimum. **The applicant shall include at least two public benches and one public art element or similar pedestrian amenity reviewed and approved by staff.**
68. Section 17.90.120(H) contains standards regarding lighting. Section 17.90.120(H.3) specifies that walkways and parking lots should be illuminated at 1.5 – 2.0 foot candles. The submitted Site Lighting Photometric Analysis (Exhibit D, Sheet E1.0) details parking lot and vehicle maneuvering area illumination at 0.6 to 15.6 foot candles and walkway illumination at 0.2 to 10.2 foot candles. The primary lighting concerns relate to up lighting and trespass onto adjacent properties as analyzed further in Chapter 15.30 of this document. The applicant is not proposing any pedestrian scaled lighting along the walkways; however, the narrative (Exhibit B) states that the civic space will contain pedestrian scale lighting. **If the applicant proposes pedestrian scale lighting as stated in the narrative, the applicant shall submit a lighting cut sheet for the proposed pedestrian scale lighting for staff review and approval; the applicant shall update the Photometric Analysis to include the proposed**

**pedestrian scale lighting in the civic space.** Section 17.90.120(H.2) states that exterior lighting must be an integral part of the architectural design and must complement ornamental street lighting and remain in context with the overall architectural character of the district. The applicant is proposing to outline the convenience store building and fuel pump area with red LED strip lighting, which is not an integral part of the architectural design nor consistent with the architectural character of the area nor in compliance with Section 17.90.00 (D)(9). **The applicant shall update the elevations to remove the proposed LED striping.** Lighting is discussed further in Chapter 15.30 (Dark Sky Ordinance) of this document.

69. Section 17.90.120(I) contains standards to promote natural surveillance of public spaces. Section 17.90.120(I.1) requires windows to be located in a manner that enables tenants, employees, and police to watch over pedestrian, parking, and loading areas. The proposed parking is located adjacent to the north and west elevations and the proposed walkways are located on the north, west, and south elevations. The west elevation contains clear windows, which will allow for surveillance of the pedestrian walkway and parking to the west of the building. The north, south, and east elevations contain spandrel windows. The applicant's narrative (Exhibit B) cites the significant interior wall displays and security risks associated with windows as reasons they are not proposing functional (i.e. real) windows. Due to the use of faux windows, the building will have limited surveillance of the parking areas and pedestrian walkways. **The applicant shall update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows to allow surveillance of the interior activity from the public right-of-way.** The lower section of the windows into the janitor's closet and women's restroom may remain spandrel windows, as proposed. **The applicant shall update the north and/or east elevations of the proposed convenience store to detail at least one active window in the storage and/or kitchen area in order to provide increased visibility to the north walkway or civic space.**
70. Section 17.90.120(I.2) states that in commercial, public, and semipublic development, including civic spaces, windows should be located in a manner that enables surveillance of interior activity from the public right-of-way. The proposed civic space is located to the northeast of the convenience store and the public right-of-way is adjacent to the south and east façades. The proposed windows along the north, south, and east façades are spandrel windows. **The applicant shall update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows to allow surveillance of the interior activity from the public right-of-way.** The lower section of the windows into the janitor's closet and women's restroom may remain spandrel windows, as proposed.
71. Section 17.90.120(I.3) contains standards to provide street address numbers. **The applicant shall provide street address numbers measuring a minimum of six (6) inches high, which clearly locates the convenience store building and its entries for patrons and emergency services. The applicant shall verify the location(s) of the address with the Building Official and emergency service providers.**
72. Section 17.90.120(I.4) states that on-site lighting should be located, oriented, and selected to facilitate surveillance of on-site activities from the public right-of-way and other public

areas. On-site lighting is evaluated in Chapter 15.30 of this document. Lighting has been designed to adequately illuminate parking areas and building entrances.

73. The intent of Section 17.90.120(J) is to promote land use compatibility and aesthetics, particularly where development abuts public spaces. Section 17.90.120(J.1) states that exterior storage of merchandise and/or materials, except as specifically authorized as a permitted accessory use, is prohibited. The applicant is not proposing outdoor storage or display areas. The applicant is proposing a dumpster area, which will be screened. On September 9, 2019, staff visited four Space Age gas stations. Two of the Space Age locations had a large shipping crate located in the parking lot area of the facility. **The applicant shall not place an external storage unit(s) on the property.**
74. Section 17.90.120(J.3) states that 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. Garbage storage areas are addressed in staff's response to Section 17.90.120(J.4), below. The submitted narrative (Exhibit B) states that the majority of mechanical equipment will be mounted on the roof and will be hidden within a roof well (i.e. screened by the applied pitch roof). The submitted building elevations (Exhibit E) do not detail the proposed locations of rooftop mechanical equipment. The applicant did not submit line of sight analysis for the rooftop equipment. **The applicant shall submit line of sight analysis for the rooftop equipment prior to submitting building permits. All mechanical, electrical, and communications equipment shall be screened from view from all public rights-of-way and civic spaces.**
75. Section 17.90.120(J)(4) contains standards for trash collection and recycling areas. The applicant proposes a dumpster area to the northwest of the fueling area, which will be screened. The submitted trash enclosure elevations (Exhibit E, Sheet A-521) detail an 8-inch reinforced CMU enclosure with a chain link gate with privacy slats. The detail specifies the enclosure will be stone masonry veneer to match the building veneer. **The trash enclosure shall be constructed of materials as identified in the plan set.** On the September 9, 2019 site visits, staff noticed some trash accumulation at a couple of the Space Age facilities. **The site shall be maintained and kept free of litter. All litter shall be collected and transported for offsite disposal as part of weekly service trips.**
76. Section 17.90.120(J.5) contains standards for exceptions to the provisions in Section 17.90.120(J). No exceptions to the external storage requirements are being requested.

#### 17.92 – Landscaping

77. Section 17.92.10 contains general provisions for landscaping. Per Section 17.92.10(C), trees over 25-inches circumference measured at a height of 4-½ 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 4-½ feet above grade has roughly an eight-inch diameter at breast height (DBH). The submitted arborist report (Exhibit I) inventoried 138 trees, including multiple trees in the adjacent right-of-way as well as on the neighboring property to the west, across the Crescent Road right-of-way. Per the report, all of the trees on the property will be removed, with the exception of trees #76-88. The

applicant is also proposing to remove trees in the rights-of-way on Highway 26, Orient Drive, and Crescent Road. Section 17.92.10(C) states that trees to be retained shall be protected from damage during construction by a construction fence located 5 feet outside the dripline. Trees and tree protection fencing will be discussed in more detail in Chapter 17.102 of this document.

78. 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.
79. Section 17.92.20 contains minimum landscaping area requirements. The subject property is zoned General Commercial, C-2. Section 17.92.20 requires that the General Commercial (C-2) zoning district requires a minimum of 20 percent of the site be landscaped. The submitted Landscape Plan (Exhibit D, Sheet L-101) details 63,329 square feet of proposed landscaped area, which is 62.6 percent of the total site area (101,208 square feet), which exceeds the landscaping requirement for the site. However, the 63,329 square feet includes the area where the future building and parking are proposed. **The applicant shall provide an updated landscaped area calculation based on the full proposal for the site, including the proposed future building and associated parking area.** However, because the proposed future building is not planned to be constructed at this time, **the applicant shall plant the area where the future building and future parking will be located according to the approved Landscape Plan.**
80. Section 17.92.30 requires trees to be planted in parking lots with more than four parking spaces, and along public street frontages. The submitted Landscape Plan (Exhibit D, Sheet L-101) does not detail street trees along the frontages of Crescent Road, Highway 26, and parts of Orient Drive. The Highway 26 frontage is 517 feet, which requires 10 large street trees or 17 medium street trees. **The applicant shall update the Landscape Plan to detail 10 large street trees or 17 medium street trees along the Highway 26 frontage of the site. The applicant shall submit details on the proposed street tree species and locations for staff review and approval. The applicant shall obtain a permit from ODOT to place trees within the highway right-of-way. The applicant shall also update the Landscape Plan to detail street trees along Crescent Road and along the southeastern portion of Orient Drive. All street trees shall be a minimum of 1.5-inches in caliper measured 6 inches above the ground and shall be planted per the City of Sandy standard planting detail. Trees and the planter strip shall be installed per the approved landscape plan. Tree ties shall be loosely tied twine or other soft, elastic material and shall be removed after one growing season (or a maximum of 1 year).** The applicant is proposing to grade large portions of the site, including the right-of-way, which will result in compacted soils. **In order to better protect newly planted trees, the applicant shall amend and aerate the soil in any areas where the soil has been compacted in a 15 foot radius around each tree to be planted and to a depth of 24 inches prior to planting trees in the right-of-way; in locations where there is a constructed planter strip (i.e. Crescent Road and Orient Drive), the applicant shall aerate the soil within the planter strip 15 feet in both directions from where the tree will be planted. The applicant shall call for an inspection with the City after aerating the soil and before planting the trees. In addition, the applicant shall obtain a letter of credit in the amount of \$500 per tree to cover**

**replacement and establishment of the right-of-way trees should a right-of-way tree die within 3 years.**

81. Section 17.92.40 requires that landscaping shall be irrigated. The submitted Landscape Plan (Exhibit D, Sheet L-101) states all landscaping shall be irrigated with an automatic system to sustain viable plant life.
82. Section 17.92.50 requires that plant materials meet a particular size. Shrubs and bushes shall be a minimum of one gallon in size or two feet in height when planted. Evergreen trees shall be at least five feet in height and deciduous trees at least 1.5 inches in caliper when planted. The Landscape Plan (Exhibit D, Sheet L-101) identifies the following deciduous trees at 1.5-inch caliper:
- 6 *Cladrastis kentukea*
  - 5 *Cornus florida* 'Cherokee Brave'
  - 15 *Cornus kousa* 'KN 30-8' PP 16309
- The Landscape Plan also identifies five (5) evergreen *Calocedrus decurrens* at 5 feet in height. The Landscape Plan identifies all shrubs at least one gallon in size.
83. Section 17.92.50(B) encourages the use of native plant materials or plants acclimatized to the Pacific Northwest where possible. A majority of the proposed plants included in the landscape plan are native to this region.
84. Section 17.92.60 requires revegetation of areas where natural vegetation has been removed or damaged in areas that are not proposed to be occupied by structures or other improvements. **The applicant shall revegetate all areas where natural vegetation has been removed or damaged in areas that are not proposed to be occupied by structures or other improvements. This includes the area where the future building and parking are proposed.**
85. Section 17.92.90 contains standards for screening. Screening is used where unsightly views or visual conflicts must be obscured or blocked and where privacy and security are desired. The applicant is proposing two planted berms in the northeast portion of the site, which will help screen the parking area located north of the proposed convenience store building. The applicant is also proposing a mix of small trees, shrubs, and groundcover along Highway 26 adjacent to the proposed parking and fueling area.
86. Section 17.92.130 contains standards for a performance bond. The applicant has the option to defer the installation of street trees and/or landscaping for weather-related reasons. Staff recommends the applicant utilize this option rather than install trees and landscaping during the dry summer months. **If the applicant chooses to postpone street tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the landscaping, assuring installation within 6 months. The cost of street trees shall be based on the street tree plan and at least \$500 per tree. The cost of landscaping shall be based on the average of three estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a three-year maintenance and warranty period.**



#### 17.94 – Drive-Up Uses

87. Section 17.94.00 contains the intent of the drive-up uses provisions, which is to ensure safe, functional drive-up uses while not impeding flow of traffic.

88. Section 17.94.20 contains minimum requirements for drive-up uses. Section 17.94.20(A) states that parking maneuvers shall not occur in the stacking area and that the stacking area shall not interfere with safe and efficient access to other parking areas on the site. The proposed stacking area appears to conflict with three or four of the five proposed westernmost parking spaces. However, staff does not think that all eight gas pump aisles will typically be at full stacking capacity. Moreover, even without four of those spaces, the proposed development would still have 13 available parking spaces, which meet the minimum requirement. Therefore, staff does not think it is necessary to remove or relocate the westernmost parking area.

89. Section 17.94.20(B) states that drive-up aisles must be located a minimum of fifty feet from residential zones to avoid adverse impacts. The adjacent properties to the north and west are outside City limits and are currently zoned residential (RRFF-5). The proposed fueling station is located more than 50 feet from the property to the north or west.

90. Section 17.94.30 contains minimum stacking distances. Section 17.94.30(D.1) states that each lane of an automotive fueling station shall provide a minimum capacity for 4 vehicles. The submitted Site Plan (Exhibit D, Sheet 3) details 8 lanes, each of which can stack 4 vehicles.

#### 17.98 – Parking

91. Section 17.98.20 contains off-street parking requirements for different uses. The proposed uses are 'Convenience Store' and 'Fuel Sales' in the off-street parking requirement table. The proposed convenience store building is 3,069 square feet, which would require 8 parking spaces (3,069 divided by 400), plus 1 parking space per 2 employees. The supplemental narrative (Exhibit C) indicates that the Space Age will have 9 employees for the largest shift, or five parking spaces. Thus, the total parking requirement is 13 parking spaces. The applicant is proposing 17 parking spaces. Per Section 17.98.10(Q), the maximum parking allowed for commercial zoned properties shall not be permitted to exceed the minimum off-street vehicle parking required by Section 17.98.20 by more than 30 percent. Thus, the maximum parking spaces allowed is 17 parking spaces (13 x 1.3).

92. The proposal also includes a future building and 20 future parking spaces. The future building is detailed at 7,425 square feet; neither the specific use nor the number of employees on the largest shift are known at this time. **Vehicular and bicycle parking requirements associated with the future building shall be analyzed at the time of development of the future building.**

93. Based on the required 13 parking spaces, two (2) bicycle parking spaces are required. The submitted Site Plan (Exhibit D, Sheet C4) details 2 bicycle parking spaces along the west side of the proposed convenience store building.

94. Section 17.98.50 contains parking setback requirements. The proposed parking area is located to the north and west of the proposed convenience store building. The proposed parking spaces are set back greater than 20 feet from the Highway 26 and Orient Drive rights-of-way in adherence with the code requirement.
95. Section 17.98.60 includes standards on parking lot design, size, and access. Section 17.98.60(A) requires parking lots to be constructed with a durable hard surface such as concrete or asphalt. Per the submitted supplemental narrative (Exhibit C) all parking and maneuvering areas will be surfaced with asphalt.
96. Section 17.98.60(B) contains standards for the size of parking spaces. The plan set (Exhibit D) identifies 37 parking spaces, including the 20 future parking spaces. All of the parking spaces are standard parking spaces at 9 feet by 18 feet, with the exception of one (1) ADA parking space with a passenger side aisle. All proposed parking spaces comply with these dimensional standards. The ADA space is located to the west of the proposed convenience store. There is no proposed ADA space detailed in the future parking area that's associated with the future building. **Signage associated with the ADA parking spaces shall meet the head clearance distance requirement in the Building Code.**
97. Section 17.98.60(C) contains standards on parking lot aisle width. All parking aisles are proposed to meet or exceed the minimum aisle width standards for one-way and two-way parking aisles. Parking aisles are detailed between 25 feet and 55 feet wide (the 55 foot wide aisle to the west of the fueling pumps includes a stacking area for two vehicles).
98. Section 17.98.80 contains provisions for access to arterial and collector streets. Primary access to the site is proposed via a driveway from Crescent Road. An additional secondary right-in, right-out driveway is proposed from Orient Drive. The applicant submitted a letter from Clackamas County (Exhibit L) approving the proposed second access on Orient Drive.
99. Section 17.98.100 contains standards for driveways. The proposed development will gain access from a proposed 28-foot wide driveway on Crescent Road. The proposal also includes a secondary right-in, right-out driveway on Orient Drive. The Site Plan (Exhibit D, Sheet 3) details the Orient Drive driveway with a 68-foot apron and a 40-foot throat. The supplemental narrative (Exhibit C) states that the wide driveway is to facilitate maneuvering by fueling trucks exiting the site onto Orient Drive and that turning templates for large delivery and fueling trucks are in the traffic study. The Traffic Impact Study (Exhibit H) includes 3 truck turning templates, including a truck turning template for a large truck with a 67 foot wheel base (WB-67). The truck turning templates are difficult to read, do not include a legend, and are based on an outdated site plan (i.e. not the site plan the applicant is proposing with this application). The turning templates do not include any turning movements associated with the proposed Orient Drive driveway, but rather focus on a truck entering the subject property from Crescent Road, turning-around on site, and exiting back onto Crescent Road. The TIS did not include a turning template that shows the need for a 68 foot wide driveway with a 40 foot throat. Presumably, the 68 foot wide driveway would make it easier to accommodate large semi-trailer trucks; however, this configuration results in an extended pedestrian crossing distance and potential higher speeds for motorists exiting the site, both of which pose a hazard to pedestrians crossing the driveway. **The applicant shall do one of the following:**

- **Update the plan set to detail the driveway on Orient Drive at a maximum of 40 feet wide, including throat and apron.** This will improve pedestrian safety at the driveway crossing and will also help discourage vehicles heading west on Orient Drive from slipping into the extra-wide driveway against traffic; or,
- **Provide an updated truck turning template based on the submitted site plan layout that demonstrates the need for the requested 68 foot driveway with 40 foot approach. The updated truck turning template shall be reviewed and approved by the City's traffic engineer. The updated turning template shall be legible and shall include a legend.**

100. Section 17.98.120 contains landscaping and screening provisions. Section 17.98.120(A) requires screening of parking areas containing 4 or more spaces. The proposed parking spaces are located north and west of the proposed convenience store building. A landscaped berm is proposed between the Orient Drive right-of-way and the parking located north of the building. A landscape buffer is proposed between the parking located west of the building and the Highway 26 right-of-way.
101. 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% opaque when viewed horizontally from between 2 and 8 feet above the average ground level. The properties to the north and west of the subject property are outside city limits and currently zoned residential (RRFF-5). The Landscape Plan (Exhibit D, Sheet L-101) details a mix of trees and shrubs between the parking and vehicle maneuvering areas and the adjacent street/property.
102. Section 17.98.120(C) requires parking facilities to include at least 10 percent landscaping. The proposal features two (2) landscaped berms and several landscape planter bays. The applicant did not submit a landscaping analysis for the parking area. **The applicant shall submit additional information regarding landscaping in the parking area to ensure that the 10 percent minimum landscaping is met.**
103. Section 17.98.120(D) restricts parking bays to no more than 20 spaces and requires landscape planters at the ends of each parking bay. The proposal contains planter bays at the ends of each parking bay that are at least five feet in width. The proposed future parking associated with the future building contains 20 parking stalls; the parking bays associated with the fueling station contain six or fewer stalls.
104. Section 17.98.120(E) states that parking area setbacks shall be landscaped with major trees, shrubs, and ground cover. The submitted Landscape Plan (Exhibit D, Sheet L-101) details a landscaped buffer between the parking area and both Highway 26 and Orient Drive. The landscaped buffer is proposed to contain a mix of plant materials including trees, shrubs, and groundcover.
105. Section 17.98.120(F) requires wheel stops or other methods to protect landscaped areas. The plan set details wheel stops in the parking areas directly north and west of the convenience store. The Landscape Plan (Exhibit D, Sheet L-101) details curb in the westernmost parking row, which is proposed to be adjacent to a walkway once the future building is built; however, will be adjacent to landscaping until the future building is built. **The applicant**

**shall update the plan set to detail wheel stops in the westernmost parking row to protect landscaping and future walkways.**

106. 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, as discussed in Chapter 17.84 above.**
107. 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 below.
108. Section 17.98.160 details requirements related to the provision of bicycle parking. The submitted Site Plan (Exhibit D, Sheet 3) details 2 bicycle parking spaces located between the proposed convenience store building and the adjacent walkway to the west.
109. Section 17.98.190 contains minimum standards for off-street loading facilities for commercial and industrial developments. The submitted supplemental narrative (Exhibit C) states that a separate designated loading area is not needed. Staff agrees with the assessment.

#### 17.102 – Urban Forestry

110. Section 17.102.20 contains information on the applicability of Urban Forestry regulations. The subject property contains 2.5 acres and therefore compliance with this chapter is required.
111. Section 17.102.50 requires the retention of at least three trees 11 inches DBH or greater to be retained for every one acre of contiguous ownership. The subject property is 2.5 acres and, therefore, requires retention of at least eight (8) trees 11-inches or greater DBH and in good health. The submitted arborist report (Exhibit I) and Tree Retention Plan (Exhibit D, Sheet 2) detail retention of 12 trees that are in good condition and are 11-inches DBH or greater. Because the future building is not proposed to be constructed at this time, **the applicant shall extend the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go and shall retain trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115).** This will result in retention of an additional five (5) trees in good condition and one (1) tree in fair condition and will help achieve the goals of the Green Corridor Agreement by maintaining existing vegetation and trees along Highway 26 as well as the intent of Section 17.92.10(C) to preserve significant trees to the greatest extent practicable. Tree # 115 is the tree closest to the proposed improvement area of the project. Tree # 115 is a 16-inch DBH Douglas fir. The proposed improvement area is located approximately 24 feet from Tree #115; thus, a 16 foot critical root protection zone for Tree #115 should not interfere with the proposed improvements. **The applicant shall update the plan set to detail the Highway 26 sidewalk as far away from the trunks of the retained trees as possible without intruding on ODOT’s clear zone; the applicant shall work with ODOT and the City of Sandy Planning Division staff to determine an appropriate location for the relocated sidewalk. The applicant shall retain an arborist on-site for any construction activity within the critical root zone of 1 foot per 1 inch DBH or 5 feet beyond the dripline of the retained trees.**

112. The applicant is proposing to remove several mature trees within the ODOT and Clackamas County rights-of-way. ODOT submitted comments (Exhibit T) stating that **the applicant shall replace the trees that are removed at a 2 to 1 ratio. The trees shall be located 36 feet from the edge of the travel lane. The applicant shall coordinate with the City of Sandy Planning Division and Magnus Bernhardt (ODOT Landscape Architect at (503) 731-8283) to discuss type of tree species and location.** Clackamas County did not submit comments regarding mitigation of trees removed from the Clackamas County right-of-way so staff is unsure what the County's requirements are. **The applicant shall work with Clackamas County to determine if the County will require replacement trees for trees removed from the Clackamas County right-of-way.**
113. Section 17.102.50(B) contains standards for the tree protection area and states that trees identified for retention shall be protected by protective fencing placed no less than 10 horizontal feet from the outside edge of the trunk. The arborist report proposes tree protection fencing at 0.5 feet per inch of DBH and states this is a typical critical root zone. However, the International Society of Arboriculture, Pacific Northwest Chapter of the International Society of Arboriculture, and Arbor Day Foundation all cite the typical critical root zone at 1 foot per 1 inch DBH. Section 17.102.50(A) states that retention trees shall be likely to grow to maturity, meaning the impacts of the development can't harm the tree in a way that makes it not capable of growing to maturity. Moreover, Section 17.92.10(C) states that retained trees shall be protected from damage during construction by a construction fence located 5 feet outside the dripline. The applicant's submitted Tree Retention Plan (Exhibit D, Sheet 2) appears to detail tree protection fencing at 0.5 feet per inch DBH; however, the plan set submitted for the completeness check detailed a wider tree protection area, presumably at 5 feet beyond the dripline in compliance with Section 17.90.10(C). Due to the inconsistencies between the submitted plan sets as well as the inconsistency between what the applicant's arborist stated as a typical critical root zone and what the leading arboricultural organizations state as a typical critical root zone, staff requested an additional review of the proposed tree retention plan by a third-party arborist. The third-party arborist report (Exhibit W) confirms that the industry standard for the critical root zone is 1 foot per 1 inch DBH. The report further recommends that tree protective fencing be installed consistent with the one foot per inch diameter formula and that the fencing be a minimum of 6-foot high chain link fence with a sign that clearly marks the area as a "Tree Root Protection Zone." **The applicant shall install tree fencing at the standard critical root zone of one foot per one inch DBH, or 5 feet beyond the dripline of the retained trees per Section 17.92.10(C). The tree protection fencing shall be 6 foot high chain link or no-jump horse fencing and shall have a sign that clearly marks the area as a Tree Root Protection Zone. The applicant shall follow all recommendations of the third-party arborist report with respect to air spading, root pruning, and any work within the critical root zone.**
114. **To ensure protection of the required retention trees, the applicant shall record a tree protection covenant specifying protection of the 12 retention trees and Trees # 110-115 and limiting removal without submittal of an Arborist's Report and City approval. This document shall include a sketch identifying the retention trees and Trees # 110-115 and the critical root zone around the retention trees and Trees # 110-115 detailed at 1 foot per 1 inch DBH.**

### 15.30 – Dark Sky Ordinance

115. Chapter 15.30 regulates outdoor lighting in order to reduce or prevent light pollution. The applicant submitted a Lighting Photometric Analysis (Exhibit D, Sheet E1.0) detailing the location of proposed lighting and projected foot candles. Section 15.30.60(D) requires all lighting systems to be designed so that the area 10 feet beyond the property line receives no more than 0.25 (one quarter) of a foot-candle of light. The submitted photometric analysis indicates that light trespass 10 feet beyond the subject property lines does not exceed the 0.25 foot-candle limit.

Section 17.90.120(H.3) specifies that walkways and parking lots should be illuminated at 1.5 to 2.0 foot candles. The submitted Lighting Photometric Analysis (Exhibit D, Sheet E1.0) details parking lot and vehicle maneuvering area illumination at 0.6 to 15.6 foot candles and walkway illumination at 0.2 to 10.2 foot candles. This is not within the 1.5-2.0 foot candle range; however, the primary lighting concerns are up lighting and trespass onto adjacent properties so the proposed on-site foot candles are fine.

The applicant is proposing 12 exterior wall sconces on the convenience store, three (3) type II medium pole mount flood lights, one (1) type III medium pole mount flood light with backlight shield, two (2) type II medium pole mount flood lights with backlight shield, six (6) LED surface mount super saver canopy lights in the fuel island, and four (4) LED surface mount very low watt canopy lights in the fuel island. The Dark Sky ordinance requires that all new lighting be full-cutoff and downward facing. Section 15.30.020 (E) is outdated and prefers low-pressure sodium lights. Staff is amenable to allowing LED lighting. The submitted lighting cut-sheets (Exhibit G) indicate that multiple proposed lights are 4,000 or 5,000 Kelvins. Based on recommendations from the Audubon Society of Portland, the American Medical Association, and the International Dark-Sky Association the lighting should not exceed 3,000 Kelvins. Based on recommendations from the Illuminating Engineering Society (IES) of North America, staff requires all proposed lighting be full-cutoff and not exceed 4,125 Kelvins. **The applicant shall submit updated lighting fixture cut-sheets for all proposed exterior lighting that detail the lighting fixtures as full-cutoff and not exceeding 4,125 Kelvins in order to minimize negative impacts on wildlife and human health.** IES RP 33-14 (13.0) states that color temperatures in the 2,100 Kelvin to 3,500 Kelvin should be considered, and that higher temperatures at 4,000 Kelvins to 5,000 Kelvins may also be considered in some circumstances. It goes on to state that in all cases, consideration should be given to environmental concerns to minimize the adverse effects of electronic light. Section 13.1.1 of IES RP 33-14 states that light systems shall be less than 4,125 Kelvins (at or below full moon equivalents). **Should the applicant prefer, the applicant may submit an updated lighting plan detailing low-pressure sodium lights in compliance with Chapter 15.30.** Staff is supportive of using LED lighting instead of low-pressure sodium lighting as preferred by the existing Dark Sky Ordinance but would like the LED lighting to minimize the adverse effects of electronic light as preferred by the IES.

### 17.66 – Adjustments and Variances

116. Adjustments are a means to vary the development standards normally applied in a particular district. This option exists for those circumstances where uniform, unvarying rules would



prevent a more efficient use of a lot. The applicant requested the following two (2) Type II adjustments:

- Adjustment to Section 17.90.120(D.1) to allow less than 50 percent of the street frontage as building.
- Adjustment to Section 17.90.120(D.1) to place a building required to meet the 50 percent frontage requirement more than 20 feet from the property line.

#### 117. BUILDING FRONTAGE ADJUSTMENT

Section 17.90.120(D.1) requires buildings to be oriented to a public street or civic space such that at least 50 percent of the site's street frontage is comprised of building(s) placed within 20 feet of a sidewalk, walkway or civic space and not more than 20 percent of the off-street parking is located between a building's front façade and the adjacent street.

Request: The applicant requests a Type II adjustment to Section 17.90.120(D.1) to not meet the 50 percent building frontage requirement. The proposed building frontage along Highway 26 is 40 percent of the lot frontage and consists of the proposed convenience store building, which will be constructed as part of this application, as well as a future building footprint, which would be constructed at a later date. The applicant is also requesting a second adjustment to this section to allow the future building to be located further than 20 feet from the sidewalk, which will be discussed in Finding #118 below. The proposal does not include parking between the building and Highway 26.

Criteria A of Section 17.66.40 states "The proposed development will not be contrary to the purposes of this chapter, policies of the Comprehensive Plan, and any other applicable policies and standards adopted by the City." The Comprehensive Plan states that the General Commercial (C-2) District is intended to provide for a wide range of commercial activities and uses that require direct automobile access. The intent of Section 17.90.120(D) is to maintain and enhance General Commercial and Industrial streetscapes as public spaces, emphasizing pedestrian-scale and character in new development consistent with the Sandy Style. The proposed development is consistent with the intent of the General Commercial zone by providing a commercial activity. The proposal also includes multiple sidewalks, which increase the pedestrian character of the area. In addition, the requirement to preserve additional trees in the Green Corridor adjacent to the sidewalk on Highway 26 will contribute to a richer pedestrian experience.

Criteria B states "The proposed development will not substantially reduce the amount of privacy enjoyed by users of nearby structures when compared to the same development located as specified by this Code." The proposal to reduce the percent of building frontage from 50 to 40 percent will not reduce the amount of privacy enjoyed by users of nearby structures. There is one property adjacent to the site to the west that is currently outside City limits and used as a residence. The proposed landscape plan details a mix of vegetation to buffer between the subject property and the property to the west to lessen the impact of the proposed development to the residence.

Criteria C states "The proposed development will not adversely affect existing physical systems and natural systems, such as traffic, drainage, dramatic land forms, or parks." With

the recommended traffic modifications, the proposed development will not adversely affect traffic. All stormwater will be managed on site and will have to meet the Chapter 13.18 of the Sandy Municipal Code.

Criteria D states “Architectural features of the proposed development will be compatible to the design character of existing structures on adjoining properties and on the proposed development site.” The subject property is at the west edge of the City and is not located near other commercial uses. The proposed buildings will be designed to be compatible with Sandy Style.

Staff believes that a combined building footprint that comprises 40 percent of the site’s street frontage is not contrary to the Comprehensive Plan or other City policies, does not reduce the amount of privacy enjoyed by users of nearby structures, will not adversely affect existing systems, and will be compatible to the design character of existing structures on adjoining properties. **Staff approves a Type II Adjustment to allow the proposed convenience store building and future building to occupy 40 percent of the Highway 26 frontage instead of the required 50 percent. The future building shall be a minimum of 165 linear feet along the Highway 26 frontage of the site. Because the future building will not be constructed as part of this application, the applicant shall extend the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go and shall retain trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115). The applicant shall update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows. The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours; the primary entrance on the south elevation shall not be a faux entrance.**

118. BUILDING FRONTAGE SETBACK ADJUSTMENT

Section 17.90.120(D.1) requires buildings to be oriented to a public street or civic space such that at least 50 percent of the site’s street frontage is comprised of building(s) placed within 20 feet of a sidewalk, walkway or civic space and not more than 20 percent of the off-street parking is located between a building’s front façade and the adjacent street.

Request: The applicant requests a Type II adjustment to Section 17.90.120(D.1) to place the future building greater than 20 feet from the proposed Highway 26 sidewalk. The proposed convenience store building is 20 feet from the Highway 26 sidewalk, which meets the code requirement; however the proposed future building is located 24 feet from the sidewalk in order to better protect the retention trees. The applicant is also requesting a second adjustment to this section to allow the building frontage to be less than 50 percent, which is discussed in Finding #117 above. The proposal does not include parking between the building and Highway 26.

Staff finds that in order to adequately protect the proposed retention trees, the future building would need to be set back further than 24 feet. The submitted Tree Retention Plan (Exhibit D, Sheet 2) and arborist report (Exhibit I) detail the critical root zone around the retention trees at 0.5 feet per 1 inch DBH. However, the industry standard for an adequate

critical root zone is 1 foot per 1 inch DBH; thus, the tree protection area will need to be expanded in order to adequately protect the proposed retention trees such that they will remain healthy and likely to grow to maturity. The third-party arborist report (Exhibit W) recommends that tree protective fencing be installed consistent with the one foot per inch diameter formula. Staff finds the future building footprint shall be relocated at a sufficient setback to not adversely affect the retention trees. This would require a Variance as the distance would be greater than a 20 percent increase from the 20 foot setback required by Section 17.90.120 (D.1). If staff processed the adjustment per the applicant's request staff would deny the adjustment as staff has no evidence the proposed location at 24 feet would adequately protect the retention trees. Because this project is on an individual lot of record and because the recommendation to increase the setback is not of the applicant's making, this can be processed as a Type II Variance.

Criteria A of Section 17.66.70 states "The circumstances necessitating the variance are not of the applicant's making." The processing change from a Type II adjustment to a Type II variance is not of the applicant's making. The applicant's arborist submitted a recommended critical root zone that is half of the accepted arboricultural industry standard. In order to better protect the required retention trees, the landscape management corridor, and the Green Corridor, staff is requiring that the standard critical root zone be applied.

Criteria B states "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." The intent of Section 17.90.120(D) is to maintain and enhance General Commercial and Industrial streetscapes as public spaces, emphasizing pedestrian-scale and character in new development consistent with the Sandy Style. While setting the building back at a distance adequate to protect retention trees at 1 foot per 1 inch DBH instead of 20 feet will reduce the pedestrian feel of the development, it will also allow for better protection of trees located along Highway 26 in line with Comprehensive Plan policies 5.8, 5.16, and 5.17.

Criteria C states "Granting of the variance will not adversely affect implementation of the Comprehensive Plan." The Comprehensive Plan states that the General Commercial (C-2) District is intended to provide for a wide range of commercial activities and uses that require direct automobile access. The proposed development is consistent with the intent of the General Commercial zone by providing a commercial activity.

Criteria D states "The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity." The proposal to increase the building setback from 20 to a distance adequate to protect retention trees at 1 foot per 1 inch DBH will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity. There is one property adjacent to the site to the west that is currently outside City limits and used as a residence. The proposed landscape plan details a mix of vegetation to buffer between the subject property and the property to the west to lessen the impact of the proposed development to the residence.

Criteria E states "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.” The proposed convenience store and gas station development is the same as would be permitted under the city code and standards.

Criteria F states “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 of shape (legally existing prior to the effective date of the Code), topography, or other circumstances over which the applicant has no control.” There is an existing Green Corridor Agreement with Clackamas County that protects existing trees along the Highway 26 side of the site that extends along the entire property. In order to better protect the trees, the future building would need to be set back further than what an adjustment would allow.

**Staff approves a Type II Variance to allow the proposed future building to be set back from the property line abutting Highway 26 a distance adequate to protect retention trees at 1 foot per 1 inch DBH or 5 feet beyond dripline per Section 17.92.10(C). The applicant shall update the plan set to detail the proposed future building set back outside of the critical root zone (defined as 1 foot per 1 inch DBH, or 5 feet beyond the dripline) of the 12 trees proposed for retention as well as the six (6) additional trees that shall be retained (Trees # 110-115).**

Other Findings:

119. Recent development at both Zion Meadows subdivision and the remodel of the Pioneer Building (former Sandy High School) have sparked unintended rodent issues in the 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 is needed.**
120. **The applicant will be required to obtain a permit for any proposed signage.**

**DECISION**

For the reasons described above, the request by JLP Development to construct a Space Age fueling station and convenience store is hereby **approved as modified by the conditions listed below**. The following adjustment and variance are also **approved**:

- Type II Adjustment to Section 17.90.120(D.1) to allow less than 50 percent of the street frontage as building. Staff approves the buildings to comprise 40 percent of the street frontage.
- Type II Variance to Section 17.90.120(D.1) to allow the building to be placed a distance adequate to protect retention trees at 1 foot per 1 inch DBH or 5 feet beyond dripline (outside the critical root zone) from the property line abutting Highway 26 in order to better protect the retention trees.

**CONDITIONS OF APPROVAL**

- A. Prior to applying for a grading and erosion control permit or building/plumbing/mechanical permits the applicant shall submit additional information as identified below:**

1. Submit a revised Site Plan and supplemental Plans to include all changes as identified in this Order including:
  - Detail 6 foot wide sidewalks along the Highway 26 frontage and 7 foot wide sidewalks along the Orient Drive frontage of the site.
  - Detail pavement markings that connect the walkway to the parking west of the fuel pumps, or install a walkway that connects the parking spaces to the Highway 26 sidewalk. If the applicant chooses pavement markings, the pavement markings shall be painted periodically as lines become faded. If the applicant chooses to install a walkway, the walkway shall be located such that it has the least impact on the Highway 26 trees while still providing a connection between the parking spaces and the Highway 26 sidewalk.
  - Detail wheel stops in the westernmost parking row.
  - Detail a six foot wide walkway connecting the front door on the south side of the future building to the Highway 26 sidewalk. The applicant shall also update the plan set to show the walkway extending around to the south side entrance of the proposed future building. To minimize impact on retention trees, the proposed entrance to the future building along Highway 26 shall be located at the southeast corner of the building.
  - Detail the proposed future building set back outside of the critical root zone (defined as 1 foot per 1 inch DBH or 5 feet beyond dripline) of the 12 trees proposed for retention as well as the six (6) additional trees that shall be retained (Trees # 110-115).
  - Detail extension of the landscape buffer along Highway 26 to approximately 260 feet from the southwest corner of the property to include the frontage where the future building will go.
  - Detail two ADA ramps at the intersection of Highway 26 and Orient Drive.
  - Ensure all site modifications (e.g., sidewalks, relocated signal pole, etc.) are located appropriately in anticipation of the addition of the future additional southbound lane on Orient Drive.
  
2. Submit a revised Landscape Plan to include the following changes:
  - Detail 10 large street trees or 17 medium street trees along the Highway 26 frontage of the site. The applicant shall submit details on the proposed street tree species and locations for staff review and approval. The applicant shall obtain a permit from ODOT to place trees within the highway right-of-way.
  - Detail street trees along Crescent Road and along the southeastern portion of Orient Drive.
  - Provide an updated landscape area calculation based on the full proposal for the site, including the proposed future building and associated parking area.
  - Submit additional information regarding landscaping in the parking area to ensure that the 10 percent minimum landscaping of the parking facilities is met.
  - Detail retention of trees located within the extended landscape buffer (Trees #110, 111, 112, 113, 114, and 115). The applicant shall retain an arborist on-site for any construction activity within the critical root zone of 1 foot per 1 inch DBH or 5 feet beyond the dripline of the retained trees.
  - Detail the Highway 26 sidewalk as far away from the trunks of the retained trees as possible without intruding on ODOT's clear zone; the applicant shall work

with ODOT and the City of Sandy Planning Division staff to determine an appropriate location for the relocated sidewalk. The applicant shall retain an arborist on-site for any construction activity within the critical root zone of 1 foot per 1 inch DBH or 5 feet beyond the dripline of the retained trees.

- Detail replacement trees to mitigate for the trees that are removed from the ODOT right-of-way at a 2 to 1 ratio. The trees shall be located 36 feet from the edge of the travel lane. The applicant shall coordinate with the City of Sandy Planning Division and Magnus Bernhardt (ODOT Landscape Architect at (503) 731-8283) to discuss type of tree species and location. The applicant shall work with Clackamas County to determine if the County will require replacement trees for trees removed from the Clackamas County right-of-way.
3. Submit a revised Lighting Layout Plan and Photometric Plan to include the following:
    - Detail the proposed pedestrian scale lighting in the civic space, if proposed as indicated in the narrative.
  4. Submit revised elevations to include the following:
    - Remove the proposed LED striping on the roofline of the gas pump facility and the convenience store.
    - Update the south elevation of the proposed convenience store to detail the windows to the right (east) of the primary entrance as active windows as they are adjacent to the Highway 26 sidewalk and walkway leading to the primary entrance.
    - Update the north and/or east elevations of the proposed convenience store to detail at least one active window in the storage and/or kitchen area.
  5. Submit updated lighting fixture cut-sheets for all proposed exterior lighting, including the proposed pedestrian scale lighting, if proposed, that detail the lighting fixtures as full-cutoff and not exceeding 4,125 Kelvins to minimize negative impact on wildlife and human health. Should the applicant prefer, the applicant may submit an updating lighting plan detailing low-pressure sodium lights in compliance with Chapter 15.30.
  6. Update the Color Schedule with an approved color for the vertical board and batten or submit additional information demonstrating that Mountain Cedar is a wood stain.
  7. Submit a line of sight analysis for the rooftop equipment.
  8. Propose an appropriate architectural treatment for the retaining wall and submit to the Planning Division for staff review and approval.
  9. The applicant shall do one of the following:
    - Reduce the combined height of the retaining wall and fence to 8 feet or less.
    - Set the fence back at least 5 feet from the top of the retaining wall to create a break between the wall and the fence.
    - Apply for a Special Variance to allow a maximum 9.1 foot tall retaining wall and fence in the rear yard.



10. The applicant shall do one of the following:

- Update the plan set to detail the driveway on Orient Drive at a maximum of 40 feet wide, including throat and apron. This will improve pedestrian safety at the driveway crossing and will also help discourage vehicles heading west on Orient Drive from slipping into the extra-wide driveway against traffic.
- Provide an updated truck turning template based on the submitted site plan layout that demonstrates the need for the requested 68 foot driveway with 40 foot approach. The updated truck turning template shall be reviewed and approved by the City's traffic engineer. The updated turning template shall be legible and shall include a legend.

**B. Prior to grading and/or excavation, the applicant shall complete the following and receive necessary approvals as specified below:**

1. Submit proof of receipt of a Department of Environmental Quality 1200C permit. (Submit to Planning Division)
2. Apply for and receive approval for a grading and erosion control permit in conformance with City standards detailed in Section 15.44 of the Municipal Code.
3. Request an inspection of installed erosion control measures in accordance with the approved plan. (Request to Public Works Department)
4. Install tree fencing at the standard critical root zone of one foot per inch DBH or 5 feet beyond dripline; the tree protection fencing shall be 6 foot high chain link or no-jump horse fencing and shall have a sign that clearly marks the area as a Tree Root Protection Zone.
5. Request an inspection to verify tree protection fencing is appropriately installed.
6. Have a licensed pest control agent evaluate the site to determine if pest eradication is needed. Submit the evaluation summary to the Planning Division.

**C. Prior to all construction activities, except grading and/or excavation, the applicant shall submit additional information with the Building Permit plans and complete required items during construction as identified below:**

1. Pay appropriate SDCs as calculated with building permit.
2. Update the address of the site to be addressed from Highway 26. The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours as the location of the front door along the Highway 26 frontage is necessary to consider the Highway 26 frontage the front lot line.

3. Record a tree protection covenant specifying protection of the 12 retention trees and Trees #110-115 limiting removal without submittal of an Arborist's Report and City approval. This document shall include a sketch identifying the retention trees and Trees # 110-115 the critical root zone around the retention trees and Trees # 110-115 detailed at 1 foot per 1 inch DBH.

**D. Prior to occupancy (temporary or final) of the building the applicant shall complete the following or provide assurance for their completion:**

1. All required improvements shall be installed or financially guaranteed prior to final occupancy of the Space Age fueling station.
2. Install street improvements along the site frontage of Highway 26, Orient Drive, and Crescent Road, including but not limited to: curbs, sidewalks, storm drainage, street lighting, and street trees per Section 17.84.50(D)(1) of the Sandy Municipal Code (SMC) and the following additional requirements: (any changes to these conditions by ODOT or Clackamas County shall be reviewed by the City of Sandy)
  - The applicant shall improve the sidewalk to current ODOT and City standards.
  - The applicant shall contact the ODOT District Contact (Loretta Kieffer, 503-667-7441) to determine permit requirements and obtain application information.
  - If a design exception is required for street trees the applicant shall adjust the location of the sidewalk to allow street trees that meet ODOT's minimum clear zone criteria and/or apply for a design exception.
  - There appears to be sufficient right-of-way to meet ODOT's clear zone criteria.
  - Any costs for a design exception shall be paid by the applicant.
  - Construct a left-turn lane on southbound SE Orient Drive at Highway 26 with accompanying signal modifications according to ODOT specifications and requirements.
  - Construct a left-turn lane on northbound SE Orient Drive at SE Crescent Road according to Clackamas County specifications and requirements and to ODOT specifications and requirements if any section of SE Orient Drive falls within ODOT jurisdiction.
  - Construct a three-lane section for SE Orient Drive from Highway 26 to north of SE Crescent Road with a raised median to restrict driveway movements at the site to right-in, right-out according to Clackamas County specifications and requirements and to ODOT specifications and requirements if any section of SE Orient Drive falls within ODOT jurisdiction.
  - Dedicate any additional right-of-way adjacent to Highway 26 and SE Orient Drive if necessary to assure that an additional southbound lane can be provided on SE Orient Drive at Highway 26.
  - With any future development beyond what is proposed to be constructed with this application, the applicant shall construct a right-turn lane on southbound SE Orient Drive at Highway 26 (this will result in three lanes for the southbound SE Orient Drive approach) with accompanying signal modifications according to ODOT specifications and requirements such that the intersection will operate at no worse than 2038 background conditions during both the AM and PM peak hours under full build-out of the site under City of Sandy C-2 zoning.

- Half street improvements on SE Orient Drive shall be required along the entire site frontage to minor arterial standards to include signing and striping plans.
- Input from ODOT shall be required on Mt Hood Highway 26, particularly at the intersection with Orient Drive, and on the impacts on the existing traffic signal function and performance and lane configuration.
- The proposed cul-de-sac shall be designed to include plan and profile as part of this development to assure grades will be met.
- All frontage improvements in, or adjacent to Clackamas County right-of-way, shall be in compliance with Clackamas County Roadway Standards. Frontage improvements in, or adjacent to State of Oregon right-of-way, shall be in compliance with Oregon Department of Transportation standards.
- The applicant shall dedicate additional right-of-way along the entire site frontage of SE Orient Drive and SE Crescent Road as necessary to accommodate the required frontage improvements, providing a minimum of 6 inches behind the sidewalk.
- Written approval shall be obtained from ODOT, in the form of a permit, for access and improvements within the Highway 26 right-of-way and the portion of SE Orient Drive under ODOT's jurisdiction.
- Minimum improvements on the SE Orient Drive frontage consistent with Clackamas County's Roadway Standards include, but are not limited to, up to a one half-street improvement, including:
  - Up to a minimum 30-foot wide, one half-street improvement shall be constructed along the entire site frontage to arterial roadway standards, per Clackamas County Roadway Standards Standard Drawing C100. As necessary, additional paved width shall be provided for the proposed second left turn lane at the intersection with Highway 26 and the northbound left from SE Orient Road to SE Crescent Road.
  - Lane transitions shall be provided per Roadway Standards Section 250.6.4 based on a 55 MPH design speed.
  - A minimum 1.5-foot wide concrete center median shall be constructed on SE Orient Drive, centered on the site driveway, extending a minimum of 40 feet beyond the north and south edge of the driveway. A minimum shy distance of 1.0 foot shall be provided from the median and travel lane. The applicant's proposal includes a median between the two southbound travel lanes to allow for a left-in and left-out for the existing driveway serving the undeveloped property (Tax Lot 24E10 05490 and 05400) on the east side of SE Orient Drive. For this location, a median will only be permitted at the center of the roadway rather than between southbound travel lanes. Based on the limited use of the existing driveway on the east side of SE Orient Drive, it does not warrant providing full access at this time.
  - Standard curb, or curb and gutter if curb line slope is less than one percent.
  - Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.
  - A minimum 7-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. If the sidewalk does not connect to sidewalk on adjacent property, the end of the sidewalk shall require the construction of a concrete ramp, adjacent to the end of the

- sidewalk, providing a transition from the new sidewalk to the edge of the pavement. The ramps shall meet ADA guidelines.
- A minimum 28-foot wide concrete driveway approach shall be constructed, per Standard Drawing D650, and shall be limited to right-out turning movements only. A wider driveway is acceptable with demonstration of the need with truck turning templates. The driveway approach and on-site curbs shall be channelized to limit right-turns into the driveway. The angle of the driveway shall be no more than necessary to accommodate truck turning and shall be demonstrated by turning templates based on anticipated vehicles. A signage plan shall be provided indicating the access restriction.
  - A striping plan for SE Orient Drive shall be provided. The northbound left turn lane queue storage at SE Crescent Road shall be the minimum as recommended in the project traffic study by Ard Engineering, dated April 8, 2019.
  - Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.
  - Minimum improvements on the SE Crescent Road frontage consistent with Clackamas County's Roadway Standards include, but are not limited to, up to a half-street improvement, including:
    - Dedicate public right-of-way as needed to accommodate the required frontage improvements.
    - A minimum total paved width of 20 feet, with a structural section for a commercial local roadway, per Clackamas County Roadway Standards Standard Drawing C100.
    - Standard curb, or curb and gutter if curb line slope is less than one percent.
    - Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.
    - A minimum 5-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. Dual curb ramps shall be constructed per ODOT Standard Drawing (RD755, RD756 and RD757) at the SE Crescent Road intersection with SE Orient Drive.
    - A minimum 28-foot wide concrete driveway approach shall be constructed, per Standard Drawing D650. A wider driveway is acceptable with demonstration of the need with truck turning templates.
    - Provide adequate intersection sight distance per Section 240 of the Clackamas County Roadway Standards.
    - Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.
    - Prior to issuance of a Development Permit and start of construction activities, off-site construction easements shall be obtained.
  - Prior to commencement of site work, a Development Permit is required and must be obtained from Clackamas County for all work performed in the road right-of-way. A Utility Placement Permit is required for any utility work within the public right-of-way, per Chapter 7 of the Roadway Standards. When there are multiple utility service trenches in the road, the trench repairs will grind and inlay the top

2” of the pavement restoration to include a minimum 12” tee beyond the furthest trench, and to combine multiple trenches into one surface repair.

- If the applicant is advised to or chooses to modify the proposal in terms of access location and/or design following the preparation of these comments the applicant shall give the Clackamas County Engineering office an opportunity to review and comment on such changes prior to a decision being made.
3. Install landscape materials as identified on the revised and approved Landscape Plan and install an automatic irrigation system in compliance with Section 17.92.40. Because the proposed future building is not planned to be constructed at this time, the applicant shall plant the area where the future building and future parking will be located according to the approved Landscape Plan. Trees shall be planted per the City of Sandy standard planting detail and shall be staked and tied with loose twine, or other soft, elastic material and shall be removed after one growing season (or a maximum of 1 year). If the applicant chooses to postpone street tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the landscaping, assuring installation within 6 months. The cost of street trees shall be based on the street tree plan and at least \$500 per tree. The cost of landscaping shall be based on the average of three estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a three-year maintenance and warranty period.
  4. Trees and the planter strip shall be installed per the approved landscape plan. In order to better protect newly planted trees, the applicant shall amend and aerate the soil in any areas where the soil has been compacted in a 15 foot radius around each tree to be planted and to a depth of 24 inches prior to planting trees in the right-of-way; in locations where there is a constructed planter strip (i.e. Crescent Road and Orient Drive), the applicant shall aerate the soil within the planter strip 15 feet in both directions from where the tree will be planted. The applicant shall call for an inspection with the City after aerating the soil and before planting the trees. In addition, the applicant shall obtain a letter of credit in the amount of \$500 per tree to cover replacement and establishment of the right-of-way trees should a right-of-way tree die within 3 years.
  5. Revegetate all areas where natural vegetation has been removed or damaged in areas that are not proposed to be occupied by structures or other improvements. This includes the area where the future building and parking are proposed.
  6. Install at least two public benches and one public art element or similar pedestrian amenity reviewed and approved by staff in the civic space.
  7. Install street address numbers measuring a minimum of six (6) inches high, which clearly locates the building and its entries for patrons and emergency services. The applicant shall verify the location(s) of the address with the Building Official and emergency service providers.
  8. Install an ADA ramp at the corner of SE Orient Drive and SE Crescent Road. Install two ADA ramps at the intersection of Highway 26 and Orient Drive.

9. Submit a mail delivery plan to the City and USPS for review and approval prior to installation of the mail delivery facility. Mail delivery facilities shall be provided by the applicant in conformance with 17.84.100 and the standards of the USPS.

**E. General Conditions:**

1. Design review, and variance/adjustment 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. Utility and frontage improvement plans are submitted solely to comply with the submission requirements of Section 17.90.100 of the Sandy Municipal Code. Land use approval does not connote approval of utility or street frontage improvement plans, which are subject to separate submittal and review processes.
3. The applicant shall call PGE's Service Coordination at 503-323-6700 when they are ready to start the project.
4. At the time of future development, the future building shall be designed to meet the Sandy Style requirements and shall be architecturally unified with the other building and structure on the site.
5. Vehicular and bicycle parking requirements associated with the future building shall be analyzed at the time of development of the future building.
6. The applicant shall ensure that the primary entrance on the south elevation is unlocked and functional during business hours; the primary entrance on the south elevation shall not be a faux entrance.
7. All street trees shall be a minimum of 1.5-inches in caliper measured 6 inches above the ground and shall be planted per the City of Sandy standard planting detail.
8. All landscaping shall be continually maintained in perpetuity, including necessary watering, weeding, pruning, and replacing.
9. The applicant shall follow all recommendations of the third-party arborist report with respect to air spading, root pruning, and any work within the critical root zone.
10. All utilities including franchise utilities shall be installed to City standards. All utilities are required to be placed underground in accordance with Section 17.100.250. All franchise utilities shall be installed underground with the exception of those listed in Section 17.84.80 (E). All onsite (including extensions from the poles in the right-of-way) overhead electrical and communications wires shall be placed underground. The applicant shall not run any wires overhead.



11. The applicant shall maintain a minimum 5 foot wide walkway free of obstructions along the north, west, and south building elevations, including the connection to Highway 26.
12. All structures on the subject property shall be constructed to comply with the standards of Section 17.80.20. All structures shall maintain a minimum 20-foot setback from the Highway 26 and Orient Drive public rights-of-way.
13. The trash enclosure shall be constructed of materials as identified in the plan set.
14. All sidewalks and ADA ramps shall comply with the most current ADA requirements.
15. Signage associated with the ADA parking spaces shall meet the head clearance distance requirement in the Building Code.
16. The pavement markings that connect the walkway to the parking west of the fuel pumps shall be painted periodically as lines become faded.
17. All on-site hydrology and hydraulics under the canopy/fueling area shall comply with the requirements of Section 13.18 of the Sandy Municipal Code and shall provide the components explained in the City of Portland Stormwater Management Manual (oil/water separator, spill control manhole, closed shut-off valve). In addition to these, the applicant shall install an impermeable liner in the pond and an emergency shut-off valve (normally open) down stream. In the case of a spill this valve could be closed. The applicant shall submit concurrence from Clackamas County to make sure they approve any potential fuel spill being routed to a stormwater pond that discharges to their roadside storm drain system.
18. All on-site grading shall be performed in accordance with the current Oregon Structural Specialty Code and shall be observed and documented under the supervision of a geotechnical Engineer or his/her representative.
19. The site shall be maintained and kept free of litter. All litter shall be collected and transported for offsite disposal as part of weekly service trips.
20. All new lighting shall be in compliance with Chapter 15.30, Dark Sky Ordinance which shall minimize light trespass on neighboring properties.
21. The applicant shall confer with Clackamas Fire District #1 to determine the number and location of on-site fire hydrants necessary to comply with the requirements of the Clackamas Fire District Fire Marshal. The applicant shall follow all Clackamas Fire District requirements.
22. The applicant shall obtain a permit for any proposed signage.
23. All rooftop equipment and mechanical, electrical, and communications equipment shall be screened from view from all public rights-of-way and civic spaces.

24. The applicant shall not place an external storage unit(s) on the property.
25. Successors-in-interest of the applicant shall comply with site development requirements prior to the issuance of building permits.
26. Comply with all other conditions or regulations imposed by Clackamas County, Clackamas Fire District #1, 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.

  
\_\_\_\_\_  
Kelly O'Neill Jr.  
Development Services Director

10/22/19  
\_\_\_\_\_  
Date

### RIGHT OF APPEAL

A decision on a land use proposal or permit may be appealed to the Planning Commission by an affected party by filing an appeal with the Director within twelve (12) calendar days of notice of the decision. Any person interested in filing an appeal should contact the city to obtain the form, "Notice of Appeal," and Chapter 17.28 of the Sandy Development Code regulating appeals. All applications for an appeal shall indicate the nature of the interpretation that is being appealed and the matter at issue will be a determination of the appropriateness of the interpretation of the requirements of the Code.

An application for an appeal shall contain:

1. An identification of the decision sought to be reviewed, including the date of the decision;
2. A statement of the interest of the person seeking review and that he/she was a party to the initial proceedings;
3. The specific grounds relied upon for review;
4. If de novo review or review by additional testimony and other evidence is requested, a statement relating the request to the factors listed in Chapter 17.28.50; and,
5. Payment of required filing fees.