CITY OF TUALATIN
Planning Division

Land Use Application

Project Information		
Project Title: CCB Driveway		
Brief Description: Proposed new access along SW 124th Ave. See detailed Narrative included in the AR submittal.		
Estimated Construction Value:		
Property Information		
Address: 12777 SW Tualatin Sherwood Road Tualatin, Oregon 97062		
Assessor's Map Number and Tax Lot(s): 2S128A000300		
Applicant/Primary Contact		
Name: Jennifer Kimura	Company Name: VLMK Engineering + Design	
Address: 3933 S Kelly Avenue		
City: Portland	State: Oregon	ZIP: 97062
Phone: 971.254.8300	Email: jenniferk@vlmk.com	
Property Owner		
Name: Columbia Corrugated Box		
Address: 12777 SW Tualatin Sherwood Road		
City: Tualatin	State: Oregon	ZIP: 97062
Phone: 971.413.6738	Email: roggy@p-r-c.com	
Property Owner's Signature: (Note: Letter of authorization is required if not signed by owner)		Date: 8-15-23

AS THE PERSON RESPONSIBLE FOR THIS APPLICATION, I HEREBY ACKNOWLEDGE THAT I HAVE READ THIS APPLICATION AND STATE THAT THE INFORMATION IN AND INCLUDED WITH THIS APPLICATION IN ITS ENTIRETY IS CORRECT. I AGREE TO COMPLY WITH ALL APPLICABLE CITY AND COUNTY ORDINANCES AND STATE LAWS REGARDING BUILDING CONSTRUCTION AND LAND USE.	
Applicant's Signature:	Date: 8.16.2023

Land Use Application Type:

- ☐ Annexation (ANN)
- ☒ Architectural Review (AR)
- ☐ Architectural Review—Single Family (ARSF)
- ☐ Architectural Review—ADU (ARADU)
- ☐ Conditional Use (CUP)
- ☐ Historic Landmark (HIST)
- ☐ Industrial Master Plan (IMP)
- ☐ Plan Map Amendment (PMA)
- ☐ Plan Text Amendment (PTA)
- ☐ Tree Removal/Review (TCP)
- ☐ Minor Architectural Review (MAR)
- ☐ Minor Variance (MVAR)
- ☐ Sign Variance (SVAR)
- ☐ Variance (VAR)
- ☐ Other _____

Office Use		
Case No:	Date Received:	Received by:
Fee:	Receipt No:	

To: Roggy Pflug

September 12, 2023

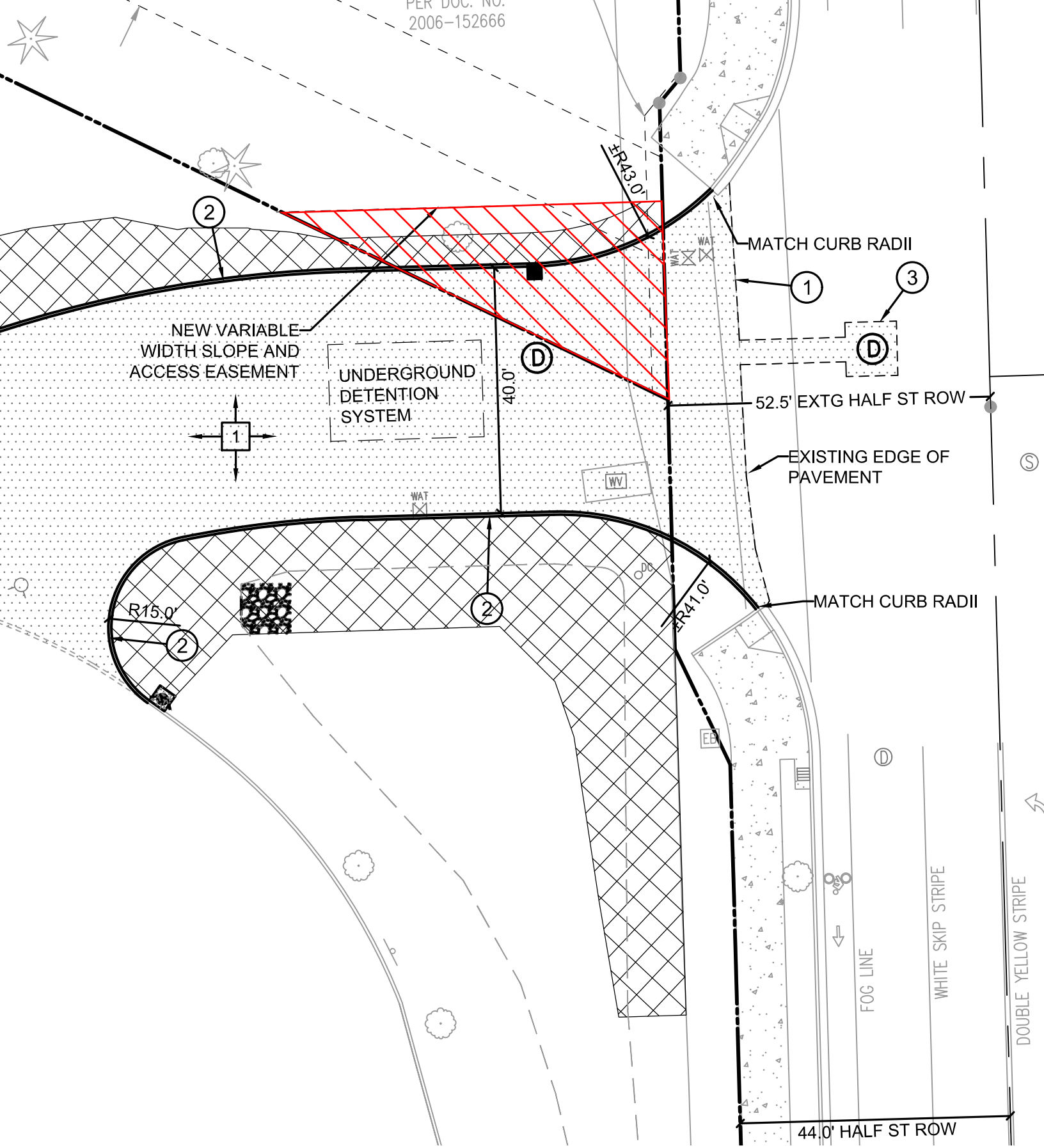
From: Charlie Johnson

Re: Proposed New Driveway

I am the owner of 20400 SW Cipole Road (Tax Lot: 2S128A000100). Please accept this correspondence as my consent and knowledge of the application for the driveway approach and tree removal proposed at 12777 SW Tualatin Sherwood Road (Tax Lot: 2S128A000300). My signature below authorizes this land use application as attached.

Charles Johnson

Date: 9-12-23



Slope & Access Easement

1" = 20'

20 0 20 40 60

124TH AVE DRIVEWAY ACCESS
COLUMBIA CORRUGATED BOX

12777 SW Tualatin Sherwood Rd
Tualatin, OR

ARCHITECTURAL REVIEW

VLMK Project Number: 20220513

Columbia Corrugated Box
Contact: Roggy Pflug
12777 SW Tualatin Sherwood Rd
Tualatin, OR 97062

Prepared By: Zach Adams
July 11th, 2023

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue, Portland, OR 97239 tel: 503.222.4453 VLMK.COM

PROJECT NARRATIVE

Project: Columbia Corrugated Box 124th Ave Driveway Access		
Site:	Address: 12777 SW Tualatin Sherwood Rd, Tualatin, OR 97062	
	Property ID: 2S128A 000300	R Number: R2035669
Cross Streets:	SW Cimino St at SW 124th Ave	
Applicant:	VLMK Engineering + Design	Contact: Jennifer Kimura, 503.709.0722
Owner:	Columbia Corrugated Box	Contact: Roggy Pflug 503.692.3344
Proposal:	The project consists of adding a new driveway access to the site via SW 124th Avenue.	
Zoning:	Industrial	

OVERVIEW:

The applicant is proposing to construct a new driveway access to the existing Columbia Corrugated Box (CCB) site via SW 124th Avenue. The proposed access will be a 40 ft wide asphalt driveway centered on the SW Cimino Rd centerline on the east side of 124th Ave. No changes to the existing building nor existing parking and drive aisles are proposed. Minor utility improvements as discussed further below are proposed due to the location of the new driveway.

An overall site plan is attached which will serve to generally describe the scope of the project.

SITE CONDITION

The site is currently fully improved with an industrial building and exterior support yards. The site is bounded by SW Cipole Rd on the west, Tualatin-Sherwood Rd to the south, 124th Ave to the east, and the Tualatin Island Greens driving range to the north. There is existing landscaping around the perimeter and interior of the property. The site is overall in good condition.

VEHICLE ACCESS

Currently, the site is accessed only via one of two driveways along SW Cipole Rd that borders the site on the west. These driveways are 210 and 800 feet from SW Tualatin-Sherwood Rd. The driveway will improve access for trucks and employees from CCB to enter and exit the site from a driveway that is further away from Tualatin-Sherwood Rd. No improvements to the internal circulation are proposed.

PARKING

No changes to the site's existing parking are proposed. The current parking spaces and layout complies with City of Tualatin standards for the existing development.

TRAFFIC AND TRANSPORTATION

A traffic study provided by Lancaster Mobley has been included in this AR application submittal. The study shows that the proposed SW 124th driveway and existing Cipole driveways will be

sufficient to serve this industrial use site. There will be a minimal increase in traffic along SW 124th Ave and either no change or a decrease in net traffic along SW Cipole Rd. Please refer to the report for a detailed traffic analysis.

JURISDICTIONS

There are several jurisdictions having some level of authority over the proposed project including:

1. City of Tualatin (Design Review, Traffic review, Public Works, Storm and Site Permits)
2. Clean Water Services (CWS) (Pre-screen Site Assessment and Public Works/Water Quality Permits)
3. Tualatin Valley Fire District

SITE UTILITIES

Storm:	The site's stormwater is managed by two stormwater swales, one at the northwest corner of the site and one at the northeast corner of the site, near where the new driveway will be constructed. These swales provide detention of stormwater and discharge stormwater into public stormwater mains in Cipole Rd and SW 124th Ave, respectively. This project will not impact the northwest swale. However, the northeast swale will be modified in shape due to the location of the new driveway. The total volume of the swale will not be decreased. New stormwater improvements include a treatment catch basin and underground detention system to manage stormwater from the new impervious area. Discharge from the detention system will connect into the public stormwater main in SW 124th Ave.
Sanitary:	The existing site is fully served with public sanitary sewer. The proposed upgrades are not anticipated to have an increase or change in impact to the sanitary system.
Water:	The site is fully served by public water and includes adequate service for on-site domestic service and fire protection systems. The only proposed work is the adjustment of one existing fire hydrant location which necessitates some new waterline work and new connections to the existing main. Onsite water service will remain in existing condition.
Gas:	The site is served by an existing gas service. No substantial impacts are anticipated with the proposed renovations.
Power:	The site is served by power with no anticipated changes.
Lighting:	On-site lighting systems will be upgraded with new energy efficient lights. Perimeter lighting will be pole mounted and shielded to prevent stray light from broadcasting to neighboring properties or the natural area to the west.
Solid Waste & Recycling:	The site is currently served by solid waste and recycling. Any changes to this service due to the new access will be coordinated with the provider, Republic Services. However, no changes are anticipated.

Responses to Applicable Sections of the Tualatin Development Code

TDC 32.010. Purpose and Applicability

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

(b) *Type II Procedure (Administrative/Staff Review with Notice).* A Type II procedure is used when the standards and criteria require limited discretion, interpretation, or policy or legal judgment. Type II decisions are made by the City Manager and require public notice and an opportunity for appeal to the Planning Commission, Architectural Review Board, or City Council as shown in Table 32-1. Those Type II decisions which are "limited land use decisions" as defined in ORS 197.015 are so noted in Table 32-1.

RESPONSE: The applicant understands these procedures. The Architectural Review will follow a Type II procedure, as determined by TDC.

TDC 32.140. Application Submittal

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

(a) *A completed application form.* The application form must contain, at a minimum, the following information:

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

(ii) The address or location of the subject property and its assessor's map and tax lot number;

(iii) The size of the subject property;

(iv) The comprehensive plan designation and zoning of the subject property;

(v) The type of application(s);

(vi) A brief description of the proposal; and

(vii) Signatures of the applicant(s), owner(s) of the subject property, and/or the duly authorized representative(s) thereof authorizing the filing of the application(s).

(b) A written statement addressing each applicable approval criterion and standard;

(c) Any additional information required under the TDC for the specific land use action sought;

(d) Payment of the applicable application fee(s) pursuant to the most recently adopted fee schedule;

(e) Recorded deed/land sales contract with legal description.

(f) A preliminary title report or other proof of ownership.

(g) For those applications requiring a neighborhood/developer meeting:

(i) The mailing list for the notice;

(ii) A copy of the notice;

(iii) An affidavit of the mailing and posting;

(iv) The original sign-in sheet of participants; and

(v) The meeting notes described in TDC 32.120(7).

(h) A statement as to whether any City-recognized Citizen Involvement Organizations (CIOs) whose boundaries include, or are adjacent to, the subject property were contacted in advance of filing the application and, if so, a summary of the contact. The summary must include the date when contact was made, the form of the contact and who it was with (e.g. phone conversation with neighborhood association chairperson, meeting with land use committee, presentation at neighborhood association meeting), and the result;

(i) Any additional information, as determined by the City Manager, that may be required by another provision, or for any other permit elsewhere, in the TDC, and any other information that may be required to adequately review and analyze the proposed development plan as to its conformance to the applicable criteria;

RESPONSE: All of the above submittal items have been included in the Type II Architectural Review application.

(2) *Application Intake.* Each application, when received, must be date-stamped with the date the application was received by the City, and designated with a receipt number and a notation of the staff person who received the application.

(3) *Administrative Standards for Applications.* The City Manager is authorized to establish administrative standards for application forms and submittals, including but not limited to plan details, information detail and specificity, number of copies, scale, and the form of submittal.

RESPONSE: The applicant understands these procedural standards.

TDC 33.110. Tree Removal Permit/Review

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

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

(3) *Exemptions.* The following actions are exempt from the requirements of a tree removal permit.

RESPONSE: None applicable

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

RESPONSE: Submitted with Type II Architectural Review application.

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

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

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

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

(iii) All existing and proposed structures;

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

(v) All existing public and private easements.

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

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

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

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

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

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

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

RESPONSE: A tree preservation plan is included with the Arborist's Tree Assessment Report. All trees over 8 inches in diameter have been tagged onsite.

(5) *Approval Criteria.*

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

(i) The tree is diseased and:

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

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

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

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

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

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

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

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

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

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

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

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

(A) Trunk Condition—extensive decay and hollow;

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

(C) Structure—Two or more dead limbs.

RESPONSE: The Arborist's Report shows that removal of the trees within the proposed disturbance limits is necessary to construct the project as proposed. The above criteria are met. Please reference the report included in this application.

(6) *Emergencies.* **RESPONSE: None applicable**

CHAPTER 73C PARKING STANDARDS

IN GENERAL

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

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

(a) Establishment of a new structure or use;

(b) Change in use; or

(c) Change in use of an existing structure.

RESPONSE: The proposal does not include any of the above, as the new access will not impact the new structure or the use of the structure. Therefore, the code requirements regarding off-street parking and loading are not applicable.

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

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

(3) *Industrial Use.* Ingress and egress for industrial uses must not be less than the following:

Required Parking Spaces	Minimum Number Required	Minimum Pavement Width	Minimum Pavement Walkways, etc.
1-250	1	36 feet for first 50' from ROW, 24 feet thereafter	No curbs or walkway required
Over 250	As required by City Manager	As required by City Manager	As required by City Manager

RESPONSE: The existing site has fewer than 250 parking spaces. Therefore, the minimum pavement width is 36' for the first 50' from ROW, and 24 feet thereafter. A 40' wide driveway is proposed along the entire length of the driveway. Therefore, this standard is met.

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

(a) Unless otherwise provided in this chapter, maximum driveway widths for Commercial, Industrial, and Institutional uses must not exceed 40 feet.

RESPONSE: The proposed 40' driveway meets this standard.

(b) Driveways must not be constructed within five feet of an adjacent property line, unless the two adjacent property owners elect to provide joint access to their respective properties, as provided by TDC73C.040.

RESPONSE: The proposed access utilizes an existing driveway that is located within five feet of an adjacent property line. The driveway at the ROW was originally located to be a joint access. However, this is no longer feasible due to existing grades. The proposed development of the lot to the north, Tualatin Logistics Park (AR 21-0011), is not proposing utilizing this driveway for access. The 124th Ave Access project proposes a new slope and access easement on the adjacent property that will be sized to meet the needs of the proposed development. The applicant will coordinate with the adjacent property owners to create the required easement. The proposal does not inhibit access to the adjacent property.

(c) The provisions of subsection (b) do not apply to townhouses, duplexes, triplexes, quadplexes, and cottage clusters which are allowed to construct driveways within five feet of adjacent property lines.

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

(e) Must comply with the distance requirements for access as provided in TDC 75.

(f) Must comply with vision clearance requirements in TDC 75.

RESPONSE: The above standards are met.

PARKING LOT LANDSCAPING

TDC 73C.240. Industrial Parking Lot Landscaping Requirements

(5) *Landscaping Along Driveway Access.* For lots with 12 or more parking spaces:

(a) Landscape area at least five (5) feet in width on each side of an accessway;

(b) Landscape area must extend 30 feet back from the property line; and

(c) Exceptions: does not apply to parking structures and underground parking which must be determined through the Architectural Review process.

RESPONSE: A landscaped area will be provided of at least five feet in width on both sides of the new driveway along its full length.

CHAPTER 74 PUBLIC IMPROVEMENT REQUIREMENTS

IMPROVEMENTS

TDC 74.120. Public Improvements

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

RESPONSE: The anticipated public improvements with this development are (1) asphalt paving to extend existing driveway, (2) installation of new storm manhole and storm lateral and (3) grading.

(2) In accordance with the Tualatin Basin Program for fish and wildlife habitat the City intends to minimize or eliminate the negative impacts of public streets by modifying right-of-way widths and street improvements when appropriate. The City Manager is authorized to modify right-of-way widths and street improvements to address the negative impacts on fish and wildlife habitat.

RESPONSE: No impacts to fish and wildlife habitat are anticipated with the Public Improvements.

TDC 74.130. Private Improvements

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

RESPONSE: The applicant understands this condition.

TDC 74.140. Construction Timing

(1) All the public improvements required under this chapter must be completed and accepted by the City prior to the issuance of a Certificate of Occupancy; or, for subdivision and partition applications, in accordance with the requirements of the Subdivision regulations.

(2) All private improvements required under this Chapter must be approved by the City prior to the issuance of a Certificate of Occupancy; or for subdivision and partition applications, in accordance with the requirements of the Subdivision regulations.

RESPONSE: The applicant is aware of these conditions.

RIGHT-OF-WAY

TDC 74.210. Minimum Street Right-of-Way Widths

The width of streets in feet must not be less than the width required to accommodate a street improvement needed to mitigate the impact of a proposed development. In cases where a street is

required to be improved according to the standards of the TDC, the width of the right-of-way must not be less than the minimums indicated in TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G.

(1) For subdivision and partition applications… **RESPONSE: Not applicable.**

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

RESPONSE: The existing half-street width of SW 124th Ave, a Major Arterial, is 44'. The preferred half width is 49'. Per early discussions with the City of Tualatin, a public access easement is allowed in lieu of dedication for the area of work adequate for a future 12-foot multi-use path. This results in a total of 56' with the added multi-use path.

(3) For development applications that will impact existing streets not adjacent to the applicant's property… **RESPONSE: Not applicable.**

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

(5) Whenever a proposed development is bisected by an existing or future road or street… **RESPONSE: Not applicable.**

(6) When a proposed development is adjacent to or bisected by a street proposed in the Transportation System Plan…. **RESPONSE: Not applicable.**

EASEMENTS AND TRACTS

TDC 74.310. Greenway, Natural Area, Bike, and Pedestrian Path Dedications and Easements

RESPONSE: Not applicable.

TDC 74.320. Slope Easements

(1) The applicant must obtain and convey to the City any slope easements determined by the City Manager to be necessary adjacent to the proposed development site to support the street

improvements in the public right-of-way or accessway or utility improvements required to be constructed by the applicant.

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

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

RESPONSE: Any required slope easements for the support of public streets are either currently in place or will be provided prior to Building Permit issuance and will meet all of the above criteria.

TDC 74.320. Slope Easements

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

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

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

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

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

RESPONSE: Any required utility easements are either currently in place or will be provided prior to Building Permit issuance, and will meet all of the above criteria.

TDC 74.340. Watercourse Easements

RESPONSE: Not applicable.

TDC 74.340. Maintenance Easement or Lots

A dedicated lot or easement will be required when access to public improvements for operation and maintenance is required, as determined by the City Manager. Access for maintenance vehicles must be constructed of an all-weather driving surface capable of carrying a 50,000-pound vehicle. The width of the lot or easement must be at least 15-feet in order to accommodate City maintenance vehicles. In subdivisions and partitions, the easement or lot must be dedicated to the City on the final plat. In any other development, the easement or lot must be granted to the City and recorded prior to issuance of a building permit.

RESPONSE: Any required maintenance easements are either currently in place or will be provided prior to Building Permit issuance, and will meet all of the above criteria.

TDC 74.410. Future Street Extensions

RESPONSE: Not applicable.

TDC 74.420. Street Improvements

RESPONSE: Not applicable, as SW 124th Ave already has half-street improvements. The ADA sidewalk ramps may receive minor improvements depending on the existing condition.

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

RESPONSE: Not applicable.

TDC 74.440. Streets, Traffic Study Required

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

(a) Assure that the existing or proposed transportation facilities in the vicinity of the proposed development are capable of accommodating the amount of traffic that is expected to be generated by the proposed development; and/or

(b) Assure that the internal traffic circulation of the proposed development will not result in conflicts between on-site parking movements and/or on-site loading movements and/or on-site traffic movements, or impact traffic on the adjacent streets.

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

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

(a) An analysis of the existing situation, including the level of service on adjacent and impacted facilities.

(b) An analysis of any existing safety deficiencies.

(c) Proposed trip generation and distribution for the proposed development.

(d) Projected levels of service on adjacent and impacted facilities.

(e) Recommendation of necessary improvements to ensure an acceptable level of service for roadways and a level of service of at least D and E for signalized and unsignalized intersections respectively, after the future traffic impacts are considered.

(f) The City Manager will determine which facilities are impacted and need to be included in the study.

(g) The study must be conducted by a registered engineer.

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

RESPONSE: A Traffic Study done by Lancaster Mobley has been provided with this AR submittal.

UTILITIES

TDC 74.610. Water Service

RESPONSE: Not applicable, existing site is served by water.

TDC 74.620. Sanitary Sewer Service

RESPONSE: Not applicable, existing site is served by sanitary sewer.

TDC 74.630. Storm Drainage System

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

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

RESPONSE: Discharge from the newly created impervious area will be managed by an on-site treatment and detention system in accordance with the City's standards. A preliminary stormwater management plan are included with the AR application.

(3) If there are undeveloped properties adjacent to the proposed development site which can be served by the storm drainage system on the proposed development site… **RESPONSE: Not applicable.**

TDC 74.640. Grading

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

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

RESPONSE: Proposed grading will not impact drainage on adjacent properties. A preliminary grading plan is included with the AR application.

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

RESPONSE: Not applicable, existing site is served by sanitary sewer.

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

(1) On subdivision and partition development applications… **RESPONSE: Not applicable**

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

RESPONSE: Discharge from the newly created impervious area will be managed by an on-site treatment and detention system in accordance with the City's standards. A preliminary stormwater management plan and preliminary storm report are included with the AR application.

(3) For on-site private and regional non-residential public facilities… **RESPONSE: Not applicable**

TDC 74.660. Underground

RESPONSE: Not applicable, existing site is serviced by applicable underground franchise utility lines.

TDC 74.670. Existing Structures

(1) Any existing structures requested to be retained by the applicant on a proposed development site must be connected to all available City utilities at the expense of the applicant.

(2) The applicant must convert any existing overhead utilities serving existing structures to underground utilities, at the expense of the applicant.

(3) The applicant must be responsible for continuing all required street improvements adjacent to the existing structure, within the boundaries of the proposed development site.

RESPONSE: The existing structure on site will be retained and the above criteria will be met.

TDC 74.700. Removal, Destruction or Injury of Trees

It is unlawful for a person, without a written permit from the City Manager, to remove, destroy, break or injure a tree, plant or shrub, that is planted or growing in or upon a public right-of-way within the City, or cause, authorize, or procure a person to do so, authorize or procure a person to injure, misuse or remove a device set for the protection of any tree, in or upon a public right-of-way.

RESPONSE: No trees will be removed from the public right-of-way without a permit.

TDC 74.705. Street Tree Removal Permit

RESPONSE: Not applicable, no existing street trees are proposed to be removed.

TDC 74.706. Street Tree Fees

RESPONSE: Not applicable

TDC 74.707. Street Tree Voluntary Planting

RESPONSE: Not applicable

TDC 74.708. Street Tree Emergencies

RESPONSE: Not applicable

TDC 74.710. Open Ground

When impervious material or substance is laid down or placed in or upon a public right-of-way near a tree, at least nine square feet of open ground for a tree up to three inches in diameter must be provided about the base of the trunk of each tree.

RESPONSE: Not applicable, no trees are proposed.

TDC 74.715. Attachments to Trees

It is unlawful for a person to attach or keep attached a rope, wire, chain, sign or other device to a tree, plant or shrub in or upon a public right-of-way or to the guard or stake intended for the protection of such tree, except as a support for a tree, plant or shrub.

RESPONSE: No attachments will be made to trees in the right of way.

TDC 74.720. Protection of Trees During Construction

(1) During the erection, repair, alteration or removal of a building or structure, it is unlawful for the person in charge of such erection, repair, alteration or removal to leave a tree in or upon a public right-of-way in the vicinity of the building or structure without a good and sufficient guard or

protectors to prevent injury to the tree arising out of or by reason of such erection, repair, alteration or removal.

(2) Excavations and driveways must not be placed within six feet of a tree in or upon a public right-of-way without written permission from the City Manager. During excavation or construction, the person must guard the tree within six feet and all building material or other debris must be kept at least four feet from any tree.

RESPONSE: Existing street trees will be protected during construction of the new driveway per the standards above.

TDC 74.725. Maintenance Responsibilities

Trees, shrubs or plants standing in or upon a public right-of-way, on public or private grounds that have branches projecting into the public street or sidewalk must be kept trimmed by the owner of the property adjacent to or in front of where such trees, shrubs or plants are growing so that:

(1) The lowest branches are not less than 12 feet above the surface of the street, and are not be less than 14 feet above the surface of streets designated as state highways.

(2) The lowest branches are not less than eight feet above the surface of a sidewalk or footpath.

(3) A plant, tree, bush or shrub must not be more than 24 inches in height in the triangular area at the street or highway corner of a corner lot, or the alley-street intersection of a lot, such an area defined by a line across the corner between the points on the street right-of-way line measured ten feet back from the corner, and extending the line to the street curbs or, if there are no curbs, then to that portion of the street or alley used for vehicular traffic.

(4) Newly planted trees may remain untrimmed if they do not interfere with street traffic or persons using the sidewalk or obstruct the light of a street electric lamp.

(5) Maintenance responsibilities of the property owner include repair and upkeep of the sidewalk in accordance with the City Sidewalk Maintenance Ordinance.

RESPONSE: Landscaping in the ROW along SW 124th will be maintained by the property owner.

TDC 74.730. Notice of Violation

When the owner, lessee, occupant or person in charge of private grounds neglects or refuses to trim a tree, shrub or plant as provided in TDC 74.725, the City Manager must cause a written notice to trim such tree or trees, shrubs or plants to be served upon such owner, lessee, occupant or person in charge, within ten days after the giving the notice; and if the owner, lessee or occupant or person in charge fails to do so, the person is guilty of violating this ordinance and subject to the penalties in TDC 74.760. The notice must be served upon the owner, lessee, occupant or person in charge either by "Certified Mail-Return Receipt Requested," or by posting the same notice on the property or near to the trees, shrubs or plants to be trimmed.

RESPONSE: The applicant understands this condition.

TDC 74.735. Trimming by City

If the owner, lessee, occupant or person in charge of the property fails and neglects to trim the trees, shrubs or plants within ten days after service of the notice in TDC 74.730, the City Manager may trim the trees, shrubs or plants. Such trimming by the City does not act to relieve such owner, lessee, occupant or person in charge of responsibility for violating this Chapter.

RESPONSE: The applicant understands this condition.

TDC 74.740. Prohibited Trees

It is unlawful for a person to plant a tree within the right-of-way of the City of Tualatin that is not in conformance with City standards, including Table 74-1. Any tree planted subsequent to adoption of this Chapter not in compliance with City standards, including Table 74-1, must be removed at the expense of the property owner.

RESPONSE: The applicant understands this condition.

TDC 74.745. Cutting and Planting Specifications

The following regulations are established for the planting, trimming and care of trees in or upon the public right-of-way of the City.

(1) When trees are cut down, the stump must be removed to a depth of six inches below the surface of the ground or finish grade of the street, whichever is of greater depth.

(2) Trees must be planted in accordance with City standards, Table 74-1, except when a greater density is allowed under a special permit from the City Manager.

RESPONSE: The applicant understands this condition.

TDC 74.750. Removal or Treatment by City

The City Manager may remove or cause or order to be removed a tree, plant or shrub, planted or growing in or upon a public right-of-way which by its nature causes an unsafe condition or is injurious to sewers or public improvements, or is affected with an injurious fungus disease, insect or other pest. When, in the opinion of the City Manager, trimming or treatment of a tree or shrub located on private grounds, but having branches extending over a public right-of-way is necessary, the City Manager may trim or treat such a branch or branches, or cause or order branches to be trimmed or treated.

RESPONSE: The applicant understands this condition.

TDC 74.755. Appeal or Permit Denial

When application for a permit under this Chapter is denied by the City Manager, an order is issued by the City Manager directing certain trees, shrubs or plants to be trimmed or removed, or a permit is

granted by the City Manager containing conditions which the applicant deems unreasonable, the applicant may appeal to the Council in writing and filed with the City Recorder within ten City business days after the denial of the permit sought or the making of the order the appellant deems unreasonable. After hearing, the Council may either grant or deny the application, rescind or modify the order from which the appeal was taken.

RESPONSE: The applicant understands this condition.

TDC 74.760. Penalties

A person who violates this ordinance or fails to trim a tree or shrub for which notice to do so was provided, must, upon conviction, be fined not more than $100.00.

RESPONSE: The applicant understands this condition.

TDC 74.765. Street Tree Species and Planting Locations

All trees, plants or shrubs planted in the right-of-way of the City must conform in species and location and in accordance with the street tree plan and City standards, including Table 74-1. If the City Manager determines that none of the species in City standards, including Table 74-1 is appropriate or finds appropriate a species not listed, the City Manager may substitute an unlisted species.

RESPONSE: The applicant understands this condition.

CHAPTER 75 ACCESS MANAGEMENT

TDC 75.020 Permit for New Driveway Approach

(1) *Applicability.* A driveway approach permit must be obtained prior to constructing, relocating, reconstructing, enlarging, or altering any driveway approach.

RESPONSE: A driveway approach permit will be required for this project.

(2) *Exceptions*… **RESPONSE: Not applicable.**

(3) *Procedure Type.* A Driveway Approach Permit is processed as a Type II procedure under TDC 32.220 (Type II).

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

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

(i) The location and dimensions of the proposed driveway approach;

(ii) The relationship to nearest street intersection and adjacent driveway approaches;

(iii) Topographic conditions;

(iv) The location of all utilities;

(v) The location of any existing or proposed buildings, structures, or vehicular use areas;

(vi) The location of any trees and vegetation adjacent to the location of the proposed driveway approach that are required to be protected pursuant to TDC Chapter 73B or 73C; and

(vii) The location of any street trees adjacent to the location of the proposed driveway approach.

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

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

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

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

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

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

(d) The proposed driveway approach, where possible:

(i) Is shared with an adjacent property; or

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

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

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

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

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

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

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

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

RESPONSE: The submittal requirements and criteria are understood for the driveway approach permit. After the Architectural Review, the applicant will be applying for this permit.

TDC 75.030 Driveway Approach Closure

RESPONSE: Not applicable.

TDC 75.040 Driveway Approach Requirements

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

driveway approach requirements, it is unlawful and a violation of this code to begin or maintain such altered use until the required increase in driveway approach is authorized by the City.

RESPONSE: The use of the existing building is not proposed to be changed, and therefore the site is in compliance independent of the driveway approach permit.

(2) Owners of two or more uses, structures, or parcels of land may agree to utilize jointly the same driveway approach when the combined driveway approach of both uses, structures, or parcels of land satisfies their combined requirements as designated in this code; provided that satisfactory legal evidence is presented to the City Attorney in the form of deeds, easements, leases or contracts to establish joint use. Copies of said deeds, easements, leases or contracts must be placed on permanent file with the City Recorder.

(3) Joint and Cross Access.

(a) Adjacent commercial uses may be required to provide cross access drive and pedestrian access to allow circulation between sites.

(b) A system of joint use driveways and cross access easements may be required and may incorporate the following:

(i) A continuous service drive or cross access corridor extending the entire length of each block served to provide for driveway separation consistent with the access management classification system and standards;

(ii) A design speed of ten mph and a maximum width of 24 feet to accommodate two-way travel aisles designated to accommodate automobiles, service vehicles, and loading vehicles;

(iii) Stub-outs and other design features to make it visually obvious that the abutting properties may be tied in to provide cross access via a service drive; and

(iv) An unified access and circulation system plan for coordinated or shared parking areas.

(c) Pursuant to this section, property owners may be required to:

(i) Record an easement with the deed allowing cross access to and from other properties served by the joint use driveways and cross access or service drive;

(ii) Record an agreement with the deed that remaining access rights along the roadway will be dedicated to the city and pre-existing driveways will be closed and eliminated after construction of the joint-use driveway;

(iii) Record a joint maintenance agreement with the deed defining maintenance responsibilities of property owners; and

(iv) If subsection(i) through (iii) above involve access to the state highway system or county road system, ODOT or the county must be contacted and must approve changes to subsection(i) through (iii) above prior to any changes.

RESPONSE: As discussed above, the proposed access is partially located on the adjacent property, however it is not proposed for joint access. Therefore, the joint and cross access standards are not applicable. An easement will be created that allows access through the portion of the adjacent property.

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

RESPONSE: Not applicable.

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

RESPONSE: The lot is fronted by three streets; access is proposed for the two lower classification of streets (Cipole & 124th Ave), while no access is proposed along Tualatin-Sherwood Rd.

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

RESPONSE: The proposed access is in compliance with this standard.

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

RESPONSE: There is an existing sidewalk along the street frontage, including ADA sidewalk ramps at the proposed driveway location. No changes to the sidewalk are proposed.

(8) The standards set forth in this Code are minimum standards for driveway approaches, and may be increased through the Architectural Review process in any particular instance where the standards provided herein are deemed insufficient to protect the public health, safety, and general welfare.

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

Use	Minimum Driveway Approach Width	Maximum Driveway Approach Width
Industrial	36 Feet	Over 250 Parking spaces = as required by the City Manager, but not exceeding 40 feet

RESPONSE: The proposed 40' wide driveway is in compliance with this condition.

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

RESPONSE: The location of the proposed driveway is in compliance with this condition.

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

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

(b) At the intersection of two local streets, driveways must be located a minimum of 30 feet from the intersection.

(c) If the subject property is not of sufficient width to allow for the separation between driveway and intersection as provided, the driveway must be constructed as far from the intersection as possible, while still maintaining the 5-foot setback between the driveway and property line.

(d) When considering a driveway approach permit, the City Manager may approve the location of a driveway closer than 150 feet from the intersection of collector or arterial streets, based on written findings of fact in support of the decision.

RESPONSE: The location of the proposed driveway is in compliance with this condition.

(12) *Vision Clearance Area.*

(a) *Local Streets.* **RESPONSE: Not applicable.**

(b) *Collector Streets.* **RESPONSE: Not applicable.**

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

RESPONSE: No objects that violate the vertical height restriction are proposed.

TDC 75.050 Access Limited Roadways

(1) This section applies to all developments, permit approvals, land use approvals, partitions, subdivisions, or any other actions taken by the City pertaining to property abutting any road or street listed in TDC 75.050(2). In addition, any property not abutted by a road or street listed in subsection (2), but having access to an arterial by any easement or prescriptive right, must be treated as if the property did abut the arterial and this Chapter applies.

(2) The following Freeways and Arterials are access limited roadways:

(f) 124th Avenue from Pacific Highway 99W south to Tonquin to Basalt Creek Parkway;

RESPONSE: The proposed driveway is located on 124th Ave along this section. Therefore, this chapter applies.

If the Council finds that any other road or street is in need of access control for any reason, it may direct that the street or road be added to this section through a Plan Text Amendment.

(3) This Chapter takes precedence over any other TDC chapter and over any other ordinance of the City when considering any development, land use approval or other proposal for property abutting an arterial or any property having an access right to an arterial.

(4) The City may act on its own initiative to protect the public safety and control access on arterials or any street to be included by TDC 75.030, consistent with its authority as the City Road Authority.

RESPONSE: The applicant understands this condition.

TDC 75.060 Interim Access Agreement

RESPONSE: Not applicable, interim access is not necessary as the site has two existing accesses that will remain operational during permitting and construction of the proposed access.

TDC 75.070 Existing Driveways and Street Intersections

(1) Existing driveways with access onto arterials on the date this chapter was originally adopted are allowed to remain. If additional development occurs on properties with existing driveways with access onto arterials then this Chapter applies and the entire site must be made to conform with the requirements of this chapter.

(2) The City Manager may restrict existing driveways and street intersections to right-in and right-out by construction of raised median barriers or other means.

RESPONSE: The location of the existing driveway is allowed per this section.

TDC 75.100 Spacing Standards for New Intersections

RESPONSE: Not applicable.

TDC 75.110 Joint Access Standards

RESPONSE: Not applicable.

TDC 75.120 Collector Streets Access Standards

RESPONSE: Not applicable.

TDC 75.130 New Streets Access Standards

RESPONSE: Not applicable.

TDC 75.140 Existing Streets Access Standards

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

(6) *124TH AVENUE.*

(a) Pacific Highway to Tualatin Road. No street or driveway accesses on the west side of this intersection will be permit-ted. No driveway accesses shall be allowed between Pacific Highway 99W and Tualatin Road.

(b) Tualatin Road to Herman Road. Between Tualatin Road and Herman Road, access to 124th Avenue shall be limited to a street intersection at Leveton Drive. The area west of the 124th Avenue/Tualatin Road intersection and south of Pacific Highway 99W will be served by a cul-de-sac connecting to the westward extension of Leveton Drive.

(c) Herman Road to Tualatin-Sherwood Road. On the east side of 124th Avenue between Herman Road and Tualatin-Sherwood Road the area will be served by the following streets or driveways:

(i) A street intersection at Myslony Street.

(ii) A street or driveway intersection approximately 800 feet south of the Myslony Street/124th Avenue intersection extending east with an alternative to extend north to connect with Myslony Street a minimum of 150 feet east of 124th Avenue. Access may be limited to right in/right out as determined by the City Manager.

(iii) Cimino Street extending east and south to an intersection at Tualatin-Sherwood Road across from 120th Avenue. The exact location and configuration of the streets and driveways shall be determined by the City Manager.

(iv) On the west side of 124th Avenue between Herman Road and Tualatin-Sherwood Road the area will be served by the following streets or driveways:

(A) A driveway across from Myslony Street.

(B) A street or driveway intersection approximately 800 feet north of the intersection of Tualatin-Sherwood Road and 124th Avenue. The exact location and configuration of the streets or driveways shall be determined by the City Manager.

(d) Tualatin-Sherwood Road. Between Tualatin-Sherwood Road and Basalt Creek Parkway access to 124th Avenue shall be limited to street intersections at Tonquin Road and one other location.

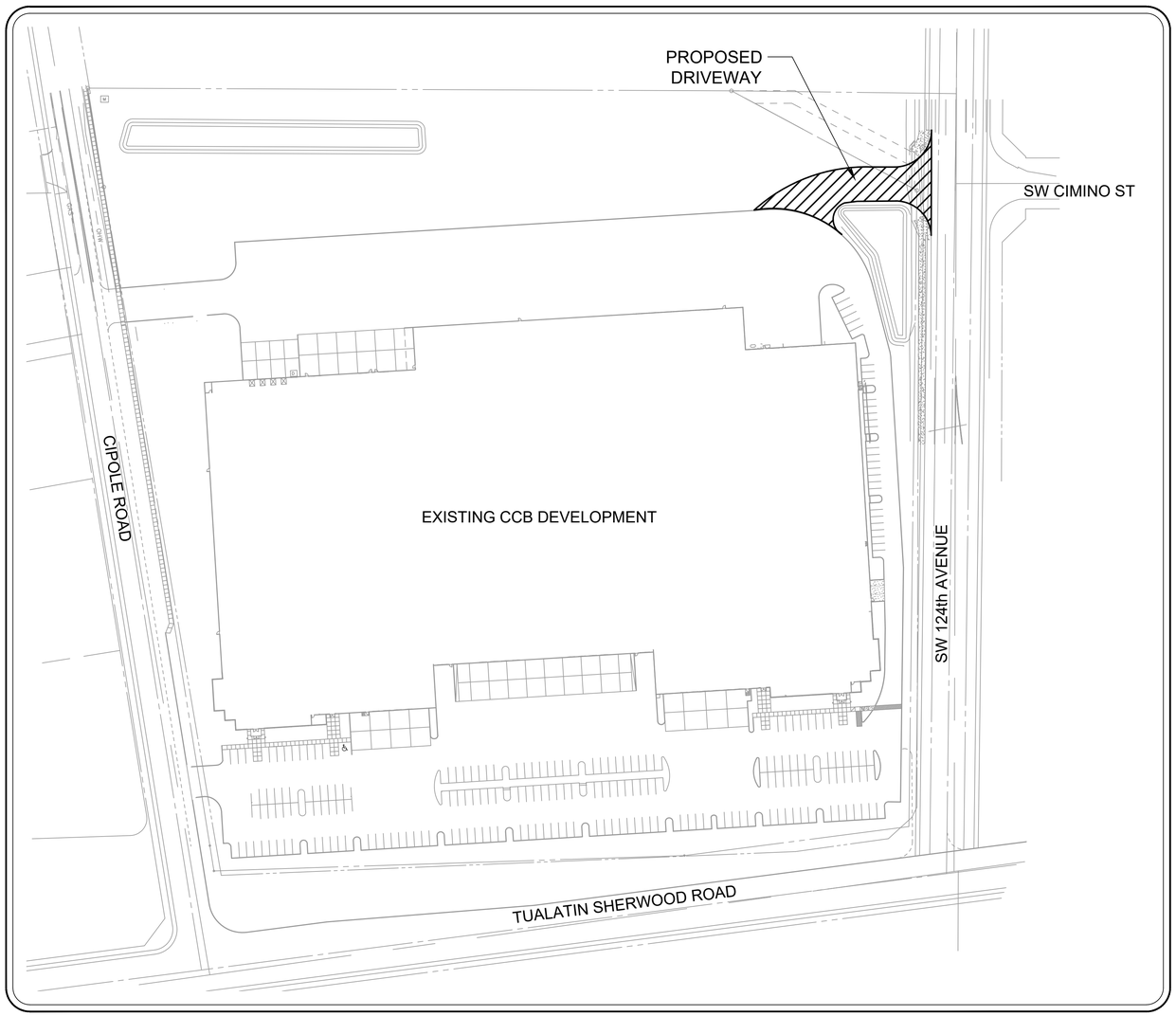
RESPONSE: The applicable standard in this section is (6) (c) (iv), as the proposed access is on the west side of 124th Ave between Herman Rd and Tualatin-Sherwood Rd. The proposed access is specified in item (B), as the proposed access is located approximately 800 feet north of the intersection of Tualatin-Sherwood Rd and 124th Ave. Therefore, the proposal is acceptable.

COLUMBIA CORRUGATED BOX

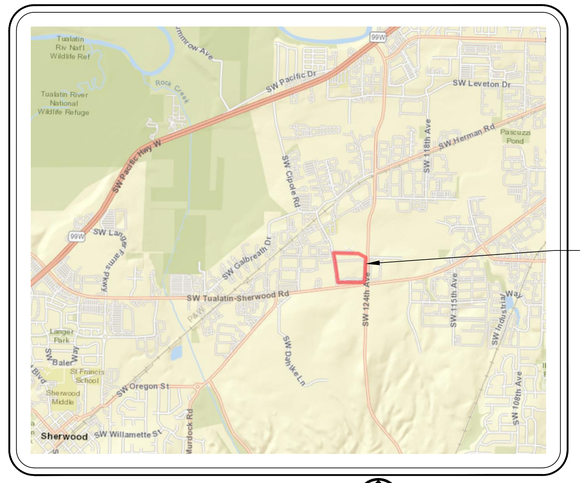
NEW DRIVEWAY

12777 SW TUALATIN-SHERWOOD

ROAD TUALATIN, OREGON 97062



SITE MAP
1" = 80'



VICINITY MAP
NTS

PROJECT DIRECTORY:

ENGINEER:
VLMK ENGINEERING + DESIGN
3933 SOUTH KELLY AVENUE
PORTLAND, OREGON 97239
PHONE: (503) 222-4453
CONTACT: BRIAN DUBAL, COREY THEISEN

SURVEYOR:
NORTHWEST SURVEYING, INC
1815 NORTHWEST 169TH PLACE SUITE 2090
BEAVERTON, OREGON 97006
PHONE: (503) 848-2127
CONTACT: COREY WATSON

GEOTECHNICAL ENGINEER:
COLUMBIA WEST ENGINEERING
11917 NE 95TH ST
VANCOUVER, WA 98682
PHONE: (360) 823-2900
CONTACT: BRETT SHIPTON

LANDSCAPE ARCHITECT:
OTTEN AND ASSOCIATES
3933 SOUTH KELLY AVENUE, SUITE 'B'
PORTLAND, OREGON 97239
PHONE: (503) 972-0311
CONTACT: ERIN HOLSONBACK

JURISDICTION:
CITY OF TUALATIN
10699 SOUTHWEST HERMAN ROAD
TUALATIN, OREGON 97062
PHONE: (503) 691-3044
CONTACT: ERIN ENGMAN

DEVELOPER:
COLUMBIA CORRUGATED BOX
12777 SW TUALATIN - SHERWOOD RD
TUALATIN, OR 97062
CONTACT: ROGGY PFLUG
EMAIL: ROGGY@CCBOX.COM

PROJECT INFORMATION:

NARRATIVE:

THE PROPOSED PROJECT CONSISTS OF ADDING A NEW ACCESS TO THE SITE VIA SW 124TH AVENUE. PROPOSED ACCESS WILL BE 40-FT WIDE AND CENTERED ON THE SW CIMINO ACROSS THE ROADWAY.

PLANNING / ZONING REVIEW:

JURISDICTION	CITY OF TUALATIN, OREGON
LAND USE ZONE	INDUSTRIAL
OVERLAY ZONES	NONE
STREET ADDRESS	12777 SW TUALATIN SHERWOOD ROAD
LEGAL DESCRIPTION	MAP 2S 1 28A, TAX LOT 300, CITY OF TUALATIN, WASHINGTON COUNTY OREGON

SHEET INDEX

VLMK ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME
COLUMBIA CORRUGATED BOX SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

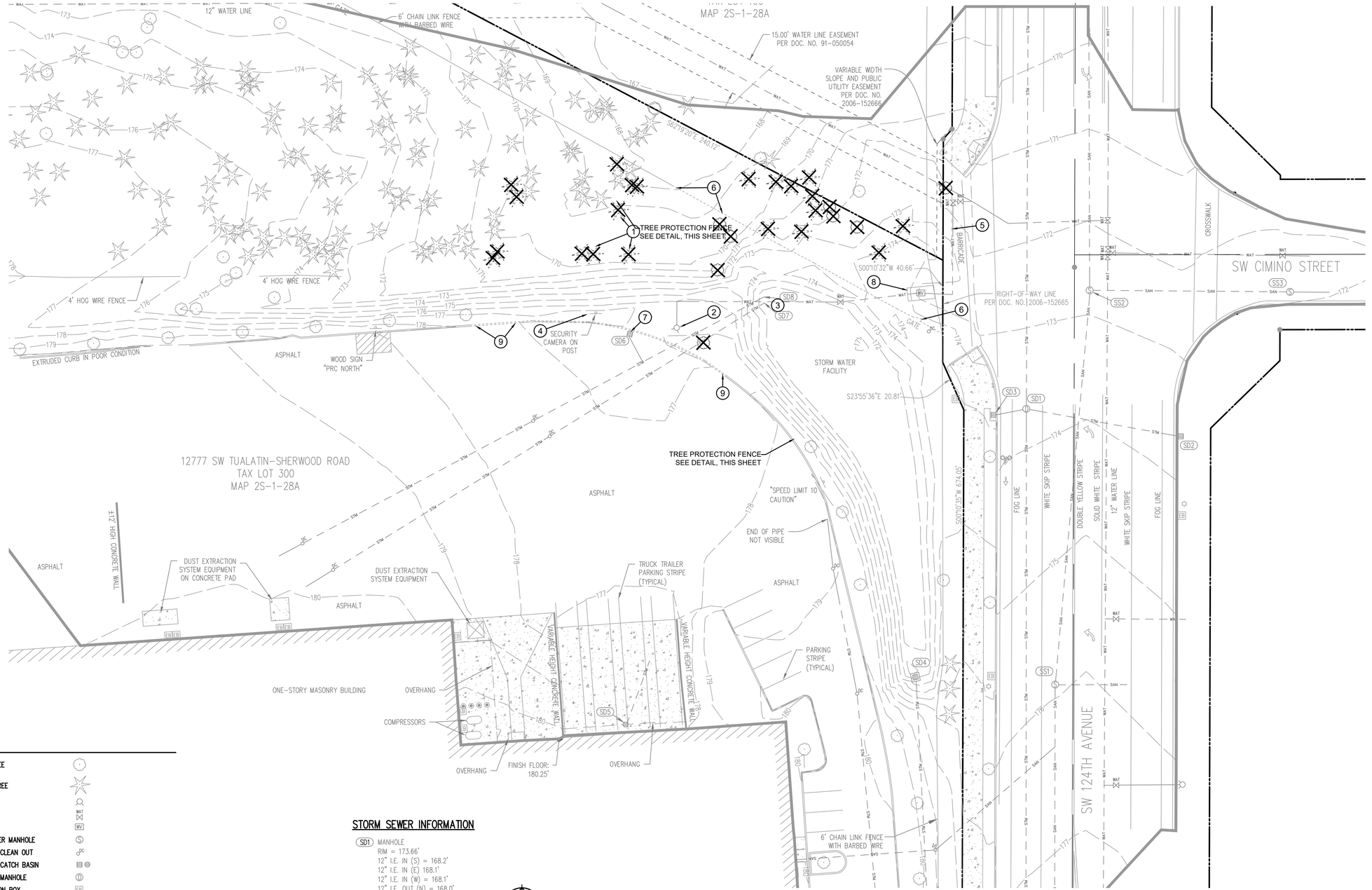
	DATE	DESCRIPTION

DATE APRIL 2022

SCALE	PROJ. NO.
AS NOTED	20220513
DRAWN: ZWA	CHECKED: BMD

COVER SHEET

CVR1.0



LEGEND

- DECIDUOUS TREE
- CONIFEROUS TREE
- FIRE HYDRANT
- WATER VALVE
- WATER VAULT
- SANITARY SEWER MANHOLE
- STORM SEWER CLEAN OUT
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- POWER JUNCTION BOX
- STREET LIGHT
- SIGN
- BOLLARD
- FOUND SURVEY MONUMENT
- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- PROPERTY LINE
- CENTERLINE
- DITCH
- CURB
- EDGE OF PAVEMENT
- EASEMENT
- FENCE LINE
- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE

SANITARY SEWER INFORMATION

(SS1) MANHOLE
RIM = 175.90'
10" (S TO N)
FLOW LINE = 164.5'

(SS2) MANHOLE
RIM = 172.46'
10" I.E. IN (W) = 164.3'
10" I.E. IN (S) = 163.7'
10" I.E. IN (E) = 163.7'
8" I.E. OUT (N) = 163.4'

(SS3) MANHOLE
RIM = 172.18'
10" (E TO W)
FLOW LINE = 164.7'

STORM SEWER INFORMATION

(SD1) MANHOLE
RIM = 173.66'
12" I.E. IN (S) = 168.2'
12" I.E. IN (E) 168.1'
12" I.E. IN (W) = 168.1'
12" I.E. OUT (N) = 168.0'

(SD2) CURB INLET
RIM = 174.08'
12" I.E. OUT (W) = 168.7'

(SD3) CURB INLET
RIM = 173.87'
12" I.E. OUT (E) = 168.2'

(SD4) DITCH INLET
RIM TOP = 173.19'
RIM BOTTOM = 172.06'
18" I.E. OUT (S) = 170.2'

(SD5) CATCH BASIN - ROUND
RIM = 176.34'
TRAP (NE)

(SD6) LYNCH STYLE CATCH BASIN
RIM = 176.33'
TRAP (S)

(SD7) CONCRETE OUTFALL
10" I.E. (W) = 171.1'

(SD8) PVC OUTFALL
10" I.E. (W) = 171.1'

EXISTING CONDITIONS & DEMO PLAN

1" = 20'

20 0 20 40 60

DEMO KEYNOTES (#)

1. REMOVE EXISTING TREES AS SHOWN (TYPICAL) AND PER ARBORISTS RECOMMENDATIONS.
2. RELOCATE EXISING FIRE HYDRANT PER PLAN ON SHEET C1.0.
3. RELOCATE EXISTING STORM OUTFALLS SD7 AND SD8 PER PLAN ON SHEET C1.0.
4. RELOCATE SIGN
5. DEMO DRIVEWAY BARRICADE
6. DEMO GATE AND FENCE AS NECESSARY
7. PROTECT EXISTING CATCH BASIN
8. PROTECT EXISTING VAULT

SURVEYOR'S NOTES

1. FIELD SURVEY FOR THIS MAP WAS COMPLETED ON FEBRUARY 13, 2023.
2. ELEVATIONS AND CONTOURS ARE BASED ON WASHINGTON COUNTY BENCHMARK NO. 102. THE BENCHMARK IS A BRASS DISK LOCATED NORTH OF THE RAILROAD TRACKS NEAR THE MOST NORTHERLY CORNER OF THE PROPERTY, AS SHOWN. IT HAS AN ELEVATION OF 157.30 FEET ON THE NGVD 1929 VERTICAL DATUM.
3. THE BASIS OS BEARINGS FOR THIS SURVEY IS WASHINGTON COUNTY RECORD OF SURVEY NO. 32478.
4. THE RIGHT-OF-WAY WIDTHS WERE ESTABLISHED USING INFORMATION FROM PLATS, RECORD SURVEYS AND THE TAX ASSESSOR'S MAP.
5. THE EASEMENTS SHOWN ON THIS MAP ARE BASED ON THE TITLE REPORT, PREPARED BY OLD REPUBLIC TITLE INSURANCE COMPANY WITH AN EFFECTIVE DATE OF MARCH XX 2023 AT 8:00 AM
6. THE UNDERGROUND UTILITIES ARE BASED ON THE MARKINGS PER LOCATE TICKET NUMBER 23016606.
7. TREES WITH NUMBER 1-447 HAVE ALUMINUM TAGS WITH CORRESPONDING NUMBERS. THE TREES WITH LARGER NUMBERS DO NOT HAVE TAGS.

UTILITY STATEMENT

THE UNDERGROUND UTILITIES HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME
COLUMBIA CORRUGATED BOX
SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

⚠	DATE	DESCRIPTION

DATE: APRIL 2022

SCALE	PROJ. NO.
AS NOTED	20220513
DRAWN	CHECKED
ZWA	BMD

EXISTING CONDITIONS & DEMO PLAN

C0.0

G:\Acad2022\20220513\0-Drawings\100 C0.0 EXISTING CONDITIONS AND DEMO PLAN.dwg7/20/2023 9:12 AM

GENERAL SYMBOLS

EXISTING	NEW	
	■	CATCH BASIN (CB) -OR- AREA DRAIN (AD)
	●	MANHOLE (MH)
	●	UTILITY POLE
	◆	FIRE HYDRANT (FH)
M	M	METER
V	V	UTILITY VAULT
T	T	TRANSFORMER AND PAD
TRAN	TRAN	TRANSFORMER
	⊗	VALVE BOX COVER
	⊠	POST INDICATOR VALVE
	✳	LIGHT POLE
	✳	WALL MOUNTED LIGHT
	FDC	FIRE DEPARTMENT CONNECTION (FDC)
	⋈	GATE VALVE
	N	CHECK VALVE
	C.O.	CLEAN OUT (CO)

NOTE:
THESE SYMBOLS, ABBREVIATIONS AND LINETYPES DO NOT NECESSARILY APPEAR IN THESE DRAWINGS. USE ONLY AS APPLICABLE.

ABBREVIATIONS

AC	ASPHALT CONCRETE
BC	BOTTOM OF CURB
B.M.	BENCH MARK
CB	CATCH BASIN
CO	CLEAN OUT
CONC	CONCRETE
DC	DOUBLE CHECK VALVE
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY
DIP	DUCTILE IRON PIPE
DW	DOMESTIC WATER
EG	EXISTING GRADE
EL	ELEVATION
EXTG	EXISTING
FDC	FIRE DEPARTMENT CONNECTION
FG	FINISHED GRADE
FW	FIRE WATER
GB	GRADE BREAK
HDPE	HIGH-DENSITY POLYETHYLENE
H.P.	HIGH POINT
MH	MANHOLE
PVC	POLYVINYL CHLORIDE
PVC C900	HIGH PRESSURE RATED PVC
SAN	SANITARY
STM	STORM
TC	TOP OF CONCRETE
TYP.	TYPICAL

W N E S

SITE PLAN

1" = 20'

20 0 20 40 60

KEYNOTES

1. MATCH EXISTING PAVEMENT PER DETAIL 1/C1.2.
2. NEW 6" CURB (TYP) PER DETAIL 2/C1.2
3. SAWCUT LINE, RESTORE SURFACE PER CITY 241 ON SHEET C1.2.

PAVEMENT SECTIONS (NON AMENDED SOIL):

(BASED ON 20 YEAR DESIGN LIFE FROM GEO REPORT BY COLUMBIA WEST ENGINEERING, DATED 03/01/2023)

1 HEAVY TRUCK ACCESS - 5.5" A.C. PAVING OVER 16.5" CRUSHED ROCK OVER COMPACTED SUBGRADE.

NOTICE TO EXCAVATORS:

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.
(NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-232-1987).

POTENTIAL UNDERGROUND FACILITY OWNERS

Dig Safely.

Call the Oregon One-Call Center
DIAL 811 or 1-800-332-2344

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME

COLUMBIA CORRUGATED BOX
SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

	DATE	DESCRIPTION

DATE	APRIL 2022
SCALE	AS NOTED
PROJ. NO.	20220513
DRAWN	ZWA
CHECKED	BMD

SITE PLAN

C1.0

GENERAL NOTES

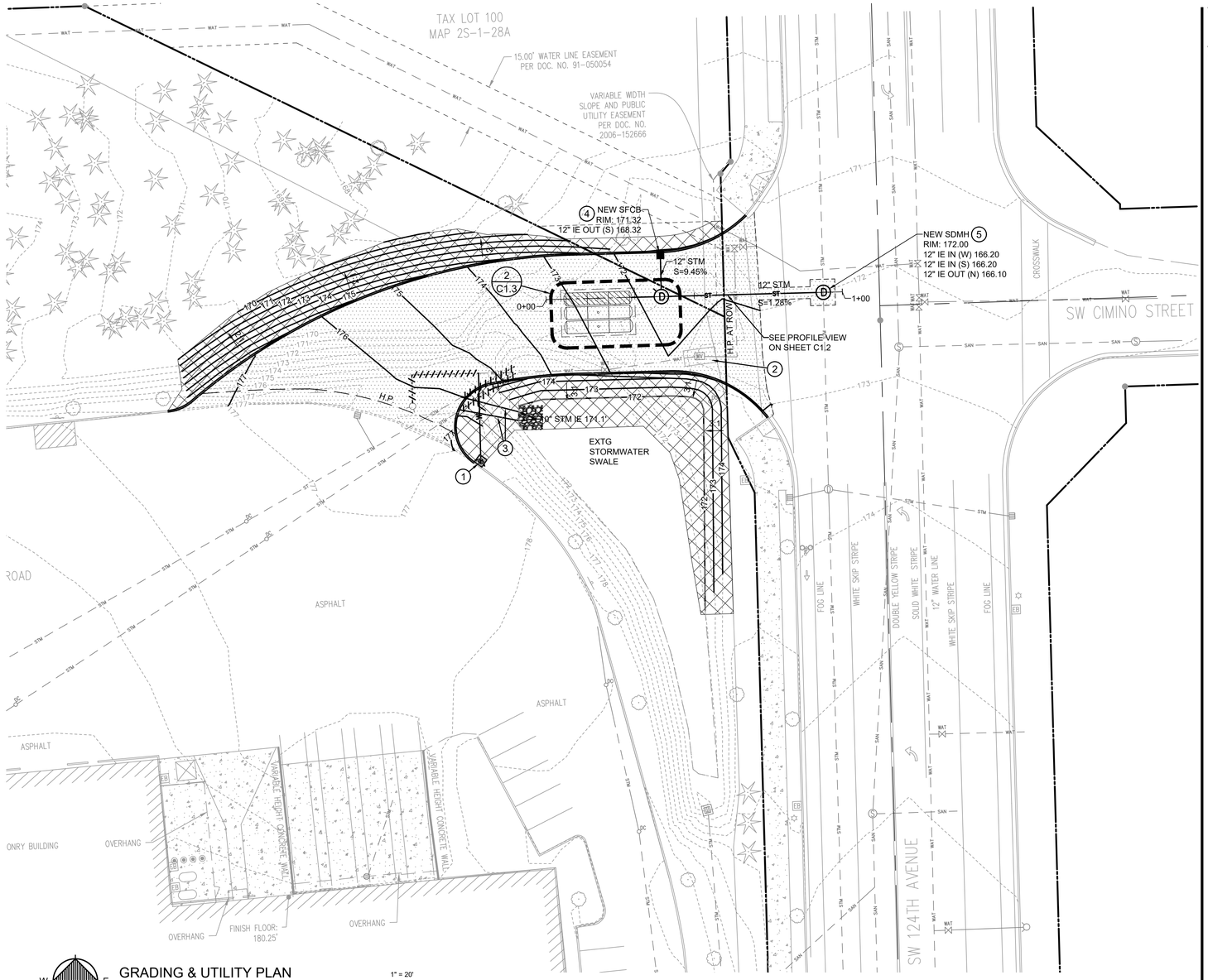
1. PRIOR TO ANY CONSTRUCTION, CONTRACTOR SHALL VERIFY EXISTING UTILITIES AND TOPOGRAPHY ARE AS SHOWN ON PLANS. WHEN ACTUAL CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
2. CONTRACTOR TO LEAVE ALL AREAS OF PROJECT FREE OF DEBRIS AND UNUSED CONSTRUCTION MATERIAL.
3. CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, SURVEYING, TESTING, PERSONNEL, TRAFFIC SAFETY CONTROL AND AS-BUILTS FOR ALL PHASES OF CONSTRUCTION.
4. CONTRACTOR SHALL COORDINATE PUBLIC IMPROVEMENTS AND INSPECTIONS WITH THE CITY OF TUALATIN
5. PROPERTY LINE BEARINGS AND DISTANCES AS WELL AS SITE AREA CALCULATIONS ARE PROVIDED FOR ZONING AND PERMIT REVIEW ONLY. REAL PROPERTY LEGAL DESCRIPTIONS AND AREA CALCULATIONS ARE TO BE PROVIDED BY A REGISTERED PROFESSIONAL SURVEYOR.
6. PROPERTY CORNER SURVEY MONUMENTS, WHICH ARE IN DANGER OF BEING DISTURBED OR DESTROYED BY THE WORK OF THIS PROJECT, SHALL BE TIED-OUT BY A REGISTERED PROFESSIONAL SURVEYOR PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, AND SHALL BE RE-SET IN ACCORDANCE WITH STATE LAW, IMMEDIATELY FOLLOWING THE COMPLETION OF ALL CONSTRUCTION
7. ADA REQUIREMENTS - ALL ACCESSIBLE ROUTES AND PARKING SPACES, AISLES, RAMPS, ETC. SHALL BE INCOMPLIANCE WITH THE CURRENT OSSC REQUIREMENTS AND ANSI-A117.1-2009 (ADAAG). ADDITIONAL DESIGN PARAMETERS:
   - 7.1. MAXIMUM RAMP SLOPE SHALL NOT EXCEED 7.5%
   - 7.2. MAXIMUM WALK CROSS-SLOPE SHALL NOT EXCEED 1.5%
   - 7.3. MAXIMUM LANDING SLOPE SHALL NOT EXCEED 1.5%
   - 7.4. NO PORTION OF ADA PARKING SPACES AND AISLES SHALL EXCEED 2.0%

GRADING NOTES

1. ATTENTION EXCAVATORS: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 811 OR 1-800-332-2344. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CALL CENTER. YOU MUST NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 811 OR 1-800-332-2344.
2. ALL NEW CONTOURS SHOWN ARE FINISH GRADES, UNLESS OTHERWISE NOTED.
3. ORGANIC AND UNDESIRABLE MATERIAL SHALL BE REMOVED FROM THE CONSTRUCTION AREA AS DIRECTED BY THE ENGINEER.
4. ALL DISTURBED AREAS NOT LANDSCAPED ARE TO BE HYDROSEEDED OR BEDDED IN STRAW TO PREVENT EROSION. SEE EROSION CONTROL PLAN, SHEET _____
5. ALL FILL AREAS SHALL BE STRIPPED OF ORGANIC MATERIAL. FILL WILL BE PLACED IN 6 TO 8-INCH LIFTS AND COMPACTED TO 95 PERCENT RELATIVE MAXIMUM DENSITY ACCORDING TO ASTM D-1557 STANDARDS. BASE ROCK IN THE PAVED AREAS WILL BE COMPACTED TO 95% ASTM D-1557. LANDSCAPED AREAS WILL BE COMPACTED TO 90 PERCENT. ADDITIONAL COMPACTION TESTS MAY BE REQUIRED BY THE CITY OR THE ENGINEER OF RECORD, IF POOR COMPACTION EFFORTS ARE OBSERVED DURING CONSTRUCTION. COMPACTION REPORTS FROM A REPUTABLE TESTING LAB WILL BE SUPPLIED TO THE ENGINEER.
6. INTERIOR SIDE SLOPES SHALL BE 3 HORIZONTAL TO 1 VERTICAL IN WATER QUALITY/DETENTION POND, TYPICAL.

UTILITY NOTES

1. ATTENTION EXCAVATORS: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 811 OR 1-800-332-2344. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CALL CENTER. YOU MUST NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 811 OR 1-800-332-2344.
2. THE WORKING DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND OR ELBOW REQUIRED OR INSTALLATION OF THE UTILITIES SHOWN. THE DRAWINGS DO NOT DEPICT EVERY DIMENSION, COMPONENT PIECE, SECTION, JOINT OR FITTING REQUIRED TO COMPLETE THE PROJECT. ALL LOCATIONS FOR WORK SHALL BE CHECKED AND COORDINATED WITH EXISTING CONDITIONS IN THE FIELD BEFORE BEGINNING CONSTRUCTION. EXISTING UNDERGROUND UTILITIES LAYING WITHIN THE LIMITS OF EXCAVATION SHALL BE VERIFIED AS TO CONDITION, SIZE AND LOCATION BY UNCOVERING, PROVIDING SUCH IS PERMITTED BY LOCAL PUBLIC AUTHORITIES WITH JURISDICTION, BEFORE BEGINNING CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY IF THERE ARE ANY DISCREPANCIES.
3. BEDDING AND PIPE ZONE BACKFILL SHALL BE PER "CITY OF TUALATIN DETAIL 241 ON SHEET C1.2.
4. CONTRACTORS SHALL CONTACT CITY OF TUALATIN PUBLIC WORKS AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION.
5. EXCAVATED SEWER TRENCH SPOIL MATERIAL SHALL BE TESTED AND LEGALLY DISPOSED OF AT A PROPER LANDFILL OR OTHER APPROPRIATE LOCATION.
6. ALL SEWER TRENCH LINES AND EXCAVATIONS SHALL BE PROPERLY SHORED AND BRACED TO PREVENT CAVING. UNUSUALLY DEEP EXCAVATIONS MAY REQUIRE EXTRA SHORING AND BRACING. ALL SHEETING, SHORING, AND BRACING OF TRENCHES SHALL CONFORM TO OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION (OSHA) REGULATIONS AND THE CITY OF CANBY STANDARD CONSTRUCTION SPECIFICATIONS.
7. CONTRACTOR SHALL NOTIFY AND COORDINATE WITH PRIVATE UTILITIES FOR RELOCATION OF CONDUITS, POWER POLES, VAULTS, PEDESTALS, ETC.
8. ALL EXISTING FACILITIES SHALL BE MAINTAINED BY THE CONTRACTOR UNLESS OTHERWISE SHOWN OR DIRECTED. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO SUPPORT, MAINTAIN, OR OTHERWISE PROTECT EXISTING UTILITIES AND OTHER FACILITIES AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL LEAVE EXISTING FACILITIES IN AN EQUAL OR BETTER-THAN-ORIGINAL CONDITION.
9. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE LOCATION, SIZE & DEPTH OF EXISTING UTILITIES. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
10. HORIZONTAL STORM AND SANITARY DRAINAGE PIPE SHALL BE PROVIDED WITH A CLEANOUT AT ITS UPPER TERMINAL AND EACH RUN OF PIPING, WHICH IS MORE THAN 100 FOOT IN TOTAL DEVELOPED LENGTH, SHALL BE PROVIDED WITH A CLEANOUT FOR EACH 100 FOOT, OR FRACTION THEREOF, IN LENGTH OF SUCH PIPING. AN ADDITIONAL CLEANOUT SHALL BE PROVIDED FOR EACH AGGREGATE HORIZONTAL CHANGE OF DIRECTION EXCEEDING 135 DEGREES. THE MAXIMUM DISTANCE ALLOWED BETWEEN MANHOLES IS 300 FEET. ALL REQUIRED CLEANOUTS MAY NOT BE LOCATED ON PLAN.
11. PRIVATE STORM SEWER LINES, DENOTED "STM" OR "ST", SHALL BE PVC 3034, PVC C900, PVC C905, HDPE, CL52 DIP OR APPROVED EQUIVALENT, UNLESS OTHERWISE NOTED. ALL STORM PIPING SHOWN HAS BEEN SIZED FOR A MANNING'S "N" VALUE = 0.013 AND PIPE INVERTS HAVE BEEN DESIGNED USING CONCENTRIC PIPE TO PIPE AND WYE FITTINGS, UNLESS OTHERWISE NOTED.
12. ALL STORM LATERALS SHALL HAVE #10 GAUGE COPPER WIRE OR TRACER TAPE AT 1.5-FT TO 2.0-FT ABOVE THE LATERAL.
13. ALL DOMESTIC (POTABLE) WATER SERVICE LINES OUTSIDE OF THE BUILDING DENOTED "DW" SHALL BE SCHEDULE 40 PVC OR PVC C900 CL150 UNLESS OTHERWISE NOTED. FIRE WATER SERVICE LINES OUTSIDE OF THE BUILDING DENOTED, "FW", "FDC" SHALL BE PVC C900 CL150 UNLESS OTHERWISE NOTED.
14. CONCRETE THRUST BLOCKING AND/OR MECHANICAL RESTRAINTS ("MEGA-LUG" OR EQUIVALENT) SHALL BE PROVIDED AT ALL WATERLINE FITTINGS AS REQUIRED BY THE CITY OF CANBY. BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH AND CLEAR OF JOINT ACCESSORIES. BEARING AREA OF THRUST BLOCK SHALL BE COMPUTED ON THE BASIS OF ALLOWABLE SOIL BEARING PRESSURE. SEE DETAIL SHEET C2.2.
15. MINIMUM COVER OVER WATERLINES IS TO BE 36 INCHES AS MEASURED FROM FINISH GRADE TO TOP OF PIPE. MINIMUM VERTICAL SEPARATION BETWEEN WATERLINE AND SANITARY SEWER AT A CROSSING IS 18 INCHES. SANITARY SEWER AT WATERLINE CROSSINGS WITH LESS THAN THE MINIMUM VERTICAL SEPARATION SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE WITH WATERTIGHT JOINTS. IN SUCH CASES THE 18-FOOT LENGTH OF SANITARY SEWER SHALL BE CENTERED AT THE CROSSING.
16. PRIOR TO BEING PLACED IN SERVICE, THE WATERLINE AND SERVICES SHALL BE FLUSHED, STERILIZED, AND RE-FLUSHED, ALL IN ACCORDANCE WITH THE CITY OF TUALATIN "PUBLIC WORKS CONSTRUCTION CODE." CITY CREWS WILL TAKE BACTERIOLOGICAL TESTS WHEN SO REQUESTED BY THE CONTRACTOR INSTALLING WATER MAINS. THE REQUEST FOR THESE TESTS SHALL BE MADE THROUGH THE CITY INSPECTOR.
17. PRIOR TO CONSTRUCTION, ALL ON-SITE FIRE WATER SYSTEM LINE SIZES, METER SIZES, DOUBLE CHECK DETECTOR ASSEMBLY (DCDA) SIZES, AND OTHER APPURTENANCES SHOWN ON THE UTILITY PLAN SHALL BE VERIFIED BY THE FIRE PROTECTION ENGINEER FOR THE PROJECT. ANALYSIS OF THE SYSTEM SHALL BE FROM THE NEW FACILITY SERVICE TO THE POINT OF CONNECTION WITH THE PUBLIC WATER SYSTEM. THE MAKES AND MODELS OF ALL SYSTEM COMPONENTS SHALL BE ACCEPTABLE PER WATER DISTRICT LIST OF APPROVED COMPONENTS.



W E S

GRADING & UTILITY PLAN 1" = 20'

20 0 20 40 60

GRADING SYMBOLS

- NEW ASPHALT PAVING AS NOTED SEE SHEET C1.0 FOR PAVEMENT SECTION
- 140 — EXISTING CONTOUR LINE
- 144 — NEW CONTOUR LINE
- 142.84 EG — EXISTING SPOT ELEVATION
- 143.40 FG — NEW SPOT ELEVATION PROVIDE STAKE.

UTILITY SYMBOLS

- SA — SANITARY - EXISTING
- ST — STORM - EXIST
- ST — SOLID WALL STORM - NEW
- PERFORATED STORM - NEW
- G — GAS - EXISTING
- T — TELEPHONE - EXISTING
- E — ELECTRICAL - EXISTING
- W — WATER - EXISTING
- W — WATER - NEW
- DW — DOMESTIC WATER - NEW
- FW — FIRE WATER - NEW
- FDC — FDC SERVICE LINE - NEW

KEYNOTES

1. RELOCATE EXISTING HYDRANT AND INSTALL PER DETAIL 610 ON SHEET C1.2
2. INSTALL H20 TRAFFIC RATED LID ON EXISTING WATER VAULT. ENSURE LID MATCHES FINISH GRADE.
3. RE-ROUTE EXISTING 10" STORM DRAIN OUTFALLS AS SHOWN. INSTALL RIP-RAP PER DETAIL 3/C1.2.
4. NEW STREAMFILTER TREATMENT CATCH BASIN PER DETAIL 4/C1.3
5. NEW STORM MANHOLE PER CITY DETAIL 011 ON SHEET C1.2.

NOTICE TO EXCAVATORS:

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.
(NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-232-1987).

POTENTIAL UNDERGROUND FACILITY OWNERS

Dig Safely.
Call the Oregon One-Call Center
DIAL 811 or 1-800-332-2344

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME

COLUMBIA CORRUGATED BOX SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

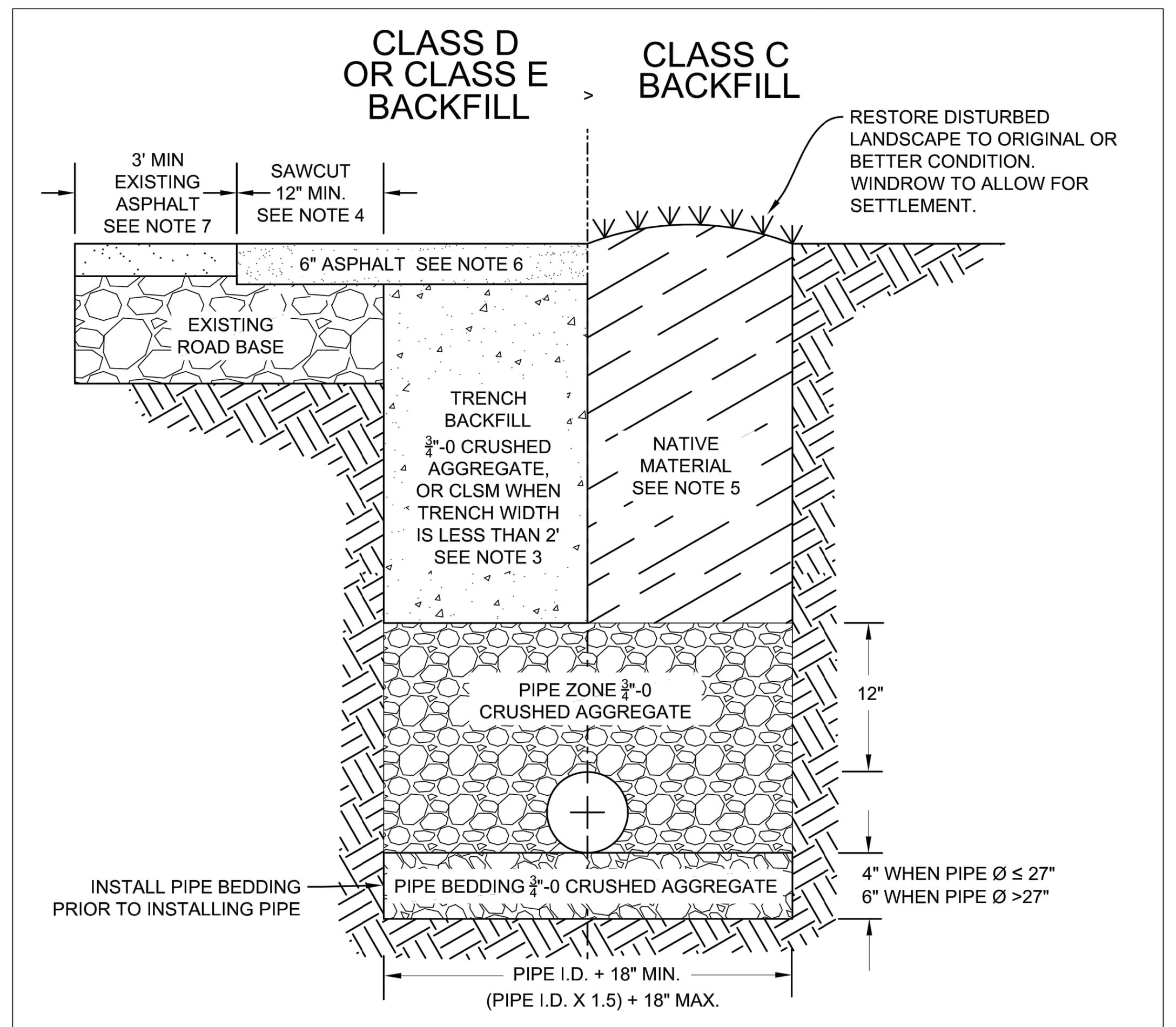
⚠	DATE	DESCRIPTION

DATE	APRIL 2022
SCALE	AS NOTED
PROJ. NO.	20220513
DRAWN	ZWA
CHECKED	BMD

GRADING & UTILITY PLAN

C1.1

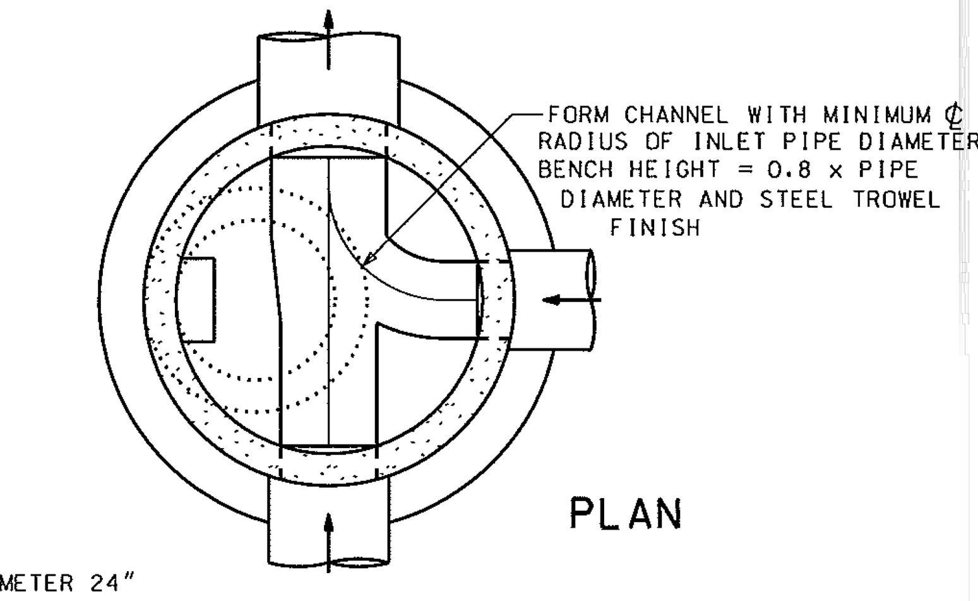
G:\Acad2022\2022\05130-Drawings\100 C1.0 Site Plan.dwg 7/20/2023 9:13 AM



NOTES:

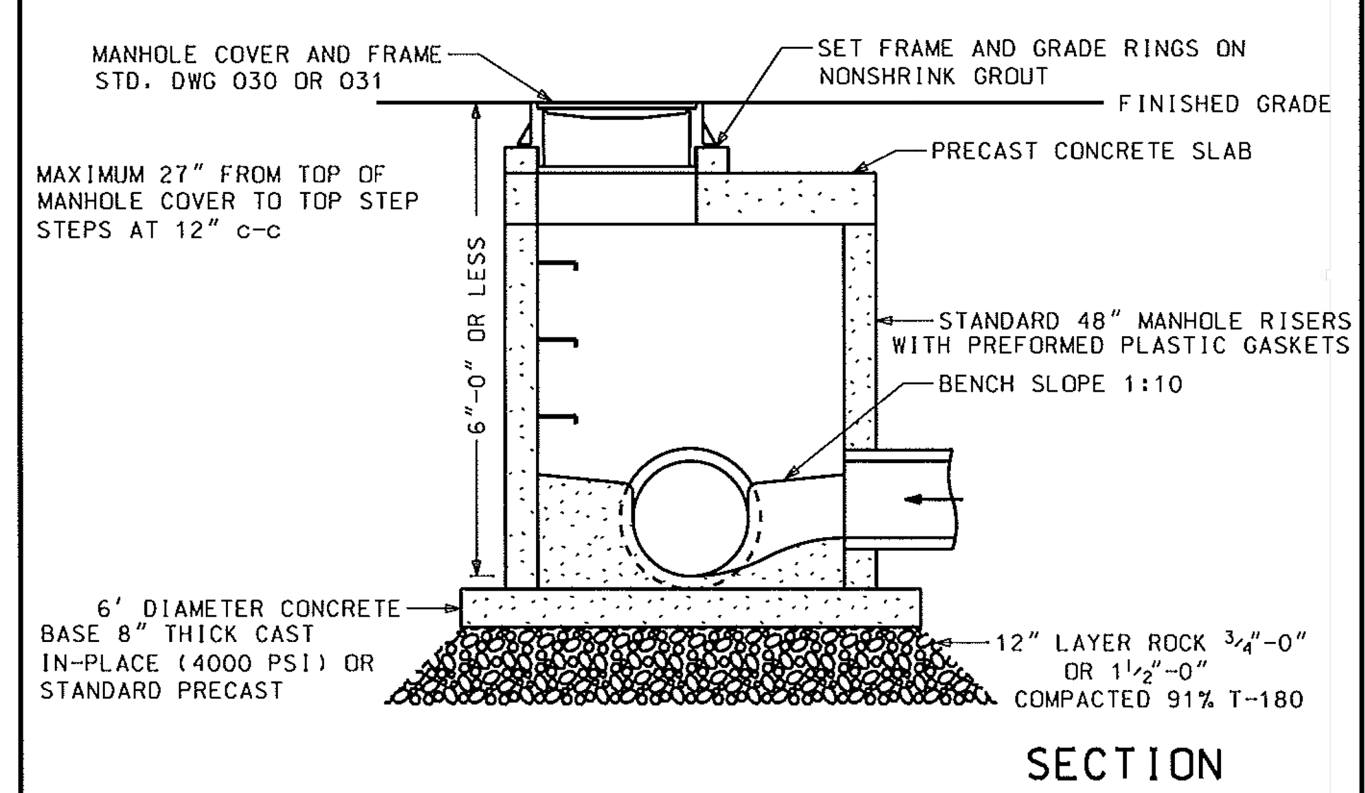
1. SEE STANDARD DRAWING NO. 480 FOR ROADS PAVED WITHIN THE LAST 5 YEARS.
2. SEE STANDARD DRAWING NO. 481 FOR CONCRETE ROADWAY RESTORATION.
3. WHEN TRENCH WIDTH IS LESS THAN 2' WIDE, BACKFILL WITH CLASS E, CONTROLLED LOW STRENGTH MATERIAL (CLSM) WITH A 28-DAY DESIGN STRENGTH OF 100-200 PSI.
4. SAWCUT A MINIMUM OF 12" OF PAVEMENT FROM EDGE OF TRENCH.
5. COMPACT CRUSHED AGGREGATE BACKFILL TO 92% AASHTO T 180, AND COMPACT NATIVE MATERIAL TO 90% AASHTO T 99, OR TO SATISFACTION OF CITY ENGINEER.
6. PROVIDE A MINIMUM ASPHALT THICKNESS OF 6" OR MATCH EXISTING THICKNESS, WHICHEVER IS GREATER.
7. IF LESS THAN 3' OF UNDISTURBED ASPHALT REMAINS BETWEEN THE EXCAVATION AND EDGE OF THE ROADWAY, REMOVE AND REPAIR THE REMAINING AREA.

CITY OF TUALATIN, OR	TRENCH & SURFACE RESTORATION			
REVISED: 2/12/2018	DRAFTED BY: S. STRASSER APPROVED BY: J. FUCHS	SCALE: NTS	DRAWING NO.	241

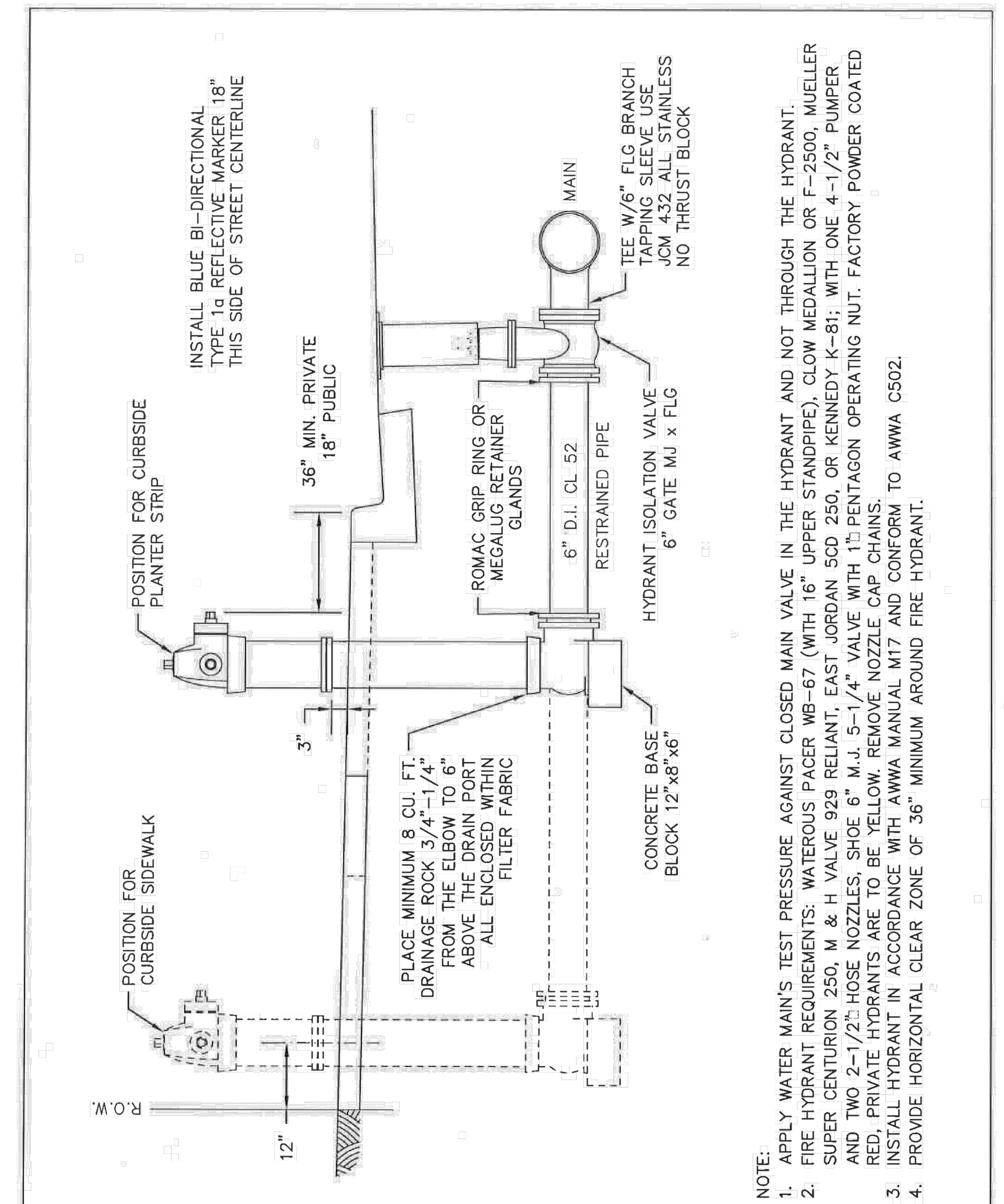


NOTES:

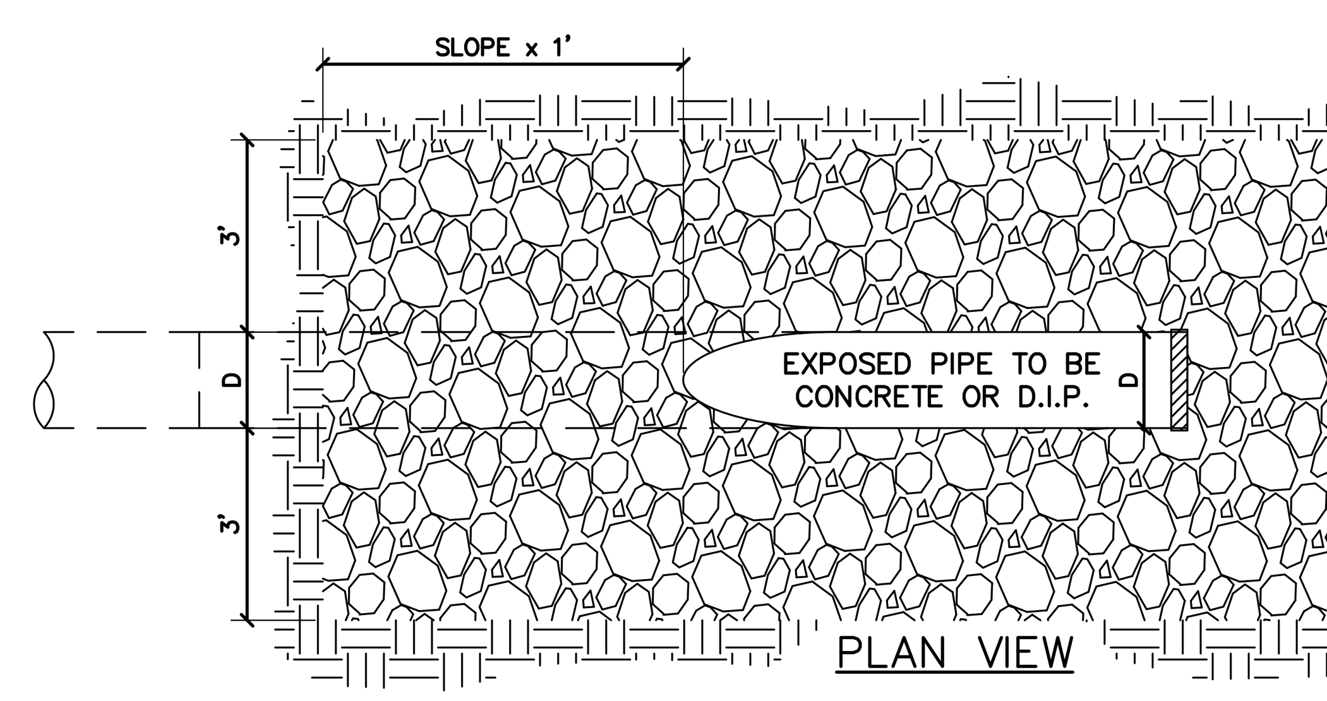
1. MAXIMUM PIPE DIAMETER 24"
2. MANHOLE TO CONFORM WITH ASTM C-478
3. FALL THROUGH MANHOLE = 0.20 FT
4. PLACE CONCRETE PIPE JOINT A MAXIMUM OF ONE PIPE DIAMETER FROM WALL OF MANHOLE
5. LOCATE MANHOLE COVER/FRAME AND STEPS OVER BENCH LEDGE WITH MAXIMUM DEPTH OF GRADE RINGS OF 10"
6. IN PAVEMENT, PLACE MINIMUM 12" OF ¾"-0" OR 1½"-0" COMPACTED ROCK OUTSIDE RISERS



CITY OF TUALATIN, OR	MANHOLE 48-INCH FLAT TOP		
REVISED: 12/2001 VALID: 3/2003	SCALE: 1:30	DRAWN: D.L. APPROVED: K.L.H.	DWG NO. 011



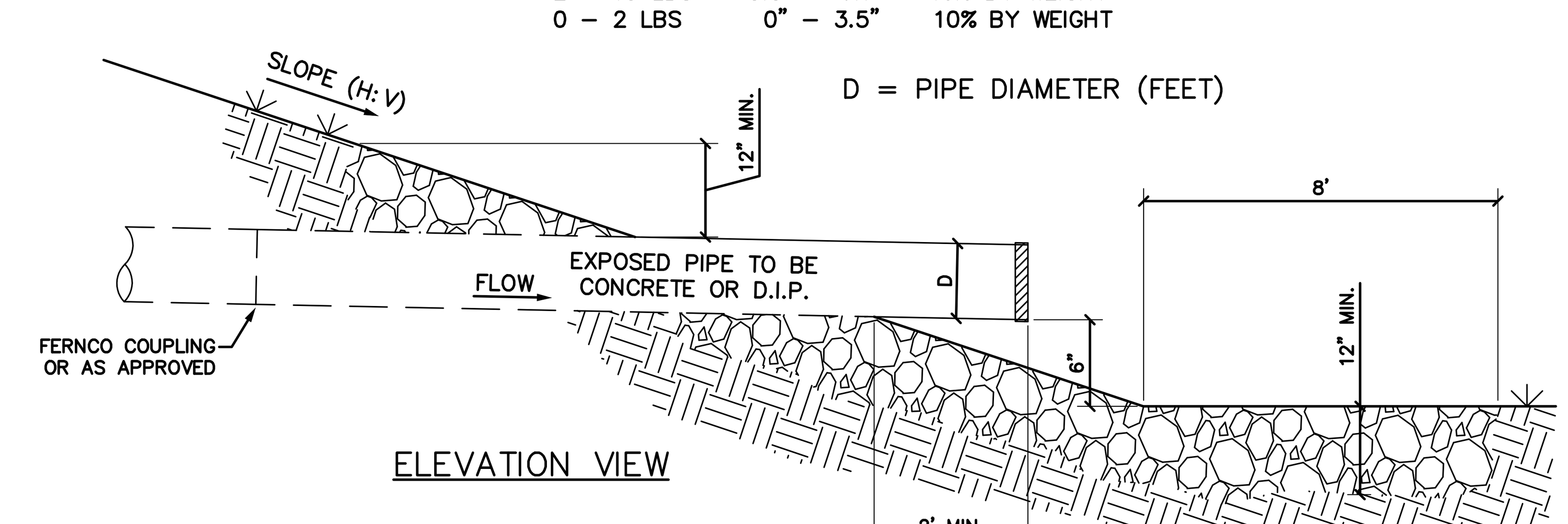
CITY OF TUALATIN, OR	FIRE HYDRANT ASSEMBLY		
REVISED: 12/2018 VALID: 12/2018	SCALE: 1:25	DRAWN: C. FERGESON APPROVED: K. MCMILLAN	DWG NO. 610

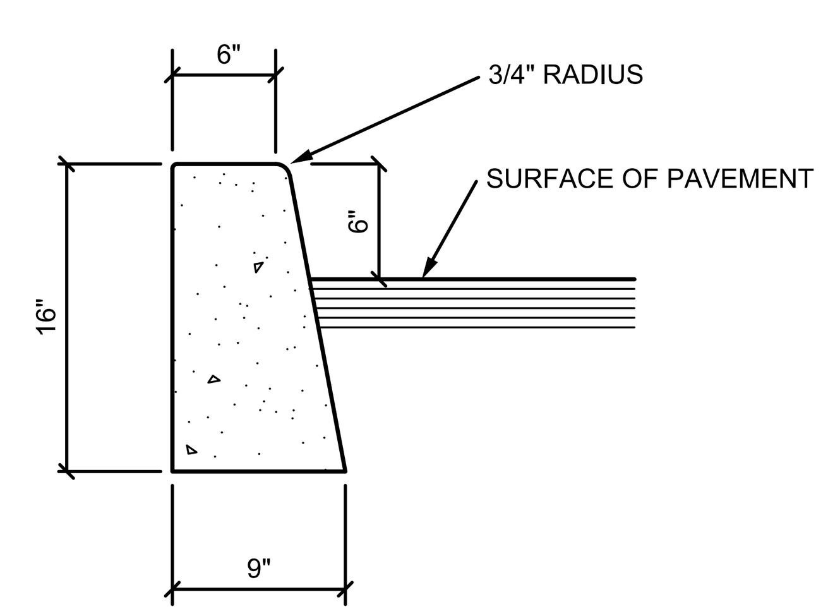


* RIPRAP SHALL CLASS 50 WITH ROCK GRADATION AS FOLLOWS:

30 – 50 LBS	8.5" – 10"	20% BY WEIGHT
15 – 30 LBS	6.7" – 8.5"	30% BY WEIGHT
2 – 15 LBS	3.5" – 6.7"	40% BY WEIGHT
0 – 2 LBS	0" – 3.5"	10% BY WEIGHT

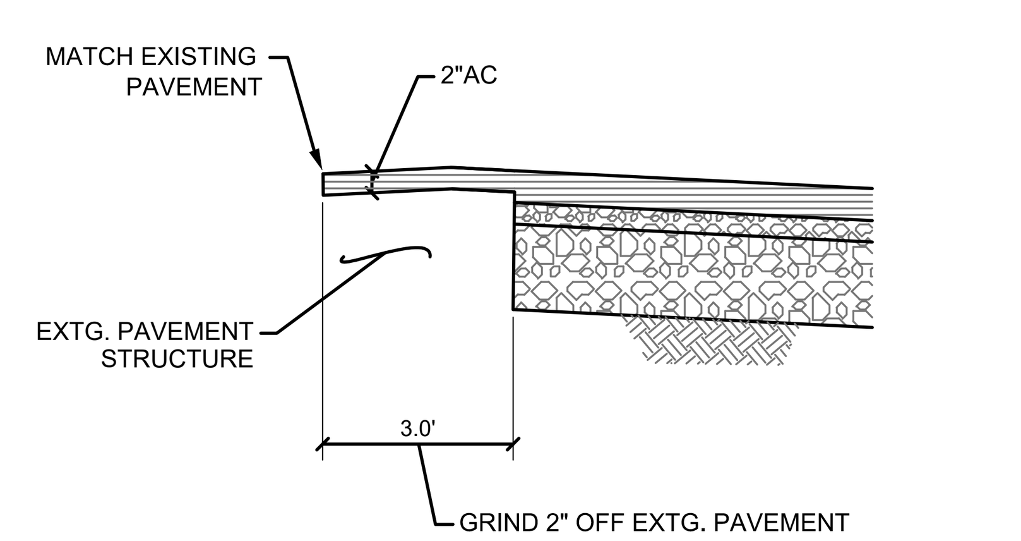
D = PIPE DIAMETER (FEET)





TYPE 'C' CURB NOTES:

1. CONCRETE TO HAVE A COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS, MAXIMUM 4-INCH SLUMP.
2. EXPANSION JOINTS: LOCATED AT 45-FT MAXIMUM AND AT ALL POINTS OF TANGENCY, COLD JOINTS AND AT EACH SIDE OF ANY STRUCTURES. EXPANSION JOINT TO BE 1/2" PRE-MOLDED, ASPHALT IMPREGNATED, NON-EXTRUDING MATERIAL OF SAME DIMENSION AS CURB.
3. CONTRACTION JOINTS: LOCATED AT 15-FT MAXIMUM. CONTRACTION JOINTS TO BE 1" DEEP TOOLED OR FORMED AROUND PERIMETER AT CURB.
4. TOPS OF CURBS SHALL SLOPE TOWARD THE ROADWAY 1/8" IN 6".
5. FACE BATTER NORMAL AS SHOWN FOR CURB TYPE.
6. BASE ROCK 2"-0 OR ¾"-0, 95% (AASHTO T-99) COMPACTION. BASE ROCK SHALL BE TO SUBGRADE OR 4 INCHES, WHICHEVER IS GREATER, AND SHALL EXTEND 12 INCHES BEHIND THE CURB.



1 / C1.2 NEW/EXTG PAVEMENT TRANSITION — TRANSITION N.T.S.

2 / C1.2 SECTION AT CURB — SITE-CRC 1" = 1'-0"

3 / C1.2 OUTFALL AND RIPRAP DETAIL

G:\Acad\2022\20220513\0-Drawings\100 C1.0 Site Plan.dwg7/20/2023 9:13 AM

VLMK ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME
COLUMBIA CORRUGATED BOX SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

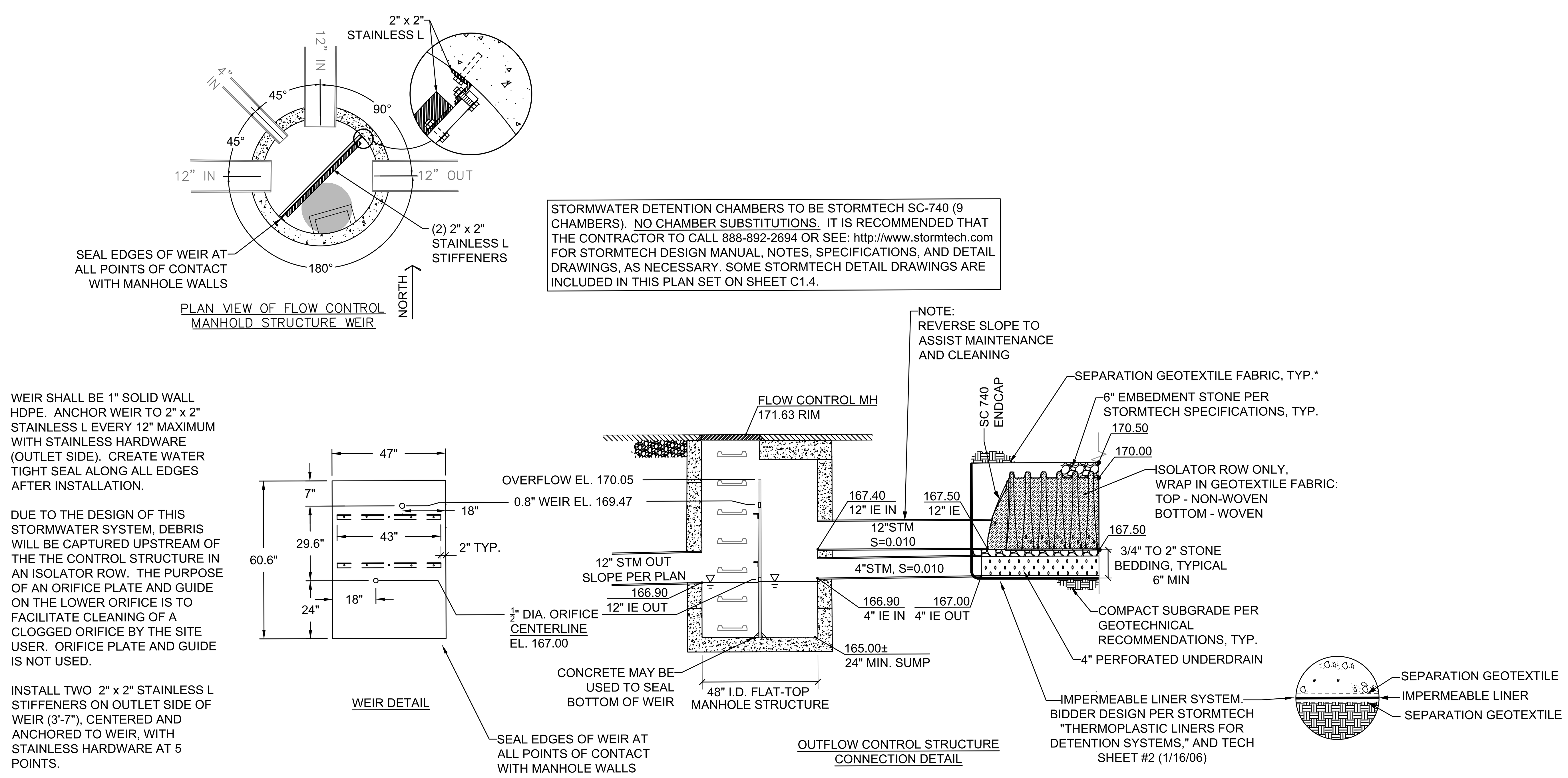
REVISIONS

Δ	DATE	DESCRIPTION

DATE APRIL 2022	
SCALE AS NOTED	PROJ. NO. 20220513
DRAWN ZWA	CHECKED BMD

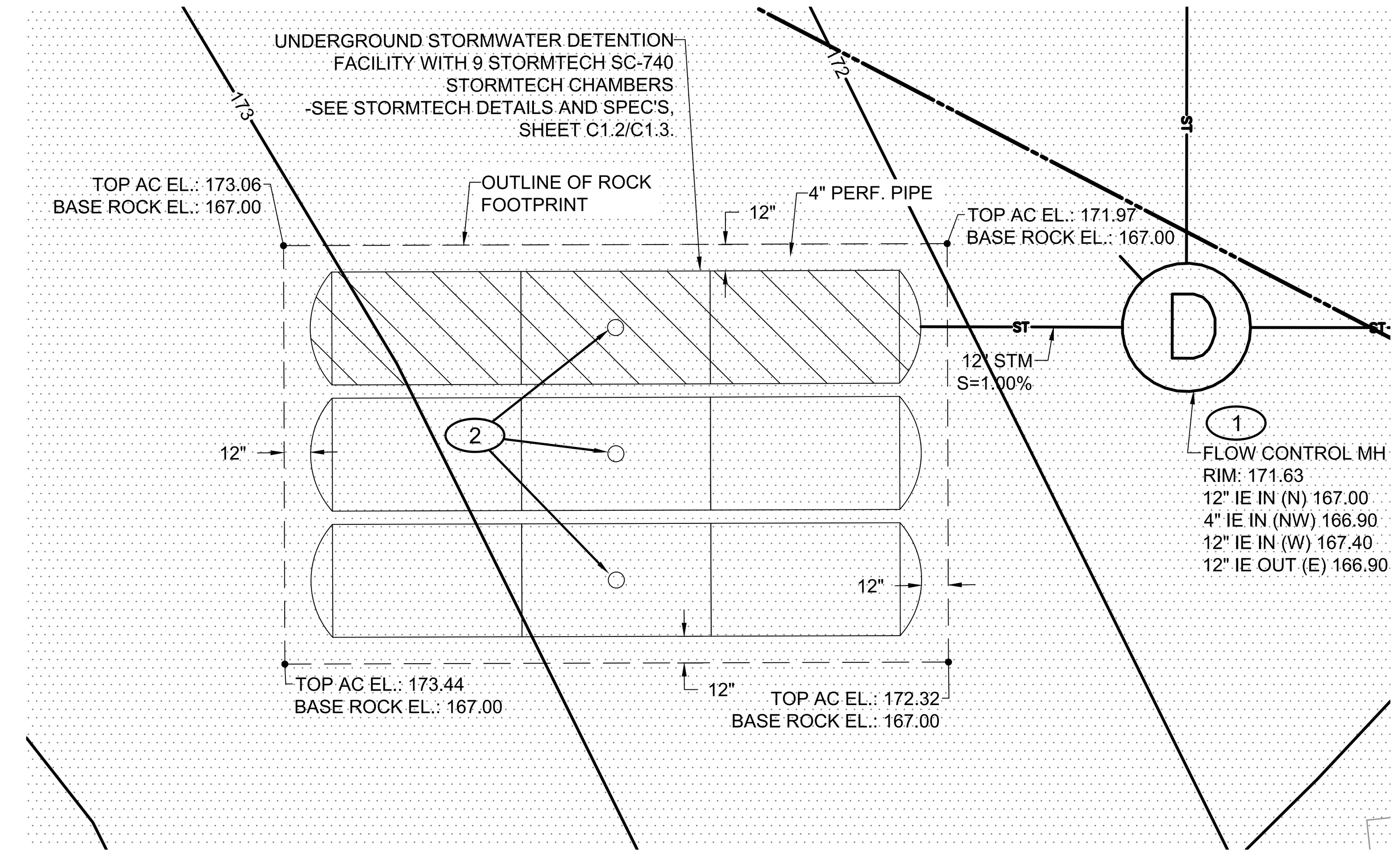
DETAILS

C1.2



2" x 2" STAINLESS L
12" IN
4" IN
45°
90°
45°
12" IN
12" OUT
SEAL EDGES OF WEIR AT ALL POINTS OF CONTACT WITH MANHOLE WALLS
180°
(2) 2" x 2" STAINLESS L STIFFENERS
NORTH
PLAN VIEW OF FLOW CONTROL MANHOLD STRUCTURE WEIR
STORMWATER DETENTION CHAMBERS TO BE STORMTECH SC-740 (9 CHAMBERS). NO CHAMBER SUBSTITUTIONS. IT IS RECOMMENDED THAT THE CONTRACTOR TO CALL 888-892-2694 OR SEE: http://www.stormtech.com FOR STORMTECH DESIGN MANUAL, NOTES, SPECIFICATIONS, AND DETAIL DRAWINGS, AS NECESSARY. SOME STORMTECH DETAIL DRAWINGS ARE INCLUDED IN THIS PLAN SET ON SHEET C1.4.
WEIR SHALL BE 1" SOLID WALL HDPE. ANCHOR WEIR TO 2" x 2" STAINLESS L EVERY 12" MAXIMUM WITH STAINLESS HARDWARE (OUTLET SIDE). CREATE WATER TIGHT SEAL ALONG ALL EDGES AFTER INSTALLATION.
DUE TO THE DESIGN OF THIS STORMWATER SYSTEM, DEBRIS WILL BE CAPTURED UPSTREAM OF THE THE CONTROL STRUCTURE IN AN ISOLATOR ROW. THE PURPOSE OF AN ORIFICE PLATE AND GUIDE ON THE LOWER ORIFICE IS TO FACILITATE CLEANING OF A CLOGGED ORIFICE BY THE SITE USER. ORIFICE PLATE AND GUIDE IS NOT USED.
INSTALL TWO 2" x 2" STAINLESS L STIFFENERS ON OUTLET SIDE OF WEIR (3'-7"), CENTERED AND ANCHORED TO WEIR, WITH STAINLESS HARDWARE AT 5 POINTS.
47"
7"
18"
43"
2" TYP.
60.6"
29.6"
24"
18"
1/2" DIA. ORIFICE CENTERLINE EL. 167.00
WEIR DETAIL
SEAL EDGES OF WEIR AT ALL POINTS OF CONTACT WITH MANHOLE WALLS
NOTE: REVERSE SLOPE TO ASSIST MAINTENANCE AND CLEANING
FLOW CONTROL MH 171.63 RIM
OVERFLOW EL. 170.05
0.8" WEIR EL. 169.47
12" STM OUT SLOPE PER PLAN
166.90
12" IE OUT
CONCRETE MAY BE USED TO SEAL BOTTOM OF WEIR
48" I.D. FLAT-TOP MANHOLE STRUCTURE
167.40
12" IE IN
167.50
12" IE
12"STM S=0.010
4"STM, S=0.010
166.90
4" IE IN
167.00
4" IE OUT
165.00±
24" MIN. SUMP
SC 740 ENDCAP
SEPARATION GEOTEXTILE FABRIC, TYP.*
6" EMBEDMENT STONE PER STORMTECH SPECIFICATIONS, TYP.
170.50
170.00
ISOLATOR ROW ONLY, WRAP IN GEOTEXTILE FABRIC: TOP - NON-WOVEN BOTTOM - WOVEN
167.50
3/4" TO 2" STONE BEDDING, TYPICAL 6" MIN
COMPACT SUBGRADE PER GEOTECHNICAL RECOMMENDATIONS, TYP.
4" PERFORATED UNDERDRAIN
IMPERMEABLE LINER SYSTEM. BIDDER DESIGN PER STORMTECH "THERMOPLASTIC LINERS FOR DETENTION SYSTEMS," AND TECH SHEET #2 (1/16/06)
SEPARATION GEOTEXTILE
IMPERMEABLE LINER
SEPARATION GEOTEXTILE
OUTFLOW CONTROL STRUCTURE CONNECTION DETAIL

1 C1.3 UNDERGROUND DETENTION & FLOW CONTROL



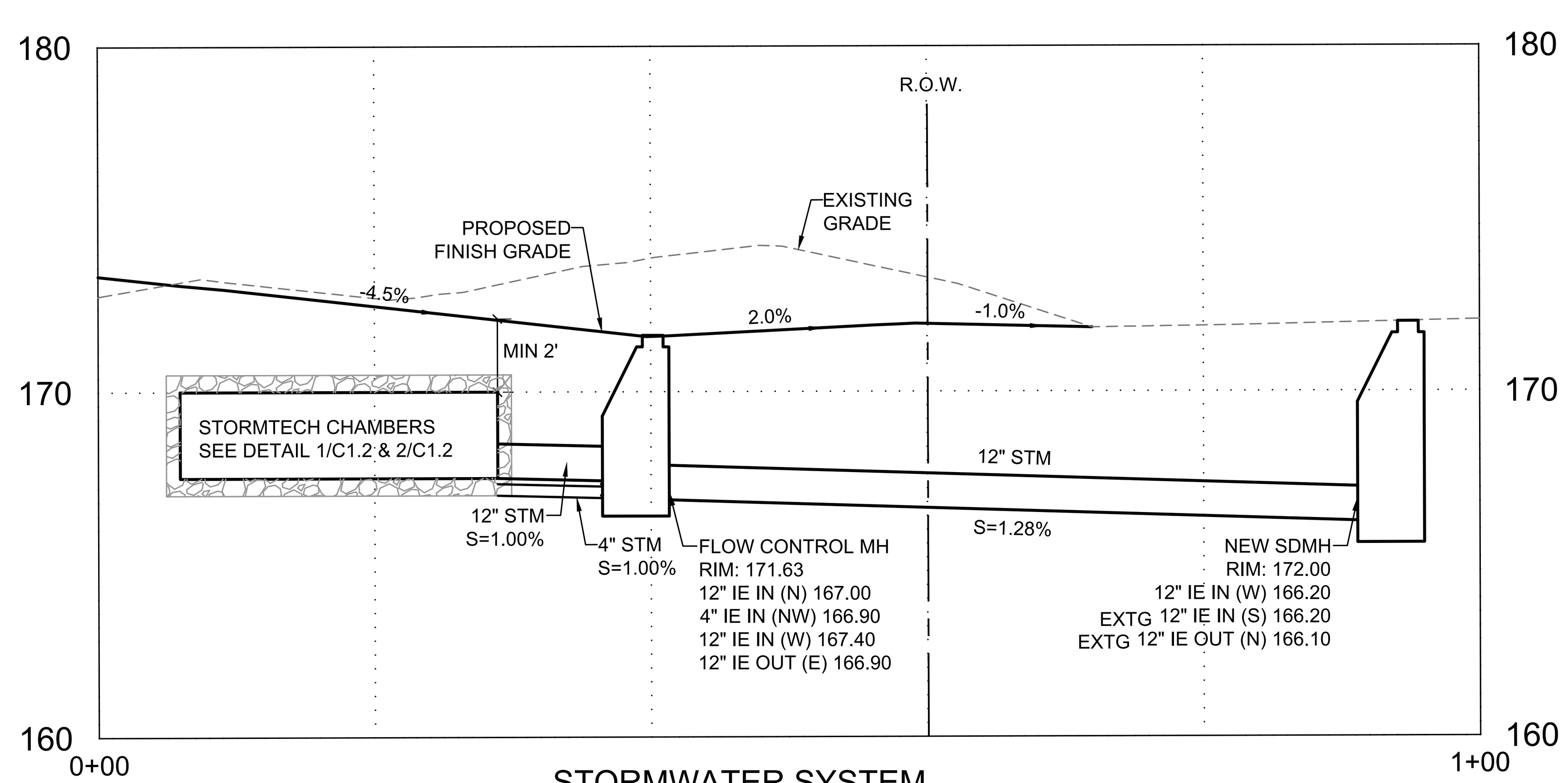
UNDERGROUND STORMWATER DETENTION FACILITY WITH 9 STORMTECH SC-740 STORMTECH CHAMBERS -SEE STORMTECH DETAILS AND SPEC'S, SHEET C1.2/C1.3.
173
172
TOP AC EL.: 173.06
BASE ROCK EL.: 167.00
OUTLINE OF ROCK FOOTPRINT
12"
4" PERF. PIPE
TOP AC EL.: 171.97
BASE ROCK EL.: 167.00
12" STM
S=1.00%
D
1
FLOW CONTROL MH
RIM: 171.63
12" IE IN (N) 167.00
4" IE IN (NW) 166.90
12" IE IN (W) 167.40
12" IE OUT (E) 166.90
2
12"
12"
TOP AC EL.: 173.44
BASE ROCK EL.: 167.00
12"
TOP AC EL.: 172.32
BASE ROCK EL.: 167.00

2 C1.3 UNDERGROUND DETENTION SYSTEM 1" = 5'

5 0 5 10 15

STORMWATER KEYNOTES

1. FLOW CONTROL MANHOLE. SEE DETAIL 1 THIS SHEET
2. INSPECTION PORT. SEE STORMTECH DETAILS, SHEET C1.4.

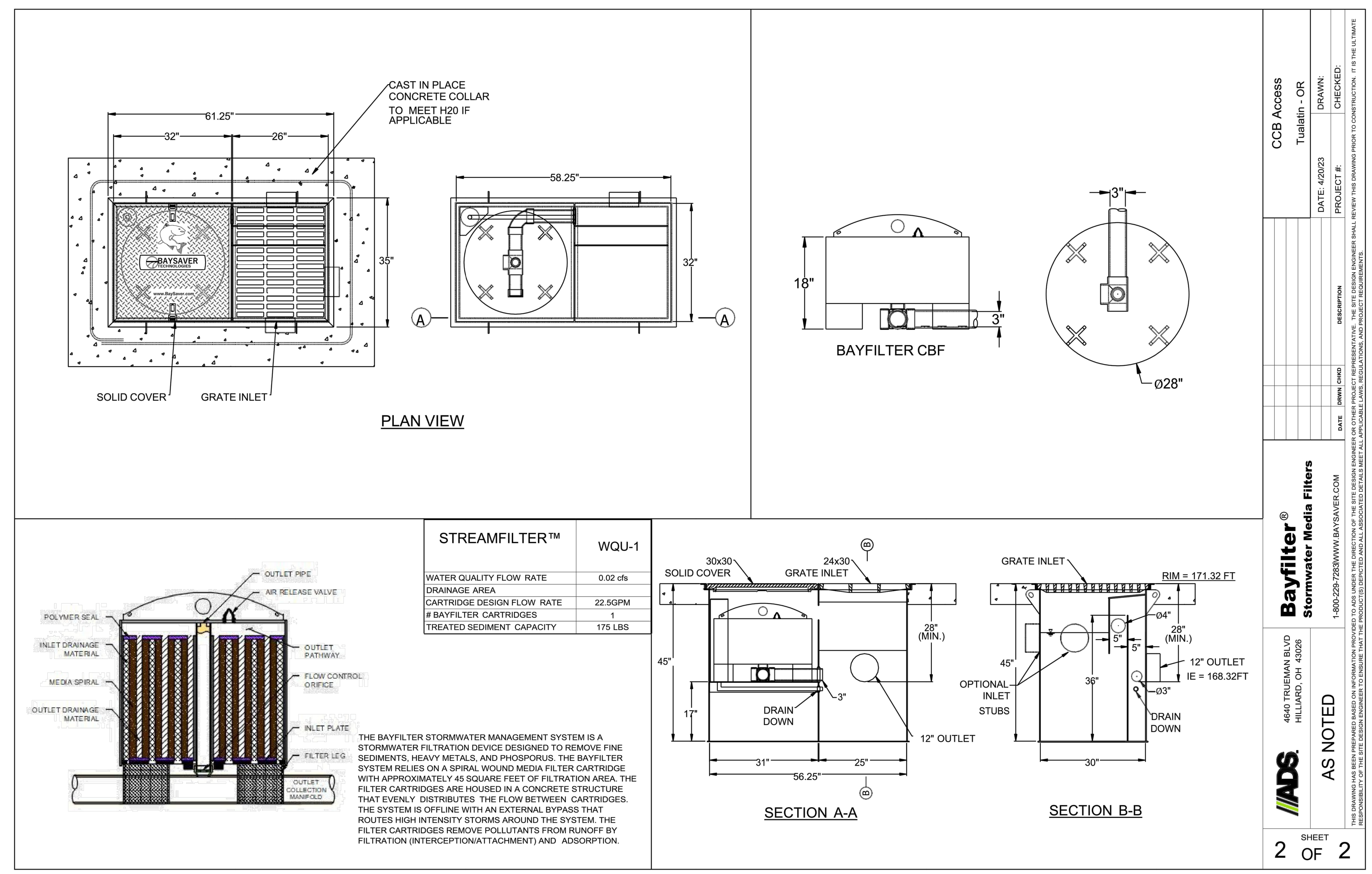


180
180
R.O.W.
EXISTING GRADE
PROPOSED FINISH GRADE
-4.5%
2.0%
-1.0%
MIN 2'
170
170
STORMTECH CHAMBERS SEE DETAIL 1/C1.2 & 2/C1.2
12" STM
12" STM S=1.00%
4" STM S=1.00%
S=1.28%
FLOW CONTROL MH
RIM: 171.63
12" IE IN (N) 167.00
4" IE IN (NW) 166.90
12" IE IN (W) 167.40
12" IE OUT (E) 166.90
NEW SDMH
RIM: 172.00
12" IE IN (W) 166.20
EXTG 12" IE IN (S) 166.20
EXTG 12" IE OUT (N) 166.10
160
160
0+00
1+00

3 C1.3 STORMWATER SYSTEM PROFILE VIEW

VERT: 1" = 4'
HORIZ: 1" = 10'

10 0 10 20 30



CAST IN PLACE CONCRETE COLLAR TO MEET H20 IF APPLICABLE
61.25"
32"
26"
35"
58.25"
32"
BAYSAVER
SOLID COVER
GRATE INLET
PLAN VIEW
18"
3"
BAYFILTER CBF
3"
Ø28"
OUTLET PIPE
AIR RELEASE VALVE
POLYMER SEAL
INLET DRAINAGE MATERIAL
MEDIA SPIRAL
OUTLET DRAINAGE MATERIAL
OUTLET PATHWAY
FLOW CONTROL ORIFICE
INLET PLATE
FILTER LEG
OUTLET COLLECTION MANIFOLD
STREAMFILTER™ WQU-1
WATER QUALITY FLOW RATE 0.02 cfs
DRAINAGE AREA
CARTRIDGE DESIGN FLOW RATE 22.5GPM
BAYFILTER CARTRIDGES 1
TREATED SEDIMENT CAPACITY 175 LBS
THE BAYFILTER STORMWATER MANAGEMENT SYSTEM IS A STORMWATER FILTRATION DEVICE DESIGNED TO REMOVE FINE SEDIMENTS, HEAVY METALS, AND PHOSPORUS. THE BAYFILTER SYSTEM RELIES ON A SPIRAL WOUND MEDIA FILTER CARTRIDGE WITH APPROXIMATELY 45 SQUARE FEET OF FILTRATION AREA. THE FILTER CARTRIDGES ARE HOUSED IN A CONCRETE STRUCTURE THAT EVENLY DISTRIBUTES THE FLOW BETWEEN CARTRIDGES. THE SYSTEM IS OFFLINE WITH AN EXTERNAL BYPASS THAT ROUTES HIGH INTENSITY STORMS AROUND THE SYSTEM. THE FILTER CARTRIDGES REMOVE POLLUTANTS FROM RUNOFF BY FILTRATION (INTERCEPTION/ATTACHMENT) AND ADSORPTION.
30x30 SOLID COVER
24x30 GRATE INLET
28" (MIN.)
45"
17"
3"
DRAIN DOWN
12" OUTLET
31"
25"
56.25"
SECTION A-A
GRATE INLET
RIM = 171.32 FT
04"
5"
28" (MIN.)
45°
OPTIONAL INLET STUBS
36"
12" OUTLET IE = 168.32FT
03"
DRAIN DOWN
30"
SECTION B-B
CCB Access
Tualatin - OR
DATE: 4/20/23
DRAWN:
PROJECT #:
CHECKED:
Bayfilter® Stormwater Media Filters
1-800-229-7283/WWW.BAYSAVER.COM
ADS
4640 TRUEMAN BLVD HILLIARD, OH 43026
AS NOTED
SHEET 2 OF 2

4 C1.3 WATER QUALITY CATCH BASIN

G:\Acad\2022\220513\0-Drawings\100 C1.0 Site Plan.dwg7/20/2023 9:13 AM

VLMK
ENGINEERING + DESIGN

3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME
COLUMBIA CORRUGATED BOX SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

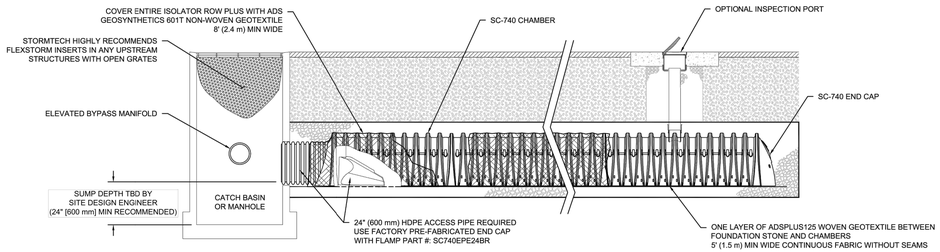
REVISIONS

	DATE	DESCRIPTION

DATE APRIL 2022	
SCALE AS NOTED	PROJ. NO. 20220513
DRAWN ZWA	CHECKED BMD

DETAILS

C1.3



SC-740 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

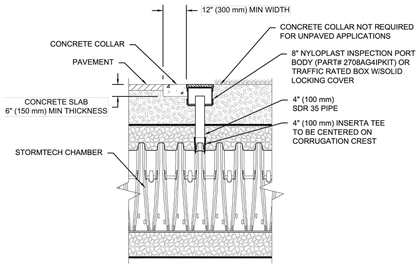
STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

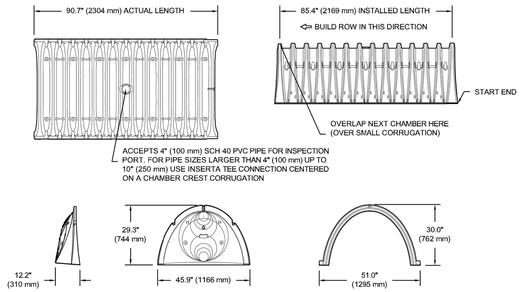
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" PVC INSPECTION PORT DETAIL (SC SERIES CHAMBER)
NTS

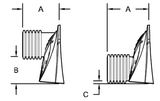
SC-740 TECHNICAL SPECIFICATION
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS



STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

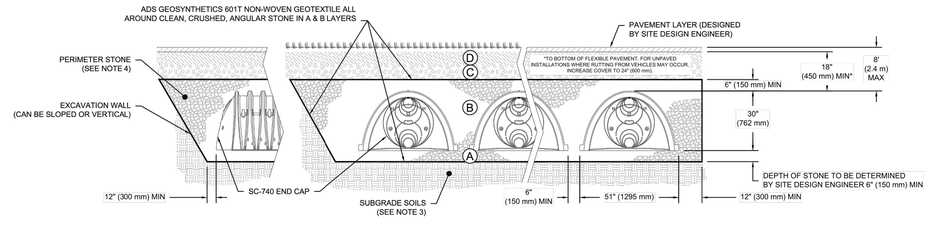
* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%, AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

SC-740
ISOLATOR ROW PLUS DETAILS
DATE: 9/12/22 | DRAWN: KLJ | CHECKED: KLJ | PROJECT #:

DATE	DRWN	CHKD	DESCRIPTION
			FOR BIDDING

StormTech® Chamber System
888-892-2694 | WWW.STORMTECH.COM

ADS
4640 TRUEMAN BLVD
HILLIARD, OH 43026

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCTS DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

SHEET 1 OF 1

SC-740
STANDARD CROSS SECTION
DATE: 9/12/22 | DRAWN: KLJ | CHECKED: KLJ | PROJECT #:

DATE	DRWN	CHKD	DESCRIPTION
			FOR BIDDING

StormTech® Chamber System
888-892-2694 | WWW.STORMTECH.COM

ADS
4640 TRUEMAN BLVD
HILLIARD, OH 43026

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCTS DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

SHEET 1 OF 1

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME
COLUMBIA CORRUGATED BOX SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

⚠	DATE	DESCRIPTION

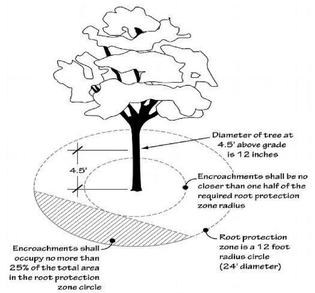
DATE
APRIL 2022

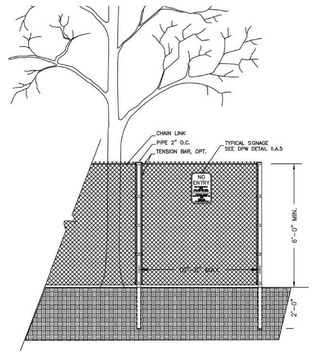
SCALE	PROJ. NO.
AS NOTED	20220513
DRAWN	CHECKED
ZWA	BMD

UNDERGROUND DETENTION DETAILS

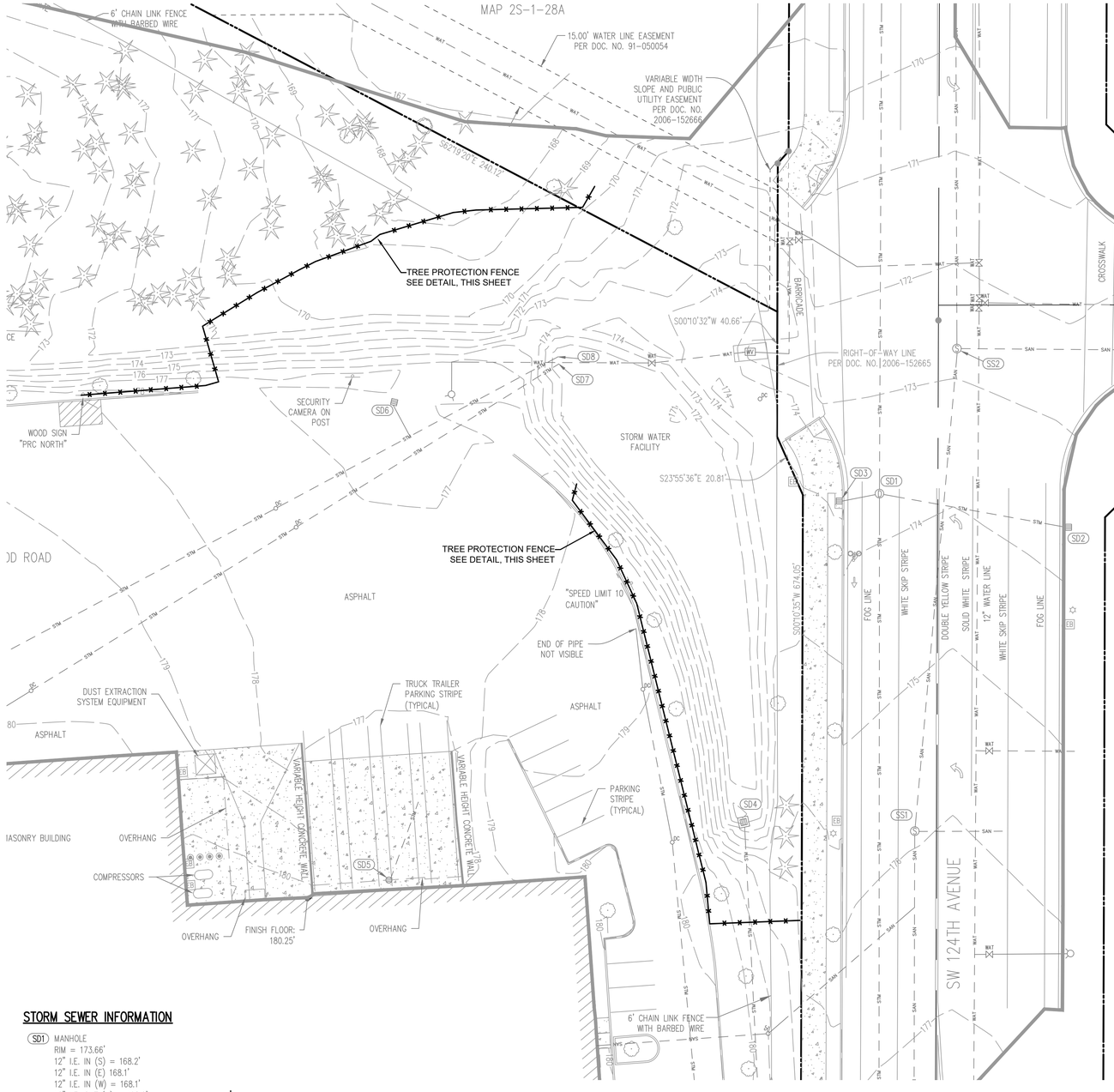
C1.4

G:\Acad2022\20220513\0-Drawings\100 C1.0 Site Plan.dwg 7/20/2023 9:13 AM





1 C0.1 TREE FENCE DETAIL



LEGEND

- DECIDUOUS TREE
- CONIFEROUS TREE
- FIRE HYDRANT
- WATER VALVE
- WATER VAULT
- SANITARY SEWER MANHOLE
- STORM SEWER CLEAN OUT
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- POWER JUNCTION BOX
- STREET LIGHT
- SIGN
- BOLLARD
- FOUND SURVEY MONUMENT
- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- PROPERTY LINE
- CENTERLINE
- DITCH
- CURB
- EDGE OF PAVEMENT
- EASEMENT
- FENCE LINE
- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE

SANITARY SEWER INFORMATION

(SS1) MANHOLE
RIM = 175.90'
10" (S TO N)
FLOW LINE = 164.5'

(SS2) MANHOLE
RIM = 172.46'
10" I.E. IN (W) = 164.3'
10" I.E. IN (S) = 163.7'
10" I.E. IN (E) = 163.7'
8" I.E. OUT (N) = 163.4'

(SS3) MANHOLE
RIM = 172.18'
10" (E TO W)
FLOW LINE = 164.7'

STORM SEWER INFORMATION

(SD1) MANHOLE
RIM = 173.66'
12" I.E. IN (S) = 168.2'
12" I.E. IN (E) 168.1'
12" I.E. IN (W) = 168.1'
12" I.E. OUT (N) = 168.0'

(SD2) CURB INLET
RIM = 174.08'
12" I.E. OUT (W) = 168.7'

(SD3) CURB INLET
RIM = 173.87'
12" I.E. OUT (E) = 168.2'

(SD4) DITCH INLET
RIM TOP = 173.19'
RIM BOTTOM = 172.06'
18" I.E. OUT (S) = 170.2'

(SD5) CATCH BASIN – ROUND
RIM = 176.34'
TRAP (NE)

(SD6) LYNCH STYLE CATCH BASIN
RIM = 176.33'
TRAP (S)

(SD7) CONCRETE OUTFALL
10" I.E. (W) = 171.1'

(SD8) PVC OUTFALL
10" I.E. (W) = 171.1'

TREE PRESERVATION PLAN

1" = 20'

20 0 20 40 60

TREE PROTECTION NOTES

1. REFER TO THE TREE PROTECTION PLAN BY TERAGAN FOR ADDITIONAL GUIDANCE ON TREE PROTECTION AND REMOVAL.
2. ALL EXISTING TREES SHOWN ON THIS PLAN ARE TO BE PROTECTED THROUGHOUT CONSTRUCTION.

SURVEYOR'S NOTES

1. FIELD SURVEY FOR THIS MAP WAS COMPLETED ON FEBRUARY 13, 2023.
2. ELEVATIONS AND CONTOURS ARE BASED ON WASHINGTON COUNTY BENCHMARK NO. 102. THE BENCHMARK IS A BRASS DISK LOCATED NORTH OF THE RAILROAD TRACKS NEAR THE MOST NORTHERLY CORNER OF THE PROPERTY, AS SHOWN. IT HAS AN ELEVATION OF 157.30 FEET ON THE NGVD 1929 VERTICAL DATUM.
3. THE BASIS OS BEARINGS FOR THIS SURVEY IS WASHINGTON COUNTY RECORD OF SURVEY NO. 32478.
4. THE RIGHT-OF-WAY WIDTHS WERE ESTABLISHED USING INFORMATION FROM PLATS, RECORD SURVEYS AND THE TAX ASSESSOR'S MAP.
5. THE EASEMENTS SHOWN ON THIS MAP ARE BASED ON THE TITLE REPORT, PREPARED BY OLD REPUBLIC TITLE INSURANCE COMPANY WITH AN EFFECTIVE DATE OF MARCH XX 2023 AT 8:00 AM
6. THE UNDERGROUND UTILITIES ARE BASED ON THE MARKINGS PER LOCATE TICKET NUMBER 23016606.
7. TREES WITH NUMBER 1-447 HAVE ALUMINUM TAGS WITH CORRESPONDING NUMBERS. THE TREES WITH LARGER NUMBERS DO NOT HAVE TAGS.

UTILITY STATEMENT

THE UNDERGROUND UTILITIES HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME
COLUMBIA CORRUGATED BOX
SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

⚠	DATE	DESCRIPTION

DATE	
APRIL 2022	
SCALE: AS NOTED	PROJ. NO.: 20220513
DRAWN: ZWA	CHECKED: BMD

TREE PRESERVATION PLAN

C0.1

PLANT LEGEND: STORM WATER FACILITY

SYMBOL	QTY.	LATIN NAME/ Common Name	SIZE	SPACING
TREES				
	3	ACER CIRCINATUM Vine Maple	2 gal./2' ht.	As Shown
	3	RHAMNUS PURSHIANA Cascara	1 gal./2' ht.	As Shown
	4	TSUGA MERTENSIANA Mountain Hemlock	2 gal./3' ht.	As Shown
SHRUBS				
	16	CORNUS SERICEA Red Osier Dogwood	1 gal./2' ht.	As Shown
	8	PHILADELPHUS LEWISII Mock Orange	1 gal./2' ht.	As Shown
	12	SPIRAEA DOUGLASII Douglas Spirea	1 gal./1.5' ht.	As Shown
	12	SYMPHORICARPUS ALBUS Snowberry	1 gal./1.5' ht.	As Shown
HERBACOUS PLANTS (*)				
	1,370	JUNCUS PATENS Spreading Rush	Plugs	6 per SF
	1,370	CAREX ROSSI Rossi Sedge	Plugs	6 per SF
	1,370	SCIRPUS MICROCARPUS Small Fruited Bulrush	Plugs	6 per SF

STORM WATER FACILITY CALCULATIONS
PER CLEAN WATER SERVICES STANDARDS

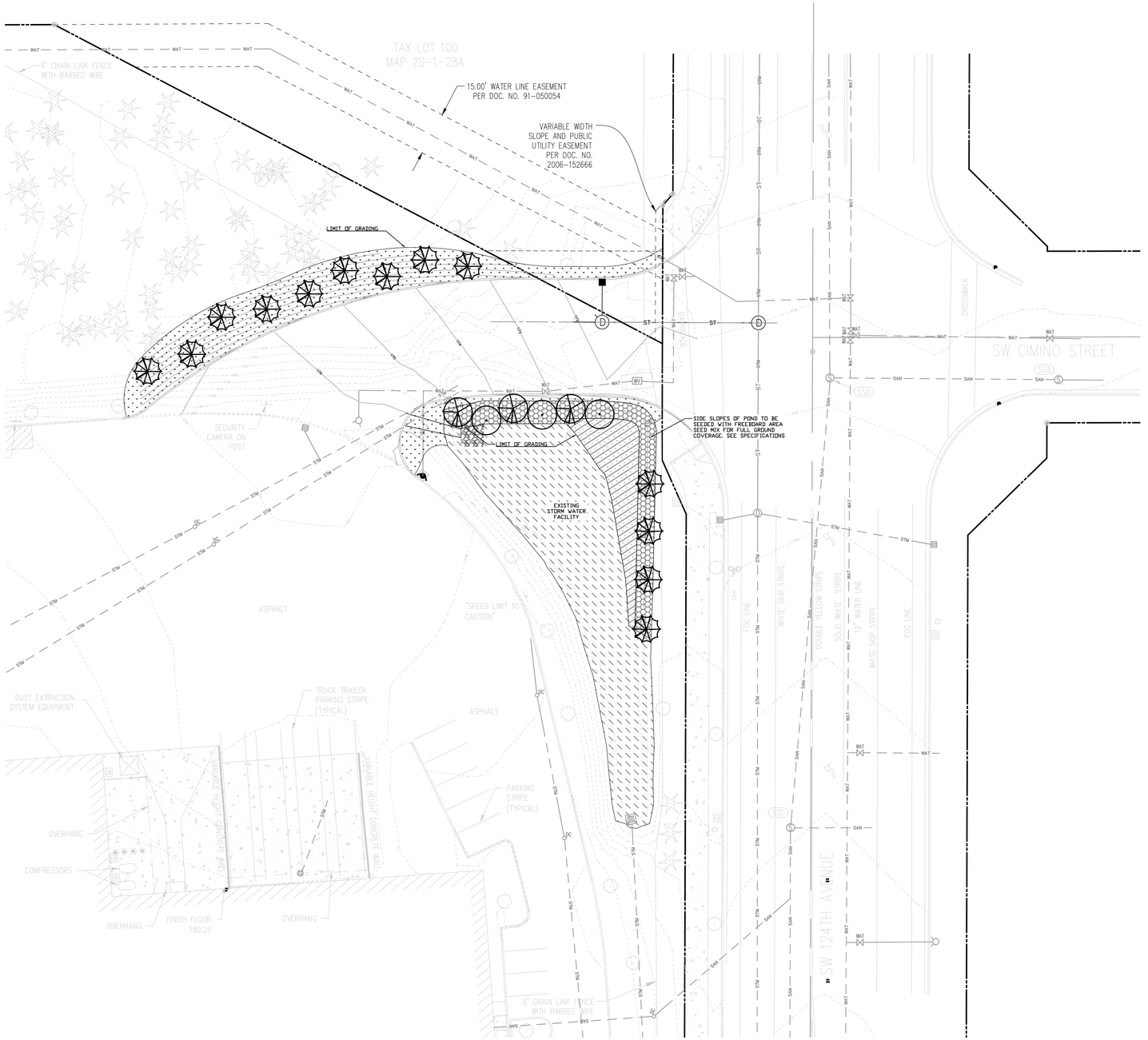
NEW / DISTURBED FACILITY AREA= 1,630 SF
TREATMENT AREA= 685 SF
HERBACEOUS PLANTS REQUIRED (6 PLUGS PER SF)= 4,110

FREEBOARD AREA= 945 SF
TREES REQUIRED (945*.01)= 10
SHRUBS REQUIRED (945*.05)= 48

PLANT LEGEND: LANDSCAPE

SYMBOL	QTY.	LATIN NAME/ Common Name	SIZE	SPACING
GROUNDCOVER				
	2,640 SF	ROUGH SEED MIX: SEE SPECIFICATIONS		
TREES				
	9	TSUGA MERTENSIANA Mountain Hemlock	5' ht.	As Shown
EXISTING PLANTS				
		EXISTING LANDSCAPE TO REMAIN		

GENERAL NOTES:
1. Contractor is to verify all plant quantities.
2. Adjust plantings in the field as necessary.
3. Project is to be irrigated by an automatic, underground system, which will provide full coverage for all plant material. System is to be design/ build by Landscape Contractor. Guarantee system for a minimum one year. Show drip systems as alternate bid only.
4. All plants are to be fully foliaged, well branched and true to form.
5. Contractor is to notify Landscape Architect or Owner's Representative of any site changes or unforeseen conditions that may be detrimental to plant health, or cause future problems to any structural elements of the project.



LANDSCAPE PLAN

SCALE 1" = 20'-0"

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME
COLUMBIA CORRUGATED BOX
SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

	DATE	DESCRIPTION

DATE: APRIL 2022
SCALE: AS NOTED
PROJ. NO.: 20220513
DRAWN: AH
CHECKED: EH

LANDSCAPE PLAN

L1.0

OUTLINE SPECIFICATIONS PLANTING AND SEEDING:

GENERAL: All plants shall conform to all applicable standards of the latest edition of the "American Association of Nurserymen Standards", A.N.S.I. Z60.1 – 1973. Meet or exceed the regulations and laws of Federal, State, and County regulations, regarding the inspection of plant materials, certified as free from hazardous insects, disease, and noxious weeds, and certified fit for sale in Oregon.

The apparent silence of the Specifications and Plans as to any detail, or the apparent omission from them of a detailed description concerning any point, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of first quality are to be used. All interpretations of these Specifications shall be made upon the basis above stated.

Landscape contractor shall perform a site visit prior to bidding to view existing conditions.

PERFORMANCE QUALITY ASSURANCE: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary horticultural practices and who are completely familiar with the specified requirements and methods needed for the proper performance of the work of this section.

NOTIFICATION: Give Landscape Architect minimum of 2 days advance notice of times for inspections. Inspections at growing site does not preclude Landscape Architect's right of rejection of deficient materials at project site. Each plant failing to meet the above mentioned "Standards" or otherwise failing to meet the specified requirements as set forth shall be rejected and removed immediately from the premises by the Contractor and at his expense, and replaced with satisfactory plants or trees conforming to the specified requirements.

SUBSTITUTIONS: Only as approved by the Landscape Architect or the Owner's Representative.

GUARANTEE AND REPLACEMENT: All plant material shall be guaranteed from final acceptance for one full growing season or one year, whichever is longer. During this period the Contractor shall replace any plant material that is not in good condition and producing new growth (except that material damaged by severe weather conditions, due to Owner's negligence, normally unforeseen peculiarities of the planting site, or lost due to vandalism). Guarantee to replace, at no cost to Owner, unacceptable plant materials with plants of same variety, age, size and quality as plant originally specified. Conditions of guarantee on replacement plant shall be same as for original plant.

Landscape Contractor shall keep on site for Owner's Representative's inspection, all receipts for soil amendment and topsoil deliveries.

PROTECTION: Protect existing roads, sidewalks, and curbs, landscaping, and other features remaining as final work. Verify location of underground utilities prior to doing work. Repair and make good any damage to service lines, existing features, etc. caused by landscaping installation.

PLANT QUALITY ASSURANCE: Deliver direct from nursery. Maintain and protect roots of plant material from drying or other possible injury. Store plants in shade and protect them from weather immediately upon delivery, if not to be planted within four hours.

Nursery stock shall be healthy, well branched and rooted, formed true to variety and species, full foliaged, free of disease, injury, defects, insects, weeds, and weed roots. Trees shall have straight trunks, symmetrical tips, and have an intact single leader. Any trees with double leaders will be rejected upon inspection. All Plants: True to name, with one of each bundle or lot tagged with the common and botanical name and size of the plants in accordance with standards of practice of the American Association of Nurserymen, and shall conform to the Standardized Plant Names, 1942 Edition.

Container grown stock: Small container–grown plants, furnished in removable containers, shall be well rooted to ensure healthy growth. **Grow container plants in containers a minimum of one year** prior to delivery, with roots filling container but not root bound. Bare root stock: Roots well–branched and fibrous. Balled and burlapped (B&B): Ball shall be of natural size to ensure healthy growth. Ball shall be firm and the burlap sound. No loose or made ball will be acceptable.

TOPSOIL AND FINAL GRADES: Landscape Contractor is to supply and place 12" of topsoil in planting beds and 6" in lawn areas. Landscape Contractor is to verify with the General Contractor if the on–site topsoil is or is not conducive to proper plant growth. The topsoil shall be a sandy loam, free of all weeds and debris inimical to lawn or plant growth. Furnish soil analysis by a qualified soil testing laboratory stating percentages of organic matter; gradation of sand, silt and clay content; cation exchange capacity; deleterious material; pH; and plant nutrient content of the topsoil. Report suitability of topsoil for plant growth and recommended quantities of nitrogen, phosphorus and potash nutrients and soil amendments (including compost) to be added to produce satisfactory topsoil. If stockpiled topsoil on site is not conducive to proper plant growth, the Landscape Contractor shall import the required amount.

Landscaping shall include finished grades and even distribution of topsoil to meet planting requirements. Grades and slopes shall be as indicated. Planting bed grades shall be approximately 3" below adjacent walks, paving, finished grade lines, etc., to allow for bark application. Finish grading shall remove all depressions or low areas to provide positive drainage throughout the area.

PLANTING SPECIFICATIONS:

SEED: Bluetag grass seed conforming to applicable State laws. No noxious weed seeds. Submit Guaranteed analysis.
Rough Seed Mix: To Contain: 60% Perennial Ryegrass, 15% Eureka Hard Fescue, and 20% Herbaceous Plants and Clover (Pro–Time 705 PDX, or approved equal). Sow at 2 lbs. Per 1,000 sq.ft.

MAINTENANCE OF SEEDED AREAS: Rough seed areas to be mowed as needed to control height.

GENERAL MAINTENANCE: Protect and maintain work described in these specifications against all defects of materials and workmanship, through final acceptance. Replace plants not in normal healthy condition at the end of this period. Water, weed, cultivate, mulch, reset plants to proper grade or upright position, remove dead wood and do necessary standard maintenance operations. Irrigate when necessary to avoid drying out of plant materials, and to promote healthy growth.

CLEAN–UP: At completion of each division of work all extra material, supplies, equipment, etc., shall be removed from the site. All walks, paving, or other surfaces shall be swept clean, mulch areas shall have debris removed and any soil cleared from surface. All areas of the project shall be kept clean, orderly and complete.

WATER QUALITY SWALE AND VEGETATED CORRIDOR SPECIFICATIONS PER APPENDIX A OF CLEAN WATER SERVICES DESIGN & CONSTRUCTION STANDARDS:

SITE PREPARATION: Landscape contractor shall asses the existing soil conditions of the vegetated swale and/or corridor to determine the appropriate soil preparation methods, as follows:

For areas with at least one foot of native topsoil, but containing non–native or invasive plants, remove undesirable plants, roots and seeds prior to planting.

For areas with either disturbed or compacted soils, or less than one foot of topsoil and containing non–native or invasive plants:
1. Remove undesireable plants, roots and seeds prior to adding topsoil.
2. Till the sub–grade in these areas to a depth of at least 4" and add at least 12" of clean compost–amended topsoil. The compost amended topsoil shall have the following characteristics to ensure a good growing medium:
   A) Texture – material passes through 1" screen
   B) Fertility – 35% organic matter
3. In the event of flood plain grading, over–excavate the sub grade to ensure 12" of topsoil can be applied without impacting surface water elevations.

Where appropriate and necessary for erosion control or to enhance organic matter, leaf compost may be placed uniformly on the topsoil. (Refer to Chapter 6, Erosion Prevention and Sediment Control). Other amendments, conditioners, and bio amendments may be added as needed to support the specified plants or adjust the soil pH. Traditional fertilization techniques (appplying N–P–K) are not necessary for native plants.

TIMING: Containerized stock shall be installed between February 1 and May 1, or between October 1 and November 15. Bare root stock shall be installed only from December 15 through April 15 (bare root stock must be 12–16 inches long). Notify Landscape Architect if planting must be performed outside these times, as additional approved measures may be needed to assure survival.

EROSION CONTROL: Grading, soil preparation, and seeding shall be performed during optimal weather conditions and at low flow levels to minimize sediment impacts. Site disturbance shall be minimized and desirable vegetation retained, where possible. Slopes shall be graded to support the establishment of vegetation. Where seeding is used for erosion control, an appropriate native grass, Regreen (or its equivalent), or sterile wheat shall be used to stabilize slopes until permanent vegetation is established. Biodegradable fabrics (coir, coconut or approved jute matting (minimum 1/4" square holes) may be used to stabilize slopes and channels. Fabrics such as burlap may be used to secure plant plugs in place and to discourage floating upon inundation. No plastic mesh that can entangle wildlife is permitted. Consult CWS Chapter 6 – Erosion Prevention and Sediment Control for additional information.

A biodegradable Erosion Control Matting shall be placed over the topsoil throughout the swale cross section, fabric shall be held in place in accordance with the manufacturer's installation requirements. Use high density jute matting in the treatment area (Geojute Plus or approved equal). In all other areas use low density jute matting (Econojute or approved equal). Landscaping shall include finished grades and even distribution of topsoil to meet planting requirements. Grades and slopes shall be as indicated on civil plans. Finish grading shall remove all depressions or low areas to provide positive drainage throughout the area.

WATER QUALITY SWALE AND VEGETATED CORRIDOR SPECIFICATIONS PER APPENDIX A OF CLEAN WATER SERVICES DESIGN & CONSTRUCTION STANDARDS CONTINUED:

INVASIVE SPECIES CONTROL: Mechanical control by hand consistent with Clean Water Services' Integrated Vegetated and Animal Management Guide (March 2003) is recommended to control invasive spread prior to installing plantings. Invasive species control to be conducted as needed based upon the site inspections. Invasive species include: Himalayan and evergreen blackberry (Rubus discolor and R. laciniatus), reed canarygrass (Phalaris arundinacea), teasel (Dipsacus fullonum), Canada and bull thistle (Cirsium arvense and C. vulgare), Scotch broom (Cytisus scoparius), purple loosestrife (Lythrum salicaria), Japanese knotweed (Polygonium cuspidatum), morning glory (Convolvulus species, giant hogweed (Heracleum mantegazzianum), English ivy (Hedera helix), nightshade (Solanum species), and clematis (Clematis ligusticifolia and C. vitalba.

FERTILIZER: Do not apply fertilizer to any plantings within the Water Quality Swale.

PLANTING TREES AND SHRUBS: Plant upright and face to give best appearance or relationship to adjacent plants and structures. Loosen and remove twine binding and burlap from top one–half of root balls. Cut off cleanly all broken or frayed roots, and spread roots out. Stagger Plants in rows. Backfill planting hole with soil mix while working each layer to eliminate voids. Plantings shall be tagged for dormant season identification and shall remain on plant material after planting for monitoring purposes.

MULCHING: Trees, shrubs, and groundcovers planted in upland areas shall be mulched a minimum of 3" in depth and 18" in diameter, to retain moisture and discourage weed growth around newly installed plant material. Appropriate mulches are made from composted bark or leaves that have not been chemically treated. The use of mulch in frequently inundated areas shall be limited, to avoid any possible water quality impacts including the leaching of tannins and nutrients, and the migration of mulch into waterways.

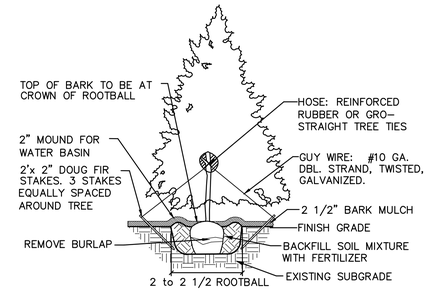
For vegetated swales, see CWS Standard Detail 710 for mulching of the treatment area plantings.

WILDLIFE PROTECTION: Depending on site conditions, appropriate measures shall taken to limit wildlife–related damage (deer, beaver, nutria, mice and voles). Examples include installing tree protector tubes or wire mesh cylinders around newly installed plantings.

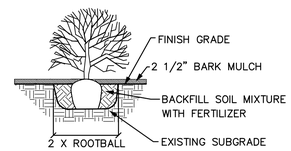
SEED: Bluetag grass seed conforming to applicable State laws. No noxious weed seeds. Submit Guaranteed analysis.
Freeboard Area Seed: To contain 40% Dwarf Tall Fescue, 30% Dwarf Perennial Rye, 25% Creeping Red Fescue and 5% Colonial Bent Grass. Apply at a rate of 2.75 lbs. / 1,000 sq.ft.

IRRIGATION: Plantings shall be watered using an approved temporary irrigation system (or equivalent) during the two year establishment period. Irrigation system shall be design/build by landscape contractor. All plantings under CWS jurisdiction are to be watered one inch per week from June 15 through October 15 for the duration of the two year maintenance period.

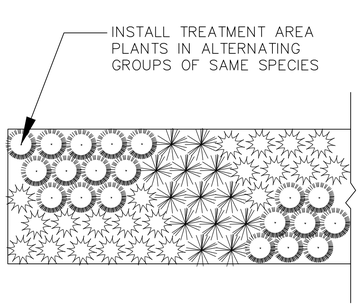
MAINTENANCE: The permitee is responsible for the maintenance of this facility to assess the status of plantings, irrigation, and mulchingfor for a minimum of two years following the acceptance of the facility by Clean Water Services. Owners Representative shall inspect the facility twice annually (Spring by June 1st & Fall by September 30th) throughout the two–year maintenance period. If at any time during the warranty period the landscaping falls below 80% survival of trees and shrubs, or 90% aerial coverage of herbaceous plants, or if the amount of invasive non–native species exceeds 20%, the Owner shall remove the undesirable vegetation and reinstall all deficient planting at the next appropriate time. The cause of plant loss and corrective measures taken shall be documented, and the two–year maintenance period shall begin again from the date of replanting.



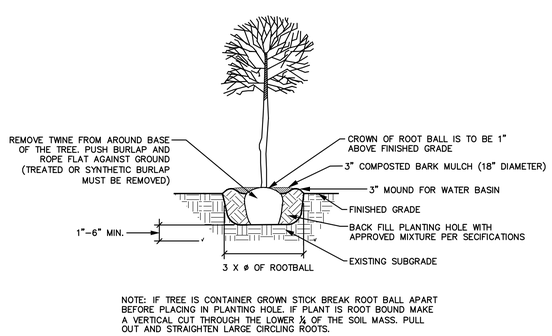
EVERGREEN TREE STAKING DETAIL
NOT TO SCALE



SHRUB PLANTING DETAIL
NOT TO SCALE



STORMWATER FACILITY PLANTING DETAIL
NOT TO SCALE



NOTE: IF TREE IS CONTAINER GROWN STICK BREAK ROOT BALL APART BEFORE PLACING IN PLANTING HOLE. IF PLANT IS ROOT BOUND MAKE A VERTICAL CUT THROUGH THE LOWER ¼ OF THE SOIL MASS. PULL OUT AND STRAIGHTEN LARGE CIRCLING ROOTS.

DECIDUOUS TREE PLANTING DETAIL
PER C.W.S NOT TO SCALE

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME
COLUMBIA CORRUGATED BOX
SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

⚠	DATE	DESCRIPTION

DATE
APRIL 2022

SCALE	PROJ. NO.
AS NOTED	20220513
DRAWN	CHECKED
AH	EH

LANDSCAPE DETAILS & SPECIFICATIONS

L2.0

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

TREE PROTECTION PLAN

for

COLUMBIA CORRUGATED BOX
12777 SW TUALATIN – SHERWOOD ROAD
TUALATIN, OR 97062

for the

SW 124TH ACCESS

Submitted by

Peter van Oss PN-8145A

Date Saturday, July 1, 2023

Teragan and Associates, Inc.™
Arboricultural Consultants
3145 Westview Circle, Lake Oswego, OR 97034
503-697-1975 | info@teragan.com

Teragan and Associates Inc.™
3145 Westview Circle, Lake Oswego, OR 97034
P: 503.697.1975 | E: info@teragan.com

Table of Contents

Teragan and Associates, Inc.
Arboricultural Consultants
3145 Westview Circle, Lake Oswego, OR 97034
503-697-1975 | info@teragan.com

Summary

Teragan and Associates has been contracted with Columbia Corrugated Box to provide arboricultural consulting services. This report is the tree protection plan for the proposed access on the northeast side of the property at the intersection of SW 124th Ave and SW Camino Street. The tree protection plan is in accordance with Chapter 32.020 – Architectural Review and 33.110 – Tree Removal Permit/Review of the City of Tualatin Code.

Background

The plans propose to add a new entrance on the NE side of the property at the intersection of SW 124th & SW Camino Street. The north side of the property is bordered by a stand of Douglas-fir (*Pseudotsuga menziesii)* which is lower in elevation than the parking lot to the south. The increase in impervious surfaces requires to install a stormwater treatment facility which was originally planned to be located in the "forested" area. This would have resulted in the loss of a large number of trees. To limit the number of trees to be removed in association with the proposed plan, the stormwater facility is now planned to be located under the new driveway approach.

Tree Inventory

Our firm completed the inventory during the site visit on March 4, 2023. The tree diameters were recorded using a diameter tape. The health and conditions of the trees are determined by the plant species profiles compared to the current condition the trees present. Attributes that can negatively impact the ratings are growing conditions, bark inclusions, broken branches, poor vigor…etc. All trees are tagged with aluminum tags that have the corresponding numbers scribed on them. The inventory spreadsheet is attached in Appendix D of this report.

Purpose and Use of the Report

The purpose of this report is to establish a narrative for the removal of the trees and tree protection measures that will need to be adhered to during the construction project to ensure a positive outcome of the retention efforts. This report may be used by the owner to establish communications between the city planning department, the contractors, and sub-contractors regarding the tree protection efforts of the project.

Limits of the Report

The trees were visually assessed from the ground only, no tools were used to assess any of the tree parts. The conclusions of my findings are determined by comparing the foreseeable impacts to the trees with the use of the provided site plans. I visited the site on March 7, 2023, and the conclusions of my findings are as of that date.

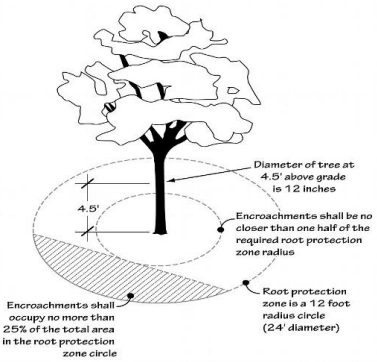
Observations

The location of the new entrance requires that the topography is altered to allow for a functional approach. The stand of trees is primarily comprised of Douglas-fir trees which has a construction tolerance that is considered to be good. The trees handle root pruning and fill soils well as long as no more than 25% of the total root volume is affected. The species does not tolerate hydrology changes well. The stand is in overall good condition with the exception of a few trees that have fruiting bodies growing on or near them that are associated with wood decaying fungi. Those trees are not associated with the proposed site improvements, but it is recommendable to monitor the trees and establish a maintenance plan in the near future.

Proposed Tree Removals

If tree removal takes place during the migratory bird season, the site should be inspected for the presence of migratory and predatory birds that may be nesting in the trees. In the Portland Metro area, the nesting season is from February 1st through August 1st. The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703 – 712) is a federal law that prohibits the disturbance of active nests. If active nests are located near the proposed construction activities the areas surrounding the nesting location must be protected and activities may not take place within a circumference of area that is bird-species specific.

The trees that are proposed for removal are directly in the footprint of the proposed site improvements or the foreseeable impacts will adversely affect greater than 25% of the total root volume of the trees. The site plan attached in Appendix C shows the root protection zone at 12X the diameter of the trees and the critical root zone of the trees at 6X the diameter of the trees. Due to the need for a significant amount of fill soil, the trees closest to the toe-of-fill are also proposed for removal.



There are five Kwanzan-cherries (*Prunus serrulata)* recommended for removal because their health and condition is poor. The trees have large cavities present and numerous large dead branches throughout the crowns. The trees are too affected and there are no reasonable maintenance options available to try and rectify the abnormalities. The inventory spreadsheet is attached in Appendix D of this report and states the current health and condition ratings as well as the removal and protection status. In total 28 trees are proposed for removal to allow for the construction of the proposed site developments and five trees are proposed due to their health and condition ratings.

Site Specific Tree Protection

Before Construction Begins

Trees that are proposed for removal that are in the root protection zones of the trees must be removed by means of felling. The removals cannot be completed with the use of earth moving equipment since pulling the trees over will cause root damages to the trees that are to be retained. It is recommended that the stumps of the removed trees remain in places where the trees have shared root protection zones.

During Construction
Trees that are retained should be protected at the recommended distance of 12 inches per diameter inch of the trees. This means that the soil disturbance should be 12 inches per diameter inch away from the tree in circumference of the tree unless the project arborist supervises the ground disturbing activities.

Although root impacts are not anticipated, it is recommended that the excavation within the root protection zone is carefully carried out. The excavation should start as far away from the tree as possible while working towards the tree in small increments. If roots larger than one-and-a-half-inch diameter are encountered, the project arborist must consult with the client and the contractor to determine the best course of action.

The attached existing conditions plan provided by VLMK has been marked up to scale. The blue circles indicate the tree protection zone at 12X the diameter and the orange circles indicate the critical root zones at 6X the tree diameter.

Additional Tree Protection Mitigation in Appendix E

Conclusion

It is my professional opinion that the tree protection measures set forth in this tree plan will suffice in the protection of the trees during construction. It is important to adhere to the standards in this report to ensure that the retention goals are successful.

Please feel free to contact me with any questions or concerns.

Sincerely,

Peter van Oss

Peter van Oss | Senior Associate

ISA Certified Arborist PN-8145A

Tree Risk Assessment Qualified

ASCA Member

Enclosures:

Appendix A: Certification of Performance

Appendix B: Assumptions and Limiting Conditions

Appendix C: Site Plan Fencing Placement and Proposed Removals

Appendix D: Inventory

Appendix E: Tree Protection Standards

Appendix F: Tree Protection Signage

Appendix A: Certification of Performance

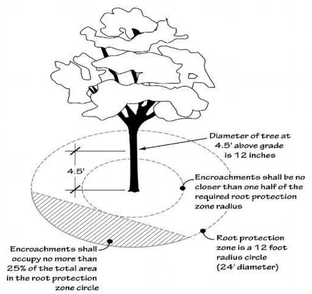
I, Peter van Oss, certify that:

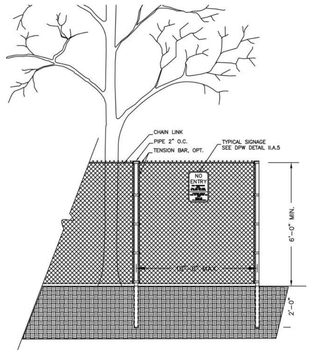
- I have personally inspected the trees and the property referred to in this report and have stated my findings accurately. The extent of the evaluation or appraisal is stated in the attached report and the Terms of the Assignment.
- I have no current or prospective interest in the vegetation or the property that is subject of this report and have no personal interest or bias with respect to the parties involved.
- The analysis, opinions and conclusions stated herein are my own and are based on current professional procedures and facts.
- My analysis, opinions and conclusions were developed, and this report has been prepared according to commonly accepted arboricultural practices.
- No one provided significant professional assistance to me, except as indicated in the report.
- My compensation is not contingent upon reporting of a predetermined conclusion that favors the cause of the client or any other party nor upon the results of the assessment, the attainment of stipulated results, or the occurrence of any subsequent events.

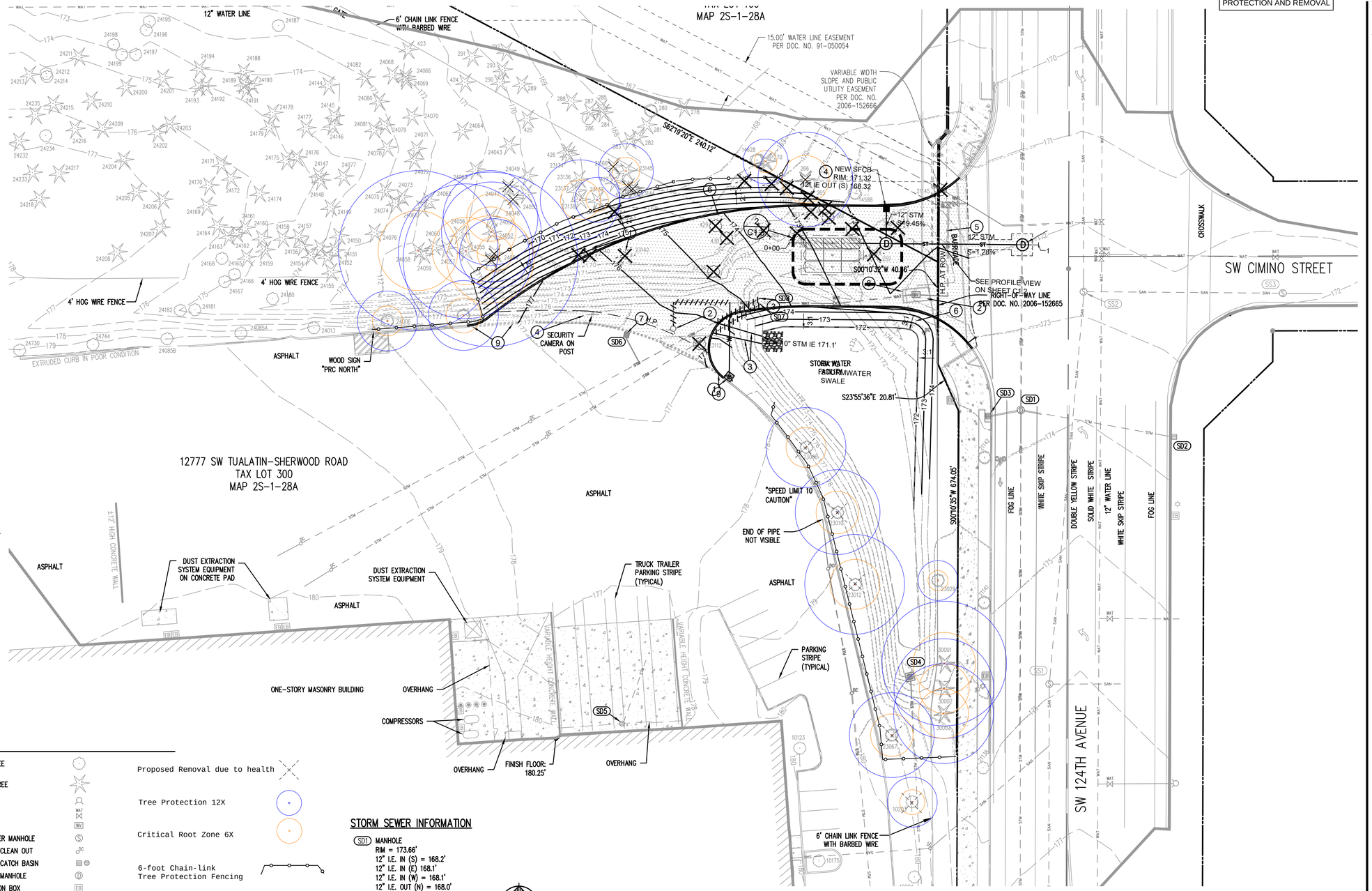
I further certify that I am a member of, and certified as an arborist by the ISA. I have been involved in the arboricultural field in a full- time capacity for a period of 17 years.

Appendix B: Assumptions and Limiting Conditions

1. A field examination of the site was made. My observations and conclusions are as of that date.
2. Care has been taken to obtain all information from a reliable source, however the arborist can neither guarantee nor be responsible for accuracy of information provided by others.
3. Unless stated otherwise, information contained in this report covers only those trees that were examined and reflects the condition of those trees at the time of inspection. The inspection is limited to visual examination of the subject trees without dissection, excavation, probing, or coring. There is no warranty or guarantee that problems or deficiencies of the subject tree may not arise in the future.
4. This report and any values/opinions expressed herein represents my opinion as an arborist. Inaction on the part of those receiving the report is not the responsibility of the arborist.
5. Loss or alteration of this report invalidates the entire report.
6. Any legal description provided to the consultant/ appraiser is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. All property is appraised or evaluated as free and clear, under responsible ownership and competent management.
7. The consultant/ appraiser shall not be required to give testimony or attend court by reason of this report unless subsequent contractual arrangements are made, including payment for such services.
8. Possession of this report does not imply right of publication or use for any other purpose by any other than the person to whom it is addressed, without the prior expressed written consent of the consultant/ appraiser.







LEGEND

- DECIDUOUS TREE
- CONIFEROUS TREE
- FIRE HYDRANT
- WATER VALVE
- WATER VAULT
- SANITARY SEWER MANHOLE
- STORM SEWER CLEAN OUT
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- POWER JUNCTION BOX
- STREET LIGHT
- SIGN
- BOLLARD
- FOUND SURVEY MONUMENT
- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- PROPERTY LINE
- CENTERLINE
- DITCH
- CURB
- EDGE OF PAVEMENT
- EASEMENT
- FENCE LINE
- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE

- Proposed Removal due to health
- Tree Protection 12X
- Critical Root Zone 6X
- 6-foot Chain-link Tree Protection Fencing

SANITARY SEWER INFORMATION

(SS1) MANHOLE
RIM = 175.90'
10" (S TO N)
FLOW LINE = 164.5'

(SS2) MANHOLE
RIM = 172.46'
10" I.E. IN (W) = 164.3'
10" I.E. IN (S) = 163.7'
10" I.E. IN (E) = 163.7'
8" I.E. OUT (N) = 163.4'

(SS3) MANHOLE
RIM = 172.18'
10" (E TO W)
FLOW LINE = 164.7'

STORM SEWER INFORMATION

(SD1) MANHOLE
RIM = 173.66'
12" I.E. IN (S) = 168.2'
12" I.E. IN (E) 168.1'
12" I.E. IN (W) = 168.1'
12" I.E. OUT (N) = 168.0'

(SD2) CURB INLET
RIM = 174.08'
12" I.E. OUT (W) = 168.7'

(SD3) CURB INLET
RIM = 173.87'
12" I.E. OUT (E) = 168.2'

(SD4) DITCH INLET
RIM TOP = 173.19'
RIM BOTTOM = 172.06'
18" I.E. OUT (S) = 170.2'

(SD5) CATCH BASIN - ROUND
RIM = 176.34'
TRAP (NE)

(SD6) LYNCH STYLE CATCH BASIN
RIM = 176.33'
TRAP (S)

(SD7) CONCRETE OUTFALL
10" I.E. (W) = 171.1'

(SD8) PVC OUTFALL
10" I.E. (W) = 171.1'

EXISTING CONDITIONS & DEMO PLAN 1" = 20'

20 0 20 40 60

DEMO KEYNOTES (#)

1. REMOVE EXISTING TREES AS SHOWN (TYPICAL) AND PER ARBORISTS RECOMMENDATIONS.
2. RELOCATE EXISING FIRE HYDRANT PER PLAN ON SHEET C1.0.
3. RELOCATE EXISTING STORM OUTFALLS SD7 AND SD8 PER PLAN ON SHEET C1.0.
4. RELOCATE SIGN
5. DEMO DRIVEWAY BARRICADE
6. DEMO GATE AND FENCE AS NECESSARY
7. PROTECT EXISTING CATCH BASIN
8. PROTECT EXISTING VAULT

SURVEYOR'S NOTES

1. FIELD SURVEY FOR THIS MAP WAS COMPLETED ON FEBRUARY 13, 2023.
2. ELEVATIONS AND CONTOURS ARE BASED ON WASHINGTON COUNTY BENCHMARK NO. 102. THE BENCHMARK IS A BRASS DISK LOCATED NORTH OF THE RAILROAD TRACKS NEAR THE MOST NORTHERLY CORNER OF THE PROPERTY, AS SHOWN. IT HAS AN ELEVATION OF 157.30 FEET ON THE NGVD 1929 VERTICAL DATUM.
3. THE BASIS OS BEARINGS FOR THIS SURVEY IS WASHINGTON COUNTY RECORD OF SURVEY NO. 32478.
4. THE RIGHT-OF-WAY WIDTHS WERE ESTABLISHED USING INFORMATION FROM PLATS, RECORD SURVEYS AND THE TAX ASSESSOR'S MAP.
5. THE EASEMENTS SHOWN ON THIS MAP ARE BASED ON THE TITLE REPORT, PREPARED BY OLD REPUBLIC TITLE INSURANCE COMPANY WITH AN EFFECTIVE DATE OF MARCH XX 2023 AT 8:00 AM
6. THE UNDERGROUND UTILITIES ARE BASED ON THE MARKINGS PER LOCATE TICKET NUMBER 23016606.
7. TREES WITH NUMBER 1-447 HAVE ALUMINUM TAGS WITH CORRESPONDING NUMBERS. THE TREES WITH LARGER NUMBERS DO NOT HAVE TAGS.

UTILITY STATEMENT

THE UNDERGROUND UTILITIES HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME

COLUMBIA CORRUGATED BOX
SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

#	DATE	DESCRIPTION

DATE	APRIL 2022
SCALE	AS NOTED
PROJ. NO.	20220513
DRAWN	ZWA
CHECKED	BMD

EXISTING CONDITIONS & DEMO PLAN

C0.0

G:\Acad\2022\20220513\0-Drawings\100 C0.0 EXISTING CONDITIONS AND DEMO PLAN.dwg6/14/2023 1:47 PM

Inventory by:
Tom Feitl
Checked by:
Peter van Oss
Inventory Date: 3/7/2023

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

ObjectID	Survey Number	Common and Scientific Name	DBH	Condition Health	Condition Structure	Crown Radius	Crown Class	Construction Impact Tolerance	To Be Removed	Protected/Other	Field Notes/ Comments
1	10204	Kwanza-cherry (Prunus serrulate	16	Poor	Poor	7	Dominant	Good		X	decay in lower stem. schizophyllum on scaffold branches
2	10203	Kwanza-cherry (Prunus serrulate	10	Poor	Poor	7	Dominant	Good		Recommended Removal	decay in lower stem. schizophyllum on trunk
3	23067	Kwanza-cherry (Prunus serrulate	17	Poor	Poor	7	Dominant	Good		Recommended Removal	decay in lower stem. schizophyllum on branches
4	23012	Kwanza-cherry (Prunus serrulate	20	Poor	Poor	7	Dominant	Good		Recommended Removal	schizophyllum on branches. large pruning cuts
5	23010	Kwanza-cherry (Prunus serrulate	17	Poor	Poor	10	Dominant	Good		Recommended Removal	schizophyllum on branches. large pruning cuts. sin scalled
6	23006	Kwanza-cherry (Prunus serrulate	16	Poor	Poor	10	Dominant	Good		Recommended Removal	large basal decay. schizophyllum on branches. large pruning cuts. sin scalled
7	430	madrone (Arbutus menziesii)	10	Good	Poor	12	Suppressed	Moderate	Remove		heavy lean horizontal growth at 10 feet.
8	429	madrone (Arbutus menziesii)	17	Good	Poor	12	Suppressed	Moderate	Remove		heavy lean
9	23126	English-hawthorn (Crataegus mon	12	Good	Poor	7	Suppressed	Good	Remove		nuisance tree
10	23142	Douglas-fir (Pseudotsuga menzie	27	Good	Fair	25	Edge of Stand	Good	Remove		leaning trunk previous failed top
11	23143	Douglas-fir (Pseudotsuga menzie	24	Good	Fair	15	Codominant	Good	Remove		
12	23144	Douglas-fir (Pseudotsuga menzie	24	Good	Fair	15	Codominant	Good	Remove		
13	23145	Douglas-fir (Pseudotsuga menzie	11	Good	Fair	5	Codominant	Good		X	
14	21166	Douglas-fir (Pseudotsuga menzie	6	Dead/Dying					Remove		
15	23136	Douglas-fir (Pseudotsuga menzie	17	Fair	Fair	10	Codominant	Good		X	
16	23137	Douglas-fir (Pseudotsuga menzie	10	Fair	Fair	3	Codominant	Good		X	
17	23138	Douglas-fir (Pseudotsuga menzie	16	Fair	Fair	7	Codominant	Good		X	sap flow pockets. boring insects suspected.
18	23139	Douglas-fir (Pseudotsuga menzie	9	Fair	Fair	4	Codominant	Good		X	
19	23141	Douglas-fir (Pseudotsuga menzie	34	Good	Fair	20	Edge of Stand	Good	Remove		
20	23142	Douglas-fir (Pseudotsuga menzie	37	Good	Fair	20	Edge of Stand	Good		X	
21	24053	Douglas-fir (Pseudotsuga menzie	35	Good	Fair	25	Edge of Stand	Good	Remove		large hanger in canopy
22	24055	Douglas-fir (Pseudotsuga menzie	27	Good	Fair	25	Edge of Stand	Good		X	
23	24056	Douglas-fir (Pseudotsuga menzie	18	Good	Fair	10	Codominant	Good		X	
24	24057	Douglas-fir (Pseudotsuga menzie	9	Good	Fair	4	Suppressed	Good		X	
25	24060	Douglas-fir (Pseudotsuga menzie	13	Good	Fair	15	Suppressed	Good		X	sparse canopy
26	24059	Douglas-fir (Pseudotsuga menzie	20	Good	Fair	15	Edge of Stand	Good		X	sparse canopy
27	24058	Douglas-fir (Pseudotsuga menzie	32	Good	Poor	20	Edge of Stand	Good		X	red ring rot throughout
28	24061	Douglas-fir (Pseudotsuga menzie	6	Dead/Dying						X	
29	24062	Douglas-fir (Pseudotsuga menzie	17	Fair	Fair	8	Codominant	Good		X	
30	24054	Douglas-fir (Pseudotsuga menzie	14	Fair	Fair	8	Codominant	Good	Remove		codominant tree at 3 feet
31	24052	Douglas-fir (Pseudotsuga menzie	20	Fair	Fair	12	Codominant	Good		X	
32	24051	Douglas-fir (Pseudotsuga menzie	19	Fair	Fair	12	Codominant	Good		X	
33	24048	Douglas-fir (Pseudotsuga menzie	11	Dead/Dying					Remove		
34	24047	Douglas-fir (Pseudotsuga menzie	8	Dead/Dying					Remove		
35	24050	Douglas-fir (Pseudotsuga menzie	8	Fair	Poor	10	Suppressed	Good		X	poison oak on trunk
36	24049	Douglas-fir (Pseudotsuga menzie	17	Fair	Fair	10	Suppressed	Good		X	
37	23134	Douglas-fir (Pseudotsuga menzie		Dead/Dying	Failed/Failing					X	failed tree. trunk broke off at 5 feet
38	425	Douglas-fir (Pseudotsuga menzie	13	Fair	Fair	8	Codominant	Good		X	

Inventory by:
Tom Feitl
Checked by:
Peter van Oss
Inventory Date: 3/7/2023

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

39	24043	Douglas-fir (Pseudotsuga menzie	24	Fair	Fair	8	Codominant	Good		X	
40	24063	Douglas-fir (Pseudotsuga menzie	18	Fair	Fair	15	Codominant	Good		X	
41	24064	Douglas-fir (Pseudotsuga menzie	18	Fair	Fair	15	Codominant	Good		X	
42	424	Douglas-fir (Pseudotsuga menzie	19	Fair	Fair	12	Codominant	Good		X	
43	423	Douglas-fir (Pseudotsuga menzie	30	Fair	Fair	25	Edge of Stand	Good		X	asymmetric canopy
44	24068	Douglas-fir (Pseudotsuga menzie	10	Fair	Fair	25	Edge of Stand	Good		X	heavy lean contorted trunk growth
45	24066	Douglas-fir (Pseudotsuga menzie	13	Fair	Fair	7	Suppressed	Good		X	
46	24070	Douglas-fir (Pseudotsuga menzie	14	Fair	Poor	7	Suppressed	Good		X	previously failed top
47	24071	Douglas-fir (Pseudotsuga menzie	14	Fair	Poor	9	Suppressed	Good		X	
48	24072	Douglas-fir (Pseudotsuga menzie	12	Fair	Poor	7	Suppressed	Good		X	
49	24073	Douglas-fir (Pseudotsuga menzie	12	Fair	Poor	7	Suppressed	Good		X	
50	24074	Douglas-fir (Pseudotsuga menzie	14	Fair	Fair	7	Suppressed	Good		X	
51	24075	Douglas-fir (Pseudotsuga menzie	9	Fair	Fair	4	Suppressed	Good		X	
52	24076	Douglas-fir (Pseudotsuga menzie	22	Fair	Fair	12	Codominant	Good		X	
53	24077	Douglas-fir (Pseudotsuga menzie	18	Fair	Fair	15	Codominant	Good		X	
54	24078	Douglas-fir (Pseudotsuga menzie	13	Fair	Fair	8	Codominant	Good		X	
55	24079	Douglas-fir (Pseudotsuga menzie	16	Fair	Fair	8	Codominant	Good		X	poison oak
56	24081	Douglas-fir (Pseudotsuga menzie	10	Fair	Fair	8	Codominant	Good		X	
57	24080	Douglas-fir (Pseudotsuga menzie	22	Fair	Fair	12	Codominant	Good		X	
58	24082	Douglas-fir (Pseudotsuga menzie	27	Fair	Fair	25	Edge of Stand	Good		X	
59	24144	Douglas-fir (Pseudotsuga menzie	22	Fair	Fair	20	Edge of Stand	Good		X	
60	24145	Douglas-fir (Pseudotsuga menzie	10	Fair	Fair	8	Suppressed	Good		X	
61	24146	Douglas-fir (Pseudotsuga menzie	22	Fair	Fair	15	Suppressed	Good		X	
62	24177	Douglas-fir (Pseudotsuga menzie	19	Fair	Fair	12	Codominant	Good		X	
63	24176	Douglas-fir (Pseudotsuga menzie	8	Dead/Dying						X	
64	24175	Douglas-fir (Pseudotsuga menzie	18	Fair	Fair	15	Codominant	Good		X	
65	24179	Douglas-fir (Pseudotsuga menzie	15	Fair	Fair	10	Codominant	Good		X	
66	24178	Douglas-fir (Pseudotsuga menzie	11	Fair	Fair	10	Codominant	Good		X	
67	24147	Douglas-fir (Pseudotsuga menzie	9	Dead/Dying						X	
68	24149	Douglas-fir (Pseudotsuga menzie	9	Dead/Dying						X	
70	24149	Douglas-fir (Pseudotsuga menzie	23	Fair	Fair	15	Codominant	Good		X	
71	24150	Douglas-fir (Pseudotsuga menzie	12	Fair	Fair	15	Suppressed	Good		X	
72	24151	Douglas-fir (Pseudotsuga menzie	12	Fair	Fair	15	Suppressed	Good		X	
73	24153	Douglas-fir (Pseudotsuga menzie	6	Dead/Dying						X	
74	24152	Douglas-fir (Pseudotsuga menzie	14	Fair	Fair	12	Codominant	Good		X	
75	24155	Douglas-fir (Pseudotsuga menzie	34	Fair	Fair	25	Edge of Stand	Good		X	
76	24154	Douglas-fir (Pseudotsuga menzie	12	Fair	Fair	12	Suppressed	Good		X	
77	24155	Douglas-fir (Pseudotsuga menzie	16	Fair	Fair	12	Dominant	Good		X	
78	24156	Douglas-fir (Pseudotsuga menzie	6	Dead/Dying						X	
79	24157	Douglas-fir (Pseudotsuga menzie	17	Fair	Fair	10	Codominant	Good		X	
80	24160	Douglas-fir (Pseudotsuga menzie	13	Dead/Dying						X	
81	24159	Douglas-fir (Pseudotsuga menzie	31	Good	Fair	25	Edge of Stand	Good		X	major asymmetry
82	24165	Douglas-fir (Pseudotsuga menzie	31	Good	Fair	25	Edge of Stand	Good		X	major asymmetry
83	24161	Douglas-fir (Pseudotsuga menzie	22	Good	Fair	15	Codominant	Good		X	
84	24162	Douglas-fir (Pseudotsuga menzie	10	Good	Fair	15	Suppressed	Good		X	
85	24163	Douglas-fir (Pseudotsuga menzie	8	Good	Fair	7	Suppressed	Good		X	
86	24164	Douglas-fir (Pseudotsuga menzie	16	Good	Fair	12	Suppressed	Good		X	major asymmetry
87	24169	Douglas-fir (Pseudotsuga menzie	16	Good	Fair	12	Codominant	Good		X	major asymmetry. velvet top fungus near tree

Inventory by:
Tom Feitl
Checked by:
Peter van Oss
Inventory Date: 3/7/2023

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

88	24170	Douglas-fir (Pseudotsuga menzie	18	Good	Fair	12	Codominant	Good		X	major asymmetry. velvet top fungus near tree . poison oak
89	24171	Douglas-fir (Pseudotsuga menzie	17	Good	Fair	12	Codominant	Good		X	
90	24172	Douglas-fir (Pseudotsuga menzie	10	Good	Fair	8	Suppressed	Good		X	
91	24174	Douglas-fir (Pseudotsuga menzie	17	Good	Fair	12	Codominant	Good		X	
92	24189	Douglas-fir (Pseudotsuga menzie	23	Good	Fair	15	Codominant	Good		X	
93	24191	Douglas-fir (Pseudotsuga menzie	8	Poor	Fair	5	Suppressed	Good		X	
94	24190	Douglas-fir (Pseudotsuga menzie	17	Good	Fair	15	Codominant	Good		X	
95	24188	Douglas-fir (Pseudotsuga menzie	13	Good	Fair	15	Suppressed	Good		X	
96	24187	Scouller-willow (Salix scouleri	20	Dead/Dying						X	
97		Scouller-willow (Salix scouleri	17	Dead/Dying						X	
98	24194	Douglas-fir (Pseudotsuga menzie	22	Good	Fair	15	Suppressed	Good		X	
99	24192	Douglas-fir (Pseudotsuga menzie	18	Good	Fair	15	Codominant	Good		X	
100	24193	Douglas-fir (Pseudotsuga menzie	10	Good	Fair	15	Suppressed	Good		X	
101	24195	red oak (Quercus rubra)	11	Fair	Fair	10	Edge of Stand	Moderate		X	Leaning, one sided canopy to north
102	24196	sweet cherry (Prunus avium)	12	Good	Fair	10	Edge of Stand	Moderate		X	Leaning, one sided canopy to north
103	24198	sweet cherry (Prunus avium)	10	Fair	Poor	10	Edge of Stand	Moderate		X	Leaning, one sided canopy to north
104	24199	sweet cherry (Prunus avium)	8	Fair	Fair	8	Suppressed	Moderate		X	Skinny canopy, leaning to north
105	24197	bigleaf-maple (Acer macrophyllu	10	Fair	Fair	10	Edge of Stand	Poor		X	Leaning, one sided canopy to north
106	24200	Douglas-fir (Pseudotsuga menzie	17	Good	Fair	10	Intermediate	Moderate		X	Poor trunk taper, lower deadwood present
107	24210	Douglas-fir (Pseudotsuga menzie	13	Fair	Poor	10	Intermediate	Moderate		X	Poor trunk taper, leaning one sided canopy to northeast
108	24216	Douglas-fir (Pseudotsuga menzie	11	Fair	Fair	10	Intermediate	Moderate		X	Poor trunk taper, no lower canopy
109	24209	Douglas-fir (Pseudotsuga menzie	12	Fair	Fair	10	Intermediate	Moderate		X	Leaning to east, no lower canopy, poor trunk taper, growing next to dead snag at base
110	24203	Douglas-fir (Pseudotsuga menzie	22	Fair	Fair	15	Codominant	Moderate		X	Poor trunk taper, lower deadwood present
111	24202	Douglas-fir (Pseudotsuga menzie	18	Fair	Poor	15	Codominant	Moderate		X	Velvet top at base, red ring rot on trunk (Polish), one sided canopy to west
112	24203	Douglas-fir (Pseudotsuga menzie	21	Poor	Poor	15	Intermediate	Moderate		X	Much deadwood, sparse/ broken top
113	24201	Scouller-willow (Salix scouleri	8	Dead/Dying	Fair	5	Edge of Stand	Moderate		X	Major dieback, little buds present
114	24205	Douglas-fir (Pseudotsuga menzie	28	Fair	Fair	20	Intermediate	Moderate		X	Lower deadwood, canopy foliage thin
115	24206	Douglas-fir (Pseudotsuga menzie	17	Fair	Fair	15	Intermediate	Moderate		X	Poor trunk taper, sprouting growth on trunk
116	24168	sweet cherry (Prunus avium)	16	Poor	Poor	12	Edge of Stand	Moderate		X	Heavy lean to south
117	24166	sweet cherry (Prunus avium)	15	Fair	Poor	15	Edge of Stand	Moderate		X	Heavy lean to south
118	24167	sweet cherry (Prunus avium)	16	Fair	Poor	15	Edge of Stand	Moderate		X	Heavy lean to south , 2 stems at base
119	24207	Douglas-fir (Pseudotsuga menzie	26	Poor	Poor	15	Intermediate	Moderate		X	Velvet top at base all sides
120	24208	Douglas-fir (Pseudotsuga menzie	36	Fair	Fair	20	Edge of Stand	Moderate		X	Dominant canopy to south
121	24218	Douglas-fir (Pseudotsuga menzie	28	Fair	Fair	20	Edge of Stand	Moderate		X	Dominant growth to south
122	24217	Douglas-fir (Pseudotsuga menzie	16	Fair	Fair	10	Intermediate	Moderate		X	Sparse, one sided canopy to east
123	24233	Douglas-fir (Pseudotsuga menzie	23	Fair	Fair	15	Intermediate	Moderate		X	Lower deadwood present
124	24232	Douglas-fir (Pseudotsuga menzie	13	Poor	Poor	5	Suppressed	Moderate		X	Sparse canopy, little foliage remaining
125	24230	Douglas-fir (Pseudotsuga menzie	11	Fair	Fair	15	Intermediate	Moderate		X	Poor trunk taper, lower deadwood
126	24234	sweet cherry (Prunus avium)	8	Poor	Poor	5	Suppressed	Moderate		X	Suppressed canopy, deadwood present
127	24215	Douglas-fir (Pseudotsuga menzie	28	Good	Good	20	Dominant	Moderate		X	Full canopy, lower deadwood
128	24235	Douglas-fir (Pseudotsuga menzie	9	Dead/Dying	Fair	0	Intermediate	Moderate		X	Standing dead tree
129	24211	Douglas-fir (Pseudotsuga menzie	22	Good	Fair	20	Edge of Stand	Moderate		X	One sided canopy to north
130	24214	sweet cherry (Prunus avium)	17	Poor	Fair	15	Edge of Stand	Moderate		X	Heavy lean to north, excessive sprouting growth on trunk
131	24213	sweet cherry (Prunus avium)	6	Poor	Poor	5	Edge of Stand	Moderate		X	Heavy lean to north, little foliage present
132	24228.1	Douglas-fir (Pseudotsuga menzie	22	Fair	Fair	20	Codominant	Moderate		X	Codominate at base with 24228.2, one sided canopy to north
133	24228.2	Douglas-fir (Pseudotsuga menzie	17	Fair	Fair	15		Moderate		X	Codominate at base with 24228.1, one sided canopy to west
134	24229	Douglas-fir (Pseudotsuga menzie	18	Fair	Fair	15	Intermediate	Moderate		X	Much deadwood
135	24231	Douglas-fir (Pseudotsuga menzie	12	Fair	Poor	10	Intermediate	Moderate		X	Sparse, one sided canopy to west, poor trunk taper

Inventory by:
Tom Feitl
Checked by:
Peter van Oss
Inventory Date: 3/7/2023

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

136	24227	Douglas-fir (Pseudotsuga menzie	23	Fair	Fair	15	Intermediate	Moderate		X	Slight lean to west, little lower foliage
137	24225	Douglas-fir (Pseudotsuga menzie	15	Poor	Poor	10	Intermediate	Moderate		X	Poor trunk taper, no lower limbs
138	24226	Douglas-fir (Pseudotsuga menzie	6	Fair	Poor	5	Suppressed	Moderate		X	One sided growth to east
139	24224	Douglas-fir (Pseudotsuga menzie	21	Fair	Fair	20	Intermediate	Moderate		X	Much lower deadwood
140	24223	Douglas-fir (Pseudotsuga menzie	13	Fair	Poor	10	Suppressed	Moderate		X	One sided canopy to south, leaning top
141	24222	Douglas-fir (Pseudotsuga menzie	11	Fair	Poor	5	Intermediate	Moderate		X	Poor trunk taper, suppressed and small canopy
142	24221	Douglas-fir (Pseudotsuga menzie	8	Fair	Fair	10	Suppressed	Moderate		X	Suppressed vertical growth
143	24220	Douglas-fir (Pseudotsuga menzie	22	Good	Fair	15	Intermediate	Moderate		X	Much lower deadwood
144	24219	Douglas-fir (Pseudotsuga menzie	42	Good	Good	25	Edge of Stand	Moderate		X	Dominant canopy to south
145	24257	Douglas-fir (Pseudotsuga menzie	39	Fair	Fair	25	Edge of Stand	Moderate		X	Dominant growth to south, deadwood on north side
146	24258	madrone (Arbutus menziesii)	12	Fair	Poor	15	Edge of Stand	Poor		X	Heavy lean to southwest , base growing from rotting fir stump
147	24260	Douglas-fir (Pseudotsuga menzie	22	Fair	Fair	15	Intermediate	Moderate		X	Lower deadwood, thinning foliage
148	24261	madrone (Arbutus menziesii)	6	Good	Fair	10	Suppressed	Poor		X	Leaning canopy to south, understory tree
149	24262	Douglas-fir (Pseudotsuga menzie	15	Fair	Poor	10	Intermediate	Moderate		X	One sided, thinning canopy
150	24263	Douglas-fir (Pseudotsuga menzie	13	Fair	Poor	10	Intermediate	Moderate		X	One sided, thinning canopy
151	24264	Douglas-fir (Pseudotsuga menzie	11	Fair	Poor	10	Intermediate	Moderate		X	Poor trunk taper, sparse canopy
152	24270	Douglas-fir (Pseudotsuga menzie	10	Poor	Poor	5	Suppressed	Moderate		X	Suppressed, sparse canopy
153	24269	Douglas-fir (Pseudotsuga menzie	8	Dead/Dying	Poor	0	Suppressed	Moderate		X	Standing dead tree
154	24268	Douglas-fir (Pseudotsuga menzie	18	Fair	Fair	15	Intermediate	Moderate		X	Poor trunk taper, no lower canopy
155	24267	Douglas-fir (Pseudotsuga menzie	14	Fair	Fair	15	Intermediate	Moderate		X	Poor trunk taper, no lower canopy, slight lean to north
156	24272	Douglas-fir (Pseudotsuga menzie	25	Good	Good	25	Edge of Stand	Moderate		X	Dominant growth to north
157	24271	Douglas-fir (Pseudotsuga menzie	6	Dead/Dying	Fair	0	Intermediate	Moderate		X	Standing dead tree
158	24273	sweet cherry (Prunus avium)	12	Fair	Fair	12	Edge of Stand	Moderate		X	2 stems at base 10,7". Leaning, one sided canopy to north
159	24275	sweet cherry (Prunus avium)	7	Fair	Fair	10	Edge of Stand	Moderate		X	Leaning, one sided canopy to north
160	24274	sweet cherry (Prunus avium)	7	Fair	Fair	10	Edge of Stand	Moderate		X	Leaning, one sided canopy to north
161	24276	Scouller-willow (Salix scouleri	7	Dead/Dying	Poor	0		Moderate		X	Standing dead tree, leaning towards north
162	24278	sweet cherry (Prunus avium)	7	Fair	Fair	10	Edge of Stand	Moderate		X	Leaning, one sided canopy to northwest
163	24266	Douglas-fir (Pseudotsuga menzie	26	Good	Fair	20	Edge of Stand	Moderate		X	One sided canopy to north, lower deadwood
164	24265	Douglas-fir (Pseudotsuga menzie	19	Fair	Poor	10	Intermediate	Moderate		X	Poor trunk taper, no lower canopy
165	24327	Douglas-fir (Pseudotsuga menzie	23	Fair	Fair	15	Intermediate	Moderate		X	Lower deadwood present
166	24327.1	Douglas-fir (Pseudotsuga menzie	8	Fair	Fair	5	Suppressed	Moderate		X	Suppressed vertical growth
167	24326	Douglas-fir (Pseudotsuga menzie	16	Fair	Fair	15	Codominant	Moderate		X	Leaning, one sided canopy to south west
168	24328	madrone (Arbutus menziesii)	7	Fair	Poor	10	Suppressed	Moderate		X	Under story tree with heavy lean to west
169	24259	Douglas-fir (Pseudotsuga menzie	34	Fair	Fair	20	Edge of Stand	Moderate		X	Dieback of limbs on north side
170	24330	Douglas-fir (Pseudotsuga menzie	7	Fair	Fair	10	Suppressed	Moderate		X	Under story tree
171	24331	Douglas-fir (Pseudotsuga menzie	37	Fair	Fair	20	Edge of Stand	Moderate		X	Dominant growth to south
172	24332	Douglas-fir (Pseudotsuga menzie	13	Fair	Fair	10	Intermediate	Moderate		X	One sided canopy to north
173	24333	Douglas-fir (Pseudotsuga menzie	36	Fair	Fair	20	Edge of Stand	Moderate		X	Dominant growth to south
174	24342	sweet cherry (Prunus avium)	16	Fair	Poor	15	Edge of Stand	Moderate		X	Leaning, one sided canopy to south
175	24338	Douglas-fir (Pseudotsuga menzie	28	Fair	Fair	20	Edge of Stand	Moderate		X	Dominant growth to south, lower deadwood
176	24334	Douglas-fir (Pseudotsuga menzie	9	Poor	Poor	5	Intermediate	Moderate		X	Minimal foliage present at top of tree, poor trunk taper

Inventory by:
Tom Feitl
Checked by:
Peter van Oss
Inventory Date: 3/7/2023

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

177	24337	Douglas-fir (Pseudotsuga menzie	7	Dead/Dying	Failed/Failing	0		Moderate		X	Standing dead snag
178	24336	Douglas-fir (Pseudotsuga menzie	11	Fair	Fair	10	Intermediate	Moderate		X	Poor trunk taper, little lower foliage present
179	24335	Douglas-fir (Pseudotsuga menzie	11	Dead/Dying	Poor	10	Intermediate	Moderate		X	Dead top, reiterating stem
180	24329	Douglas-fir (Pseudotsuga menzie	8	Fair	Fair	5	Suppressed	Moderate		X	Under story tree
181	24318	Douglas-fir (Pseudotsuga menzie	17	Fair	Fair	15		Moderate		X	Poor trunk taper, lower deadwood
182	24321	Douglas-fir (Pseudotsuga menzie	14	Fair	Poor	10	Codominant	Moderate		X	Poor trunk taper, leaning, one sided canopy to south
183	23219	Douglas-fir (Pseudotsuga menzie	24	Fair	Fair	20	Edge of Stand	Moderate		X	Dominant growth to north
184	24320	Douglas-fir (Pseudotsuga menzie	21	Fair	Fair	10	Intermediate	Moderate		X	Poor trunk taper, little lower foliage, leaning to east
185	24322	Douglas-fir (Pseudotsuga menzie	18	Fair	Poor	15	Intermediate	Moderate		X	One sided canopy to south, reiterated top
186	24323	Douglas-fir (Pseudotsuga menzie	13	Fair	Poor	15	Intermediate	Moderate		X	Poor trunk taper, heavy top
187	24324	Douglas-fir (Pseudotsuga menzie	17	Fair	Fair	10	Intermediate	Moderate		X	Lower canopy deadwood
188	24295	Douglas-fir (Pseudotsuga menzie	18	Fair	Fair	10	Codominant	Moderate		X	One sided canopy to east, growing in stand of 3
189	24294	Douglas-fir (Pseudotsuga menzie	25	Good	Fair	20	Codominant	Moderate		X	One sided canopy to north , growing in stand of 3
190	24293	Douglas-fir (Pseudotsuga menzie	24	Good	Fair	20	Edge of Stand	Moderate		X	One sided canopy to north west, growing in stand of 3
191	24296	Scouller-willow (Salix scouleri	6	Dead/Dying	Poor	5	Edge of Stand	Moderate		X	Heavy dieback, leaning to north
192	24297	Scouller-willow (Salix scouleri	8	Dead/Dying	Poor	5	Edge of Stand	Moderate		X	Heavy dieback, leaning to north
193	24298	Scouller-willow (Salix scouleri	14	Dead/Dying	Poor	10	Edge of Stand	Moderate		X	Heavy dieback, leaning to north
194	24299	bigleaf-maple (Acer macrophyllu	10	Fair	Fair	10	Edge of Stand	Poor		X	Leaning, one sided canopy to north
195	24315.2	Douglas-fir (Pseudotsuga menzie	17	Fair	Fair	15	Codominant	Moderate		X	Codominate with #24315.1, one sided canopy to north
196	24315.1	Douglas-fir (Pseudotsuga menzie	15	Fair	Fair	15	Codominant	Moderate		X	Codominate with #24315.2, one sided canopy to south
197	24317	Douglas-fir (Pseudotsuga menzie	7	Dead/Dying	Failed/Failing	0	Intermediate	Moderate		X	Standing dead spar
198	24316	Douglas-fir (Pseudotsuga menzie	19	Fair	Fair	15	Intermediate	Moderate		X	Lower deadwood
199	24341	Douglas-fir (Pseudotsuga menzie	10	Poor	Fair	5	Intermediate	Moderate		X	Sparse canopy, poor trunk taper
200	24340	Douglas-fir (Pseudotsuga menzie	6	Dead/Dying	Failed/Failing	0	Intermediate	Moderate		X	Standing dead spar
201	24339	Douglas-fir (Pseudotsuga menzie	7	Dead/Dying	Failed/Failing	0	Intermediate	Moderate		X	Standing dead spar
202	24314	Douglas-fir (Pseudotsuga menzie	17	Fair	Fair	15	Intermediate	Moderate		X	No lower branches
203	24313	Douglas-fir (Pseudotsuga menzie	10	Fair	Fair	10	Suppressed	Moderate		X	Suppressed vertical growth
204	24312	Douglas-fir (Pseudotsuga menzie	35	Good	Fair	25	Intermediate	Moderate		X	Large deadwood present, full canopy
205	24311	madrone (Arbutus menziesii)	13	Good	Fair	10	Edge of Stand	Poor		X	Heavy lean to south
206	24310	sweet cherry (Prunus avium)	18	Fair	Fair	20	Edge of Stand	Moderate		X	Leaning, one sided canopy to south
207	24308	Douglas-fir (Pseudotsuga menzie	35	Good	Fair	25	Edge of Stand	Moderate		X	Codominate leaders at approx 50’
208	24306	Douglas-fir (Pseudotsuga menzie	25	Fair	Fair	15	Edge of Stand	Moderate		X	Dominant growth to west
209	24305	Douglas-fir (Pseudotsuga menzie	20	Fair	Fair	15	Intermediate	Moderate		X	Lower deadwood present
210	24304	Douglas-fir (Pseudotsuga menzie	37	Good	Fair	25	Edge of Stand	Moderate		X	Dominant growth to west
211	24301	Douglas-fir (Pseudotsuga menzie	12	Poor	Fair	5	Suppressed	Moderate		X	Suppressed by adjacent large fir, sparse foliage
212	24300	Douglas-fir (Pseudotsuga menzie	34	Good	Good	20	Edge of Stand	Moderate		X	Dominant growth to north
213	24302	western-red-cedar (Thuja plicat	7	Good	Fair	8	Suppressed	Poor		X	Suppressed vertical growth
214	24303	sweet cherry (Prunus avium)	14	Good	Fair	10	Edge of Stand	Moderate		X	Codominate leaders at approx 50’, one sided canopy to west
215	24393	black cottonwood (Populus trich	14	Fair	Poor	15	Edge of Stand	Moderate		X	Heavy lean to west
216	24379	black cottonwood (Populus trich	12	Fair	Poor	12	Edge of Stand	Moderate		X	Heavy lean to west
217	Underwat	black cottonwood (Populus trich	20	Good	Fair	20	Dominant	Moderate		X	Competing tops, growing in standing water
218	24392	black cottonwood (Populus trich	9	Good	Good	10	Intermediate	Moderate		X	Growing on edge of wetland
219	24680	sweet cherry (Prunus avium)	6	Fair	Poor	5	Edge of Stand	Moderate		X	Heavy lean to south

Inventory by:
Tom Feitl
Checked by:
Peter van Oss
Inventory Date: 3/7/2023

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

220	24692	Kwanza-cherry (Prunus serrulate	17	Poor	Failed/Failing	15	Dominant	Moderate		X	Multi stem at 5', south stem splitting at union
221	24699	Kwanza-cherry (Prunus serrulate	10	Poor	Failed/Failing	5	Dominant	Moderate		X	Former stem failure, canopy has heavy lean to west
222	24705	Kwanza-cherry (Prunus serrulate	10	Fair	Poor	8	Dominant	Moderate		X	Leaning canopy to south
223	24722	madrone (Arbutus menziesii)	8	Good	Poor	10	Edge of Stand	Poor		X	Heavy lean to south
224	24721	madrone (Arbutus menziesii)	7	Good	Poor	10	Edge of Stand	Poor		X	Codominate leaders 5,5", heavy lean to south
225	24711	Kwanza-cherry (Prunus serrulate	13	Poor	Failed/Failing	8	Dominant	Moderate		X	Cracking stems, leaning toward south
226	24726	Kwanza-cherry (Prunus serrulate	14	Fair	Poor	10	Dominant	Moderate		X	Canopy leaning to south
227	24730	Kwanza-cherry (Prunus serrulate	8	Fair	Poor	8	Dominant	Moderate		X	Leaning canopy to south, suckering at base
228	24744	Kwanza-cherry (Prunus serrulate	11	Poor	Poor	8	Dominant	Moderate		X	Large cavity and decay at base west side
229	24085.2	Kwanza-cherry (Prunus serrulate	10	Poor	Poor	10	Dominant	Moderate		X	Cavities and decay at base south side, leaning to south
230	24085.3	sweet cherry (Prunus avium)	12	Fair	Fair	12	Edge of Stand	Moderate		X	Leaning, one sided canopy to sw
231	24085.4	sweet cherry (Prunus avium)	8	Fair	Fair	10	Edge of Stand	Moderate		X	Leaning, one sided canopy to south
232	24085.5	Kwanza-cherry (Prunus serrulate	10	Fair	Poor	12	Edge of Stand	Moderate		X	Leaning, one sided canopy to south
233	24085.1	Kwanza-cherry (Prunus serrulate	10	Poor	Poor	10	Edge of Stand	Moderate		X	Leaning, one sided canopy to south
234	24013	Kwanza-cherry (Prunus serrulate	10	Fair	Poor	5	Edge of Stand	Moderate		X	Leaning, one sided canopy to south
235	24013.1	sweet cherry (Prunus avium)	8	Fair	Fair	10	Edge of Stand	Moderate		X	Clump of stems at base, Leaning, one sided canopy to south
236	24006	Kwanza-cherry (Prunus serrulate	12	Fair	Poor	10	Edge of Stand	Moderate		X	Canopy leaning to south
237	24002	Kwanza-cherry (Prunus serrulate	14	Fair	Poor	10	Edge of Stand	Moderate		X	Canopy leaning to south
238	259	Douglas-fir (Pseudotsuga menzie	45	Good	Good	20	Edge of Stand	Moderate	Remove		Dominant canopy to south
239	260	madrone (Arbutus menziesii)	18	Fair	Failed/Failing	15	Edge of Stand	Poor	Remove		Heavy lean to south, trunk has failed into chainlink fence
240	258	Douglas-fir (Pseudotsuga menzie	31	Good	Good	25	Edge of Stand	Moderate	Remove		Dominant growth to east
241	253	Douglas-fir (Pseudotsuga menzie	45	Good	Good	20	Dominant	Moderate		X	Full canopy
242	254	Douglas-fir (Pseudotsuga menzie	22	Fair	Fair	15	Codominant	Moderate		X	One sided canopy to south, growing from clump at base
243	255	Douglas-fir (Pseudotsuga menzie	27	Good	Fair	20	Dominant	Moderate		X	Dominant stem growing from clump at base
244	256	Douglas-fir (Pseudotsuga menzie	8	Fair	Poor	10	Suppressed	Moderate		X	Suppressed stem growing from clump at base
245	257	Douglas-fir (Pseudotsuga menzie	21	Fair	Poor	15	Codominant	Moderate		X	Growing from clump at base, leaning canopy,
246	261	bigleaf-maple (Acer macrophyllu	20	Fair	Fair	15	Edge of Stand	Poor	Remove		Leaning, one sided canopy to east
247	262	madrone (Arbutus menziesii)	11	Fair	Poor	10	Suppressed	Poor	Remove		Split stems at 4', extended lateral growth
248	263	Douglas-fir (Pseudotsuga menzie	32	Good	Fair	20	Edge of Stand	Moderate	Remove		Dominant canopy to southeast
249	264	Douglas-fir (Pseudotsuga menzie	21	Fair	Fair	15	Intermediate	Moderate		X	Poor trunk taper, lower deadwood
250	265	Douglas-fir (Pseudotsuga menzie	11	Poor	Fair	10	Suppressed	Moderate	Remove		Suppressed, sparse canopy
251	266	Douglas-fir (Pseudotsuga menzie	19	Fair	Fair	15	Edge of Stand	Moderate	Remove		Dominant growth to northeast
252	268	Douglas-fir (Pseudotsuga menzie	42	Good	Fair	20	Edge of Stand	Moderate	Remove		Dominant growth to south
253	267	Douglas-fir (Pseudotsuga menzie	21	Fair	Fair	15	Intermediate	Moderate	Remove		Poor trunk taper, lower deadwood
254	269	Douglas-fir (Pseudotsuga menzie	18	Fair	Fair	15	Intermediate	Moderate	Remove		One sided canopy to west
255	270	Douglas-fir (Pseudotsuga menzie	9	Fair	Poor	10	Edge of Stand	Moderate		X	Trunk has heavy lean at base, loss of foliage in canopy
256	271	deodora-cedar (Cedrus deodara)	12	Good	Good	10	Intermediate	Moderate		X	Growing in row of 4
257	272	deodora-cedar (Cedrus deodara)	12	Good	Good	10	Intermediate	Moderate		X	Growing in row of 4
258	273	deodora-cedar (Cedrus deodara)	12	Good	Good	10	Intermediate	Moderate		X	Growing in row of 4
259	10	deodora-cedar (Cedrus deodara)	12	Good	Good	10	Intermediate	Moderate		X	Growing in row of 4
260	275	Douglas-fir (Pseudotsuga menzie	23	Good	Fair	20	Edge of Stand	Moderate		X	One sided canopy to NE
261	276	Douglas-fir (Pseudotsuga menzie	9	Poor	Poor	5	Suppressed	Moderate		X	Suppressed canopy, thinning foliage
262	277	Douglas-fir (Pseudotsuga menzie	9	Fair	Fair	10	Suppressed	Moderate		X	Suppressed vertical growth

Inventory by:
Tom Feitl
Checked by:
Peter van Oss
Inventory Date: 3/7/2023

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

263	278	Douglas-fir (Pseudotsuga menzie	12	Fair	Fair	10	Suppressed	Moderate		X	Leaning canopy to east
264	279	Douglas-fir (Pseudotsuga menzie	24	Fair	Fair	15	Intermediate	Moderate		X	Upper canopy leaning to east, poor trunk taper
265	280	bigleaf-maple (Acer macrophyllu	14	Fair	Fair	12	Edge of Stand	Poor		X	Leaning, one sided canopy to north
266	281	Douglas-fir (Pseudotsuga menzie	21	Fair	Fair	20	Intermediate	Moderate		X	Poor trunk taper, lower deadwood present
267	282	Douglas-fir (Pseudotsuga menzie	14	Fair	Poor	10	Intermediate	Moderate		X	Extended vertical growth, poor trunk taper, canopy leaning to east
268	283	Douglas-fir (Pseudotsuga menzie	12	Poor	Poor	10	Intermediate	Moderate		X	Canopy leaning over towards west
269	284	Douglas-fir (Pseudotsuga menzie	8	Dead/Dying	Fair	5	Suppressed	Moderate		X	Little foliage left, much deadwood
270	285	bigleaf-maple (Acer macrophyllu	10	Fair	Poor	15	Suppressed	Poor		X	Leaning, one sided canopy to north
271	287	Douglas-fir (Pseudotsuga menzie	18	Fair	Fair	15	Intermediate	Moderate		X	Poor trunk taper, heavy top
272	286	bigleaf-maple (Acer macrophyllu	9	Dead/Dying	Poor	10	Suppressed	Poor		X	Decay and bark sloughing on trunk at 6’
273	288	Douglas-fir (Pseudotsuga menzie	26	Fair	Fair	20	Intermediate	Moderate		X	Dominant growth to north
274	289	Douglas-fir (Pseudotsuga menzie	15	Fair	Poor	10	Intermediate	Moderate		X	Poor trunk taper, sparse canopy
275	290	Douglas-fir (Pseudotsuga menzie	10	Poor	Poor	5	Suppressed	Moderate		X	Suppressed canopy
276	293	Douglas-fir (Pseudotsuga menzie	8	Dead/Dying	Fair	0	Intermediate	Moderate		X	Standing dead tree
277	291	Douglas-fir (Pseudotsuga menzie	16	Fair	Fair	15	Edge of Stand	Moderate		X	Dominant growth to north
278	292	Douglas-fir (Pseudotsuga menzie	25	Fair	Fair	20	Edge of Stand	Moderate		X	Dominant growth to northwest
279	294	Douglas-fir (Pseudotsuga menzie	31	Good	Fair	20	Intermediate	Moderate		X	Lower deadwood
280	21145	Douglas-fir (Pseudotsuga menzie	14	Good	Good	10	Dominant	Moderate	Remove		Growing near fence line, full canopy
281	23029	bigleaf-maple (Acer macrophyllu	8	Good	Poor	10	Dominant	Poor		X	Base has been damaged from fencing
282	30001	shore-pine, lodge-pole-pine (Pi	25	Fair	Fair	15	Dominant	Moderate		X	Pruned for road clearance, pitch moth on trunk
283	30002	shore-pine, lodge-pole-pine (Pi	20	Fair	Fair	15	Codominant	Moderate		X	Leaning to west, Pruned for road clearance, pitch moth on trunk
284	30003	shore-pine, lodge-pole-pine (Pi	20	Fair	Fair	15	Codominant	Moderate		X	Dominant canopy to south, lots of pitch moth on lower trunk
	428	Removed/Missing								X	
	14619	Removed/Missing								X	
	23112	Removed/Missing								X	
	23140	Removed/Missing								X	
									24	**263**	

Appendix E: Tree Protection Specifications

It is critical that the following steps be taken to ensure that they are retained and protected.

Before Construction Begins

1. **Notify all contractors of the tree protection procedures.** For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection. It can only take one mistake with a misplaced trench or other action to destroy the future of a tree.
   1.1. Hold a Tree Protection meeting with all contractors to fully explain the goals of the tree protection.
   1.2. Have all subcontractors sign memoranda of understanding regarding the goals of tree protection. Memoranda to include penalty for violating tree protection plan. Penalty to equal appraised value of tree(s) within the violated tree protection zone per the current Trunk Formula Method as outlined by the Council of Tree & Landscape Appraisers current edition of the *Guide for Plant Appraisal*.
2. **Fencing.**
   2.1. Establish fencing around each tree or grove of trees to be retained as shown on the tree protection site plan in Appendix C.
   2.2. The fencing is to be put in place before the ground is cleared to protect the trees and the soil around the trees from any disturbance at all. The exception is if trees are to be removed that are located within the tree protection zones, they should be removed prior to installing the tree protection fencing without the use of mechanized wheeled or tracked equipment.
   2.3. Fencing is to be placed at the edge of the root protection zone as shown on the Tree Protection Plan (Appendix C). Root protection zones are established by the project arborist based on the needs of the site and the tree to be protected.
   2.4. "Protection fencing consisting of a minimum 6-foot-high metal chain-link fencing shall be established at the edge of the root protection zone and permissible encroachment area on the development site. Existing structures and/or existing secured fencing at least 3.5 feet tall can serve as the required protective fencing." If construction fencing is used it is recommended that the panels are secured to the soil to prevent movement of the fencing during construction.
   2.5. Fencing is to remain in the position that is established by the project arborist and not to be moved without written permission from the project arborist until the end of the project after the final inspection has been completed.
3. **Signage**
   3.1. All tree protection fencing should have signage clearly indicating that the area is a vegetation protection zone (Signage provided with the tree protection application).
   3.2. Signage should be placed as to be visible from all sides of a tree protection area and spaced every 35 feet.

During Construction

4. **Protection guidelines within the Root Protection Zone**
   - 4.1. No traffic shall be allowed within the root protection zone. No vehicle, heavy equipment, or even repeated foot traffic.
   - 4.2. No storage of materials including but not limited to soil, construction material, or waste from the site.
   - 4.3. Waste includes but is not limited to concrete wash out, gasoline, diesel, paint, cleaner, thinners, etc.
   - 4.4. Construction trailers are not to be parked / placed within the root protection zone without written clearance from the project arborist.
   - 4.5. No vehicles shall be allowed to park within the root protection areas.
   - 4.6. No activity shall be allowed that will cause soil compaction within the root protection zone.
   - 4.7. The use of straw waddles is strongly recommended instead of silt fencing to avoid the need for trenching within the root protection zones.
5. **Landscaping**
   - 5.1. Landscaping within the tree protection zones at a distance of 12X the diameter of the tree may commence after approval from the project arborist.
   - 5.2. Inground irrigation systems must be avoided, and it is recommended that only above ground irrigation systems are used. Temporary systems and/or drip irrigation are preferred.
   - 5.3. Any hardscapes within the tree protection zones shall be approved by the project arborist prior to soil disturbance taking place.
   - 5.4. Landscape vegetation can be installed inside of the tree protection zones by pocket planting only. It is not recommended that soils are amended unless laboratory testing indicates that soil amelioration is needed.
   - 5.5. No more than 4” of fill is allowed within the tree protection zone measured at a distance of 12X the diameter in circumference of the trees. No more than 25% of the tree protection zone may be impacted without the consent of the project arborist.
   - 5.6. It is highly recommended that nutrient rich mulch or arborist woodchips are used in the planter areas. The material may be enriched with nitrogen to enhance the nutrient uptake by the soils.
6. **Tree protection.** Retained trees shall be protected from any cutting, skinning, or breaking of branches, trunks, or roots.
7. **Root pruning.** The roots that are to be cut from existing trees that are to be retained, the project consulting arborist shall be notified to evaluate, document, and oversee the proper cutting of roots with sharp cutting tools. Cut roots are to be immediately covered with soil or mulch to prevent them from drying out.
8. **Grade changes**. No grade change should be allowed within the root protection zone.
9. **Root protection zone changes.** Any necessary deviation of the root protection zone shall be cleared by the project consulting arborist in writing.
10. **Watering**. Provide water to trees during the summer months as needed. Tree(s) that will have had root system(s) cut back will need supplemental water to overcome the loss of ability to absorb necessary moisture during the summer months.
11. **Utilities**. Any necessary passage of utilities through the root protection zone shall be by means of tunneling under roots by hand digging or boring.
12. **Re-inspection of fencing.** Tree protection fencing is subject to inspection by the city. The project arborist highly recommends monthly inspections of tree protection fencing to ensure compliance with the permit and protection of the trees.

After Construction

13. Fences are to remain standing until the final inspection has been completed by the city for the project.
14. Provide for or ensure that adequate drainage will occur around the retained trees.
15. Pruning of the existing trees should be completed as one of the last steps of the landscaping process before the final placement of trees, shrubs, ground covers, mulch, or turf.
16. Trees that are retained may need to be fertilized as called for by the project arborist if acceptable thresholds are exceeded. Lab analysis may be required.
17. The existing trees should be monitored for decline for a period of three years post construction. Proper care should be prescribed if the trees start to show signs of stress.

If there are any questions or concerns regarding the proper protection of the trees during the construction process, contact the project arborist.

VEGETATION/TREE PROTECTION ZONE

DO NOT REMOVE OR ADJUST THIS FENCING. THE FENCE LOCATIONS ARE APPROVED TO PROTECT VEGETATION AND TREES.

Please contact the Code Enforcement Specialist and project arborist, if alterations to the approved location of the protection fencing are needed.

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

Project Arborist: TERAGAN & ASSOCIATES, INC 503-697-1975

lancaster mobley

12777 SW Tualatin-Sherwood Road

Transportation Impact Analysis

Tualatin, Oregon

Date:
July 11, 2023

Prepared for:
Roggy Pflug, Columbia Corrugated Box

Prepared by:
Myla Cross
Jennifer Danziger, PE

RENEWS: 12/31/2023

List of Appendices

List of Figures

List of Tables

Executive Summary

1. A new access is proposed along SW 124th Avenue for the industrial site located at 12777 SW Tualatin-Sherwood Rd in Tualatin, Oregon. Two businesses operate at this site: Columbia Corrugated Box and Packaging Resources. The facility currently has two existing driveways along SW Cipole Road and is seeking to construct a new driveway at the northern edge of the property line to intersect with SW 124th Avenue opposite SW Cimino Street.
2. Traffic counts show that the site generated 175 trips during the morning peak hour (6:40 to 7:40 AM), and 179 trips during the evening peak hour (3:20 to 4:20 PM). No new site trips will be generated by the development, the proposed access driveway will instead only result in new trip distribution into and out of the site.
3. Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of the study intersections that do not already have planned and funded improvements.
4. Left-turn lane warrants are not met under the 2025 buildout scenario for the two existing site accesses along SW Cipole Road. The proposed new site access on SW 124th Avenue will have a left-turn lane.
5. Preliminary traffic signal warrants are not met at any of the site accesses under buildout conditions.
6. Based on the sight distance analysis, the proposed site access will meet intersection sight distance recommendations and stopping sight distance requirements.
7. The proposed access opposite SW Cimino Street along SW 124th Avenue will meet the Tualatin Development Code access spacing standards.
8. All study area intersections are anticipated to operate within the acceptable jurisdiction standards. Therefore, no mitigation for traffic operations is required or recommended. The access configuration options have minimal effect on study area operations.
9. The analysis shows little change in queues between background and buildout conditions. The queues can all be accommodated within the available storage. Therefore, no mitigation for queuing operations is required or recommended.

Project Description

Introduction

A new access is proposed along SW 124th Avenue for the industrial site located at 12777 SW Tualatin-Sherwood Road in Tualatin, Oregon. Two businesses operate at this site: Columbia Corrugated Box and Packaging Resources. The facility currently has two existing driveways along SW Cipole Road and is seeking to construct a new driveway at the northern edge of the property line to intersect with SW 124th Avenue opposite SW Cimino Street.

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the proposed development and to determine any mitigation that may be necessary to do so. Based on prior scoping coordination with the City of Tualatin and Washington County, the report includes safety and capacity analyses at four intersections:

1. SW Tualatin-Sherwood Road & SW 124th Avenue
2. SW Cipole Road & Existing Northern Site Access
3. SW Cipole Road & Existing Southern Site Access
4. SW 124th Avenue & Proposed Site Access

Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations are included in the appendix to this report.

Location Description

The Columbia Corrugated Box and Packaging Resources facility is located east of SW Cipole Road, north of SW Tualatin-Sherwood Road, and west of SW 124th Avenue, on Tax Lot 2S128A 000300, shown in red in Figure 1. The property is surrounded by homogenous land uses consisting predominantly of industrial warehouses or undeveloped land.

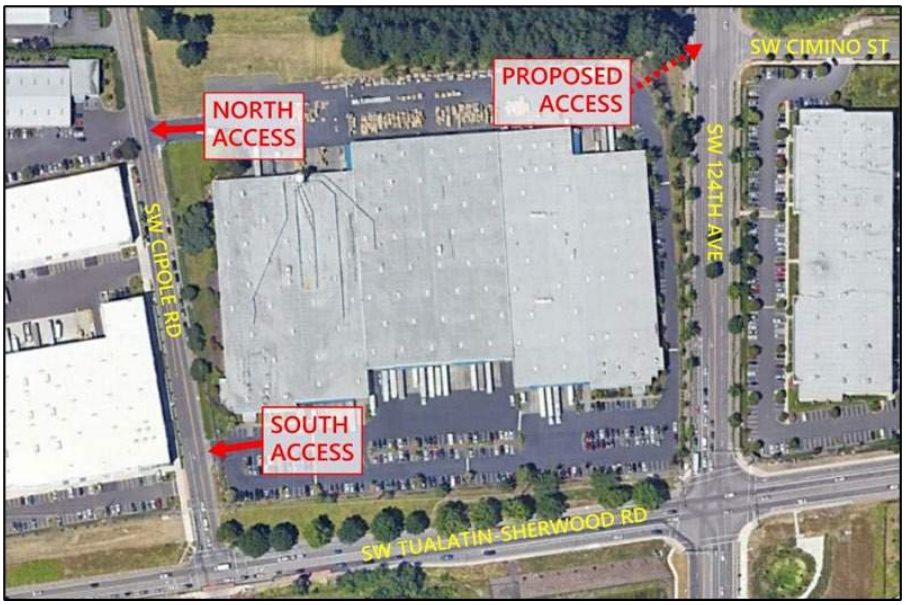


Figure 1: Project Location (Map © Google Earth)

Vicinity Streets

The characteristics of study area roadways are summarized in Table 1.

Table 1: Roadway Characteristics

Street Name	Jurisdiction	Functional Classification	Travel Lanes	Posted Speed	Curbs & Sidewalks	On-Street Parking	Bicycle Facilities
SW Tualatin-Sherwood Road	Washington County	Major Arterial	3-4*	45 mph	Partial Both Sides	Prohibited	Bike Lanes
SW Cipole Road	Washington County	Major Collector	2	45 mph	Partial Both Sides	Prohibited	None
SW 124th Avenue	City of Tualatin (adjacent to site)	Major Arterial	4-5	45 mph	Partial Both Sides	Prohibited	Bike Lanes

** The Tualatin-Sherwood Road expansion project is a Washington County Capital Improvement Program (CIP) Project that intends to expand the roadway to 5 to 6 lanes, improve bicycle and pedestrian facilities, improve storm drainage, and install street lighting.*

Study Intersections

Through coordination with the City of Tualatin and Washington County, four study intersections were identified for evaluation. The existing characteristics of these intersections are summarized in Table 2. A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2.

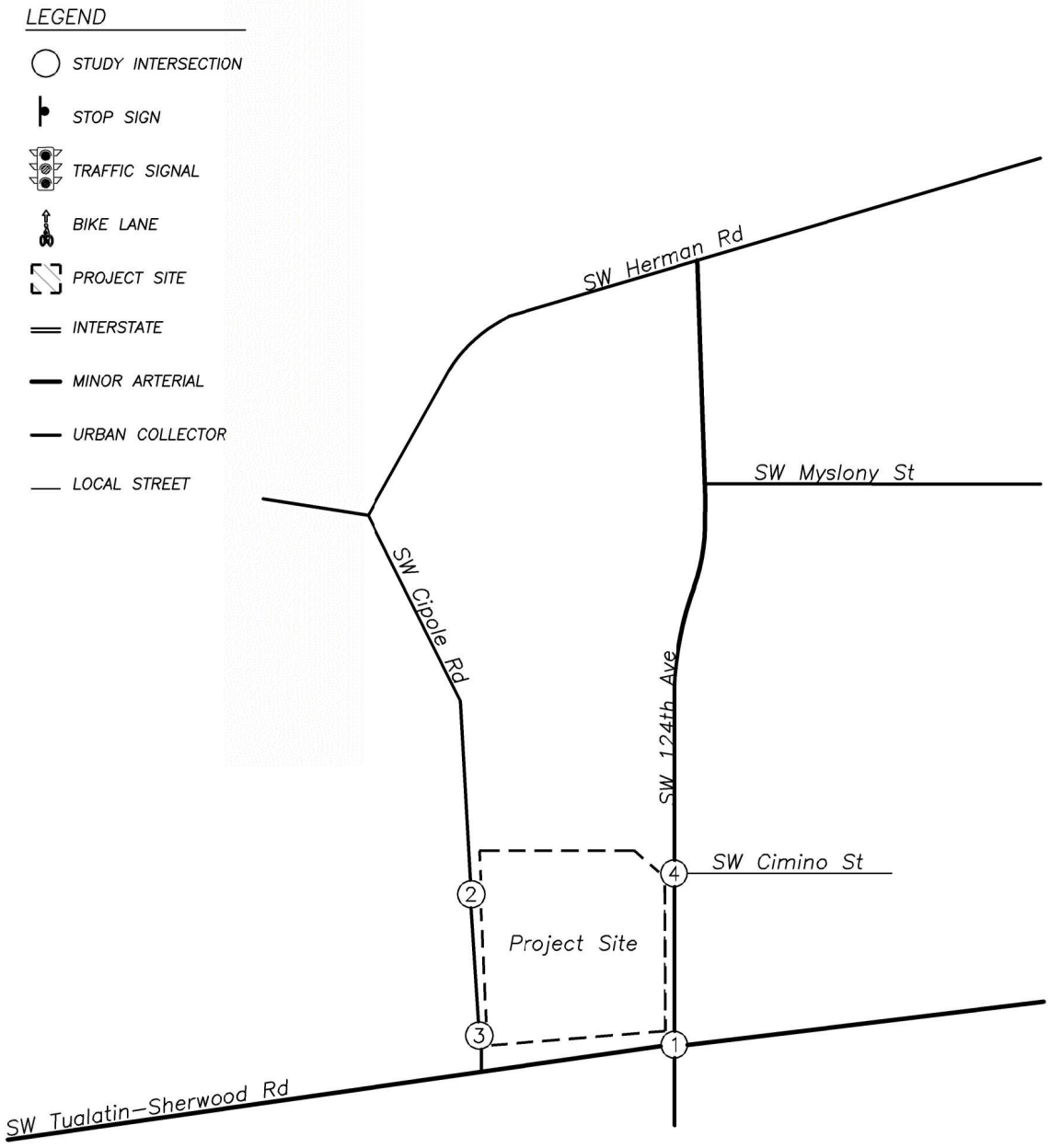
Table 2: Vicinity Intersection Descriptions

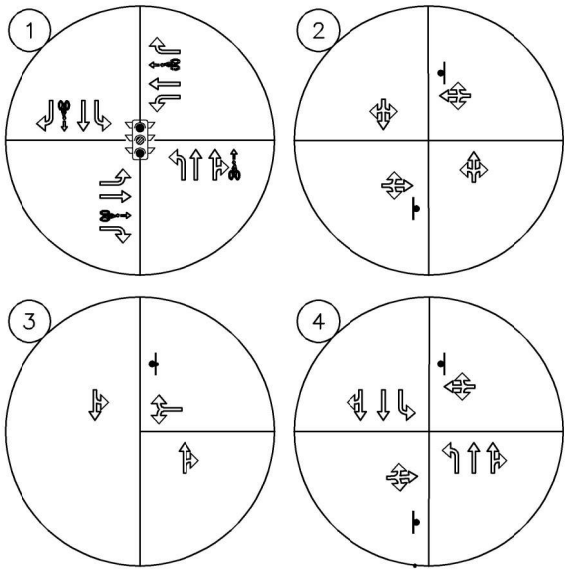
Intersection		Geometry	Traffic Control	Phasing/Stopped Approaches
1	SW 124th Avenue & SW Tualatin-Sherwood Road	Four Legs	Signal	All Protected/Permitted Left EB/WB/SB Right-Turn Overlap
2	SW Cipole Road & Existing Northern Site Access	Four Legs	Stop Control	EB/WB Stop-Controlled
3	SW Cipole Road & Existing Southern Site Access	Four Legs	Stop Control	WB Stop-Controlled
4	SW 124th Avenue & Proposed Site Access/SW Cimino Street	Four Legs*	Stop Control	EB/WB Stop-Controlled

** The new site access will form the eastbound leg of the intersection will be stop controlled.*

Public Transit

The project is located near one transit line that has stops within an approximate one-fourth mile walking/biking distance of the southern part of the site. Route 97 – Tualatin-Sherwood Road provides weekday rush-hour service between W Langer Drive/Sherwood Plaza and the Tualatin WES Station. The nearest bus stops to the site are located near the intersection of SW Cipole Road and SW Tualatin-Sherwood Road. Weekday service is scheduled with four westbound and three eastbound trips in the morning at approximately 60-minute headways. Afternoon service is scheduled with four eastbound and three westbound trips at approximately 60-minute headways. There is currently no weekend or holiday service.





no scale

lancaster mobley

VICINITY MAP

Figure 2

12777 SW Tualatin-Sherwood Road

05/31/2023

Site Trips

Trip Generation

Normal operating hours at the site facilities are:

- Packaging Resources Production Personnel
  - The day shift begins at 7:00 AM and ends at 3:30 PM. When overtime is required, the shift begins at 5:00 AM.
  - The swing shift begins at 4:00 PM and ends at 12:30 AM. When overtime is required, the shift ends at 2:30 AM.
- Columbia Corrugated Box Production Personnel
  - The day shift begins at 7:30 AM and ends at 4:00 PM. When overtime is required, the shift begins at 5:30 AM.
  - The swing shift begins at 4:30 PM and ends at 2:30 AM. This is a four-day schedule operating Tuesday through Friday. When overtime is required, the swing shift will also work the same hours on Monday.
- Office personnel hours are generally 8:00 AM to 5:00 PM.

To determine the number of trips that generated by the site, traffic counts were taken at the project site driveways on a typical weekday on Tuesday, February 28, 2023, from 5:30 AM to 8:30 AM and 3:00 PM to 6:00 PM. The peak counts are compared with trip rates from the *Trip Generation Manual*[1] based on the square footage of the building. The resulting trip generation comparison is presented in Table 3.

Table 3: Trip Generation Summary Comparison – Existing Land Use

Land Use (ITE Code)	Size	AM Peak Hour			PM Peak Hour			Weekday Total
		In	Out	Total	In	Out	Total	
Field Measured Trip Generation (February 28, 2023)								
Passenger Vehicles*	315,000 SF	157	8	165	53	111	164	-
Trucks		1	9	10	9	6	15	-
Total		**158**	**17**	**175**	**62**	**117**	**179**	
ITE Rates Trip Estimates (Land Use Code 110 – General Light Industrial)								
Passenger Vehicles	315,000 SF	190	25	215	11	78	89	1,156
Trucks		2	1	3	2	1	3	78
Total		**192**	**26**	**218**	**13**	**79**	**92**	**1,234**

** On the day of the survey, the facility had 86 personnel clock in prior to 6:00 AM and 52 personnel clock in prior to 7:00 AM. A factor of 2.65 (138/52) was applied to the entering volumes to account for the scheduled overtime.*

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

The traffic counts show that the site generated 175 trips during the morning peak hour (6:40 to 7:40 AM), and 179 trips during the evening peak hour (3:20 to 4:20 PM).

The trip generation estimates using ITE trip rates and assuming general light industrial for the site project that a site of this size would generate 218 trips during the morning peak hour, 92 trips during the evening peak hour and 1,234 trips during the average weekday.

As shown, the ITE trip estimates differ from the actual driveway counts and the peak trends are reversed and are not indicative of the true number of site trips generated by the development. Therefore, the field observed trip generation be used for analysis.

Trip Distribution and Assignment

Overall Distribution

The location of major transportation facilities and regional distribution of households was used to approximate the distribution on the nearby transportation network. The resulting distribution is consistent with other industrials developments proposed in Tualatin.

For trucks entering/exiting SW Cipole Road, the following broad trip distribution is assumed:

- Approximately 20 percent will travel to/from the north via SW 124th Avenue
- Approximately 10 percent will travel to/from the west via SW Tualatin-Sherwood Road
- Approximately 35 percent will travel to/from the east via SW Tualatin-Sherwood Road
- Approximately 35 percent will travel to/from the south via SW 124th Avenue

For passenger vehicles entering/exiting SW Cipole Road, the following broad trip distribution is assumed:

- Approximately 10 percent will travel to/from the north via SW Cipole Road
- Approximately 25 percent will travel to/from the north via SW 124th Avenue
- Approximately 15 percent of site trips will travel to/from the west via SW Tualatin-Sherwood Road
- Approximately 25 percent of site trips will travel to/from the east via SW Tualatin-Sherwood Road
- Approximately 25 percent of site trips will travel to/from the south via SW 124th Avenue

Existing Access Configuration

While the truck distribution was found to be reasonably consistent between the morning and evening peak hours, the passenger vehicle traffic had different trends. This difference may reflect a number of factors including the congestion in the transportation system and the ease or difficulty of making left-turn movements from the driveways during these periods.

The following split in driveway usage was observed during the surveys:

- Approximately 45 percent of trucks used the north access and 55 percent used the south access during either peak hour
- Approximately 100 percent of passenger vehicles used the south access during the morning peak hour

- Approximately 10 percent of passenger vehicles used the north access and 90 percent used the south access during the evening peak hour.

The following directional split was observed based on the combined driveway volumes during the surveys:

- Approximately 20 percent of trucks were traveling to/from the north on SW Cipole Road and 80 percent were traveling to/from the south during either peak hour
- Approximately 20 percent of passenger vehicles were traveling to/from the north on SW Cipole Road and 80 percent were traveling to/from the south during the morning peak hour
- Approximately 45 percent of passenger vehicles were traveling to/from the north on SW Cipole Road and 55 percent were traveling to/from the south during the evening peak hour

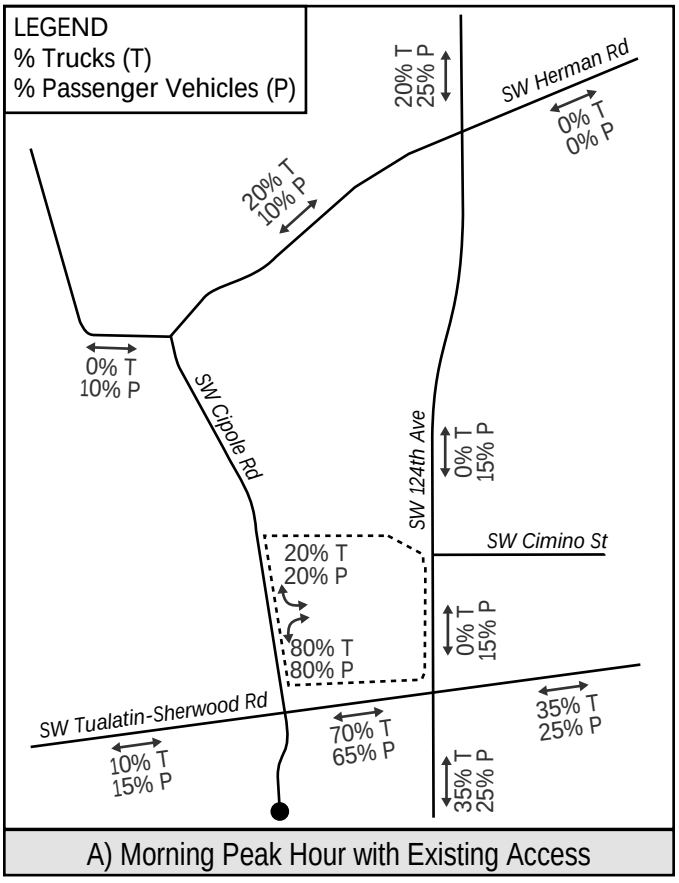
Images A and B of Figure 3 illustrate the distribution of truck and passenger vehicle traffic on the network based on the existing access configuration and survey data.

Proposed Access Configuration

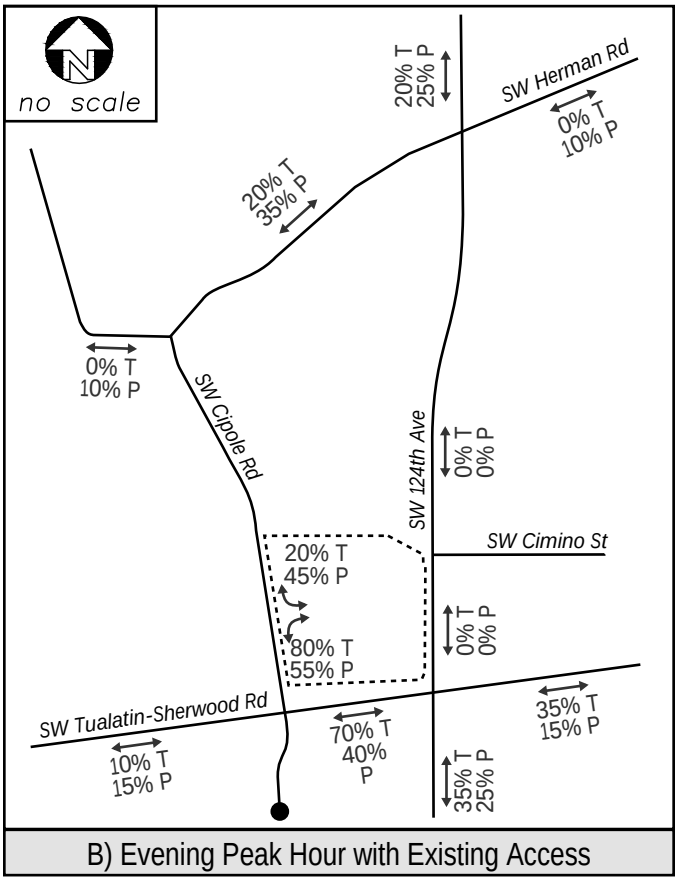
Adding the proposed access to SW 124th Avenue opposite SW Cimino Street is anticipated to create the following shifts in driveway utilization:

- Approximately 20 percent of trucks are assumed to use the north access, 30 percent are assumed to use the south access, and 50 percent are assumed to use the new east access during either peak hour
- Approximately 50 percent of passenger vehicles are assumed to use the south access and 50 percent are assumed to use the new east access during the morning peak hour
- Approximately 10 percent of passenger vehicles are assumed to use the north access, 50 percent are assumed to use the south access, and 40 percent are assumed to use the new east access during the evening peak hour.

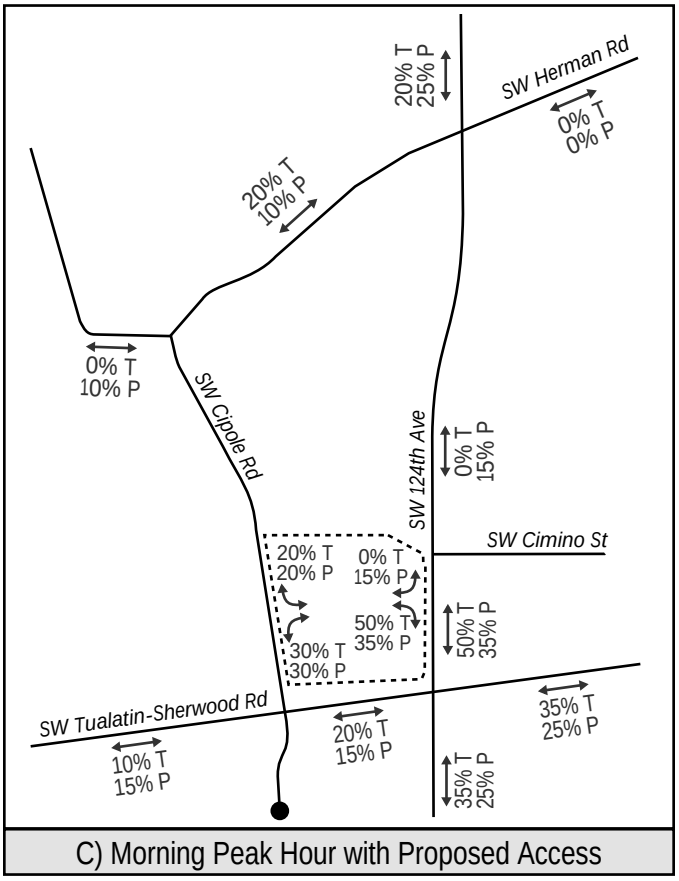
The resulting trip distribution is shown in Images C and D of Figure 3, and the trip assignment for the existing driveway configuration and proposed driveway configuration is shown in Figure 4 and Figure 5.



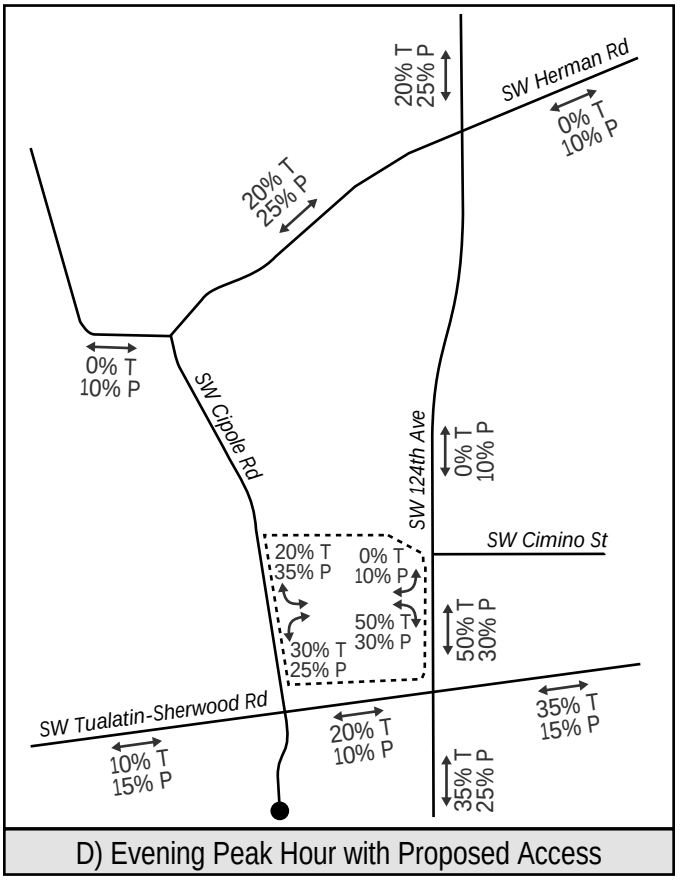
A) Morning Peak Hour with Existing Access



B) Evening Peak Hour with Existing Access



C) Morning Peak Hour with Proposed Access



D) Evening Peak Hour with Proposed Access

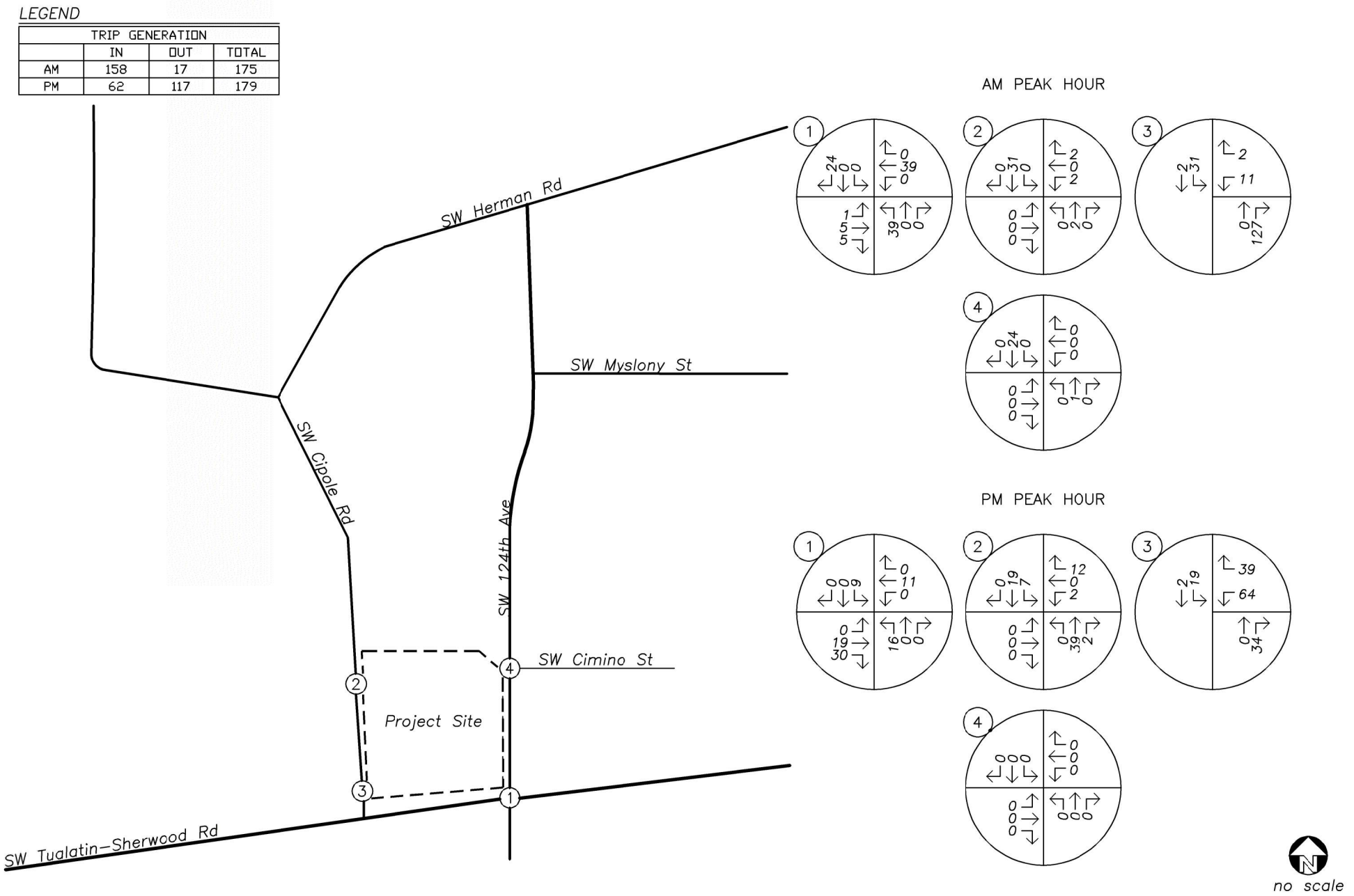
lancaster mobley

TRIP DISTRIBUTION

Figure 3

12777 SW Tualatin-Sherwood Road

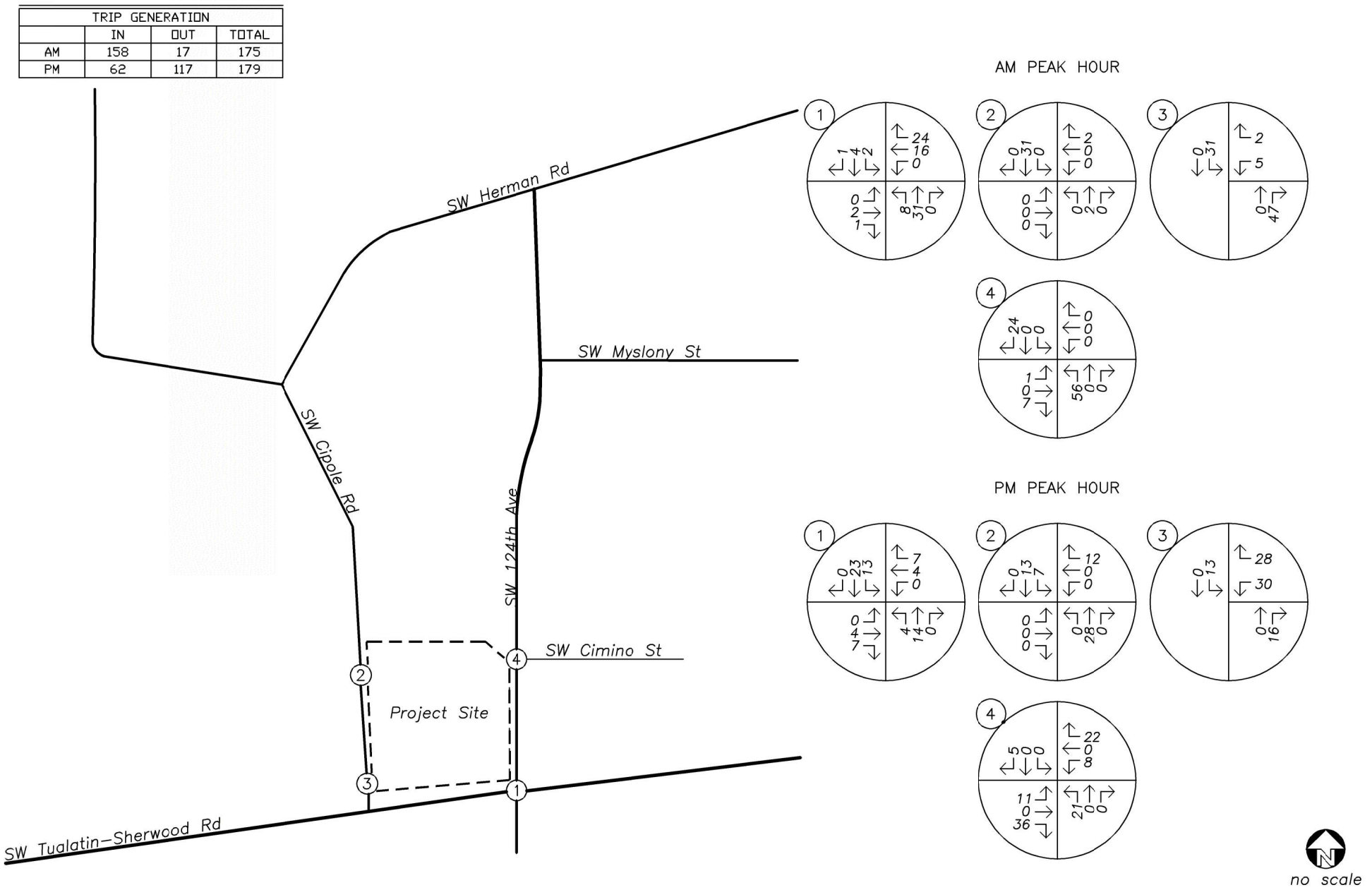
7/10/2023



SITE TRIP ASSIGNMENT
Existing Development Plan
AM & PM Peak Hours

Figure 4
12777 SW Tualatin-Sherwood Road
05/3´/2023

TRIP GENERATION			
	IN	OUT	TOTAL
AM	158	17	175
PM	62	117	179



SITE TRIP ASSIGNMENT
Proposed Development Plan
AM & PM Peak Hours

Figure 5
12777 SW Tualatin-Sherwood Road
05/3´/2023

Traffic Volumes

Existing Conditions

New turning movement counts were collected at the study intersections on Tuesday, May 9, and Wednesday May 10, 2023. Morning volumes at the driveway were adjusted to reflect a condition with no early start for overtime. Figure 6 displays the Year 2023 existing condition traffic volumes. The new turning movement counts are included in Appendix B.

Background Year 2025 Conditions

To provide an analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. Two components were included in the background traffic estimates: 1) general growth and 2) growth associated with planned developments. An analysis year of 2025 was evaluated to correspond with completion of the improvements along SW Tualatin-Sherwood Road.

For the background growth, an annual growth rate of 2.0 percent per year was applied to the year 2023 existing traffic volumes.

Four nearby projects are currently anticipated to be fully operational at the time of project buildout:

- Tualatin Logistics Park – this project is located immediately north of the CCB property between SW Tualatin-Sherwood Road and SW Cipole Road and is planned to be fully operational by 2025.
- Avery I & II – this project is located north of SW Avery Street, and west of SW Teton Avenue, and is planned to be fully operational by the end of 2023.
- Walgraeve Industrial Park (Hedges Creek) – this project is located on the northeast corner of SW Myslony Street & SW 112th Avenue and is planned to be fully operational by 2025.
- 124th Business Park – this project is located north of SW Cimino Street. While the land use application for this project has not yet been submitted, volumes from the proposed project are included for a conservative analysis.

Therefore, trip assignments associated with all nearby developments were included in the background year condition. Detailed project information can be found in the appendix to this document.

Figure 7 displays the Year 2025 background volumes which include the general growth and growth from planned developments.

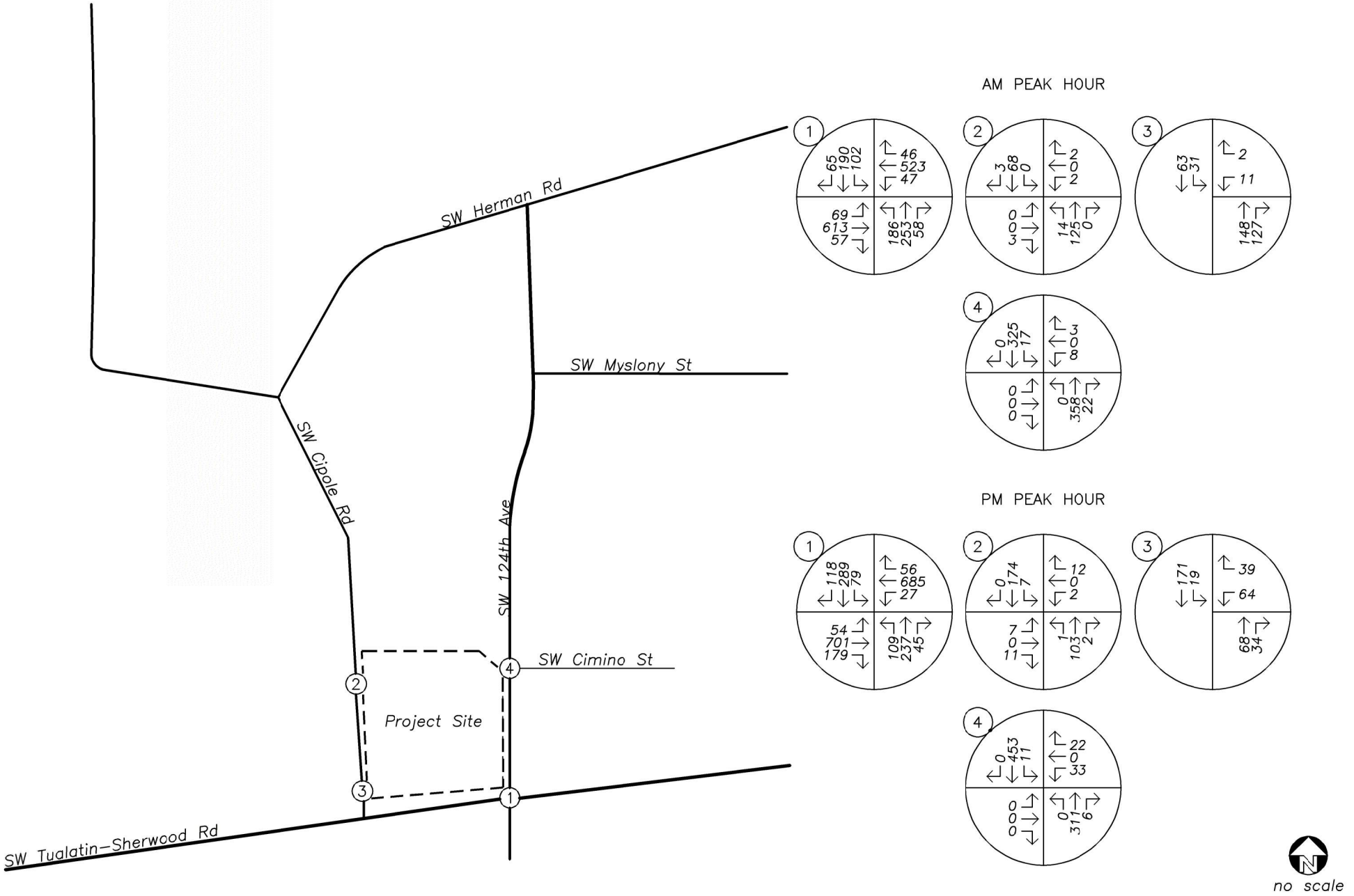
Tualatin-Sherwood Road (Langer Farms Parkway to Teton Avenue)

The Tualatin-Sherwood Road expansion project is a Washington County Capital Improvement Program (CIP) Project that intends to expand the roadway to five lanes, improve bicycle and pedestrian facilities, improve storm drainage, and install street lighting. Construction began in July 2022 and the target completion date is October 2025. Since the project is under way, it was assumed as part of the Background conditions.

Note, traffic forecasts were not available for the opening year of this project, so the background volumes shown in Figure 7 do not reflect any shifts in traffic due to latent demand that may occur with increased capacity on SW Tualatin-Sherwood Road.

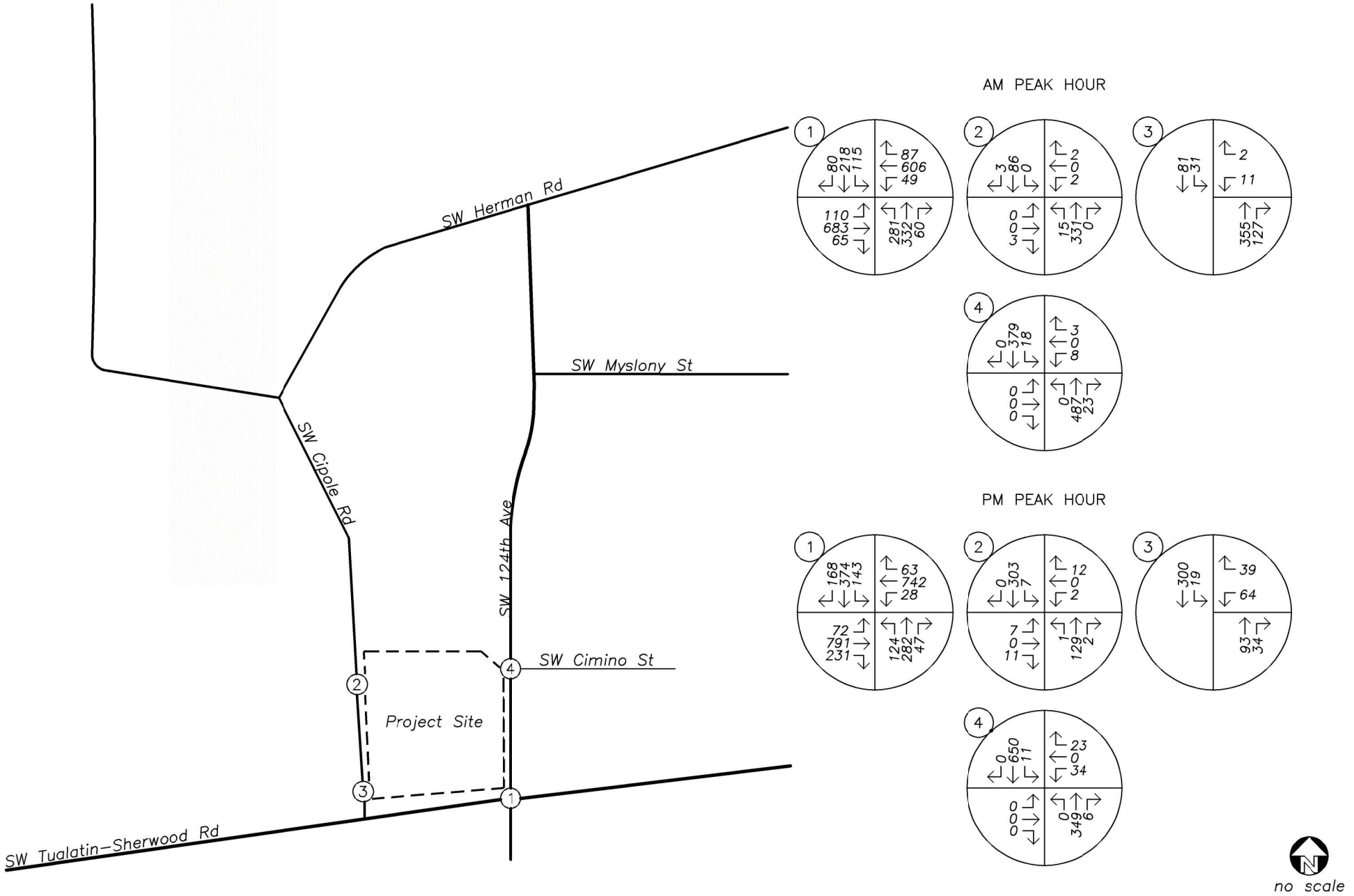
Buildout Year 2025 Conditions

The redistributed site trips due to the proposed site access, as described earlier within the *Site Trips* section, were added to the Year 2025 background volumes to obtain the expected Year 2025 buildout conditions.



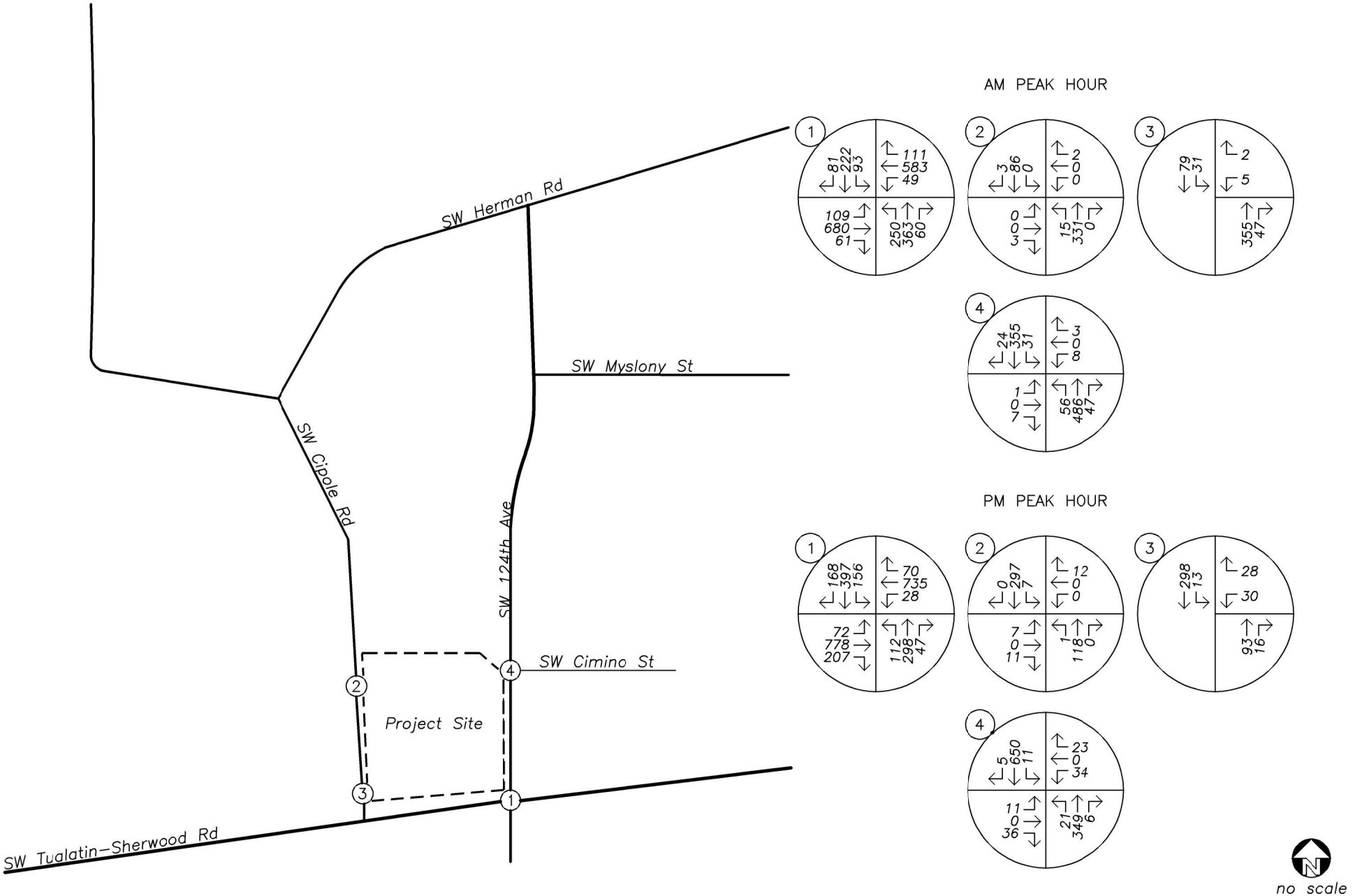
TRAFFIC VOLUMES
Year 2023 Existing Conditions
AM & PM Peak Hours

Figure 6
12777 SW Tualatin-Sherwood Road
05/3´/2023



TRAFFIC VOLUMES
Year 2025 Background Conditions
AM & PM Peak Hours

Figure 7
12777 SW Tualatin-Sherwood Road
05/31/2023



lancaster mobley

TRAFFIC VOLUMES

Year 2025 Buildout Conditions
AM & PM Peak Hours

Figure 8

12777 SW Tualatin-Sherwood Road
05/31/2023

Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Data System, a review of approximately five years of the most recent available crash history (January 2017 through December 2021) was performed at the study intersections. To review the crash data at the existing site accesses, ODOT TransGIS was used to help identify the location of crashses associated with the site driveways. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Detailed ODOT crash reports are included in the technical appendix to this report.

Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- Property Damage Only (PDO)
- Suspected Serious Injury (Injury C)
- Suspected Minor Injury (Injury B)
- Possible Injury (Injury A)
- Fatal Injury

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak hour represents approximately 10 percent of the average daily traffic (ADT) at the intersection.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for each of the study intersections.

Table 4: Crash Type Summary

Intersection		Crash Type					Total Crashes
		Rear End	Turning/ Angle	Fixed Object	Other	Ped/Bike	
1	SW 124th Avenue & SW Tualatin-Sherwood Road	37	13	1	1	0	52
3	SW Cipole Road & Existing Southern Site Access	0	2	0	0	0	2
4	SW 124th Avenue & Proposed Site Access/SW Cimino Street	1	0	0	0	0	1

Table 5: Crash Severity and Rate Summary

Intersection		Crash Severity					Total Crashes	PHV	Crash Rate	90th % Rate
		PDO	C	B	A	Fatal				
1	SW 124th Avenue & SW Tualatin-Sherwood Road	19	25	7	1	0	52	2,579	**1.104**	0.860
3	SW Cipole Road & Existing Southern Site Access	1	1	0	0	0	2	398	0.275	0.408
4	SW 124th Avenue & Proposed Site Access/SW Cimino Street	1	0	0	0	0	1	836	0.065	0.408

Pedestrian and Bicycle Collisions

No collisions with a pedestrian or bicyclist were reported during the five-year analysis period.

Crash Severity

None of the intersection crashes reported in the five-year analysis period resulted in a fatality but one of the crashes resulted in a serious injury (Type A):

- A turning collision between a northbound left-turning vehicle on 124th Avenue and a westbound vehicle on SW Tualatin-Sherwood Road resulted in a Type B injury to the driver who did not have the right-of-way and a Type A injury to the driver of the vehicle that was struck.

ODOT 90th Percentile Crash Rates

Intersection crash rates were compared to the published statewide 90th percentile crash rates within ODOT's Analysis Procedures Manual (APM). According to Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control in the APM, intersections which experience crash rates in excess of 90th percentile crash rates should be "flagged for further analysis".

The intersection of SW 124th Avenue & SW Tualatin-Sherwood Road was identified as having a crash rate that exceeds the ODOT 90th percentile threshold. Historically, this corridor has experienced significant queuing that begins at the intersection with OR Highway 99W in Sherwood and often extends into Tualatin. Many of the rear-end collisions in the corridor occurred hundreds of feet from the associated intersection.

Washington County has two planned improvements along SW Tualatin-Sherwood Road that will help to relieve the congestion and should consequently reduce the crash rates in this corridor:

- The first is the project at SW Tualatin-Sherwood Road and Highway 99W in Sherwood. This project will add significant capacity to the highway intersection and widen SW Tualatin-Sherwood Road to SW Olds Place. Construction began in September 2022 and is expected to be completed in the spring of 2025.
- The second is the project on SW Tualatin-Sherwood Road from Langer Farms Parkway to Teton Avenue. This project will widen SW Tualatin-Sherwood Road to provide two through travel lanes in each direction and will add turn lanes to some intersections.

Reducing congestion will have a particularly strong influence on reducing rear-end type collisions, which accounted for more than 70 percent of the crashes at the intersection. Therefore, no additional mitigation is recommended.

Washington County SPIS List

One of the study area intersections is listed in the Washington County SPIS List:

1. SW Tualatin-Sherwood Road & SW 124th Avenue

These listings are consistent with the crash rate findings and should be similarly improved with the Washington County planned and funded improvements in the corridor.

Conclusion

Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of the study intersections that do not already have planned and funded improvements.

Warrant Analysis

Turn lane warrants and preliminary traffic signal warrants were examined for the study intersections where such treatments would be applicable.

Left-Turn Lane Warrants

A left-turn refuge lane is primarily a safety consideration for the major street, removing left-turning vehicles from the through traffic stream. Turn lane warrants were evaluated based on the *National Cooperative Highway Research Project's* (NCHRP) *Report 457*, which considers the number of advancing and opposing vehicles as well as the number of turning vehicles, the travel speed, and the number of through travel lanes.

The left-turn lane warrants were evaluated at the two existing site accesses but not the proposed new access because the proposed access is already striped with a left-turn lane. Left-turn lane warrants are not projected to be met at either existing site access in either the northbound or southbound directions under any of the analysis scenarios. Accordingly, no new turn lanes are recommended.

Preliminary Traffic Signal Warrants

Preliminary traffic signal warrants were examined for the site accesses for 2025 buildout conditions to determine whether the installation of a new traffic signal will be warranted at the intersection upon completion of the proposed development. Due to insufficient main and side-street traffic volumes, traffic signal warrants are not projected to be met at any of the site accesses.

Sight Distance

A sight distance analysis was performed for the proposed new site driveway. Both intersection sight distance (ISD) and stopping sight distance (SSD) are assessed. The ISD is an operational measure, intended to provide sufficient line of sight along the major street so that a driver could turn from the minor street without impeding traffic flow. The SSD is the minimum requirement to ensure safe operation of the roadway. Stopping sight distance allows an oncoming driver to see a hazard in the roadway, react, and come to a complete stop if

necessary to avoid a collision. According to *A Policy on Geometric Design of Highway and Streets,*[2] as long as the available intersection sight distance is at least equal to the minimum required stopping sight distance for the design speed of the roadway, adequate sight distance is available for safe operation of the intersection.

Intersection Sight Distance

For ISD, the driver's eye is assumed to be 14.5 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The oncoming vehicle driver's eye height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

Stopping Sight Distance

For SSD, the measurement from the driveway is the same but the SSD is also measured from the driver's eye height (3.5 feet) looking towards an object in the roadway at 2.0 feet. SSD is the same for both passenger vehicles and trucks.

Available Sight Distance

Table 6 compares the available sight distance measured in the field with the calculated recommendations and requirements for the traffic movements at the proposed site driveway. The speed of approaching vehicles was assumed to be 45 mph in the northbound direction, where vehicles may be accelerating after passing through the traffic signal at SW Tualatin-Sherwood Road, and 50 mph in the southbound direction, where vehicles are traveling on a longer, unimpeded segment of roadway.

Table 6: Sight Distance Comparison

Proposed Access Turn Movement	Approach Speed	Recommended ISD	Required SSD	Available Sight Distance
Left Turns (Looking South)	45 mph	565 ft	360 ft	>1,000 ft
Right Turns (Looking North)	50 mph	480 ft	425 ft	750 ft

Conclusion

Based on the analysis, the proposed site access has available sight distance which exceeds the ISD recommendations and SSD requirements in both directions.

Access Spacing

Tualatin Development Code (TDC) 75.140 (6)(iv) indicates one driveway on the west side of SW 124th Avenue between SW Tualatin-Sherwood Road and SW Myslony Road to be located at least 800 feet north of SW Tualatin-Sherwood Road, approximately opposite SW Cimino Street. The proposed access will be located opposite SW Cimino Street thus meeting the access spacing standard.

[2] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.

Operational Analysis

Methodology

An operational analysis was conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM)[3]. Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little, or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection. The analysis was performed using the Synchro software which applies the HCM6 methodologies.

Performance Standards

The following agency performance standards are applicable in the study area:

- The City of Tualatin requires intersections to operate at a minimum E for unsignalized intersections.
- Washington County requires intersections to operate with a v/c ratio of 0.99 or less.

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 7 for the morning and evening peak hours. Traffic signal timing along SW Tualatin-Sherwood Road was optimized and coordinated for the new lane configuration. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

As shown in Table 7, all study area intersections are anticipated to meet jurisdictional standards for the buildout condition. Therefore, no mitigation for traffic operations is required or recommended.

[3] Transportation Research Board, *Highway Capacity Manual 6th Edition*, 2016.

Table 7: Capacity Analysis Summary

Intersection & Scenario	Performance Standard	AM Peak Hour			PM Peak Hour		
		LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. SW Tualatin-Sherwood Road & SW 124th Avenue							
2023 Existing	0.99	C	29	0.73	C	26	0.72
2025 Background		C	35	0.55	C	27	0.61
2025 Buildout		C	32	0.54	C	28	0.62
2. SW Cipole Road & Existing Northern Site Access							
2023 Existing	LOS E	A	10	0.01	B	11	0.03
2025 Background		B	12	0.44	B	12	0.40
2025 Buildout		B	12	0.43	B	12	0.16
3. SW Cipole Road & Existing Southern Site Access							
2023 Existing	LOS E	B	11	0.02	B	11	0.15
2025 Background		B	13	0.04	B	12	0.18
2025 Buildout		B	13	0.04	B	11	0.09
4. SW 124th Avenue & Proposed Site Access / SW Cimino Street							
2023 Existing	LOS E	B	14	0.03	B	14	0.13
2025 Background		C	17	0.04	C	16	0.16
2025 Buildout		C	20	0.06	C	18	0.18

*Locations that do not meet standards are **BOLDED**.*

Queuing Analysis

An analysis of queuing was conducted for key study intersections. The analysis was conducted using the Synchro/SimTraffic software, with the reported values representing 95th percentile queue lengths. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may not be frequently observed in the field. Note, this analysis does not account for upstream congestion outside of the study area.

The effective storage for the turning lanes was obtained from the Washington County plans for the SW Tualatin-Sherwood Road improvements from SW Langer Farms Parkway to SW Teton Avenue, the site plan, or from Google Earth. Where dual left-turn lanes are planned, the storage for each lane is estimated.

The resulting 95th percentile queue estimates are summarized in Table 8.

Table 8: Queuing Analysis Summary

Movement	Effective Storage (ft)	AM/PM Peak Hour - 95th Percentile Queue (ft)	
		2025 Background	2025 Buildout
1. SW Tualatin-Sherwood Road & SW 124th Avenue			
EB L1	275	75 / 50	75 / 50
EB L2	350	100 / 100	125 / 75
EB R	350	50 / 100	50 /100
WB L1	380	25 / 25	25 / 25
WB L2	470	75 / 50	75 / 25
WB R	380	50 / 50	50 / 50
NB L1	300	225 / 100	225 / 75
NB L2	300	250 / 175	250 / 150
SB L1	200	100 / 100	75 / 100
SB L2	240	100 /200	125 / 200
SB R	250	50 / 100	50 / 100
2. SW Cipole Road & Existing Northern Site Access			
WB LTR	125	- / 25	-
SB LTR	300	100 / 100	75 / 100
NB LTR	300	100 / 75	100 / 75
3. SW Cipole Road & Existing Southern Site Access			
WB LR	100	50 / **125**	25 / 75
SB L	300	125 / 175	75 / 225
4. SW 124th Avenue & Proposed Site Access/SW Cimino Street			
EB LTR	100	-	25 / 50
NB L	250	-	50 / 50
SB L	250	25 / 25	25 / 25

The analysis shows little change in queues between background and buildout conditions. The queues can all be accommodated within the available storage. Therefore, no mitigation for queuing operations is required or recommended.

Conclusions

Key findings of this study include:

- Traffic counts show that the site generated 175 trips during the morning peak hour (6:40 to 7:40 AM), and 179 trips during the evening peak hour (3:20 to 4:20 PM). No new site trips will be generated by the development, the proposed access driveway will instead only result in new trip distribution into and out of the site.
- Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of the study intersections that do not already have planned and funded improvements.
- Left-turn lane warrants are not met under the 2025 buildout scenario for the two existing site accesses along SW Cipole Road. The proposed new site access on SW 124th Avenue will have a left-turn lane.
- Preliminary traffic signal warrants are not met at any of the site driveways under buildout conditions.
- Based on the sight distance analysis, the proposed site access will meet intersection sight distance recommendations and stopping sight distance requirements.
- The proposed access opposite SW Cimino Street along SW 124th Avenue will meet the Tualatin Development Code access spacing standards.
- All study area intersections are anticipated to operate within the acceptable jurisdiction standards. Therefore, no mitigation for traffic operations is required or recommended. The access configuration options have minimal effect on study area operations.
- The analysis shows little change in queues between background and buildout conditions. The queues can all be accommodated within the available storage. Therefore, no mitigation for queuing operations is required or recommended.

Appendix A – Site Information

Site Plan

Trip Generation Calculations

Scoping Memo

GENERAL SYMBOLS

EXISTING	NEW	
	■	CATCH BASIN (CB) -OR- AREA DRAIN (AD)
◎	●	MANHOLE (MH)
—○—	—●—	UTILITY POLE
⬡	◣	FIRE HYDRANT (FH)
M	M	METER
V	V	UTILITY VAULT
T	T	TRANSFORMER AND PAD
TRAN	TRAN	TRANSFORMER
⊗	⊗	VALVE BOX COVER
⊠	⊠	POST INDICATOR VALVE
☼	☼	LIGHT POLE
☼	☼	WALL MOUNTED LIGHT
⅄	⅄	FIRE DEPARTMENT CONNECTION (FDC)
⋈	⋈	GATE VALVE
N	N	CHECK VALVE
C.O.	C.O.	CLEAN OUT (CO)

NOTE:
THESE SYMBOLS, ABBREVIATIONS AND LINETYPES DO NOT NECESSARILY APPEAR IN THESE DRAWINGS. USE ONLY AS APPLICABLE.

ABBREVIATIONS

AC	ASPHALT CONCRETE
BC	BOTTOM OF CURB
B.M.	BENCH MARK
CB	CATCH BASIN
CO	CLEAN OUT
CONC	CONCRETE
DC	DOUBLE CHECK VALVE
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY
DIP	DUCTILE IRON PIPE
DW	DOMESTIC WATER
EG	EXISTING GRADE
EL	ELEVATION
EXTG	EXISTING
FDC	FIRE DEPARTMENT CONNECTION
FG	FINISHED GRADE
FW	FIRE WATER
GB	GRADE BREAK
HDPE	HIGH-DENSITY POLYETHYLENE
H.P.	HIGH POINT
MH	MANHOLE
PVC	POLYVINYL CHLORIDE
PVC C900	HIGH PRESSURE RATED PVC
SAN	SANITARY
STM	STORM
TC	TOP OF CONCRETE
TYP.	TYPICAL

W E N S

SITE PLAN

1" = 20'

20 0 20 40 60

KEYNOTES

1. MATCH EXISTING PAVEMENT PER DETAIL 1/C1.2.
2. NEW 6" CURB (TYP) PER DETAIL 2/C1.2
3. SAWCUT LINE, RESTORE SURFACE PER CITY 241 ON SHEET C1.2.

PAVEMENT SECTIONS (NON AMENDED SOIL):

(BASED ON 20 YEAR DESIGN LIFE FROM GEO REPORT BY COLUMBIA WEST ENGINEERING, DATED 03/01/2023)

1 HEAVY TRUCK ACCESS - 5.5" A.C. PAVING OVER 16.5" CRUSHED ROCK OVER COMPACTED SUBGRADE.

NOTICE TO EXCAVATORS:

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.
(NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-232-1987).

POTENTIAL UNDERGROUND FACILITY OWNERS

Dig Safely.

Call the Oregon One-Call Center
DIAL 811 or 1-800-332-2344

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME

COLUMBIA CORRUGATED BOX
SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

	DATE	DESCRIPTION

DATE APRIL 2022	
SCALE AS NOTED	PROJ. NO. 20220513
DRAWN ZWA	CHECKED BMD

SITE PLAN

C1.0

G:\Acad2022\2022051304-Drawings\100 C1.0 Site Plan.dwg\9/22/2023 9:38 AM

321 SW 4th Ave., Suite 400
Portland, OR 97204
503.248.0313
lancastermobley.com

Memorandum

To: **Mike McCarthy, Tony Doran, City of Tualatin**
Naomi Vogel, Jinde Zhu, Washington County

Copy: **Brian Dubal, VLMK Engineering + Design**
Roggy Pflug, Columbia Corrugated Box

From: **Myla Cross**
Jennifer Danziger, PE

Date: **April 24, 2023**

Subject: **12777 SW Tualatin Sherwood Road – Proposed New Access – Scoping Memorandum**

This memorandum proposes a scope of work for the transportation impact analysis (TIA) of a new proposed access along SW 124th Avenue for the industrial site located at 12777 SW Tualatin-Sherwood Rd in Tualatin, Oregon. Two businesses operate at this site: Columbia Corrugated Box and Packaging Resources.

Project Description

The facility currently has two existing driveways along SW Cipole Road and is seeking to construct a new driveway at the northern edge of the property line along SW 124th Avenue opposite SW Cimino Street, as shown in Figure 1.

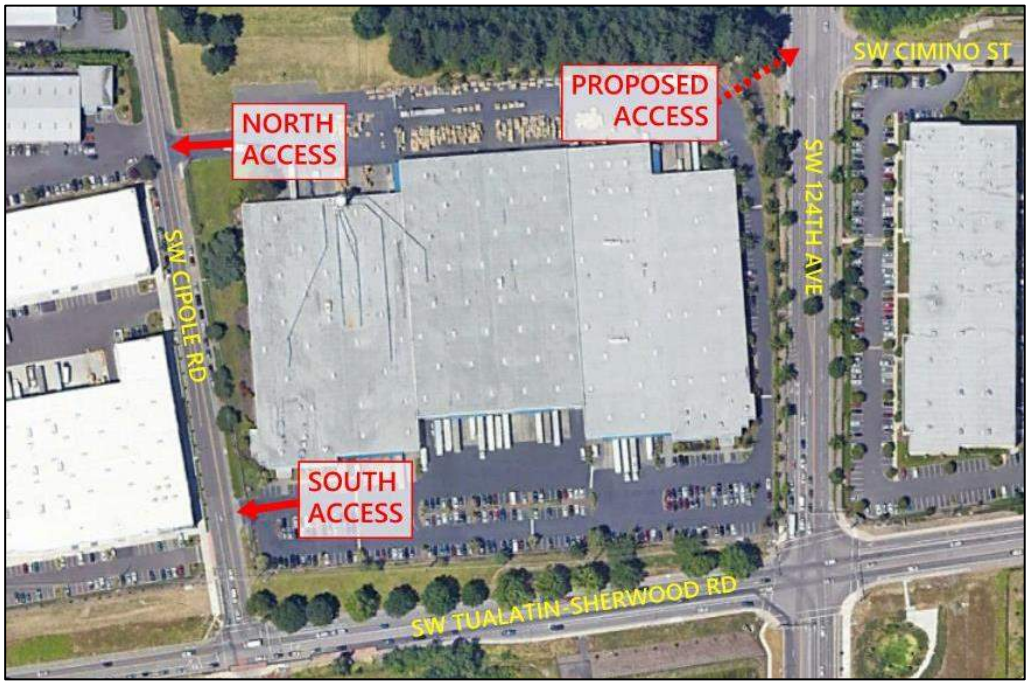


Figure 1: Site Location (© Google Earth)

Trip Generation

Normal operating hours are:

- Packaging Resources Production Personnel
    - The day shift begins at 7:00 AM and ends at 3:30 PM. When overtime is required, the shift begins at 5:00 AM.
    - The swing shift begins at 4:00 PM and ends at 12:30 AM. When overtime is required, the shift ends at 2:30 AM.
- Columbia Corrugated Box Production Personnel
    - The day shift begins at 7:30 AM and ends at 4:00 PM. When overtime is required, the shift begins at 5:30 AM.
    - The swing shift begins at 4:30 PM and ends at 2:30 AM. This is a four-day schedule operating Tuesday through Friday. When overtime is required, the swing shift will also work the same hours on Monday.
- Office personnel hours are generally 8:00 AM to 5:00 PM.

To determine trips that will be generated by the redevelopment, traffic counts were taken at the project site driveways on a typical weekday on Tuesday, February 28, 2023, from 5:30 AM to 8:30 AM and 3:00 PM to 6:00 PM. The peak counts are compared with trip rates from the *Trip Generation Manual*[1] based on the square footage of the building. The resulting trip generation comparison is presented in Table 1.

Table 1: Trip Generation Summary Comparison – Existing Land Use

Land Use (ITE Code)	Size	AM Peak Hour			PM Peak Hour			Weekday Total
		In	Out	Total	In	Out	Total	
Field Measured Trip Generation (February 28, 2023)								
Passenger Vehicles*	315,000 SF	157	8	165	53	111	164	-
Trucks		1	9	10	9	6	15	-
Total		158	17	175	62	117	179	
ITE Rates Trip Estimates (Land Use Code 110 – General Light Industrial)								
Passenger Vehicles	315,000 SF	190	25	215	11	78	89	1,156
Trucks		2	1	3	2	1	3	78
Total		192	26	218	13	79	92	1,234

** On the day of the survey, the facility had 86 personnel clock in prior to 6:00 AM and 52 personnel clock in prior to 7:00 AM. A factor of 2.65 (138/52) was applied to the entering volumes to account for the scheduled overtime.*

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

The traffic counts show that the site generated 175 trips during the morning peak hour (6:40 to 7:40 AM), and 179 trips during the evening peak hour (3:20 to 4:20 PM).

The trip generation estimates using ITE trip rates and assuming general light industrial for the site project that a site of this size would generate 218 trips during the morning peak hour, 92 trips during the evening peak hour and 1,234 trips during the average weekday.

As shown, the ITE trip estimates differ from the actual driveway counts and the peak trends are reversed. and are not indicative of the true number of site trips generated by the development. Therefore, it is recommended that the field observed trip generation be used for analysis.

Trip Distribution

A distribution of site trips to/from the project site is necessary to identify intersections to be included in the study area of the TIA. Figure 2 illustrates the proposed trip distribution for the morning and evening peak hours for the existing and proposed driveway configurations. Details about each are provided below.

Overall Distribution

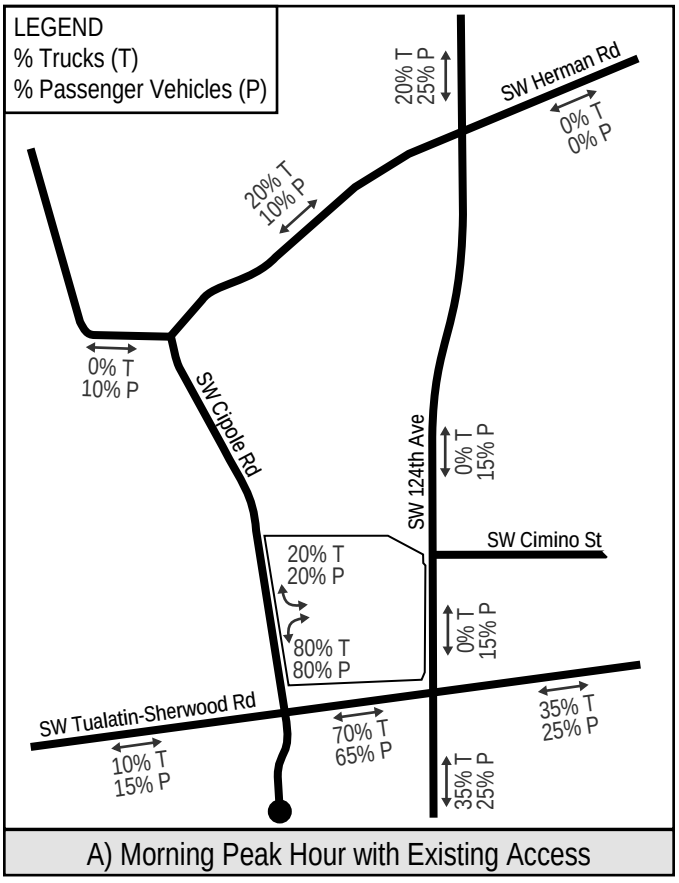
The location of major transportation facilities and regional distribution of households was used to approximate the distribution on the nearby transportation network. The resulting distribution is consistent with other industrials developments proposed in Tualatin.

For trucks entering/exiting SW Cipole Road, the following broad trip distribution is assumed:

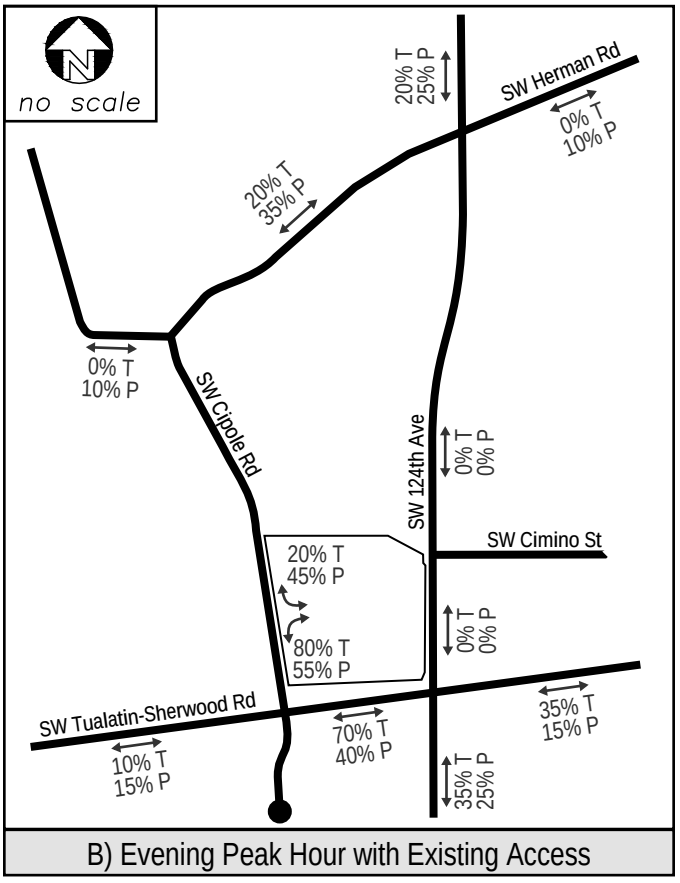
- Approximately 20 percent will travel to/from the north via SW 124th Avenue
- Approximately 10 percent will travel to/from the west via SW Tualatin-Sherwood Road
- Approximately 35 percent will travel to/from the east via SW Tualatin-Sherwood Road
- Approximately 35 percent will travel to/from the south via SW 124th Avenue

For passenger vehicles entering/exiting SW Cipole Road, the following broad trip distribution is assumed:

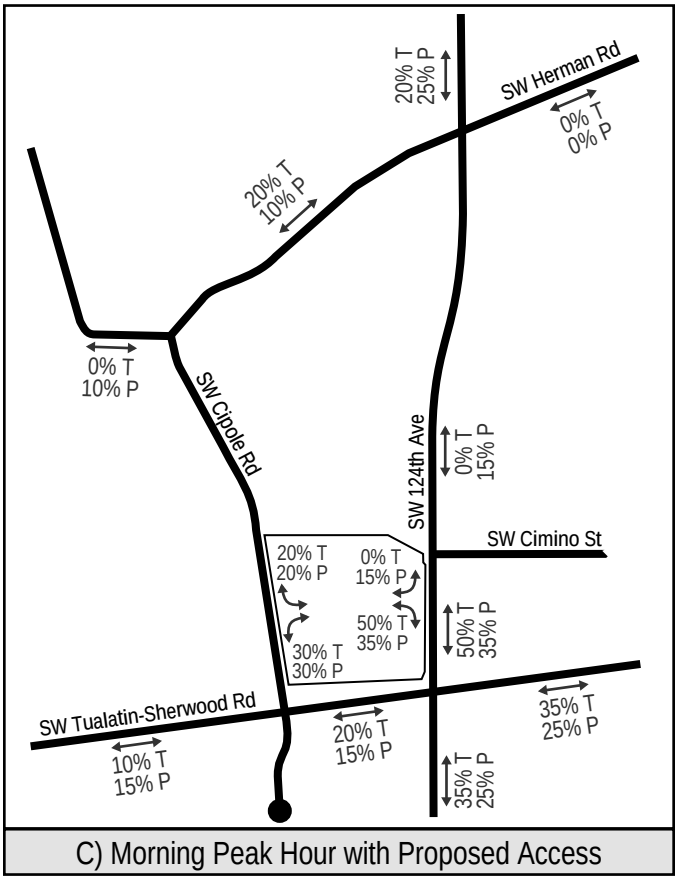
- Approximately 10 percent will travel to/from the north via SW Cipole Road
- Approximately 25 percent will travel to/from the north via SW 124th Avenue
- Approximately 15 percent of site trips will travel to/from the west via SW Tualatin-Sherwood Road
- Approximately 25 percent of site trips will travel to/from the east via SW Tualatin-Sherwood Road
- Approximately 25 percent of site trips will travel to/from the south via SW 124th Avenue



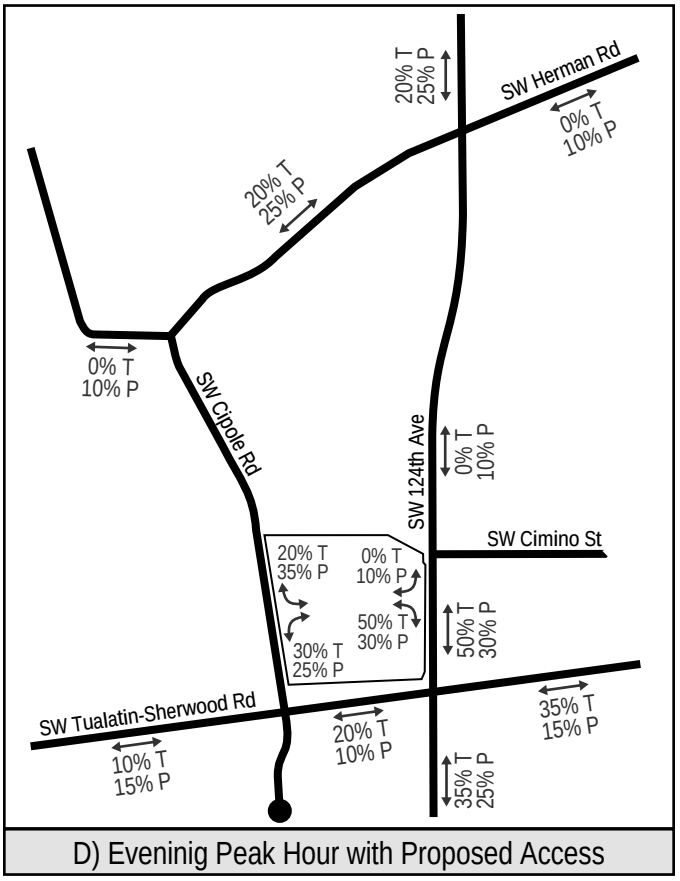
A) Morning Peak Hour with Existing Access



B) Evening Peak Hour with Existing Access



C) Morning Peak Hour with Proposed Access



D) Eveninig Peak Hour with Proposed Access

lancaster mobley

TRIP DISTRIBUTION

Figure 2

12777 SW Tualatin-Sherwood Road
4/21/2023

Existing Access Configuration

While the truck distribution was found to be reasonably consistent between the morning and evening peak hours, the passenger vehicle traffic had different trends. This difference may reflect a number of factors including the congestion in the transportation system and the ease or difficulty of making left-turn movements from the driveways during these periods.

The following split in driveway usage was observed during the surveys:

- Approximately 45 percent of trucks used the north access and 55 percent used the south access during either peak hour
- Approximately 100 percent of passenger vehicles used the south access during the morning peak hour
- Approximately 10 percent of passenger vehicles used the north access and 90 percent used the south access during the evening peak hour.

The following directional split was observed based on the combined driveway volumes during the surveys:

- Approximately 20 percent of trucks were traveling to/from the north on SW Cipole Road and 80 percent were traveling to/from the south during either peak hour
- Approximately 20 percent of passenger vehicles were traveling to/from the north on SW Cipole Road and 80 percent were traveling to/from the south during the morning peak hour
- Approximately 45 percent of passenger vehicles were traveling to/from the north on SW Cipole Road and 55 percent were traveling to/from the south during the evening peak hour

Images A and B in Figure 2 illustrate the distribution of truck and passenger vehicle traffic on the network based on the existing access configuration and survey data.

Proposed Access Configuration

Adding the proposed access to SW 124th Avenue opposite SW Cimino Street is anticipated to create the following shifts in driveway utilization:

- Approximately 20 percent of trucks are assumed to use the north access, 30 percent are assumed to use the south access, and 50 percent are assumed to use the new east access during either peak hour
- Approximately 50 percent of passenger vehicles are assumed to use the south access and 50 percent are assumed to use the new east access during the morning peak hour
- Approximately 10 percent of passenger vehicles are assumed to use the north access, 50 percent are assumed to use the south access, and 40 percent are assumed to use the new east access during the evening peak hour.

Images C and D in Figure 2 illustrate the distribution of truck and passenger vehicle traffic on the network based with the assumed shifts in traffic associated with the proposed access configuration.

Trip Assignment

Figure 3 illustrates the estimated existing trips on the area roadways (Image A) and the trip assignment with the proposed new access to SW 124th Avenue (Image B). Image C shows the net change in traffic volumes on roadway segments as a result of the proposed new access while Image D shows the change in total entering traffic volumes by intersection.

Segment Changes

As shown in Figure 3, Image C, some roadway segments are anticipated to have a net increase in traffic while others are anticipated to have a net decrease in volumes. Segments anticipated to have a net increase include:

- SW 124th Avenue between SW Tualatin-Sherwood Road and the proposed access/SW Cimino Street
- SW 124th Avenue between the Proposed Access/SW Cimino Street and SW Herman Road

All other segments will experience a net decrease in traffic or no change.

Intersection Changes

As shown in Figure 3, Image D, some intersections are anticipated to have a net increase in traffic while others are anticipated to have a net decrease in volumes. Intersections anticipated to have a net increase include:

- SW 124th Avenue at the Proposed Access/SW Cimino Street

All other intersections will experience a net decrease in traffic or no change in total entering volume; however, one intersection will experience shifts in volumes from one approach to another. This intersections is:

- SW 124th Avenue at SW Tualatin-Sherwood Road

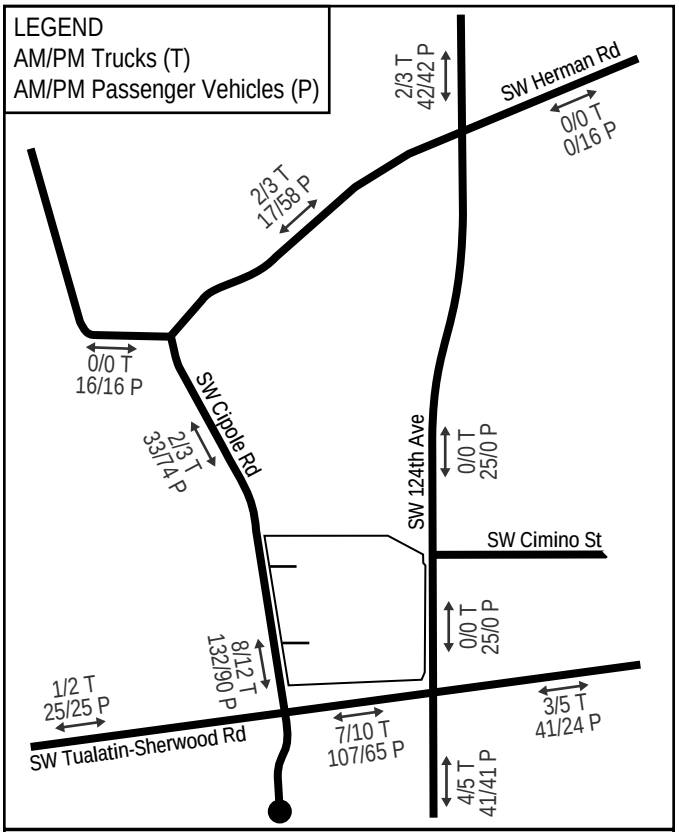
Proposed Study Intersections

The proposed project lies within the City of Tualatin's planning area boundary, but traffic is also anticipated to affect Washington County roadway facilities. Tualatin Development Code (TDC) 74.440 does not establish criteria for determining the study area traffic studies; the need for a traffic study and the study area are determined by city staff. However, staff have provided a general guideline of 60 peak hour trips and 500 daily trips through an intersection. Washington County (Resolution & Order 86-95) defines the impact area for developments as "those road links where site-generated traffic equals or exceeds 10% of existing average daily traffic" (ADT).

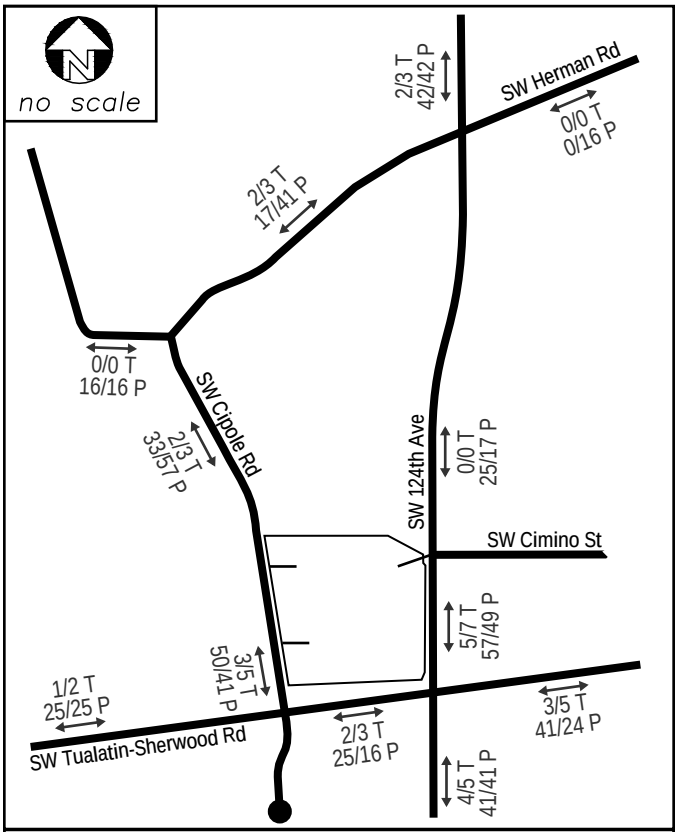
Using the trip assignments and the criteria discussed above, the following list of intersections are proposed for the study area:

1. SW Tualatin-Sherwood Road & SW 124th Avenue
2. SW Cipole Road & Existing Northern Site Access
3. SW Cipole Road & Existing Southern Site Access
4. SW 124th Avenue & Proposed Site Access/SW Cimino Street

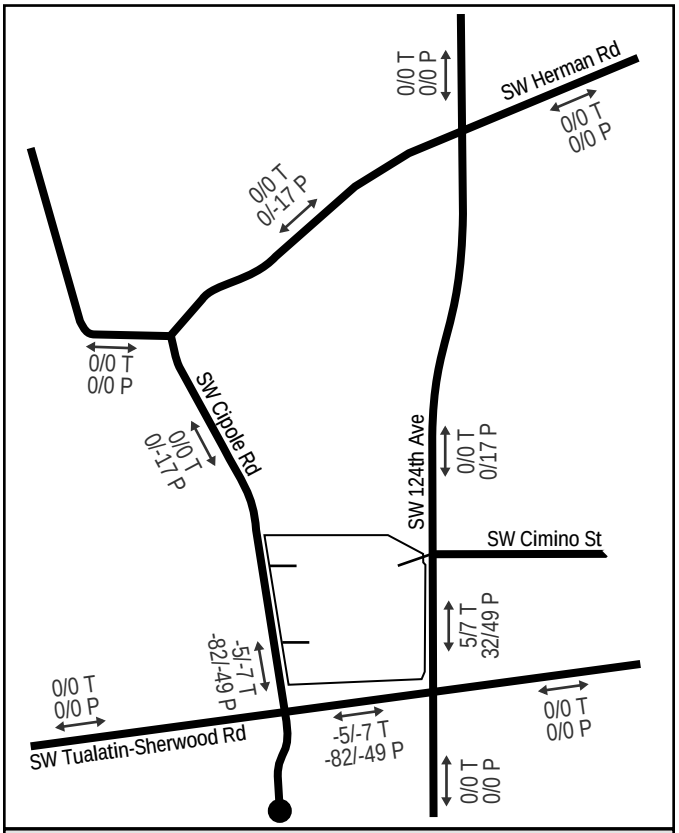
The other intersections within the vicinity of the site are not proposed for analysis as they do not meet the 60-trip threshold or 10 percent impact.



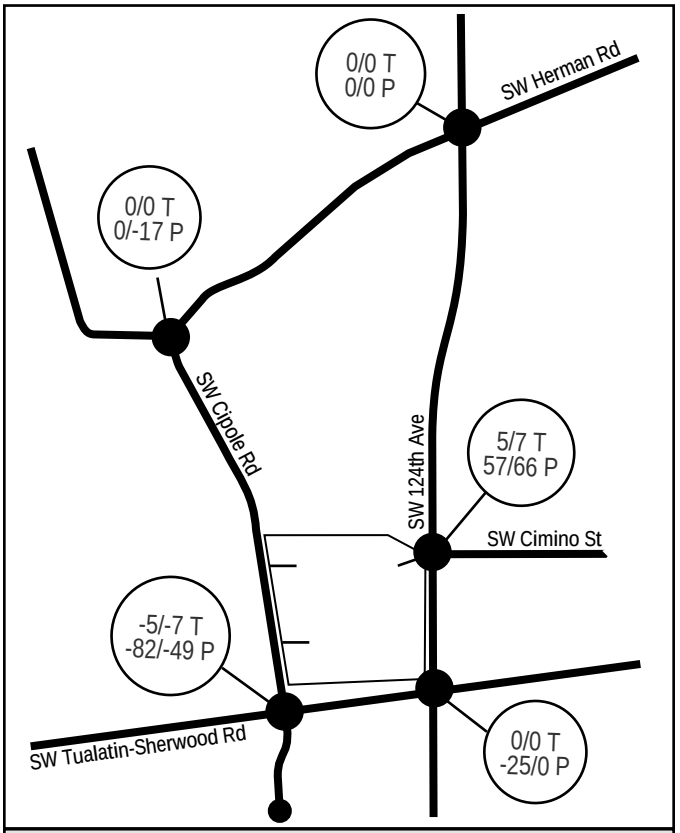
A) Peak Hours with Existing Access



B) Peak Hours with Proposed Access



C) Net Change with Proposed Access - Segments



D) Net Change with Proposed Access - Intersections

lancaster mobley

TRIP ASSIGNMENT

Figure 3

12777 SW Tualatin-Sherwood Road
4/21/2023

Existing Traffic Volumes

New traffic counts will be collected at all study area intersections while school is in session. No adjustment is proposed since traffic volumes have largely stabilized near pre-pandemic levels.

Traffic Volume Projections

To develop future volumes, we propose using a background growth rate of 2 percent per year plus the traffic volumes from approved projects.

TIA Report

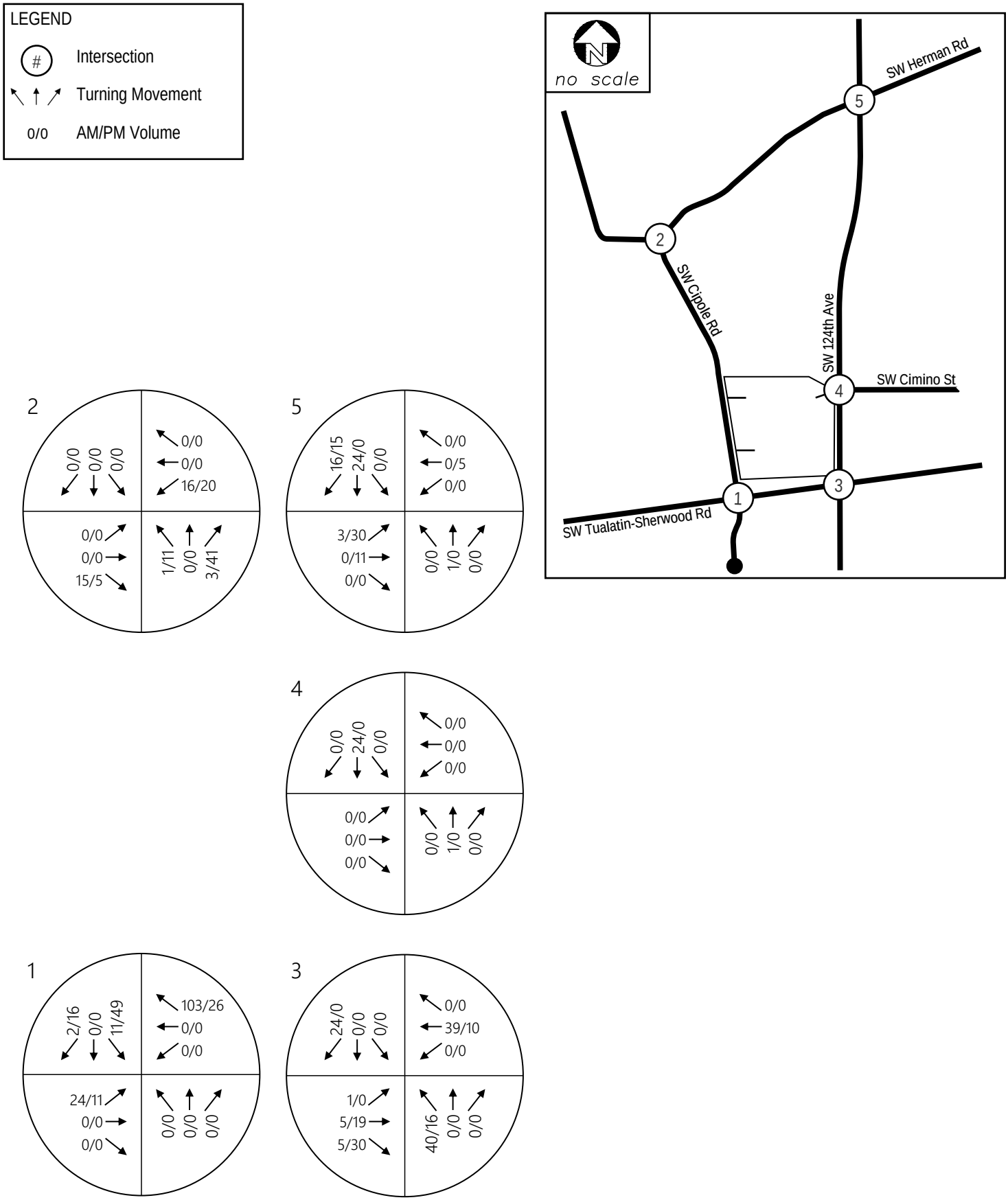
The TIA will address safety and analysis requirements, including crash analysis, turn lane warrants, signal warrants, sight distance assessment, and operations.

Summary of Scoping Proposal

Please review our proposed TIA scope of analysis and confirm the following:

- Trip generation is acceptable.
- Trip distribution is acceptable. Any changes to the distribution will be confirmed with agency staff.
- The 6 intersections proposed for the study are acceptable.
- Using new traffic counts for the existing condition is acceptable.
- Our background growth rate of 2 percent per year is acceptable.

In addition to the Tualatin Logistics Park immediately north of the site, please confirm any in-process trips from approved projects that should be included in the background condition.



lancaster mobley

TRIP ASSIGNMENT WITH EXISTING ACCESS

Figure 4

12777 SW Tualatin-Sherwood Road
4/25/2023

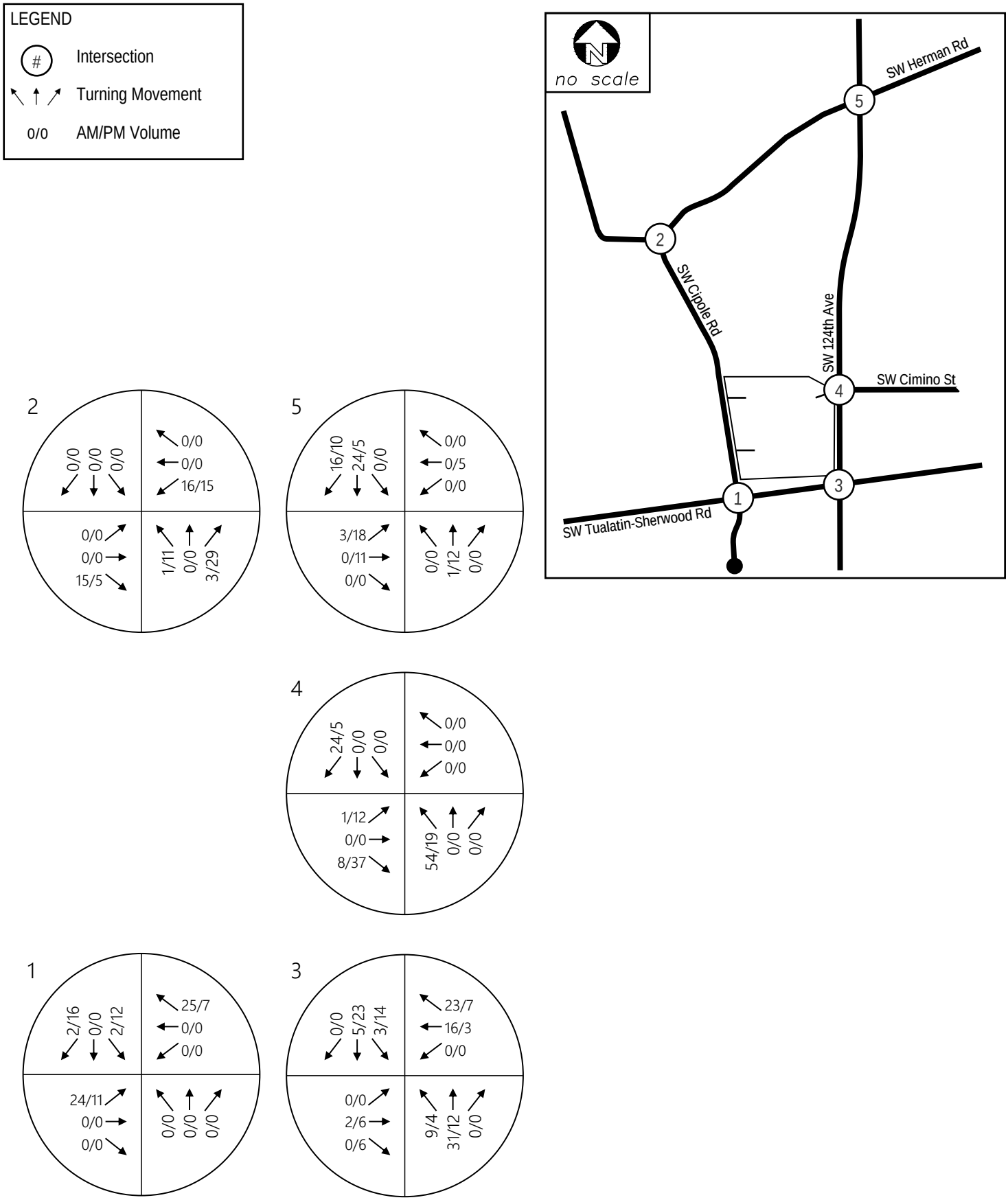
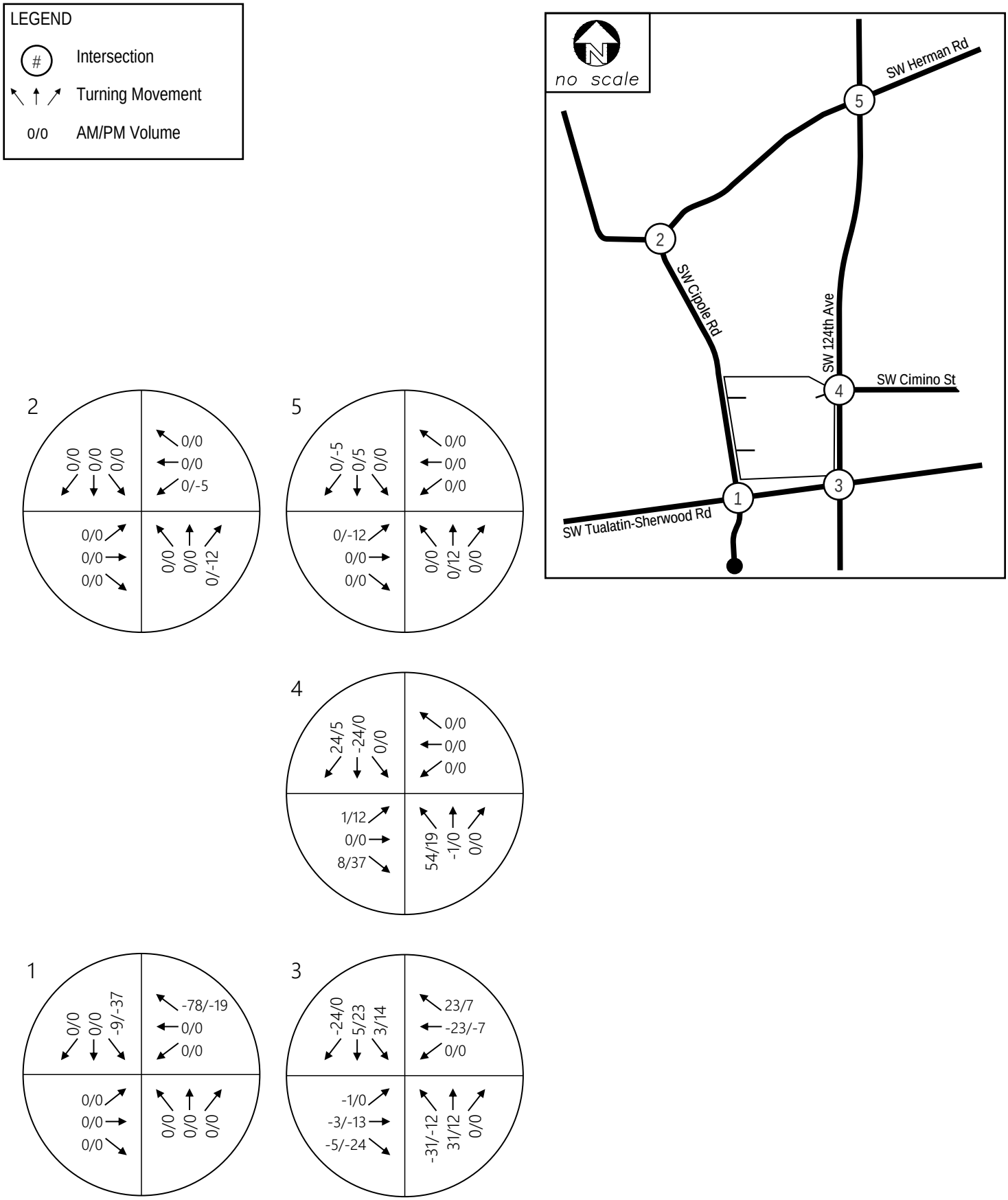


Figure 5

TRIP ASSIGNMENT WITH PROPOSED ACCESS

12777 SW Tualatin-Sherwood Road
4/25/2023



lancaster mobley

CHANGE IN TRIP ASSIGNMENT WITH PROPOSED ACCESS

Figure 6

12777 SW Tualatin-Sherwood Road
4/25/2023

Appendix B – Traffic Data

Turning Movement Counts

In-Process Projects

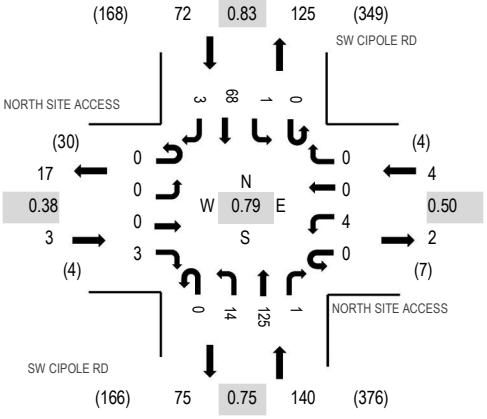
Tualatin-Sherwood Road Improvements

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

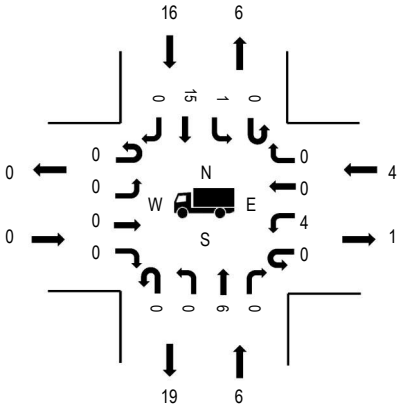
Location: 1 SW CIPOLE RD & NORTH SITE ACCESS AM
Date: Tuesday, February 28, 2023
Peak Hour: 06:45 AM - 07:45 AM
Peak 15-Minutes: 06:45 AM - 07:00 AM

Peak Hour

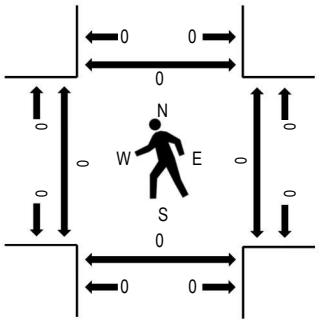
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.38
WB	100.0%	0.50
NB	4.3%	0.75
SB	22.2%	0.83
All	11.9%	0.79

Traffic Counts - Motorized Vehicles

Interval Start Time	NORTH SITE ACCESS Eastbound				NORTH SITE ACCESS Westbound				SW CIPOLE RD Northbound				SW CIPOLE RD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
5:30 AM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	1	0	10	142
5:35 AM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	2	0	12	146
5:40 AM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	1	1	9	148
5:45 AM	0	0	0	0	0	0	0	0	0	0	12	0	0	0	1	0	13	156
5:50 AM	0	0	0	0	0	0	0	0	0	0	15	0	0	0	1	1	17	169
5:55 AM	0	0	0	0	0	0	0	0	0	1	7	1	0	0	2	1	12	175
6:00 AM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	2	0	9	183
6:05 AM	0	0	0	0	0	0	0	0	0	2	4	0	0	0	1	0	7	191
6:10 AM	0	0	0	0	0	0	0	0	0	1	10	0	0	0	0	0	11	208
6:15 AM	0	0	0	0	0	0	0	0	0	0	6	1	0	0	2	1	10	210
6:20 AM	0	0	0	0	0	0	0	0	0	1	10	1	0	0	1	0	13	212
6:25 AM	0	0	0	0	0	0	0	0	0	1	14	0	0	0	4	0	19	217
6:30 AM	0	0	0	0	0	0	0	0	0	0	11	0	0	0	2	1	14	213
6:35 AM	0	0	0	0	0	0	0	0	0	0	12	0	0	0	2	0	14	215
6:40 AM	0	0	0	0	0	0	0	0	0	0	10	1	0	0	5	1	17	218
6:45 AM	0	0	0	0	0	0	0	0	0	0	23	0	0	0	3	0	26	219
6:50 AM	0	0	0	0	0	1	0	0	0	1	14	1	0	0	6	0	23	211
6:55 AM	0	0	0	0	0	0	0	0	0	6	6	0	0	0	7	1	20	209
7:00 AM	0	0	0	1	0	0	0	0	0	0	8	0	0	0	7	1	17	204
7:05 AM	0	0	0	0	0	1	0	0	0	1	14	0	0	0	7	1	24	203
7:10 AM	0	0	0	0	0	0	0	0	0	2	4	0	0	0	7	0	13	200
7:15 AM	0	0	0	1	0	0	0	0	0	1	4	0	0	0	6	0	12	204
7:20 AM	0	0	0	1	0	0	0	0	0	1	11	0	0	0	5	0	18	209
7:25 AM	0	0	0	0	0	1	0	0	0	1	9	0	0	0	4	0	15	202
7:30 AM	0	0	0	0	0	0	0	0	0	1	6	0	0	0	9	0	16	197
7:35 AM	0	0	0	0	0	1	0	0	0	0	13	0	0	0	3	0	17	
7:40 AM	0	0	0	0	0	0	0	0	0	0	13	0	0	1	4	0	18	
7:45 AM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	9	0	18	

7:50 AM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	11	0	21
7:55 AM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	6	0	15
8:00 AM	0	0	0	0	0	0	0	0	0	1	7	0	0	0	8	0	16
8:05 AM	0	0	0	0	0	0	0	0	0	0	13	0	0	0	8	0	21
8:10 AM	0	0	0	0	0	0	0	0	0	0	11	0	0	0	6	0	17
8:15 AM	0	0	0	0	0	0	0	0	0	0	9	1	0	0	7	0	17
8:20 AM	0	0	0	1	0	0	0	0	0	0	5	0	0	0	5	0	11
8:25 AM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	3	0	10
Count Total	0	0	0	4	0	4	0	0	0	21	349	6	0	1	158	9	552
Peak Hour	0	0	0	3	0	4	0	0	0	14	125	1	0	1	68	3	219

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

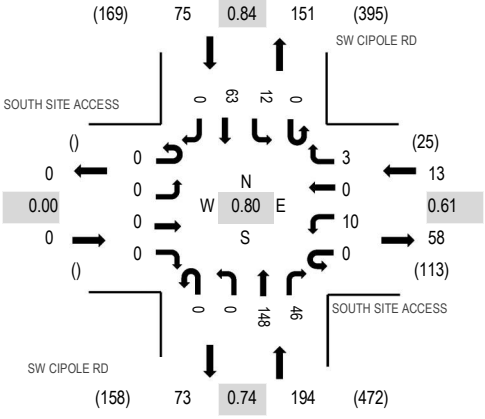
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
5:30 AM	0	0	0	0	0	5:30 AM	0	0	0	0	0	5:30 AM	0	0	0	0	0
5:35 AM	0	0	0	0	0	5:35 AM	0	0	0	0	0	5:35 AM	0	0	0	0	0
5:40 AM	0	0	0	0	0	5:40 AM	0	0	0	0	0	5:40 AM	0	0	0	0	0
5:45 AM	0	2	0	0	2	5:45 AM	0	0	0	0	0	5:45 AM	0	0	0	0	0
5:50 AM	0	1	0	0	1	5:50 AM	0	0	0	0	0	5:50 AM	0	0	0	0	0
5:55 AM	0	1	0	0	1	5:55 AM	0	0	0	0	0	5:55 AM	0	0	0	0	0
6:00 AM	0	1	0	0	1	6:00 AM	0	0	0	0	0	6:00 AM	0	0	0	0	0
6:05 AM	0	1	0	0	1	6:05 AM	0	0	0	0	0	6:05 AM	0	0	0	0	0
6:10 AM	0	0	0	0	0	6:10 AM	0	0	0	0	0	6:10 AM	0	0	0	0	0
6:15 AM	0	1	0	0	1	6:15 AM	0	0	0	0	0	6:15 AM	0	0	0	0	0
6:20 AM	0	1	0	0	1	6:20 AM	0	0	0	0	0	6:20 AM	0	0	0	0	0
6:25 AM	0	1	0	0	1	6:25 AM	0	0	0	0	0	6:25 AM	0	0	0	0	0
6:30 AM	0	0	0	0	0	6:30 AM	0	0	0	0	0	6:30 AM	0	0	0	0	0
6:35 AM	0	0	0	0	0	6:35 AM	0	0	0	0	0	6:35 AM	0	0	0	0	0
6:40 AM	0	1	0	1	2	6:40 AM	0	0	0	0	0	6:40 AM	0	0	0	0	0
6:45 AM	0	1	0	0	1	6:45 AM	0	0	0	0	0	6:45 AM	0	0	0	0	0
6:50 AM	0	1	1	1	3	6:50 AM	0	0	0	0	0	6:50 AM	0	0	0	0	0
6:55 AM	0	0	0	1	1	6:55 AM	0	0	0	0	0	6:55 AM	0	0	0	0	0
7:00 AM	0	1	0	0	1	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	1	1	3	5	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	3	3	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	3	3	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	1	0	1	2	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	1	2	3	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	0	1	1	2	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	1	0	1	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	1	1	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	1	0	0	1	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	1	0	0	1	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	0	2	0	3	5	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	2	2	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	1	0	2	3	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	1	0	0	1	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	1	1	0	3	5	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	1	1	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
Count Total	1	23	4	29	57	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	0	6	4	16	26	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

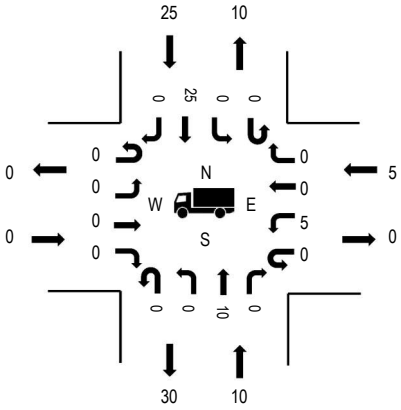
Location: 2 SW CIPOLE RD & SOUTH SITE ACCESS AM
Date: Tuesday, February 28, 2023
Peak Hour: 06:40 AM - 07:40 AM
Peak 15-Minutes: 06:45 AM - 07:00 AM

Peak Hour

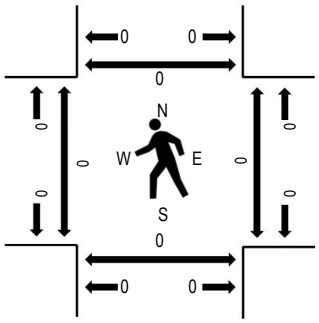
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	38.5%	0.61
NB	5.2%	0.74
SB	33.3%	0.84
All	14.2%	0.80

Traffic Counts - Motorized Vehicles

Interval Start Time	SOUTH SITE ACCESS Eastbound				SOUTH SITE ACCESS Westbound				SW CIPOLE RD Northbound				SW CIPOLE RD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
5:30 AM	0	0	0	0	0	0	0	0	0	0	7	1	0	0	4	0	12	165
5:35 AM	0	0	0	0	0	1	0	0	0	0	6	0	0	0	3	0	10	173
5:40 AM	0	0	0	0	0	0	0	0	0	0	8	0	0	1	3	0	12	181
5:45 AM	0	0	0	0	0	0	0	0	0	0	11	1	0	0	1	0	13	190
5:50 AM	0	0	0	0	0	0	0	0	0	0	13	2	0	0	1	0	16	206
5:55 AM	0	0	0	0	0	0	0	0	0	0	10	1	0	0	2	0	13	219
6:00 AM	0	0	0	0	0	0	0	0	0	0	7	1	0	2	1	0	11	236
6:05 AM	0	0	0	0	0	1	0	0	0	0	7	0	0	0	1	0	9	253
6:10 AM	0	0	0	0	0	0	0	0	0	0	11	2	0	0	3	0	16	270
6:15 AM	0	0	0	0	0	0	0	0	0	0	6	1	0	1	2	0	10	268
6:20 AM	0	0	0	0	0	1	0	1	0	0	12	5	0	1	0	0	20	277
6:25 AM	0	0	0	0	0	1	0	0	0	0	16	2	0	2	2	0	23	278
6:30 AM	0	0	0	0	0	3	0	0	0	0	11	4	0	1	1	0	20	280
6:35 AM	0	0	0	0	0	0	0	1	0	0	14	1	0	1	1	0	18	280
6:40 AM	0	0	0	0	0	1	0	0	0	0	12	4	0	0	4	0	21	282
6:45 AM	0	0	0	0	0	0	0	0	0	0	23	3	0	1	2	0	29	281
6:50 AM	0	0	0	0	0	0	0	1	0	0	16	6	0	2	4	0	29	272
6:55 AM	0	0	0	0	0	1	0	0	0	0	14	9	0	2	4	0	30	265
7:00 AM	0	0	0	0	0	3	0	1	0	0	15	5	0	1	3	0	28	258
7:05 AM	0	0	0	0	0	2	0	0	0	0	15	3	0	0	6	0	26	248
7:10 AM	0	0	0	0	0	0	0	0	0	0	3	1	0	1	9	0	14	241
7:15 AM	0	0	0	0	0	1	0	0	0	0	9	3	0	0	6	0	19	244
7:20 AM	0	0	0	0	0	0	0	0	0	0	10	3	0	1	7	0	21	245
7:25 AM	0	0	0	0	0	2	0	0	0	0	11	6	0	1	5	0	25	235
7:30 AM	0	0	0	0	0	0	0	0	0	0	8	1	0	2	9	0	20	221
7:35 AM	0	0	0	0	0	0	0	1	0	0	12	2	0	1	4	0	20	
7:40 AM	0	0	0	0	0	0	0	1	0	0	15	2	0	1	1	0	20	
7:45 AM	0	0	0	0	0	0	0	0	0	0	10	1	0	2	7	0	20	

7:50 AM	0	0	0	0	0	0	0	0	0	0	10	3	0	2	7	0	22
7:55 AM	0	0	0	0	0	0	0	0	0	0	15	2	0	1	5	0	23
8:00 AM	0	0	0	0	0	0	0	0	0	0	9	3	0	1	5	0	18
8:05 AM	0	0	0	0	0	0	0	0	0	0	11	2	0	0	6	0	19
8:10 AM	0	0	0	0	0	0	0	0	0	0	9	1	0	1	6	0	17
8:15 AM	0	0	0	0	0	1	0	0	0	0	12	1	0	1	5	0	20
8:20 AM	0	0	0	0	0	1	0	0	0	0	4	1	0	0	5	0	11
8:25 AM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	4	0	11
Count Total	0	0	0	0	0	19	0	6	0	0	389	83	0	30	139	0	666
Peak Hour	0	0	0	0	0	10	0	3	0	0	148	46	0	12	63	0	282

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

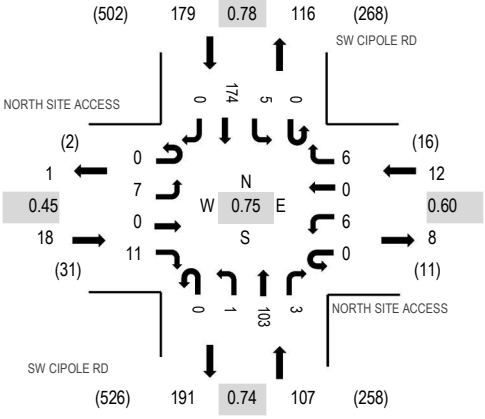
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
5:30 AM	0	0	0	0	0	5:30 AM	0	0	0	0	0	5:30 AM	0	0	0	0	0
5:35 AM	0	1	1	0	2	5:35 AM	0	0	0	0	0	5:35 AM	0	0	0	0	0
5:40 AM	0	0	0	0	0	5:40 AM	0	0	0	0	0	5:40 AM	0	0	0	0	0
5:45 AM	0	1	0	0	1	5:45 AM	0	0	0	0	0	5:45 AM	0	0	0	0	0
5:50 AM	0	0	0	1	1	5:50 AM	0	0	0	0	0	5:50 AM	0	0	0	0	0
5:55 AM	0	2	0	1	3	5:55 AM	0	0	0	0	0	5:55 AM	0	0	0	0	0
6:00 AM	0	0	0	0	0	6:00 AM	0	0	0	0	0	6:00 AM	0	0	0	0	0
6:05 AM	0	1	1	0	2	6:05 AM	0	0	0	0	0	6:05 AM	0	0	0	0	0
6:10 AM	0	1	0	2	3	6:10 AM	0	0	0	0	0	6:10 AM	0	0	0	0	0
6:15 AM	0	0	0	2	2	6:15 AM	0	0	0	0	0	6:15 AM	0	0	0	0	0
6:20 AM	0	0	1	0	1	6:20 AM	0	0	0	0	0	6:20 AM	0	0	0	0	0
6:25 AM	0	1	1	1	3	6:25 AM	0	0	0	0	0	6:25 AM	0	0	0	0	0
6:30 AM	0	0	2	1	3	6:30 AM	0	0	0	0	0	6:30 AM	0	0	0	0	0
6:35 AM	0	0	0	0	0	6:35 AM	0	0	0	0	0	6:35 AM	0	0	0	0	0
6:40 AM	0	1	0	1	2	6:40 AM	0	0	0	0	0	6:40 AM	0	0	0	0	0
6:45 AM	0	1	0	0	1	6:45 AM	0	0	0	0	0	6:45 AM	0	0	0	0	0
6:50 AM	0	3	0	2	5	6:50 AM	0	0	0	0	0	6:50 AM	0	0	0	0	0
6:55 AM	0	0	0	1	1	6:55 AM	0	0	0	0	0	6:55 AM	0	0	0	0	0
7:00 AM	0	2	2	0	4	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	1	2	4	7	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	5	5	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	1	0	3	4	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	1	0	2	3	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	1	3	4	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	1	1	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	3	3	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	0	1	1	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	2	2	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	1	0	1	2	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	1	1	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	0	1	0	2	3	8:00 AM	0	0	0	0	0	8:00 AM	0	0	1	0	1
8:05 AM	0	0	0	3	3	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	2	2	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	3	0	0	3	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	1	3	4	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	2	2	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
Count Total	0	22	13	50	85	Count Total	0	0	0	0	0	Count Total	0	0	1	0	1
Peak Hour	0	10	5	25	40	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

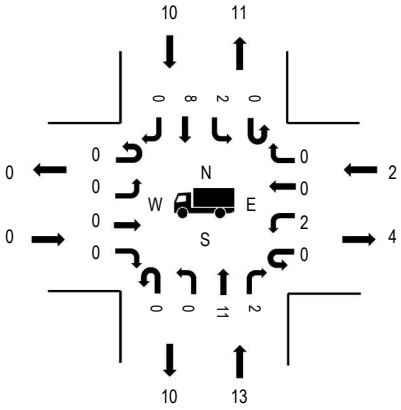
Location: 1 SW CIPOLE RD & NORTH SITE ACCESS PM
Date: Tuesday, February 28, 2023
Peak Hour: 03:20 PM - 04:20 PM
Peak 15-Minutes: 03:25 PM - 03:40 PM

Peak Hour

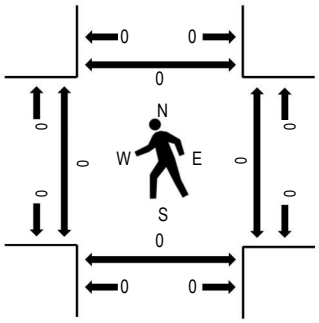
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.45
WB	16.7%	0.60
NB	12.1%	0.74
SB	5.6%	0.78
All	7.9%	0.75

Traffic Counts - Motorized Vehicles

Interval Start Time	NORTH SITE ACCESS Eastbound				NORTH SITE ACCESS Westbound				SW CIPOLE RD Northbound				SW CIPOLE RD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
3:00 PM	0	0	0	1	0	0	0	0	0	0	7	0	0	0	10	0	18	295
3:05 PM	0	0	0	1	0	0	0	0	0	0	9	0	0	0	16	0	26	303
3:10 PM	0	0	0	0	0	0	0	0	0	0	8	0	0	0	14	0	22	302
3:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	1	10	0	15	305
3:20 PM	0	0	0	0	0	1	0	0	0	0	5	0	0	0	19	0	25	316
3:25 PM	0	0	0	0	0	1	0	0	0	0	8	0	0	0	13	0	22	311
3:30 PM	0	2	0	7	0	1	0	1	0	0	17	0	0	1	18	0	47	307
3:35 PM	0	0	0	1	0	1	0	1	0	0	11	0	0	0	22	0	36	276
3:40 PM	0	0	0	1	0	0	0	0	0	0	5	0	0	0	11	0	17	269
3:45 PM	0	1	0	1	0	0	0	1	0	1	5	2	0	1	10	0	22	276
3:50 PM	0	2	0	0	0	0	0	0	0	0	9	0	0	0	14	0	25	271
3:55 PM	0	0	0	0	0	0	0	0	0	0	7	0	0	1	12	0	20	268
4:00 PM	0	0	0	1	0	0	0	0	0	0	11	0	0	0	14	0	26	271
4:05 PM	0	0	0	0	0	1	0	3	0	0	6	0	0	1	14	0	25	268
4:10 PM	0	0	0	0	0	1	0	0	0	0	11	0	0	1	12	0	25	275
4:15 PM	0	2	0	0	0	0	0	0	0	0	8	1	0	0	15	0	26	272
4:20 PM	0	1	0	0	0	0	0	0	0	0	5	0	0	0	14	0	20	270
4:25 PM	0	0	0	1	0	1	0	0	0	0	8	0	0	0	8	0	18	278
4:30 PM	0	0	0	1	0	0	0	0	0	0	4	0	0	0	11	0	16	280
4:35 PM	0	0	0	2	0	1	0	0	0	0	6	0	0	0	20	0	29	278
4:40 PM	0	0	0	0	0	0	0	0	0	0	4	1	0	0	19	0	24	271
4:45 PM	0	1	0	0	0	0	0	0	0	0	3	0	0	0	13	0	17	258
4:50 PM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	15	0	22	259
4:55 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	21	0	23	254
5:00 PM	0	0	0	0	0	0	0	0	1	0	4	0	0	0	18	0	23	241
5:05 PM	0	1	0	0	0	1	0	0	0	0	9	0	0	0	21	0	32	
5:10 PM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	12	0	22	
5:15 PM	0	1	0	0	0	0	0	0	0	0	12	0	0	0	11	0	24	

5:20 PM	0	0	0	0	0	0	0	0	0	0	14	0	0	0	14	0	28
5:25 PM	0	0	0	0	0	0	0	0	0	0	11	0	0	0	9	0	20
5:30 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	11	0	14
5:35 PM	0	0	0	1	0	0	0	0	0	1	6	0	0	0	14	0	22
5:40 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	8	0	11
5:45 PM	0	1	0	1	0	1	0	0	0	0	2	0	0	0	13	0	18
5:50 PM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	10	0	17
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10
Count Total	0	12	0	19	0	10	0	6	1	2	250	5	0	6	496	0	807
Peak Hour	0	7	0	11	0	6	0	6	0	1	103	3	0	5	174	0	316

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

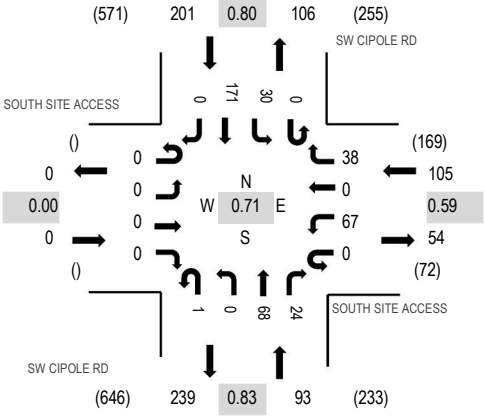
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
3:00 PM	0	2	0	1	3	3:00 PM	0	0	0	0	0	3:00 PM	0	0	0	0	0
3:05 PM	0	0	0	2	2	3:05 PM	0	0	0	0	0	3:05 PM	0	0	0	0	0
3:10 PM	0	2	0	0	2	3:10 PM	0	0	0	0	0	3:10 PM	0	0	0	0	0
3:15 PM	0	0	0	1	1	3:15 PM	0	0	0	0	0	3:15 PM	0	0	0	0	0
3:20 PM	0	0	1	2	3	3:20 PM	0	0	0	0	0	3:20 PM	0	0	0	0	0
3:25 PM	0	2	1	1	4	3:25 PM	0	0	0	0	0	3:25 PM	0	0	0	0	0
3:30 PM	0	2	0	0	2	3:30 PM	0	0	0	0	0	3:30 PM	0	0	0	0	0
3:35 PM	0	2	0	1	3	3:35 PM	0	0	0	0	0	3:35 PM	0	0	0	0	0
3:40 PM	0	1	0	0	1	3:40 PM	0	0	0	0	0	3:40 PM	0	0	0	0	0
3:45 PM	0	2	0	0	2	3:45 PM	0	0	0	0	0	3:45 PM	0	0	0	0	0
3:50 PM	0	0	0	1	1	3:50 PM	0	0	0	0	0	3:50 PM	0	0	0	0	0
3:55 PM	0	0	0	1	1	3:55 PM	0	0	0	0	0	3:55 PM	0	0	0	0	0
4:00 PM	0	0	0	2	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	1	0	1	2	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	2	0	0	2	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	1	0	1	2	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	1	0	0	1	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	2	1	1	4	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	2	0	0	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	1	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	2	0	1	3	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	1	1
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	1	0	0	1
4:50 PM	0	2	0	0	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	2	2	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	1	1	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	1	1	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	1	1	0	2	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	1	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	0	29	6	21	56	Count Total	0	0	0	0	0	Count Total	0	1	0	1	2
Peak Hour	0	13	2	10	25	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

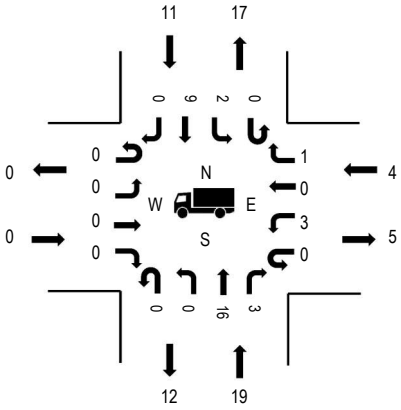
Location: 2 SW CIPOLE RD & SOUTH SITE ACCESS PM
Date: Tuesday, February 28, 2023
Peak Hour: 03:20 PM - 04:20 PM
Peak 15-Minutes: 03:30 PM - 03:45 PM

Peak Hour

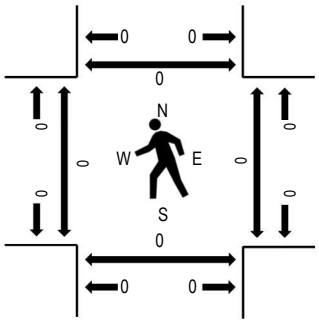
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	3.8%	0.59
NB	20.4%	0.83
SB	5.5%	0.80
All	8.5%	0.71

Traffic Counts - Motorized Vehicles

Interval Start Time	SOUTH SITE ACCESS Eastbound				SOUTH SITE ACCESS Westbound				SW CIPOLE RD Northbound				SW CIPOLE RD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
3:00 PM	0	0	0	0	0	4	0	2	0	0	6	1	0	0	12	0	25	363
3:05 PM	0	0	0	0	0	1	0	2	0	0	6	4	0	2	14	0	29	378
3:10 PM	0	0	0	0	0	4	0	0	0	0	4	4	0	2	12	0	26	383
3:15 PM	0	0	0	0	0	1	0	1	0	0	5	0	0	2	10	0	19	392
3:20 PM	0	0	0	0	0	1	0	1	0	0	5	4	0	5	12	0	28	399
3:25 PM	0	0	0	0	0	2	0	0	0	0	6	2	0	4	12	0	26	394
3:30 PM	0	0	0	0	0	12	0	13	0	0	5	5	0	3	26	0	64	392
3:35 PM	0	0	0	0	0	10	0	3	1	0	7	2	0	2	21	0	46	347
3:40 PM	0	0	0	0	0	5	0	1	0	0	6	4	0	3	11	0	30	340
3:45 PM	0	0	0	0	0	2	0	0	0	0	7	1	0	3	9	0	22	335
3:50 PM	0	0	0	0	0	0	0	1	0	0	7	2	0	2	14	0	26	334
3:55 PM	0	0	0	0	0	1	0	2	0	0	6	0	0	2	11	0	22	328
4:00 PM	0	0	0	0	0	14	0	5	0	0	6	1	0	1	13	0	40	329
4:05 PM	0	0	0	0	0	11	0	3	0	0	5	0	0	2	13	0	34	325
4:10 PM	0	0	0	0	0	7	0	7	0	0	3	2	0	3	13	0	35	325
4:15 PM	0	0	0	0	0	2	0	2	0	0	5	1	0	0	16	0	26	321
4:20 PM	0	0	0	0	0	2	0	2	0	0	5	1	0	0	13	0	23	320
4:25 PM	0	0	0	0	0	4	0	1	0	0	9	0	0	0	10	0	24	324
4:30 PM	0	0	0	0	0	3	0	0	0	0	6	0	0	0	10	0	19	322
4:35 PM	0	0	0	0	0	1	0	0	0	0	14	0	0	0	24	0	39	324
4:40 PM	0	0	0	0	0	1	0	1	0	0	5	0	0	0	18	0	25	312
4:45 PM	0	0	0	0	0	1	0	0	0	0	7	0	0	0	13	0	21	302
4:50 PM	0	0	0	0	0	2	0	1	0	0	4	1	0	0	12	0	20	299
4:55 PM	0	0	0	0	0	2	0	0	0	0	4	0	0	0	17	0	23	291
5:00 PM	0	0	0	0	0	11	0	2	0	0	6	0	0	1	16	0	36	281
5:05 PM	0	0	0	0	0	1	0	3	0	0	5	0	0	0	25	0	34	
5:10 PM	0	0	0	0	0	2	0	1	0	0	3	0	0	0	25	0	31	
5:15 PM	0	0	0	0	0	0	0	1	0	0	8	0	0	0	16	0	25	

5:20 PM	0	0	0	0	0	0	0	1	0	0	5	0	0	0	21	0	27
5:25 PM	0	0	0	0	0	2	0	0	0	0	9	0	0	0	11	0	22
5:30 PM	0	0	0	0	0	1	0	2	0	0	2	0	0	0	16	0	21
5:35 PM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	20	0	27
5:40 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	11	0	15
5:45 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	16	0	18
5:50 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	8	0	12
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	13
Count Total	0	0	0	0	0	111	0	58	1	0	197	35	0	37	534	0	973
Peak Hour	0	0	0	0	0	67	0	38	1	0	68	24	0	30	171	0	399

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

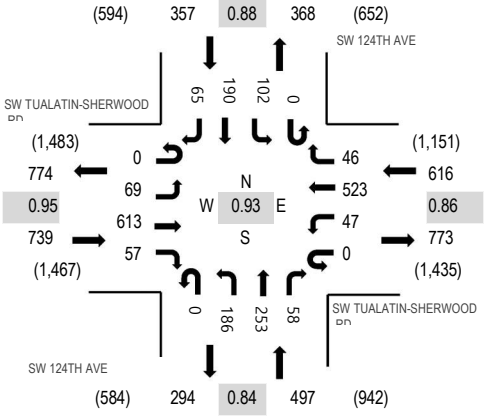
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
3:00 PM	0	3	1	1	5	3:00 PM	0	0	0	0	0	3:00 PM	0	0	0	0	0
3:05 PM	0	0	0	1	1	3:05 PM	0	0	0	0	0	3:05 PM	0	0	0	0	0
3:10 PM	0	0	0	0	0	3:10 PM	0	0	0	0	0	3:10 PM	0	0	0	0	0
3:15 PM	0	0	0	1	1	3:15 PM	0	0	0	0	0	3:15 PM	0	0	0	0	0
3:20 PM	0	2	0	3	5	3:20 PM	0	0	0	0	0	3:20 PM	0	0	0	0	0
3:25 PM	0	2	0	2	4	3:25 PM	0	0	0	0	0	3:25 PM	0	0	0	0	0
3:30 PM	0	4	0	1	5	3:30 PM	0	0	0	0	0	3:30 PM	0	0	0	0	0
3:35 PM	0	1	1	0	2	3:35 PM	0	0	0	0	0	3:35 PM	0	0	0	0	0
3:40 PM	0	3	1	0	4	3:40 PM	0	0	0	0	0	3:40 PM	0	0	0	0	0
3:45 PM	0	3	0	1	4	3:45 PM	0	0	0	0	0	3:45 PM	0	0	0	0	0
3:50 PM	0	1	0	1	2	3:50 PM	0	0	0	0	0	3:50 PM	0	0	0	0	0
3:55 PM	0	0	0	0	0	3:55 PM	0	0	0	0	0	3:55 PM	0	0	0	0	0
4:00 PM	0	0	0	1	1	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	1	0	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	1	2	1	4	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	1	0	1	2	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	2	0	0	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	3	2	1	6	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	2	0	1	3	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	1	0	1	2	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	2	0	1	3	4:40 PM	0	0	0	0	0	4:40 PM	1	0	0	0	1
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	2	0	0	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	1	1	2	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	1	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	1	0	1	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	1	0	0	0	1
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	4	0	0	0	4
5:25 PM	0	1	0	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	1	0	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	1	1	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	0	40	8	21	69	Count Total	0	0	0	0	0	Count Total	6	0	0	0	6
Peak Hour	0	19	4	11	34	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

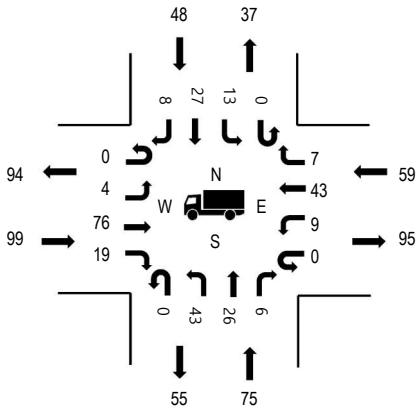
Location: 1 SW 124TH AVE & SW TUALATIN-SHERWOOD RD AM
Date: Tuesday, May 9, 2023
Peak Hour: 07:10 AM - 08:10 AM
Peak 15-Minutes: 07:40 AM - 07:55 AM

Peak Hour

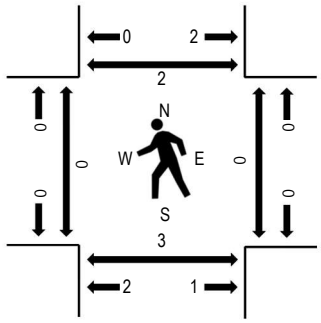
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	13.4%	0.95
WB	9.6%	0.86
NB	15.1%	0.84
SB	13.4%	0.88
All	12.7%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	SW TUALATIN-SHERWOOD RD Eastbound				SW TUALATIN-SHERWOOD RD Westbound				SW 124TH AVE Northbound				SW 124TH AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
6:15 AM	0	7	42	8	0	3	24	7	0	17	6	2	0	3	10	4	133	1,965
6:20 AM	0	5	33	13	0	4	42	1	0	16	11	6	0	3	9	4	147	2,009
6:25 AM	0	4	48	7	0	2	24	3	0	22	13	1	0	3	6	4	137	2,021
6:30 AM	0	3	49	16	0	3	37	0	0	13	11	3	0	2	14	2	153	2,085
6:35 AM	0	5	42	11	0	1	47	2	0	9	15	2	0	5	12	1	152	2,119
6:40 AM	0	4	55	13	0	1	40	4	0	20	20	2	0	3	19	8	189	2,151
6:45 AM	0	4	63	8	0	6	48	0	0	33	17	6	0	9	5	6	205	2,152
6:50 AM	0	3	40	9	0	5	43	1	0	19	24	6	0	5	14	2	171	2,149
6:55 AM	0	7	64	10	0	2	49	2	0	6	15	3	0	6	11	4	179	2,177
7:00 AM	0	5	53	3	0	3	26	4	0	20	23	7	0	7	13	0	164	2,171
7:05 AM	0	7	47	7	0	3	48	4	0	14	10	9	0	4	5	1	159	2,187
7:10 AM	0	11	47	6	0	5	46	3	0	16	16	3	0	5	14	4	176	2,209
7:15 AM	0	7	61	3	0	1	42	3	0	16	11	7	0	10	11	5	177	2,189
7:20 AM	0	7	46	7	0	4	33	0	0	13	28	4	0	4	12	1	159	
7:25 AM	0	7	54	3	0	6	61	1	0	16	12	7	0	10	15	9	201	
7:30 AM	0	3	49	9	0	1	54	1	0	11	22	5	0	6	15	11	187	
7:35 AM	0	4	56	6	0	4	43	8	0	16	18	3	0	8	12	6	184	
7:40 AM	0	4	48	3	0	8	36	6	0	14	30	5	0	7	24	5	190	
7:45 AM	0	2	58	3	0	1	58	2	0	21	17	6	0	12	15	7	202	
7:50 AM	0	10	51	1	0	4	36	6	0	19	33	5	0	5	23	6	199	
7:55 AM	0	2	55	6	0	1	35	6	0	15	18	3	0	14	13	5	173	
8:00 AM	0	5	46	8	0	2	40	5	0	13	26	6	0	12	15	2	180	
8:05 AM	0	7	42	2	0	10	39	5	0	16	22	4	0	9	21	4	181	
8:10 AM	0	8	22	3	0	5	39	2	0	14	27	3	0	4	26	3	156	
Count Total	0	131	1,171	165	0	85	990	76	0	389	445	108	0	156	334	104	4,154	
Peak Hour	0	69	613	57	0	47	523	46	0	186	253	58	0	102	190	65	2,209	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

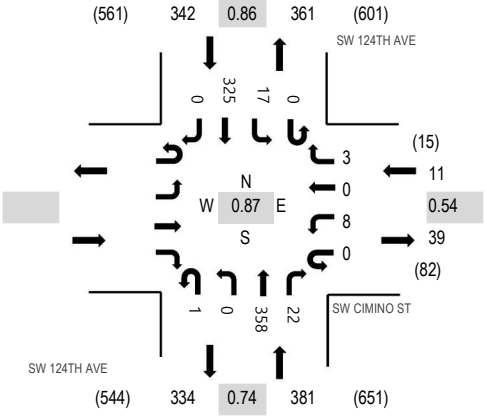
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
6:15 AM	4	3	2	0	9	6:15 AM	0	0	0	0	0	6:15 AM	0	0	0	0	0
6:20 AM	5	4	6	4	19	6:20 AM	0	0	0	0	0	6:20 AM	0	0	0	1	1
6:25 AM	10	3	3	0	16	6:25 AM	0	0	0	0	0	6:25 AM	0	0	0	0	0
6:30 AM	3	2	4	2	11	6:30 AM	0	0	0	0	0	6:30 AM	0	0	0	0	0
6:35 AM	8	6	3	5	22	6:35 AM	0	0	0	0	0	6:35 AM	0	0	0	0	0
6:40 AM	6	2	1	2	11	6:40 AM	0	0	0	0	0	6:40 AM	0	0	0	0	0
6:45 AM	6	5	7	1	19	6:45 AM	0	0	0	0	0	6:45 AM	0	0	0	0	0
6:50 AM	7	7	5	2	21	6:50 AM	0	0	0	0	0	6:50 AM	0	0	0	0	0
6:55 AM	12	2	5	6	25	6:55 AM	0	0	0	0	0	6:55 AM	0	0	0	0	0
7:00 AM	8	8	7	5	28	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	6	6	7	0	19	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	12	10	5	5	32	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	8	11	7	3	29	7:15 AM	0	0	0	0	0	7:15 AM	0	2	0	0	2
7:20 AM	8	10	6	2	26	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	1	1
7:25 AM	5	4	7	5	21	7:25 AM	0	0	0	0	0	7:25 AM	0	1	0	1	2
7:30 AM	8	5	4	6	23	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	11	9	4	4	28	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	6	6	3	5	20	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	10	4	6	1	21	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	5	7	6	7	25	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	9	1	3	6	19	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	7	5	1	1	14	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	10	3	7	3	23	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	10	8	2	1	21	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
Count Total	184	131	111	76	502	Count Total	0	0	0	0	0	Count Total	0	3	0	3	6
Peak Hour	99	75	59	48	281	Peak Hour	0	0	0	0	0	Peak Hour	0	3	0	2	5

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

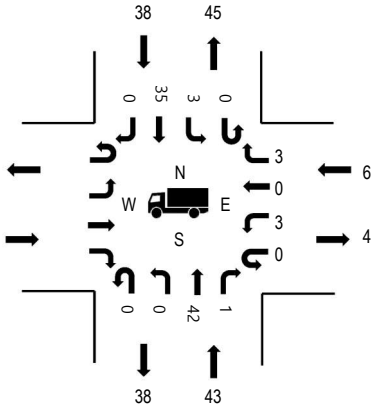
Location: 2 SW 124TH AVE & SW CIMINO ST AM
Date: Wednesday, May 10, 2023
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:50 AM - 08:05 AM

Peak Hour

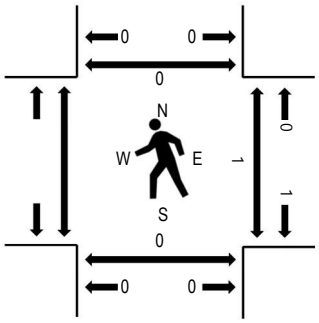
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB		
WB	54.5%	0.54
NB	11.3%	0.74
SB	11.1%	0.86
All	11.9%	0.87

Traffic Counts - Motorized Vehicles

Interval Start Time	Eastbound				SW CIMINO ST Westbound				SW 124TH AVE Northbound				SW 124TH AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
6:15 AM					0	0	0	0	0	0	21	2	0	0	14	0	37	493
6:20 AM					0	0	0	0	0	0	20	2	0	1	11	0	34	509
6:25 AM					0	0	0	0	0	0	15	0	0	0	13	0	28	525
6:30 AM					0	0	0	0	0	0	12	1	0	0	15	0	28	549
6:35 AM					0	0	0	0	0	0	23	5	0	0	26	0	54	573
6:40 AM					0	0	0	0	0	0	16	3	0	2	14	0	35	591
6:45 AM					0	0	0	0	0	0	27	3	0	2	22	0	54	628
6:50 AM					0	1	0	0	0	0	34	4	0	3	20	0	62	629
6:55 AM					0	0	0	0	0	0	17	2	0	1	24	0	44	643
7:00 AM					0	0	0	0	0	0	18	4	0	2	15	0	39	666
7:05 AM					0	2	0	0	0	0	19	2	0	0	16	0	39	696
7:10 AM					0	1	0	0	0	0	18	2	0	2	16	0	39	710
7:15 AM					0	0	0	1	0	0	16	3	0	1	32	0	53	734
7:20 AM					0	0	0	0	0	0	25	3	0	0	22	0	50	
7:25 AM					0	0	0	0	0	0	19	2	0	1	30	0	52	
7:30 AM					0	0	0	0	0	0	27	2	0	1	22	0	52	
7:35 AM					0	1	0	0	0	0	29	2	0	3	37	0	72	
7:40 AM					0	2	0	0	1	0	34	2	0	3	30	0	72	
7:45 AM					0	1	0	2	0	0	24	2	0	0	26	0	55	
7:50 AM					0	0	0	0	0	0	39	0	0	3	34	0	76	
7:55 AM					0	2	0	0	0	0	41	1	0	2	21	0	67	
8:00 AM					0	1	0	0	0	0	44	3	0	2	19	0	69	
8:05 AM					0	1	0	0	0	0	25	1	0	1	25	0	53	
8:10 AM					0	0	0	0	0	0	35	1	0	0	27	0	63	
Count Total					0	12	0	3	1	0	598	52	0	30	531	0	1,227	
Peak Hour					0	8	0	3	1	0	358	22	0	17	325	0	734	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

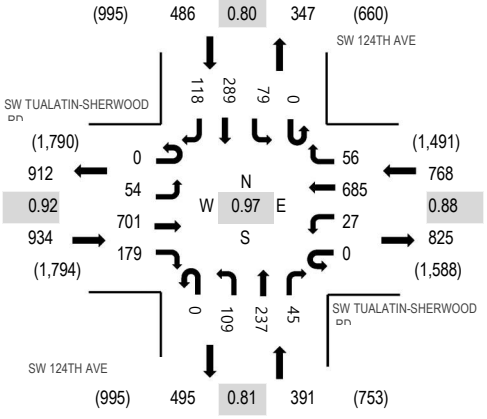
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
6:15 AM		5	0	2	7	6:15 AM		0	0	0	0	6:15 AM		0	0	0	0
6:20 AM		4	0	1	5	6:20 AM		0	0	0	0	6:20 AM		0	0	0	0
6:25 AM		0	0	1	1	6:25 AM		0	0	0	0	6:25 AM		0	0	0	0
6:30 AM		1	0	1	2	6:30 AM		0	0	0	0	6:30 AM		0	0	0	0
6:35 AM		0	0	1	1	6:35 AM		0	0	0	0	6:35 AM		0	0	0	0
6:40 AM		2	0	1	3	6:40 AM		0	0	0	0	6:40 AM		0	0	0	0
6:45 AM		1	0	1	2	6:45 AM		0	0	0	0	6:45 AM		0	0	0	0
6:50 AM		3	0	1	4	6:50 AM		0	0	0	0	6:50 AM		0	0	0	0
6:55 AM		4	0	3	7	6:55 AM		0	0	0	0	6:55 AM		0	0	0	0
7:00 AM		0	0	2	2	7:00 AM		0	0	0	0	7:00 AM		0	0	0	0
7:05 AM		1	1	3	5	7:05 AM		0	0	0	0	7:05 AM		0	0	0	0
7:10 AM		6	0	3	9	7:10 AM		0	0	0	0	7:10 AM		0	0	0	0
7:15 AM		2	1	4	7	7:15 AM		0	0	0	0	7:15 AM		0	0	0	0
7:20 AM		5	0	2	7	7:20 AM		0	0	0	0	7:20 AM		0	0	0	0
7:25 AM		5	0	5	10	7:25 AM		0	0	0	0	7:25 AM		0	0	0	0
7:30 AM		5	0	2	7	7:30 AM		0	0	0	0	7:30 AM		0	0	0	0
7:35 AM		3	1	4	8	7:35 AM		0	0	0	0	7:35 AM		0	0	0	0
7:40 AM		6	0	1	7	7:40 AM		0	0	0	0	7:40 AM		0	0	0	0
7:45 AM		1	2	2	5	7:45 AM		0	0	0	0	7:45 AM		0	1	0	1
7:50 AM		1	0	9	10	7:50 AM		0	0	0	0	7:50 AM		0	1	0	1
7:55 AM		2	1	3	6	7:55 AM		0	0	0	0	7:55 AM		0	0	0	0
8:00 AM		4	1	2	7	8:00 AM		0	0	0	0	8:00 AM		0	0	0	0
8:05 AM		2	0	1	3	8:05 AM		0	0	0	0	8:05 AM		0	1	0	1
8:10 AM		7	0	3	10	8:10 AM		1	0	0	1	8:10 AM		0	0	0	0
Count Total		70	7	58	135	Count Total		1	0	0	1	Count Total		0	3	0	3
Peak Hour		43	6	38	87	Peak Hour		1	0	0	1	Peak Hour		0	3	0	3

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

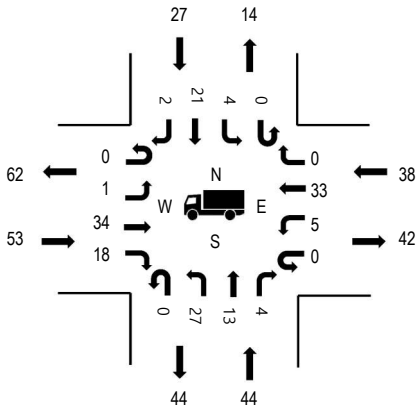
Location: 1 SW 124TH AVE & SW TUALATIN-SHERWOOD RD PM
Date: Tuesday, May 9, 2023
Peak Hour: 03:35 PM - 04:35 PM
Peak 15-Minutes: 04:10 PM - 04:25 PM

Peak Hour

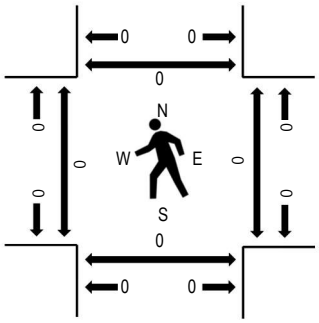
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	5.7%	0.92
WB	4.9%	0.88
NB	11.3%	0.81
SB	5.6%	0.80
All	6.3%	0.97

Traffic Counts - Motorized Vehicles

Interval Start Time	SW TUALATIN-SHERWOOD RD Eastbound				SW TUALATIN-SHERWOOD RD Westbound				SW 124TH AVE Northbound				SW 124TH AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
3:00 PM	0	3	51	13	0	2	69	5	0	10	10	4	0	6	19	4	196	2,503
3:05 PM	0	9	47	16	0	2	53	2	0	13	25	10	0	9	27	12	225	2,534
3:10 PM	0	10	48	14	0	4	54	5	0	9	23	7	0	7	25	10	216	2,517
3:15 PM	0	5	53	18	0	2	65	5	0	10	11	2	0	9	17	8	205	2,527
3:20 PM	0	7	43	15	0	0	46	4	0	8	14	6	0	14	30	10	197	2,536
3:25 PM	0	2	52	8	0	2	51	3	0	14	12	6	0	9	24	11	194	2,567
3:30 PM	0	4	43	26	0	0	38	9	0	8	15	1	0	10	39	17	210	2,576
3:35 PM	0	6	51	19	0	0	54	8	0	7	12	5	0	13	28	10	213	2,579
3:40 PM	0	2	64	8	0	2	57	3	0	6	18	5	0	7	28	13	213	2,558
3:45 PM	0	8	68	14	0	3	67	2	0	7	17	2	0	7	18	6	219	2,552
3:50 PM	0	3	52	17	0	5	53	6	0	12	17	2	0	5	22	3	197	2,536
3:55 PM	0	5	58	9	0	0	54	2	0	8	35	4	0	4	30	9	218	2,537
4:00 PM	0	4	53	22	0	2	56	7	0	18	17	8	0	10	22	8	227	2,530
4:05 PM	0	6	63	15	0	1	52	3	0	14	17	2	0	6	23	6	208	
4:10 PM	0	0	51	17	0	2	62	6	0	4	34	3	0	5	28	14	226	
4:15 PM	0	4	71	15	0	4	60	6	0	14	7	0	0	7	19	7	214	
4:20 PM	0	5	71	13	0	1	71	7	0	4	19	4	0	4	22	7	228	
4:25 PM	0	5	60	12	0	3	52	4	0	7	18	4	0	1	22	15	203	
4:30 PM	0	6	39	18	0	4	47	2	0	8	26	6	0	10	27	20	213	
4:35 PM	0	3	51	14	0	3	61	4	0	6	16	4	0	5	19	6	192	
4:40 PM	0	10	58	14	0	1	36	6	0	6	20	6	0	5	27	18	207	
4:45 PM	0	2	60	8	0	1	65	4	0	4	18	4	0	5	24	8	203	
4:50 PM	0	7	52	13	0	5	59	2	0	11	16	6	0	5	17	5	198	
4:55 PM	0	5	56	20	0	2	53	0	0	9	17	1	0	8	29	11	211	
Count Total	0	121	1,315	358	0	51	1,335	105	0	217	434	102	0	171	586	238	5,033	
Peak Hour	0	54	701	179	0	27	685	56	0	109	237	45	0	79	289	118	2,579	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

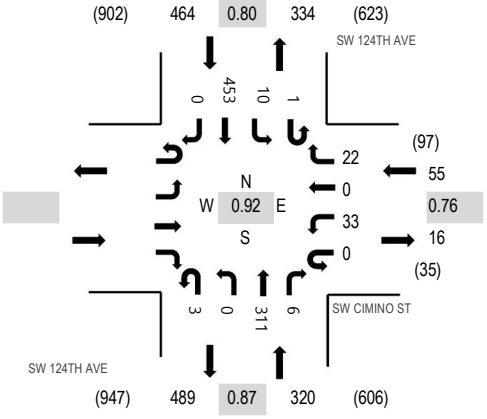
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
3:00 PM	8	2	7	2	19	3:00 PM	0	0	0	0	0	3:00 PM	0	1	0	0	1
3:05 PM	11	3	2	13	29	3:05 PM	0	0	0	0	0	3:05 PM	0	0	0	0	0
3:10 PM	6	4	6	5	21	3:10 PM	0	0	0	0	0	3:10 PM	0	0	0	0	0
3:15 PM	4	1	2	1	8	3:15 PM	0	0	0	0	0	3:15 PM	0	0	0	0	0
3:20 PM	13	7	4	1	25	3:20 PM	0	0	0	0	0	3:20 PM	0	0	0	0	0
3:25 PM	9	3	2	4	18	3:25 PM	0	0	0	0	0	3:25 PM	0	0	0	0	0
3:30 PM	5	8	3	3	19	3:30 PM	0	0	0	0	0	3:30 PM	0	0	0	0	0
3:35 PM	4	3	3	3	13	3:35 PM	0	0	0	0	0	3:35 PM	0	0	0	0	0
3:40 PM	1	4	3	3	11	3:40 PM	0	0	0	0	0	3:40 PM	0	0	0	0	0
3:45 PM	8	6	4	1	19	3:45 PM	0	0	0	0	0	3:45 PM	0	0	0	0	0
3:50 PM	8	7	6	3	24	3:50 PM	0	0	0	0	0	3:50 PM	0	0	0	0	0
3:55 PM	7	1	4	4	16	3:55 PM	0	0	0	0	0	3:55 PM	0	0	0	0	0
4:00 PM	4	4	4	5	17	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	4	5	1	1	11	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	1	3	1	3	8	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	4	2	3	1	10	4:15 PM	1	0	0	0	1	4:15 PM	0	0	0	0	0
4:20 PM	5	2	4	0	11	4:20 PM	1	0	0	0	1	4:20 PM	0	0	0	0	0
4:25 PM	4	5	3	1	13	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	3	2	2	2	9	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	4	2	4	0	10	4:35 PM	0	0	0	1	1	4:35 PM	0	0	0	0	0
4:40 PM	2	2	3	3	10	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	2	0	0	1	3	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	1	0	3	3	7	4:50 PM	1	0	0	0	1	4:50 PM	0	0	0	0	0
4:55 PM	3	2	1	2	8	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
Count Total	121	78	75	65	339	Count Total	3	0	0	1	4	Count Total	0	1	0	0	1
Peak Hour	53	44	38	27	162	Peak Hour	2	0	0	0	2	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

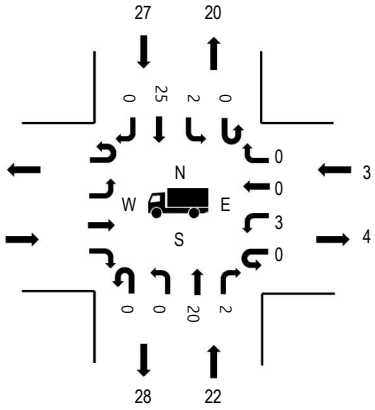
Location: 2 SW 124TH AVE & SW CIMINO ST PM
Date: Wednesday, May 10, 2023
Peak Hour: 03:25 PM - 04:25 PM
Peak 15-Minutes: 03:25 PM - 03:40 PM

Peak Hour

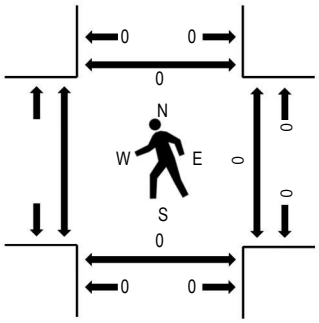
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

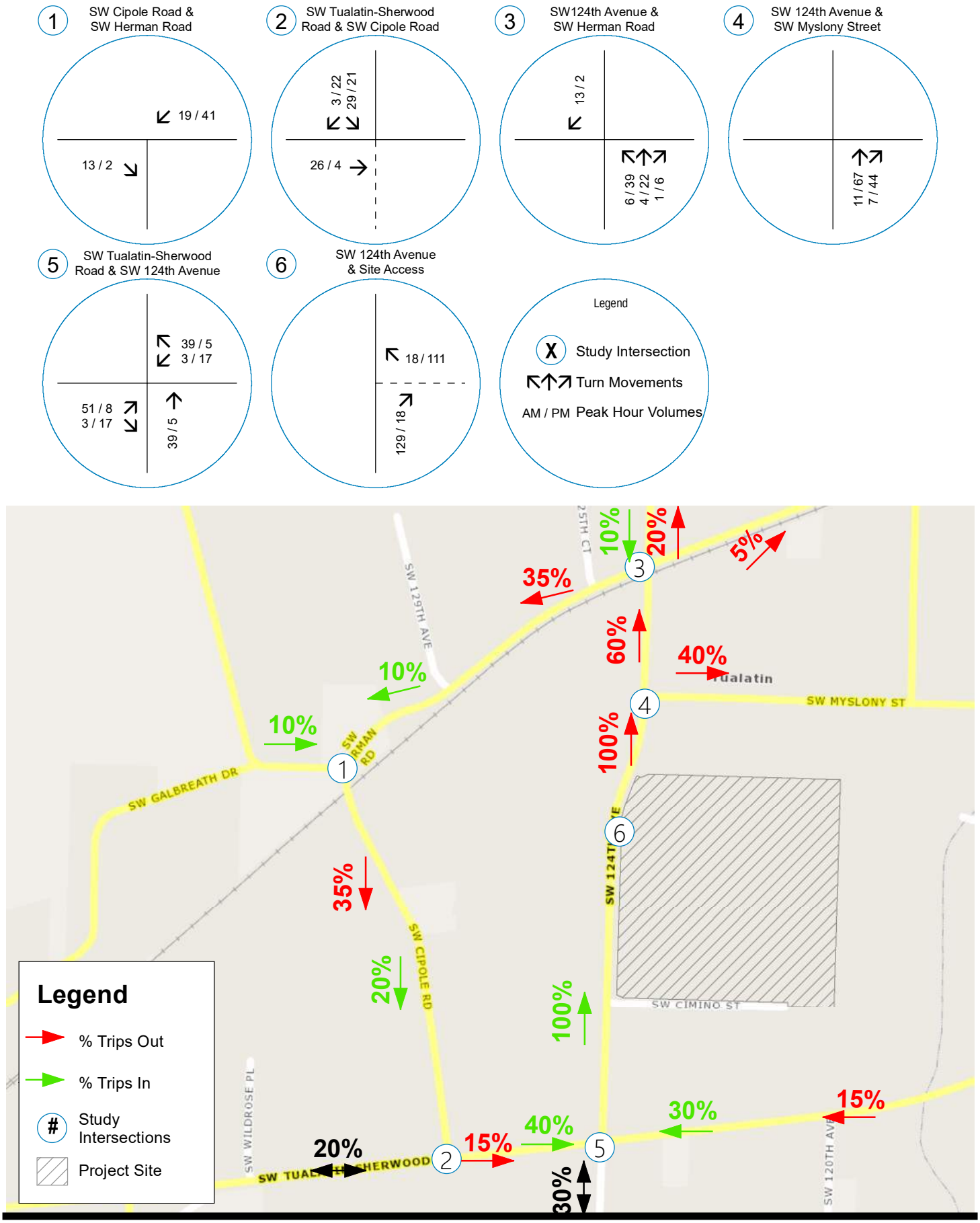
	HV%	PHF
EB		
WB	5.5%	0.76
NB	6.9%	0.87
SB	5.8%	0.80
All	6.2%	0.92

Traffic Counts - Motorized Vehicles

Interval Start Time	SW CIMINO ST Eastbound				SW CIMINO ST Westbound				SW 124TH AVE Northbound				SW 124TH AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
3:00 PM					0	1	0	0	0	0	21	1	0	0	27	0	50	800
3:05 PM					0	2	0	2	0	0	24	0	0	0	35	0	63	816
3:10 PM					0	2	0	1	0	0	19	3	0	1	43	0	69	832
3:15 PM					0	2	0	0	0	0	30	5	0	1	25	0	63	825
3:20 PM					0	0	0	1	0	0	13	0	0	1	42	0	57	830
3:25 PM					0	3	0	2	0	0	17	1	0	1	51	0	75	839
3:30 PM					0	2	0	2	1	0	16	2	0	0	50	0	73	828
3:35 PM					0	1	0	1	0	0	29	0	0	2	46	0	79	815
3:40 PM					0	3	0	1	0	0	24	0	0	2	42	0	72	814
3:45 PM					0	3	0	2	0	0	23	0	0	0	32	0	60	809
3:50 PM					0	4	0	1	0	0	23	1	0	2	44	0	75	805
3:55 PM					0	4	0	4	0	0	36	0	0	1	19	0	64	812
4:00 PM					0	1	0	3	0	0	32	0	0	0	30	0	66	805
4:05 PM					0	6	0	2	0	0	28	0	0	0	43	0	79	
4:10 PM					0	2	0	0	2	0	29	1	0	0	28	0	62	
4:15 PM					0	2	0	3	0	0	25	0	1	0	37	0	68	
4:20 PM					0	2	0	1	0	0	29	1	0	2	31	0	66	
4:25 PM					0	3	0	1	0	0	21	1	0	1	37	0	64	
4:30 PM					0	1	0	3	0	0	20	1	0	0	35	0	60	
4:35 PM					0	7	0	2	0	0	23	0	0	2	44	0	78	
4:40 PM					0	2	0	1	0	0	28	0	0	0	36	0	67	
4:45 PM					0	4	0	1	0	0	26	0	0	0	25	0	56	
4:50 PM					0	2	0	0	1	0	31	0	0	1	47	0	82	
4:55 PM					0	1	0	3	0	0	18	0	0	1	34	0	57	
Count Total					0	60	0	37	4	0	585	17	1	18	883	0	1,605	
Peak Hour					0	33	0	22	3	0	311	6	1	10	453	0	839	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
3:00 PM		0	0	0	0	3:00 PM		0	0	0	0	3:00 PM		0	1	0	1
3:05 PM		6	0	0	6	3:05 PM		0	0	0	0	3:05 PM		0	0	0	0
3:10 PM		2	0	2	4	3:10 PM		0	0	0	0	3:10 PM		0	0	0	0
3:15 PM		4	0	2	6	3:15 PM		0	0	0	0	3:15 PM		0	0	0	0
3:20 PM		0	0	2	2	3:20 PM		0	0	0	0	3:20 PM		0	1	0	1
3:25 PM		3	0	2	5	3:25 PM		0	0	0	0	3:25 PM		0	0	0	0
3:30 PM		0	1	2	3	3:30 PM		0	0	0	0	3:30 PM		0	0	0	0
3:35 PM		4	0	3	7	3:35 PM		0	0	0	0	3:35 PM		0	1	0	1
3:40 PM		1	1	5	7	3:40 PM		0	0	0	0	3:40 PM		0	0	0	0
3:45 PM		1	0	2	3	3:45 PM		0	0	0	0	3:45 PM		0	0	0	0
3:50 PM		5	0	4	9	3:50 PM		0	0	0	0	3:50 PM		0	0	0	0
3:55 PM		2	0	1	3	3:55 PM		0	0	0	0	3:55 PM		0	0	0	0
4:00 PM		0	0	0	0	4:00 PM		0	0	0	0	4:00 PM		0	0	0	0
4:05 PM		2	1	2	5	4:05 PM		0	0	0	0	4:05 PM		0	0	0	0
4:10 PM		1	0	2	3	4:10 PM		0	0	0	0	4:10 PM		0	0	0	0
4:15 PM		0	0	1	1	4:15 PM		0	0	0	0	4:15 PM		0	0	0	0
4:20 PM		3	0	3	6	4:20 PM		0	0	0	0	4:20 PM		0	0	0	0
4:25 PM		0	0	1	1	4:25 PM		0	0	0	0	4:25 PM		0	0	0	0
4:30 PM		0	0	0	0	4:30 PM		0	0	0	0	4:30 PM		0	0	0	0
4:35 PM		0	1	2	3	4:35 PM		0	0	0	0	4:35 PM		0	0	0	0
4:40 PM		1	0	1	2	4:40 PM		0	0	0	0	4:40 PM		0	0	0	0
4:45 PM		0	0	1	1	4:45 PM		0	0	0	0	4:45 PM		0	0	0	0
4:50 PM		3	0	1	4	4:50 PM		0	0	0	0	4:50 PM		0	0	0	0
4:55 PM		2	0	1	3	4:55 PM		0	0	0	0	4:55 PM		0	0	0	0
Count Total		40	4	40	84	Count Total		0	0	0	0	Count Total		0	3	0	3
Peak Hour		22	3	27	52	Peak Hour		0	0	0	0	Peak Hour		0	1	0	1

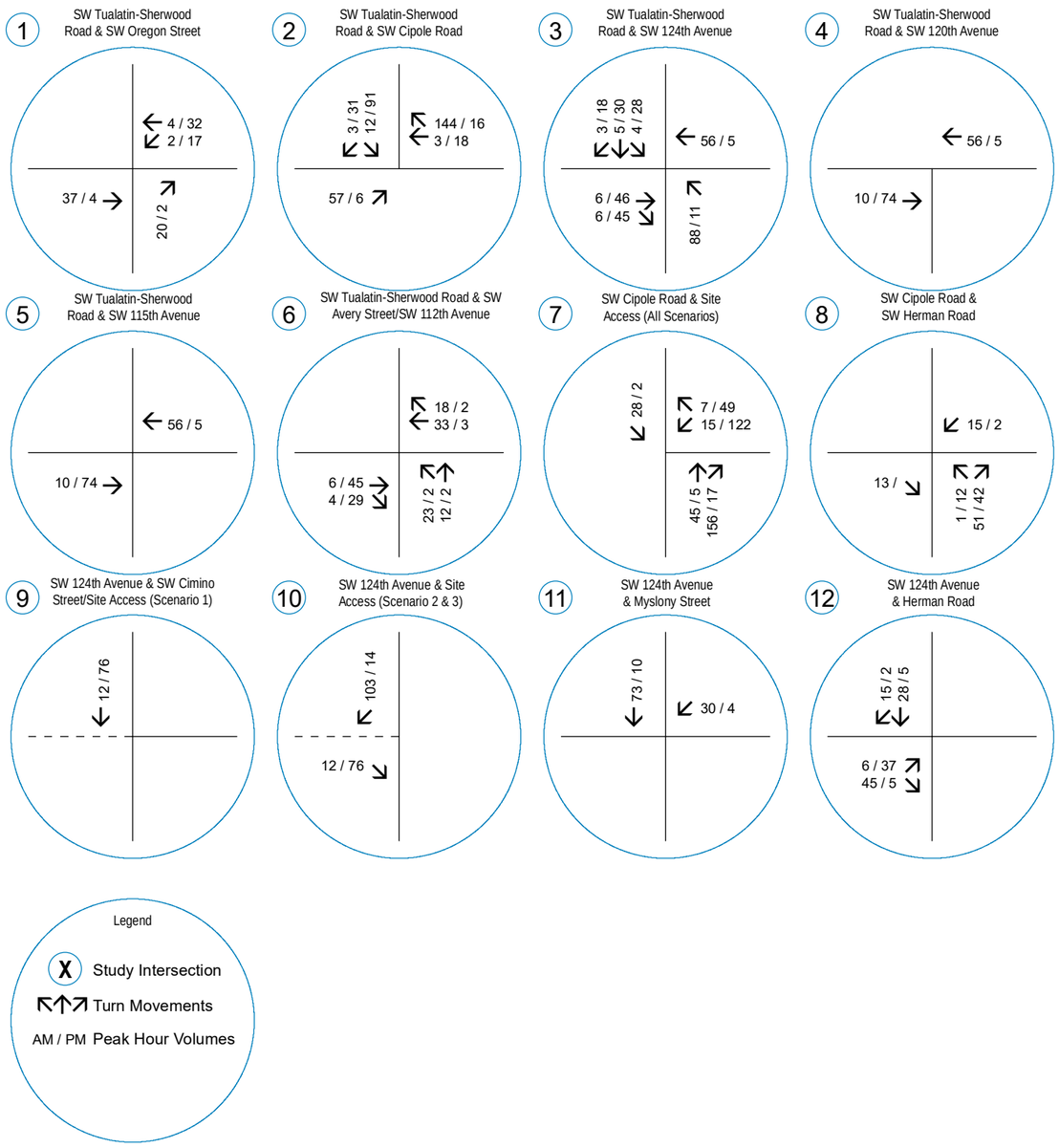


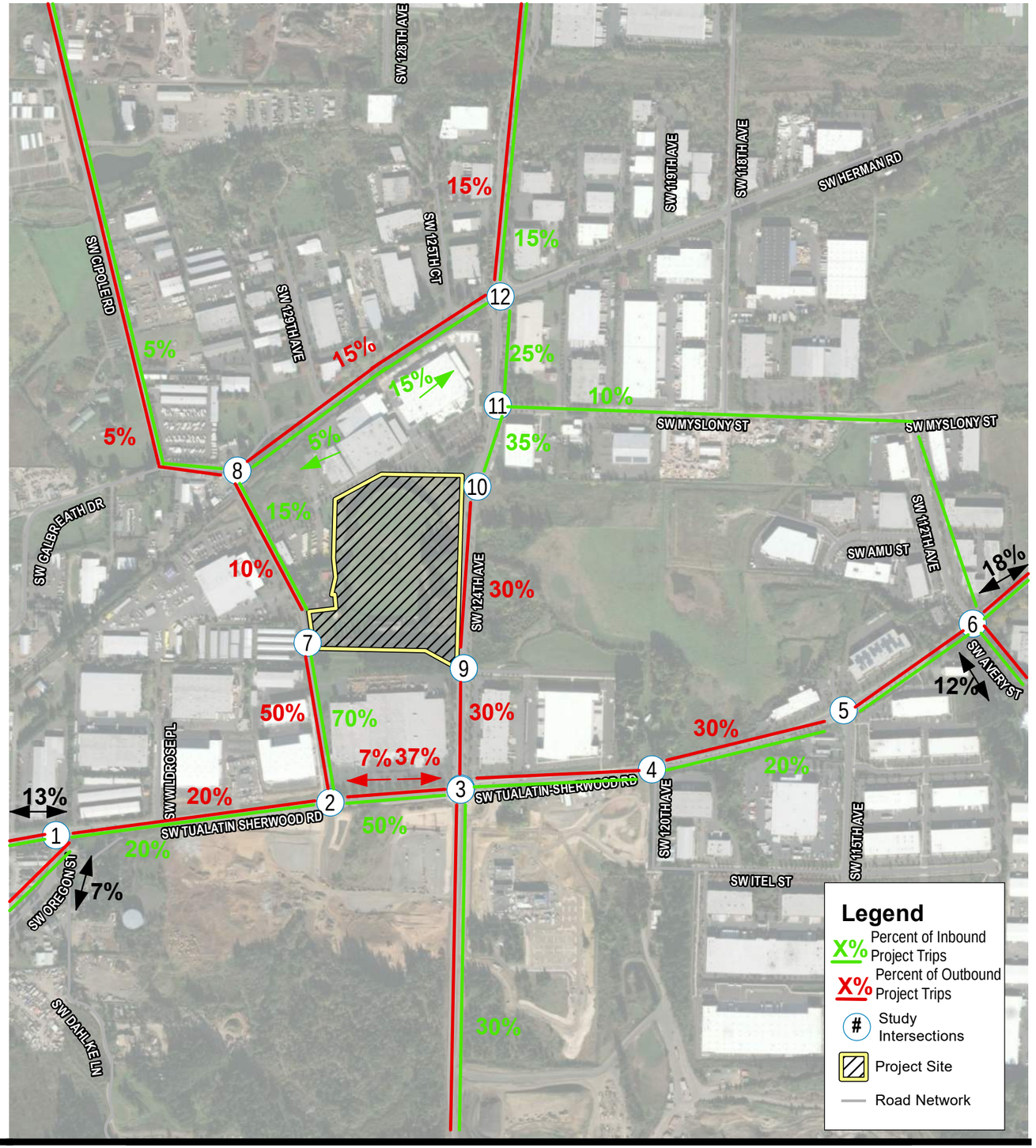
lancaster mobley

Traffic Volumes
Trip Distribution &
Assignment

NOT TO SCALE

Figure 3
124th Business Park TIA
7/25/2022





lancaster mobley

TRAFFIC VOLUMES
Trip Distribution & Assignment: Scenario 2
AM & PM Peak Hour

NOT TO SCALE

Figure 3
Tualatin Logistics Park TIA
12/6/2021

LEGEND

XX% *PERCENT OF PROJECT TRIPS*

TOTAL TRIP GENERATION			
	IN	OUT	TOTAL
AM	126	39	165
PM	54	125	179

AM PEAK HOUR

PM PEAK HOUR

No Scale

Figure 5

Hedges Creek Industrial

3/30/2022

SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Total Trips

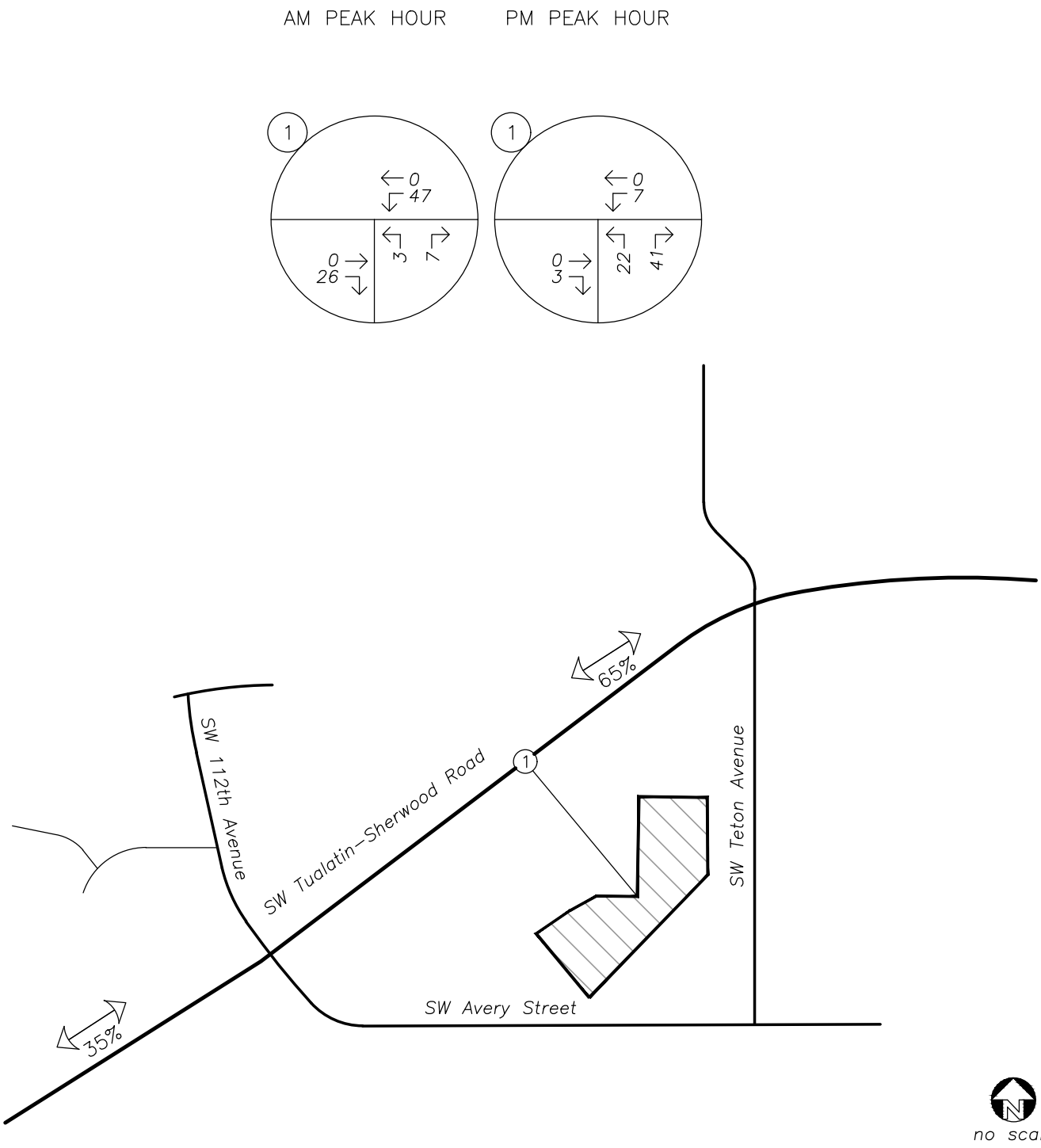
AM & PM Peak Hours

lancaster mobley

LEGEND

XX% PERCENT OF PROJECT TRIPS

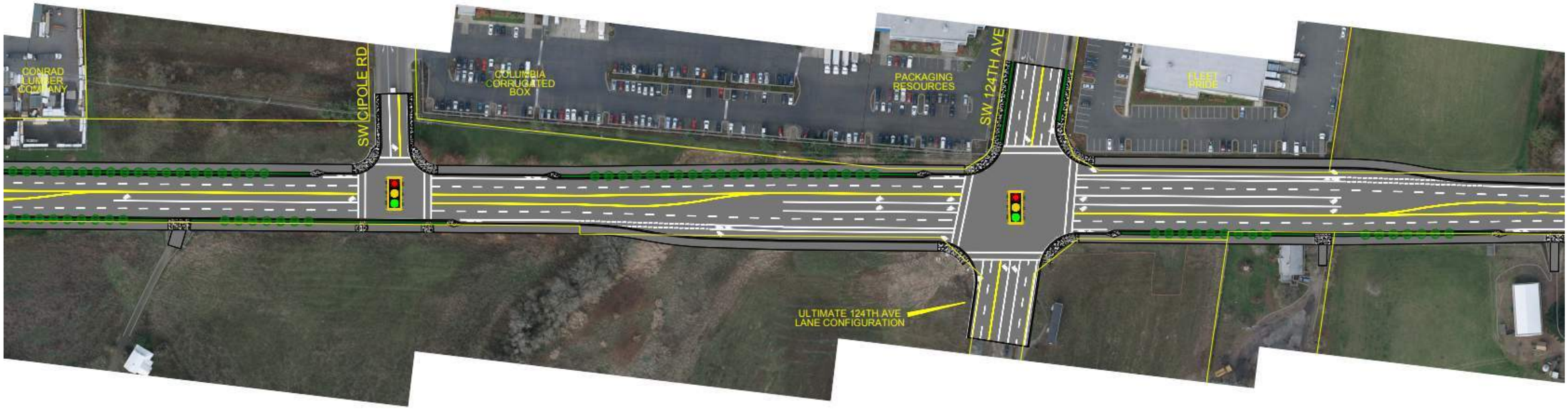
TRIP GENERATION			
	IN	OUT	TOTAL
AM	73	10	83
PM	10	63	73



SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM & PM Peak Hours

Figure 3
Avery I & II
2/8/2022



TUALATIN-SHERWOOD ROAD
LANGER FARMS PKWY TO TETON AVE

PIRELIMINARY - SUBJECT TO CHANGE

WASHINGTON COUNTY OREGON

DAVID EVANS AND ASSOCIATES INC.
2100 SW River Parkway
Portland Oregon 97201
Phone: 503.223.6663

N

Appendix C – Safety

Crash Reports

LTL Warrant Analysis

Signal Warrant Analysis

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at CIMINO ST, City of Tualatin, Washington County, 01/01/2016 to 12/31/2021

1 - 1 of 1 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R U G S	M J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
05345	N	N	N	N	N	N	08/31/2017	16	SW CIMINO ST	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										27
CITY							TH	0	SW 124TH AVE	N		STOP SIGN	N	DRY	REAR		N/A	N -S									000	00
N							3P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 22 17.75	-122 48 20.26																UNK				
																02	NONE 9	STOP										
																	N/A	N -S									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				

SW Cipole Road & Existing Southern Access

Crashes 2020
- Fatal
- Injury
- Property Damage Only

Crashes 2019
- Fatal
- Injury
- Property Damage Only

Crashes 2018
- Fatal
- Injury
- Property Damage Only

Crashes 2017
- Fatal
- Injury
- Property Damage Only

0 0.0175 0.035 0.07 mi

5/20/2023

Oregon Department of Transportation, Geographic Information Services Unit

Oregon Department of Transportation

CITY OF SHERWOOD, WASHINGTON COUNTY

CIPOLE RD and Intersectional Crashes at CIPOLE RD, City of Sherwood, Washington County, 01/01/2017 to 12/31/2021

14 - 17 of 17 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D / D E A L C / M R U G S / J I N V / S C H L / W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V# SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P# PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED / LOC	ERROR	ACT	EVENT	CAUSE
											02 NONE 9	STRGHT										
											N/A	E -W								000		00
											PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000		00
																	UNK					
05993	N N N N	09/27/2017	17	SW CIPOLE RD	ALLEY		N	N	CLR	ANGL-OTH	01 NONE 0	TURN-L										02
NONE		WE	175	SW TUALATIN-SHERWOOD	N	(NONE)	UNKNOWN	N	DRY	TURN	PRVTE	E -S								018		00
N		5P			07			N	DAY	INJ	PSNGR CAR		01 DRVR	INJC	26	F	OR-Y		028	000		02
N		45 22 10.6	-122 48 33.2			(02)											OR<25					
											02 NONE 0	STRGHT										
											PRVTE	S -N								000		00
											PSNGR CAR		01 DRVR	NONE	16	F	OR-Y		000	000		00
																	OR<25					
04375	N N N N	07/18/2017	17	SW CIPOLE RD	ALLEY		N	N	CLR	ANGL-OTH	01 NONE 9	TURN-L										02
NONE		TU	175	SW TUALATIN-SHERWOOD	N	(NONE)	UNKNOWN	N	DRY	TURN	N/A	E -S								018		00
N		5A			08			N	DAWN	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000		00
N		45 22 10.6	-122 48 33.2			(02)											UNK					
											02 NONE 9	TURN-L										
											N/A	N -E								019		00
											PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000		00
																	UNK					
03170	N N N N N N	05/31/2017	14	SW CIPOLE RD	STRGHT		N	N	CLR	S-1STOP	01 NONE 0	STRGHT									013	27,29
CITY		WE	300	SW TUALATIN-SHERWOOD	W	(NONE)	TRF SIGNAL	N	DRY	REAR	PRVTE	W -E								000		00
N		8A			08			N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	35	F	OR-Y		016,026	038		27,29
N		45 22 8.04	-122 48 37.32			(02)											OR<25					
											01 NONE 0	STRGHT										
											PRVTE	W -E								000		00
											PSNGR CAR		02 PSNG	NO<5	01	F			000	000		00
											02 NONE 0	STOP										
											PRVTE	W -E								011	013	00
											PSNGR CAR		01 DRVR	INJC	32	M	OR-Y		000	000		00
																	OR<25					
											03 NONE 0	STOP										
											PRVTE	W -E								022		00
											PSNGR CAR		01 DRVR	INJC	33	F	OR-Y		000	000		00
																	OR<25					

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at TUALATIN-SHERWOOD, City of Tualatin, Washington County, 01/01/2016 to 12/31/2021

1 - 4 of 52 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G N	J	S I H V	C	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02547	N	N	N	N				05/21/2018	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 1	STRGHT											27,29
CITY								MO	0	SW 124TH AVE	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S									000		00
N								8A			06	0		N	DAY	INJ		SEMI TOW		01	DRVR	NONE	49	M	OTH-Y		016,026	038		27,29
N								45 22 9.72	-122 48 20.29																N-RES					
																	02	NONE 0	STOP											
																		PRVTE	N -S									012		00
																		PSNGR CAR		01	DRVR	INJC	65	F	OR-Y		000	000		00
																									OR<25					
00625	N	N	N	N	N	N	N	02/06/2019	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 1	TURN-L											27,29
CITY								WE	0	SW 124TH AVE	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -E									000		00
N								11A			06	0		N	DAY	INJ		SEMI TOW		01	DRVR	NONE	31	M	OTH-Y		016,026	038		27,29
N								45 22 9.72	-122 48 20.29																N-RES					
																	02	NONE 0	STOP											
																		PRVTE	N -S									011		00
																		PSNGR CAR		01	DRVR	INJC	17	M	OR-Y		000	000		00
																									OR<25					
02851	N	N	N	N	N	N	N	08/06/2020	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										013	07,29
CITY								TH	0	SW 124TH AVE	N		TRF SIGNAL	N	DRY	REAR		N/A	N -S									000		00
N								5P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 22 9.72	-122 48 20.29																UNK					
																	02	NONE 9	STOP											
																		N/A	N -S									011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
03895	N	Y	N	N	N	N	N	10/25/2020	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
CITY								SU	0	SW 124TH AVE	N		TRF SIGNAL	N	DRY	REAR		N/A	N -S									000		00
N								12P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 22 9.73	-122 48 20.32																UNK					
																	02	NONE 9	STOP											
																		N/A	N -S									011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
04191	N	N	N	N	N	N	N	10/05/2021	16	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	07
CITY								TU	0	SW 124TH AVE	N		TRF SIGNAL	N	WET	REAR		PRVTE	N -S									000		00
N								3P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	42	M	OTH-Y		043,026	000		07
N								45 22 9.73	-122 48 20.32																OR<25					
																	02	NONE 0	STOP											
																		PRVTE	N -S									011	013	00
																		PSNGR CAR		01	DRVR	INJB	73	F	OR-Y		000	022		00
																									OR<25					

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at TUALATIN-SHERWOOD, City of Tualatin, Washington County, 01/01/2016 to 12/31/2021

5 - 10 of 52 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	S I H V	W C O R L K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																03	NONE 0 PRVTE PSNGR CAR	STOP N -S	01	DRVR	NONE	69	M	OR-Y OR<25		000	011 000		00 00
02692	N N N N						04/23/2016	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							SA	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		N/A	E -W									000		00
N N							12P 45 22 9.72	-122 48 20.29		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	STOP E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	011 000		00 00
03949	N N N N N N						06/16/2016	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	Y	CLD	FIX OBJ	01	NONE 9	TURN-L										040	08
CITY							TH	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	FIX		N/A	N -E									000		00
N N							6P 45 22 9.72	-122 48 20.29		05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
04777	N N N N N N						08/04/2017	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY							FR	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W									000		00
N N							3P 45 22 9.72	-122 48 20.29		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y OR<25		043	000		07
																02	NONE 0 PRVTE PSNGR CAR	STOP E -W	01	DRVR	INJC	37	F	OR-Y OR<25		000	011 000		00 00
07573	N N N N N N						11/28/2017	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										27,07
CITY							TU	0	SW 124TH AVE	E		TRF SIGNAL	N	WET	REAR		PRVTE	E -W									000		00
N N							5P 45 22 9.72	-122 48 20.29		06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	48	F	OR-Y OR<25		016,043	038		27,07
																02	NONE 0 PRVTE PSNGR CAR	STOP E -W	01	DRVR	NONE	29	M	OR-Y OR<25		000	011 000		00 00
03012	N N N N N N						05/23/2017	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										07
CITY							TU	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		N/A	E -W									000		00
N N							6P 45 22 9.72	-122 48 20.29		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	STOP E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	011 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	I H V	C L L	S W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
00173	N	N	N	N	N	N	N	01/10/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										013	07
CITY								TH	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W									000		00
N								6P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	48	F	OR-Y		043	000		07
N								45 22 9.72	-122 48 20.29																OR>25					
																	02	NONE 0	STOP											
																		PRVTE	E -W									011	013	00
																		PSNGR CAR		01	DRVR	INJC	67	F	OR-Y		000	000		00
																									OR<25					
																	03	NONE 0	STOP											
																		PRVTE	E -W									022		00
																		PSNGR CAR		01	DRVR	INJC	51	F	OR-Y		000	000		00
																									OR<25					
																	03	NONE 0	STOP											
																		PRVTE	E -W									022		00
																		PSNGR CAR		02	PSNG	INJC	08	M			000	000		00
																	04	NONE 0	STOP											
																		PRVTE	E -W									022		00
																		PSNGR CAR		01	DRVR	NONE	17	M	OR-Y		000	000		00
																									OR<25					
02816	N	N	N	N	N	N	N	06/05/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												27,29
CITY								WE	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W									000		00
N								2A			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OTH-Y		016,026	038		27,29
N								45 22 9.72	-122 48 20.29																OR<25					
																	02	NONE 0	STOP											
																		PRVTE	E -W									011		00
																		PSNGR CAR		01	DRVR	INJC	56	M	OR-Y		000	000		00
																									OR<25					
00333	N	N	N	N				01/18/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	RAIN	S-STRGHT	01	NONE 9	STRGHT												29
NONE								FR	0	SW 124TH AVE	E		TRF SIGNAL	N	WET	REAR		N/A	E -W									000		00
N								6P			06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 22 9.72	-122 48 20.29																UNK					
																	02	NONE 9	STRGHT											
																		N/A	E -W									006		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
00653	N	Y	N	N	N	N	N	02/09/2019	16	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT												29
CITY								SA	0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		N/A	E -W									000		00
N								1P			09	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 22 42.84	-122 48 17.93																UNK					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	S H V	W O R L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 9 N/A MTRCYCLE	STOP E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	011 000		00 00
01258	N	N	N	N	N	N	03/12/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT											27,29
CITY			TU					0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		N/A	E -W									000		00
N N			4P 45 22 9.72					-122 48 20.29		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	STOP E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	011 000		00 00
04350	N	N	N	N			11/24/2020	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE			TU					0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W									000		00
N N			10A 45 22 9.72					-122 48 20.29		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	36	F	OR-Y OR<25		042	000		29
																02	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	NONE	65	M	OR-Y OR<25		000	006 000		00 00
00204	N	N	N	N			01/17/2021	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											27,29
NONE			SU					0	SW 124TH AVE	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W									000		00
N N			6P 45 22 9.74					-122 48 20.29		06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	29	F	OR-Y OR>25		016,026	038		27,29
																02	NONE PRVTE PSNGR CAR	STOP E -W	01	DRVR	INJC	54	F	OR-Y OR<25		000	011 000		00 00
00314	N	N	N	N			01/27/2021	16	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29,07
NONE			WE					0	SW 124TH AVE	E		R-GRN-SIG	N	DRY	REAR		N/A	E -W									000		00
N N			11A 45 23 16.38					-122 48 15.27		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	STOP E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	012 000		00 00
04362	N	N	N	N	N	N	06/19/2019	16	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 9	STRGHT											07
CITY			WE					0	SW 124TH AVE	S		TRF SIGNAL	N	DRY	REAR		N/A	S -N									000		00
N N			6P 45 22 42.84					-122 48 17.93		06	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at TUALATIN-SHERWOOD, City of Tualatin, Washington County, 01/01/2016 to 12/31/2021

19 - 23 of 52 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	I H V	C O R L	W K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 9	STOP										
																		N/A	S -N									011	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
03535	N	N	N	N	N	N	N	05/31/2016	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY								TU	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E								000	00
N N								2P 45 22 9.72	-122 48 20.29		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	41	M	OR-Y OR<25		043	000	07
																	02	NONE 0	STOP										
																		PRVTE	W -E									011	00
																		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y OR<25		000	000	00
04658	N	N	N	N	N	N	N	07/15/2016	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY								FR	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E								000	00
N N								3P 45 22 9.72	-122 48 20.29		06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	50	F	OTH-Y OR<25		043	000	07
																	02	NONE 0	STOP										
																		PRVTE	W -E									011	00
																		PSNGR CAR		01	DRVR	NONE	40	F	OR-Y OR<25		000	000	00
01864	N	N	N	N	N	N	N	03/20/2016	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE 9	STRGHT										27,29
CITY								SU	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		N/A	W -E								000	00
N N								4P 45 22 9.72	-122 48 20.29		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
																	02	NONE 9	STOP										
																		N/A	W -E									011	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
05361	N	N	N	N				08/11/2016	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE								TH	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		N/A	W -E								000	00
N N								6P 45 22 9.72	-122 48 20.29		06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
																	02	NONE 9	STOP										
																		N/A	W -E									011	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
07665	N	N	N	N				11/08/2016	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										27,29
NO RPT								TU	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		N/A	E -W								000	00
N N								3P 45 22 9.72	-122 48 20.29		05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	I H V	C O R K	W	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 9	STOP										
																		N/A	E -W									011	00
																		SEMI TOW		01	DRVR	NONE	00	Unk	UNK		000	000	00
																									UNK				
00025	N	N	N	N	N	N	N	01/02/2017	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
CITY								MO	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E								000	00
N								5P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	79	M	OR-Y		026	000	29
N								45 22 9.72	-122 48 20.29																OR<25				
																	02	NONE 0	STOP										
																		PRVTE	W -E									011	00
																		PSNGR CAR		01	DRVR	INJC	30	F	OR-Y		000	000	00
																									OR<25				
																	02	NONE 0	STOP										
																		PRVTE	W -E									011	00
																		PSNGR CAR		02	PSNG	INJC	05	F			000	000	00
02204	N	N	N	N	N	N	N	04/18/2017	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY								TU	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E								000	00
N								6P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	18	F	OTH-Y		043	000	07
N								45 22 9.72	-122 48 20.29																OR<25				
																	02	NONE 0	STOP										
																		PRVTE	W -E									011	00
																		PSNGR CAR		01	DRVR	INJC	18	F	OR-Y		000	000	00
																									OR<25				
05685	N	N	N	N				09/15/2017	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 1	STRGHT										29
NONE								FR	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E								000	00
N								5P			06	0		N	DAY	INJ		SEMI TOW		01	DRVR	NONE	38	M	OR-Y		026	000	29
N								45 22 9.72	-122 48 20.29																OR<25				
																	02	NONE 0	STOP										
																		PRVTE	W -E									012	00
																		PSNGR CAR		01	DRVR	INJC	56	F	OR-Y		000	000	00
																									OR<25				
06563	N	N	N	N	N	N	N	10/19/2017	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
CITY								TH	0	SW 124TH AVE	W		TRF SIGNAL	N	WET	REAR		PRVTE	W -E								000	00
N								6P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	17	M	OR-Y		043	000	07
N								45 22 9.72	-122 48 20.29																OR<25				
																	02	NONE 0	STOP										
																		PRVTE	W -E									011	00
																		PSNGR CAR		01	DRVR	INJC	50	M	OR-Y		000	000	00
																									OR<25				

124TH AVE at TUALATIN-SHERWOOD, City of Tualatin, Washington County, 01/01/2016 to 12/31/2021

	S D M																					
SER#	P R J S W	DATE	CLASS	CITY STREET		INT-TYPE					SPCL USE											
INVEST	E A U I C O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE			A	S						
RD DPT	E L G N H R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED				
UNLOC?	D C S V L K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V# TYPE	TO	P# TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE
											02 NONE 0	STOP										
											PRVTE	W -E								011		00
											PSNGR CAR		02 PSNG	INJC	50	F			000	000		00
07889	N N N N	12/09/2017	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE 9	STRGHT										29
NONE		SA	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR	N/A	W -E								000		00
N		1P			06	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000		00
N		45 22 9.72	-122 48 20.29														UNK					
											02 NONE 9	STOP										
											N/A	W -E								011		00
											PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000		00
																	UNK					
03819	N N N N N N	07/29/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT									013	27,29
CITY		MO	0	SW 124TH AVE	W		UNKNOWN	N	DRY	REAR	PRVTE	E -W								000		00
N		9A			05	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	81	M	OR-Y		016,026	038		27,29
N		45 22 9.72	-122 48 20.29														OR<25					
											02 NONE 0	STOP										
											PRVTE	E -W								011	013	00
											PSNGR CAR		01 DRVR	INJC	64	M	OR-Y		000	000		00
																	OR<25					
											03 NONE 0	STOP										
											PRVTE	E -W								022		00
											PSNGR CAR		01 DRVR	NONE	37	F	OR-Y		000	000		00
																	OR<25					
04114	N N N N	08/13/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT										29
NONE		TU	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR	PRVTE	W -E								000		00
N		2A			06	0		N	DLIT	INJ	PSNGR CAR		01 DRVR	NONE	35	M	OR-Y		026	000		29
N		45 22 9.72	-122 48 20.29														OR<25					
											02 NONE 0	STOP										
											PRVTE	W -E								011		00
											PSNGR CAR		01 DRVR	INJC	59	M	OR-Y		000	000		00
																	OR<25					
82093	N N N N	06/23/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT										29
NONE		SU	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR	PRVTE	W -E								000		00
N		11A			06	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	62	F	OR-Y		026	000		29
N		45 22 9.71	-122 48 20.29														OR<25					
											02 NONE 0	STOP										
											PRVTE	W -E								011		00
											PSNGR CAR		01 DRVR	INJC	70	F	OR-Y		000	000		00
																	OR<25					

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at TUALATIN-SHERWOOD, City of Tualatin, Washington County, 01/01/2016 to 12/31/2021

33 - 37 of 52 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R J S W U G H R I N V L K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE TRLR QTY / TYPE / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
00771	N	N	N N	02/12/2019	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT											29
NONE				TU	0	SW 124TH AVE	W		TRF SIGNAL	N	WET	REAR		N/A	W -E									000		00
N				8A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 22 9.72	-122 48 20.29																UNK					
													02	NONE 9	STOP											
														N/A	W -E									011		00
														PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																					UNK					
83688	N	N	N N	10/21/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	ANIMAL	01	NONE 9	STRGHT										035	12
NONE				MO	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	OTH		N/A	E -W									000		00
N				5A			05	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 22 9.72	-122 48 20.27																UNK					
04439	N	N	N N	12/01/2020	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE				TU	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000		00
N				10A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	54	M	OR-Y		026	000		07
N				45 22 9.72	-122 48 20.29																OR<25					
													02	NONE 0	STOP											
														PRVTE	W -E									011		00
														PSNGR CAR		01	DRVR	INJC	42	M	OR-Y		000	000		00
																					OR<25					
83080	N	N	N N	11/03/2020	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE				TU	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000		00
N				1P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	66	F	OR-Y		026	000		29
N				45 22 9.75	-122 48 20.31																OR<25					
													02	NONE 0	STOP											
														PRVTE	W -E									011		00
														PSNGR CAR		01	DRVR	INJC	27	F	OR-Y		000	000		00
																					OR<25					
04555	N	N	N N N N	12/10/2020	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT											07
CITY				TH	0	SW 124TH AVE	W		TRF SIGNAL	N	WET	REAR		N/A	W -E									000		00
N				9P			06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 22 9.72	-122 48 20.29																UNK					
													02	NONE 9	STOP											
														N/A	W -E									011		00
														PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																					UNK					

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at TUALATIN-SHERWOOD, City of Tualatin, Washington County, 01/01/2016 to 12/31/2021

38 - 41 of 52 Crash records shown.

SER# INVEST RD DPT UNLOC?	S P E A U I C O / E L G N H R / D C S V L K (D M R J S W)	DATE DAY TIME LAT	CLASS DIST FROM LONG	CITY STREET FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V#	SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03889	N Y N N N N	10/25/2020	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	29
CITY		SU	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000		00
N		12P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	53	M	OR-Y		026	000		29
N		45 22 9.72	-122 48 20.29																OR<25					
											02	NONE 0	STOP											
												PRVTE	W -E									011	013	00
												PSNGR CAR		01	DRVR	INJC	68	M	OR-Y		000	000		00
																			OR>25					
											02	NONE 0	STOP											
												PRVTE	W -E									011	013	00
												PSNGR CAR		02	PSNG	INJC	60	F			000	000		00
											03	NONE 0	STOP											
												PRVTE	W -E									022		00
												PSNGR CAR		01	DRVR	INJC	55	F	OR-Y		000	000		00
																			OR>25					
04005	N N N N N N	09/24/2021	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											27,29
CITY		FR	0	SW 124TH AVE	W		TRF SIGNAL	N	DRY	REAR		N/A	W -E									000		00
N		9P			06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N		45 22 9.72	-122 48 20.29																UNK					
											02	NONE 9	STOP											
												N/A	W -E									011		00
												PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK					
06385	N N N N N N	09/21/2016	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLD	O-1 L-TURN	01	NONE 0	STRGHT											04
CITY		WE	0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E -W									000		00
N		8A			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	57	F	OR-Y		000	000		00
N		45 22 9.72	-122 48 20.29																OR<25					
											02	NONE 0	TURN-L											
												PRVTE	W -N									000		00
												PSNGR CAR		01	DRVR	NONE	23	F	OR-Y		020,004	000		04
																			OR<25					
00335	N N N N	01/18/2017	16	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	RAIN	O-1 L-TURN	01	NONE 0	STRGHT											04
NO RPT		WE	0	SW 124TH AVE	CN		TRF SIGNAL	N	WET	TURN		PRVTE	S -N									000		00
N		1P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	23	M	OR-Y		000	000		00
N		45 23 16.36	-122 48 15.23																OR<25					
											02	NONE 0	TURN-L											
												PRVTE	N -E									000		00
												PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		020	000		04
																			OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04434	N	N	N	N	N	N	07/21/2017	16	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											04
CITY			FR				0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN			PRVTE	N -S									000		00
N			3P							01	2		N	DAY	INJ			PSNGR CAR		01	DRVR	INJB	35	M	OR-Y		020	000		04
N			45 22 42.84				-122 48 17.93																		OR<25				
																02	NONE 0	TURN-L											
																	PRVTE	S -W									000		00
																	PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		000	000		00
																									OR<25				
01124	N	N	N	N	N	N	03/05/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										080	02
CITY			TU				0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN			PRVTE	S -N									000		00
N			7A							04	0		N	DAY	INJ			PSNGR CAR		01	DRVR	INJC	49	M	OR-Y		000	000		00
N			45 22 9.72				-122 48 20.29																		OR<25				
																02	NONE 0	TURN-L											
																	PRVTE	N -E									000		00
																	PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		028,004	000		02
																									OR<25				
																03	NONE 0	STOP											
																	PRVTE	E -W									022		00
																	PSNGR CAR		01	DRVR	NONE	40	M	OR-Y		000	000		00
																									OR<25				
02524	N	N	N	N	N	N	05/18/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	TURN-L											04
CITY			SA				0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN			PRVTE	W -N									000		00
N			3P							02	0		N	DAY	INJ			PSNGR CAR		01	DRVR	INJC	77	F	OR-Y		020	000		04
N			45 22 9.72				-122 48 20.29																		OR<25				
																02	NONE 0	STRGHT											
																	PRVTE	E -W									000		00
																	PSNGR CAR		01	DRVR	INJC	23	M	OR-Y		000	000		00
																									OR<25				
06869	N	N	N	N	N	N	12/23/2019	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	STRGHT											04
CITY			MO				0	SW 124TH AVE	CN		TRF SIGNAL	N	DRY	TURN			PRVTE	E -W									000		00
N			1P							02	0		N	DAY	INJ			PSNGR CAR		01	DRVR	INJC	22	F	OR-Y		000	000		00
N			45 22 9.72				-122 48 20.29																		OR<25				
																02	NONE 0	TURN-L											
																	PRVTE	W -N									000		00
																	PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		020	000		04
																									OR<25				
00382	N	N	N	N			01/17/2020	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	TURN-L										087	02
CITY			FR				0	SW 124TH AVE	CN		TRF SIGNAL	N	WET	TURN			PRVTE	W -N									000	087	00
N			4A							02	0		N	DLIT	INJ			PSNGR CAR		01	DRVR	INJB	25	F	OR-Y		028,004	000		02
N			45 22 9.72				-122 48 20.29																		OR<25				

CITY OF TUALATIN, WASHINGTON COUNTY

124TH AVE at TUALATIN-SHERWOOD, City of Tualatin, Washington County, 01/01/2016 to 12/31/2021

46 - 49 of 52 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	I H V	C O R L	W K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	INJA	58	F	OR-Y OR<25		000	000 000	087	00 00
02936	N	N	N	N	N	N	N	08/14/2020 CITY N N	14 FR 4P 45 22 9.72	SW TUALATIN-SHERWOOD SW 124TH AVE	INTER CN 01	CROSS 0	N TRF SIGNAL	N	CLR DRY DAY	O-1 L-TURN TURN INJ	01	NONE 0 PRVTE PSNGR CAR	TURN-L S -W	01	DRVR	INJC	51	F	OR-Y OR<25		028,004	000 000	087	02 00 02
									-122 48 20.29								02	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	01	DRVR	INJC	18	M	OR-Y OR<25		000	000 000	087	00 00
03941	N	N	N	N		Y		10/28/2020 CITY N N	14 WE 6A 45 22 9.72	SW TUALATIN-SHERWOOD SW 124TH AVE	INTER CN 01	CROSS 0	N TRF SIGNAL	N	FOG DRY DLIT	O-1 L-TURN TURN INJ	01	NONE 0 PRVTE PSNGR CAR	TURN-L S -W	01	DRVR	INJC	60	M	OR-Y OR<25		028,004	000 000		02 00 02
									-122 48 20.29								02	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	01	DRVR	INJC	31	F	OR-Y OR<25		000	000 000		00 00
01745	N	N	N	N	N	N	N	05/12/2021 CITY N N	14 WE 2P 45 22 9.73	SW TUALATIN-SHERWOOD SW 124TH AVE	INTER CN 01	CROSS 0	N TRF SIGNAL	N	CLR DRY DAY	O-1 L-TURN TURN INJ	01	NONE PRVTE PSNGR CAR	STRGHT N -S	01	DRVR	INJC	27	M	SUSP OR>25		000	000 000		04 00 04
									-122 48 20.3								02	NONE PRVTE PSNGR CAR	TURN-L S -W	01	DRVR	INJB	20	F	OR-Y OR<25		000	000 000		00 00
																	02	NONE PRVTE PSNGR CAR	TURN-L S -W	02	PSNG	INJB	16	F			000	000 000		00 00
05337	Y	N	N	N	N	N	N	12/04/2021 CITY N N	14 SA 3P 45 22 9.72	SW TUALATIN-SHERWOOD SW 124TH AVE	INTER CN 02	CROSS 0	N TRF SIGNAL	N	RAIN WET DAY	ANGL-OTH TURN INJ	01	NONE 0 PRVTE PSNGR CAR	TURN-R E -N	01	DRVR	INJB	28	M	OR-Y OR<25		047,001	017		01,08 00 01,08
									-122 48 20.29								01	NONE 0 PRVTE PSNGR CAR	TURN-R E -N	02	PSNG	INJB	01	M			000	000 000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
																02	NONE 0	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		01	DRVR	INJC	24	F	OR-Y		000	000	00
																								OR<25				
05216	N	N	N	N	N	N	11/28/2021	14	SW TUALATIN-SHERWOOD	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE	TURN-L										02
CITY			SU				0	SW 124TH AVE	CN		L-GRN-SIG	N	DRY	TURN			PRVTE	W -N								000	00
N			7P							02	0		N	DLIT	INJ			PSNGR CAR		01	DRVR	INJC	88	M	OR-Y		004,028	000	02
N			45 22 9.74				-122 48 20.32																	OR<25				
																01	NONE	TURN-L										
																	PRVTE	W -N									000	00
																	PSNGR CAR		02	PSNG	INJC	86	F			000	000	00
																02	NONE	STRGHT										
																	PRVTE	E -W									000	00
																	PSNGR CAR		01	DRVR	NONE	19	M	OTH-Y		000	000	00
																								N-RES				
00229	N	N	N	N			01/21/2021	14	SW TUALATIN-SHERWOOD	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	STRGHT										02
NONE			TH				0	SW 124TH AVE	CN		L-GRN-SIG	N	DRY	TURN			N/A	E -W								000	00
N			10A							02	0		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N			45 22 9.75				-122 48 20.32																	UNK				
																02	NONE 9	TURN-L										
																	N/A	W -N									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				

Left-Turn Lane Warrant Analysis

Project: 23033 - 12777 SW Tualatin-Sherwood Road
Intersection: South Driveway
Date: 7/11/2023
Scenario: Buildout - AM Peak Hour

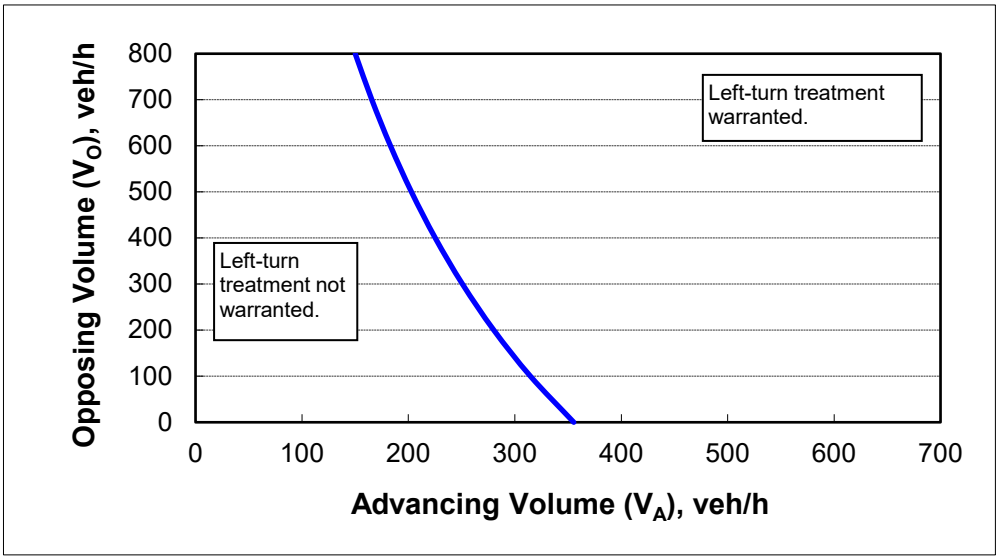
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	30%
Advancing volume (V_A), veh/h:	110
Opposing volume (V_O), veh/h:	352

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	237
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: 23033 - 12777 SW Tualatin-Sherwood Road
Intersection: North Driveway
Date: 7/11/2023
Scenario: Buildout - PM Peak Hour

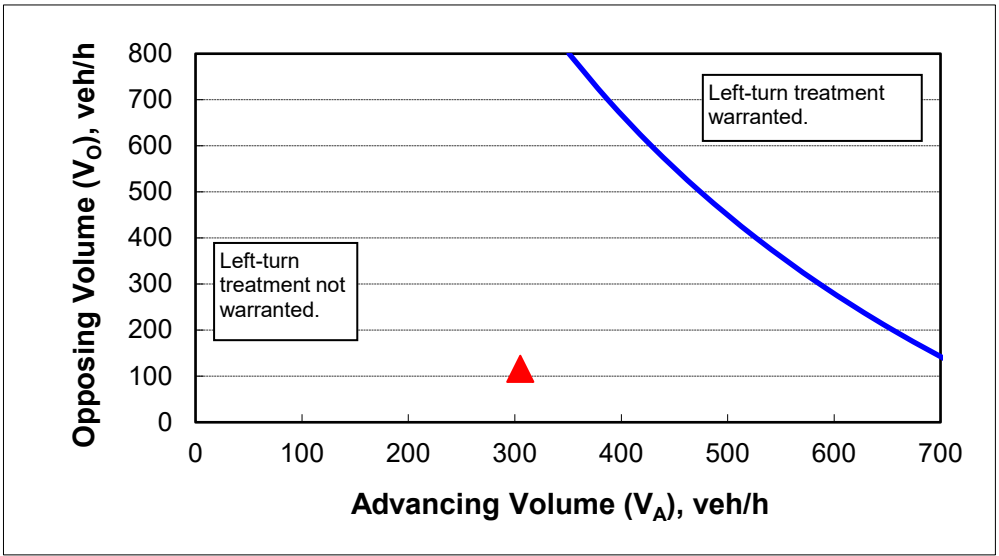
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	4%
Advancing volume (V_A), veh/h:	305
Opposing volume (V_O), veh/h:	116

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	722
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Traffic Signal Warrant Analysis

Project: 23033 - 12777 SW Tualatin Sherwood Road
Date: 7/11/2023
Scenario: Year 2024 Buildout Conditions

Major Street:	SW Cipole Road	Minor Street:	North Site Access	
Number of Lanes:	1	Number of Lanes:	1	
PM Peak Hour Volumes:	436	PM Peak Hour Volumes:	48	25% Right-Turn Discount

Warrant Used:

_____ 100 percent of standard warrants used
X 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	4,360	6,200	
Minor Street*	480	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	4,360	9,300	
Minor Street*	480	950	**No**
Combination Warrant			
Major Street	4,360	7,440	
Minor Street*	480	1,480	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

Project: 23033 - 12777 SW Tualatin Sherwood Road
Date: 7/11/2023
Scenario: Year 2024 Buildout Conditions

Major Street:	SW Cipole Road	Minor Street:	South Site Access	
Number of Lanes:	1	Number of Lanes:	1	
PM Peak Hour Volumes:	395	PM Peak Hour Volumes:	22	25% Right-Turn Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	3,950	6,200	
Minor Street*	220	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	3,950	9,300	
Minor Street*	220	950	**No**
Combination Warrant			
Major Street	3,950	7,440	
Minor Street*	220	1,480	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

Project: 23033 - 12777 SW Tualatin Sherwood Road
Date: 7/11/2023
Scenario: Year 2024 Buildout Conditions PM

Major Street:	SE 124th Avenue	Minor Street:	New East Site Acces / SW Cim	
Number of Lanes:	2	Number of Lanes:	1	
PM Peak Hour Volumes:	925	PM Peak Hour Volumes:	103	25% Right-Turn Discount

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

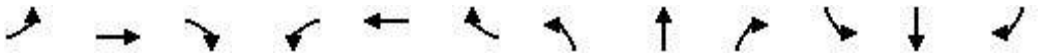
	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	9,250	7,400	
Minor Street*	1,030	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	9,250	11,100	
Minor Street*	1,030	950	**No**
Combination Warrant			
Major Street	9,250	8,880	
Minor Street*	1,030	1,480	**No**

* Minor street right-turning traffic volumes reduced by 25%

Appendix D – Operations Analysis

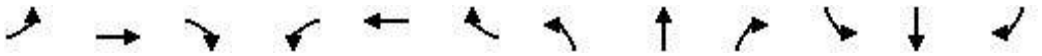
Synchro Reports

SimTraffic Queuing Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	613	57	47	523	46	186	253	58	102	190	65
Future Volume (vph)	69	613	57	47	523	46	186	253	58	102	190	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.5	4.0	4.0	4.0
Lane Util. 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
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1792	1524	1719	1810	1538	1626	1712	1455	1703	1792	1524
Flt Permitted	0.29	1.00	1.00	0.23	1.00	1.00	0.30	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	512	1792	1524	418	1810	1538	507	1712	1455	507	1792	1524
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	77	681	63	52	581	51	207	281	64	113	211	72
RTOR Reduction (vph)	0	0	23	0	0	20	0	0	52	0	0	57
Lane Group Flow (vph)	77	681	40	52	581	31	207	281	12	113	211	15
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	11%	11%	11%	6%	6%	6%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	70.6	64.9	76.4	68.2	63.7	72.0	34.8	23.3	23.3	28.4	20.1	25.8
Effective Green, g (s)	70.6	66.4	76.4	68.2	65.2	72.0	34.8	24.8	23.3	28.4	21.6	25.8
Actuated g/C Ratio	0.59	0.55	0.64	0.57	0.54	0.60	0.29	0.21	0.19	0.24	0.18	0.22
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5	5.5	4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	1.5	1.5	4.5	1.5	1.5	2.0	2.0	1.5	2.0	1.5
Lane Grp Cap (vph)	357	991	970	286	983	922	254	353	282	202	322	327
v/s Ratio Prot	c0.01	c0.38	0.00	0.01	0.32	0.00	c0.08	c0.16		0.04	0.12	0.00
v/s Ratio Perm	0.12		0.02	0.10		0.02	0.16		0.01	0.09		0.01
v/c Ratio	0.22	0.69	0.04	0.18	0.59	0.03	0.81	0.80	0.04	0.56	0.66	0.05
Uniform Delay, d1	13.2	19.3	8.1	14.9	18.4	9.8	36.3	45.2	39.3	38.0	45.7	37.4
Progression Factor	1.00	0.86	0.72	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	3.2	0.0	0.1	2.6	0.0	17.0	11.0	0.0	1.9	3.6	0.0
Delay (s)	13.2	19.8	5.9	15.0	21.0	9.8	53.3	56.2	39.3	39.9	49.4	37.4
Level of Service	B	B	A	B	C	A	D	E	D	D	D	D
Approach Delay (s)		18.1			19.7			53.2			44.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	613	57	47	523	46	186	253	58	102	190	65
Future Volume (veh/h)	69	613	57	47	523	46	186	253	58	102	190	65
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	1811	1811	1811	1826	1826	1826	1737	1737	1737	1811	1811	1811
Adj Flow Rate, veh/h	77	681	46	52	581	-27	207	281	42	113	211	50
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	6	6	6	5	5	5	11	11	11	6	6	6
Cap, veh/h	414	1028	954	383	1029	956	253	344	273	207	359	344
Arrive On Green	0.05	0.75	0.74	0.03	0.56	0.00	0.07	0.20	0.19	0.07	0.20	0.19
Sat Flow, veh/h	1725	1811	1535	1739	1826	1547	1654	1737	1472	1725	1811	1535
Grp Volume(v), veh/h	77	681	46	52	581	-27	207	281	42	113	211	50
Grp Sat Flow(s),veh/h/ln	1725	1811	1535	1739	1826	1547	1654	1737	1472	1725	1811	1535
Q Serve(g_s), s	2.3	22.1	0.8	1.5	24.5	0.0	8.0	18.6	2.9	6.3	12.7	3.1
Cycle Q Clear(g_c), s	2.3	22.1	0.8	1.5	24.5	0.0	8.0	18.6	2.9	6.3	12.7	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	414	1028	954	383	1029	956	253	344	273	207	359	344
V/C Ratio(X)	0.19	0.66	0.05	0.14	0.56	-0.03	0.82	0.82	0.15	0.55	0.59	0.15
Avail Cap(c_a), veh/h	433	1028	954	410	1029	956	253	420	337	207	438	411
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.77	0.77	0.77	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.2	9.1	5.1	12.7	16.8	0.0	44.1	46.0	41.0	37.5	43.7	37.3
Incr Delay (d2), s/veh	0.1	2.6	0.1	0.1	2.2	0.0	17.4	8.3	0.1	1.7	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	6.1	0.3	0.6	10.0	0.0	3.6	8.6	1.0	2.7	5.6	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	11.7	5.2	12.8	19.0	0.0	61.5	54.3	41.1	39.3	44.2	37.4
LnGrp LOS	B	B	A	B	B	A	E	D	D	D	D	D
Approach Vol, veh/h		804			606			530			374	
Approach Delay, s/veh		11.5			19.3			56.1			41.8	
Approach LOS		B			B			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	72.1	12.0	27.8	8.6	71.6	12.0	27.8
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	6.0	59.5	8.0	27.5	6.0	59.5	8.0	27.5
Max Q Clear Time (g_c+I1), s	3.5	24.1	10.0	14.7	4.3	26.5	8.3	20.6
Green Ext Time (p_c), s	0.1	20.3	0.0	1.9	0.1	15.7	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	28.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	3	2	0	2	14	125	0	0	68	3
Future Vol, veh/h	0	0	3	2	0	2	14	125	0	0	68	3
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	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	6	6	6	5	5	5	22	22	22
Mvmt Flow	0	0	3	2	0	2	16	139	0	0	76	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	250	249	78	250	250	139	79	0	0	139	0	0
Stage 1	78	78	-	171	171	-	-	-	-	-	-	-
Stage 2	172	171	-	79	79	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.56	6.26	4.15	-	-	4.32	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4.054	3.354	2.245	-	-	2.398	-	-
Pot Cap-1 Maneuver	708	657	988	695	646	899	1500	-	-	1330	-	-
Stage 1	936	834	-	822	750	-	-	-	-	-	-	-
Stage 2	835	761	-	920	821	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	700	649	988	687	638	899	1500	-	-	1330	-	-
Mov Cap-2 Maneuver	700	649	-	687	638	-	-	-	-	-	-	-
Stage 1	925	834	-	812	741	-	-	-	-	-	-	-
Stage 2	823	752	-	917	821	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	9.6	0.7	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1500	-	-	988	779	1330	-	-
HCM Lane V/C Ratio	0.01	-	-	0.003	0.006	-	-	-
HCM Control Delay (s)	7.4	0	-	8.7	9.6	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	2	148	127	31	63
Future Vol, veh/h	11	2	148	127	31	63
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	90	90	90	90	90	90
Heavy Vehicles, %	6	6	5	5	33	33
Mvmt Flow	12	2	164	141	34	70

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	373	235	0	0	305	0
Stage 1	235	-	-	-	-	-
Stage 2	138	-	-	-	-	-
Critical Hdwy	6.46	6.26	-	-	4.43	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	-	-	2.497	-
Pot Cap-1 Maneuver	620	794	-	-	1099	-
Stage 1	795	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	600	794	-	-	1099	-
Mov Cap-2 Maneuver	600	-	-	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	851	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	2.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	623	1099	-
HCM Lane V/C Ratio	-	-	0.023	0.031	-
HCM Control Delay (s)	-	-	10.9	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

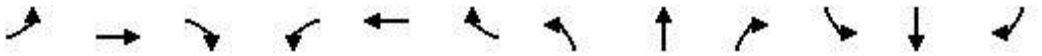
Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	8	0	3	0	358	22	17	325	0
Future Vol, veh/h	0	0	0	8	0	3	0	358	22	17	325	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	-	-	-	-	-	-	250	-	-	250	-	-
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	2	2	2	2	2	2
Mvmt Flow	0	0	0	9	0	3	0	389	24	18	353	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	584	802	177	614	790	207	353	0	0	413	0	0
Stage 1	389	389	-	401	401	-	-	-	-	-	-	-
Stage 2	195	413	-	213	389	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	395	316	835	376	321	799	1202	-	-	1142	-	-
Stage 1	606	607	-	597	599	-	-	-	-	-	-	-
Stage 2	788	592	-	769	607	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	389	311	835	371	316	799	1202	-	-	1142	-	-
Mov Cap-2 Maneuver	389	311	-	371	316	-	-	-	-	-	-	-
Stage 1	606	597	-	597	599	-	-	-	-	-	-	-
Stage 2	785	592	-	757	597	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.5	0	0.4
HCM LOS	A	B		

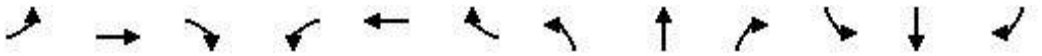
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1202	-	-	-	434	1142	-	-
HCM Lane V/C Ratio	-	-	-	-	0.028	0.016	-	-
HCM Control Delay (s)	0	-	-	0	13.5	8.2	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	701	179	27	685	56	109	237	45	79	289	118
Future Volume (vph)	54	701	179	27	685	56	109	237	45	79	289	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.5	4.0	4.0	4.0
Lane Util. 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
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1792	1495	1719	1810	1538	1626	1712	1455	1703	1792	1524
Flt Permitted	0.20	1.00	1.00	0.22	1.00	1.00	0.20	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	355	1792	1495	392	1810	1538	345	1712	1455	621	1792	1524
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	56	723	185	28	706	58	112	244	46	81	298	122
RTOR Reduction (vph)	0	0	70	0	0	23	0	0	37	0	0	93
Lane Group Flow (vph)	56	723	115	28	706	35	112	244	9	81	298	29
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	11%	11%	11%	6%	6%	6%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	72.0	66.5	74.5	67.4	64.2	71.4	32.1	24.1	24.1	30.5	23.3	28.8
Effective Green, g (s)	72.0	68.0	74.5	67.4	65.7	71.4	32.1	25.6	24.1	30.5	24.8	28.8
Actuated g/C Ratio	0.60	0.57	0.62	0.56	0.55	0.60	0.27	0.21	0.20	0.25	0.21	0.24
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5	5.5	4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	1.5	1.5	4.5	1.5	1.5	2.0	2.0	1.5	2.0	1.5
Lane Grp Cap (vph)	274	1015	928	255	990	915	177	365	292	222	370	365
v/s Ratio Prot	c0.01	c0.40	0.01	0.00	0.39	0.00	c0.04	0.14		0.02	c0.17	0.00
v/s Ratio Perm	0.11		0.07	0.06		0.02	0.13		0.01	0.07		0.02
v/c Ratio	0.20	0.71	0.12	0.11	0.71	0.04	0.63	0.67	0.03	0.36	0.81	0.08
Uniform Delay, d1	15.0	18.9	9.3	15.3	20.2	10.1	35.7	43.3	38.6	35.5	45.3	35.3
Progression Factor	1.01	0.86	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	3.5	0.0	0.1	4.4	0.0	5.3	3.6	0.0	0.4	11.4	0.0
Delay (s)	15.2	19.8	5.6	15.3	24.5	10.1	41.1	46.9	38.6	35.9	56.7	35.4
Level of Service	B	B	A	B	C	B	D	D	D	D	E	D
Approach Delay (s)		16.8			23.1			44.3			48.1	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	701	179	27	685	56	109	237	45	79	289	118
Future Volume (veh/h)	54	701	179	27	685	56	109	237	45	79	289	118
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1811	1811	1811	1826	1826	1826	1737	1737	1737	1811	1811	1811
Adj Flow Rate, veh/h	56	723	170	28	706	-14	112	244	25	81	298	101
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	6	6	5	5	5	11	11	11	6	6	6
Cap, veh/h	320	1036	943	321	1027	930	200	379	303	232	367	346
Arrive On Green	0.05	0.76	0.74	0.03	0.56	0.00	0.07	0.22	0.21	0.05	0.20	0.19
Sat Flow, veh/h	1725	1811	1502	1739	1826	1547	1654	1737	1472	1725	1811	1535
Grp Volume(v), veh/h	56	723	170	28	706	-14	112	244	25	81	298	101
Grp Sat Flow(s),veh/h/ln	1725	1811	1502	1739	1826	1547	1654	1737	1472	1725	1811	1535
Q Serve(g_s), s	1.7	24.4	3.5	0.8	33.1	0.0	6.5	15.3	1.6	4.5	18.8	6.5
Cycle Q Clear(g_c), s	1.7	24.4	3.5	0.8	33.1	0.0	6.5	15.3	1.6	4.5	18.8	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	320	1036	943	321	1027	930	200	379	303	232	367	346
V/C Ratio(X)	0.17	0.70	0.18	0.09	0.69	-0.02	0.56	0.64	0.08	0.35	0.81	0.29
Avail Cap(c_a), veh/h	346	1036	943	364	1027	930	200	420	337	259	438	406
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.77	0.77	0.77	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.4	9.0	5.2	13.4	18.7	0.0	37.3	42.7	38.5	37.1	45.7	38.6
Incr Delay (d2), s/veh	0.1	3.0	0.3	0.0	3.8	0.0	2.1	1.9	0.0	0.3	8.0	0.2
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	0.6	6.4	1.0	0.3	13.8	0.0	2.7	6.6	0.6	1.9	9.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.5	12.1	5.6	13.4	22.5	0.0	39.4	44.6	38.6	37.4	53.7	38.7
LnGrp LOS	B	B	A	B	C	A	D	D	D	D	D	D
Approach Vol, veh/h		949			720			381			480	
Approach Delay, s/veh		11.1			22.6			42.7			47.8	
Approach LOS		B			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	72.7	12.0	28.3	8.2	71.5	10.1	30.2
Change Period (Y+Rc), s	4.0	5.5	4.0	5.5	4.0	5.5	4.0	5.5
Max Green Setting (Gmax), s	6.0	59.5	8.0	27.5	6.0	59.5	8.0	27.5
Max Q Clear Time (g_c+I1), s	2.8	26.4	8.5	20.8	3.7	35.1	6.5	17.3
Green Ext Time (p_c), s	0.0	22.1	0.0	1.9	0.1	15.8	0.1	1.9

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	0	11	2	0	12	1	103	2	7	174	0
Future Vol, veh/h	7	0	11	2	0	12	1	103	2	7	174	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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	17	17	17	12	12	12	6	6	6
Mvmt Flow	8	0	12	2	0	13	1	112	2	8	189	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	327	321	189	326	320	113	189	0	0	114	0	0
Stage 1	205	205	-	115	115	-	-	-	-	-	-	-
Stage 2	122	116	-	211	205	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.27	6.67	6.37	4.22	-	-	4.16	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.27	5.67	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.27	5.67	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.653	4.153	3.453	2.308	-	-	2.254	-	-
Pot Cap-1 Maneuver	630	599	858	599	573	901	1327	-	-	1451	-	-
Stage 1	802	736	-	855	772	-	-	-	-	-	-	-
Stage 2	887	803	-	758	705	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	617	595	858	588	569	901	1327	-	-	1451	-	-
Mov Cap-2 Maneuver	617	595	-	588	569	-	-	-	-	-	-	-
Stage 1	801	732	-	854	771	-	-	-	-	-	-	-
Stage 2	873	802	-	743	701	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	9.4	0.1	0.3
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1327	-	-	745	837	1451	-	-
HCM Lane V/C Ratio	0.001	-	-	0.026	0.018	0.005	-	-
HCM Control Delay (s)	7.7	0	-	10	9.4	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	64	39	68	34	19	171
Future Vol, veh/h	64	39	68	34	19	171
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, %	4	4	20	20	6	6
Mvmt Flow	70	42	74	37	21	186

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	321	93	0	0	111	0
Stage 1	93	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.16	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.254	-
Pot Cap-1 Maneuver	668	959	-	-	1454	-
Stage 1	926	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	657	959	-	-	1454	-
Mov Cap-2 Maneuver	657	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	792	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	746	1454	-
HCM Lane V/C Ratio	-	-	0.15	0.014	-
HCM Control Delay (s)	-	-	10.7	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

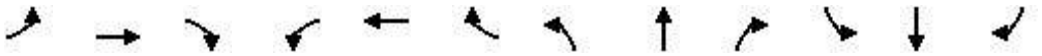
Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	33	0	22	0	311	6	11	453	0
Future Vol, veh/h	0	0	0	33	0	22	0	311	6	11	453	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	-	-	-	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	6	6	6	7	7	7	6	6	6
Mvmt Flow	0	0	0	36	0	24	0	338	7	12	492	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	685	861	246	612	858	173	492	0	0	345	0	0
Stage 1	516	516	-	342	342	-	-	-	-	-	-	-
Stage 2	169	345	-	270	516	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.62	6.62	7.02	4.24	-	-	4.22	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.62	5.62	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.62	5.62	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.56	4.06	3.36	2.27	-	-	2.26	-	-
Pot Cap-1 Maneuver	338	295	760	369	286	828	1033	-	-	1182	-	-
Stage 1	515	538	-	635	627	-	-	-	-	-	-	-
Stage 2	822	640	-	701	523	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	326	292	760	366	283	828	1033	-	-	1182	-	-
Mov Cap-2 Maneuver	326	292	-	366	283	-	-	-	-	-	-	-
Stage 1	515	533	-	635	627	-	-	-	-	-	-	-
Stage 2	798	640	-	694	518	-	-	-	-	-	-	-

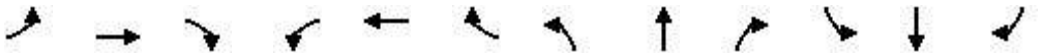
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.8	0	0.2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1033	-	-	-	471	1182	-	-
HCM Lane V/C Ratio	-	-	-	-	0.127	0.01	-	-
HCM Control Delay (s)	0	-	-	0	13.8	8.1	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	683	65	49	606	48	281	294	60	110	213	76
Future Volume (vph)	84	683	65	49	606	48	281	294	60	110	213	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	3406	1524	3335	3438	1538	3155	3169		3303	1792	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3303	3406	1524	3335	3438	1538	3155	3169		3303	1792	1524
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	93	759	72	54	673	53	312	327	67	122	237	84
RTOR Reduction (vph)	0	0	27	0	0	26	0	15	0	0	0	63
Lane Group Flow (vph)	93	759	45	54	673	27	312	379	0	122	237	21
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	11%	11%	11%	6%	6%	6%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	9.8	57.5	75.7	5.0	52.7	61.0	18.2	30.2		8.3	20.3	30.1
Effective Green, g (s)	9.8	59.0	75.7	5.0	54.2	61.0	18.2	31.7		8.3	21.8	30.1
Actuated g/C Ratio	0.08	0.49	0.63	0.04	0.45	0.51	0.15	0.26		0.07	0.18	0.25
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	1.5	1.5	4.5	1.5	1.5	2.0		1.5	2.0	1.5
Lane Grp Cap (vph)	269	1674	961	138	1552	781	478	837		228	325	433
v/s Ratio Prot	0.03	c0.22	0.01	0.02	c0.20	0.00	c0.10	0.12		0.04	c0.13	0.00
v/s Ratio Perm			0.02			0.02						0.01
v/c Ratio	0.35	0.45	0.05	0.39	0.43	0.03	0.65	0.45		0.54	0.73	0.05
Uniform Delay, d1	52.1	20.0	8.4	56.0	22.4	14.8	47.9	36.9		54.0	46.3	34.1
Progression Factor	0.83	0.65	0.55	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.8	0.0	0.7	0.9	0.0	2.4	0.1		1.2	6.8	0.0
Delay (s)	43.4	13.8	4.7	56.7	23.3	14.8	50.4	37.0		55.2	53.1	34.1
Level of Service	D	B	A	E	C	B	D	D		E	D	C
Approach Delay (s)		16.1			25.0			42.9			50.1	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	683	65	49	606	48	281	294	60	110	213	76
Future Volume (veh/h)	84	683	65	49	606	48	281	294	60	110	213	76
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	1811	1811	1811	1826	1826	1826	1737	1737	1737	1811	1811	1811
Adj Flow Rate, veh/h	93	759	55	54	673	-25	312	327	45	122	237	62
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	6	6	6	5	5	5	11	11	11	6	6	6
Cap, veh/h	833	1877	971	117	1106	560	321	674	92	185	315	630
Arrive On Green	0.50	1.00	1.00	0.03	0.32	0.00	0.10	0.23	0.22	0.06	0.17	0.16
Sat Flow, veh/h	3346	3441	1535	3374	3469	1547	3209	2918	398	3346	1811	1535
Grp Volume(v), veh/h	93	759	55	54	673	-25	312	184	188	122	237	62
Grp Sat Flow(s),veh/h/ln	1673	1721	1535	1687	1735	1547	1605	1650	1665	1673	1811	1535
Q Serve(g_s), s	1.8	0.0	0.0	1.9	19.7	0.0	11.6	11.6	11.8	4.3	14.9	0.0
Cycle Q Clear(g_c), s	1.8	0.0	0.0	1.9	19.7	0.0	11.6	11.6	11.8	4.3	14.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.24	1.00		1.00
Lane Grp Cap(c), veh/h	833	1877	971	117	1106	560	321	381	385	185	315	630
V/C Ratio(X)	0.11	0.40	0.06	0.46	0.61	-0.04	0.97	0.48	0.49	0.66	0.75	0.10
Avail Cap(c_a), veh/h	833	1877	971	169	1446	711	321	440	444	363	498	785
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	0.0	0.0	56.8	34.5	0.0	53.8	39.9	40.2	55.6	47.1	21.7
Incr Delay (d2), s/veh	0.0	0.5	0.1	1.0	2.5	0.0	42.4	0.4	0.4	1.5	1.4	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	0.7	0.1	0.0	0.8	8.4	0.0	6.5	4.6	4.7	1.8	6.7	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	0.5	0.1	57.9	37.0	0.0	96.2	40.3	40.5	57.0	48.5	21.8
LnGrp LOS	C	A	A	E	D	A	F	D	D	E	D	C
Approach Vol, veh/h		907			702			684			421	
Approach Delay, s/veh		2.8			40.0			65.9			47.0	
Approach LOS		A			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	69.5	17.5	24.9	35.4	42.3	10.7	31.7
Change Period (Y+Rc), s	4.0	5.5	5.5	* 5.5	5.5	* 5.5	4.0	5.5
Max Green Setting (Gmax), s	6.0	51.5	12.0	* 32	9.0	* 49	13.0	30.5
Max Q Clear Time (g_c+I1), s	3.9	2.0	13.6	16.9	3.8	21.7	6.3	13.8
Green Ext Time (p_c), s	0.1	25.6	0.0	2.4	0.3	15.1	0.5	3.8

Intersection Summary	
HCM 6th Ctrl Delay	35.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	11.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	3	2	0	2	15	331	0	0	86	3
Future Vol, veh/h	0	0	3	2	0	2	15	331	0	0	86	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	6	6	6	5	5	5	22	22	22
Mvmt Flow	0	0	3	2	0	2	17	368	0	0	96	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	2	0	0	3	0	0	57	8	2	191	8	1
Stage 1	-	-	-	-	-	-	2	2	-	5	5	-
Stage 2	-	-	-	-	-	-	55	6	-	186	3	-
Critical Hdwy	4.1	-	-	4.16	-	-	7.15	6.55	6.25	7.32	6.72	6.42
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.32	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.32	5.72	-
Follow-up Hdwy	2.2	-	-	2.254	-	-	3.545	4.045	3.345	3.698	4.198	3.498
Pot Cap-1 Maneuver	1634	-	-	1593	-	-	933	881	1073	727	849	1028
Stage 1	-	-	-	-	-	-	1013	888	-	967	853	-
Stage 2	-	-	-	-	-	-	950	885	-	772	855	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1634	-	-	1593	-	-	849	880	1073	489	848	1028
Mov Cap-2 Maneuver	-	-	-	-	-	-	849	880	-	489	848	-
Stage 1	-	-	-	-	-	-	1013	888	-	967	852	-
Stage 2	-	-	-	-	-	-	840	884	-	452	855	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.6	12.2	9.8
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	879	1634	-	-	1593	-	-	853
HCM Lane V/C Ratio	0.437	-	-	-	0.001	-	-	0.116
HCM Control Delay (s)	12.2	0	-	-	7.3	0	-	9.8
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	2.2	0	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	2	355	127	31	81
Future Vol, veh/h	11	2	355	127	31	81
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	90	90	90	90	90	90
Heavy Vehicles, %	6	6	5	5	33	33
Mvmt Flow	12	2	394	141	34	90

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	623	465	0	0	535	0
Stage 1	465	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.46	6.26	-	-	4.43	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	-	-	2.497	-
Pot Cap-1 Maneuver	443	589	-	-	893	-
Stage 1	624	-	-	-	-	-
Stage 2	861	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	425	589	-	-	893	-
Mov Cap-2 Maneuver	425	-	-	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	827	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	2.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	444	893	-
HCM Lane V/C Ratio	-	-	0.033	0.039	-
HCM Control Delay (s)	-	-	13.4	9.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

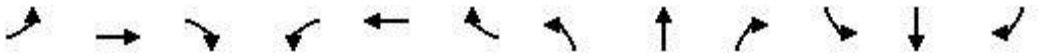
Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	8	0	3	0	384	23	18	365	0
Future Vol, veh/h	0	0	0	8	0	3	0	384	23	18	365	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	-	-	-	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	6	6	6	7	7	7	6	6	6
Mvmt Flow	0	0	0	9	0	3	0	427	26	20	406	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	660	899	203	683	886	227	406	0	0	453	0	0
Stage 1	446	446	-	440	440	-	-	-	-	-	-	-
Stage 2	214	453	-	243	446	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.62	6.62	7.02	4.24	-	-	4.22	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.62	5.62	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.62	5.62	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.56	4.06	3.36	2.27	-	-	2.26	-	-
Pot Cap-1 Maneuver	352	281	810	328	275	764	1114	-	-	1076	-	-
Stage 1	567	577	-	555	566	-	-	-	-	-	-	-
Stage 2	774	573	-	728	562	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	346	276	810	323	270	764	1114	-	-	1076	-	-
Mov Cap-2 Maneuver	346	276	-	323	270	-	-	-	-	-	-	-
Stage 1	567	566	-	555	566	-	-	-	-	-	-	-
Stage 2	771	573	-	714	551	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	14.7	0	0.4
HCM LOS	A	B		

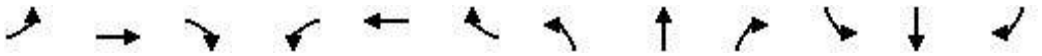
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1114	-	-	-	383	1076	-	-
HCM Lane V/C Ratio	-	-	-	-	0.032	0.019	-	-
HCM Control Delay (s)	0	-	-	0	14.7	8.4	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	791	231	28	742	58	124	277	47	110	341	146
Future Volume (vph)	68	791	231	28	742	58	124	277	47	110	341	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	3406	1507	3335	3438	1538	3155	3182		3303	1792	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3303	3406	1507	3335	3438	1538	3155	3182		3303	1792	1524
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	70	815	238	29	765	60	128	286	48	113	352	151
RTOR Reduction (vph)	0	0	99	0	0	28	0	11	0	0	0	81
Lane Group Flow (vph)	70	815	139	29	765	32	128	323	0	113	352	70
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	11%	11%	11%	6%	6%	6%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	9.0	61.2	70.2	3.3	55.5	63.5	9.0	28.5		8.0	27.5	36.5
Effective Green, g (s)	9.0	62.7	70.2	3.3	57.0	63.5	9.0	30.0		8.0	29.0	36.5
Actuated g/C Ratio	0.08	0.52	0.59	0.03	0.48	0.53	0.08	0.25		0.07	0.24	0.30
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	1.5	1.5	4.5	1.5	1.5	2.0		1.5	2.0	1.5
Lane Grp Cap (vph)	247	1779	881	91	1633	813	236	795		220	433	514
v/s Ratio Prot	0.02	c0.24	0.01	0.01	c0.22	0.00	c0.04	0.10		0.03	c0.20	0.01
v/s Ratio Perm			0.08			0.02						0.04
v/c Ratio	0.28	0.46	0.16	0.32	0.47	0.04	0.54	0.41		0.51	0.81	0.14
Uniform Delay, d1	52.5	18.0	11.4	57.2	21.3	13.6	53.5	37.6		54.1	42.9	30.3
Progression Factor	0.80	0.60	0.25	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.8	0.0	0.7	1.0	0.0	1.4	0.1		0.8	10.6	0.0
Delay (s)	42.2	11.6	2.8	58.0	22.2	13.6	54.9	37.7		55.0	53.5	30.4
Level of Service	D	B	A	E	C	B	D	D		D	D	C
Approach Delay (s)		11.6			22.8			42.4			48.1	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	791	231	28	742	58	124	277	47	110	341	146
Future Volume (veh/h)	68	791	231	28	742	58	124	277	47	110	341	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		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	1811	1811	1811	1826	1826	1826	1737	1737	1737	1811	1811	1811
Adj Flow Rate, veh/h	70	815	223	29	765	-12	128	286	27	113	352	130
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	6	6	5	5	5	11	11	11	6	6	6
Cap, veh/h	679	1841	881	87	1198	596	188	774	73	175	426	653
Arrive On Green	0.41	1.00	1.00	0.03	0.35	0.00	0.06	0.25	0.24	0.05	0.24	0.22
Sat Flow, veh/h	3346	3441	1515	3374	3469	1547	3209	3050	286	3346	1811	1535
Grp Volume(v), veh/h	70	815	223	29	765	-12	128	154	159	113	352	130
Grp Sat Flow(s),veh/h/ln	1673	1721	1515	1687	1735	1547	1605	1650	1686	1673	1811	1535
Q Serve(g_s), s	1.6	0.0	0.0	1.0	22.2	0.0	4.7	9.2	9.4	4.0	22.1	0.0
Cycle Q Clear(g_c), s	1.6	0.0	0.0	1.0	22.2	0.0	4.7	9.2	9.4	4.0	22.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	679	1841	881	87	1198	596	188	419	428	175	426	653
V/C Ratio(X)	0.10	0.44	0.25	0.33	0.64	-0.02	0.68	0.37	0.37	0.65	0.83	0.20
Avail Cap(c_a), veh/h	679	1841	881	169	1446	706	321	440	449	363	498	714
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	0.0	0.0	57.4	33.0	0.0	55.4	36.9	37.0	55.8	43.6	21.6
Incr Delay (d2), s/veh	0.0	0.7	0.6	0.8	2.6	0.0	1.6	0.2	0.2	1.5	8.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.2	0.1	0.4	9.4	0.0	1.9	3.6	3.8	1.7	10.6	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	0.7	0.6	58.3	35.6	0.0	57.0	37.1	37.2	57.3	52.0	21.7
LnGrp LOS	C	A	A	E	D	A	E	D	D	E	D	C
Approach Vol, veh/h		1108			782			441			595	
Approach Delay, s/veh		2.4			37.0			42.9			46.4	
Approach LOS		A			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	68.2	12.5	32.2	29.9	45.4	10.3	34.4
Change Period (Y+Rc), s	4.0	5.5	5.5	* 5.5	5.5	* 5.5	4.0	5.5
Max Green Setting (Gmax), s	6.0	51.5	12.0	* 32	9.0	* 49	13.0	30.5
Max Q Clear Time (g_c+I1), s	3.0	2.0	6.7	24.1	3.6	24.2	6.0	11.4
Green Ext Time (p_c), s	0.0	30.7	0.4	2.6	0.2	15.7	0.4	3.4

Intersection Summary	
HCM 6th Ctrl Delay	26.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	11

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	0	11	2	0	12	1	129	2	7	303	0
Future Vol, veh/h	7	0	11	2	0	12	1	129	2	7	303	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	17	17	17	12	12	12	6	6	6
Mvmt Flow	8	0	12	2	0	13	1	140	2	8	329	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	13	0	0	12	0	0	197	39	6	104	39	7
Stage 1	-	-	-	-	-	-	22	22	-	11	11	-
Stage 2	-	-	-	-	-	-	175	17	-	93	28	-
Critical Hdwy	4.1	-	-	4.27	-	-	7.22	6.62	6.32	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.22	5.62	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.22	5.62	-	6.16	5.56	-
Follow-up Hdwy	2.2	-	-	2.353	-	-	3.608	4.108	3.408	3.554	4.054	3.354
Pot Cap-1 Maneuver	1619	-	-	1514	-	-	741	834	1048	867	845	1064
Stage 1	-	-	-	-	-	-	971	857	-	999	878	-
Stage 2	-	-	-	-	-	-	804	862	-	904	864	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1619	-	-	1514	-	-	513	829	1048	749	840	1064
Mov Cap-2 Maneuver	-	-	-	-	-	-	513	829	-	749	840	-
Stage 1	-	-	-	-	-	-	966	853	-	994	877	-
Stage 2	-	-	-	-	-	-	502	861	-	750	860	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.8	1.1	10.3	12.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	828	1619	-	-	1514	-	-	838
HCM Lane V/C Ratio	0.173	0.005	-	-	0.001	-	-	0.402
HCM Control Delay (s)	10.3	7.2	0	-	7.4	0	-	12.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	2

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	64	39	93	34	19	300
Future Vol, veh/h	64	39	93	34	19	300
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, %	4	4	20	20	6	6
Mvmt Flow	70	42	101	37	21	326

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	488	120	0	0	138	0
Stage 1	120	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.16	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.254	-
Pot Cap-1 Maneuver	535	926	-	-	1421	-
Stage 1	900	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	525	926	-	-	1421	-
Mov Cap-2 Maneuver	525	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	683	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	628	1421	-
HCM Lane V/C Ratio	-	-	0.178	0.015	-
HCM Control Delay (s)	-	-	12	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0	-

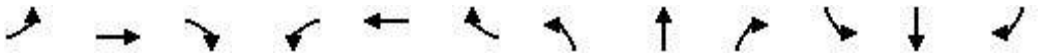
Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	34	0	23	0	335	6	11	562	0
Future Vol, veh/h	0	0	0	34	0	23	0	335	6	11	562	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	-	-	-	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	6	6	6	7	7	7	6	6	6
Mvmt Flow	0	0	0	37	0	25	0	364	7	12	611	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	817	1006	306	698	1003	186	611	0	0	371	0	0
Stage 1	635	635	-	368	368	-	-	-	-	-	-	-
Stage 2	182	371	-	330	635	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.62	6.62	7.02	4.24	-	-	4.22	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.62	5.62	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.62	5.62	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.56	4.06	3.36	2.27	-	-	2.26	-	-
Pot Cap-1 Maneuver	272	243	696	320	234	812	931	-	-	1156	-	-
Stage 1	438	476	-	613	610	-	-	-	-	-	-	-
Stage 2	808	623	-	646	461	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	262	241	696	317	232	812	931	-	-	1156	-	-
Mov Cap-2 Maneuver	262	241	-	317	232	-	-	-	-	-	-	-
Stage 1	438	471	-	613	610	-	-	-	-	-	-	-
Stage 2	783	623	-	639	456	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	15	0	0.2
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	-	420	1156	-	-
HCM Lane V/C Ratio	-	-	-	-	0.148	0.01	-	-
HCM Control Delay (s)	0	-	-	0	15	8.1	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	680	61	49	583	72	250	325	60	88	217	77
Future Volume (vph)	83	680	61	49	583	72	250	325	60	88	217	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	3406	1524	3335	3438	1538	3155	3176		3303	1792	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3303	3406	1524	3335	3438	1538	3155	3176		3303	1792	1524
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	92	756	68	54	648	80	278	361	67	98	241	86
RTOR Reduction (vph)	0	0	25	0	0	39	0	13	0	0	0	64
Lane Group Flow (vph)	92	756	43	54	648	41	278	415	0	98	241	22
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	11%	11%	11%	6%	6%	6%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	10.3	59.8	75.4	5.1	54.6	62.1	15.6	28.6		7.5	20.5	30.8
Effective Green, g (s)	10.3	61.3	75.4	5.1	56.1	62.1	15.6	30.1		7.5	22.0	30.8
Actuated g/C Ratio	0.09	0.51	0.63	0.04	0.47	0.52	0.13	0.25		0.06	0.18	0.26
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	1.5	1.5	4.5	1.5	1.5	2.0		1.5	2.0	1.5
Lane Grp Cap (vph)	283	1739	957	141	1607	795	410	796		206	328	441
v/s Ratio Prot	0.03	c0.22	0.01	0.02	c0.19	0.00	c0.09	0.13		0.03	c0.13	0.00
v/s Ratio Perm			0.02			0.02						0.01
v/c Ratio	0.33	0.43	0.04	0.38	0.40	0.05	0.68	0.52		0.48	0.73	0.05
Uniform Delay, d1	51.6	18.5	8.5	55.9	21.0	14.4	49.8	38.7		54.4	46.2	33.6
Progression Factor	0.83	0.66	0.84	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7	0.0	0.6	0.8	0.0	3.5	0.3		0.6	7.2	0.0
Delay (s)	43.1	12.9	7.1	56.6	21.7	14.4	53.3	39.0		55.0	53.4	33.6
Level of Service	D	B	A	E	C	B	D	D		D	D	C
Approach Delay (s)		15.5			23.4			44.6			49.8	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	680	61	49	583	72	250	325	60	88	217	77
Future Volume (veh/h)	83	680	61	49	583	72	250	325	60	88	217	77
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	1811	1811	1811	1826	1826	1826	1737	1737	1737	1811	1811	1811
Adj Flow Rate, veh/h	92	756	51	54	648	2	278	361	45	98	241	64
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	6	6	6	5	5	5	11	11	11	6	6	6
Cap, veh/h	851	1869	968	117	1079	534	321	715	88	157	319	642
Arrive On Green	0.51	1.00	1.00	0.03	0.31	0.30	0.10	0.24	0.23	0.05	0.18	0.16
Sat Flow, veh/h	3346	3441	1535	3374	3469	1547	3209	2956	366	3346	1811	1535
Grp Volume(v), veh/h	92	756	51	54	648	2	278	200	206	98	241	64
Grp Sat Flow(s),veh/h/ln	1673	1721	1535	1687	1735	1547	1605	1650	1671	1673	1811	1535
Q Serve(g_s), s	1.7	0.0	0.0	1.9	19.0	0.0	10.2	12.6	12.8	3.5	15.2	0.0
Cycle Q Clear(g_c), s	1.7	0.0	0.0	1.9	19.0	0.0	10.2	12.6	12.8	3.5	15.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	851	1869	968	117	1079	534	321	399	404	157	319	642
V/C Ratio(X)	0.11	0.40	0.05	0.46	0.60	0.00	0.87	0.50	0.51	0.63	0.76	0.10
Avail Cap(c_a), veh/h	851	1869	968	169	1446	698	321	440	446	363	498	793
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	0.0	0.0	56.8	35.0	10.0	53.2	39.2	39.5	56.2	47.0	21.2
Incr Delay (d2), s/veh	0.0	0.5	0.1	1.0	2.5	0.0	20.4	0.4	0.4	1.5	1.4	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	0.7	0.1	0.0	0.8	8.1	0.0	4.9	5.0	5.2	1.5	6.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	0.5	0.1	57.9	37.5	10.0	73.7	39.6	39.8	57.7	48.3	21.2
LnGrp LOS	C	A	A	E	D	A	E	D	D	E	D	C
Approach Vol, veh/h		899			704			684			403	
Approach Delay, s/veh		2.8			39.0			53.5			46.3	
Approach LOS		A			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	69.2	17.5	25.1	36.0	41.3	9.6	33.0
Change Period (Y+Rc), s	4.0	5.5	5.5	* 5.5	5.5	* 5.5	4.0	5.5
Max Green Setting (Gmax), s	6.0	51.5	12.0	* 32	9.0	* 49	13.0	30.5
Max Q Clear Time (g_c+I1), s	3.9	2.0	12.2	17.2	3.7	21.0	5.5	14.8
Green Ext Time (p_c), s	0.1	25.4	0.0	2.5	0.3	14.8	0.4	4.0

Intersection Summary	
HCM 6th Ctrl Delay	31.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	11.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	3	0	0	2	15	331	0	0	86	3
Future Vol, veh/h	0	0	3	0	0	2	15	331	0	0	86	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	6	6	6	5	5	5	22	22	22
Mvmt Flow	0	0	3	0	0	2	17	368	0	0	96	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	2	0	0	3	0	0	53	4	2	187	4	1
Stage 1	-	-	-	-	-	-	2	2	-	1	1	-
Stage 2	-	-	-	-	-	-	51	2	-	186	3	-
Critical Hdwy	4.1	-	-	4.16	-	-	7.15	6.55	6.25	7.32	6.72	6.42
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.32	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.32	5.72	-
Follow-up Hdwy	2.2	-	-	2.254	-	-	3.545	4.045	3.345	3.698	4.198	3.498
Pot Cap-1 Maneuver	1634	-	-	1593	-	-	938	886	1073	732	853	1028
Stage 1	-	-	-	-	-	-	1013	888	-	972	857	-
Stage 2	-	-	-	-	-	-	954	888	-	772	855	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1634	-	-	1593	-	-	855	886	1073	495	853	1028
Mov Cap-2 Maneuver	-	-	-	-	-	-	855	886	-	495	853	-
Stage 1	-	-	-	-	-	-	1013	888	-	972	857	-
Stage 2	-	-	-	-	-	-	845	888	-	452	855	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12.2	9.7
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	885	1634	-	-	1593	-	-	858
HCM Lane V/C Ratio	0.434	-	-	-	-	-	-	0.115
HCM Control Delay (s)	12.2	0	-	-	0	-	-	9.7
HCM Lane LOS	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	2.2	0	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	2	355	47	31	79
Future Vol, veh/h	5	2	355	47	31	79
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	90	90	90	90	90	90
Heavy Vehicles, %	6	6	5	5	33	33
Mvmt Flow	6	2	394	52	34	88

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	576	420	0	0	446	0
Stage 1	420	-	-	-	-	-
Stage 2	156	-	-	-	-	-
Critical Hdwy	6.46	6.26	-	-	4.43	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	-	-	2.497	-
Pot Cap-1 Maneuver	472	625	-	-	968	-
Stage 1	654	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	455	625	-	-	968	-
Mov Cap-2 Maneuver	455	-	-	-	-	-
Stage 1	654	-	-	-	-	-
Stage 2	831	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	2.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	493	968	-
HCM Lane V/C Ratio	-	-	0.016	0.036	-
HCM Control Delay (s)	-	-	12.4	8.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

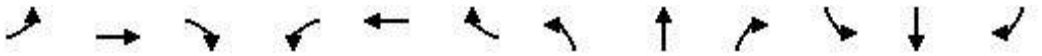
Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	7	8	0	3	56	383	23	18	341	24
Future Vol, veh/h	1	0	7	8	0	3	56	383	23	18	341	24
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	-	-	-	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	6	6	6	7	7	7	6	6	6
Mvmt Flow	1	0	8	9	0	3	62	426	26	20	379	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	770	1009	203	793	1009	226	406	0	0	452	0	0
Stage 1	433	433	-	563	563	-	-	-	-	-	-	-
Stage 2	337	576	-	230	446	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.62	6.62	7.02	4.24	-	-	4.22	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.62	5.62	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.62	5.62	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.56	4.06	3.36	2.27	-	-	2.26	-	-
Pot Cap-1 Maneuver	294	242	810	272	232	765	1114	-	-	1077	-	-
Stage 1	577	585	-	468	497	-	-	-	-	-	-	-
Stage 2	656	505	-	741	562	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	276	224	810	254	215	765	1114	-	-	1077	-	-
Mov Cap-2 Maneuver	276	224	-	254	215	-	-	-	-	-	-	-
Stage 1	545	574	-	442	469	-	-	-	-	-	-	-
Stage 2	617	477	-	720	551	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.6	17	1	0.4
HCM LOS	B	C		

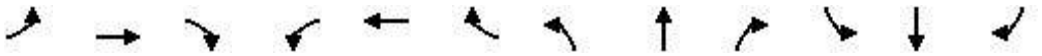
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1114	-	-	652	311	1077	-	-
HCM Lane V/C Ratio	0.056	-	-	0.014	0.039	0.019	-	-
HCM Control Delay (s)	8.4	-	-	10.6	17	8.4	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0	0.1	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	778	207	28	735	65	112	293	47	123	364	146
Future Volume (vph)	68	778	207	28	735	65	112	293	47	123	364	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	3406	1507	3335	3438	1538	3155	3185		3303	1792	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3303	3406	1507	3335	3438	1538	3155	3185		3303	1792	1524
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	70	802	213	29	758	67	115	302	48	127	375	151
RTOR Reduction (vph)	0	0	91	0	0	32	0	10	0	0	0	85
Lane Group Flow (vph)	70	802	122	29	758	35	115	340	0	127	375	66
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	11%	11%	11%	6%	6%	6%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	8.9	59.9	68.6	3.3	54.3	62.8	8.7	29.3		8.5	29.1	38.0
Effective Green, g (s)	8.9	61.4	68.6	3.3	55.8	62.8	8.7	30.8		8.5	30.6	38.0
Actuated g/C Ratio	0.07	0.51	0.57	0.03	0.46	0.52	0.07	0.26		0.07	0.26	0.32
Clearance Time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	1.5	4.5	1.5	1.5	4.5	1.5	1.5	2.0		1.5	2.0	1.5
Lane Grp Cap (vph)	244	1742	861	91	1598	804	228	817		233	456	533
v/s Ratio Prot	0.02	c0.24	0.01	0.01	c0.22	0.00	0.04	c0.11		0.04	c0.21	0.01
v/s Ratio Perm			0.07			0.02						0.03
v/c Ratio	0.29	0.46	0.14	0.32	0.47	0.04	0.50	0.42		0.55	0.82	0.12
Uniform Delay, d1	52.5	18.7	12.0	57.2	22.0	14.0	53.6	37.1		53.9	42.1	29.2
Progression Factor	0.80	0.61	0.26	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.8	0.0	0.7	1.0	0.0	0.6	0.1		1.4	10.9	0.0
Delay (s)	42.3	12.2	3.1	58.0	23.0	14.0	54.2	37.2		55.3	53.0	29.2
Level of Service	D	B	A	E	C	B	D	D		E	D	C
Approach Delay (s)		12.4			23.5			41.4			47.9	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	778	207	28	735	65	112	293	47	123	364	146
Future Volume (veh/h)	68	778	207	28	735	65	112	293	47	123	364	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		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	1811	1811	1811	1826	1826	1826	1737	1737	1737	1811	1811	1811
Adj Flow Rate, veh/h	70	802	198	29	758	-5	115	302	27	127	375	130
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	6	6	5	5	5	11	11	11	6	6	6
Cap, veh/h	667	1822	866	87	1191	600	173	780	69	191	444	663
Arrive On Green	0.40	1.00	1.00	0.03	0.34	0.00	0.05	0.25	0.24	0.06	0.25	0.23
Sat Flow, veh/h	3346	3441	1515	3374	3469	1547	3209	3066	272	3346	1811	1535
Grp Volume(v), veh/h	70	802	198	29	758	-5	115	162	167	127	375	130
Grp Sat Flow(s),veh/h/ln	1673	1721	1515	1687	1735	1547	1605	1650	1688	1673	1811	1535
Q Serve(g_s), s	1.6	0.0	0.0	1.0	22.0	0.0	4.2	9.7	9.9	4.5	23.7	0.0
Cycle Q Clear(g_c), s	1.6	0.0	0.0	1.0	22.0	0.0	4.2	9.7	9.9	4.5	23.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	667	1822	866	87	1191	600	173	420	429	191	444	663
V/C Ratio(X)	0.10	0.44	0.23	0.33	0.64	-0.01	0.67	0.39	0.39	0.66	0.84	0.20
Avail Cap(c_a), veh/h	667	1822	866	169	1446	714	321	440	450	363	498	709
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	0.0	0.0	57.4	33.1	0.0	55.7	37.0	37.1	55.4	43.1	21.2
Incr Delay (d2), s/veh	0.0	0.7	0.5	0.8	2.6	0.0	1.6	0.2	0.2	1.5	10.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.2	0.1	0.4	9.3	0.0	1.7	3.8	4.0	1.9	11.5	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	0.7	0.5	58.3	35.7	0.0	57.3	37.2	37.4	56.9	53.6	21.2
LnGrp LOS	C	A	A	E	D	A	E	D	D	E	D	C
Approach Vol, veh/h		1070			782			444			632	
Approach Delay, s/veh		2.5			36.8			42.5			47.6	
Approach LOS		A			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	67.5	12.0	33.4	29.4	45.2	10.9	34.5
Change Period (Y+Rc), s	4.0	5.5	5.5	* 5.5	5.5	* 5.5	4.0	5.5
Max Green Setting (Gmax), s	6.0	51.5	12.0	* 32	9.0	* 49	13.0	30.5
Max Q Clear Time (g_c+I1), s	3.0	2.0	6.2	25.7	3.6	24.0	6.5	11.9
Green Ext Time (p_c), s	0.0	29.8	0.4	2.3	0.2	15.7	0.5	3.5

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	10.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	0	11	0	0	12	1	118	0	7	297	0
Future Vol, veh/h	7	0	11	0	0	12	1	118	0	7	297	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	17	17	17	12	12	12	6	6	6
Mvmt Flow	8	0	12	0	0	13	1	128	0	8	323	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	13	0	0	12	0	0	190	35	6	93	35	7
Stage 1	-	-	-	-	-	-	22	22	-	7	7	-
Stage 2	-	-	-	-	-	-	168	13	-	86	28	-
Critical Hdwy	4.1	-	-	4.27	-	-	7.22	6.62	6.32	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.22	5.62	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.22	5.62	-	6.16	5.56	-
Follow-up Hdwy	2.2	-	-	2.353	-	-	3.608	4.108	3.408	3.554	4.054	3.354
Pot Cap-1 Maneuver	1619	-	-	1514	-	-	749	838	1048	881	850	1064
Stage 1	-	-	-	-	-	-	971	857	-	1004	882	-
Stage 2	-	-	-	-	-	-	811	865	-	912	864	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1619	-	-	1514	-	-	524	834	1048	774	846	1064
Mov Cap-2 Maneuver	-	-	-	-	-	-	524	834	-	774	846	-
Stage 1	-	-	-	-	-	-	966	853	-	999	882	-
Stage 2	-	-	-	-	-	-	514	865	-	771	860	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.8	0	10.1	12
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	830	1619	-	-	1514	-	-	844
HCM Lane V/C Ratio	0.156	0.005	-	-	-	-	-	0.392
HCM Control Delay (s)	10.1	7.2	0	-	0	-	-	12
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	1.9

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	28	93	16	13	298
Future Vol, veh/h	30	28	93	16	13	298
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, %	4	4	20	20	6	6
Mvmt Flow	33	30	101	17	14	324

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	462	110	0	0	118	0
Stage 1	110	-	-	-	-	-
Stage 2	352	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.16	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.254	-
Pot Cap-1 Maneuver	554	938	-	-	1446	-
Stage 1	910	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	547	938	-	-	1446	-
Mov Cap-2 Maneuver	547	-	-	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	699	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	685	1446	-
HCM Lane V/C Ratio	-	-	0.092	0.01	-
HCM Control Delay (s)	-	-	10.8	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	36	34	0	23	21	335	6	11	562	5
Future Vol, veh/h	11	0	36	34	0	23	21	335	6	11	562	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	-	-	-	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	6	6	6	7	7	7	6	6	6
Mvmt Flow	12	0	39	37	0	25	23	364	7	12	611	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	866	1055	308	744	1054	186	616	0	0	371	0	0
Stage 1	638	638	-	414	414	-	-	-	-	-	-	-
Stage 2	228	417	-	330	640	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.62	6.62	7.02	4.24	-	-	4.22	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.62	5.62	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.62	5.62	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.56	4.06	3.36	2.27	-	-	2.26	-	-
Pot Cap-1 Maneuver	250	227	694	296	218	812	926	-	-	1156	-	-
Stage 1	436	474	-	576	581	-	-	-	-	-	-	-
Stage 2	760	595	-	646	458	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	236	219	694	272	210	812	926	-	-	1156	-	-
Mov Cap-2 Maneuver	236	219	-	272	210	-	-	-	-	-	-	-
Stage 1	425	469	-	562	566	-	-	-	-	-	-	-
Stage 2	718	580	-	603	453	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.5	16.6	0.5	0.2
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	926	-	-	477	372	1156	-	-
HCM Lane V/C Ratio	0.025	-	-	0.107	0.167	0.01	-	-
HCM Control Delay (s)	9	-	-	13.5	16.6	8.1	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.6	0	-	-

Intersection: 1: SW 124th Avenue & SW Tualatin Sherwood Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (ft)	75	106	290	266	63	35	96	281	260	65	223	252
Average Queue (ft)	17	44	128	138	14	5	27	147	135	16	102	160
95th Queue (ft)	51	83	236	237	43	23	70	239	228	44	220	241
Link Distance (ft)			784	784				2368	2368			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250	250			350	385	385			385	465	465
Storage Blk Time (%)			1									
Queuing Penalty (veh)			1									

Intersection: 1: SW 124th Avenue & SW Tualatin Sherwood Road

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	L	T	R
Maximum Queue (ft)	230	232	110	126	250	70
Average Queue (ft)	105	104	33	49	131	15
95th Queue (ft)	190	190	79	100	225	46
Link Distance (ft)	662	662			690	690
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			120	120		
Storage Blk Time (%)			0	0	15	
Queuing Penalty (veh)			0	1	16	

Intersection: 2: SW Cipole Road

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	98	80
Average Queue (ft)	56	45
95th Queue (ft)	84	76
Link Distance (ft)	570	1052
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: SW Cipole Road

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	48	53	163
Average Queue (ft)	12	8	32
95th Queue (ft)	39	35	113
Link Distance (ft)	497	104	570
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: SW 124th Avenue

Movement	WB	NB	SB
Directions Served	LTR	TR	L
Maximum Queue (ft)	43	3	36
Average Queue (ft)	11	0	4
95th Queue (ft)	35	2	21
Link Distance (ft)	729	690	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			250
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 20: SW Tualatin Sherwood Road & SW Cipole Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	111	287	303	47	354	372	92	69	103	129
Average Queue (ft)	52	127	140	12	144	143	36	28	76	84
95th Queue (ft)	90	235	264	38	297	326	75	58	100	126
Link Distance (ft)		2081	2081		784	784		552		104
Upstream Blk Time (%)									2	9
Queuing Penalty (veh)									0	8
Storage Bay Dist (ft)	360			265			150		175	
Storage Blk Time (%)		0			1				2	9
Queuing Penalty (veh)		0			0				6	20

Zone Summary

Zone wide Queuing Penalty: 52

Intersection: 1: SW 124th Avenue & SW Tualatin Sherwood Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (ft)	62	134	291	300	92	24	48	318	320	56	136	168
Average Queue (ft)	11	40	142	151	41	2	12	183	178	18	24	85
95th Queue (ft)	39	93	247	258	80	15	37	288	288	46	90	152
Link Distance (ft)			784	784				2368	2368			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250	250			350	385	385			385	465	465
Storage Blk Time (%)			1	0					0			
Queuing Penalty (veh)			0	0					0			

Intersection: 1: SW 124th Avenue & SW Tualatin Sherwood Road

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	L	T	R
Maximum Queue (ft)	212	185	114	279	392	107
Average Queue (ft)	108	79	36	69	212	32
95th Queue (ft)	180	164	83	186	344	77
Link Distance (ft)	662	662			690	690
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			120	120		
Storage Blk Time (%)			0	0	32	
Queuing Penalty (veh)			0	1	35	

Intersection: 2: SW Cipole Road

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	5	88	101
Average Queue (ft)	0	43	56
95th Queue (ft)	4	71	84
Link Distance (ft)	363	570	1052
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: SW Cipole Road

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	155	26	240
Average Queue (ft)	55	1	63
95th Queue (ft)	109	11	174
Link Distance (ft)	497	104	570
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: SW 124th Avenue

Movement	WB	SB
Directions Served	LTR	L
Maximum Queue (ft)	78	29
Average Queue (ft)	35	2
95th Queue (ft)	65	11
Link Distance (ft)	729	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		250
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 36

Intersection: 1: SW 124th Avenue & SW Tualatin Sherwood Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (ft)	71	142	271	278	57	27	67	280	268	58	231	278
Average Queue (ft)	22	47	122	132	15	4	21	144	135	19	85	151
95th Queue (ft)	58	105	227	244	44	16	52	248	245	47	206	235
Link Distance (ft)			784	784				2368	2368			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250	250			350	385	385			385	465	465
Storage Blk Time (%)			0					0				
Queuing Penalty (veh)			0					0				

Intersection: 1: SW 124th Avenue & SW Tualatin Sherwood Road

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	L	T	R
Maximum Queue (ft)	230	231	83	207	294	74
Average Queue (ft)	115	101	23	50	137	16
95th Queue (ft)	206	198	60	125	252	50
Link Distance (ft)	662	662			690	690
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			120	120		
Storage Blk Time (%)				0	15	
Queuing Penalty (veh)				0	14	

Intersection: 2: SW Cipole Road & Existing North Access

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	99	81
Average Queue (ft)	56	44
95th Queue (ft)	86	73
Link Distance (ft)	570	1052
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: SW Cipole Road & Existing South Access

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	36	44	85
Average Queue (ft)	5	4	17
95th Queue (ft)	24	24	61
Link Distance (ft)	497	104	570
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: SW 124th Avenue & Proposed East Access/SW Cimino Street

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	TR
Maximum Queue (ft)	30	34	59	34	3
Average Queue (ft)	6	9	14	4	0
95th Queue (ft)	25	33	44	19	2
Link Distance (ft)	626	729			1905
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			250	250	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 14

Intersection: 1: SW 124th Avenue & SW Tualatin Sherwood Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (ft)	60	93	277	290	113	15	60	310	317	56	136	167
Average Queue (ft)	15	36	135	145	43	2	14	180	177	19	17	72
95th Queue (ft)	45	74	245	259	90	9	43	275	289	45	72	139
Link Distance (ft)			784	784				2368	2368			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250	250			350	385	385			385	465	465
Storage Blk Time (%)			1						0			
Queuing Penalty (veh)			0						0			

Intersection: 1: SW 124th Avenue & SW Tualatin Sherwood Road

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	L	T	R
Maximum Queue (ft)	242	215	112	280	494	112
Average Queue (ft)	109	79	36	77	215	31
95th Queue (ft)	193	169	82	193	375	77
Link Distance (ft)	662	662			690	690
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			120	120		
Storage Blk Time (%)			0	1	28	
Queuing Penalty (veh)			1	2	34	

Intersection: 2: SW Cipole Road & Existing North Access

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	6	77	103
Average Queue (ft)	0	41	59
95th Queue (ft)	4	66	87
Link Distance (ft)	254	570	1052
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: SW Cipole Road & Existing South Access

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	89	260
Average Queue (ft)	34	72
95th Queue (ft)	65	206
Link Distance (ft)	497	570
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: SW 124th Avenue & Proposed East Access/SW Cimino Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (ft)	54	76	47	28
Average Queue (ft)	25	32	9	2
95th Queue (ft)	49	62	31	15
Link Distance (ft)	626	729		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	250
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 37

Lawyers Title
of Oregon, LLC

PRELIMINARY REPORT

In response to the application for a policy of title insurance referenced herein Lawyers Title of Oregon, LLC hereby reports that it is prepared to issue, or cause to be issued, as of the specified date, a policy or policies of title insurance describing the land and the estate or interest hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an exception herein or not excluded from coverage pursuant to the printed Schedules or Conditions of said policy forms.

The printed Exceptions and Exclusions from the coverage of said policy or policies are set forth in Exhibit One. Copies of the policy forms should be read. They are available from the office which issued this report.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby.

The policy(s) of title insurance to be issued hereunder will be policy(s) of Fidelity National Title Insurance Company, a/an Florida corporation.

Please read the exceptions shown or referred to herein and the Exceptions and Exclusions set forth in Exhibit One of this report carefully. The Exceptions and Exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects and encumbrances affecting title to the land.

This preliminary report is for the exclusive use of the parties to the contemplated transaction, and the Company does not have any liability to any third parties nor any liability until the full premium is paid and a policy is issued. Until all necessary documents are placed of record, the Company reserves the right to amend or supplement this preliminary report.

Countersigned

Anne Merrell

6000 Meadows Rd, Ste 100, Lake Oswego, OR 97035
(503)968-1082 FAX (503)968-1852

PRELIMINARY REPORT

ESCROW OFFICER: Vicki Gillespie
vgillespie@ltic.com
503-968-1082

ORDER NO.: 872301078

TITLE OFFICER: Jason Parkrosz

TO: Lawyers Title of Oregon, LLC
6000 Meadows Rd, Ste 100
Lake Oswego, OR 97035

ESCROW LICENSE NO.: 201011109
OWNER/SELLER: Tanner Investments Turn the Page, LLC
BUYER/BORROWER: TBD
PROPERTY ADDRESS: 12777 SW Tualatin Sherwood Road, Tualatin, OR 97062-8051

EFFECTIVE DATE: July 24, 2023, 08:00 AM

1. THE POLICY AND ENDORSEMENTS TO BE ISSUED AND THE RELATED CHARGES ARE:

		AMOUNT		PREMIUM
ALTA Owner's Policy 2021 **Owner's Standard**	$	TBD	$	TBD
OTIRO Endorsement No. 110			$	0.00
ALTA Loan Policy 2021 **Extended Lender's**	$	TBD	$	TBD
OTIRO 209.10-06 - Restrictions, Encroachments, Minerals - Current Violations (ALTA 9.10-06)			$	100.00
OTIRO 222-06 - Location (ALTA 22-06)			$	0.00
OTIRO 208.2-06 - Commercial Environmental Protection Lien (ALTA 8.2-06)			$	0.00
Government Lien Search			$	30.00

2. THE ESTATE OR INTEREST IN THE LAND HEREINAFTER DESCRIBED OR REFERRED TO COVERED BY THIS REPORT IS:

   A Fee

3. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:

   Tanner Investments Turn the Page, LLC, an Oregon limited liability company

4. THE LAND REFERRED TO IN THIS REPORT IS SITUATED IN THE CITY OF TUALATIN, COUNTY OF WASHINGTON, STATE OF OREGON, AND IS DESCRIBED AS FOLLOWS:

   SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

EXHIBIT "A"

Legal Description

PARCEL I:

That certain parcel of real property situated in the Northeast quarter of Section 28, Township 2 South, Range 1 West of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon, described as follows:

All that part of the Southeast quarter of the Northeast quarter of Section 28, Township 2 South, Range 1 West of the Willamette Meridian, lying North of the center line of county road No. 492 (also known as Tualatin-Sherwood Road) and East of County Road No. 505 (also known as S.W. Cipole Road).

EXCEPTING THEREFROM that portion described in Dedication Deed recorded October 9, 1991, as Document No. 91056458.

AND FURTHER EXCEPTING THEREFROM that portion described in Dedication Deed recorded January 28, 2008, as Document No. 2008-007416 and was re-recorded on June 9, 2008, as Document No. 2008-051623.

AND FURTHER EXCEPTING THEREFROM that portion described in Dedication Deed recorded June 23, 2022, as Document No. 2022-041327.

PARCEL II:

A tract of land located in the Northeast quarter of Section 28, Township 2 South, Range 1 West of the Willamette Meridian, in the City of Tualatin, County of Washington and State of Oregon, being more particularly described as follows:

Commencing at the Northeast corner of said Section 28; thence along the East line of said Northeast quarter South 00° 43' 09" West, a distance of 1,324.57 feet to a 3/4 inch iron pipe marking the Northeast corner of that tract of land conveyed to Earl J. Itel, as trustee, by deed recorded in Book 750, Page 0279, Washington County Deed Records; thence along the North line of said Itel Tract North 89° 45' 44" West, a distance of 45.01 feet to the true point of beginning of this description; thence continuing along said North line North 89° 45' 44" West, a distance of 959.23 feet to a point 33.00 feet Easterly of, when measured at right angles to the centerline of Cipole Road (County Road No. 505); thence parallel with said centerline North 9° 08' 30" West, a distance of 118.19 feet; thence parallel with the North line of said Itel Tract South 89° 45' 44" East, a distance of 759.19 feet; thence South 61° 45' 44" East, a distance of 248.38 feet to the true point of beginning.

AS OF THE DATE OF THIS REPORT, ITEMS TO BE CONSIDERED AND EXCEPTIONS TO COVERAGE IN ADDITION TO THE PRINTED EXCEPTIONS AND EXCLUSIONS IN THE POLICY FORM WOULD BE AS FOLLOWS:

GENERAL EXCEPTIONS:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.

2. Any facts, rights, interests or claims, which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.

3. Easements, or claims of easement, which are not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.

4. Any encroachment (of existing improvements located on the Land onto adjoining land or of existing improvements located on adjoining land onto the subject Land), encumbrance, violation, variation or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the subject Land.

5. Any lien or right to a lien for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the Public Records.

SPECIFIC ITEMS AND EXCEPTIONS:

6. Property taxes in an undetermined amount, which are a lien but not yet payable, including any assessments collected with taxes to be levied for the fiscal year 2023-2024.

7. City Liens, if any, in favor of the City of Tualatin. None found as of July 31, 2023.

8. Rights of the public to any portion of the Land lying within the area commonly known as streets, roads and/or highways.

9. Reservations contained in the Patent

From:	The United States of America
To:	A. D. Tufts
Recording Date:	December 16, 1880
Recording No:	Book P, Page 402
Certificate No.:	737

Which among other things recites as follows:

The right to prospect for, mine and remove all oil, gas and other mineral deposits.

A right of way thereon for ditches or canals constructed by the authority of the United States of America..

Any vested and accrued water rights for mining, agricultural, manufacturing or other purposes and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by local customs, laws and decisions of courts.

The right of the proprietor of a vein or lode to extract and remove his ore therefrom should the same be found to penetrate or intersect the premises hereby granted as provided by law.

10. Restrictive Covenant for a Non-Access Reserve Strip, including the terms and provisions thereof,

    Recording Date: October 9, 1991
    Recording No.: 91-056460

11. Agreement for Water Service and Access Management, including the terms and provisions thereof,

    By and Between: T. L. Edgar Co., an Oregon corporation and Corrugated Box Co., Inc., an Oregon corporation and the City of Tualatin, a municipal corporation of the State of Oregon
    Recording Date: November 22, 1991
    Recording No.: 91-065138

    and Re-Recording Date: January 7, 1992
    and Re-Recording No: 92-003431
    Reason: To include legal description

12. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

    Granted to: City of Tualatin
    Purpose: Water line
    Recording Date: November 22, 1991
    Recording No: 91-065145
    Affects: Reference is hereby made to said document for full particulars

13. An unrecorded lease with certain terms, covenants, conditions and provisions set forth therein as disclosed by the document

    Entitled: Memorandum of Lease
    Lessor: Marvin L. Lince and James G. Tanner, tenants in common
    Lessee: Columbia Corrugated Box Co., Inc., an Oregon corporation
    Recording Date: April 11, 1994
    Recording No: 94-034484

    Any defect in or invalidity of, or other matters relating to the leasehold estate referred to herein, which would be disclosed by an examination of the unrecorded lease.

14. Conditions and restrictions as established by Washington County:

    Purpose: Establishing County Road No. 2737 (Tualatin-Sherwood/Edy Road and Oregon Street)
    Resolution and Order No.: 94-46
    Recording Date: May 9, 1994
    Recording No.: 94-045181

15. An option to purchase said Land with certain terms, covenants, conditions and provisions as set forth therein.

    Optionor: Marvin L. Lince and James G. Tanner, tenants in common
    Optionee: Stephen M. Tanner
    Disclosed by: Memorandum of Option Agreement
    Recording Date: April 22, 1996
    Recording No: 96-035551

Memorandum of First Amendment to Option Agreement, including the terms and provisions thereof

Recording Date: October 1, 2007
Recording No.: 2007-105176

16. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to: City of Tualatin
Purpose: Slope and public utilities
Recording Date: January 28, 2008
Recording No: 2008-007417
Affects: Easterly portion abutting SW 124th Avenue

17. Conditions and restrictions as established by the City of Tualatin:

Purpose: Establishing a zone of benefit recovery charge for street improvements
Resolution No.: 5023-11
Recording Date: November 2, 2011
Recording No.: 2011-077061

18. Personal property taxes, if any.

19. Terms and Provisions of that Dedication Deed, as granted in a document:

Recording Date: June 23, 2022
Recording No: 2022-041327

20. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to: Washington County, a political subdivisions of the State of Oregon
Purpose: Slope Easements, Public Utilities Easement, and Temporary Construction Easement
Recording Date: June 23, 2022
Recording No: 2022-041327

21. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to: Portland General Electric Company, an Oregon corporation
Purpose: Utilities
Recording Date: December 20, 2022
Recording No: 2022-072564
Affects: Reference is hereby made to said document for full particulars

22. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to: Portland General Electric Company, an Oregon corporation
Purpose: Powerline
Recording Date: February 14, 2023
Recording No: 2023-005815
Affects: Reference is hereby made to said document for full particulars

23. Please be advised that our search did not disclose any open Deeds of Trust of record. If you should have knowledge of any outstanding obligation, please contact the Title Department immediately for further review prior to closing.

24. The Company will require the following documents for review prior to the issuance of any title insurance predicated upon a conveyance or encumbrance from the entity named below.

Limited Liability Company: Tanner Investments Turn the Page, LLC, an Oregon limited liability company

a. A copy of its operating agreement, if any, and any and all amendments, supplements and/or modifications thereto, certified by the appropriate manager or member.

b. If a domestic Limited Liability Company, a copy of its Articles of Organization and all amendment thereto with the appropriate filing stamps.

c. If the Limited Liability Company is member-managed a full and complete current list of members certified by the appropriate manager or member.

d. A current dated certificate of good standing from the proper governmental authority of the state in which the entity was created

e. If less than all members, or managers, as appropriate, will be executing the closing documents, furnish evidence of the authority of those signing.

The Company reserves the right to add additional items or make further requirements after review of the requested documentation.

25. The Company will require the following documents for review prior to the issuance of any title insurance predicated upon a conveyance or encumbrance by the corporation named below:

Name of Corporation: Columbia Corrugated Box Company, Inc.

a) A Copy of the corporation By-laws and Articles of Incorporation

b) An original or certified copy of a resolution authorizing the transaction contemplated herein

c) If the Articles and/or By-laws require approval by a 'parent' organization, a copy of the Articles and By-laws of the parent

d) A current dated certificate of good standing from the proper governmental authority of the state in which the entity was created

The Company reserves the right to add additional items or make further requirements after review of the requested documentation.

26. Facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.

To remove this item, the Company will require an affidavit and indemnity on a form supplied by the Company.

27. Any lien or right to a lien for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the public records.

To remove this item, the Company will require an affidavit and indemnity on a form supplied by the Company.

28. Any encroachment (of existing improvements located on the subject Land onto adjoining land or of existing improvements located on adjoining land onto the subject Land), encumbrance, violation, variation or adverse circumstance affecting the title that would be disclosed by an accurate and complete land survey of the subject Land.

The Company will require a survey of the Land by a professional surveyor, and this exception may be eliminated or limited as a result thereof.

ADDITIONAL REQUIREMENTS/NOTES:

A. Note: Property taxes for the fiscal year shown below are paid in full.

Fiscal Year:	2022-2023
Amount:	$231,331.60
Levy Code:	088.15
Account No.:	R547180
Map No.:	2S128A000300

Prior to close of escrow, please contact the Tax Collector's Office to confirm all amounts owing, including current fiscal year taxes, supplemental taxes, escaped assessments and any delinquencies.

B. Note: Property taxes for the fiscal year shown below are paid in full.

Fiscal Year:	2022-2023
Amount:	$229,713.25
Levy Code:	088.15
Account No.:	R2035669
Map No.:	2S128A000300

Prior to close of escrow, please contact the Tax Collector's Office to confirm all amounts owing, including current fiscal year taxes, supplemental taxes, escaped assessments and any delinquencies.

C. In addition to the standard policy exceptions, the exceptions enumerated above shall appear on the final ALTA Policy unless removed prior to issuance.

D. Note: The name(s) of the proposed insured(s) furnished with this application for title insurance is/are:

No names were furnished with the application. Please provide the name(s) of the buyers as soon as possible.

E. Notice: Please be aware that due to the conflict between federal and state laws concerning the cultivation, distribution, processing, manufacture, sale, dispensing or use of marijuana and psilocybin, the Company is not able to close or insure any transaction involving Land associated with these activities.

F. Note: There are NO conveyances affecting said Land recorded within 24 months of the date of this report.

G. Washington County imposes a transfer tax of $1.00 per $1,000 (or fraction thereof) of the selling price in a real estate transfer, unless the county approves an exemption application. Exemption criteria and applications are available at the county's website, see: http://www.co.washington.or.us/AssessmentTaxation/Recording/TransferTaxExemption/index.cfm.

H. THE FOLLOWING NOTICE IS REQUIRED BY STATE LAW: YOU WILL BE REVIEWING, APPROVING AND SIGNING IMPORTANT DOCUMENTS AT CLOSING. LEGAL CONSEQUENCES FOLLOW FROM THE SELECTION AND USE OF THESE DOCUMENTS. YOU MAY CONSULT AN ATTORNEY ABOUT THESE DOCUMENTS. YOU SHOULD CONSULT AN ATTORNEY IF YOU HAVE QUESTIONS OR CONCERNS ABOUT THE TRANSACTION OR ABOUT THE DOCUMENTS. IF YOU WISH TO REVIEW TRANSACTION DOCUMENTS THAT YOU HAVE NOT SEEN, PLEASE CONTACT THE ESCROW AGENT.

I. Recording Charge (Per Document) is the following:

County	First Page	Each Additional Page
Multnomah	$86.00	$5.00
Washington	$81.00	$5.00
Clackamas	$93.00	$5.00

Note: When possible the company will record electronically. An additional charge of $5.00 applies to each document which is recorded electronically.

Note: Please send any documents for recording to the following address:
Portland Title Group
Attn: Recorder
1455 SW Broadway, Suite 1450
Portland, OR. 97201

J. Note: Effective January 1, 2008, Oregon law (ORS 314.258) mandates withholding of Oregon income taxes from sellers who do not continue to be Oregon residents or qualify for an exemption. Please contact your Escrow Closer for further information.

K. Note: This map/plat is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances or acreage shown thereon.

L. NOTE: IMPORTANT INFORMATION REGARDING PROPERTY TAX PAYMENTS

Fiscal Year:	July 1st through June 30th
Taxes become a lien on real property, but are not yet payable:	July 1st
Taxes become certified and payable (approximately on this date):	October 15th
First one third payment of taxes is due:	November 15th
Second one third payment of taxes is due:	February 15th
Final payment of taxes is due:	May 15th

Discounts: If two thirds are paid by November 15th, a 2% discount will apply.
If the full amount of the taxes are paid by November 15th, a 3% discount will apply.

Interest: Interest accrues as of the 15th of each month based on any amount that is unpaid by the due date. No interest is charged if the minimum amount is paid according to the above mentioned payment schedule.

M. Note: If an Owner's Title Insurance Policy is requested, the State of Oregon requires every ALTA Owner's Policy (07-01-2021) to include the OTIRO 110 Endorsement as a supplement to the definition of Insured in said Owner's Policy's Conditions to confirm coverage is the same for an Oregon Registered Domestic Partner as it is for a Spouse.

EXHIBIT ONE

2021 AMERICAN LAND TITLE ASSOCIATION LOAN POLICY (07-01-2021)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. a. any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) that restricts, regulates, prohibits, or relates to:
   i. the occupancy, use, or enjoyment of the Land;
   ii. the character, dimensions, or location of any improvement on the Land;
   iii. the subdivision of land; or
   iv. environmental remediation or protection.
   b. any governmental forfeiture, police, regulatory, or national security power.
   c. the effect of a violation or enforcement of any matter excluded under Exclusion 1.a. or 1.b.
2. Any power of eminent domain. Exclusion 2 does not modify or limit the coverage provided under Covered Risk 7.
3. Any defect, lien, encumbrance, adverse claim, or other matter:
   a. created, suffered, assumed, or agreed to by the Insured Claimant;
   b. not Known to the Company, not recorded in the Public Records at the Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   c. resulting in no loss or damage to the Insured Claimant;
   d. attaching or created subsequent to the Date of Policy (Exclusion 3.d. does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
   e. resulting in loss or damage that would not have been sustained if consideration sufficient to qualify the Insured named in Schedule A as a bona fide purchaser or encumbrancer had been given for the Insured Mortgage at the Date of Policy.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business law.
5. Invalidity or unenforceability of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or Consumer Protection Law.
6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights law, that the transaction creating the lien of the Insured Mortgage is a:
   a. fraudulent conveyance or fraudulent transfer;
   b. voidable transfer under the Uniform Voidable Transactions Act; or
   c. preferential transfer:
      i. to the extend the Insured Mortgage is not a transfer made as a contemporaneous exchange for new value; or
      ii. for any reason not stated in the Covered Risk 13.b
7. Any claim of a PACA-PSA Trust. Exclusion 7 does not modify or limit the coverage provided under Covered Risk 8.
8. Any lien on the Title for real estate taxes or assessments imposed by a governmental authority and created or attaching between the Date of Policy and the date of recording of the Insured Mortgage in the Public Records. Exclusion 8 does not modify or limit the coverage provided under Covered Risk 2.b. or 11.b.
9. Any discrepancy in the quantity of the area, square footage, or acreage of the Land or of any improvement to the Land.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage.

SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof, water rights, claims or title to water.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
5. Any lien for services, labor or material heretofore or hereafter furnished, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, imposed by law and not shown by the Public Records.

2021 AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY (07-01-2021)
EXCLUSIONS FROM COVERAGE

The following matters are excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses that arise by reason of:

1. a. any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) that restricts, regulates, prohibits, or relates to:
   i. the occupancy, use, or enjoyment of the Land;
   ii. the character, dimensions or location of any improvement on the Land;
   iii. the subdivision of land; or
   iv. environmental remediation or protection;
   b. any governmental forfeiture, police, regulatory, or national security power
   c. the effect of a violation or enforcement of any matter excluded under Exclusion 1.a. or 1.b.

   Exclusion 1 does not modify or limit the coverage provided under Covered Risk 5 or 6.
2. Any power of eminent domain. Exclusion 2 does not modify or limit the coverage provided under Covered Risk 7.
3. Any defect, lien, encumbrance, adverse claim, or other matter:
   a. created, suffered, assumed or agreed to by the Insured Claimant;
   b. not known to the Company, not recorded in the Public Records at the Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   c. resulting in no loss or damage to the Insured Claimant;
   d. attaching or created subsequent to the Date of Policy (Exclusion 3.d. does not modify or limit the coverage provided under Covered Risk 9 or 10); or
   e. resulting in loss or damage that would not have been sustained if consideration sufficient to qualify the Insured named in Schedule A as a bona fide purchaser had been given for the Title at the Date of Policy.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights law, that the transaction vesting the Title as shown in Schedule A is a:
   a. fraudulent conveyance or fraudulent transfer, or
   b. voidable transfer under the Uniform Voidable Transactions Act; or
   c. preferential transfer:
      i. to the extent the instrument of transfer vesting the Title as shown in Schedule A is not a transfer made as a contemporaneous exchange for new value; or
      ii. for any other reason not stated in Covered Risk 9.b.
5. Any claim of a PACA-PSA Trust. Exclusion 5 does not modify or limit the coverage provided under Covered Risk 8.
6. Any lien on the Title for real estate taxes or assessments imposed or collected by a governmental authority that becomes due and payable after the Date of Policy. Exclusion 6 does not modify or limit the coverage provided under Covered Risk 2.b.
7. Any discrepancy in the quantity of the area, square footage, or acreage of the Land or of any improvement to the Land.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage.

SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof, water rights, claims or title to water.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
5. Any lien for services, labor or material heretofore or hereafter furnished, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, imposed by law and not shown by the Public Records.

EXHIBIT ONE

2006 AMERICAN LAND TITLE ASSOCIATION LOAN POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses that arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning) restricting, regulating, prohibiting or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions or location of any improvement erected on the land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed or agreed to by the Insured Claimant;
   (b) not known to the Company, not recorded in the Public Records at Date of Policy, but known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with the applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.
6. Any claim, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in the Covered Risk 13(b) of this policy.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage.

SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof, water rights, claims or title to water.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
5. Any lien for services, labor or material heretofore or hereafter furnished, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, imposed by law and not shown by the Public Records.

2006 AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses that arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning) restricting, regulating, prohibiting or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions or location of any improvement erected on the land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed or agreed to by the Insured Claimant;
   (b) not known to the Company, not recorded in the Public Records at Date of Policy, but known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in the Covered Risk 9 of this policy.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage.

SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof, water rights, claims or title to water.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
5. Any lien for services, labor or material heretofore or hereafter furnished, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, imposed by law and not shown by the Public Records.

WIRE SAFE™ | Inquire before you wire!

WIRE FRAUD ALERT

This Notice is not intended to provide legal or professional advice.
If you have any questions, please consult with a lawyer.

All parties to a real estate transaction are targets for wire fraud and many have lost hundreds of thousands of dollars because they simply relied on the wire instructions received via email, without further verification. **If funds are to be wired in conjunction with this real estate transaction, we strongly recommend verbal verification of wire instructions through a known, trusted phone number prior to sending funds.**

In addition, the following non-exclusive self-protection strategies are recommended to minimize exposure to possible wire fraud.

- **NEVER RELY** on emails purporting to change wire instructions. Parties to a transaction rarely change wire instructions in the course of a transaction.
- **ALWAYS VERIFY** wire instructions, specifically the ABA routing number and account number, by calling the party who sent the instructions to you. DO NOT use the phone number provided in the email containing the instructions, use phone numbers you have called before or can otherwise verify. **Obtain the number of relevant parties to the transaction as soon as an escrow account is opened.** DO NOT send an email to verify as the email address may be incorrect or the email may be intercepted by the fraudster.
- **USE COMPLEX EMAIL PASSWORDS** that employ a combination of mixed case, numbers, and symbols. Make your passwords greater than eight (8) characters. Also, change your password often and do NOT reuse the same password for other online accounts.
- **USE MULTI-FACTOR AUTHENTICATION** for email accounts. Your email provider or IT staff may have specific instructions on how to implement this feature.

For more information on wire-fraud scams or to report an incident, please refer to the following links:

Federal Bureau of Investigation:
http://www.fbi.gov

Internet Crime Complaint Center:
http://www.ic3.gov

FIDELITY NATIONAL FINANCIAL
PRIVACY NOTICE

Effective January 1, 2023

Fidelity National Financial, Inc. and its majority-owned subsidiary companies (collectively, "FNF," "our," or "we") respect and are committed to protecting your privacy. This Privacy Notice explains how we collect, use, and protect personal information, when and to whom we disclose such information, and the choices you have about the use and disclosure of that information.

A limited number of FNF subsidiaries have their own privacy notices. If a subsidiary has its own privacy notice, the privacy notice will be available on the subsidiary's website and this Privacy Notice does not apply.

Collection of Personal Information

FNF may collect the following categories of Personal Information:

- contact information (*e.g.*, name, address, phone number, email address);
- demographic information (*e.g.*, date of birth, gender, marital status);
- identity information (*e.g.* Social Security Number, driver's license, passport, or other government ID number);
- financial account information (*e.g.* loan or bank account information); and
- other personal information necessary to provide products or services to you.

We may collect Personal Information about you from:

- information we receive from you or your agent;
- information about your transactions with FNF, our affiliates, or others; and
- information we receive from consumer reporting agencies and/or governmental entities, either directly from these entities or through others.

Collection of Browsing Information

FNF automatically collects the following types of Browsing Information when you access an FNF website, online service, or application (each an "FNF Website") from your Internet browser, computer, and/or device:

- Internet Protocol (IP) address and operating system;
- browser version, language, and type;
- domain name system requests; and
- browsing history on the FNF Website, such as date and time of your visit to the FNF Website and visits to the pages within the FNF Website.

Like most websites, our servers automatically log each visitor to the FNF Website and may collect the Browsing Information described above. We use Browsing Information for system administration, troubleshooting, fraud investigation, and to improve our websites. Browsing Information generally does not reveal anything personal about you, though if you have created a user account for an FNF Website and are logged into that account, the FNF Website may be able to link certain browsing activity to your user account.

Other Online Specifics

Cookies. When you visit an FNF Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. Information gathered using cookies helps us improve your user experience. For example, a cookie can help the website load properly or can customize the display page based on your browser type and user preferences. You can choose whether or not to accept cookies by changing your Internet browser settings. Be aware that doing so may impair or limit some functionality of the FNF Website.

Web Beacons. We use web beacons to determine when and how many times a page has been viewed. This information is used to improve our websites.

Do Not Track. Currently our FNF Websites do not respond to "Do Not Track" features enabled through your browser.

Links to Other Sites. FNF Websites may contain links to unaffiliated third-party websites. FNF is not responsible for the privacy practices or content of those websites. We recommend that you read the privacy policy of every website you visit.

Use of Personal Information

FNF uses Personal Information for three main purposes:

- To provide products and services to you or in connection with a transaction involving you.
- To improve our products and services.
- To communicate with you about our, our affiliates', and others' products and services, jointly or independently.

When Information Is Disclosed

We may disclose your Personal Information and Browsing Information in the following circumstances:

- to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to affiliated or nonaffiliated service providers who provide or perform services or functions on our behalf and who agree to use the information only to provide such services or functions;
- to affiliated or nonaffiliated third parties with whom we perform joint marketing, pursuant to an agreement with them to jointly market financial products or services to you;
- to law enforcement or authorities in connection with an investigation, or in response to a subpoena or court order; or
- in the good-faith belief that such disclosure is necessary to comply with legal process or applicable laws, or to protect the rights, property, or safety of FNF, its customers, or the public.

The law does not require your prior authorization and does not allow you to restrict the disclosures described above. Additionally, we may disclose your information to third parties for whom you have given us authorization or consent to make such disclosure. We do not otherwise share your Personal Information or Browsing Information with nonaffiliated third parties, except as required or permitted by law.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of bankruptcy, reorganization, insolvency, receivership, or an assignment for the benefit of creditors. By submitting Personal Information and/or Browsing Information to FNF, you expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings.

Security of Your Information

We maintain physical, electronic, and procedural safeguards to protect your Personal Information.

Choices With Your Information

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you.

For California Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties, except as permitted by California law. For additional information about your California privacy rights, please visit the "California Privacy" link on our website (https://fnf.com/pages/californiaprivacy.aspx) or call (888) 413-1748.

For Nevada Residents: We are providing this notice pursuant to state law. You may be placed on our internal Do Not Call List by calling FNF Privacy at (888) 714-2710 or by contacting us via the information set forth at the end of this Privacy Notice. For further information concerning Nevada's telephone solicitation law, you may contact: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: aginquiries@ag.state.nv.us.

For Oregon Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes.

For Vermont Residents: We will not disclose information about your creditworthiness to our affiliates and will not disclose your personal information, financial information, credit report, or health information to nonaffiliated third parties to market to you, other than as permitted by Vermont law, unless you authorize us to make those disclosures.

For Virginia Residents: For additional information about your Virginia privacy rights, please email privacy@fnf.com or call (888) 714-2710.

Information From Children

The FNF Websites are not intended or designed to attract persons under the age of eighteen (18). We do not collect Personal Information from any person that we know to be under the age of thirteen (13) without permission from a parent or guardian.

International Users

FNF's headquarters is located within the United States. If you reside outside the United States and choose to provide Personal Information or Browsing Information to us, please note that we may transfer that information outside of your country of residence. By providing FNF with your Personal Information and/or Browsing Information, you consent to our collection, transfer, and use of such information in accordance with this Privacy Notice.

FNF Website Services for Mortgage Loans

Certain FNF companies provide services to mortgage loan servicers, including hosting websites that collect customer information on behalf of mortgage loan servicers (the "Service Websites"). The Service Websites may contain links to both this Privacy Notice and the mortgage loan servicer or lender's privacy notice. The sections of this Privacy Notice titled When Information is Disclosed, Choices with Your Information, and Accessing and Correcting Information do not apply to the Service Websites. The mortgage loan servicer or lender's privacy notice governs use, disclosure, and access to your Personal Information. FNF does not share Personal Information collected through the Service Websites, except as required or authorized by contract with the mortgage loan servicer or lender, or as required by law or in the good-faith belief that such disclosure is necessary: to comply with a legal process or applicable law, to enforce this Privacy Notice, or to protect the rights, property, or safety of FNF or the public.

Your Consent To This Privacy Notice; Notice Changes

By submitting Personal Information and/or Browsing Information to FNF, you consent to the collection and use of the information in accordance with this Privacy Notice. We may change this Privacy Notice at any time. The Privacy Notice's effective date will show the last date changes were made. If you provide information to us following any change of the Privacy Notice, that signifies your assent to and acceptance of the changes to the Privacy Notice.

Accessing and Correcting Information; Contact Us

If you have questions or would like to correct your Personal Information, visit FNF's Privacy Inquiry Website or contact us by phone at (888) 714-2710, by email at privacy@fnf.com, or by mail to:

Fidelity National Financial, Inc.
601 Riverside Avenue,
Jacksonville, Florida 32204
Attn: Chief Privacy Officer

Washington County, Oregon **2019-004779**
D-DBS
Stn=6 M FERNANDES **01/25/2019 08:42:32 AM**
$10.00 $11.00 $5.00 $60.00 **$86.00**

I, Richard Hobernicht, Director of Assessment and Taxation and Ex-Officio County Clerk for Washington County, Oregon, do hereby certify that the within instrument of writing was received and recorded in the book of records of said county.

Richard Hobernicht, Director of
Assessment and Taxation, Ex-Officio

After Recording Return to:
Steven M. Zipper
Gevurtz Menashe, P.C.
115 NW First Avenue, Suite 400
Portland, OR 97209

Until Further Notice, Send Tax Statements to:
No change

BARGAIN & SALE DEED

Stephen M. Tanner and Bonnie J. Tanner, Trustees of the TANNER FAMILY 2014 TRUST U/A/D AUGUST 28, 2014, Grantor, conveys to **TANNER INVESTMENTS TURN THE PAGE, LLC**, an Oregon limited liability company, Grantee, all of Grantor's right, title and interest in and to the following described real property in the City of Tualatin, County of Washington and State of Oregon and legally described as:

SEE EXHIBIT "A" ATTACHED HERETO AND INCORPORATED HEREIN. .

The true and actual consideration paid for this conveyance is: OTHER VALUE GIVEN.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

EXECUTED this 24th day of October, 2018.

GRANTOR:

Stephen M. Tanner, Trustee of the Tanner
Family 2014 Trust U/A/D August 28, 2014

Bonnie J. Tanner, Trustee of the Tanner
Family 2014 Trust U/A/D August 28, 2014

STATE OF OREGON)
) ss.
County of Multnomah)

This record was acknowledged before me October 24, 2018 by Stephen M. Tanner and Bonnie J. Tanner.

OFFICIAL STAMP
MARIBEL WEBBER
NOTARY PUBLIC-OREGON
COMMISSION NO. 953919
MY COMMISSION EXPIRES AUGUST 31, 2020

NOTARY PUBLIC FOR OREGON
My commission expires: 8·31·20

Exhibit "A"

Real property in the City of Tualatin, County of Washington, State of Oregon, described as follows:

PARCEL I:

THAT CERTAIN PARCEL OF REAL PROPERTY SITUATED IN THE NORTHEAST QUARTER OF SECTION 28, TOWNSHIP 2 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF WASHINGTON AND STATE OF OREGON, DESCRIBED AS FOLLOWS:

ALL THAT PART OF THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 28, TOWNSHIP 2 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, LYING NORTH OF THE CENTER LINE OF COUNTY ROAD NO. 492 (ALSO KNOWN AS TUALATIN-SHERWOOD ROAD) AND EAST OF COUNTY ROAD NO. 505 (ALSO KNOWN AS S.W. CIPOLE ROAD).

EXCEPTING THEREFROM THAT PORTION DESCRIBED IN DEDICATION DEED RECORDED OCTOBER 09, 1991 AS FEE NO. 91056458.

PARCEL II:

A TRACT OF LAND LOCATED IN THE NORTHEAST QUARTER OF SECTION 28, TOWNSHIP 2 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF WASHINGTON AND STATE OF OREGON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 28;
THENCE ALONG THE EAST LINE OF SAID NORTHEAST QUARTER SOUTH 00°43'09" WEST, A DISTANCE OF 1,324.57 FEET TO A 3/4 INCH IRON PIPE MARKING THE NORTHEAST CORNER OF THAT TRACT OF LAND CONVEYED TO EARL J. ITEL, AS TRUSTEE, BY DEED RECORDED IN BOOK 750, PAGE 0279, WASHINGTON COUNTY DEED RECORDS;
THENCE ALONG THE NORTH LINE OF SAID ITEL TRACT NORTH 89°45'44" WEST, A DISTANCE OF 45.01 FEET TO THE TRUE POINT OF BEGINNING OF THIS DESCRIPTION;
THENCE CONTINUING ALONG SAID NORTH LINE NORTH 89°45'44" WEST, A DISTANCE OF 959.23 FEET TO A POINT 33.00 FEET EASTERLY OF, WHEN MEASURED AT RIGHT ANGLES TO THE CENTERLINE OF CIPOLE ROAD (COUNTY ROAD NO. 505);
THENCE PARALLEL WITH SAID CENTERLINE NORTH 9°08'30" WEST, A DISTANCE OF 118.19 FEET;
THENCE PARALLEL WITH THE NORTH LINE OF SAID ITEL TRACT SOUTH 89°45'44" EAST, A DISTANCE OF 759.19 FEET;
THENCE SOUTH 61°45'44" EAST, A DISTANCE OF 248.38 FEET TO THE TRUE POINT OF BEGINNING.

Tax Parcel Number: R547180 and R2035669

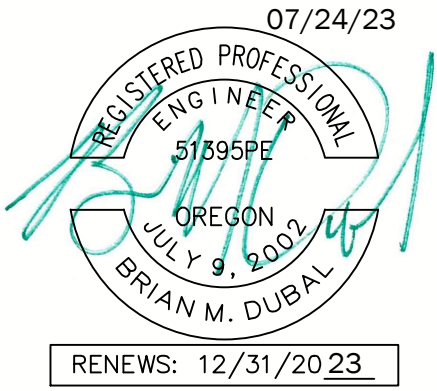
COLUMBIA CORRUGATED BOX – NEW ACCESS

12777 SW Tualatin – Sherwood Rd
Tualatin, Oregon 97062

PRELIMINARY STORMWATER REPORT

VLMK Project Number: 20220513

Columbia Corrugated Box
12777 SW Tualatin – Sherwood Rd
Tualatin, OR 97062
Contact: Roggy Pflug



Prepared By: Corey Theisen, P.E.
April 2023

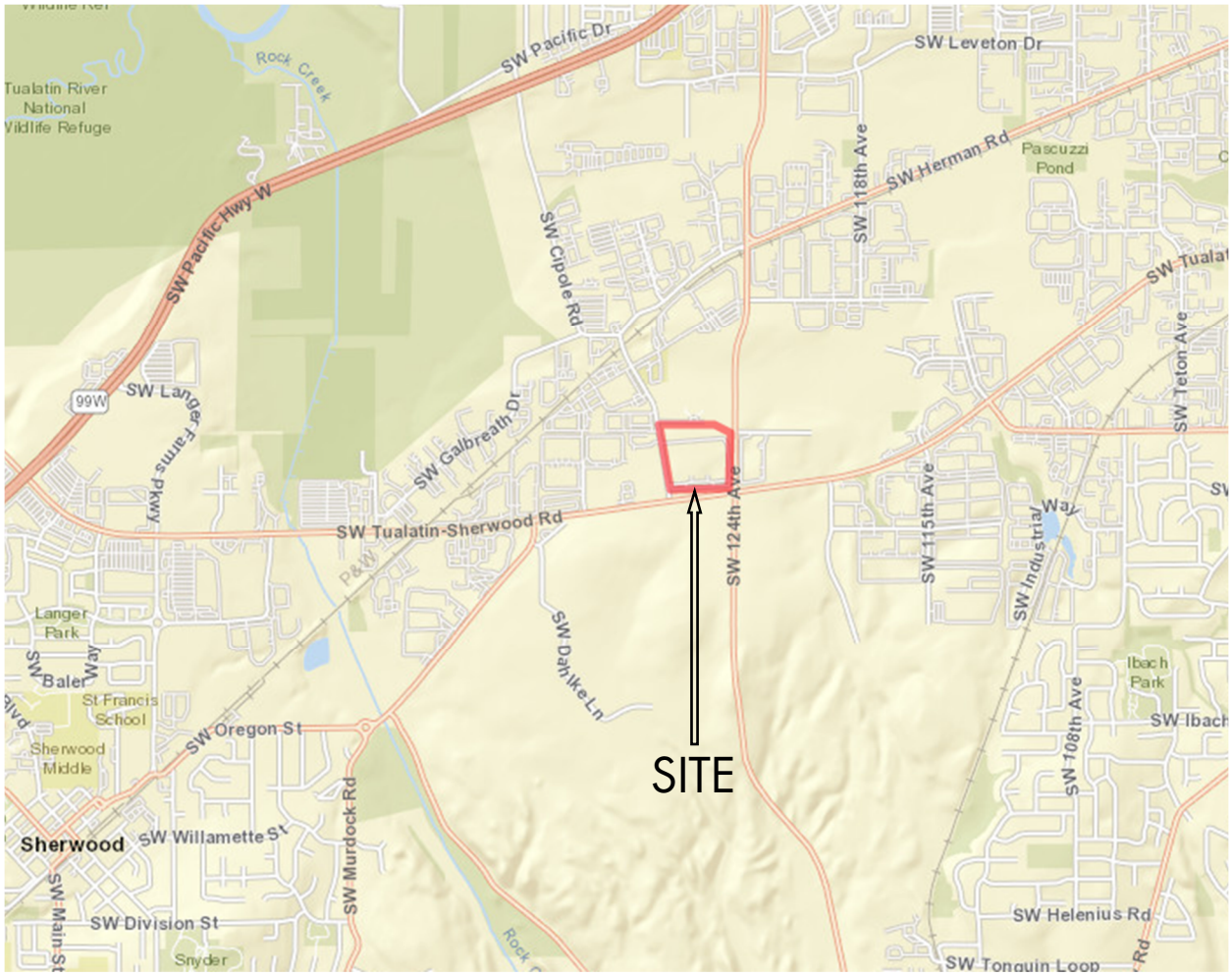
VLMK
ENGINEERING + DESIGN

Project:	CCB New Access	*Project Number:*	20220513
Project Address:	12777 SW Tualatin-Sherwood Rd Tualatin, Oregon 97062		

TABLE OF CONTENTS

I. STORMWATER REPORT

A. Site Vicinity Map



B. **Project Information**

Columbia Corrugated Box is an existing development in Tualatin, Oregon. The development was completed in two phases about 30 years ago. The current site has access from two driveways along SW Cipole Rd to the west. This project proposes to construct a new access from the east along SW 124th Ave. There is an existing driveway in the public ROW that has not been extended into the site. The new 40' access will utilize this existing driveway. This report describes the proposed stormwater management approach for these improvements.

Currently, the site's stormwater is managed by two stormwater swales, one at the northwest corner of the site and one at the northeast corner of the site, near where the new driveway will be constructed. These swales provide detention of stormwater and discharge stormwater into public stormwater mains in Cipole Rd and SW 124th Ave, respectively. This project will not impact the northwest swale. However, the northeast swale will be modified due to the location of the new driveway, as discussed further below.

Survey information for the site is from a topographic survey provided by: Northwest Surveying Inc. (1815 NW 169th Place, Suite 2090, Beaverton, OR 97006. (503)848-2127).

All stormwater facilities and conveyance systems for this development have been designed per the 2019 Clean Water Services Design & Construction Standards.

Additional design information was obtained from:

- USDA NRCS Web Soil Survey of Washington County, Oregon

Software used in design:

- HydroCAD Stormwater Modeling Software
- Microsoft Excel
- AutoCAD Civil 3D 2022

C. **Stormwater Narrative**

Onsite stormwater runoff from the new driveway will collect in a catch basin and be conveyed to an underground detention system. The catch basin will be fitted with StreamFilter cartridges manufactured by ADS to provide treatment of stormwater from pollution-generating surfaces (i.e. asphalt). The underground detention system will consist of (9) SC-740 StormTech chambers, also manufactured by ADS. The chamber system will be completely lined due to the results of infiltration testing in the area that demonstrated poorly infiltrating native soils. The treatment and detention systems were sized per CWS Design and Construction Standards. Discharge rates from storms up to the 10-year event will be reduced below pre-developed conditions as shown in the HydroCAD report in the appendix, except for the 2-year storm, as discussed below.

Per Clean Water Services section 4.03.3, this development is classified as a Low Risk, Developed, and Small. Hydromodification will be addressed via CWS C&DS 4.03.5 (b). See appendix E for a breakdown of this analysis.

D. **On-Site Stormwater Management Methodology**

Water Quality Treatment

The CWS water quality event used to size on-site water quality facilities is 0.36" developed over 4 hours. A single StreamFilter fitted in a Bayfillter CBF catch basin is sufficiently sized for the contributing basin area. The catch basin will be located at the single low point of the new driveway. Please see Basin Map in Appendix A for the location of the catch basin and delineation of the treatment area. Please see Appendix C for the sizing calculation.

Storm Quantity Control

Stormtech underground chambers are being proposed as the method for stormwater detention to meet the Clean Water Services hydromodification requirements for this project classification, as shown below.

TABLE 4-7

Post-Development Peak Runoff Rate	**Pre-Development Peak Runoff Rate Target**
2-year, 24-hour	50% of 2-year, 24-hour
5-year, 24-hour	5-year, 24 hour
10-year, 24-hour	10-year, 24-hour

Nine (9) SC-740 chambers are proposed with a flow control manhole designed with two orifices to meet the flow attenuation requirements. The manhole will have an overflow weir to allow the passage of stormwater greater than the 10-year design storm. The system will be installed with an impermeable liner due to the results of infiltration testing in the area that demonstrates the presence of poorly infiltrating native soils. Discharge from the system will be conveyed to a new public storm manhole in SW 124th Ave. Please reference the basin map in Appendix A for the system location and contributing basin area. Below is a summary of the results of the detention system design. Please see Appendix B for the HydroCAD calculations.

Flow Attenuation Summary			
	Pre-development	Post-Development	Attenuated Outflow
2 year event (2.5″)	0.00 cfs	0.09 cfs	0.01 cfs
5 year event (3.10″)	0.02 cfs	0.11 cfs	0.02 cfs
10 year event (3.45″)	0.02 cfs	0.12 cfs	0.02 cfs

Since the pre-development flow for the 2-year event is 0.00 cfs, which cannot be achieved in the post-development condition, the smallest orifice size of ½″ was used to attenuate flow up to the 2-year storm. This is allowed per Clean Water Services Design & Construction Standards Section 4.08.6(c).

Conveyance

Conveyance calculations will be provided prior to permit submittal.

Modification of Existing Swale

A portion of the existing swale at the northeast corner of the site will be partially filled in for the construction of the new driveway. To offset the reduction of storage volume, the pond will be graded and widened out along it's eastern boundary. The existing bottom of pond and top of pond surface area is 3,400 sf and 5,380 sf, respectively. The volume of the 2' storage depth is approximately 8,780 cf. The proposed bottom of pond and top of pond surface area is 3,495 sf and 5,350 sf, respectively. The resulting volume of the 2' storage depth is approximately 8,845 cf. Therefore, pond performance will not be impacted negatively. Please see the grading plan included in Appendix A. Please see Appendix F for the storage volume calculation.

II. APPENDIX

A. Onsite Basin Map

GENERAL NOTES

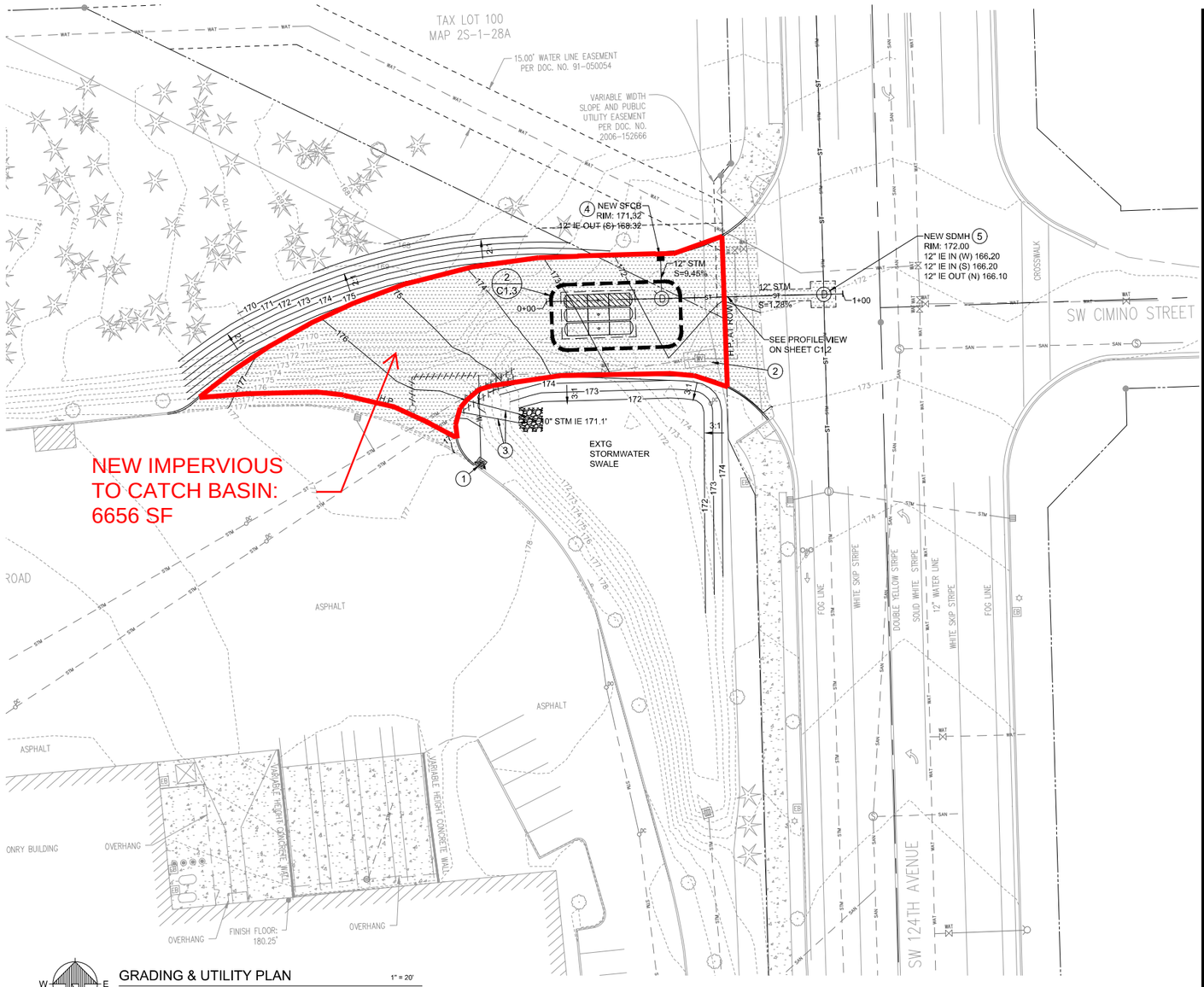
1. PRIOR TO ANY CONSTRUCTION, CONTRACTOR SHALL VERIFY EXISTING UTILITIES AND TOPOGRAPHY ARE AS SHOWN ON PLANS. WHEN ACTUAL CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
2. CONTRACTOR TO LEAVE ALL AREAS OF PROJECT FREE OF DEBRIS AND UNUSED CONSTRUCTION MATERIAL.
3. CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, SURVEYING, TESTING, PERSONNEL, TRAFFIC SAFETY CONTROL AND AS-BUILTS FOR ALL PHASES OF CONSTRUCTION.
4. CONTRACTOR SHALL COORDINATE PUBLIC IMPROVEMENTS AND INSPECTIONS WITH THE CITY OF TUALATIN
5. PROPERTY LINE BEARINGS AND DISTANCES AS WELL AS SITE AREA CALCULATIONS ARE PROVIDED FOR ZONING AND PERMIT REVIEW ONLY. REAL PROPERTY LEGAL DESCRIPTIONS AND AREA CALCULATIONS ARE TO BE PROVIDED BY A REGISTERED PROFESSIONAL SURVEYOR.
6. PROPERTY CORNER SURVEY MONUMENTS, WHICH ARE IN DANGER OF BEING DISTURBED OR DESTROYED BY THE WORK OF THIS PROJECT, SHALL BE TIED-OUT BY A REGISTERED PROFESSIONAL SURVEYOR PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, AND SHALL BE RE-SET IN ACCORDANCE WITH STATE LAW, IMMEDIATELY FOLLOWING THE COMPLETION OF ALL CONSTRUCTION
7. ADA REQUIREMENTS - ALL ACCESSIBLE ROUTES AND PARKING SPACES, AISLES, RAMPS, ETC. SHALL BE INCOMPLIANCE WITH THE CURRENT OSSC REQUIREMENTS AND ANSI-A117.1-2009 (ADAAG). ADDITIONAL DESIGN PARAMETERS:
   - 7.1. MAXIMUM RAMP SLOPE SHALL NOT EXCEED 7.5%
   - 7.2. MAXIMUM WALK CROSS-SLOPE SHALL NOT EXCEED 1.5%
   - 7.3. MAXIMUM LANDING SLOPE SHALL NOT EXCEED 1.5%
   - 7.4. NO PORTION OF ADA PARKING SPACES AND AISLES SHALL EXCEED 2.0%

GRADING NOTES

1. ATTENTION EXCAVATORS: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 811 OR 1-800-332-2344. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CALL CENTER. YOU MUST NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 811 OR 1-800-332-2344.
2. ALL NEW CONTOURS SHOWN ARE FINISH GRADES, UNLESS OTHERWISE NOTED.
3. ORGANIC AND UNDESIRABLE MATERIAL SHALL BE REMOVED FROM THE CONSTRUCTION AREA AS DIRECTED BY THE ENGINEER.
4. ALL DISTURBED AREAS NOT LANDSCAPED ARE TO BE HYDROSEEDED OR BEDDED IN STRAW TO PREVENT EROSION. SEE EROSION CONTROL PLAN, SHEET ____
5. ALL FILL AREAS SHALL BE STRIPPED OF ORGANIC MATERIAL. FILL WILL BE PLACED IN 6 TO 8-INCH LIFTS AND COMPACTED TO 95 PERCENT RELATIVE MAXIMUM DENSITY ACCORDING TO ASTM D-1557 STANDARDS. BASE ROCK IN THE PAVED AREAS WILL BE COMPACTED TO 95% ASTM D-1557. LANDSCAPED AREAS WILL BE COMPACTED TO 90 PERCENT. ADDITIONAL COMPACTION TESTS MAY BE REQUIRED BY THE CITY OR THE ENGINEER OF RECORD, IF POOR COMPACTION EFFORTS ARE OBSERVED DURING CONSTRUCTION. COMPACTION REPORTS FROM A REPUTABLE TESTING LAB WILL BE SUPPLIED TO THE ENGINEER.
6. INTERIOR SIDE SLOPES SHALL BE 3 HORIZONTAL TO 1 VERTICAL IN WATER QUALITY/DETENTION POND, TYPICAL.

UTILITY NOTES

1. ATTENTION EXCAVATORS: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 811 OR 1-800-332-2344. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CALL CENTER. YOU MUST NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 811 OR 1-800-332-2344.
2. THE WORKING DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND OR ELBOW REQUIRED OR INSTALLATION OF THE UTILITIES SHOWN. THE DRAWINGS DO NOT DEPICT EVERY DIMENSION, COMPONENT PIECE, SECTION, JOINT OR FITTING REQUIRED TO COMPLETE THE PROJECT. ALL LOCATIONS FOR WORK SHALL BE CHECKED AND COORDINATED WITH EXISTING CONDITIONS IN THE FIELD BEFORE BEGINNING CONSTRUCTION. EXISTING UNDERGROUND UTILITIES LAYING WITHIN THE LIMITS OF EXCAVATION SHALL BE VERIFIED AS TO CONDITION, SIZE AND LOCATION BY UNCOVERING, PROVIDING SUCH IS PERMITTED BY LOCAL PUBLIC AUTHORITIES WITH JURISDICTION, BEFORE BEGINNING CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY IF THERE ARE ANY DISCREPANCIES.
3. BEDDING AND PIPE ZONE BACKFILL SHALL BE PER "CITY OF TUALATIN DETAIL 241 ON SHEET C1.2.
4. CONTRACTORS SHALL CONTACT CITY OF TUALATIN PUBLIC WORKS AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION.
5. EXCAVATED SEWER TRENCH SPOIL MATERIAL SHALL BE TESTED AND LEGALLY DISPOSED OF AT A PROPER LANDFILL OR OTHER APPROPRIATE LOCATION.
6. ALL SEWER TRENCH LINES AND EXCAVATIONS SHALL BE PROPERLY SHORED AND BRACED TO PREVENT CAVING, UNUSUALLY DEEP EXCAVATIONS MAY REQUIRE EXTRA SHORING AND BRACING, ALL SHEETING, SHORING, AND BRACING OF TRENCHES SHALL CONFORM TO OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION (OSHA) REGULATIONS AND THE CITY OF CANBY STANDARD CONSTRUCTION SPECIFICATIONS.
7. CONTRACTOR SHALL NOTIFY AND COORDINATE WITH PRIVATE UTILITIES FOR RELOCATION OF CONDUITS, POWER POLES, VAULTS, PEDESTALS, ETC.
8. ALL EXISTING FACILITIES SHALL BE MAINTAINED BY THE CONTRACTOR UNLESS OTHERWISE SHOWN OR DIRECTED. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO SUPPORT, MAINTAIN, OR OTHERWISE PROTECT EXISTING UTILITIES AND OTHER FACILITIES AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL LEAVE EXISTING FACILITIES IN AN EQUAL OR BETTER-THAN-ORIGINAL CONDITION.
9. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE LOCATION, SIZE & DEPTH OF EXISTING UTILITIES. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
10. HORIZONTAL STORM AND SANITARY DRAINAGE PIPE SHALL BE PROVIDED WITH A CLEANOUT AT ITS UPPER TERMINAL AND EACH RUN OF PIPING, WHICH IS MORE THAN 100 FOOT IN TOTAL DEVELOPED LENGTH, SHALL BE PROVIDED WITH A CLEANOUT FOR EACH 100 FOOT, OR FRACTION THEREOF, IN LENGTH OF SUCH PIPING. AN ADDITIONAL CLEANOUT SHALL BE PROVIDED FOR EACH AGGREGATE HORIZONTAL CHANGE OF DIRECTION EXCEEDING 135 DEGREES. THE MAXIMUM DISTANCE ALLOWED BETWEEN MANHOLES IS 300 FEET. ALL REQUIRED CLEANOUTS MAY NOT BE LOCATED ON PLAN.
11. PRIVATE STORM SEWER LINES, DENOTED "STM" OR "ST", SHALL BE PVC 3034, PVC C900, PVC C905, HDPE, CL52 DIP OR APPROVED EQUIVALENT, UNLESS OTHERWISE NOTED. ALL STORM PIPING SHOWN HAS BEEN SIZED FOR A MANNING'S "N" VALUE = 0.013 AND PIPE INVERTS HAVE BEEN DESIGNED USING CONCENTRIC PIPE TO PIPE AND WYE FITTINGS, UNLESS OTHERWISE NOTED.
12. ALL STORM LATERALS SHALL HAVE #10 GAUGE COPPER WIRE OR TRACER TAPE AT 1.5-FT TO 2.0-FT ABOVE THE LATERAL.
13. ALL DOMESTIC (POTABLE) WATER SERVICE LINES OUTSIDE OF THE BUILDING DENOTED "DW" SHALL BE SCHEDULE 40 PVC OR PVC C900 CL150 UNLESS OTHERWISE NOTED. FIRE WATER SERVICE LINES OUTSIDE OF THE BUILDING DENOTED, "FW", "FDC" SHALL BE PVC C900 CL150 UNLESS OTHERWISE NOTED.
14. CONCRETE THRUST BLOCKING AND/OR MECHANICAL RESTRAINTS ("MEGA-LUG" OR EQUIVALENT) SHALL BE PROVIDED AT ALL WATERLINE FITTINGS AS REQUIRED BY THE CITY OF CANBY. BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH AND CLEAR OF JOINT ACCESSORIES. BEARING AREA OF THRUST BLOCK SHALL BE COMPUTED ON THE BASIS OF ALLOWABLE SOIL BEARING PRESSURE. SEE DETAIL SHEET C2.2.
15. MINIMUM COVER OVER WATERLINES IS TO BE 36 INCHES AS MEASURED FROM FINISH GRADE TO TOP OF PIPE. MINIMUM VERTICAL SEPARATION BETWEEN WATERLINE AND SANITARY SEWER AT A CROSSING IS 18 INCHES. SANITARY SEWER AT WATERLINE CROSSINGS WITH LESS THAN THE MINIMUM VERTICAL SEPARATION SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE WITH WATERTIGHT JOINTS. IN SUCH CASES THE 18-FOOT LENGTH OF SANITARY SEWER SHALL BE CENTERED AT THE CROSSING.
16. PRIOR TO BEING PLACED IN SERVICE, THE WATERLINE AND SERVICES SHALL BE FLUSHED, STERILIZED, AND RE-FLUSHED, ALL IN ACCORDANCE WITH THE CITY OF TUALATIN "PUBLIC WORKS CONSTRUCTION CODE." CITY CREWS WILL TAKE BACTERIOLOGICAL TESTS WHEN SO REQUESTED BY THE CONTRACTOR INSTALLING WATER MAINS. THE REQUEST FOR THESE TESTS SHALL BE MADE THROUGH THE CITY INSPECTOR.
17. PRIOR TO CONSTRUCTION, ALL ON-SITE FIRE WATER SYSTEM LINE SIZES, METER SIZES, DOUBLE CHECK DETECTOR ASSEMBLY (DCDA) SIZES, AND OTHER APPURTENANCES SHOWN ON THE UTILITY PLAN SHALL BE VERIFIED BY THE FIRE PROTECTION ENGINEER FOR THE PROJECT. ANALYSIS OF THE SYSTEM SHALL BE FROM THE NEW FACILITY SERVICE TO THE POINT OF CONNECTION WITH THE PUBLIC WATER SYSTEM. THE MAKES AND MODELS OF ALL SYSTEM COMPONENTS SHALL BE ACCEPTABLE PER WATER DISTRICT LIST OF APPROVED COMPONENTS.



N W E S

GRADING & UTILITY PLAN 1" = 20'

20 0 20 40 60

GRADING SYMBOLS

- NEW ASPHALT PAVING AS NOTED SEE SHEET C1.0 FOR PAVEMENT SECTION
- 140 EXISTING CONTOUR LINE
- 144 NEW CONTOUR LINE
- 142.84 EG EXISTING SPOT ELEVATION
- 143.40 FG NEW SPOT ELEVATION PROVIDE STAKE.

UTILITY SYMBOLS

- SA / ST SANITARY - EXISTING / STORM - EXIST
- ST SOLID WALL STORM - NEW
- ST PERFORATED STORM - NEW
- G GAS - EXISTING
- T TELEPHONE - EXISTING
- E ELECTRICAL - EXISTING
- W WATER - EXISTING
- W WATER - NEW
- DW DOMESTIC WATER - NEW
- FW FIRE WATER - NEW
- FDC FDC SERVICE LINE - NEW

KEYNOTES

1. RELOCATE EXISTING HYDRANT AND INSTALL PER DETAIL 610 ON SHEET C1.2
2. INSTALL H20 TRAFFIC RATED LID ON EXISTING WATER VAULT. ENSURE LID MATCHES FINISH GRADE.
3. RE-ROUTE EXISTING 10" STORM DRAIN OUTFALLS AS SHOWN. INSTALL RIP-RAP PER DETAIL 3/C1.2.
4. NEW STREAMFILTER TREATMENT CATCH BASIN PER DETAIL 4/C1.3
5. NEW STORM MANHOLE PER CITY DETAIL 011 ON SHEET C1.2.

NOTICE TO EXCAVATORS:
ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.
(NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-232-1987).

POTENTIAL UNDERGROUND FACILITY OWNERS

Dig Safely.

Call the Oregon One-Call Center
DIAL 811 or 1-800-332-2344

VLMK
ENGINEERING + DESIGN
3933 S Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

PROJECT NAME
COLUMBIA CORRUGATED BOX
SW 124TH ACCESS

12777 SW Tualatin Sherwood Road
Tualatin, Oregon 97062

REVISIONS

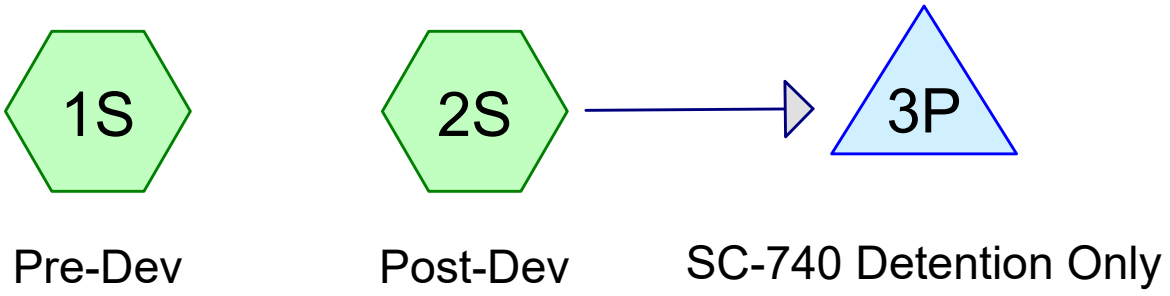
	DATE	DESCRIPTION

DATE	APRIL 2022
SCALE	AS NOTED
PROJ. NO.	20220513
DRAWN	ZWA
CHECKED	BMD

GRADING & UTILITY PLAN

C1.1

B. **Onsite Flow Attenuation: HydroCAD Calculations**



Subcat Reach Pond Link

Routing Diagram for 20220513 Storm
Prepared by VLMK Engineers, Printed 4/21/2023

Summary for Subcatchment 1S: Pre-Dev

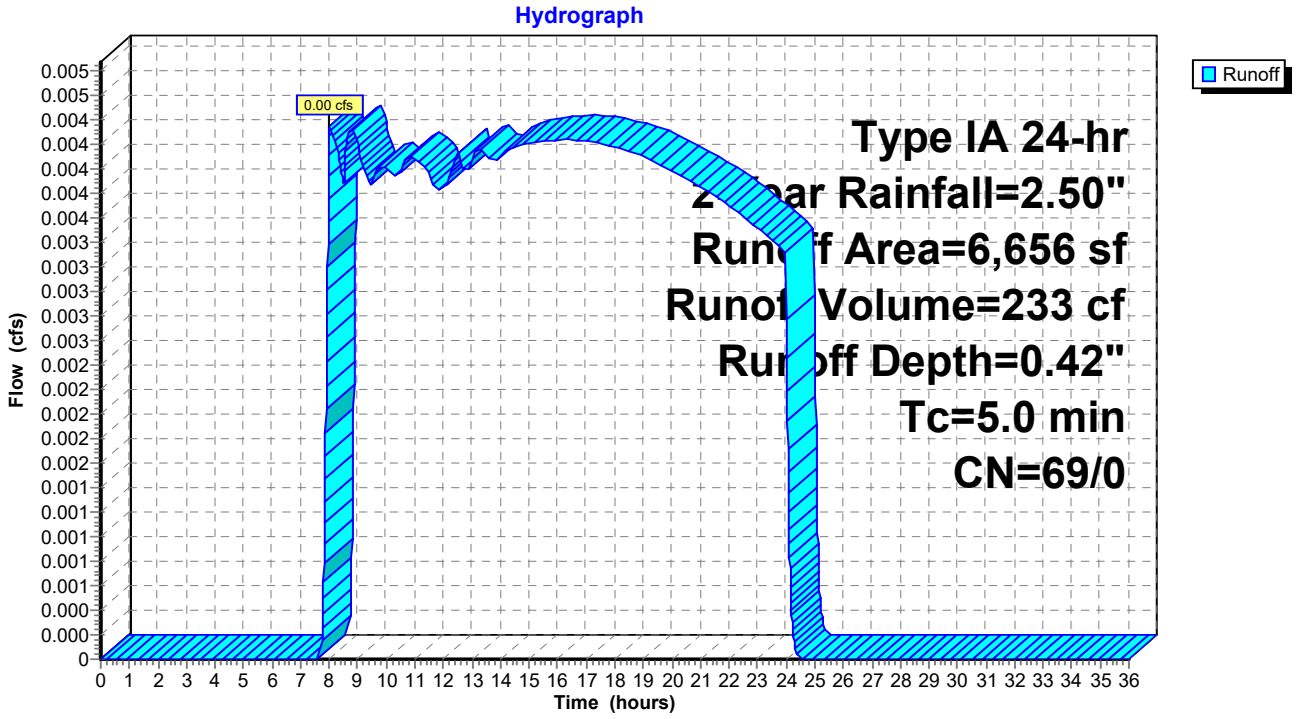
Runoff = 0.00 cfs @ 8.01 hrs, Volume= 233 cf, Depth= 0.42"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
6,656	69	50-75% Grass cover, Fair, HSG B
6,656	69	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment 1S: Pre-Dev



Summary for Subcatchment 2S: Post-Dev

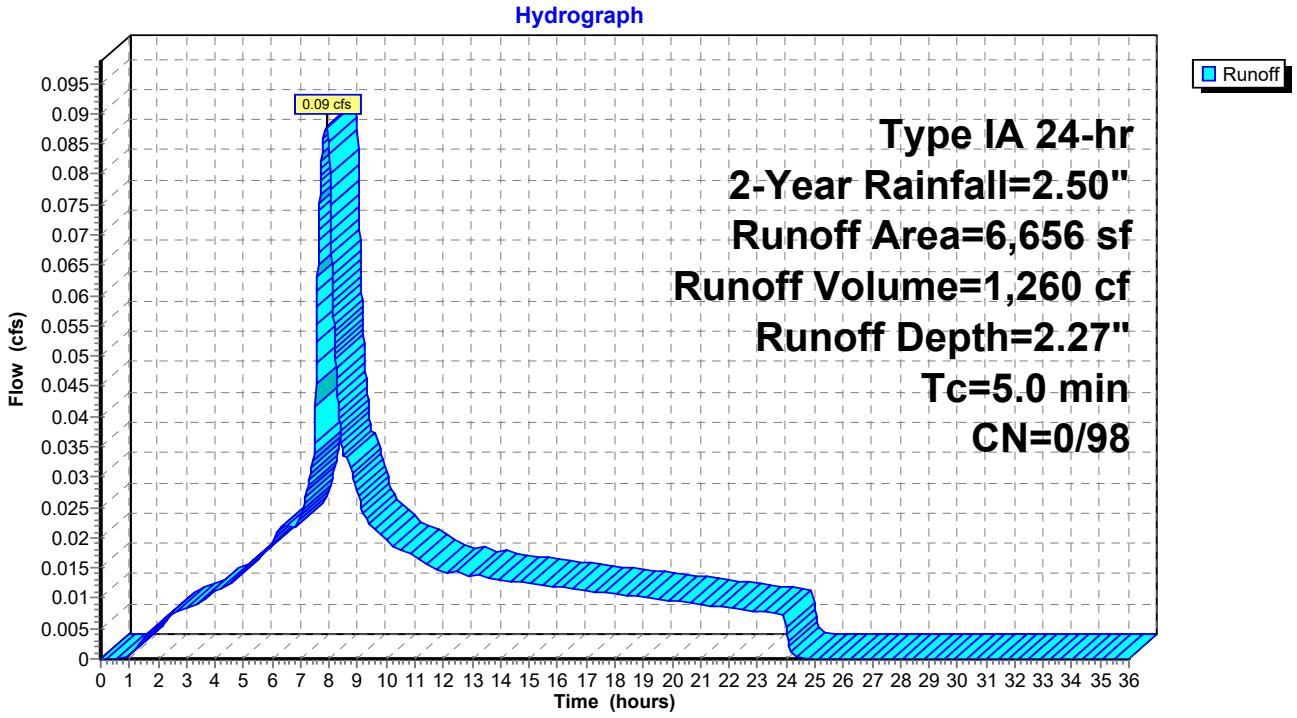
Runoff = 0.09 cfs @ 7.88 hrs, Volume= 1,260 cf, Depth= 2.27"
Routed to Pond 3P : SC-740 Detention Only

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	6,656	98	Impervious
	6,656	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment 2S: Post-Dev



Summary for Pond 3P: SC-740 Detention Only

Inflow Area = 6,656 sf,100.00% Impervious, Inflow Depth = 2.27" for 2-Year event
Inflow = 0.09 cfs @ 7.88 hrs, Volume= 1,260 cf
Outflow = 0.01 cfs @ 18.81 hrs, Volume= 1,024 cf, Atten= 88%, Lag= 655.9 min
Primary = 0.01 cfs @ 18.81 hrs, Volume= 1,024 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 169.46' @ 18.81 hrs Surf.Area= 393 sf Storage= 617 cf

Plug-Flow detention time= 643.2 min calculated for 1,023 cf (81% of inflow)
Center-of-Mass det. time= 517.9 min (1,190.5 - 672.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	167.00'	385 cf	**15.75'W x 24.98'L x 3.50'H Field A** 1,377 cf Overall - 413 cf Embedded = 963 cf x 40.0% Voids
#2A	167.50'	413 cf	**ADS_StormTech SC-740 +Cap** x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
		799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	**0.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	169.47'	**0.8" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	170.05'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.01 cfs @ 18.81 hrs HW=169.46' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.01 cfs @ 7.52 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=167.00' (Free Discharge)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: SC-740 Detention Only - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

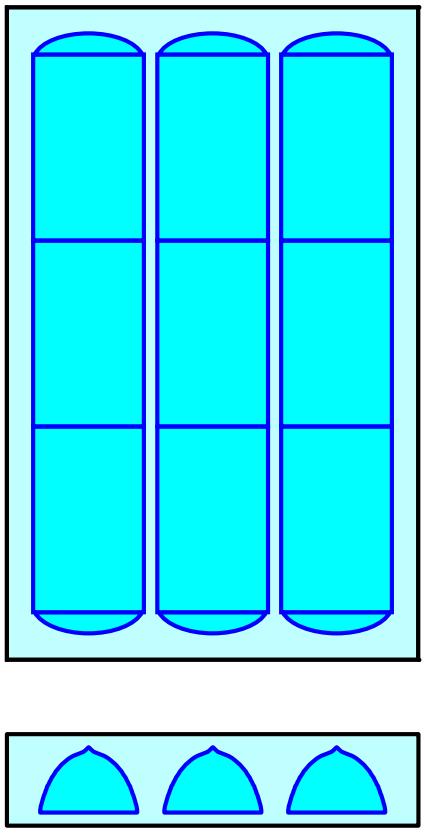
3 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 22.98' Row Length +12.0" End Stone x 2 = 24.98' Base Length
3 Rows x 51.0" Wide + 6.0" Spacing x 2 + 12.0" Side Stone x 2 = 15.75' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

9 Chambers x 45.9 cf = 413.5 cf Chamber Storage

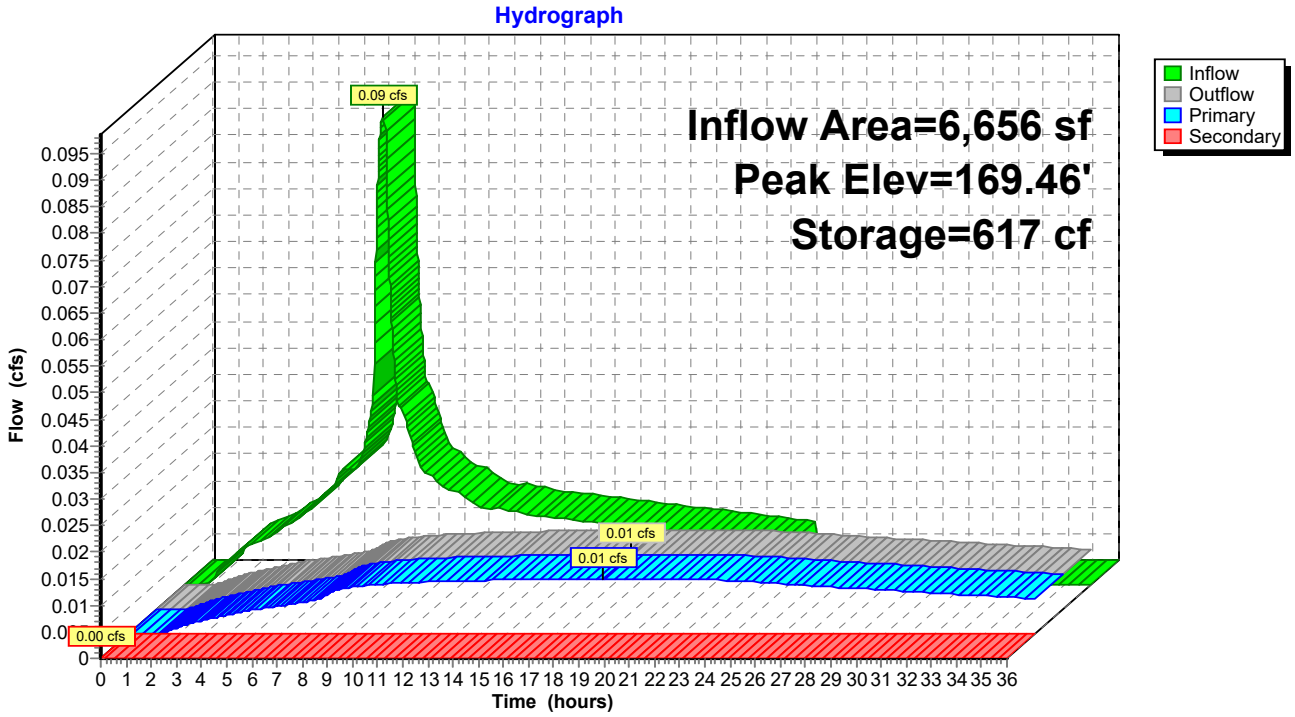
1,376.8 cf Field - 413.5 cf Chambers = 963.4 cf Stone x 40.0% Voids = 385.4 cf Stone Storage

Chamber Storage + Stone Storage = 798.8 cf = 0.018 af
Overall Storage Efficiency = 58.0%
Overall System Size = 24.98' x 15.75' x 3.50'

9 Chambers
51.0 cy Field
35.7 cy Stone



Pond 3P: SC-740 Detention Only



Summary for Subcatchment 1S: Pre-Dev

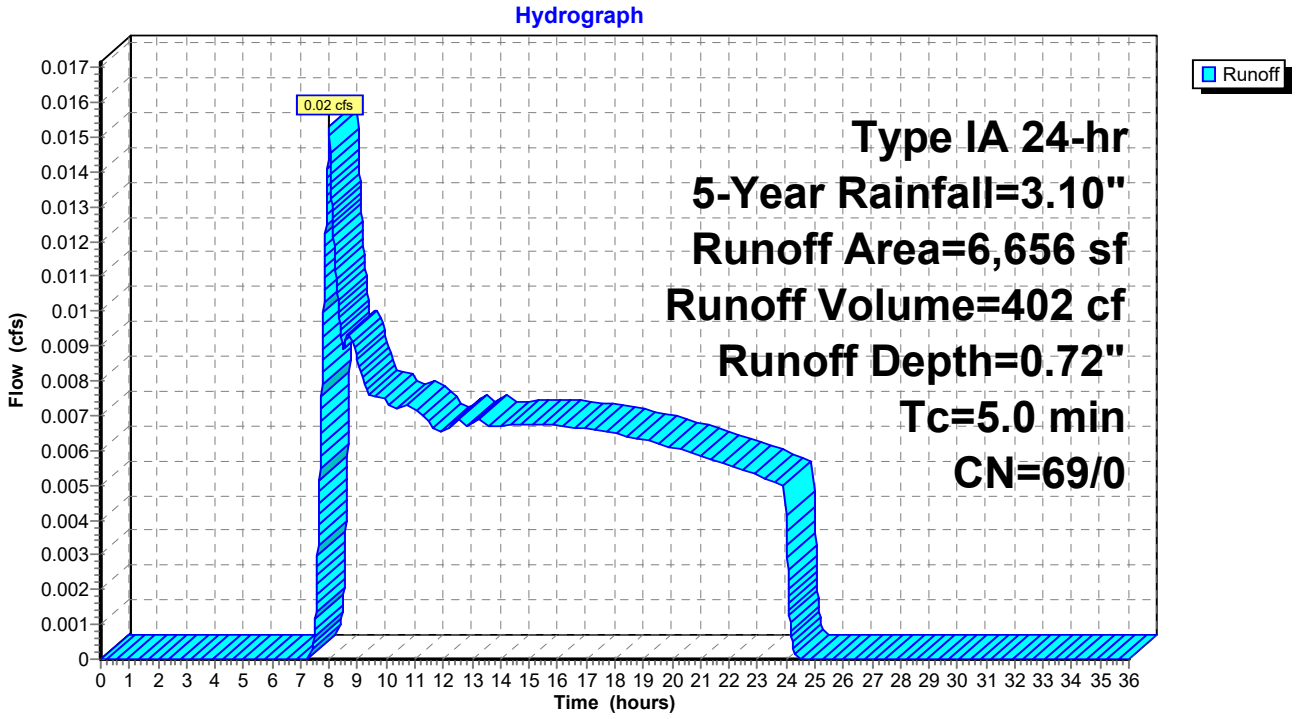
Runoff = 0.02 cfs @ 8.00 hrs, Volume= 402 cf, Depth= 0.72"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type IA 24-hr 5-Year Rainfall=3.10"

Area (sf)	CN	Description
6,656	69	50-75% Grass cover, Fair, HSG B
6,656	69	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment 1S: Pre-Dev



Summary for Subcatchment 2S: Post-Dev

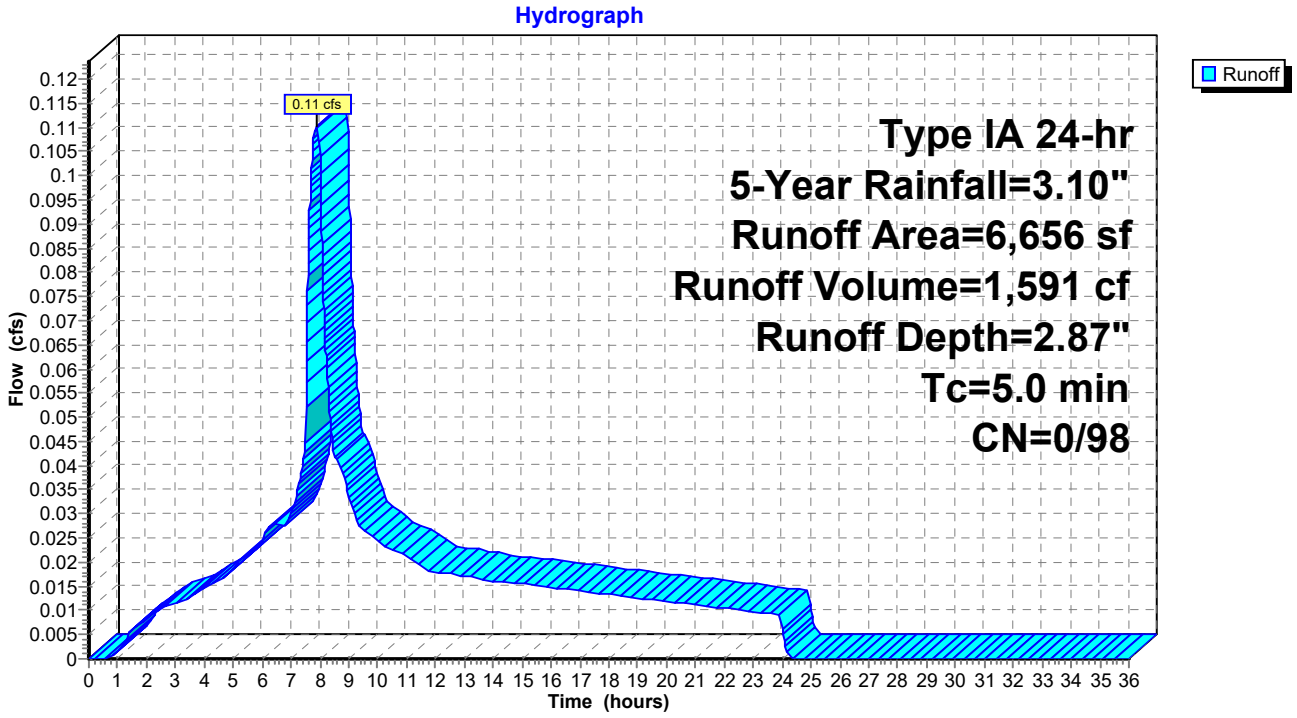
Runoff = 0.11 cfs @ 7.88 hrs, Volume= 1,591 cf, Depth= 2.87"
Routed to Pond 3P : SC-740 Detention Only

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type IA 24-hr 5-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	6,656	98	Impervious
	6,656	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment 2S: Post-Dev



Summary for Pond 3P: SC-740 Detention Only

Inflow Area = 6,656 sf,100.00% Impervious, Inflow Depth = 2.87" for 5-Year event
Inflow = 0.11 cfs @ 7.88 hrs, Volume= 1,591 cf
Outflow = 0.02 cfs @ 11.52 hrs, Volume= 1,336 cf, Atten= 83%, Lag= 218.4 min
Primary = 0.02 cfs @ 11.52 hrs, Volume= 1,336 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 169.75' @ 11.52 hrs Surf.Area= 393 sf Storage= 677 cf

Plug-Flow detention time= 555.4 min calculated for 1,336 cf (84% of inflow)
Center-of-Mass det. time= 445.1 min (1,111.2 - 666.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	167.00'	385 cf	**15.75'W x 24.98'L x 3.50'H Field A** 1,377 cf Overall - 413 cf Embedded = 963 cf x 40.0% Voids
#2A	167.50'	413 cf	**ADS_StormTech SC-740 +Cap** x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
		799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	**0.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	169.47'	**0.8" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	170.05'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.02 cfs @ 11.52 hrs HW=169.75' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.01 cfs @ 7.95 fps)
└**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 2.38 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=167.00' (Free Discharge)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: SC-740 Detention Only - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

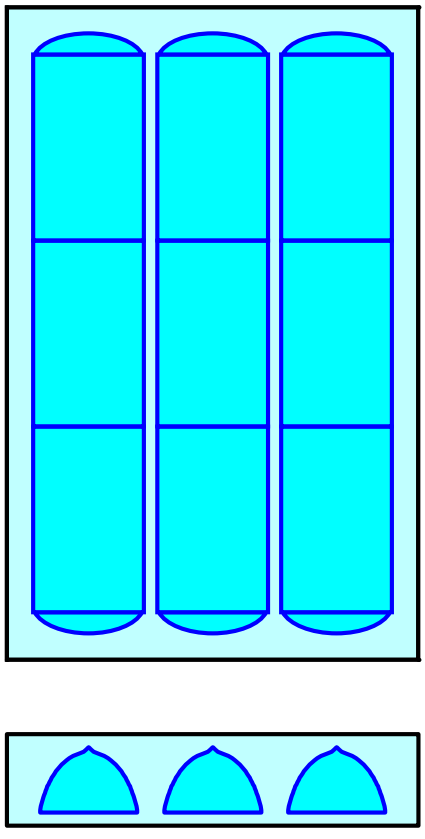
3 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 22.98' Row Length +12.0" End Stone x 2 = 24.98' Base Length
3 Rows x 51.0" Wide + 6.0" Spacing x 2 + 12.0" Side Stone x 2 = 15.75' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

9 Chambers x 45.9 cf = 413.5 cf Chamber Storage

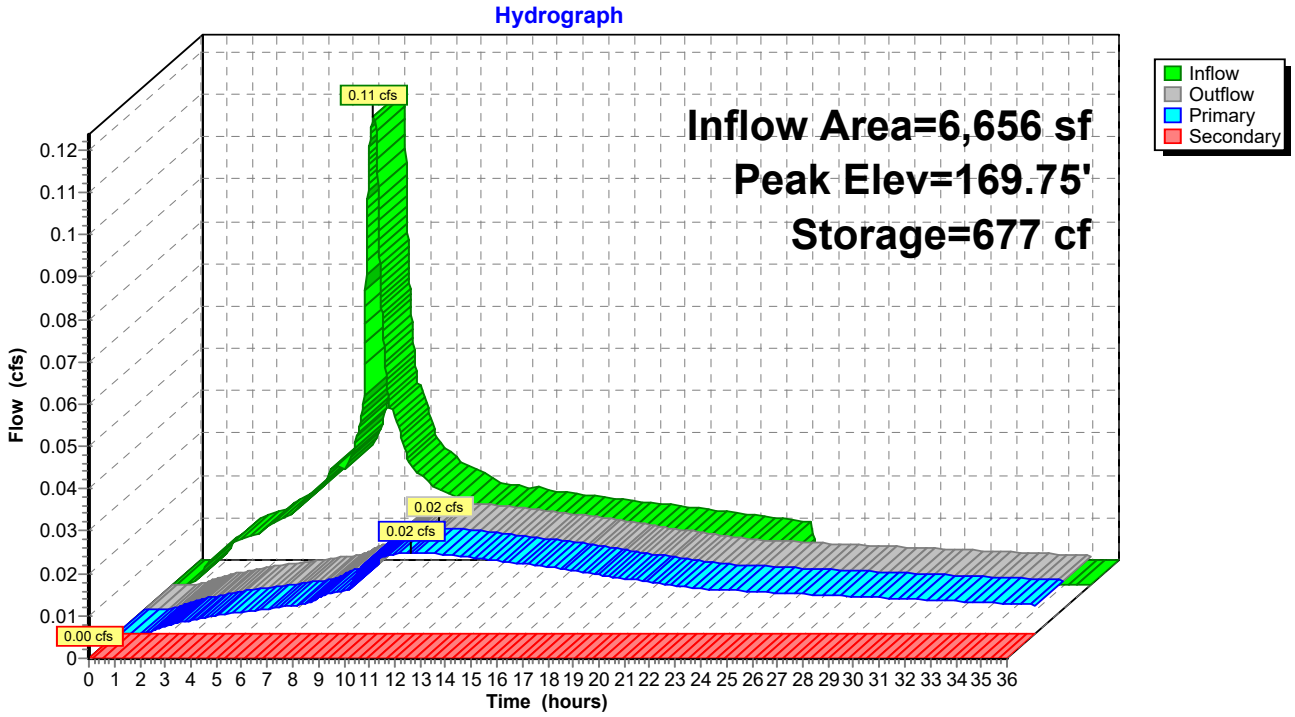
1,376.8 cf Field - 413.5 cf Chambers = 963.4 cf Stone x 40.0% Voids = 385.4 cf Stone Storage

Chamber Storage + Stone Storage = 798.8 cf = 0.018 af
Overall Storage Efficiency = 58.0%
Overall System Size = 24.98' x 15.75' x 3.50'

9 Chambers
51.0 cy Field
35.7 cy Stone



Pond 3P: SC-740 Detention Only



Summary for Subcatchment 1S: Pre-Dev

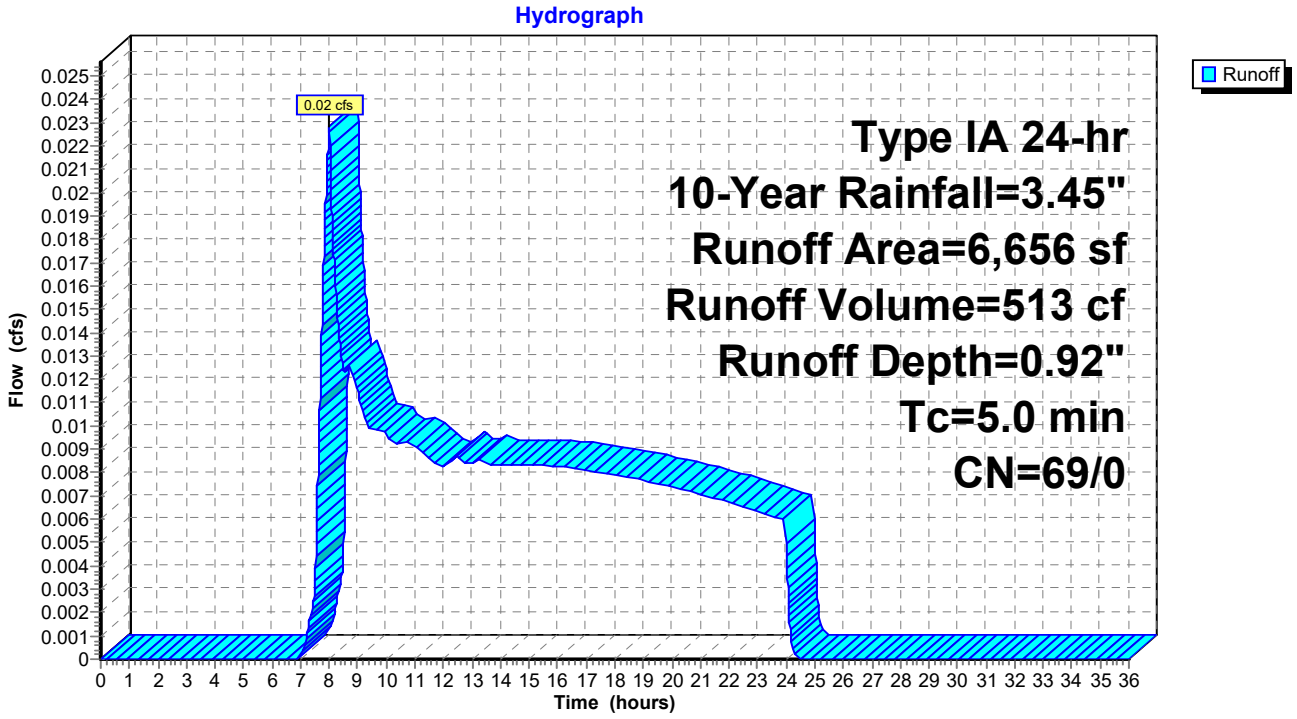
Runoff = 0.02 cfs @ 8.00 hrs, Volume= 513 cf, Depth= 0.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
6,656	69	50-75% Grass cover, Fair, HSG B
6,656	69	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment 1S: Pre-Dev



Summary for Subcatchment 2S: Post-Dev

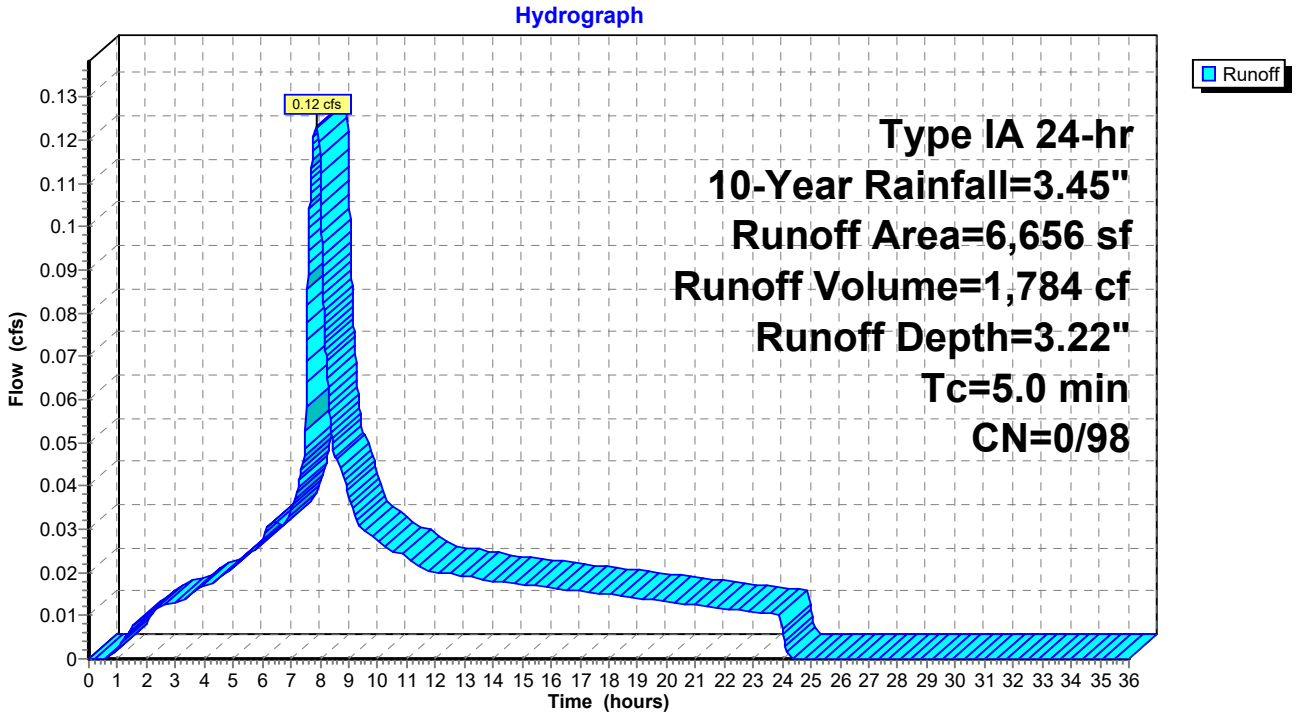
Runoff = 0.12 cfs @ 7.88 hrs, Volume= 1,784 cf, Depth= 3.22"
Routed to Pond 3P : SC-740 Detention Only

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10-Year Rainfall=3.45"

	Area (sf)	CN	Description
*	6,656	98	Impervious
	6,656	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment 2S: Post-Dev



Summary for Pond 3P: SC-740 Detention Only

Inflow Area = 6,656 sf,100.00% Impervious, Inflow Depth = 3.22" for 10-Year event
Inflow = 0.12 cfs @ 7.88 hrs, Volume= 1,784 cf
Outflow = 0.02 cfs @ 11.01 hrs, Volume= 1,525 cf, Atten= 81%, Lag= 187.9 min
Primary = 0.02 cfs @ 11.01 hrs, Volume= 1,525 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 170.03' @ 11.01 hrs Surf.Area= 393 sf Storage= 724 cf

Plug-Flow detention time= 513.0 min calculated for 1,525 cf (85% of inflow)
Center-of-Mass det. time= 412.0 min (1,075.2 - 663.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	167.00'	385 cf	**15.75'W x 24.98'L x 3.50'H Field A** 1,377 cf Overall - 413 cf Embedded = 963 cf x 40.0% Voids
#2A	167.50'	413 cf	**ADS_StormTech SC-740 +Cap** x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
		799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	**0.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	169.47'	**0.8" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	170.05'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.02 cfs @ 11.01 hrs HW=170.03' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.35 fps)
└**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 3.48 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=167.00' (Free Discharge)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: SC-740 Detention Only - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

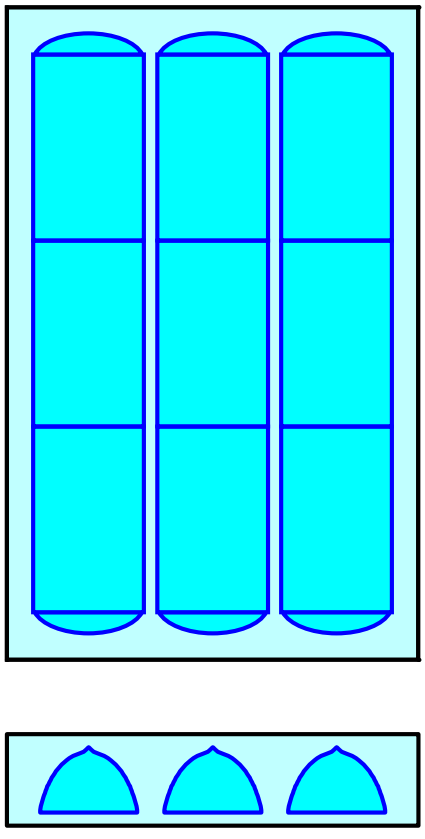
3 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 22.98' Row Length +12.0" End Stone x 2 = 24.98' Base Length
3 Rows x 51.0" Wide + 6.0" Spacing x 2 + 12.0" Side Stone x 2 = 15.75' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

9 Chambers x 45.9 cf = 413.5 cf Chamber Storage

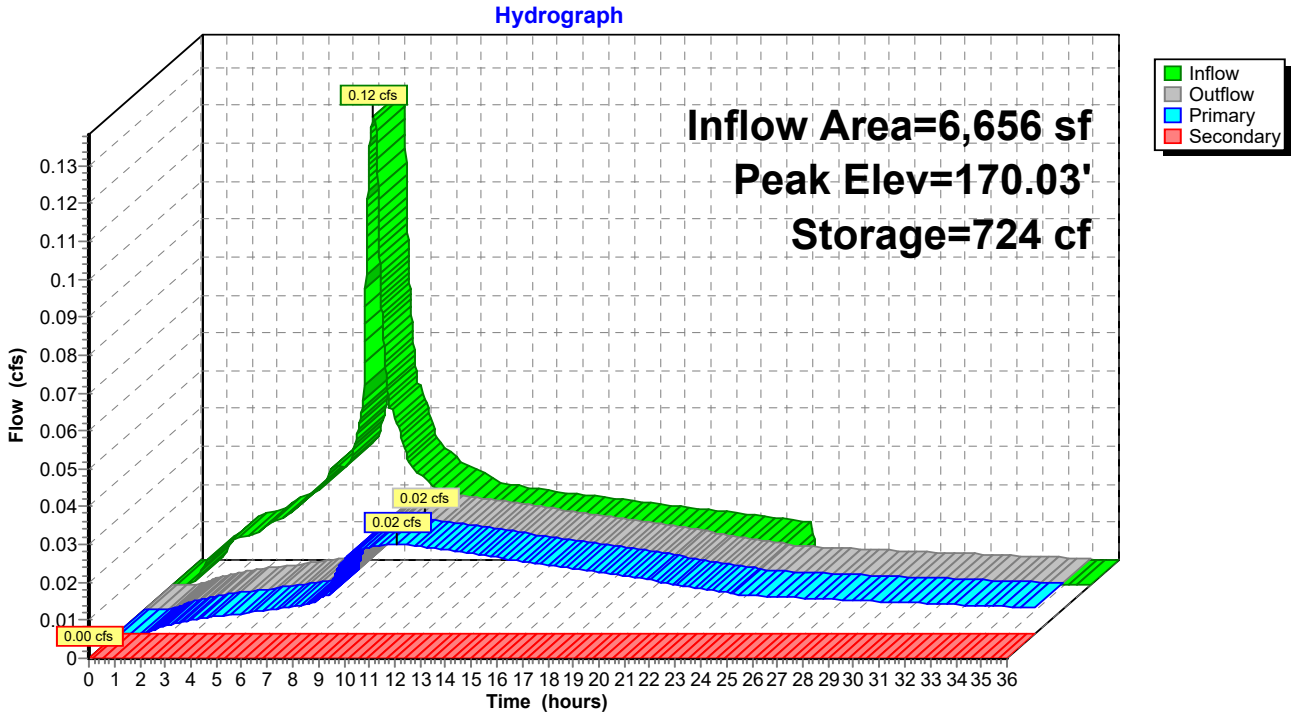
1,376.8 cf Field - 413.5 cf Chambers = 963.4 cf Stone x 40.0% Voids = 385.4 cf Stone Storage

Chamber Storage + Stone Storage = 798.8 cf = 0.018 af
Overall Storage Efficiency = 58.0%
Overall System Size = 24.98' x 15.75' x 3.50'

9 Chambers
51.0 cy Field
35.7 cy Stone



Pond 3P: SC-740 Detention Only



Summary for Subcatchment 1S: Pre-Dev

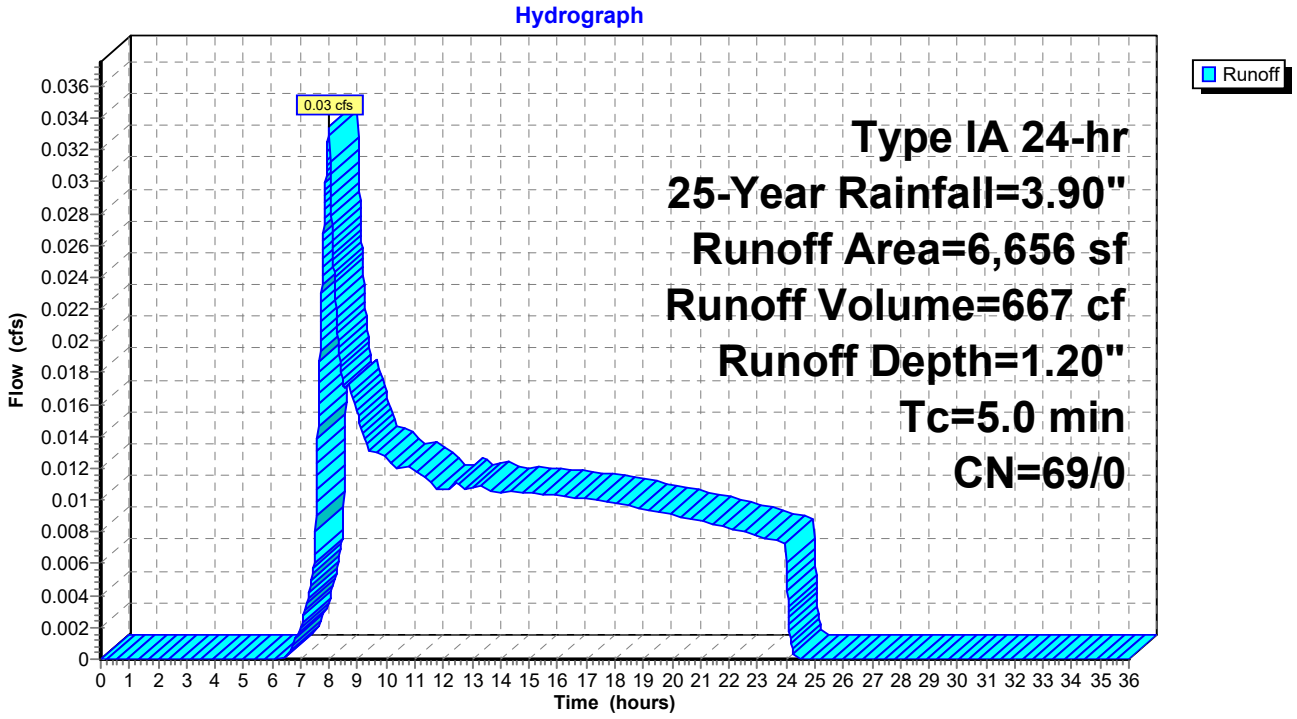
Runoff = 0.03 cfs @ 8.00 hrs, Volume= 667 cf, Depth= 1.20"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
6,656	69	50-75% Grass cover, Fair, HSG B
6,656	69	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment 1S: Pre-Dev



Summary for Subcatchment 2S: Post-Dev

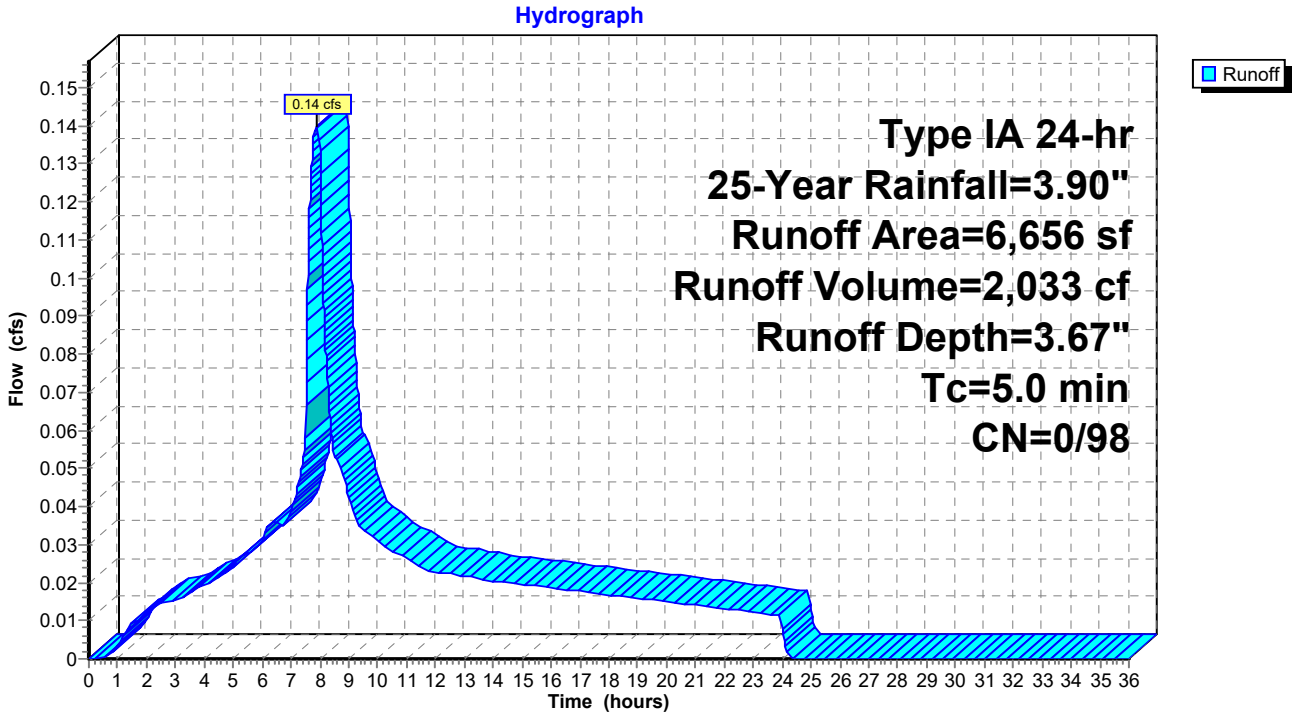
Runoff = 0.14 cfs @ 7.88 hrs, Volume= 2,033 cf, Depth= 3.67"
Routed to Pond 3P : SC-740 Detention Only

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	6,656	98	Impervious
	6,656	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment 2S: Post-Dev



Summary for Pond 3P: SC-740 Detention Only

Inflow Area = 6,656 sf,100.00% Impervious, Inflow Depth = 3.67" for 25-Year event
Inflow = 0.14 cfs @ 7.88 hrs, Volume= 2,033 cf
Outflow = 0.05 cfs @ 8.61 hrs, Volume= 1,770 cf, Atten= 62%, Lag= 43.8 min
Primary = 0.02 cfs @ 8.61 hrs, Volume= 1,665 cf
Secondary = 0.03 cfs @ 8.61 hrs, Volume= 105 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 170.06' @ 8.61 hrs Surf.Area= 393 sf Storage= 730 cf

Plug-Flow detention time= 462.0 min calculated for 1,770 cf (87% of inflow)
Center-of-Mass det. time= 370.7 min (1,030.9 - 660.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	167.00'	385 cf	**15.75'W x 24.98'L x 3.50'H Field A** 1,377 cf Overall - 413 cf Embedded = 963 cf x 40.0% Voids
#2A	167.50'	413 cf	**ADS_StormTech SC-740 +Cap** x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
		799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	**0.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	169.47'	**0.8" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	170.05'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.02 cfs @ 8.61 hrs HW=170.06' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.40 fps)
—**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 3.60 fps)

Secondary OutFlow Max=0.02 cfs @ 8.61 hrs HW=170.06' (Free Discharge)
↑—**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.02 cfs @ 0.37 fps)

Pond 3P: SC-740 Detention Only - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech®SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

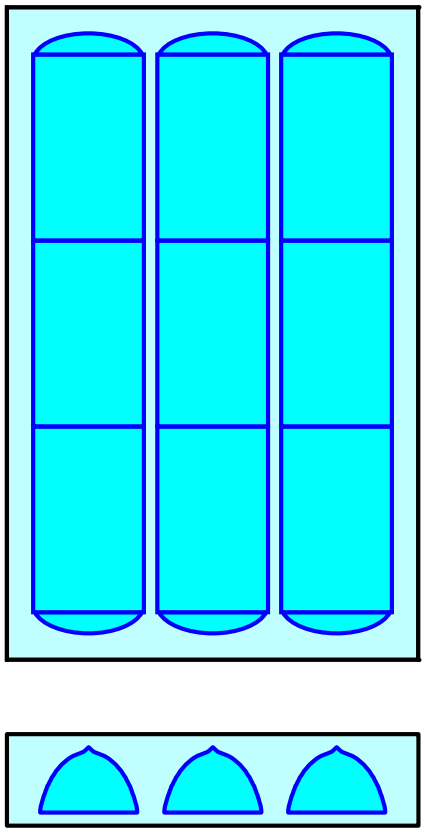
3 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 22.98' Row Length +12.0" End Stone x 2 = 24.98' Base Length
3 Rows x 51.0" Wide + 6.0" Spacing x 2 + 12.0" Side Stone x 2 = 15.75' Base Width
6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

9 Chambers x 45.9 cf = 413.5 cf Chamber Storage

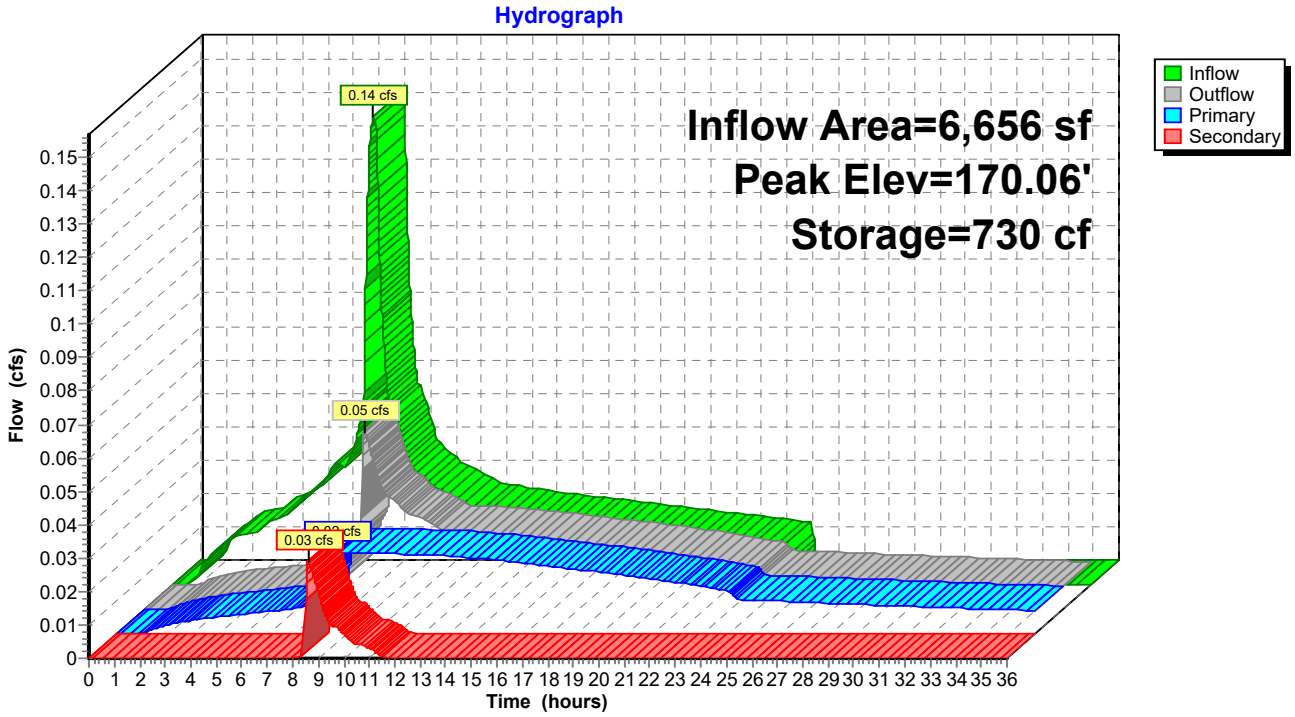
1,376.8 cf Field - 413.5 cf Chambers = 963.4 cf Stone x 40.0% Voids = 385.4 cf Stone Storage

Chamber Storage + Stone Storage = 798.8 cf = 0.018 af
Overall Storage Efficiency = 58.0%
Overall System Size = 24.98' x 15.75' x 3.50'

9 Chambers
51.0 cy Field
35.7 cy Stone



Pond 3P: SC-740 Detention Only



C. **Onsite Water Quality Treatment Sizing Calculations**

VLMK ENGINEERING + DESIGN

Project: Project Name *Job #:* 20220513 *By:* Init's ZWA *Date:* 04-21-2023 *Sheet #:*

Water Quality Calculations

Based on the CWS December 2019 Design and Construction Standards

Treat Using ADS BayFilter Catch Basin Units:
Each Cartridge Treats 25 gpm (0.055 cfs)

(Filter Unit Name) 6,556 sf of Impervious Surface Area

Water Quality Volume (V_{wq}):

V_{wq} = Impervious Area • 0.36"

V_{wq} = 6,556 sf • 0.36 in • 1/12 ft/in

V_{wq} = 197 cf

Water Quality Flowrate (Q_{wq}):

$Q_{wq} = V_{wq} / Time$ Time = 4 hours

Q_{wq} = 0.014 cfs < 0.055 cfs

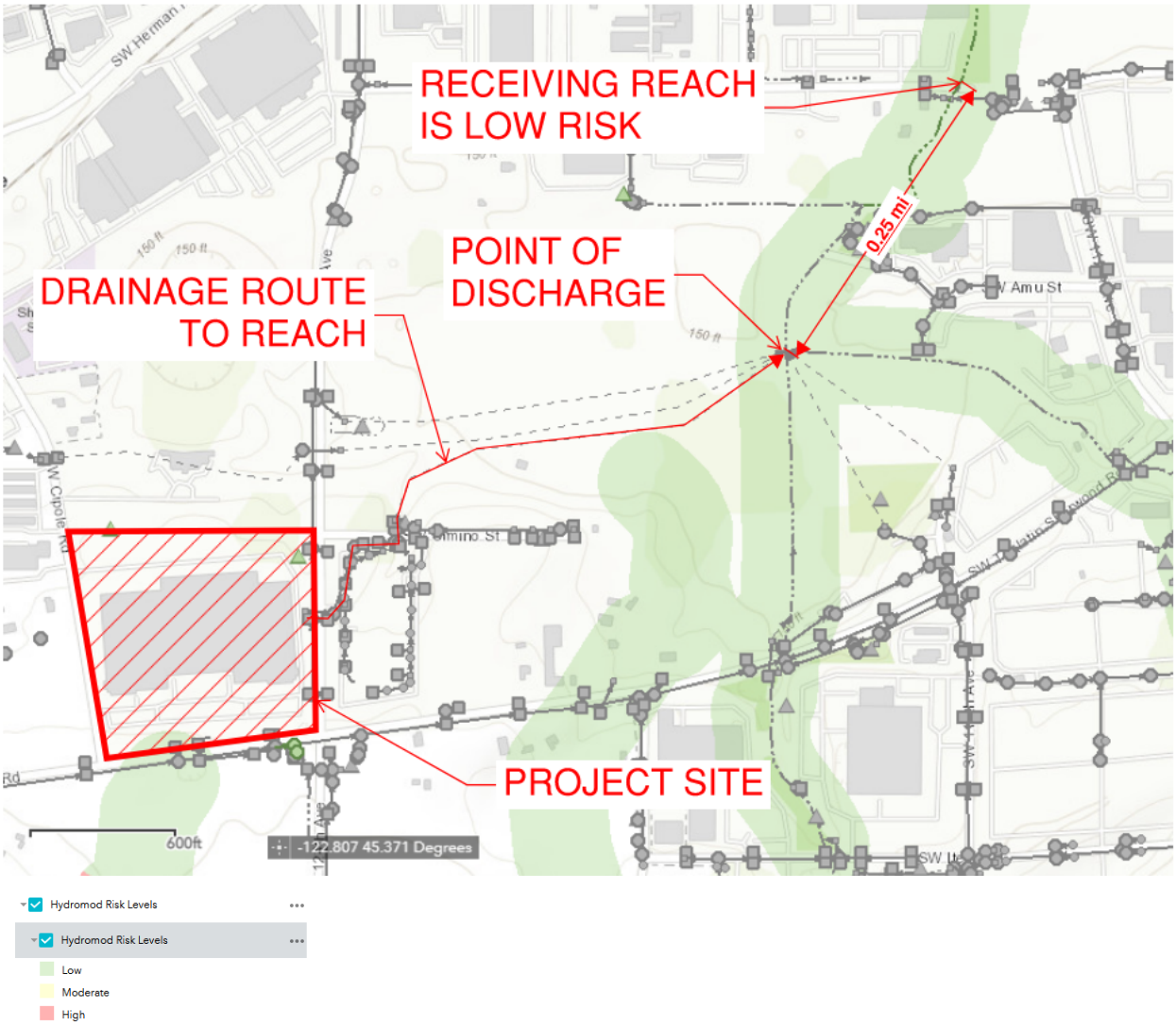
Use One Cartridge Catch Basin Unit(s)

Water Quality Requirements Met

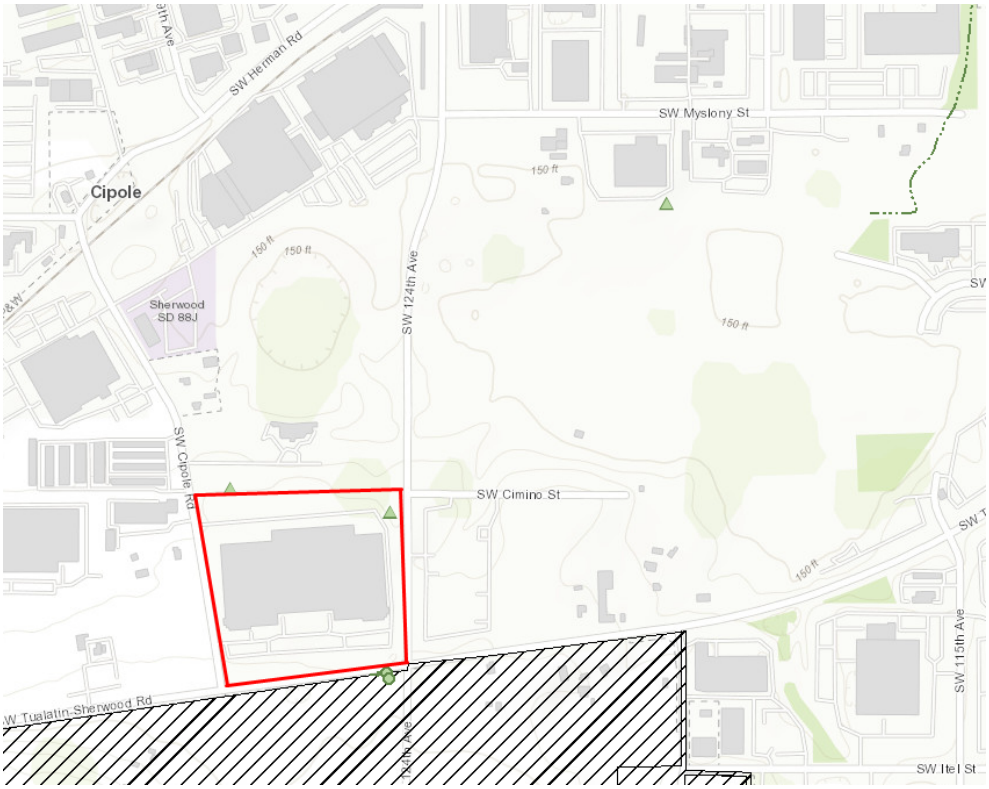
D. **Onsite Conveyance Calculations (To be provided later)**

E. **Onsite Hydromodification Analysis**

Starting with CWS Design and Construction Standards, section 4.03.3:
Using the CWS public Sanitary and Storm sewer map:



Per 4.03.3.a.3, the receiving reach is ¼ mile past the point of discharge, which as shown on the above map is green, and therefore the site is **Low Risk.**



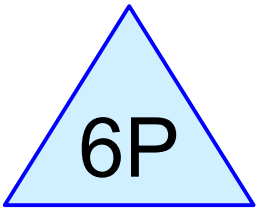
Using 4.03.3(b), the project site is not within the expansion areas, and is therefore designated as a **Developed Area:**

The proposed project will install ~6,580 SF of new impervious area. No existing impervious area will be modified. Per 4.03.3 (c), this will be **Project Size Category: Small**

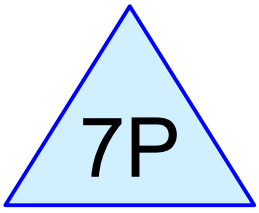
A) Small: 1,000 to 12,000 square feet
B) Medium: over 12,000 to 80,000 square feet
C) Large: over 80,000 square feet and larger

Therefore, the project will be Low Risk, Developed, and Small → **Category 1:**

F. **Stormwater Swale Volume Calculation**



Extg Storm Swale
(Volume Calc Only)



Proposed Storm Swale
(Volume Calc Only)

Subcat Reach Pond Link

Summary for Pond 6P: Extg Storm Swale (Volume Calc Only)

[43] Hint: Has no inflow (Outflow=Zero)

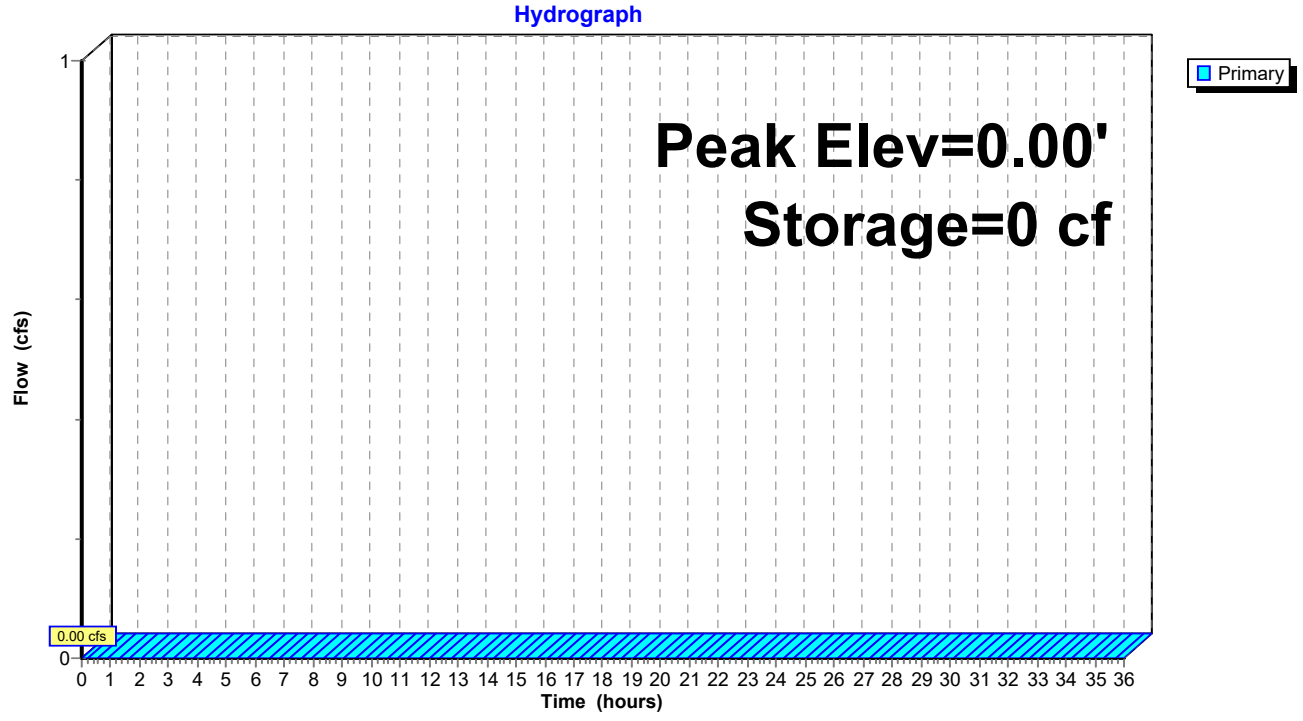
Volume	Invert	Avail.Storage	Storage Description
#1	172.00'	8,780 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
172.00	3,400	0	0
174.00	5,380	8,780	8,780

Device	Routing	Invert	Outlet Devices
#1	Primary	172.00'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 6P: Extg Storm Swale (Volume Calc Only)



Summary for Pond 7P: Proposed Storm Swale (Volume Calc Only)

[43] Hint: Has no inflow (Outflow=Zero)

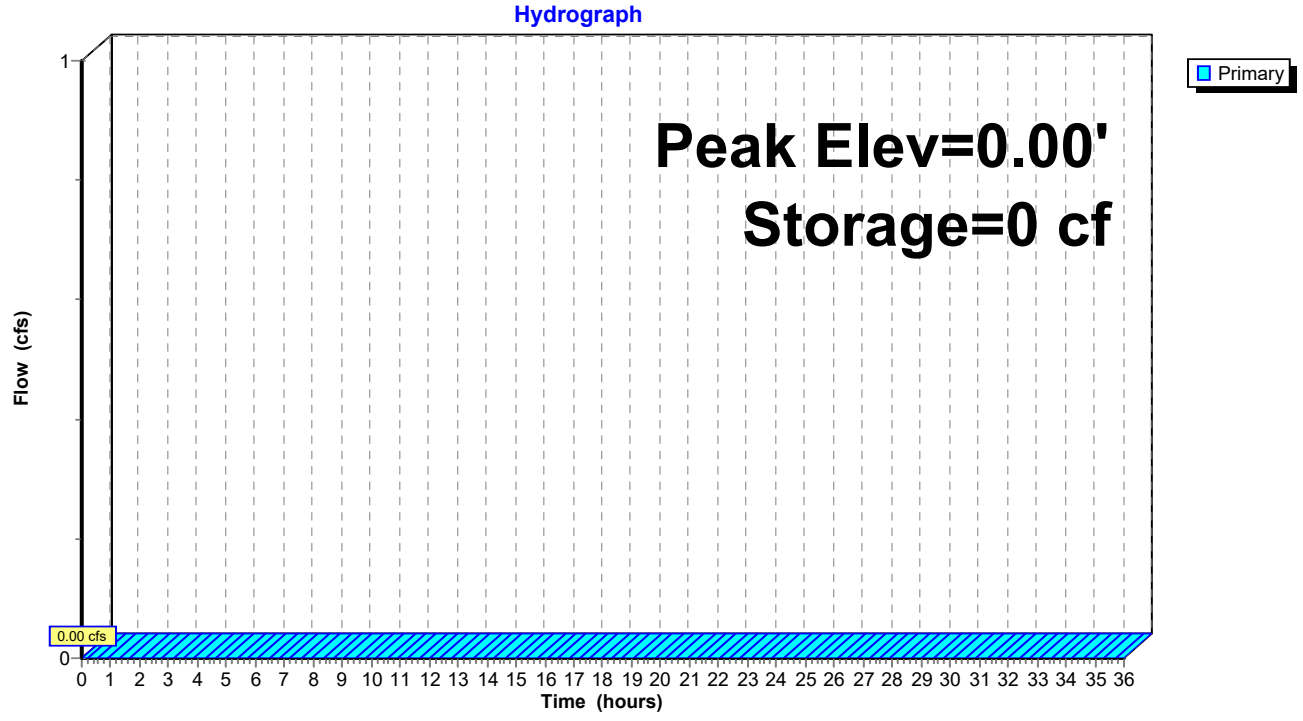
Volume	Invert	Avail.Storage	Storage Description
#1	172.00'	8,845 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
172.00	3,495	0	0
174.00	5,350	8,845	8,845

Device	Routing	Invert	Outlet Devices
#1	Primary	172.00'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 7P: Proposed Storm Swale (Volume Calc Only)



Clean Water Services

June 7, 2023
Expires Jun 6, 2025

JACK DALTON
ENVIRONMENTAL SCIENCE & ASSESSMENT
4831 NE FREMONT ST SUITE 2B
PORTLAND OR 97213

RE: 12777 SW Tualatin Sherwood Road, Columbia Corrugated Box access road;
CWS file 23-001372 (Tax map 2S128A0 Tax lot 00300)

Clean Water Services has received your Sensitive Area Certification for the above referenced site. District staff has reviewed the submitted materials including site conditions and the description of your project. Staff concurs that the above referenced project will not significantly impact the existing Sensitive Areas found near the site. In light of this result, this document will serve as your Service Provider letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, state, and federal law.

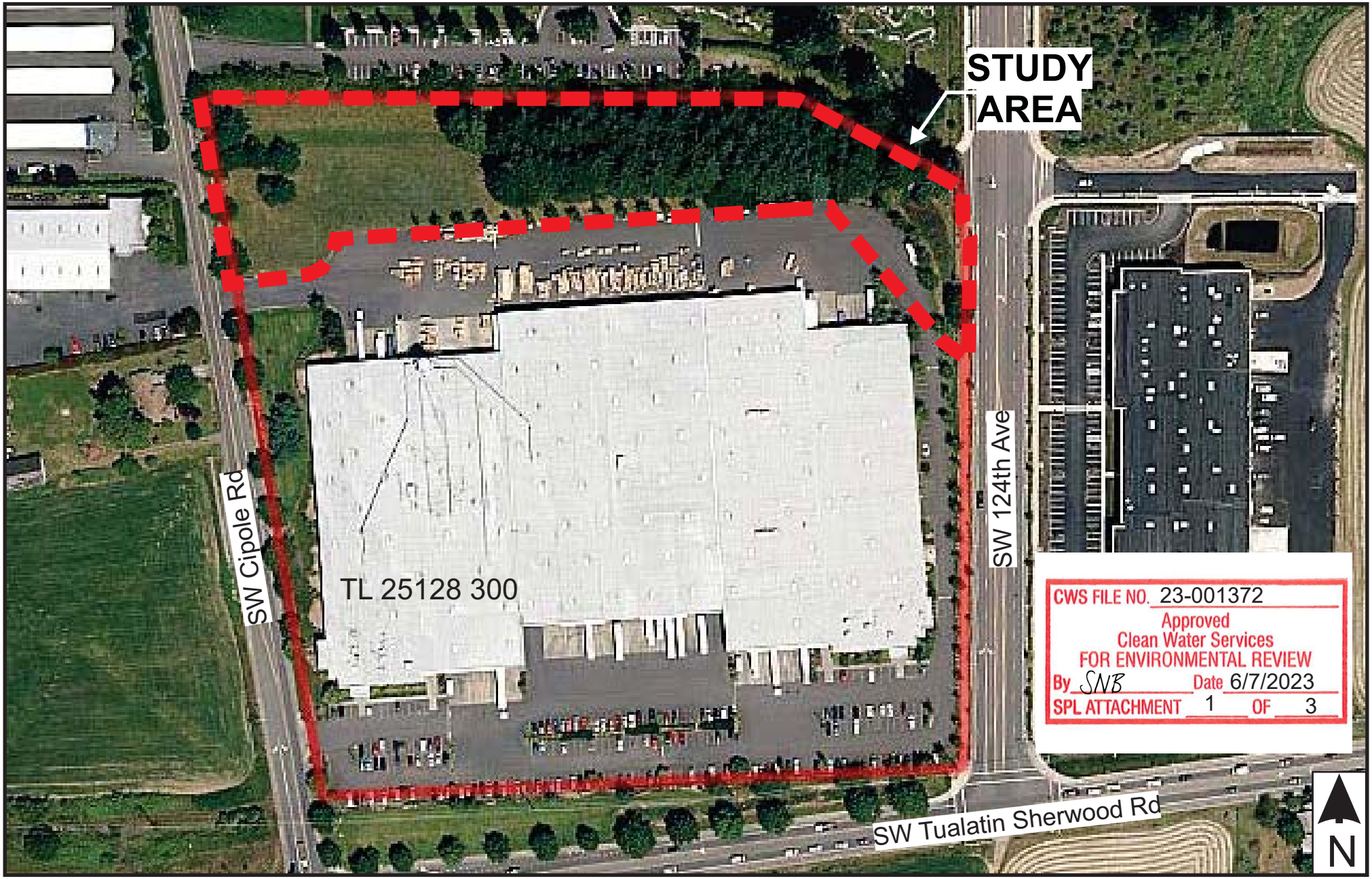
This letter does NOT eliminate the need to protect Sensitive Areas if they are subsequently identified on your site.

Sincerely,

Stacy Benjamin

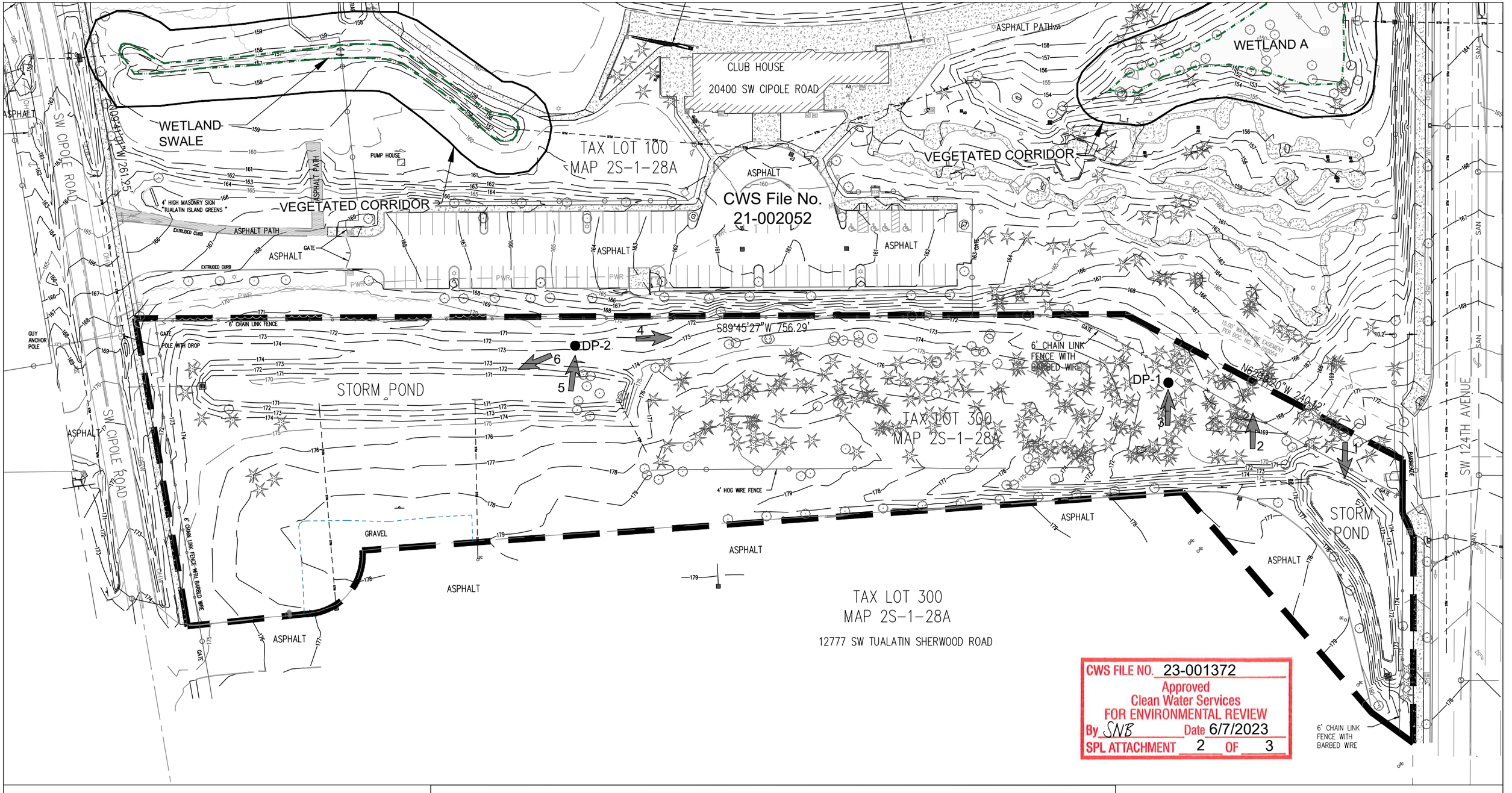
Stacy Benjamin
Environmental Plan Review

Attachments (3)



Source: Google Earth Pro

Environmental Science & Assessment, LLC	Aerial Map TLP - Offsite Common Access Easement Tualatin, Oregon	0 80 160 ft	Figure 2



CWS FILE NO. 23-001372
Approved
Clean Water Services
FOR ENVIRONMENTAL REVIEW
By SNB Date 6/7/2023
SPL ATTACHMENT 2 OF 3

● Wetland/VC Data Plot 1➔ Photo Point — — Study Area Boundary

Environmental Science & Assessment, LLC
e s & a
4831 NE Fremont St., Suite 2B
Portland, OR 97213
Phone: 503.478.0424
www.esapdx.com

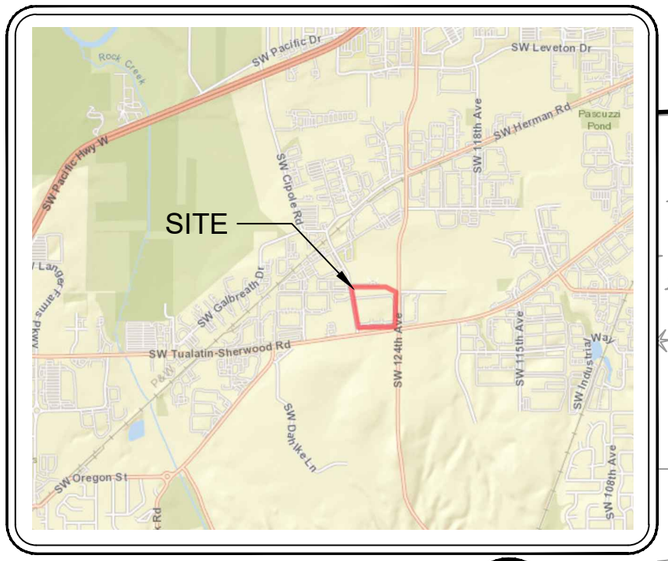
Existing Conditons Map
Tualatin Logistics Park
Tualatin, Oregon

Base Map Source:	Northwest Surveying, Inc.
Modified By:	KR
Date:	5/21
Rev:	2/22
Proj. #	21016

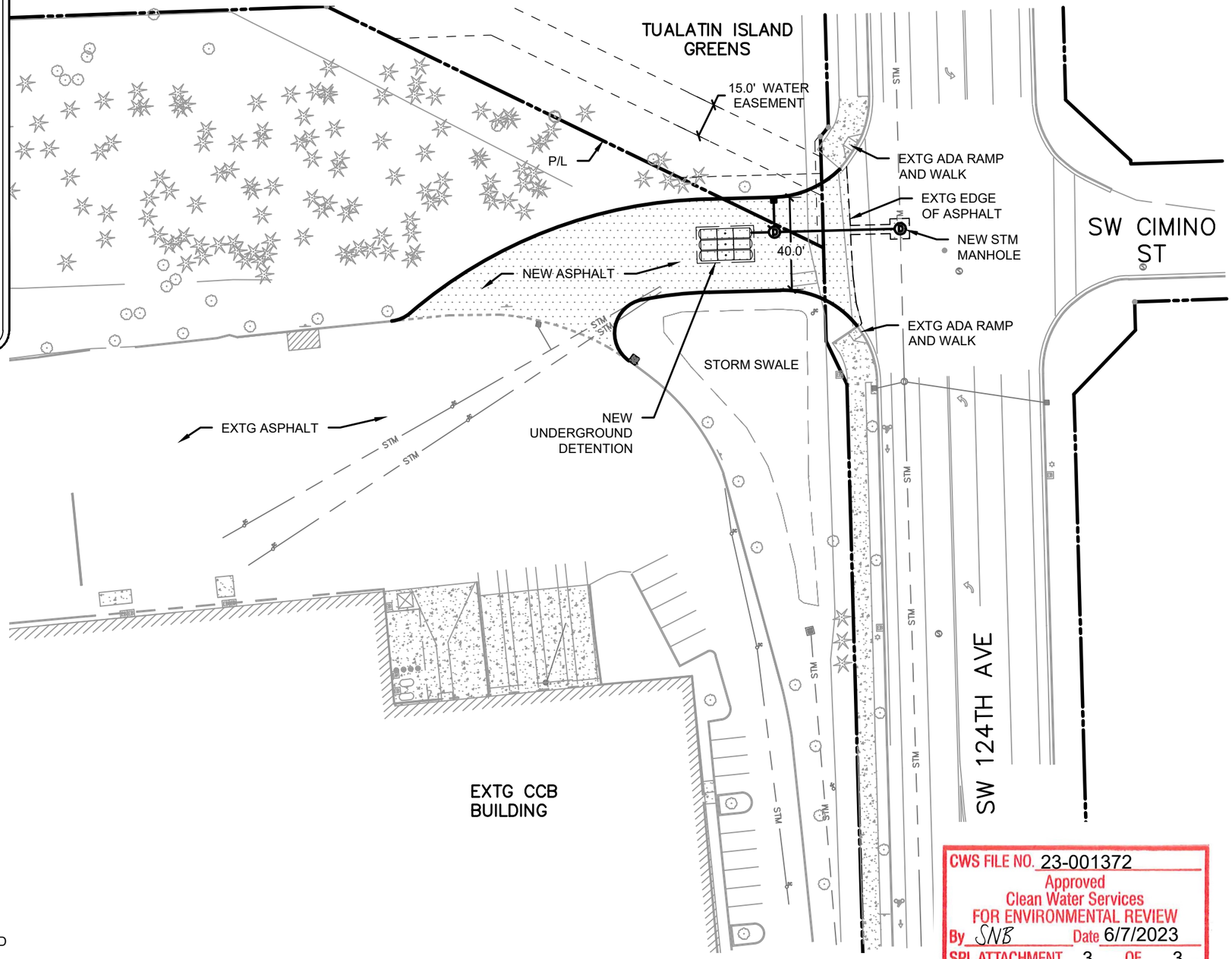
N

Figure 3

1"=70'
0 35 70



VICINITY MAP
NTS



SITE PLAN
1" = 50'

PROJECT INFORMATION:

NARRATIVE:

THE PROJECT CONSISTS OF ADDING A NEW ACCESS TO THE SITE VIA SW 124TH AVENUE. PROPOSED ACCESS WILL BE A 40-FT WIDE ASPHALT DRIVEWAY CENTERED ON THE SW CIMINO ROAD CENTERLINE ON THE EAST SIDE OF 124TH.

PLANNING / ZONING REVIEW:

JURISDICTION	CITY OF TUALATIN, OREGON
LAND USE ZONE	INDUSTRIAL
OVERLAY ZONES	NONE
STREET ADDRESS	12777 SW TUALATIN SHERWOOD ROAD
LEGAL DESCRIPTION	MAP 2S 1 28A, TAX LOT 300, CITY OF TUALATIN, WASHINGTON COUNTY OREGON

CWS FILE NO. 23-001372
Approved
Clean Water Services
FOR ENVIRONMENTAL REVIEW
By SNB Date 6/7/2023
SPL ATTACHMENT 3 OF 3

Figure 4

VLMK
ENGINEERING + DESIGN
3933 SW Kelly Avenue
Portland, Oregon 97239
503.222.4453
VLMK.COM

COLUMBIA CORRUGATED BOX
SW 124TH ACCESS
TUALATIN, OREGON
SITE PLAN

DATE: MAY 2023
SCALE: AS NOTED
PROJ. NO.: 20220513
DRAWN:
CHECKED:

G:\Acad\2022\20220513\10-Drawings\100 C1.0 Site Plan.dwg8/4/2023 1:15 PM

REPUBLIC SERVICES

Southwest Ridder Road, Wilsonville, OR 97070
republicservices.com

June 12, 2023

Jennifer Kimura

Re: Columbia Corrugated Box Inc.
12777 SW Tualatin Sherwood Rd.
Tualatin, OR 97062

Dear Jennifer,

Thank you, for sending us the preliminary site plans for this proposed development in Tualatin Oregon.

My Company: Republic Services of Clackamas and Washington Counties has the franchise agreement to service this area with the City of Tualatin. We will provide complete commercial waste removal and recycling services as needed on a weekly basis for this location

We have reviewed the proposed new site access driveway located at the Northeast corner of the existing property off SW 124th Ave. The proposed access consisting of a 40' wide asphalt driveway centered on the SW Cimino Road centerline on the East side of 124th, will be adequate for our trucks to service this site.

Thanks Jennifer, for your help and concerns for our services prior to this project being developed.

Sincerely,

Kelly Herrod
Operations Supervisor
Republic Services Inc.

FIRE CODE / LAND USE / BUILDING REVIEW APPLICATION

Tualatin Valley Fire & Rescue

North Operating Center
11945 SW 70th Avenue
Tigard, OR 97223
Phone: 503-649-8577

South Operating Center
8445 SW Elligsen Rd
Wilsonville, OR 97070
Phone: 503-649-8577

REV 6-30-20

Project Information

Applicant Name: VLMK - Jennifer Kimura
Address: 3933 S Kelly Ave Portland, Oregon 97239
Phone: 971.254.8300
Email: jenniferk@vlmk.com
Site Address: 12777 SW Tualatin Sherwood Road
City: Tualatin, Oregon 97062
Map & Tax Lot #: 2S128A000300
Business Name: Columbia Corrugated Box
Land Use/Building Jurisdiction: Tualatin
Land Use/ Building Permit # Tualatin

Choose from: Beaverton, Tigard, Newberg, Tualatin, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

Project Description

Proposal to install new access to CCB's site along SW 124th Ave. This new access will improve access for trucks and employees to enter and exit the site from a driveway that is further away from Tualatin-Sherwood Road.

Permit/Review Type (check one):

- ☒ Land Use / Building Review - Service Provider Permit
- ☐ Emergency Radio Responder Coverage Install/Test
- ☐ LPG Tank (Greater than 2,000 gallons)
- ☐ Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)
  - * Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.
- ☐ Explosives Blasting (Blasting plan is required)
- ☐ Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)
- ☐ Tents or Temporary Membrane Structures (in excess of 10,000 square feet)
- ☐ Temporary Haunted House or similar
- ☐ OLCC Cannabis Extraction License Review
- ☐ Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

For Fire Marshal's Office Use Only

TVFR Permit # 2023-0079
Permit Type: SPP - Tualatin
Submittal Date: 6/8/2023
Assigned To: Mc McGladrey
Due Date: 6/9/2023
Fees Due: Ø
Fees Paid: N/A

Approval/Inspection Conditions

(For Fire Marshal's Office Use Only)

This section is for application approval only

Mc [signature] 6/9/2023
Fire Marshal or Designee Date

Conditions: None

See Attached Conditions: ☐ Yes ☐ No

Site Inspection Required: ☐ Yes ☒ No

This section used when site inspection is required

Inspection Comments:

N/A

Final TVFR Approval Signature & Emp ID Date

Neighborhood Meeting Roster for CCB 124th Ave Driveway Access

Wednesday, June 14th

6:00pm Juanita Pohl Center

Name:	Address:	Phone #:	Email address:
Roggy Pflug - CCB	12771 Tualatin Sherwood Road	503.683.3344	roggy@p-r-c.com
Brian Dubal – VL MK	3933 S Kelly Ave	503.222.4453	briand@vlmk.com
Corey Thiesen - VLMK	3933 S Kelly Ave	503.222.4453	coreyt@vlmk.com
Jennifer Kimura - VLMK	3933 S Kelly Ave	503.222.4453	jenniferk@vlmk.com

VLMK
ENGINEERING + DESIGN

MEMORANDUM

To:	City of Tualatin	*Date:*	06/14/2023
From:	VLMK Engineering + Design – Jennifer Kimura	*Project:*	CCB 124th Driveway Access
Subject:	CCB Neighborhood Meeting	*Project Number:*	20220513

VLMK Staff arrived at the Juanita Pohl Center at approximately 5:30 pm. Roggy Pflug representing Columbia Corrugated Box joined the VLMK Team at approximately 5:45 pm.

The meeting was not attended by any Neighbors, CIO's or other interested parties.

The Neighborhood Meeting adjourned at approximately 6:20 pm.

cc:

Attachments:

June 7, 2023

CITY OF TUALATIN

City of Tualatin
18880 SW Martinazzi Avenue
Tualatin, OR 97062

Re: Citizen Involvement Organization Statement
Project: 12777 Tualatin-Sherwood Road: CCB 124th Access

To whom it may concern:

As of the date of this letter, the only contact this project has had with any Citizen Involvement Organizations (CIO) has been to invite all that are on the CIO list (provided to us by the City of Tualatin, see attachment) to the Neighborhood Meeting on June 14th.

Any conversations with them at that meeting will be documented and included as part of the Neighborhood Meeting notes. These notes will be included in the subsequent design review submittal.

Sincerely,
VLMK Engineering + Design

BRIAN M DUBAL, P.E.
Principal

Attachment(s): Citizen Involvement Organizations Contact list

CIO contact list provided for proposed project at 12777 Tualatin-Sherwood Road:

riverparkcio@gmail.com
jasuwi7@gmail.com
christine@newmountaingroup.com
dan@danhardyproperties.com
katepinamonti@hotmail.com
cynmartz12@gmail.com
daniel@bachhuber.co
cio.east.west@gmail.com
doug_ulmer@comcast.net
keenanwoods7@gmail.com
keenanwoods7@gmail.com
dana476@gmail.com
mcrowell248@comcast.net
tualatinmidwestcio@gmail.com
dikkusan@live.com
cniew@yahoo.com
tmpgarden@comcast.net
snoelluwcwle@yahoo.com
MartinazziWoodsCIO@gmail.com
solson.1827@gmail.com
delmoore@frontier.com
jamison.l.shields@gmail.com
ClaudiaSterling68@gmail.com
abuschert@gmail.com
roydloop@gmail.com
Tualatinibachcio@gmail.com
Parsons.Patricia@outlook.com
afbohn@gmail.com
edkcnw@comcast.net
rwcleanrooms@gmail.com
byromcio@gmail.com
timneary@gmail.com
jujuheir@aol.com
kapaluapro@aol.com
katzmari22@gmail.com
mwestenhaver@hotmail.com
tualatincommercialcio@gmail.com
tualatincommercialcio@gmail.com
scottm@capacitycommercial.com
scottm@capacitycommercial.com
robertekellogg@yahoo.com
christine@newmountaingroup.com

CERTIFICATION OF SIGN POSTING

Signs must adhere to the requirements of TDC 32.150.

As the applicant for the CCB Driveway Approach and Tree Removal project, I hereby certify that on this day, 9/21/23 sign(s) was/were posted on the subject property in accordance with the requirements of the Tualatin Development Code and the Community Development Division.

Applicant's Name: Amy Tallent

(Please Print)

Applicant's Signature: Amy Tallent

Date: 9/21/23


NOTICE of Hearing
Proposal submitted as: CCB
DRIVEWAY APPROACH
& TREE REMOVAL
AR23-0010
FOR MORE INFORMATION:
TUALATIN.GOV/PROJECTS


NOTICE of Hearing
Proposal submitted as: CCB
DRIVEWAY APPROACH
& TREE REMOVAL
AR23-0010
FOR MORE INFORMATION:
TUALATIN.GOV/PROJECTS


NOTICE of Hearing
Proposal submitted as: CCB
DRIVEWAY APPROACH
& TREE REMOVAL
AR23-0010
FOR MORE INFORMATION:
TUALATIN.GOV/PROJECTS