TO: **CITY OF WEST LINN PUBLIC WORKS**

FROM: **ALEX SIMPSON, PE, CIVIL ENGINEER**
JAKE ASHFORD, PWS, NATURAL RESOURCES SCIENTIST
HARPER HOUF PETERSON RIGHELLIS INC.

Harper Houf Peterson Righellis Inc.
ENGINEERS ◆ PLANNERS
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205 SE Spokane Street, Suite 200, Portland, OR 97202
PHONE: 503.221.1131 www.hhpr.com FAX: 503.221.1171

DATE: MAY 22, 2026

RE: **RESPONSE**
APPEAL OF PLANNING COMMISSION DECISION AND WAIVER OF APPEAL FEE REQUEST BY SAVANNA OAKS NEIGHBORHOOD ASSOCIATION REGARDING CUP-25-02/DR-25-02/WAP-25-01 – BASIS OF APPEAL NO.11

Basis of Appeal No. 11 claims that the project does not meet CDC 32.010(E). CDC 32.010(E) is a portion of the purpose statement for the Water Resource Protection Area section of the code, and it is not an applicable approval criterion. Nevertheless, this memorandum addresses the concerns presented in Basis of Appeal No. 11 for the record.

Water Resource Area:

As stated in the Water Resources Area (WRA) Review prepared by HHPR in November 2025 (Exhibit PC-F), there are two permanent WRA impact locations associated with the project. The impact area in the western portion of the project site is located on a terrace above a stream (identified as Stream 1[1]). Existing site constraints such as the steep slopes, wetlands, and Stream 1 naturally restrict developable area on site. These site constraints make complete avoidance of the WRAs (both the western and eastern impact areas shown on Figure 1 of Exhibit PC-F) not possible since the mapped WRA extends into the buildable, terraced area of the site. However, project impacts on WRAs have been minimized. Measures include minimizing areas of vegetation disturbance within the WRAs to the greatest extent practicable, utilizing Previously Developed Areas (PDA) to the maximum extent possible, and minimizing grading and site clearing in and around WRAs to accommodate the project. This is accomplished by only grading and clearing small areas within the WRA that are required to provide vehicular access lanes for service and emergency vehicles. Emergency access vehicles require clear widths, slopes, and turning radii to maneuver, and the site has been configured to provide adequate emergency access while minimizing disturbance to the WRA. Additionally, the project does not propose any crossings of WRAs, only minor, unavoidable, encroachments into the edges of WRAs due to the developable area site constraints. The project does not propose any crossings, spannings, or impacts to fish bearing streams, riparian corridors, or wetlands.

Habitat friendly development practices have been incorporated into the design of the project. For example, this project:

1. Restores disturbed soils to an improved level of porosity and nutrients to regain natural filtration of storm water and provide increased vegetation and habitat growth.

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[1] *Basis of Appeal No. 11 claims that Stream 1 is named Bernert Creek. Based on accepted and available online stream mapping, this is inaccurate. As explained in Section D of our report (Exhibit PC-F), Stream 1 is an unnamed intermittent stream that daylights out of two corrugated metal culverts downslope of Salamo Road, flows south through a ravine in the western portion of the study area and continues south out of the study area before draining under I-205, and ultimately to the Willamette River via Bernert Creek. Based on the Oregon Department of Forestry's "Forest Practices Act Stream and Steep Slopes Maps of Fish Presence", this stream is mapped as "non fish bearing". Although it leads to Bernert Creek, Stream 1 is not documented in online maps as part of Bernert Creek.*

2. Utilizes a series of storm water treatment measures (catch basins, sediment filters, oil filters, and detention storage) to provide multiple opportunities for storm water treatment and reduce the possibility of system failure.
3. Installs high-quality landscape which provides additional filtering of stormwater.
4. Utilizes segments of multi-functional open drainage systems to collect and convey stormwater.
5. Retains stormwater runoff in a detention system to slow the release of stormwater.
6. Reduces paved surfaces to the minimum necessary to facilitate safe and efficient use of the site.
7. Uses previously developed areas (PDAs) for development instead of non-PDA areas.
8. Minimizes the buildings, hardscape, and disturbance footprint by constructing a multi-story building rather than a larger footprint.

Note that the western impact area referred to in Basis of Appeal No. 11 is sparsely vegetated with invasive Himalayan blackberry and covered in several inches of woodchips. No trees are present in the impact area. The unvegetated areas do not act as quality habitat due to a lack of food and refuge areas. The unvegetated areas do not provide water quality benefits to the stream because they do not provide shade, erosion control, or water treatment. There are no plant stems to reduce velocity of flowing water, no leaves or branches to reduce velocity of falling rain, and the open areas do not provide ecological niches or refugia.

Additionally, the applicant is mitigating for the impacts to this mostly unvegetated area on site at the required ratios for mapped WRA as outlined in Chapter 32.090.C(2). The mitigation proposed by the project is located on site adjacent to a wetland. The area proposed for mitigation is also a sparsely vegetated area with invasive species, including scotch broom and Himalayan blackberry that gives way to woodchips farther to the west. Planting this area with native trees, shrubs, and flowering plants will enhance the buffer of water resources on site and protect and improve the functions and values of the wetland and enhance the value of fish and wildlife habitat on site. Increasing the vegetated buffer and replacing woodchips with native vegetation will increase shade, erosion control, and interception of precipitation in addition to foraging habitat, ecological niches, and refugia for local wildlife species. Water quality improvements will benefit fish species in lower regions of the watershed. As stated in the Water Resources Area Review (Exhibit PC-F), no state listed salmonid species of fish are mapped within Stream 1 according to StreamNet Mapper. Stream 1 is not mapped as Essential Salmonid Habitat (ESH) by the Department of State Lands ESH mapper.

Finally, the list of casual observations of species on the ODOT parcel from 1995 to 2013 (referenced in the appeal statement) does not identify any federal or state threatened, endangered species, or species of concern. The list identifies two de-listed species.

Site Stormwater:

As stated in the Stormwater Management Report prepared by HHPR in March 2026 (submitted into the record concurrently with this letter), Stormwater management for the development complies with the City of West Linn Stormwater Management Manual dated May 2025. The project's stormwater management system additionally complies with the City of West Linn Public Works Design Standards. Maintenance access to the project stormwater system is provided by the same circulation system that serves the entirety of the project.

The City of West Linn's water quality requirements are met by treating runoff using proprietary treatment structures (Contech StormFilter). Per the geotechnical report, infiltration of stormwater is not allowable due to the site's steep slopes and subsurface conditions. Regarding flow control, the project provides a stormwater detention system. Peak-flow matching is required for the project such that the post-developed 2, 10, and 25-year, 24-hour storm events are equal to or below their respective pre-developed flow rates. The ultimate discharge location for the project is to the existing natural Stream 1 WRA located at the southwest portion of the site, although no portion of the project's stormwater detention, treatment facilities, or outfall or energy dissipaters (e.g., rip rap) encroaches into any WRA. Managed stormwater is released at a peak flow rate that does not exceed its pre-developed flow rate. Overall, there will not be any adverse off-site impacts caused by the stormwater management nor any adverse impacts upon the hydrologic conditions of the site.

In summary, the project meets the City of West Linn requirements pertaining to the Water Resources Area and stormwater management.

Sincerely,

Alex Simpson, PE

Alex Simpson, PE

Project Manager/Principal-in-Charge

Qualifications

Alex is a Principal at HHPR with 14 years of civil engineering and project management experience. He has worked on a wide range of public buildings and facilities, including public works and operations facilities. Alex is adept at providing comprehensive civil engineering services as a key member of the design team. This includes due diligence and concept studies to identify challenges and key site elements early on, through detailed construction document design, permitting, and construction management. Alex brings his expertise to the team on items including site layout and maneuverability studies, grading optimization, design of stormwater management systems, site utility design, ADA accessibility, and street and sidewalk design.

Areas of Expertise

- Public Works Facilities
- Project Management
- Decant, Fuel, Wash Buildings
- Project Coordination & Permitting
- Constructability Review
- Construction Cost Analysis
- Site Development Design
- Plan & Document Review (QC)

Education

BS, Civil Engineering,
Oregon State University

Registrations

Professional Civil Engineer,
OR #87502

Years of Experience

14 years

Similar Project Experience

Wilsonville Public Works

Wilsonville Public Works | City of Wilsonville. Alex served as Project Manager and Project Engineer for the City of Wilsonville's new award-winning public works facility. This 6.1-acre facility includes a new office building, warehouse, wash building, decant facility, and covered materials storage for the City's public works department. The site includes grading and natural resources constraints that were used as opportunities to enhance the overall project. Alex prepared detailed site, grading, utility, and stormwater design plans for the project. This project was completed in 2024.

Oregon City Public Works

Oregon City Public Works | City of Oregon City. Alex served as Project Manager and Project Engineer for the City of Oregon City's new public works facility. The 5.0-acre award-winning project redeveloped an existing building, warehouse and exterior site for the City's public works, engineering, and parks department offices. The project involved close coordination with the public works department and staff to ensure that site access, circulation, parking, and other needs were met. Alex prepared detailed site, grading, utility, and stormwater design plans for the project. This project was completed in 2023.

Covered Bulk Storage

Tualatin Operations & Service Center | City of Tualatin. Alex served as Project Engineer for the expansion of the City of Tualatin public works complex. The project constructed a 9,000 SF building addition to the City of Tualatin's public works facility. HHPR designed a new parking lot, ADA improvements, pedestrian connections, plaza, signing and striping, stormwater management, utility (storm sewer, sanitary sewer, fire water, domestic water). Stormwater management was accomplished by utilizing an existing onsite treatment / detention swale and 11 drywells. This project was completed in 2021.

Additional Project Experience

- Sandy Area Metro Operation Expansion
- City of Gladstone Public Works Improvements
- City of West Linn Public Works
- City of Tigard Public Works Concept
- City of Sherwood Public Works Concept
- McMinnville Water & Light Operations Facility

Jake Ashford, PWS

Title: *Senior Scientist*
Role on Project: *Senior Scientist | Scientist*

Harper Houf Peterson Righellis Inc.

Qualifications: Jake has 10 years of environmental consulting and biological research experience throughout Oregon, Washington, and California. Jake has a range of technical skills including wetland and waters delineation and permitting, nesting bird surveying, construction and mitigation monitoring, CESCL inspections, stream assessment, and environmental compliance. Jake's expertise includes technical writing and editing, client and project management, preparing permit applications, writing mitigation plans, and facilitating permitting with local, state, and federal agencies in Oregon, Washington, and California.

Education: MS, Environmental Science University of California, Riverside; BS, Aquatic Biology University of California, Santa Barbara

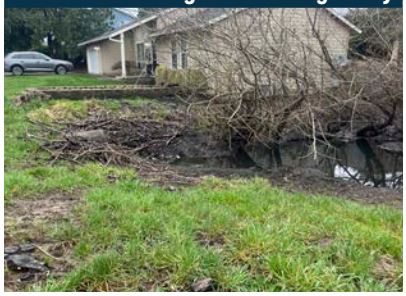
Registrations/Certifications:
Professional Wetland Scientist (**PWS**)
ODOT Certified ESA FAHP Biologist
Wetland Delineation Certification

Years of Experience: 10 years

Technical Expertise:
- Wetland Delineations
- Mitigation Planting Plans
- Joint Permit Applications
- Sensitive Area Certification Forms
- Biological Surveys
- Site Assessments
- Natural Resources Assessments
- Stream Assessments
- Wetland Rating Forms
- Environmental Permitting
- Environmental Compliance

Gresham Hogan Road FAHP

Hillwood Drainage Permitting Study



Relevant Project Experience:

Gresham Hogan Road FAHP Environmental Inspections | City of Gresham. For this task order, HHPR was brought on to provide environmental inspections and reports for the SE 242nd/Hogan Road: Burnside Road to Powell Boulevard Capital Improvements project for compliance with ODOT's FAHP Programmatic. Jake completed two FAHP inspections and prepared FAHP inspection reports, as well as submission of the Oregon Environmental Permits Project Completion form. HHPR has three ODOT-certified biologists authorized to complete ESA compliance analysis and inspections for ODOT-funded projects, including those receiving funding from the Federal-Aid Highway Program.

Bendemeer Sanitary Sewer Upgrade | City of Hillsboro. Jake served as a natural resources scientist for this project that upgraded the Bendemeer Trunk sanitary sewer line to accommodate future industrial development north of Highway 26. The project entails replacing approximately 1,900 LF of existing 18-inch diameter sanitary sewer, as well as approximately 1,600 LF of existing 12-inch diameter sanitary sewer. The line crosses a stream, three wetlands, and CWS Vegetated Corridors. Jake and other environmental staff conducted OHWM and wetland delineation along the project corridor documenting three wetlands, one stream, and one ditch. Vegetated Corridors regulated by CWS were delineated in association with the wetlands and stream. Jake obtained a Removal/Fill Individual Permit from the Oregon DSL and a SPL from CWS.

Bell Street – 362nd Avenue Extension | City of Sandy. Jake served as a natural resources scientist on this project that was identified as an important link in the City's Transportation System Plan. This street extension crossed two streams, a wetland, and associated riparian areas. HHPR completed wetland and stream delineations; obtained federal, state, and local permits; and designed mitigation for the project.

Replacement of Main Tanks & Transmission Main| City of Newport. Jake served as the environmental lead for this project, which will replace two water main tanks and transmission mains between the main tanks and the existing Newport Water Treatment Plant. The transmission main will pass through Big Creek Park and cross below Anderson Creek, which contains ESA-listed coho salmon and coastal cutthroat. The project is funded through preliminary design via a grant from FEMA. Jake and staff performed a wetland and OHWM delineation, worked with the team to develop strategies for protecting resources, conducted preliminary agency coordination on permitting and grant funding requirements, developed a permitting strategy for the next phase of the project, documented grant funding environmental compliance requirements, and provided materials for an additional grant proposal.

Hillwood Drainage Permitting Study | City of Hillsboro. Jake served as the environmental lead for this project, developing options to address drainage issues in a residential neighborhood and prevent flooding of residential properties. In addition to an undersized culvert and gradient issues causing the flooding, beaver regularly block the culvert mouth, exacerbating flooding and resulting in significant maintenance costs for the City. The site contains wetlands, a mitigation site, and fish habitat, with residential homes close to the bank on both sides of the stream. Jake and staff assisted in this effort by completing a wetland and OHWM delineation of the site, providing information regarding beaver exclusion, and comparing alternatives from a permitting and mitigation perspective.

Shadowbrook Slope Stabilization| Equity Lifestyle Properties. Jake served as the environmental lead for this project, which stabilized the heavily eroded bank of Sieben Creek, which runs through a deeply incised ravine. Frequent bank failure threatened homes at Shadowbrook Mobile Home Park. The project included relocation of existing mobile homes directly affected by the erosion concerns and cutting the top of bank down and back to more stable rock and conglomerate, followed by building a tiered bank and replanting. Jake and team completed early coordination with Clackamas County regarding regulated buffers; completed a delineation of the Sieben Creek OHWM and a wetland determination; prepared a delineation report; obtained a Removal-Fill permit from DSL, and coordinated with a subcontractor to provide a fish salvage prior to over-stream work. Coordination with USACE and strategic placement of BMPs allowed the project to avoid federal permits.

Harper Houf Peterson Righellis Inc.

WEST LINN OPERATIONS COMPLEX

WEST LINN, OREGON

Stormwater Management Report

MARCH 2026

PREPARED FOR:
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EXPIRES: 12/31/2026

Harper Houf Peterson Righellis Inc.
ENGINEERS◆PLANNERS
LANDSCAPE ARCHITECTS◆SURVEYORS

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PROJECT OVERVIEW

The West Linn Public Works Department proposes to construct a new public works operations complex at 22500 Salamo Road in West Linn, Oregon. The proposed development includes a multi-story 28,200 square foot office and warehouse building, an 11,000 square foot warehouse and shop building, truck wash and decant buildings, fueling station, covered and open bulk storage areas, asphalt roadways for site access and parking, concrete hardscape and sidewalks, and landscaping. The total project footprint is approximately 5.7 acres. The project is situated on a vacant lot east of Salamo Road, north of Highway 205, west of an existing public works material laydown area, and south of existing private residences off of Barrington Drive. Stormwater BMPs (best management practices) outlined in this report will comply with the City of West Linn Stormwater Management Manual dated May 2025. See Table 1 below for design requirements per the City of West Linn.

Table 1. West Linn Stormwater Management Criteria

Design Requirement	West Linn Criteria
Project Classification	Centralized Subdivision and Large Development (Creates or replaces 10,000 SF or more of impervious surface area) • Use a downstream, centralized stormwater management facility to meet the infiltration, water quality, and flow control performance standard for all impervious surfaces on site.
Flow Control Performance	Match pre-developed discharge rates for the 2-year, 10-year and 25-year, 24-hour storm events using the 'Engineered Method' – Santa Barbara Urban Hydrograph (SBUH) Method using the Soil Conservation Service Type 1-A, 24-hour rainfall distribution.
Water Quality	Stormwater management facilities must treat 80% of the average annual runoff (1 inch per 24 hour period).
Conveyance	Storm pipes shall be sized using the 25-year, 24-hour storm event.
Downstream Analysis	Review and physically inspect either 1,500 feet downstream of the proposed outlet or to the distance which the project contributes less than 15% of the total upstream basin area. Confirm nothing downstream of the end point will be adversely affected by the project's runoff.

BASIN CHARACTERISTICS

Existing Conditions

The existing conditions within the project footprint consist of a stabilized hill with a mix of trees and vegetated ground cover, as well as a large gravel pad. Slopes within the vegetated areas of the site vary beyond 50% while the gravel area is generally flat. Existing drainage flows north to south towards a natural ravine southwest of the site, ultimately flowing to the east along the toe of the fill slope of Highway 205.

The following technical criteria were determined for the existing site:

- **Hydrologic Soil Group D (Per USGS WebSoil Survey)**
  - **64D – Kinton Silt Loam: 13.5% of Site Area, Soil Group C**
  - **34C – Nekia Silty Clay Loam: 7.2% of Site Area, Soil Group C**
  - **89D – Witzel Very Stony Silt Loam: 79.2% of Site Area. Soil Gound D**
- **Basin 1 Time of Concentration: 15.3 minutes**
- **Basin 2 Time of Concentration: 16.5 minutes**
- **Curve Number:**
  - **70 (Existing ground per West Linn Stormwater Management Manual 2.3.2.1)**

The existing basin map is available in appendix A. Additional soil data is available in appendix B.

Infiltration as a method of stormwater management was not recommended by the geotechnical engineer (Columbia West) in the draft geotechnical report dated April 3, 2025 “due to the presence of steep slopes at the site and subsurface conditions”. Refer to appendix B for the Executive Summary of the geotechnical report.

Proposed Conditions

The proposed operations complex will include two new buildings, covered truck wash and decant structures, covered and open bulk storage areas, asphalt pavement for site access, parking, and material lay-down, concrete hardscape, walls, and landscaping. The proposed site generally maintains the flow characteristics of the existing site, utilizing a network of underground storm pipes to convey stormwater north to south. At the south end of the site, a proprietary underground chamber system (R-Tank) is proposed for detention of runoff with a proprietary mechanical treatment system (Contech StormFilter vault, manhole, and catch basin) providing pretreatment. The release rate of the stormwater from the R-Tank will be regulated by a flow control manhole to match the existing 2, 10, and 25-year, 24-hour storm events, meeting the City of West Linn criteria for large developments. Stormwater will outfall downslope at the south end of the site towards the existing natural ravine. The following technical criteria were determined for the proposed site:

- **Time of Concentration (all basins): 5 minutes**
- **Curve Number:**
  - **98 (Proposed Impervious Area)**
  - **80 (Proposed Landscaping)**

The proposed basin map is available in appendix A and storm plan sheets are available in appendix C.

STORMWATER MANAGEMENT

Water Quality

The City of West Linn water quality requirements will be met by treating runoff using a proprietary treatment vault, manhole, and catch basin (Contech StormFilter). According the City of West Linn Stormwater Management Manual, “manufactured stormwater treatment technology” is ranked third in the hierarchy of stormwater management facilities used to manage the water quality design storm,

behind full or partial infiltration, and vegetated filtration or other green infrastructure. Per the geotechnical report (see appendix B), infiltration is not recommended due to the site's steep slopes and subsurface conditions. Vegetated filtration is not feasible due the site's topography. The proposed development utilizes the flat areas of the existing site for its buildings and hardscape, leaving only very steep terrain as options for placing a vegetated swale or pond. Placing a pond or swale in the steep slopes of the site would not provide adequate residence time for stormwater treatment and would require very large walls to accommodate the cut section of a pond. Therefore, underground detention is proposed beneath the asphalt of the south parking lot with upstream treatment provided by a Contech StormFilter vault, manhole, and catch basin.

The following City of West Linn Water Quality Design Storm was used for water quality calculations:

- **1 inch per 24-hour period**

Table 2 below provides a summary of the water quality calculations.

Table 2. Water Quality Calculation Summary

Basin	Water Quality Flow (cfs)	Proposed Treatment Facility	Number of Cartridges*
WQ 1	0.696	Contech StormFilter 8' x 16' Peak Diversion Vault	25
WQ 2	0.053	Contech StormFilter 48" Water Quality Manhole	2
WQ 3	0.080	Contech StormFilter Steel 3 - Cartridge Catch Basin	3

*Calculations assume 18" PSROB cartridges with peak flow capacity of 0.028 cfs (12.53 gpm)

Refer to appendix A for water quality basin map. Refer to appendix D for hydrographs.

An oil-water separator is proposed in the east lot to treat stormwater runoff from a future fuel island. The fuel island will be designed and constructed in a later phase of the project.

Hydromodification and Detention

The project proposes to add 4.09 acres (178,110 SF) of impervious area to the site; therefore, it is classified as a 'large development' by the City of West Linn Stormwater Management Manual. Peak-flow matching is required for the pre-developed 2, 10, and 25-year, 24-hour storm events. The site layout lends itself to a 'centralized' approach with all stormwater on site being piped to a single centralized underground detention facility. The Santa Barbara Urban Hydrograph (SBUH) was chosen to demonstrate the detention facility is adequately sized for flow control using the following parameters:

- **2-Year: 2.5 inches**
- **5-Year: 3.1 inches**
- **10-Year: 3.45 inches**
- **25-Year: 4.9 inches**
- **Type 1A Rainfall Distribution**

Site stormwater will be routed to a 16,601 CF R-Tank set at elevation 300.86 beneath the site's south parking lot. Flow out of the R-Tank is regulated by a flow control manhole with a single 4.0" diameter orifice set at elevation 300.86. A 12" overflow is provided at elevation 304.86 which helps to convey the 10, 25, and 100 year storm events.

The proposed R-Tank is designed to capture and detain runoff from Basin 1 only. Basin 2 will shed stormwater offsite as topographical constraints do not allow for stormwater to be captured and routed back to the facility. Basin 2 includes just 1,637 SF of new impervious area with the rest of the basin being made up of pervious fill slope (0.49 Acres) to catch the existing grade downslope of the project. Basin 3 will be routed around the project site, bypassing the development. Refer to the Conveyance section of this report for more information on Basin 3 and refer to appendix A for the proposed basin map.

Table 3 below provides a summary of the flow control data for this project.

Table 3. Flow Control Data

Storm Event	Pre-Developed Flow (cfs)	Post-Developed Flow (cfs)	Detained Release Rate (cfs)
2-Year	0.630	2.575	0.626
10-Year	1.610	3.852	1.189
25-Year	2.139	4.455	2.090

Refer to appendix D for hydrographs.

Conveyance

The project site sits at the bottom of an existing 2:1 slope which will shed water toward the proposed development. The upper access road will require fill to construct, creating a low point north of the road. Stormwater will drain to the toe of this fill slope and be conveyed to a proposed ditch inlet just west of the eastern asphalt yard via a constructed conveyance ditch and discharged through a 12" culvert to the existing southeastern wetland, bypassing the project site. Runoff from the existing hill above the eastern yard will be captured by a french drain where it will ultimately flow to the proposed bypass culvert. See 'basin 3' in the proposed basin map exhibit in appendix A for basin, conveyance ditch, bypass culvert and french drain locations.

The site stormwater conveyance system has been sized using the Santa Barabara Urban Hydrograph Method (SBUH) to convey the 25-year storm event. Proposed storm pipes have a minimum slope of 0.50%, full-flow velocity of 2 feet per second, and were analyzed using a Manning's 'n' coefficient of 0.013. Refer to appendix E for conveyance calculations.

Downstream Analysis

HHPR physically inspected 1,500' from the ultimate outlet of the proposed stormwater system and observed no existing obstructions or downstream deficiencies. Due to the proposed upstream treatment and detention of stormwater to pre-developed levels, no adverse effects are anticipated to the downstream system.

Operations and Maintenance

The proposed Ferguson R-Tank, Contech StormFilter Vault, StormFilter Manhole, and StormFilter Catch Basin are located on the project site and are the responsibility of the project Owner: City of West Linn Public Works Department. Refer to appendix F for O&M requirements for the proposed proprietary stormwater systems.

CONCLUSION

The proposed stormwater management plan will achieve stormwater quality and flow control to the standards of the City of West Linn Stormwater Management Manual dated May 2025.

Appendix A – Figures

P:\01-Portland\SEA (Scott Edwards Architecture)\SEA-158 (West Linn Public Works)\SEA158-DOCS\Reports\Stormwater\Exhibits\ SEA158-Existing Basin Map.dwg

SALAMO RD

EX RAVINE

WETLAND BOUNDARY

VEGETATED CORRIDOR

LEGEND

- BASIN 1
  PERVIOUS: 85,620 SF (1.97)
- BASIN 1 - OFFSITE
  PERVIOUS: 21,159 SF (0.49 AC)
- BASIN 2
  PERVIOUS: 221,441 SF (5.08 AC)
- BASIN 2 - OFFSITE
  PERVIOUS: 256,078 SF (5.88 AC)

0 50 100 200
SCALE: 1" = 100'

DATE	NO.	DESCRIPTION

REVISIONS

DESIGNED: HHPR
DRAWN: HHPR
CHECKED: AJS
DATE: MARCH 2026

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
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EXISTING BASIN MAP

WEST LINN OPERATIONS COMPLEX

WEST LINN, OREGON

SHEET NO. EX

JOB NO. SEA-158

P:\01-Portland\SEA (Scott Edwards Architecture)\SEA-158 (West Linn Public Works)\SEA158-DOCS\Reports\Stormwater\Exhibits\ SEA158-Proposed Basin Map.dwg

SALAMO RD

BASIN 3
CONVEYANCE DITCH
TO CULVERT BYPASS

BASIN 3 BYPASS
INLET AND CULVERT

BASIN 3 FRENCH DRAIN
TO CULVERT BYPASS

FFE = 316.00

FFE =
311.00

EX RAVINE

PROPOSED R-TANK

IE OUT = 297.00

WETLAND
BOUNDARY

VEGETATED CORRIDOR

LEGEND

BASIN 1
IMPERVIOUS: 176,473 SF (4.05 AC)
PERVIOUS: 56,361 SF (1.29 AC)

BASIN 2
IMPERVIOUS: 1,637 SF (0.04 AC)
PERVIOUS: 21,569 SF (0.49 AC)

BASIN 3 - BYPASSED
IMPERVIOUS: 0 SF (0.00 AC)
PERVIOUS: 239,195 SF (5.50 AC)

0 25 50 100
SCALE: 1" = 100'

N

DATE	NO.	DESCRIPTION

REVISIONS

DESIGNED: LEM
DRAWN: LEM
CHECKED: AJS
DATE: MARCH 2026

HHPR Harper Houf Peterson Righellis Inc.
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PROPOSED BASIN MAP - DETENTION

WEST LINN OPERATIONS COMPLEX

WEST LINN, OREGON

SHEET NO. DET

JOB NO. SEA-158

P:\01-Portland\SEA (Scott Edwards Architecture)\SEA-158 (West Linn Public Works)\SEA158-DOCS\Reports\Stormwater\Exhibits\ SEA158-Water Quality Basin Map.dwg

SALAMO RD

FFE = 316.00

FFE = 311.00

EX RAVINE

IE OUT = 297.00

CONTECH STORMFILTER CATCH BASIN WITH (3) PSORB CARTRIDGES

PROPOSED R-TANK

VEGETATED CORRIDOR

8 X 16 CONTECH STORMFILTER VAULT WITH (25) PSORB CARTRIDGES

48" CONTECH STORMFILTER MANHOLE WITH (2) PSORB CARTRIDGES

WETLAND BOUNDARY

LEGEND

WQ BASIN 1
IMPERVIOUS: 148,101 SF (3.40 AC)

WQ BASIN 2
IMPERVIOUS: 11,268 SF (0.26 AC)

WQ BASIN 3
IMPERVIOUS: 16,988 SF (0.39 AC)

0 25 50 100
SCALE: 1" = 100'

N

DATE	NO.	DESCRIPTION

R E V I S I O N S

DESIGNED: LEM
DRAWN: LEM
CHECKED: AJS
DATE: MARCH 2026

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
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PROPOSED BASIN MAP - WATER QUALITY

WEST LINN OPERATIONS COMPLEX

WEST LINN, OREGON

SHEET NO. **WQ**

JOB NO. SEA-158

Appendix B – Geotechnical Data

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,320 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
48D	Kinton silt loam, 15 to 30 percent slopes	1.0	13.5%
64C	Nekia silty clay loam, 8 to 15 percent slopes	0.5	7.2%
89D	Witzel very stony silt loam, 3 to 40 percent slopes	5.7	79.2%
Totals for Area of Interest		**7.2**	**100.0%**

Clackamas County Area, Oregon

48D—Kinton silt loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2258
Elevation: 250 to 1,400 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kinton and similar soils: 85 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kinton

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified glaciolacustrine deposits

Typical profile

H1 - 0 to 15 inches: silt loam
H2 - 15 to 35 inches: silt loam
H3 - 35 to 60 inches: silt loam

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 30 to 40 inches to fragipan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 27 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F002XB005OR - Loess Hill Group
Forage suitability group: Moderately Well Drained >15% Slopes (G002XY003OR)
Other vegetative classification: Moderately Well Drained >15% Slopes (G002XY003OR)
Hydric soil rating: No

Minor Components

Delena

Percent of map unit: 2 percent
Landform: Hillslopes, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, riser
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

64C—Nekia silty clay loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2269
Elevation: 250 to 1,200 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Nekia and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nekia

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, nose slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from basalt

Typical profile

H1 - 0 to 19 inches: silty clay loam
H2 - 19 to 39 inches: clay
H3 - 39 to 43 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R002XC012OR - Red Hill Group
Forage suitability group: Well drained < 15% Slopes (G002XY002OR)
Other vegetative classification: Well drained < 15% Slopes (G002XY002OR)
Hydric soil rating: No

89D—Witzel very stony silt loam, 3 to 40 percent slopes

Map Unit Setting

National map unit symbol: 227s
Elevation: 300 to 1,000 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Witzel and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Witzel

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, nose slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from basalt

Typical profile

H1 - 0 to 4 inches: very stony silt loam
H2 - 4 to 16 inches: very stony silty clay loam
H3 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 40 percent
Depth to restrictive feature: 12 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R002XC009OR - Bald Group
Forage suitability group: Well Drained > 15% Slopes (G002XY001OR)
Other vegetative classification: Well Drained > 15% Slopes (G002XY001OR)
Hydric soil rating: No

EXECUTIVE SUMMARY

This executive summary presents the primary geotechnical considerations associated with the proposed City of West Linn's Operations Center located in West Linn, Oregon. Our conclusions and recommendations are based on the subsurface information presented in the report and proposed development information provided by the design team. Detailed discussion of the geotechnical considerations summarized here is presented in respective sections of the report.

- Based on our understanding of the proposed development and the results of our explorations and engineering analyses, it is our opinion that the proposed development can be constructed at the site.

- Undocumented fill was encountered to depths between 1 foot and 31 feet BGS in 15 of our 18 explorations and to depths between 10.5 and 49.5 feet BGS in prior explorations by others. The composition and consistency of the fill are highly variable and generally include medium stiff to hard clay with varying proportions of sand and gravel or very loose to very dense gravel and sand with varying proportions of clay and silt. The fill also includes cobbles and boulders. Bark chip fill was encountered in seven of our explorations to depths between 6 and 24 inches. To prevent excessive differential settlement, foundations and floor slabs should not bear on the undocumented fill, unless it has been improved. This material should be evaluated during construction and removed from foundation and floor slab subgrade.

- Based on the assumed foundation loads, buildings in areas not underlain by undocumented fill or underlain by less than a few feet of undocumented fill can be supported on conventional spread footings, provided the undocumented fill is removed and replaced with structural fill and the buildings can safely withstand the predicted static foundation settlement.

- In lieu of removal of undocumented fill where the fill is more than a few feet thick, settlement-sensitive structures can be supported on deep foundations or ground improvement.

- The proposed pedestrian bridge foundations can be supported on micropiles that penetrate through the fill present at the north end of the bridge and into the underlying basalt. The south end of the bridge will be supported on the Building B foundation that is underlain by basalt.

- The native, dense gravel, cobbles, and boulders encountered at shallow depths will result in difficult excavation with conventional equipment in both fill and decomposed/weathered basalt as well as the underlying intact basalt. In addition, because of the presence of cobbles and boulders in the near-surface fill and decomposed/weathered basalt, we expect difficult excavation at shallow depths. Utility trenches may result in slowed excavation and larger backfill volumes due to the presence of cobbles, boulders, and related caving.

- The project budget should include a contingency for removal of boulders.

- Static groundwater was measured at depths as shallow as 79.1 feet BGS in the VWPs installed at the site. Based on planned development grades, static groundwater is not a design consideration. Perched groundwater could be encountered at shallow depths following periods of heavy or prolonged rainfall.

- Based on soil and groundwater conditions at the site, liquefaction and lateral spreading are not design considerations at the site.

- Eleven of our 18 explorations encountered topsoil in the upper 6 to 12 inches, which includes an approximately 4- to 6-inch-thick root zone. In general, the topsoil is soft and contains organic material. This material exhibits low or highly variable strength and generally does not provide consistent subgrade support for foundations, floor slabs, or pavement. We recommend that the topsoil be removed, stabilized, or scarified and compacted as recommended for structural fill where it is present.

- Minor to severe caving was observed in 6 of our 13 test pits, starting at depths between 0 feet and 1 foot BGS. Caving was observed to occur within the fill.

- The on-site soil is suitable for use as structural fill, provided it is properly moisture conditioned and free of oversized materials. Moisture conditioning (drying) of the soil will likely be required depending on location and depth. It will be impossible to dry the soil during periods of extended wet weather.

- As an alternative to the use of thickened granular sections to support construction traffic, cement amendment can be used to obtain suitable support properties. However, depending on the grade and location, cobbles and boulders could be present in the subgrade. These oversized materials can damage cement tilling equipment when encountered and may require removal before cement amendment.

- Perimeter building foundation drains are recommended based on the preliminary grading plan and site surface and subsurface conditions.

- The site is classified as Site Class C according to the 2022 SOSSC and ASCE 7-16 based on site-specific shear wave velocity measurements. Buildings founded directly on basalt can be designed using Site Class B.

- Due to the presence of steep slopes at the site and subsurface conditions, we do not recommend that stormwater drainage be infiltrated on the site. Stormwater should be routed to an appropriate stormwater system.

- The 100 percent DD grading plans show fill slopes with gradients between 1H:1V and 2H:1V. Fill slopes steeper than 2H:1V will likely require reinforcement with geogrid to improve stability. Additional slope stability analysis of geogrid-reinforced fill slopes should be conducted once the fill slope material types and gradation properties are known.

- The 100 percent DD grading plans show a retaining wall with an exposed height of up to approximately 17.3 feet located south and west of the proposed buildings. We anticipate the wall will likely be MSE-type. Supplemental test pits will be required along the proposed wall alignment to evaluate wall foundation bearing conditions and global stability of the wall system, which will be a part of the wall design package.

Appendix C – Plan Sheets

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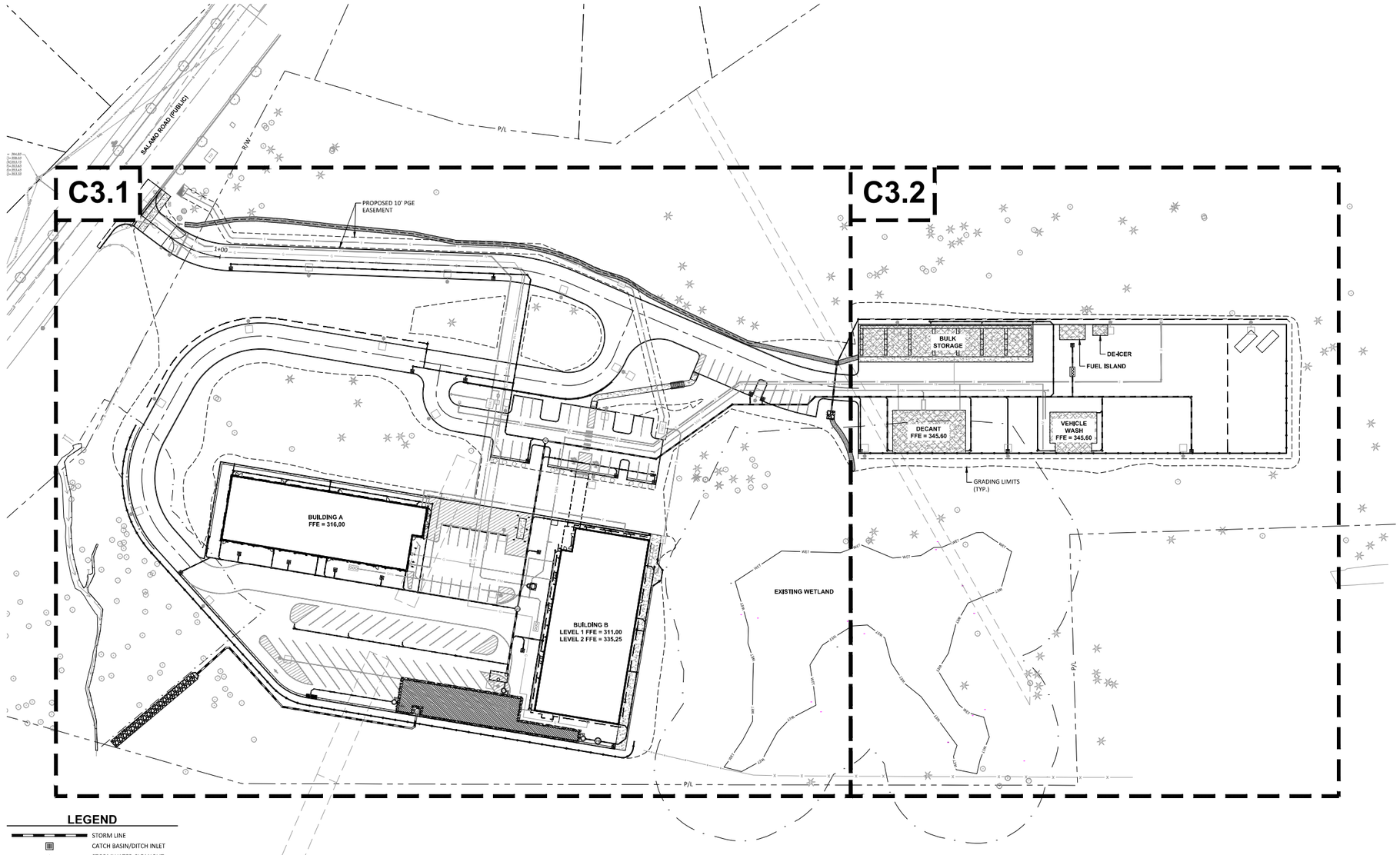

LEGEND

- STORM LINE
- CATCH BASIN/DITCH INLET
- STORMWATER CLEANOUT
- BACKWATER VALVE
- STORMWATER MANHOLE (SD)
- 72" STORMFILTER MANHOLE (WQ)
- UNDERGROUND STORM FACILITY
- GRAVITY LINE
- WATER LINE
- 100 EXISTING CONTOUR
- 102 PROPOSED MINOR CONTOUR
- 110 PROPOSED MAJOR CONTOUR
- EXISTING ROW/PROPERTY LINE
- GRADING LIMITS
- WET WETLAND BOUNDARY
- NATURAL RESOURCES BUFFER

THESE DRAWINGS ARE THE ORIGINAL UNPUBLISHED WORK OF THE ARCHITECT AND MAY NOT BE DUPLICATED OR USED WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT.

0 20 40 80
SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER
07.2012
OREGON
SEPT. 15, 2015
ALEXANDER J. SIMPSON
EXPIRES: 06/30/2026

WEST LINN PUBLIC WORKS FACILITY

Job Number: 23028

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ISSUE	DATE
100% CONSTRUCTION DOCUMENTATION	03.20.2026

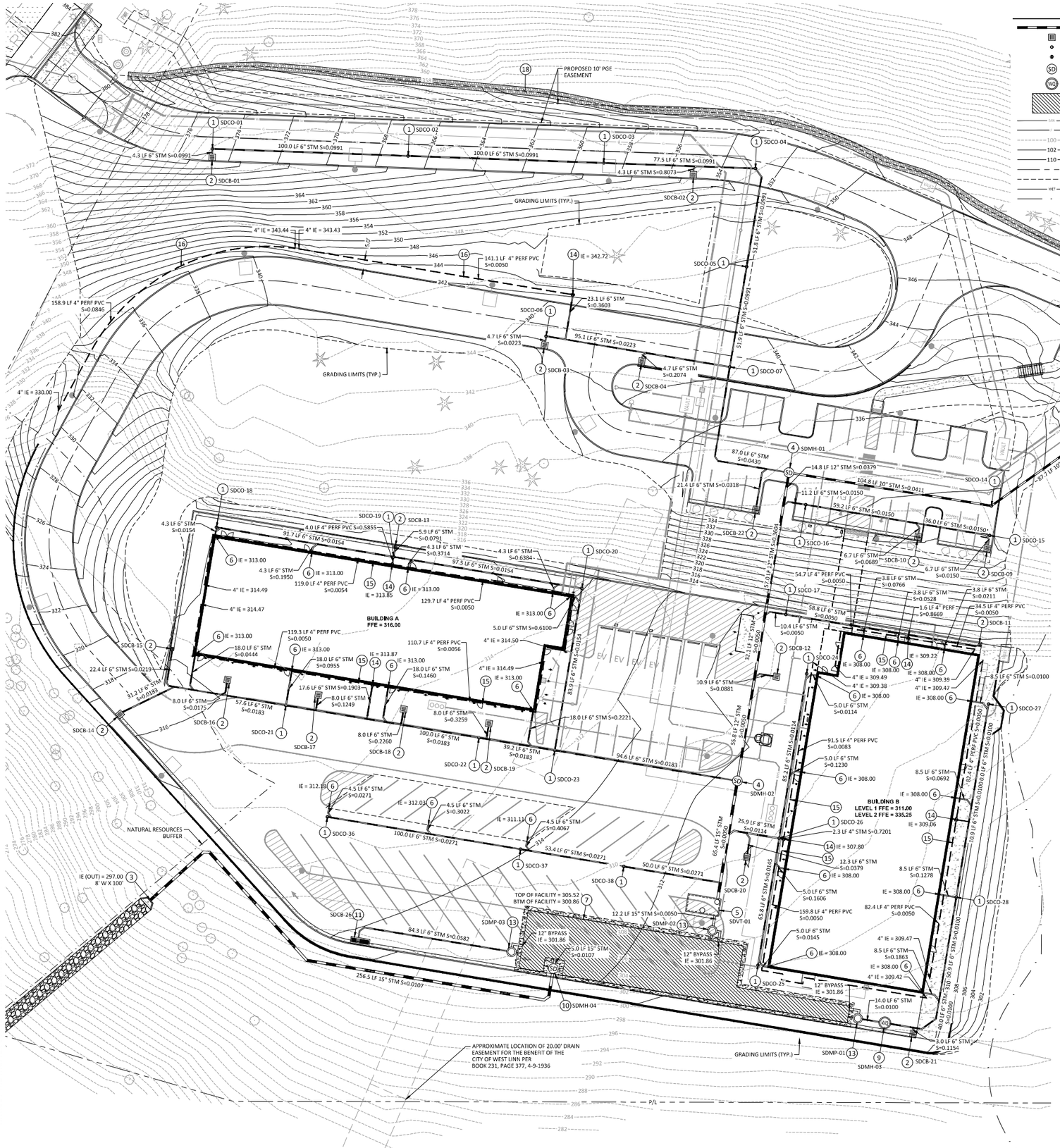
Drawing:

OVERALL STORMWATER PLAN

Sheet No:

C3.0

FILE PATH: C:\Revit_Local\23028_West Linn Public Works_tjorgensen\ZEPNR.rvt



LEGEND

- STORM LINE
- CATCH BASIN/DITCH INLET
- STORMWATER CLEANOUT
- BACKWATER VALVE
- STORMWATER MANHOLE
- 48" STORMFILTER MANHOLE
- UNDERGROUND STORM FACILITY
- GRAVITY LINE
- WATER LINE
- EXISTING CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING ROW/PROPERTY LINE
- GRADING LIMITS
- WETLAND BOUNDARY
- NATURAL RESOURCES BUFFER

CONSTRUCTION NOTES

1. CONSTRUCT CLEANOUT PER DETAIL ON SHEET C5.1. SEE THIS SHEET FOR DATA.
2. CONSTRUCT LYNCH STYLE CATCH BASIN PER DETAIL ON SHEET C5.1. SEE THIS SHEET FOR DATA.
3. CONSTRUCT STORM OUTFALL AND RIPRAP PAD PER DETAIL ON SHEET C5.1. INSTALL CONCRETE HEADWALL PER DETAIL ON SHEET C5.2.
4. CONSTRUCT STORM SEWER MANHOLE PER DETAIL ON SHEET C5.1. SEE THIS SHEET FOR DATA.
5. PROPOSED CONTECH 8x16 PEAK DIVERSION STORMFILTER VAULT WITH (25) 18" PSORB CARTRIDGES PER DETAIL ON SHEET C5.1.
6. ROOF DRAIN POINT OF CONNECTION. REFER TO PLUMBING PLANS FOR CONTINUATION.
7. PROPOSED UNDERGROUND DETENTION FOR STORMWATER MANAGEMENT PER DETAIL ON SHEET C5.3. 17,500 CF R-TANK OR EQUIVALENT.
8. CONSTRUCT CLASS 50 RIPRAP STORM OUTFALL PER DETAIL ON SHEET C5.1. INSTALL CONCRETE HEADWALL FOR SMALL DIAMETER PIPE PER COH STD. DWG. 420-3 ON SHEET C5.2.
9. CONSTRUCT CONTECH 48" STORMFILTER MANHOLE WITH (2) 18" PSORB CARTRIDGES PER DETAIL ON SHEET C5.1. SEE THIS SHEET FOR DATA.
10. CONSTRUCT FLOW CONTROL MANHOLE PER DETAIL ON SHEET C5.1. SEE THIS SHEET FOR DATA.
11. CONSTRUCT CONTECH STORMFILTER CATCH BASIN WITH (3) 18" PSORB CARTRIDGES PER DETAIL ON SHEET C5.2. SEE THIS SHEET FOR DATA.
12. CONSTRUCT DITCH INLET PER DETAIL ON SHEET C5.1. SEE THIS SHEET FOR DATA.
13. CONSTRUCT 30" FREEDOM BASIN WITH SOLID LID PER DETAIL ON SHEET C5.3.
14. INSTALL BACKWATER VALVE. CLEANCHECK, OR EQUAL WITH RISER AND CAST-IRON FRAME TO FINISHED GRADE.
15. INSTALL FOUNDATION DRAIN PER DETAIL ON SHEET C5.1. SEE THIS SHEET FOR DATA.
16. CONSTRUCT UNDERDRAIN PERF PIPE PER DETAIL ON SHEET C5.5.
18. INSTALL DRAINAGE DITCH PER DETAIL ON SHEET C5.1

STORM DRAINAGE DATA

NUMBER	DESCRIPTION	RIM ELEV.	INVERT ELEV.
SDCB-01	LYNCH STYLE CATCH BASIN	374.68	6" IE OUT (N) = 370.68
SDCB-02	LYNCH STYLE CATCH BASIN	355.01	6" IE OUT (N) = 349.38
SDCB-03	LYNCH STYLE CATCH BASIN	339.35	6" IE OUT (N) = 334.70
SDCB-04	LYNCH STYLE CATCH BASIN	338.29	6" IE OUT (N) = 334.45
SDCB-09	LYNCH STYLE CATCH BASIN	333.20	6" IE OUT (N) = 329.68
SDCB-10	LYNCH STYLE CATCH BASIN	333.52	6" IE OUT (N) = 329.50
SDCB-11	LYNCH STYLE CATCH BASIN	310.71	6" IE OUT (W) = 308.00
SDCB-12	LYNCH STYLE CATCH BASIN	310.25	6" IE OUT (W) = 308.25
SDCB-13	LYNCH STYLE CATCH BASIN	315.49	6" IE OUT (S) = 312.00
SDCB-14	LYNCH STYLE CATCH BASIN	316.32	6" IE OUT (NE) = 312.91
SDCB-15	LYNCH STYLE CATCH BASIN	315.83	6" IE OUT (S) = 312.83
SDCB-16	LYNCH STYLE CATCH BASIN	315.65	6" IE OUT (S) = 312.00
SDCB-17	LYNCH STYLE CATCH BASIN	315.65	6" IE OUT (S) = 312.00
SDCB-18	LYNCH STYLE CATCH BASIN	315.65	6" IE OUT (S) = 312.00
SDCB-19	LYNCH STYLE CATCH BASIN	315.65	6" IE OUT (S) = 312.00
SDCB-20	LYNCH STYLE CATCH BASIN	309.91	6" IE OUT (N) = 307.27
SDCB-21	LYNCH STYLE CATCH BASIN	310.38	6" IE OUT (N) = 306.51
SDCB-22	LYNCH STYLE CATCH BASIN	334.52	6" IE OUT (N) = 330.00
SDCB-23	LYNCH STYLE CATCH BASIN	344.64	8" IE OUT (S) = 341.14
SDCB-24	LYNCH STYLE CATCH BASIN	344.30	6" IE OUT (S) = 340.80
SDCB-26	CONTECH STORMFILTER CATCH BASIN	313.80	6" IE OUT (N) = 310.22
SDCO-01	CLEANOUT	374.83	6" IE IN (E) = 370.25 6" IE OUT (E) = 370.25
SDCO-02	CLEANOUT	366.82	6" IE IN (W) = 360.34 6" IE OUT (E) = 360.34
SDCO-03	CLEANOUT	358.82	6" IE IN (W) = 350.44 6" IE OUT (E) = 350.44
SDCO-04	CLEANOUT	352.79	6" IE IN (W) = 342.75 6" IE OUT (SE) = 342.75
SDCO-05	CLEANOUT	345.71	6" IE IN (N) = 337.62 6" IE OUT (S) = 337.62
SDCO-07	CLEANOUT	339.17	6" IE IN (N) = 332.48 6" IE OUT (S) = 332.48 6" IE IN (W) = 332.48
SDCO-12	CLEANOUT	346.02	10" IE IN (E) = 337.06 10" IE OUT (SW) = 337.06
SDCO-13	CLEANOUT	343.76	10" IE IN (E) = 336.66 10" IE OUT (SW) = 336.66
SDCO-14	CLEANOUT	333.91	10" IE OUT (W) = 333.05 10" IE IN (NE) = 333.05
SDCO-15	CLEANOUT	333.42	6" IE IN (S) = 329.58 6" IE OUT (W) = 329.58

STORM DRAINAGE DATA

NUMBER	DESCRIPTION	RIM ELEV.	INVERT ELEV.
SDCO-16	CLEANOUT	334.33	6" IE IN (E) = 328.15 6" IE OUT (W) = 328.15
SDCO-17	CLEANOUT	311.08	6" IE IN (E) = 307.50 6" IE OUT (W) = 307.50
SDCO-18	CLEANOUT	316.19	6" IE IN (S) = 312.93 6" IE OUT (E) = 312.93
SDCO-19	CLEANOUT	313.14	6" IE IN (W) = 311.53 6" IE OUT (E) = 311.53 6" IE IN (N) = 311.53 4" IE IN (S) = 311.53
SDCO-20	CLEANOUT	316.05	6" IE OUT (S) = 310.03 6" IE IN (W) = 310.03
SDCO-21	CLEANOUT	315.93	6" IE IN (N) = 311.28 6" IE OUT (E) = 311.28 6" IE IN (W) = 311.28
SDCO-22	CLEANOUT	315.91	6" IE OUT (E) = 309.46 6" IE IN (W) = 309.46
SDCO-23	CLEANOUT	315.36	6" IE IN (N) = 308.74 6" IE OUT (E) = 308.74 6" IE IN (W) = 308.74
SDCO-24	CLEANOUT	310.79	6" IE IN (E) = 307.94 6" IE OUT (S) = 307.94
SDCO-25	CLEANOUT	310.86	6" IE IN (E) = 307.93 6" IE OUT (N) = 307.93
SDCO-26	CLEANOUT	310.80	6" IE IN (S) = 306.97 8" IE OUT (W) = 306.97 6" IE IN (N) = 306.97 4" IE IN (E) = 306.97
SDCO-27	CLEANOUT	310.87	6" IE IN (W) = 307.91 6" IE OUT (S) = 307.91
SDCO-28	CLEANOUT	310.87	6" IE IN (N) = 306.91 6" IE OUT (S) = 306.91 6" IE IN (W) = 306.91
SDCO-36	CLEANOUT	315.11	6" IE IN (N) = 312.06 6" IE OUT (E) = 312.06
SDCO-37	CLEANOUT	314.08	6" IE IN (W) = 309.35 6" IE OUT (E) = 309.35
SDCO-38	CLEANOUT	312.67	6" IE IN (W) = 307.90 6" IE OUT (E) = 307.90
SDDI-01	DITCH INLET	344.91	8" IE OUT (S) = 342.12 6" IE IN (NE) = 342.13
SDMH-01	STORMWATER MANHOLE	334.87	10" IE IN (E) = 328.74 12" IE OUT (S) = 328.54 6" IE IN (W) = 328.74
SDMH-02	STORMWATER MANHOLE	311.56	6" IE IN (W) = 307.01 15" IE OUT (S) = 306.81 12" IE IN (N) = 307.01
SDMH-03	48" CONTECH STORMFILTER MANHOLE	310.57	6" IE IN (E) = 306.00 6" IE OUT (W) = 303.70
SDMH-04	60" FLOW CONTROL MANHOLE	312.40	15" IE OUT (S) = 300.36 15" IE IN (N) = 300.56
SDMP-01	30" DRAIN-RITE BASIN FOR R-TANK ACCESS	310.63	6" IE IN (E) = 303.56 6" IE OUT (W) = 300.86 12" IE OUT (N) = 301.86
SDMP-02	30" DRAIN-RITE BASIN FOR R-TANK ACCESS	311.17	12" IE OUT (E) = 301.86 15" IE IN (N) = 304.12 15" IE OUT (S) = 300.86
SDMP-03	30" DRAIN-RITE BASIN FOR R-TANK ACCESS	312.84	12" IE OUT (N) = 301.86 6" IE IN (W) = 305.31 6" IE OUT (E) = 300.86
SDVT-01	CONTECH PEAK DIVERSION STORMFILTER VAULT	311.08	15" IE IN (N) = 306.48 15" IE OUT (S) = 304.18

THESE DRAWINGS ARE THE ORIGINAL UNPUBLISHED WORK OF THE ARCHITECT AND ARE NOT TO BE USED OR DISCLOSED WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT.

REGISTERED PROFESSIONAL ENGINEER
OREGON
OCT. 15, 2010
ALEXANDER J. SIMPSON
EXPIRES: 06/30/2026

WEST LINN PUBLIC WORKS FACILITY

Job Number: 23028

WEST LINN, OR

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ISSUE	DATE
100% CONSTRUCTION DOCUMENTATION	03.20.2026

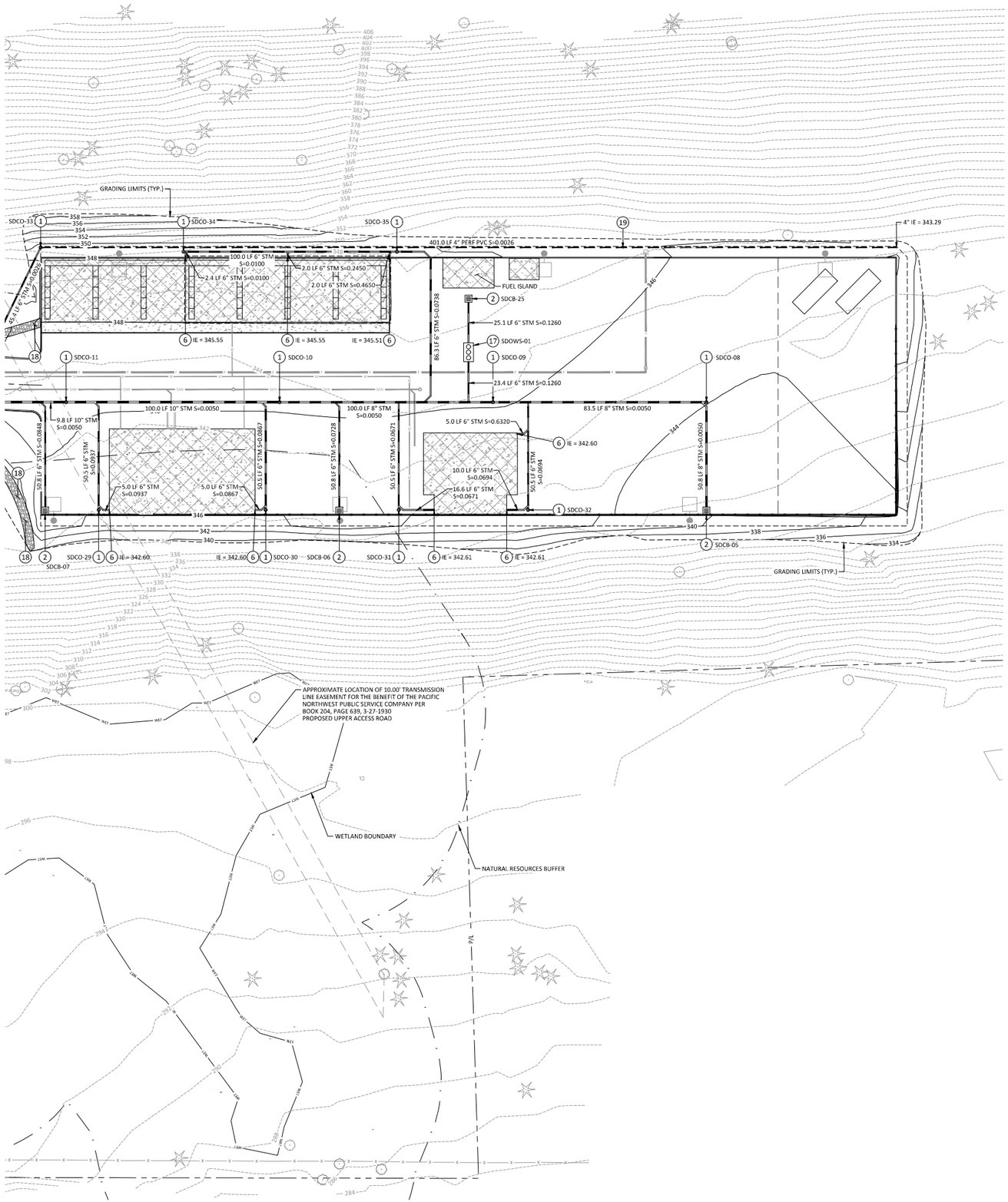
Drawing:

WEST STORMWATER PLAN

Sheet No:

C3.1

FILE PATH: C:\Revit_Local\23028_West Linn Public Works_jorgensenZEPNR.rvt



CONSTRUCTION NOTES

1. CONSTRUCT CLEANOUT PER DETAIL ON SHEET C5.1. SEE THIS SHEET FOR DATA.
2. CONSTRUCT LYNCH STYLE CATCH BASIN PER DETAIL ON SHEET C5.1. SEE THIS SHEET FOR DATA.
6. ROOF DRAIN POINT OF CONNECTION. REFER TO PLUMBING PLANS FOR CONTINUATION.
17. PROPOSED 1,000 GAL STRIEM (MODEL OT-1000) OIL/WATER SEPARATOR.
18. INSTALL DRAINAGE DITCH PER DETAIL ON SHEET C5.1
19. INSTALL FRENCH DRAIN PER DETAIL ON SHEET C5.5.

LEGEND

- STORM LINE
- CATCH BASIN/DITCH INLET
- STORMWATER CLEANOUT
- GRAVITY LINE
- WATER LINE
- EXISTING CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EXISTING ROW/PROPERTY LINE
- GRADING LIMITS
- WETLAND BOUNDARY
- NATURAL RESOURCES BUFFER

STORM DRAINAGE DATA

NUMBER	DESCRIPTION	RIM ELEV.	INVERT ELEV.
SDCB-05	LYNCH STYLE CATCH BASIN	342.58	8" IE OUT (N) = 339.08
SDCB-06	LYNCH STYLE CATCH BASIN	344.67	6" IE OUT (N) = 341.67
SDCB-07	LYNCH STYLE CATCH BASIN	345.09	6" IE OUT (N) = 341.59
SDCB-25	LYNCH STYLE CATCH BASIN	347.38	6" IE OUT (S) = 344.38
SDCO-08	CLEANOUT	344.03	8" IE IN (S) = 338.83 8" IE OUT (W) = 338.83
SDCO-09	CLEANOUT	346.09	8" IE IN (E) = 338.33 8" IE OUT (W) = 338.33
SDCO-10	CLEANOUT	346.21	8" IE IN (E) = 337.83 10" IE OUT (W) = 337.83
SDCO-11	CLEANOUT	346.54	10" IE IN (E) = 337.33 10" IE OUT (W) = 337.33
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SDOWS-01	OIL WATER SEPARATOR	344.57	6" IE IN (N) = 341.22 6" IE OUT (S) = 341.22

REGISTERED PROFESSIONAL ENGINEER
87,282
OREGON
SEPT. 15, 2015
ALEXANDER J. SIMPSON
EXPIRES: 06/30/2026

WEST LINN PUBLIC WORKS FACILITY

Job Number: 23028

WEST LINN, OR

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0 10 20 40
SCALE: 1" = 20'

ISSUE	DATE
100% CONSTRUCTION DOCUMENTATION	03.20.2026

Drawing:

EAST STORMWATER PLAN

Sheet No:

C3.2

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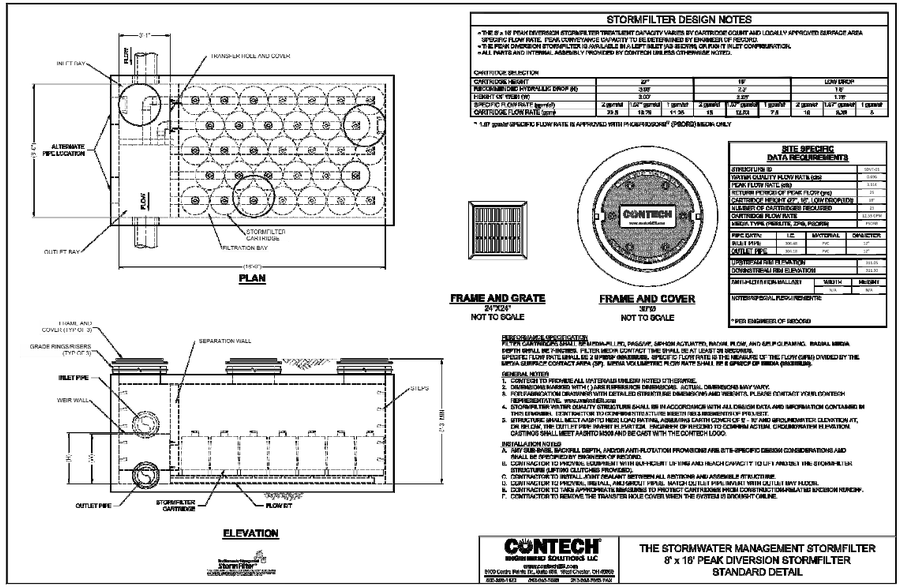

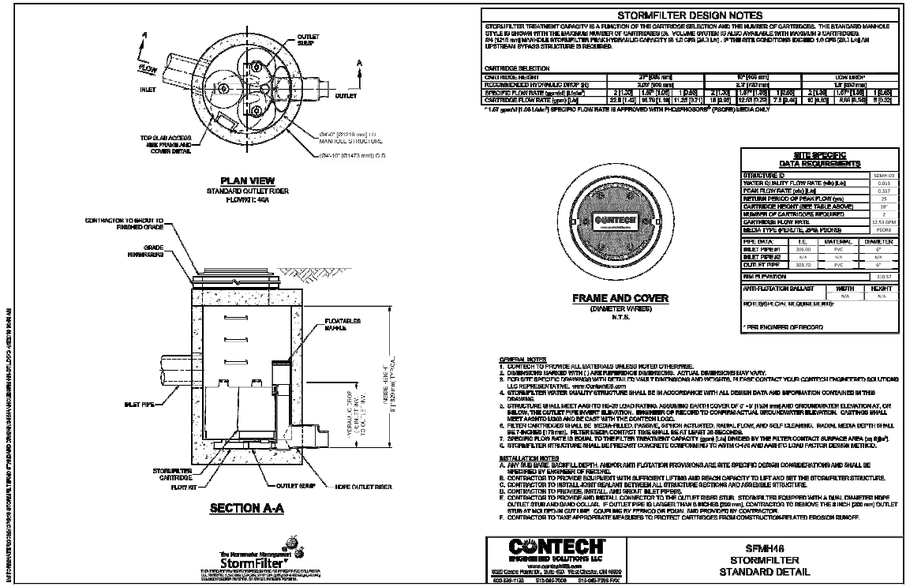

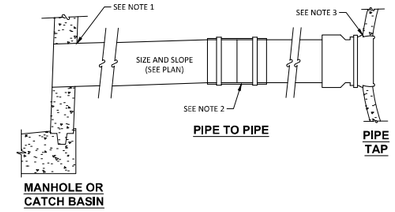

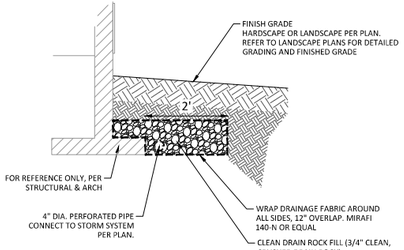

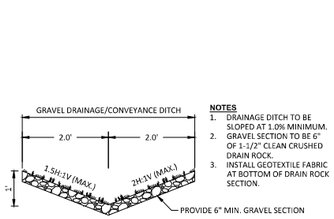

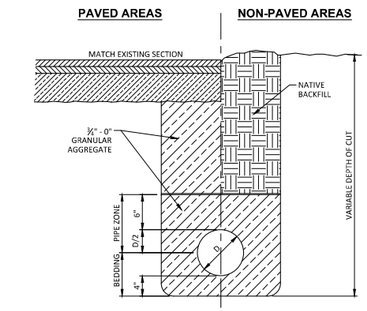

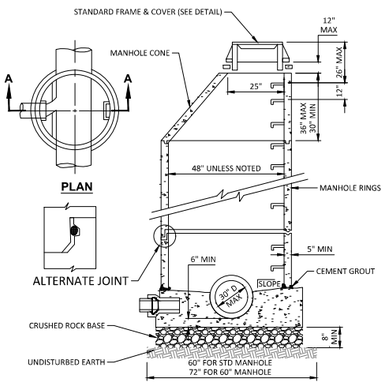

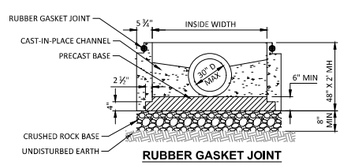

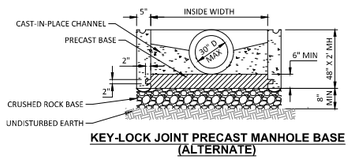

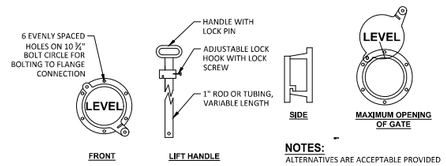

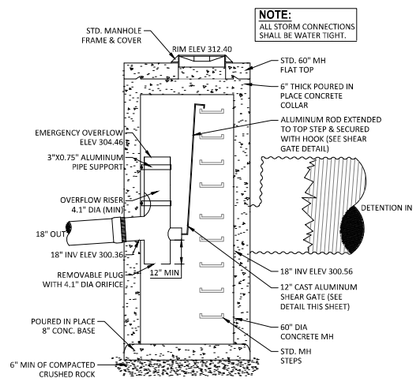

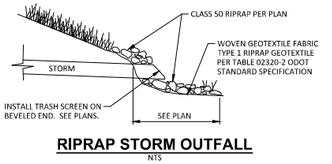

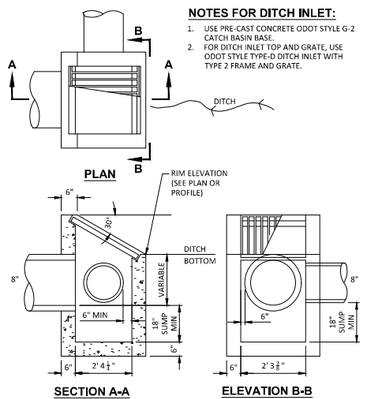

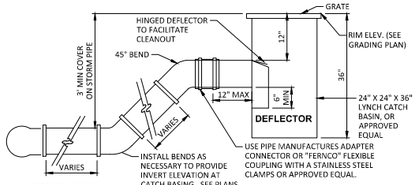

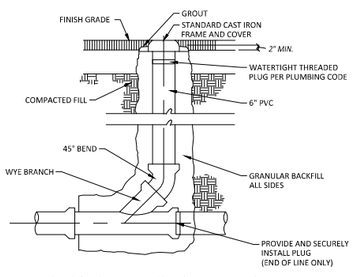

NOTES:
1. ALL PRECAST MANHOLE RINGS AND CONES SHALL CONFORM TO ASTM C-478 WITH CAST IN STEPS. (SEE DETAIL)
2. IN OVER EXCAVATED AREAS PROVIDE SUPPORT FOR THE PIPE AS FOLLOWS: PLACE 3/4" MINUS CRUSHED ROCK OVER UNDISTURBED GROUND IN 6" LAYERS AND COMPACT USING HAND TAMPER.
3. BASE CONCRETE SHALL BE 3000 P.S.I., 2-4 IN. SLUMP. FLOW LINES AND INSIDE SURFACES SHALL BE TROWLED SMOOTH & UNIFORM AT TIME OF POUR. MANHOLE BASE MAY BE MONOLITHICALLY CAST TO 8" ABOVE BARREL OF MAIN SEWER.
4. CAST IN PLACE, MONOLITHIC MANHOLE MAY BE SUBSTITUTED WITH SPECIFIC APPROVAL OF THE ENGINEER.
5. SEE INSERT-A-TEE MANHOLE CONNECTION DETAILS.
6. JOINTS SHALL BE CONSTRUCTED SO AS TO BE WATERTIGHT. KENT-SEAL NO. 2 OR APPROVED EQUAL SHALL BE USED ON TONGUE & GROOVE SECTIONS, AND ON RISER RINGS PREMOLDED "O-RING" MAY BE SUBSTITUTED ON BELL & SPIGOT SECTIONS. ALL JOINTS SHALL BE GROUTED WITH SUPERIOR ADVANTAGE GROUT & STRUCK EVEN WITH THE WALL. GROUT MUST MEET ASTM C-827 FOR NON SHRINKAGE AS PER 2002 APWA 2440.50(b).
7. MANHOLES UNDER 6'-0" IN DEPTH FROM RIM TO SHELF SHALL HAVE A FLAT TOP IN LIEU OF CONE (SEE DETAIL ON THIS SHEET, ABOVE).
STANDARD PRECAST MANHOLE
NTS

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REGISTERED PROFESSIONAL ENGINEER
87,262
OREGON
JULY 15, 2015
ALEXANDER J. SIMPSON
EXPIRES: 06/30/2026

WEST LINN PUBLIC WORKS FACILITY

Job Number: 23028

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Drawing:

DETAILS

Sheet No:

C5.1

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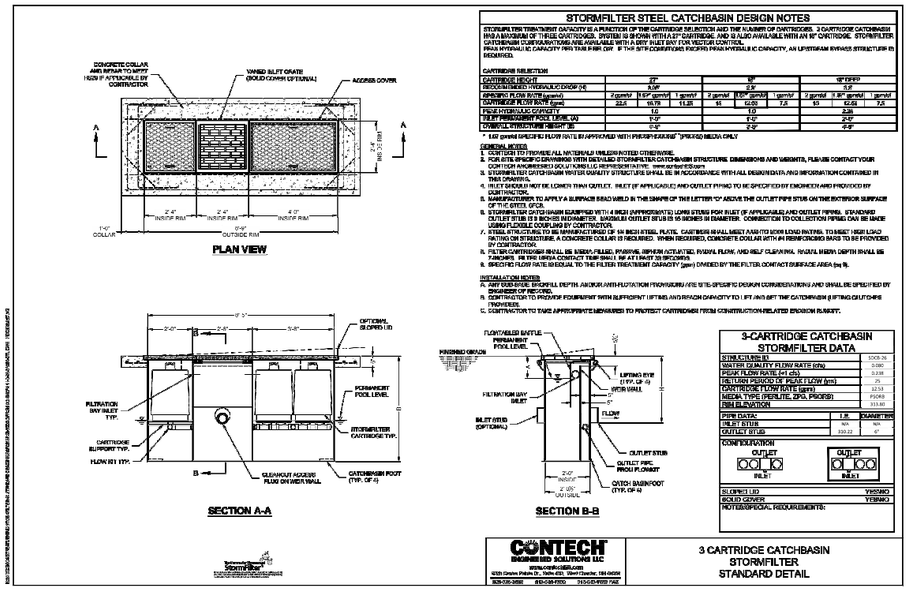
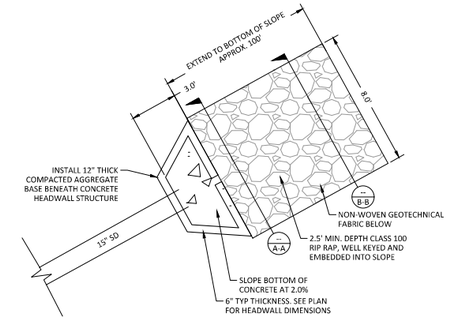
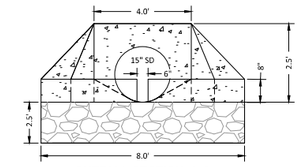
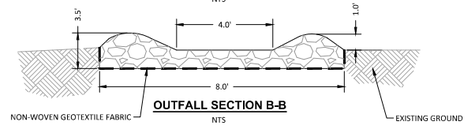






OUTFALL SECTION A-A
NTS



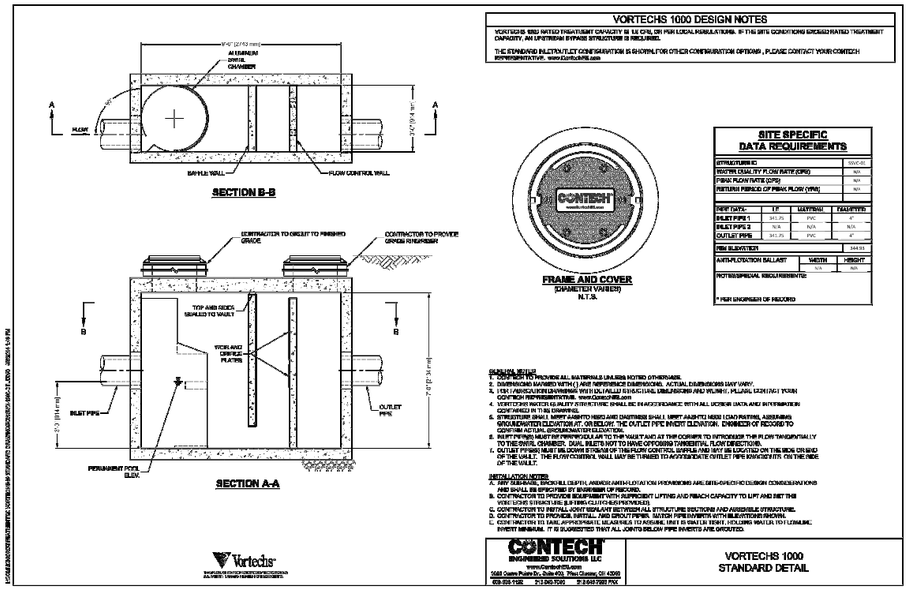
OUTFALL SECTION B-B
NTS

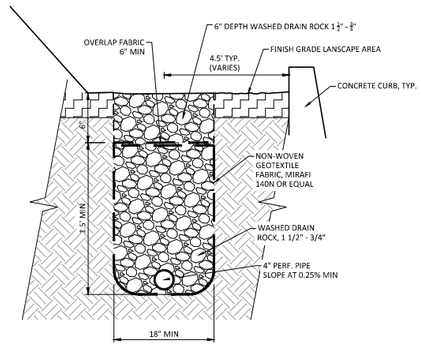
NOTES:

1. SLOPE RIP RAP AWAY FROM OUTFALL STRUCTURE TO MATCH EXISTING. SLOPE AS SHOWN ON PLANS.
2. RIP RAP PAD TO BE INSTALLED PERPENDICULAR TO SLOPE.
3. RIP RAP TO BE ODOT CLASS 100.
4. CONTRACTOR TO SUBMIT FINAL DESIGN FOR THE CONCRETE OUTFALL STRUCTURE.
5. PRECAST CONCRETE STRUCTURE MAY BE ACCEPTABLE, PROVIDE SUBMITTAL TO ENGINEER.
6. INSTALL 12" THICK COMPACTED AGGREGATE BASE BENEATH CONCRETE HEADWALL STRUCTURE.

CONCRETE HEADWALL & OUTFALL DETAIL

NTS





FRENCH DRAIN

NTS

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REGISTERED PROFESSIONAL ENGINEER 87,202 OREGON JULY 15, 2015 ALEXANDER J. SIMPSON EXPIRES: 06/30/2020

WEST LINN PUBLIC WORKS FACILITY

Job Number: 23028

WEST LINN, OR

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ISSUE DATE

Drawing:

DETAILS

Sheet No:

C5.2

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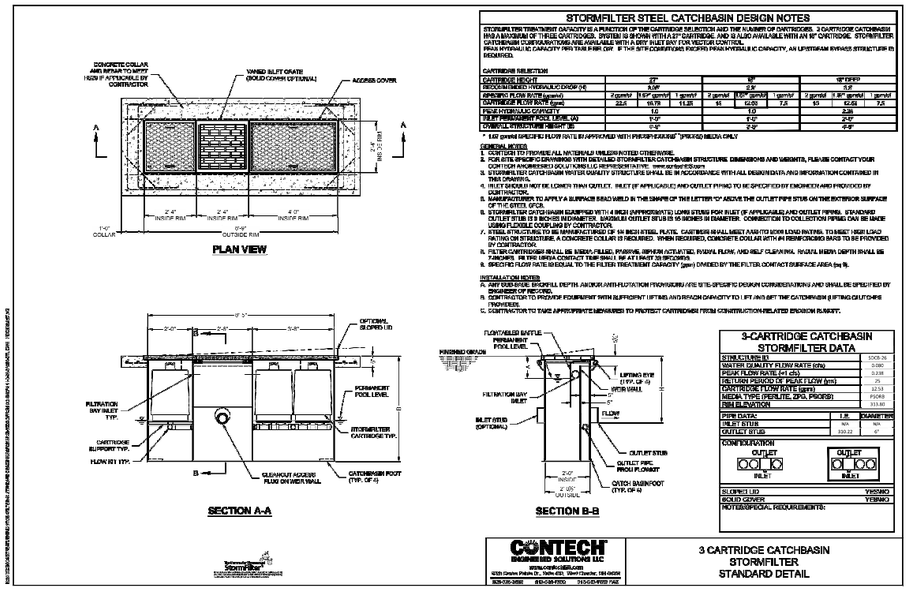
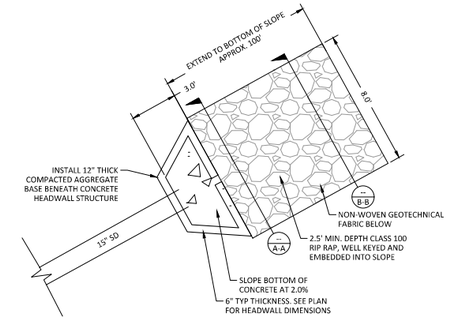
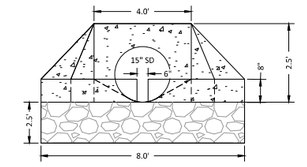
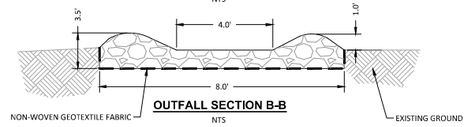






OUTFALL SECTION A-A
NTS



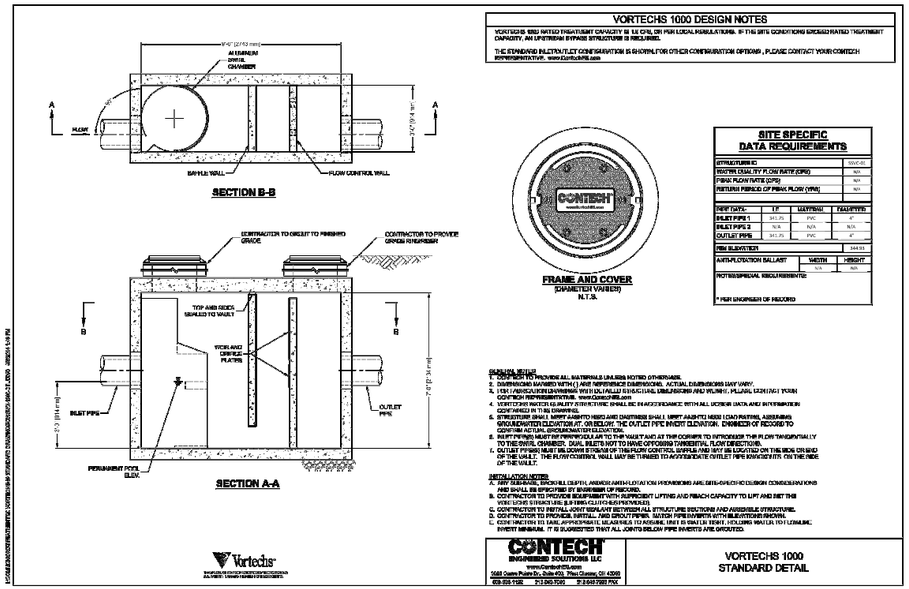
OUTFALL SECTION B-B
NTS

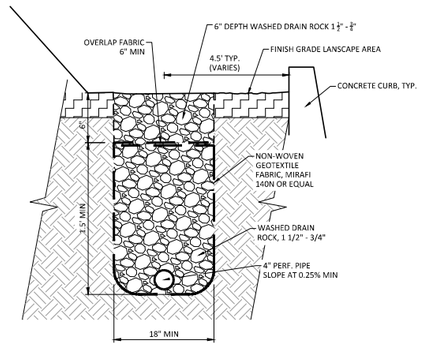
NOTES:

1. SLOPE RIP RAP AWAY FROM OUTFALL STRUCTURE TO MATCH EXISTING. SLOPE AS SHOWN ON PLANS.
2. RIP RAP PAD TO BE INSTALLED PERPENDICULAR TO SLOPE.
3. RIP RAP TO BE ODOT CLASS 100.
4. CONTRACTOR TO SUBMIT FINAL DESIGN FOR THE CONCRETE OUTFALL STRUCTURE.
5. PRECAST CONCRETE STRUCTURE MAY BE ACCEPTABLE, PROVIDE SUBMITTAL TO ENGINEER.
6. INSTALL 12" THICK COMPACTED AGGREGATE BASE BENEATH CONCRETE HEADWALL STRUCTURE.

CONCRETE HEADWALL & OUTFALL DETAIL

NTS





FRENCH DRAIN

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C5.2

Appendix D – Hydrographs

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 1

Basin 1 - Existing

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 240.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.40		0.00		0.00		
Land slope (%)	= 15.50		0.00		0.00		
Travel Time (min)	**= 14.63**	**+**	**0.00**	**+**	**0.00**	**=**	**14.63**
Shallow Concentrated Flow							
Flow length (ft)	= 318.00		0.00		0.00		
Watercourse slope (%)	= 15.10		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=7.90		0.00		0.00		
Travel Time (min)	**= 0.67**	**+**	**0.00**	**+**	**0.00**	**=**	**0.67**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 15.30 min

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 3

Basin 2 - Existing

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 273.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.40		0.00		0.00		
Land slope (%)	= 16.60		0.00		0.00		
Travel Time (min)	**= 15.78**	**+**	**0.00**	**+**	**0.00**	**=**	**15.78**
Shallow Concentrated Flow							
Flow length (ft)	= 179.00		0.00		0.00		
Watercourse slope (%)	= 4.50		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=4.31		0.00		0.00		
Travel Time (min)	**= 0.69**	**+**	**0.00**	**+**	**0.00**	**=**	**0.69**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 16.50 min

Hydrograph Report - WATER QUALITY

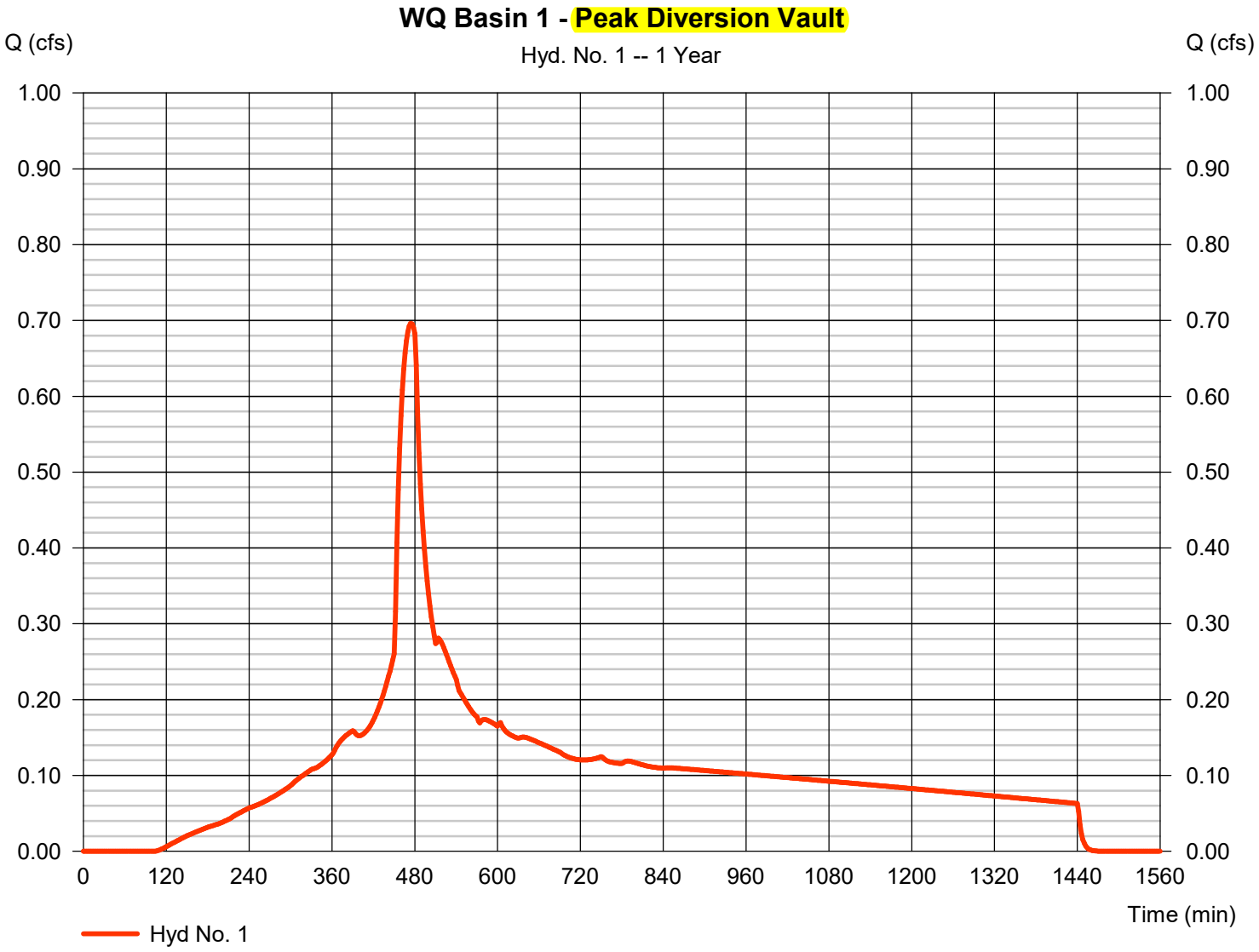
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Wednesday, 03 / 11 / 2026

Hyd. No. 1

WQ Basin 1 - Peak Diversion Vault

1" per 24-hour period

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.696 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	9,761 cuft
Drainage area	=	3.400 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



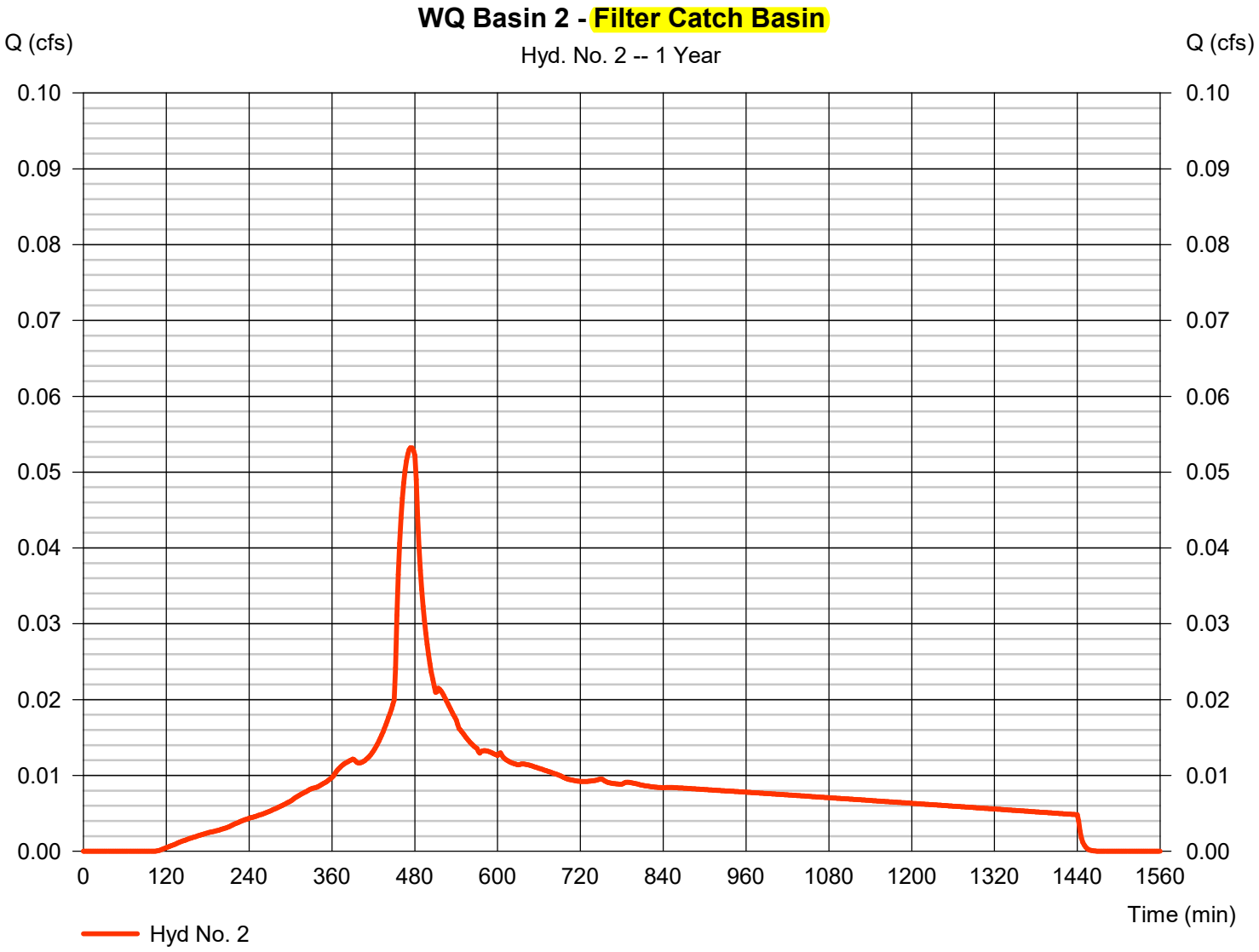
Hydrograph Report - WATER QUALITY

Hyd. No. 2

WQ Basin 2 - Filter Catch Basin

1" per 24-hour period

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.053 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	746 cuft
Drainage area	=	0.260 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



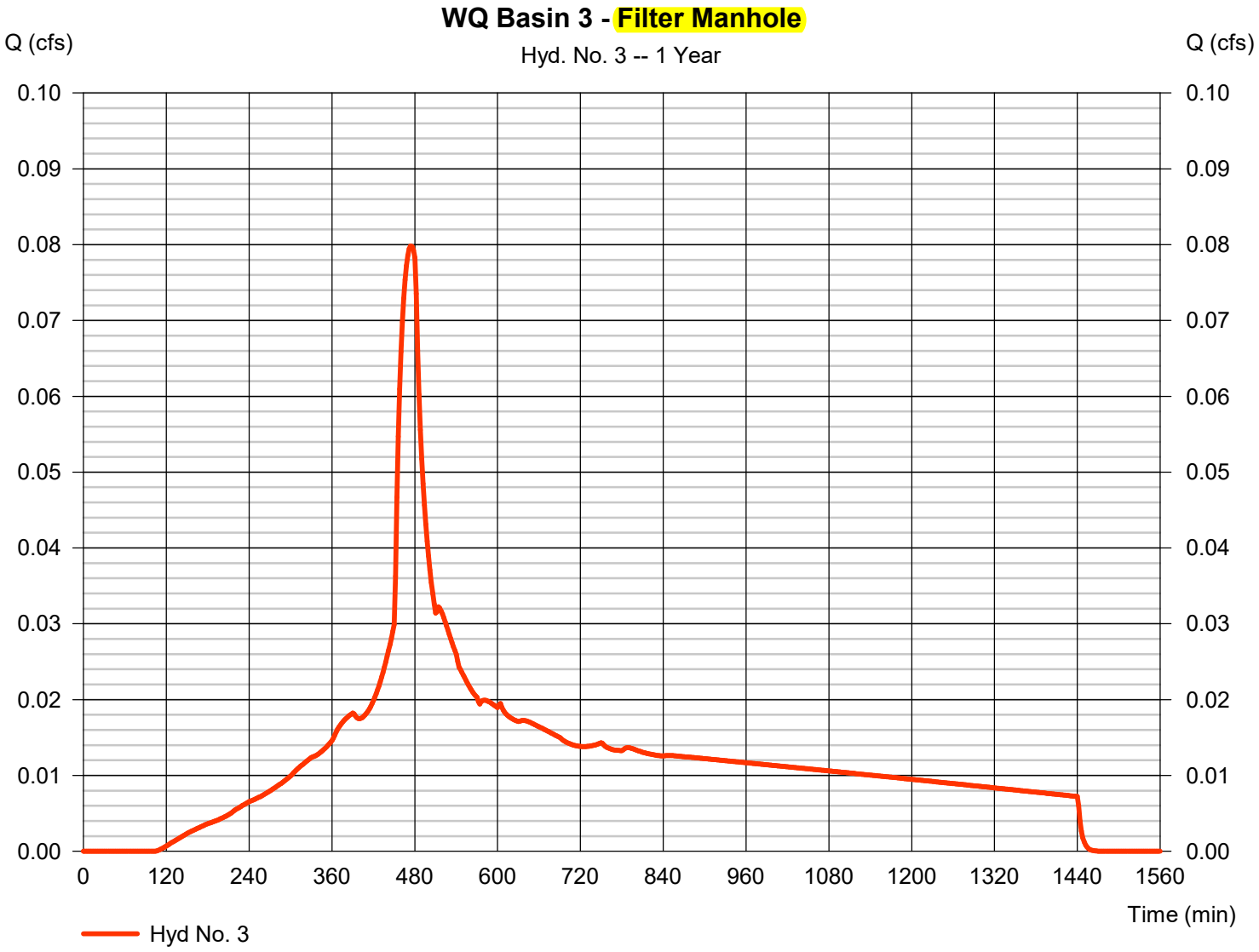
Hydrograph Report - WATER QUALITY

Hyd. No. 3

WQ Basin 3 - Filter Manhole

1" per 24-hour period

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.080 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	1,120 cuft
Drainage area	=	0.390 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



Hydrograph Report

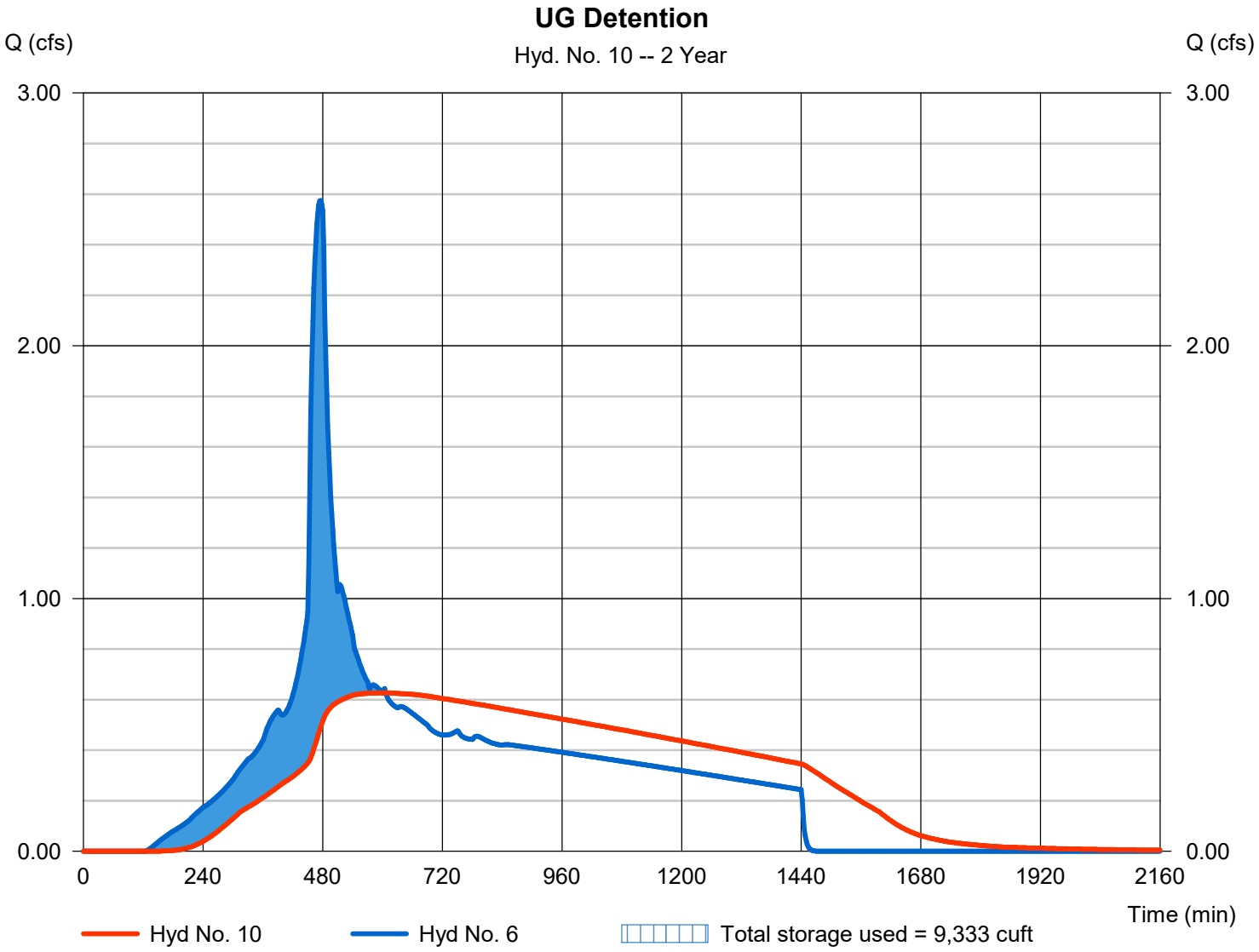
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Wednesday, 03 / 11 / 2026

Hyd. No. 10

UG Detention

Hydrograph type	=	Reservoir	Peak discharge	=	0.627 cfs
Storm frequency	=	2 yrs	Time to peak	=	606 min
Time interval	=	2 min	Hyd. volume	=	36,200 cuft
Inflow hyd. No.	=	6 - Basin 1 - Proposed	Max. Elevation	=	102.62 ft
Reservoir name	=	UG Detention	Max. Storage	=	9,333 cuft

Storage Indication method used.



Hydrograph Report

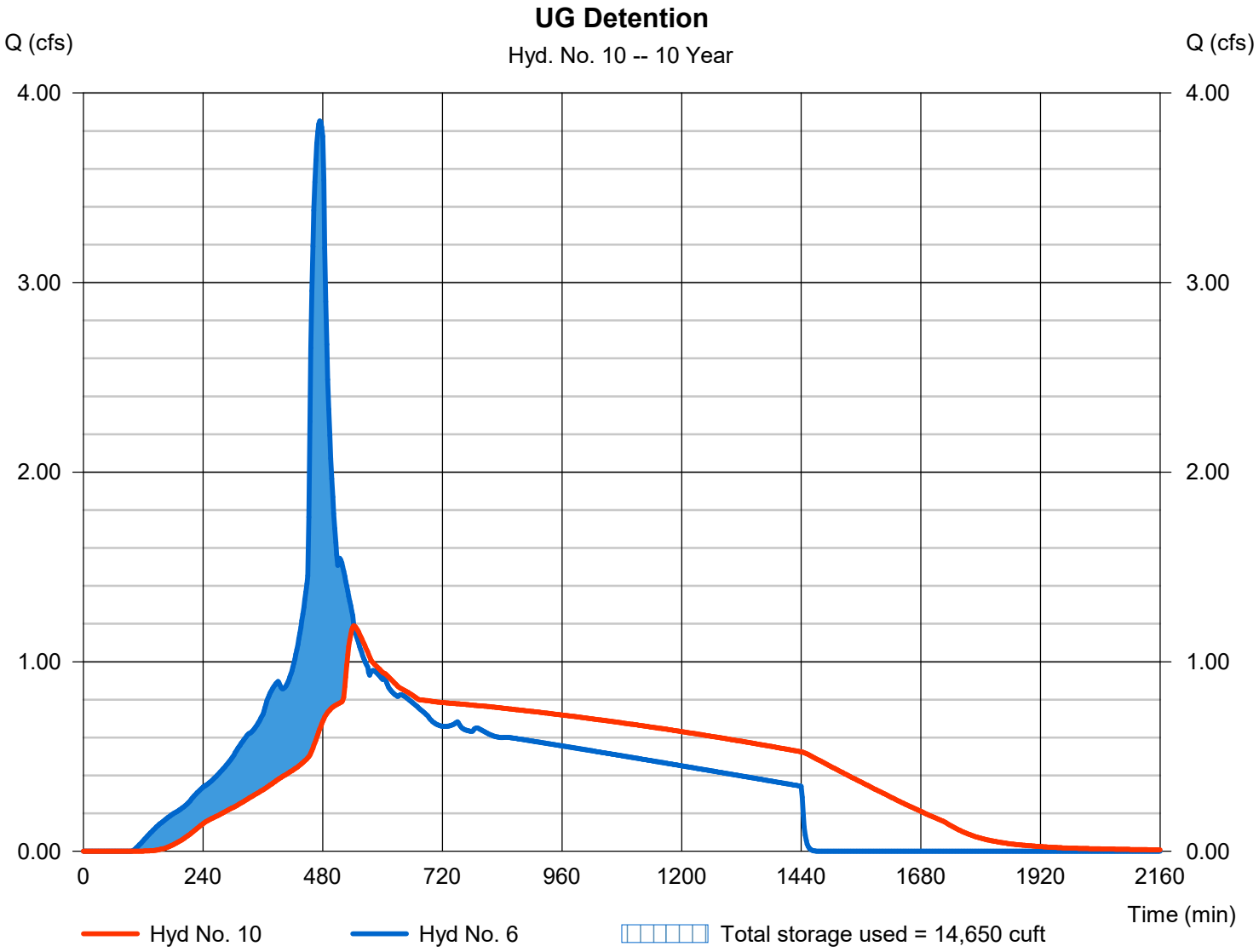
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Wednesday, 03 / 11 / 2026

Hyd. No. 10

UG Detention

Hydrograph type	= Reservoir	Peak discharge	= 1.189 cfs
Storm frequency	= 10 yrs	Time to peak	= 542 min
Time interval	= 2 min	Hyd. volume	= 53,986 cuft
Inflow hyd. No.	= 6 - Basin 1 - Proposed	Max. Elevation	= 104.11 ft
Reservoir name	= UG Detention	Max. Storage	= 14,650 cuft

Storage Indication method used.



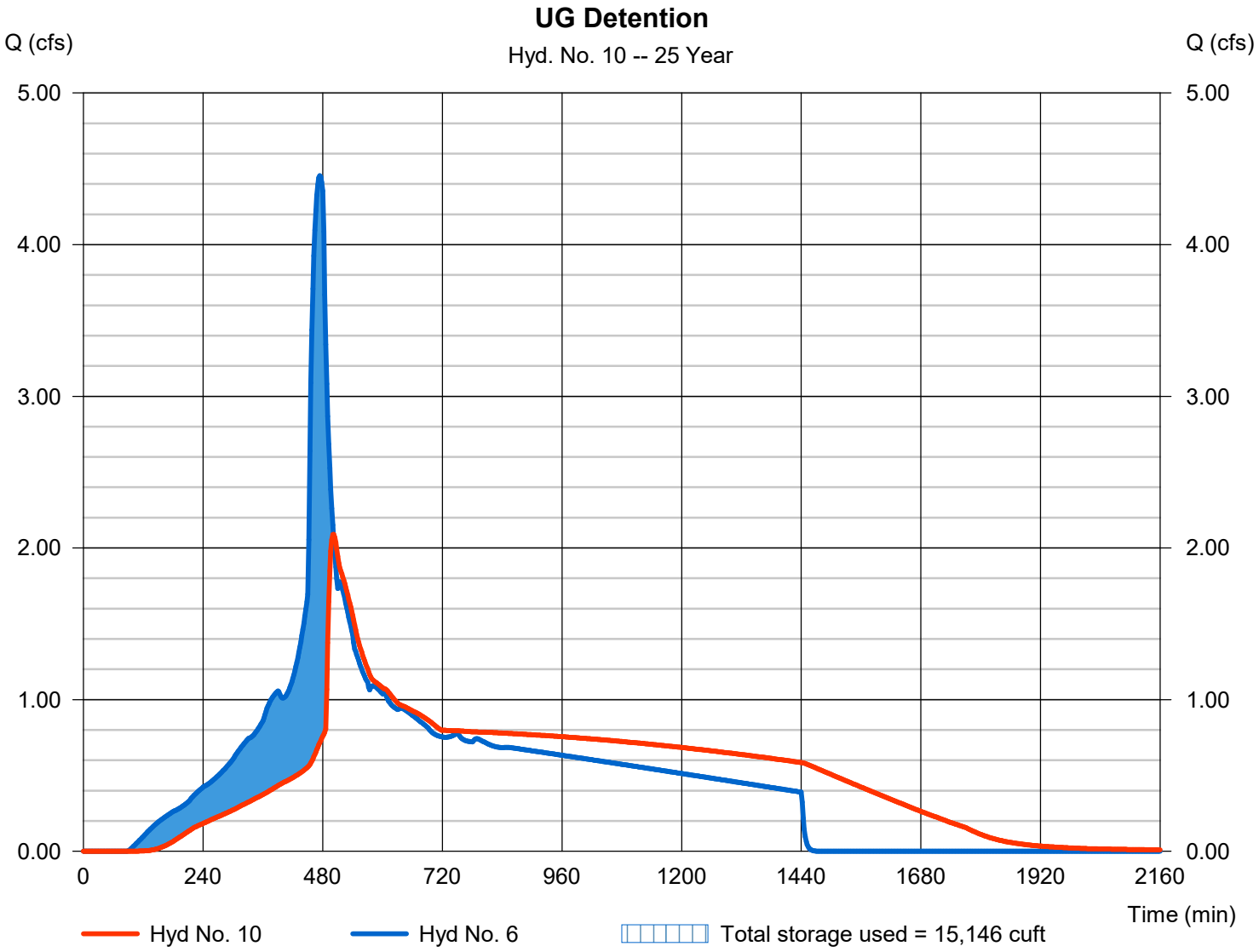
Hydrograph Report

Hyd. No. 10

UG Detention

Hydrograph type	= Reservoir	Peak discharge	= 2.090 cfs
Storm frequency	= 25 yrs	Time to peak	= 502 min
Time interval	= 2 min	Hyd. volume	= 62,505 cuft
Inflow hyd. No.	= 6 - Basin 1 - Proposed	Max. Elevation	= 104.25 ft
Reservoir name	= UG Detention	Max. Storage	= 15,146 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - UG Detention

Pond Data

Trapezoid -Bottom L x W = 150.0 x 25.0 ft, Side slope = 0.00:1, Bottom elev. = 100.00 ft, Depth = 4.66 ft, Voids = 95.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	3,750	0	0
0.47	100.47	3,750	1,660	1,660
0.93	100.93	3,750	1,660	3,320
1.40	101.40	3,750	1,660	4,980
1.86	101.86	3,750	1,660	6,641
2.33	102.33	3,750	1,660	8,301
2.80	102.80	3,750	1,660	9,961
3.26	103.26	3,750	1,660	11,621
3.73	103.73	3,750	1,660	13,281
4.19	104.19	3,750	1,660	14,941
4.66	104.66	3,750	1,660	16,601

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	4.00	0.00	0.00
Span (in)	= 12.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 100.00	100.00	0.00	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

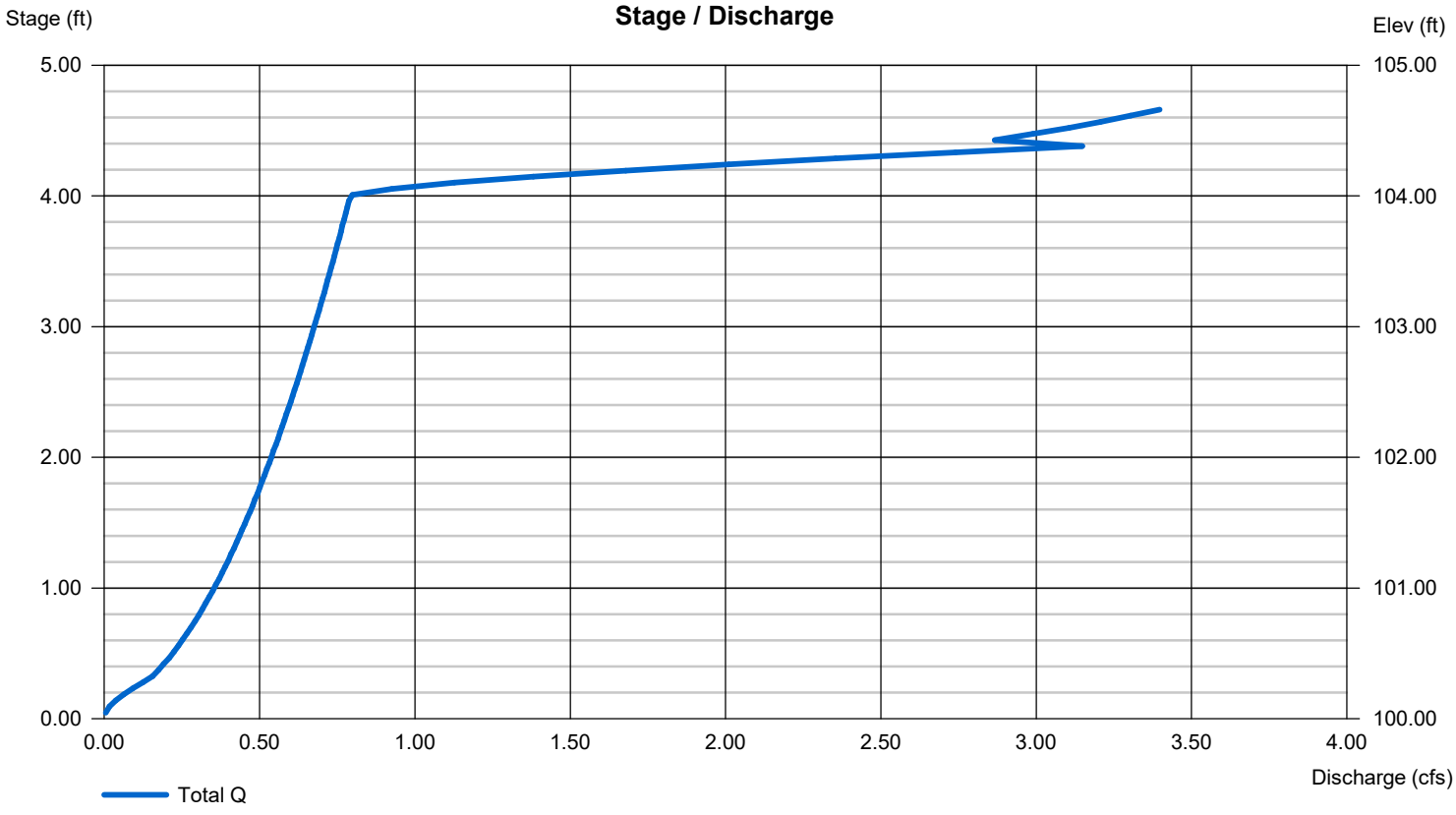
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.14	0.00	0.00	0.00
Crest El. (ft)	= 104.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Appendix E – Conveyance

P:\01-Portland\SEA (Scott Edwards Architecture)\SEA-158 (West Linn Public Works)\SEA158-DOCS\Reports\Stormwater\Exhibits\ SEA158-Pipe Conveyance Map.dwg

SALAMO RD

BASIN B1

BASIN B2

BASIN B3

BASIN B4

BASIN B5

BASIN B6

BASIN 3 BYPASS
INLET AND CULVERT

BASIN A1

BASIN A2

BASIN A3

BASIN A4

R-A1

R-A2

R-A3

R-A4

BASIN D1

BASIN D2

BASIN D3

BASIN D4

BASIN D5

BASIN D6

BASIN D7

BASIN D8

BASIN D9

R-D1

R-D2

R-D3

R-D4

R-D5

R-D6

R-D7

R-D8

R-D9

R-D10

R-D11

R-D12

R-D13

R-D14

R-D15

R-D16

R-D17

R-D18

R-D19

R-D20

R-D21

EX RAVINE

PROPOSED R-TANK

IE OUT = 297.00

WETLAND
BOUNDARY

VEGETATED CORRIDOR

LEGEND

BASINS

A — STORM PIPE NAME

STORM PIPE

0 20 40 80
SCALE: 1" = 80'

N

DATE	NO.	DESCRIPTION

REVISIONS

DESIGNED: LEM
DRAWN: LEM
CHECKED: AJS
DATE: MARCH 2026

Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS
205 SE Spokane Street, Suite 200, Portland, OR 97202
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PIPE CONVEYANCE MAP

WEST LINN OPERATIONS COMPLEX

WEST LINN, OREGON

SHEET NO. CON

JOB NO. SEA-158

West Linn PW - Conveyance Calculations						
Pipe Name	Contributing Basin	Contributing Pipe	25-yr Runoff (CFS)	Pipe Size (in)	Min. Slope (%)	Pipe Capacity (cfs)
A1	A1	N/A	0.552	8	0.5	0.850
A2	R-A1	N/A	0.018	6	0.5	0.400
A3	N/A	A1, A2	0.570	8	0.5	0.850
A4	A2	N/A	0.009	6	0.5	0.400
A5	N/A	A3, A4	0.579	8	0.5	0.850
A6	R-A3	N/A	0.064	6	0.5	0.400
A7	N/A	A5, A6	0.643	8	0.5	0.850
A8	R-A2	N/A	0.018	6	0.5	0.400
A9	N/A	A7, A8	0.661	8	0.5	0.850
A10	A3	N/A	0.183	6	0.5	0.400
A11	N/A	A9, A10	0.844	8	0.5	0.850
A12	R-A4	A11	0.899	10	0.5	1.550
A13	A4	N/A	0.165	6	0.5	0.400
A14	N/A	A12, A13	1.064	10	0.5	1.550
B1	B1	N/A	0.174	6	9.9	1.770
B2	B2	N/A	0.156	6	9.9	1.770
B3	N/A	B1, B2	0.330	6	9.9	1.770
B4	B5	N/A	0.073	6	2.2	0.830
B5	B4	N/A	0.128	6	2.2	0.830
B6	N/A	B4, B5	0.201	6	2.2	0.830
B7	B3	N/A	0.055	6	7.5	1.540
B8	N/A	A14, B7	1.119	10	0.5	1.550
B9	B2	N/A	0.156	6	0.5	0.400
C1	N/A	B3, B6	0.531	6	4.3	1.160
C2	C1	N/A	0.073	6	3.2	1.000
C3	N/A	C1, C2	0.604	6	4.3	1.160
C4	N/A	B8, B9	1.275	10	1.8	2.940
C5	N/A	C3, C4	1.879	10	3.8	4.270
C6	C3	N/A	0.037	6	1.5	0.690
C7	C2	N/A	0.119	6	1.5	0.690
C8	N/A	C2, C3	0.156	6	1.5	0.690
C9	N/A	C5, C8	2.035	10	36.0	13.150
D1	B6	N/A	0.156	6	1.8	0.760
D2	D9	N/A	0.018	6	2.2	0.830
D3	N/A	D1, D2	0.174	6	1.8	0.760
D4	R-D1	N/A	0.018	6	1.8	0.760
D5	N/A	D3, D4	0.192	6	1.8	0.760
D6	D5	N/A	0.018	6	1.8	0.760
D7	N/A	D5, D6	0.210	6	1.8	0.760
D8	R-D3	N/A	0.027	6	1.8	0.760
D9	N/A	D7, D8	0.237	6	1.8	0.760
D10	D6	N/A	0.018	6	1.8	0.760
D11	N/A	D9, D10	0.255	6	1.8	0.760
D12	R-D5	N/A	0.040	6	1.8	0.760
D13	N/A	D11, D12	0.295	6	1.8	0.760
D14	D7	N/A	0.018	6	1.8	0.760
D15	N/A	D13, D14	0.313	6	1.8	0.760
D16	D8	N/A	0.018	6	1.8	0.760
D17	N/A	D15, D16	0.331	6	1.8	0.760
D18	R-D7	N/A	0.027	6	1.8	0.760
D19	N/A	D17, D18	0.358	6	1.8	0.760
D20	R-D2	N/A	0.018	6	1.5	0.690
D21	R-D4	N/A	0.027	6	1.5	0.690
D22	N/A	D20, D21	0.045	6	1.5	0.690
D23	D10	N/A	0.046	6	1.5	0.690
D24	N/A	D22, D23	0.091	6	1.5	0.690
D25	R-D6	N/A	0.040	6	1.5	0.690
D26	N/A	D24, D25	0.131	6	1.5	0.690
D27	R-D8	N/A	0.027	6	1.5	0.690

Sizing Criteria:
CWS 25-Year Storm Event = 3.90 in/24-hours
Manning 'N' Coeff = 0.013
2 fps minimum full-flow velocity

D28	N/A	D26, D27	0.158	6	1.5	0.690
D29	R-D9	N/A	0.005	6	1.5	0.690
D30	N/A	D28, D29	0.163	6	1.5	0.690
D31	N/A	D19, D30	0.521	6	1.8	0.760
D32	D11	N/A	0.009	6	0.5	0.400
D33	R-D20	N/A	0.009	6	0.5	0.400
D34	N/A	D32, D33	0.018	6	0.5	0.400
D35	R-D19	N/A	0.009	6	0.5	0.400
D36	N/A	D34, D35	0.027	6	0.5	0.400
D37	R-D18	N/A	0.009	6	0.5	0.400
D38	N/A	D36, D37	0.036	6	0.5	0.400
D39	N/A	C9, D38	2.071	12	0.5	2.520
D40	D4	N/A	0.202	6	0.5	0.400
D41	N/A	D39, D40	2.273	12	0.5	2.520
D42	N/A	D31, D41	2.794	15	0.5	4.570
D43	R-D16	N/A	0.027	6	1.1	0.590
D44	R-D14	N/A	0.046	6	1.1	0.590
D45	N/A	D43, D44	0.073	6	1.1	0.590
D46	R-D10	N/A	0.027	6	0.5	0.400
D47	R-D12	N/A	0.046	6	0.5	0.400
D48	N/A	D46, D47	0.073	6	0.5	0.400
D49	N/A	D45, D48	0.146	6	1.1	0.590
D50	D3	N/A	0.211	6	0.5	0.400
D51	N/A	D49, D50	0.357	6	0.5	0.400
D52	N/A	D42, D51	3.151	15	0.5	4.570
D53	R-D21	N/A	0.046	6	2.7	0.920
D54	N/A	D52, D53	3.197	15	0.5	4.570
D55	R-D17	N/A	0.027	6	1.0	0.560
D56	R-D15	N/A	0.027	6	1.0	0.560
D57	N/A	D55, D56	0.054	6	1.0	0.560
D58	R-D13	N/A	0.027	6	1.0	0.560
D59	N/A	D57, D58	0.081	6	1.0	0.560
D60	R-D11	N/A	0.027	6	1.0	0.560
D61	N/A	D59, D60	0.108	6	1.0	0.560
D62	D2	N/A	0.394	6	1.0	0.560
D63	N/A	D61, D62	0.502	6	1.0	0.560
D64	D1	N/A	0.202	6	5.8	1.350
D65	N/A	D54, D63, D64	3.855	15	1.3	7.370
Z1	Offsite Bypass	N/A	2.003	12	0.5	2.520

Appendix F – O&M

FERGUSON WATERWORKS

R TANK

STORMWATER STORAGE SYSTEM

OPERATIONS AND MAINTENANCE MANUAL

Green Stormwater Infrastructure Solutions

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TABLE OF CONTENTS

GENERAL INFORMATION 3
INSPECTION INFORMATION 3
INSPECTION CHECKLIST 4
SYSTEM MAINTENANCE 5
INSPECTION AND MAINTENANCE COST ESTIMATE WORKSHEET 6

DISCLAIMER

Read the following information before inspecting, cleaning, or performing maintenance on this Stormwater Treatment Device. This manual is intended to explain the specifics of the maintenance on R-Tank Stormwater Storage Systems.

It is the responsibility of all personnel to familiarize themselves with, understand and comply with all applicable local, state, and federal laws. All information in this manual is current at the time of printing but are subject to change based on the development of new processes and procedures. Ferguson Enterprises assumes no responsibility and is not accountable for any injuries, fines, penalties, or losses that occur involving any procedure in this manual or other actions taken. The R-Tank Stormwater Storage System performance is based on the procedures being followed in this manual. Non-Compliance with the outlined measures will be the responsibility of the owner.

GENERAL INFORMATION

Your R-Tank System has been designed to function in conjunction with the engineered drainage system on your site, the existing municipal infrastructure, and/or the existing soils and geography of the receiving watershed. Unless your site included certain unique and rare features, the operation of your R-Tank System will be driven by naturally occurring systems and will function autonomously. However, upholding a proper schedule of Inspection & Maintenance is critical to ensuring continued functionality and optimum performance of the system.

INSPECTION INFORMATION

During construction, the system shall be protected from sediment laden runoff and only activated once the site has been fully stabilized.

Both the R-Tank and all stormwater pre-treatment features incorporated into your site must be inspected regularly. Inspections should be done every six months for the first year of operation, and at least yearly thereafter. Inspections may be required more frequently for pre-treatment systems. You should refer to the manufacturer requirements for the proper inspection schedule.

With the right equipment most inspections and measurements can be accomplished from the surface without physically entering any confined spaces. If your inspection does require confined space entry, you must follow all local, regional, and OSHA requirements.

All maintenance features of your system can be accessed through a covering at the surface. With the lid removed, you can visually inspect each component to identify sediment, trash, and other contaminants within the structure. Check your construction plans to identify the maintenance features engineered into your R-Tank system, which may include:

Upstream Pipes, Inlets, and Manholes: Working from the structures adjacent the R-Tank toward those farther away, check for debris and sediment in both the structures and the pipes. Be sure to include all structures that contain pre- treatment systems. Some structures may include a sump.

Maintenance Ports / Inspection Ports: Maintenance/inspection ports are located near the inlet and outlet connections, treatment rows, and throughout the system. These should be used to check for sediment and typically allow access for backflushing and cleaning.

Treatment Row: On installations in 2018 or later, inlet pipes may connect to a row of modules with 12” diameter access holes running horizontally through the module that can be jet vacuumed. Check these rows for accumulation of sediment and debris.

All observations and measurements should be recorded on an Inspection Log kept on file. We have included a form you can use at the end of this guide.

INSPECTION CHECKLIST

Site Name:		Company:	
Location:		Contact:	
City and State:		Phone:	
System Owner:		Email:	

Inspection Description	Frequency	Observations / Notes	Initials
Pretreatment Systems	Quarterly		
Connections	Bi-Annually		
Inspection Ports	Bi-Annually		
Accumulation of Sediment or Debris	Bi-Annually		
Upslope Erosion	Quarterly		
Accidental or Illicit Spillage	Quarterly		

Maintenance Items	Required Maintenance Activities	Initials
Pretreatment Systems		
Connections		
Inspection Ports		
Accumulation of Sediment or Debris		
Upslope Erosion		
Accidental or Illicit Spillage		

SYSTEM MAINTENANCE

For modules taller than 40” the R-Tank Stormwater Storage Systems should be back-flushed once sediment accumulation has reached 6”. For modules less than 40” tall, perform maintenance when sediment depths are greater than 15% of the total system height. If your system includes a Treatment Row with linear access through the modules from the inlet pipe, backflush this area when sediment depths reach 6”.

BEFORE ANY MAINTENANCE IS PERFORMED ON YOUR SYSTEM - PLUG THE OUTLET PIPE TO PREVENT CONTAMINATION OF THE DOWNSTREAM SYSTEMS.

Maintenance During Construction

Installed R-Tank Stormwater Storage Systems should be properly protected post installation, but before the System is accepted by owners in the following manner:

- **Vehicular Traffic:** Protect system from heavy construction equipment loads by using smaller vehicles, low ground pressure tracked equipment when possible, or protective measures such as steel plates to spread the load experienced by the system.
- **Sediment and Debris:** Use proper erosion control Best Management Practices to prevent sediment and debris from reaching the system.
- **Remove Sediment and Debris, as Needed:** If upslope practices fail to prevent sediment laden runoff from entering the upstream inlets, pipes, and system, sediment removal should be performed using jet-vac equipment.

Maintenance After Construction

Site specific conditions (land use, climate, tree cover, slopes, construction activities, etc.) along with data from regular inspections will determine how frequently the system must be cleaned. At a minimum, vacuum cleaning should occur every 1 to 2 years. Routine maintenance, such as pre-treatment inlet cleanout should occur every 3 to 6 months.

- Begin by cleaning all upstream structures, pipes, and pre-treatment systems containing sediment and/ or debris. If your system includes a Treatment Row, this portion of the system should be cleaned with traditional jet-vac equipment. Add a centralizer to the jet for easiest access through the modules.
- Complete initial debris removal by vacuuming debris up the inspection port locations, while using the jetting water to push debris to the hose. For finer debris, back-flush the R-Tank system. To perform this, water is pumped into the system through the inspection ports as rapidly as possible. The turbulent action of the water moving through the R-Tank will suspend sediments which may then be pumped out. If your system includes an outlet structure, this will be the ideal location to pump contaminated water out of the system. However, removal of back-flush water may be accomplished through the inspection ports, as well.
- For systems with large footprints that would require extensive volumes of water to properly flush the system, you should consider performing your maintenance within 24 hours of a rain event. Stormwater entering the system will aid in the suspension of sediments and reduce the volume of water required to properly flush the system.

INSPECTION AND MAINTENANCE COST ESTIMATE WORKSHEET

Project Name:		Engineer:	
Location:		City / State:	
Owner:		Contact:	
Phone:		Email:	

Life Expectancy (Yrs.) =	

Inspection Description	Frequency / Year	Total Services*	Cost per Service	Total Cost**
Pretreatment Systems	4		$	$
Connections	2		$	$
Inspection Ports	2		$	$
Accumulation of Sediment or Debris	2		$	$
Upslope Erosion	4		$	$
Accidental or Illicit Spillage	4		$	$

Maintenance Items	Frequency / Year	Total Services*	Cost per Service	Total Cost**
Pretreatment Systems			$	$
Connections			$	$
Inspection Ports			$	$
Accumulation of Sediment or Debris			$	$
Upslope Erosion			$	$
Accidental or Illicit Spillage			$	$
System Vacuuming			$	$
Total Costs = Inspection Costs + Maintenance Costs =				$
Estimated Annual Operating Expenses = Total Costs / Years of Service =				$

** Total Services = Frequency of Services / Yr. multiplied by Life Expectancy*
*** Total Cost = Total Services multiplied by Cost per Service*

CONTECH®
ENGINEERED SOLUTIONS

StormFilter Inspection and Maintenance Procedures

The Stormwater Management StormFilter®

Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the StormFilter to its full efficiency and effectiveness.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is a good practice to inspect the system after major storm events.

Maintenance Procedures

Although there are many effective maintenance options, we believe the following procedure to be efficient, using common equipment and existing maintenance protocols. The following two-step procedure is recommended::

1. **Inspection**
   - Inspection of the vault interior to determine the need for maintenance.
2. **Maintenance**
   - Cartridge replacement
   - Sediment removal

Inspection and Maintenance Timing

At least one scheduled inspection should take place per year with maintenance following as warranted.

First, an inspection should be done before the winter season. During the inspection the need for maintenance should be determined and, if disposal during maintenance will be required, samples of the accumulated sediments and media should be obtained.

Second, if warranted, a maintenance (replacement of the filter cartridges and removal of accumulated sediments) should be performed during periods of dry weather.

In addition to these two activities, it is important to check the condition of the StormFilter unit after major storms for potential damage caused by high flows and for high sediment accumulation that may be caused by localized erosion in the drainage area. It may be necessary to adjust the inspection/ maintenance schedule depending on the actual operating conditions encountered by the system. In general, inspection activities can be conducted at any time, and maintenance should occur, if warranted, during dryer months in late summer to early fall.

Maintenance Frequency

The primary factor for determining frequency of maintenance for the StormFilter is sediment loading.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media inside the cartridges. The flow through the system will naturally decrease as more and more particulates are trapped. Eventually the flow through the cartridges will be low enough to require replacement. It may be possible to extend the usable span of the cartridges by removing sediment from upstream trapping devices on a routine as-needed basis, in order to prevent material from being re-suspended and discharged to the StormFilter treatment system.

The average maintenance lifecycle is approximately 1-5 years. Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction may need to be inspected and maintained more often than those with fully stabilized surface conditions.

Regulatory requirements or a chemical spill can shift maintenance timing as well. The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after major storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual StormFilter system or site. It is recommended that the site owner develop a database to properly manage StormFilter inspection and maintenance programs..

Inspection Procedures

The primary goal of an inspection is to assess the condition of the cartridges relative to the level of visual sediment loading as it relates to decreased treatment capacity. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, then typically large amounts of sediments will be present and very little flow will be discharged from the drainage pipes. If this is the case, then maintenance is warranted and the cartridges need to be replaced.

Warning: In the case of a spill, the worker should abort inspection activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct an inspection:

Important: Inspection should be performed by a person who is familiar with the operation and configuration of the StormFilter treatment unit and the unit's role, relative to detention or retention facilities onsite.

1. If applicable, set up safety equipment to protect and notify surrounding vehicle and pedestrian traffic.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the access portals to the vault and allow the system vent.
4. Without entering the vault, visually inspect the inside of the unit, and note accumulations of liquids and solids.
5. Be sure to record the level of sediment build-up on the floor of the vault, in the forebay, and on top of the cartridges. If flow is occurring, note the flow of water per drainage pipe. Record all observations. Digital pictures are valuable for historical documentation.
6. Close and fasten the access portals.
7. Remove safety equipment.
8. If appropriate, make notes about the local drainage area relative to ongoing construction, erosion problems, or high loading of other materials to the system.
9. Discuss conditions that suggest maintenance and make decision as to whether or not maintenance is needed.

Maintenance Decision Tree

The need for maintenance is typically based on results of the inspection. The following Maintenance Decision Tree should be used as a general guide. (Other factors, such as Regulatory Requirements, may need to be considered).

Please note Stormwater Management StormFilter devices installed downstream of, or integrated within, a stormwater storage facility typically have different operational parameters (i.e. draindown time). In these cases, the inspector must understand the relationship between the retention/detention facility and the treatment system by evaluating site specific civil engineering plans, or contacting the engineer of record, and make adjustments to the below guidance as necessary. Sediment deposition depths and patterns within the StormFilter are likely to be quite different compared to systems without upstream storage and therefore shouldn't be used exclusively to evaluate a need for maintenance.

1. Sediment loading on the vault floor.
   a. If >4" of accumulated sediment, maintenance is required.
2. Sediment loading on top of the cartridge.
   a. If >1/4" of accumulation, maintenance is required.
3. Submerged cartridges.
   a. If >4" of static water above cartridge bottom for more than 24 hours after end of rain event, maintenance is required. (Catch basins have standing water in the cartridge bay.)
4. Plugged media.
   a. While not required in all cases, inspection of the media within the cartridge may provide valuable additional information.
   b. If pore space between media granules is absent, maintenance is required.
5. Bypass condition.
   a. If inspection is conducted during an average rain fall event and StormFilter remains in bypass condition (water over the internal outlet baffle wall or submerged cartridges), maintenance is required.
6. Hazardous material release.
   a. If hazardous material release (automotive fluids or other) is reported, maintenance is required.
7. Pronounced scum line.
   a. If pronounced scum line (say ≥ 1/4" thick) is present above top cap, maintenance is required.

Maintenance

Depending on the configuration of the particular system, maintenance personnel will be required to enter the vault to perform the maintenance.

Important: If vault entry is required, OSHA rules for confined space entry must be followed.

Filter cartridge replacement should occur during dry weather. It may be necessary to plug the filter inlet pipe if base flows is occurring.

Replacement cartridges can be delivered to the site or customers facility. Information concerning how to obtain the replacement cartridges is available from Contech Engineered Solutions.

Warning: In the case of a spill, the maintenance personnel should abort maintenance activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct cartridge replacement and sediment removal maintenance:

1. If applicable, set up safety equipment to protect maintenance personnel and pedestrians from site hazards.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the doors (access portals) to the vault and allow the system to vent.
4. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
5. Make notes about the external and internal condition of the vault. Give particular attention to recording the level of sediment build-up on the floor of the vault, in the forebay, and on top of the internal components.
6. Using appropriate equipment offload the replacement cartridges (up to 150 lbs. each) and set aside.
7. Remove used cartridges from the vault using one of the following methods:

Method 1:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

   Using appropriate hoisting equipment, attach a cable from the boom, crane, or tripod to the loose cartridge. Contact Contech Engineered Solutions for suggested attachment devices.

B. Remove the used cartridges (up to 250 lbs. each) from the vault.

Important: Care must be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner.

C. Set the used cartridge aside or load onto the hauling truck.

D. Continue steps a through c until all cartridges have been removed.

Method 2:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

B. Unscrew the cartridge cap.

C. Remove the cartridge hood and float.

D. At location under structure access, tip the cartridge on its side.

E. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.

F. Set the empty, used cartridge aside or load onto the hauling truck.

G. Continue steps a through e until all cartridges have been removed.

8. Remove accumulated sediment from the floor of the vault and from the forebay. This can most effectively be accomplished by use of a vacuum truck.
9. Once the sediments are removed, assess the condition of the vault and the condition of the connectors.
10. Using the vacuum truck boom, crane, or tripod, lower and install the new cartridges. Once again, take care not to damage connections.
11. Close and fasten the door.
12. Remove safety equipment.
13. Finally, dispose of the accumulated materials in accordance with applicable regulations. Make arrangements to return the used **empty** cartridges to Contech Engineered Solutions.

Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads.

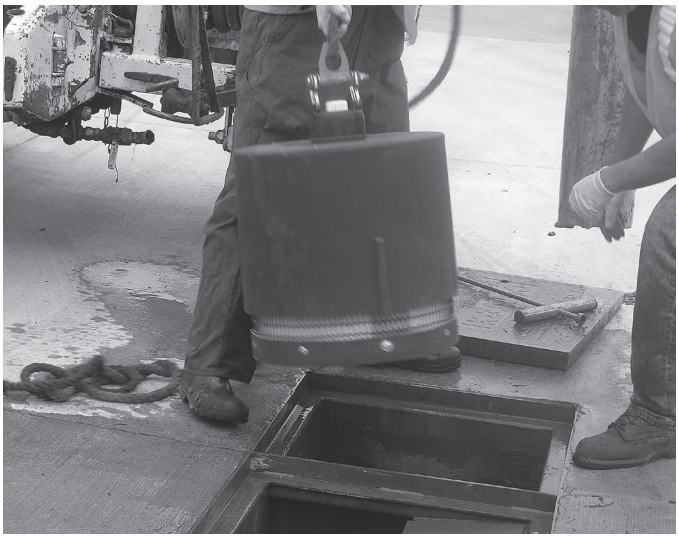
Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Related Maintenance Activities - Performed on an as-needed basis

StormFilter units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.



Inspection Report

Date: _____ Personnel: _____

Location: _____ System Size: _____ Months in Service: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other: _____

Sediment Thickness in Forebay: _____ Date: _____

Sediment Depth on Vault Floor: _____

Sediment Depth on Cartridge Top(s): _____

Structural Damage: _____

Estimated Flow from Drainage Pipes (if available): _____

Cartridges Submerged: Yes ☐ No ☐ Depth of Standing Water: _____

StormFilter Maintenance Activities (check off if done and give description)

☐ Trash and Debris Removal: _____

☐ Minor Structural Repairs: _____

☐ Drainage Area Report _____

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

Items Needing Further Work: _____

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

_____

_____

_____

_____

_____

_____

_____

_____

Review the condition reports from the previous inspection visits.

StormFilter Maintenance Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other: _____

List Safety Procedures and Equipment Used: _____

_____

_____

System Observations

Months in Service: _____

Oil in Forebay (if present): Yes ☐ No ☐

Sediment Depth in Forebay (if present): _____

Sediment Depth on Vault Floor: _____

Sediment Depth on Cartridge Top(s): _____

Structural Damage: _____

Drainage Area Report

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

StormFilter Cartridge Replacement Maintenance Activities

Remove Trash and Debris: Yes ☐ No ☐ Details: _____

Replace Cartridges: Yes ☐ No ☐ Details: _____

Sediment Removed: Yes ☐ No ☐ Details: _____

Quantity of Sediment Removed (estimate?):

Minor Structural Repairs: Yes ☐ No ☐ Details: _____

Residuals (debris, sediment) Disposal Methods: _____

Notes:

_____

_____

_____

_____

_____

_____

_____

RECYCLED PAPER

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CONTECH®
ENGINEERED SOLUTIONS

OPERATION AND MAINTENANCE

STORMFILTER CATCH BASIN O&M

CatchBasin StormFilter™

Important: These guidelines should be used as a part of your site stormwater plan.

Overview

The CatchBasin StormFilter™ (CBSF) consists of a multi-chamber steel, concrete, or plastic catch basin unit. The steel CBSF is offered both as a standard and as a deep unit for additional internal overflow and sediment capacity.

The CBSF is installed flush with the finished grade and is applicable for both constrained lot and retrofit applications. Steel and concrete units can accept surface and piped influent for roof leaders or similar applications.

The steel, concrete and plastic CBSF units have capacities of 4, 8 and 2 cartridges, respectively. Internal overflow capacity varies by system type from 0.5 cfs for the plastic, 1.3 cfs for the concrete and 1.0 or 1.8 cfs for the steel unit.

Design Operation

The CBSF is installed as the primary receiver of runoff, similar to a standard, grated catch basin. The steel and concrete CBSF units have an H-20 rated, traffic bearing lid that allows the filter to be installed in parking lots, and for all practical purposes, takes up no land area. Plastic units can be used in landscaped areas or other non-traffic-bearing applications.

The steel CBSF consists of a sumped inlet chamber and cartridge chamber(s). Runoff enters the sumped inlet chamber either by sheet flow from a paved surface or from an inlet pipe discharging directly to the unit vault. The inlet chamber is equipped with an internal baffle, which traps debris and floating oil and grease, and an overflow weir. While in the inlet chamber, heavier solids are allowed to settle into the deep sump, while lighter solids and soluble pollutants are directed into the cartridge chamber through a port between the baffle and the overflow weir.

The concrete and plastic units operate similarly minus the presence of the inlet chamber or deep sump.

Once in the cartridge chamber, polluted water ponds and percolates horizontally through the media in the filter cartridges. Treated water collects in the cartridge's center tube from where it is directed to the outlet chamber and discharged to the outlet pipe on the downstream side of the overflow weir.

When influent flows exceed the water quality design value, excess water spills over the overflow weir, bypassing the cartridge bay, and discharges to the outlet pipe.

Applications

The CBSF is particularly useful where small flows are being treated or for sites that have little available hydraulic head. The unit is ideal for applications in which standard catch basins are to be used. Both water quality and catchment issues can be resolved with the use of the CBSF.

Retro-Fit

The retrofit market has many possible applications for the CBSF. The CBSF can be installed by replacing an existing catch basin without having to "chase the grade," thus reducing the high cost of re piping the storm system.

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CatchBasin StormFilter™

Maintenance Guidelines

Maintenance procedures for typical catch basins can be applied to the CatchBasin StormFilter (CBSF). The filter cartridges contained in the CBSF are easily removed and replaced during maintenance activities according to the following guidelines.

1. Establish a safe working area as per typical catch basin service activity.
2. Remove steel grate and diamond plate cover (weight 100 lbs. each) or plastic grating.
3. Turn cartridge(s) approximately ¼ turn counter-clockwise to disconnect from pipe manifold.
4. Remove cartridge(s) from catch basin by hand or with appropriate hoisting equipment.
5. Remove accumulated sediment via vactor truck from all interior chambers.
6. Rinse interior of both bays and vactor remaining water and sediment.
7. Install fresh cartridge(s), by rotating ¼ turn clockwise, taking care not to damage cartridge connectors.
8. Replace cover(s).
9. Dispose of accumulated debris and spent media in accordance with local regulations.
10. Return used, empty cartridges to Contech for refurbishing.

Media may be removed from the filter cartridges using the vactor truck before the cartridges are removed from the catch basin structure once the top cap and hood are removed. The vactor truck must be equipped with a hose capable of reaching areas of restricted clearance.

Empty cartridges can be easily removed from the catch basin structure by hand. Empty cartridges should be reassembled and returned to Contech as appropriate.

Refurbished cartridges are available from Contech on an exchange basis. Contact the maintenance department of Contech at 513-645-7770 for more information.

Onsite maintenance is estimated at 26 minutes once setup for a single cartridge unit. Add approximately 5 minutes for each additional cartridge.

Mosquito Abatement

In certain areas of the United States, mosquito abatement is desirable to reduce the incidence of vectors.

In BMPs with standing water, which could provide mosquito breeding habitat, certain abatement measures can be taken.

1. Periodic observation of the standing water to determine if the facility is harboring mosquito larvae.
2. Regular catch basin maintenance.
3. Use of larvicides containing Bacillus thuringiensis israelensis (BTI). BTI is a bacterium toxic to mosquito and black fly larvae.

In some cases, the presence of petroleum hydrocarbons may interrupt the mosquito growth cycle.

Using Larvicides in the CatchBasin StormFilter

Larvicides should be used according to manufacturer's recommendations.

Two widely available products are Mosquito Dunks and Summit B.t.i. Briquets. For more information, visit https://www.amvac.com/products/summit-bti-briquets.

The larvicide must be in contact with the permanent pool. The larvicide should also be fastened to the CatchBasin StormFilter to prevent displacement by high flows. A magnet can be used with a steel catch basin.

For more information on mosquito abatement in stormwater BMPs, refer to the following: https://anrcatalog.ucanr.edu/pdf/8125.pdf.

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ABD Engineering & Design

Architectural Acoustics ▪ AV Design ▪ Noise & Vibration

Report on:

West Linn Public Works Operations Center Noise Study

Prepared for:

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2525 East Burnside Street
Portland, OR 97214

ABD Project Number: 26-5336

May 21, 2026

Note:

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Executive Summary

The West Linn Public Works Department is proposing to build a new Operations Center facility near Greene St. and Salamo Rd. in West Linn, OR. ABD Engineering & Design, Inc. (ABD) was asked to conduct an environmental noise study of the activities proposed on the site and determine if any mitigation would be required to reduce the noise radiating from activity on the proposed site to meet the requirements of the state, county, and city noise codes.

The results of ABD's environmental noise study demonstrate that noise levels radiating from equipment operating at the site are predicted to comply with all applicable noise control regulations as designed.

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1. Introduction

The West Linn Public Works Department is proposing to relocate their Operations Center (WLPWOC) from the existing Norfolk Street facility to a new location near the intersection of Greene Street and Salamo Road in West Linn, OR (see Figure 1, Figure 2, and Figure 3). The proposed new site is located to the north of Interstate 205, and is part of Clackamas County.

ABD Engineering & Design (ABD) conducted a noise study to assess the proposed usage to predict whether sound levels for all existing and approved noise-sensitive land uses around the site will comply with relevant noise regulations. This report presents the results of that study.

2. Overview of the Noise Study

In conducting the environmental noise study for the proposed site operations, the following steps were taken:

1. Applicable government regulations were reviewed to determine the noise criteria that must be met.
2. The loudest hourly statistical noise levels that could radiate from the proposed operations were predicted at noise-receiving locations in the vicinity of the site. The prediction locations chosen were considered representative of locations in the area with the greatest potential for receiving noise that could exceed the appropriate criteria.
3. The "loudest-hour" noise levels predicted at the receivers were compared against the limits specified in the OAR DEQ and CCC regulations. This also complies with the WLMC and WLCP noise regulations, which defer to the DEQ limits.
4. In addition to predicting noise levels at individual noise-sensitive receivers, noise level predictions were also made to determine noise contours around the site to show the area outside of which the noise levels meet the DEQ criteria.

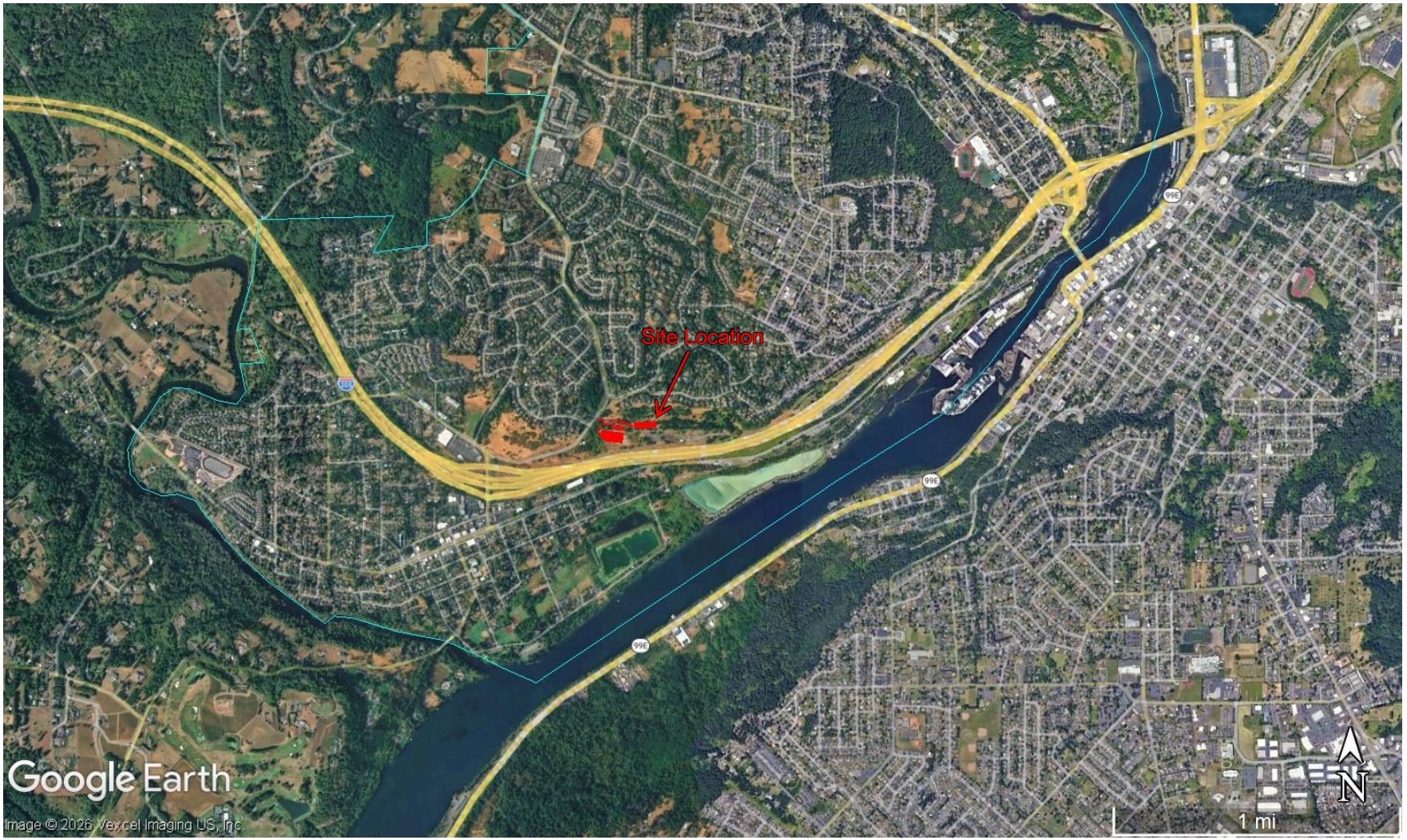


Figure 1. New WLPWOC facility vicinity map

Figure 2. Area map

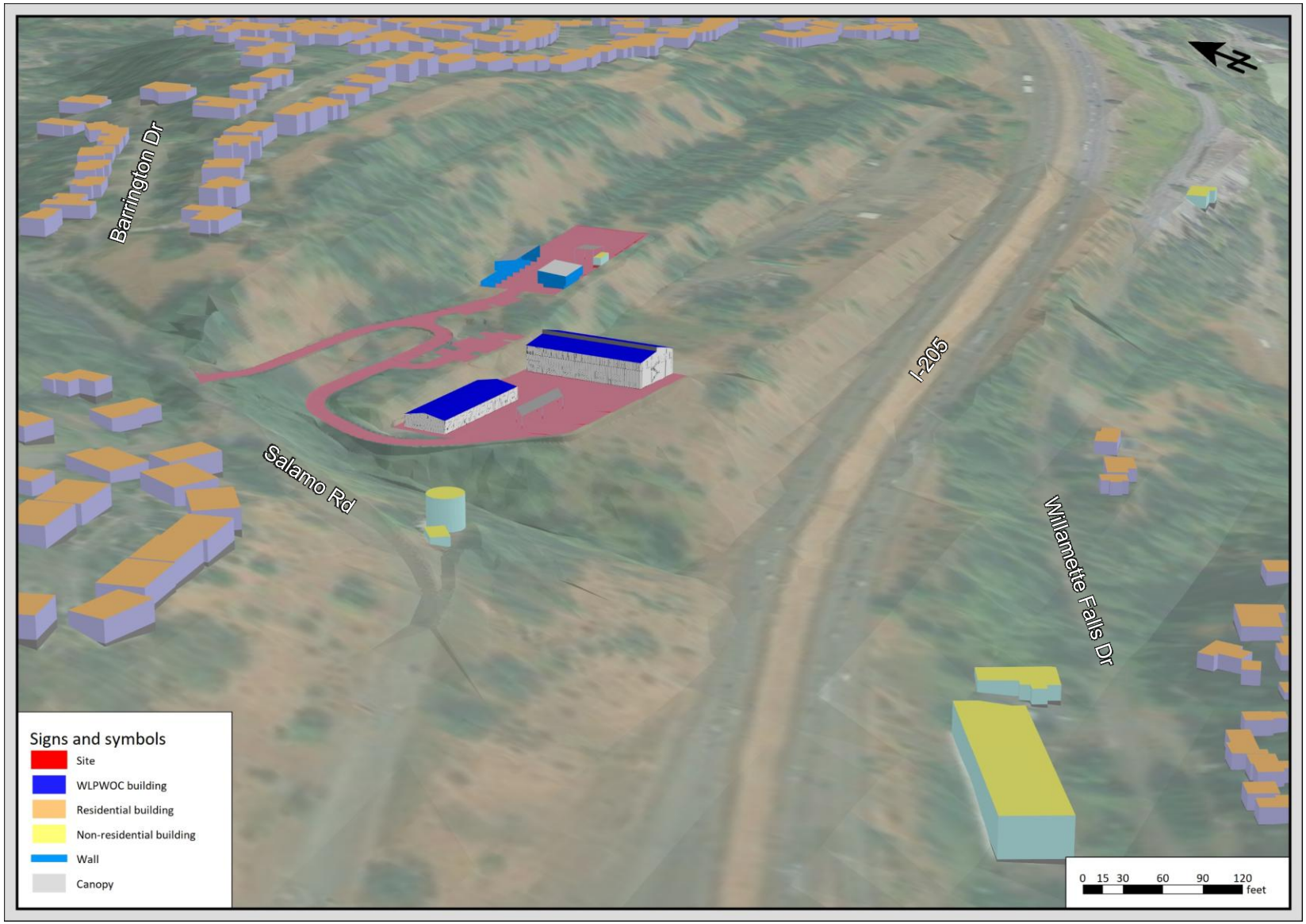


Figure 3. Elevation rendering

3. Definitions

Sound is the term given to variations in air pressure capable of being detected by the human ear. Small fluctuations in atmospheric pressure (sound pressure) constitute the physical property measured with a sound pressure level meter. Because the human ear can detect variations in atmospheric pressure over a wide range of magnitudes, sound pressure is expressed on a logarithmic scale in units called decibels (dB)[1]. A change of 2-3 dB is just perceptible, and an increase of 10 dB is perceived as a doubling of the apparent loudness.

The human auditory response to sound is a function of the magnitude of the sound, the frequency spectrum of the sound (the specific pitch components of the sound), the duration of the sound, and the existence of other sounds. It is difficult to describe the perceived level of a sound with a single number because of the many parameters that influence the human auditory response. However, there have been a significant number of acoustic studies that have helped provide noise descriptors that correlate well with human responses.

Studies have conclusively shown that at equal sound pressure levels, people are generally more sensitive to higher-frequency sounds (such as those made by speech, horns, and whistles) than lower-frequency sounds (such as those made by motors and engines)[2]. To address this preferential response to frequency, the A-weighting scale was developed. The A-weighted scale adjusts the sound level in each frequency band in a similar manner to how the human auditory system perceives sound levels. Thus, the A-weighted sound level (referred to as "dBA") provides a single number rating that defines the level of a sound and has some correlation with the sensitivity of the human ear to that sound.

Since noise tends to fluctuate over time, especially for environmental measurements, the A-weighted sound level alone is not sufficient to describe the noise environment at a given location. Therefore, the DEQ includes limits based on the duration of the noise within any one-hour period, which are referred to as hourly statistical levels. For this project, the relevant metrics are L_{50} (greater than 50%, or 30 minutes in an hour), L_{10} (between 6 and 30 minutes), and L_1 (between 36 seconds and 6 minutes). Because statistical metrics are calculated on a "time-above" basis, they do not add together. Short-term sources such as those covered by the L_1 and L_{pk} limits will not be present for long enough to affect the L_{10} or L_{50} metrics. Likewise, the longer-term sources such as idling vehicles are much quieter than the short-term limits, and do not substantively affect the short-term metrics. Therefore, in most cases, each statistical metric can be treated independently from the others unless otherwise noted.

Short-term or impulsive sound is perceived differently from more continuous sound. The DEQ includes a peak sound level (L_{pk}) limit – this is a sound metric related to the instantaneous unweighted (dBZ) sound pressure level; therefore, the peak metric is a single number and does not have a corresponding sound spectrum. A separate metric used in the CCC regulation is the $L_{max\text{-}1s}$, which is the loudest 1-second average A-weighted sound pressure level.

---

[1] Because decibels are a logarithmic unit, when several decibel levels are combined, logarithmic addition is used instead of typical arithmetic addition. For instance, 40 dB + 40 dB = 43.0 dB, 50 dB + 50 dB = 53.0 dB, and 40 dB + 50 dB = 50.4 dB, which rounds to 50 dB.

[2] D.W. Robinson and R.S. Dadson, "A Re-Determination of the Equal-Loudness Relations for Pure Tones," British Journal of Applied Physics, vol. 7, pp. 166-181, 1956. (Adopted by the International Organization for Standardization as Recommendation R-226.)

4. Noise Criteria

The site is governed by several noise regulations, as discussed below. Regulations related to noise can be found in the state code (Oregon Administrative Rules *OAR*), the county code (Clackamas County Code *CCC*), and city codes (West Linn Municipal Code *WLMC*, West Linn Comprehensive Plan *WLCP*, and West Linn Community Development Code *WLCDC*).

4.1 Planning Commission Hearing – Staff Supplemental Findings Memo

As part of the application process, the project was reviewed by the West Linn Planning Commission. A memorandum of staff supplemental findings was issued on February 18, 2026. This memo includes responses to public comments, including several items related to noise. As noted in the memo, the site is not expected to generate high noise levels because the existing site (which is closer and less buffered to residences) does not exceed the DEQ standards, and thus a noise study is not required. However, as a good faith effort, West Linn Public Works is voluntarily conducting a noise study – this report fulfills this criterion.

4.2 OAR 340-035 DEQ Noise Control Regulations

Chapter 340 of the Oregon Administrative Rules (Department of Environmental Quality, DEQ) includes provisions for noise control. OAR 340-035-0035 provides noise regulations for industry and commerce – it is not clear if this would be applicable to a government-owned public works facility, and it is noted that construction and maintenance of capital equipment is specifically exempt from these regulations [OAR 340-035-0035(5)(h)]. However, to be conservative, the noise generated by the site is compared against these limits.

For new noise sources on a previously unused site, there are two relevant regulations [OAR 340-035-0035(1)(b)(B)(i)] – a maximum permissible noise rule, and an ambient degradation rule. The maximum permissible noise rule prohibits the generation of noise levels exceeding certain maximum limits, based on the receiving property use, the duration of the noise, and the time of day; a separate impulsive noise limit [OAR 340-035-0035(1)(d)(B)] is also applicable. The ambient degradation rule sets a limit on how much the existing background noise level can be increased by the new noise source for the L_{50} and L_{10} hourly metrics only - ABD has included information that can be used to compare predicted levels with existing ambient noise levels, which are summarized in Appendix A at the end of this report. Table 1 below presents a summary of the relevant OAR noise limits for this project.

The noise limits are applicable only at a "noise sensitive property," which includes residences. The location where this regulation is applicable is 25 feet from the receiving building or at the receiving property line, whichever is further from the noise source [OAR 340-035-0035(3)(b)].

Table 1. Noise level limits generated by an industrial or commercial noise source on a previously unused site [OAR 340-035-0035(1)(b)(B)(i), 0035(1)(d)(B), and Table 8]

Hourly Statistical Noise Level	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)	Maximum Increase in Ambient Level
L_{50}	55 dBA	50 dBA	+10 dBA
L_{10}	60 dBA	55 dBA	+10 dBA
L_1	75 dBA	60 dBA	*n/a*
L_{pk}	100 dBZ	80 dBZ	*n/a*

4.3 CCC 6.05 Noise Control

The WLPWOC site is located within Clackamas County. Chapter 6.05 indicates that noise limits are applicable at a noise-sensitive unit only when a complaint is received. In such an instance, a limit of 50 dBA at night (between 10 p.m. and 7 a.m.) or 60 dBA during the day (7 a.m. to 10 p.m.) would apply for sound generated by the site [CCC 6.05.040.A] – sound levels from site operations equal to or lower than this level are allowable. No time constant is specified in the regulation, so a maximum 1-second average level is assumed ($L_{max\text{-}1s}$), as this is a common and easily-measurable metric for noise regulations.

It is noted that sound related to or caused by emergency work [CCC 6.05.050.B] and sound generated by normal operations of utility organizations [CCC 6.05.050.F] are specifically exempt from these noise control regulations. However, to be conservative, results in this report are compared against the limits.

4.4 WLMC/WLCDC 55.070 Submittal Requirements

The Community Development Code portion of the West Linn Municipal Code discusses requirements for the review of development proposals. One of the submittal requirements [WLCDC 55.070.D.2.h] indicates that if the proposed land use is expected to generate noise exceeding DEQ limits (see Section §4.2 above), a noise study by a licensed acoustical engineer is required demonstrating compliance with the DEQ standards. This appears to be based on the WLCP Goal 6 requirements (see §4.5 below).

As noted in §4.1, the existing WLPWOC facility is in compliance with the DEQ regulations, and no noise complaints have been received for that site in the past 13 years, despite the site being in close proximity to residences and in a quiet neighborhood. Site noise levels are not expected to significantly change at the new site, residences will be further away, and background noise levels will be louder. Therefore, this requirement is not applicable to this project. However, this report details the results of a noise study meeting these requirements commissioned as a good faith effort by West Linn Public Works.

4.5 WLCP Goal 6.4 Noise Control

Goal 6 of the West Linn Comprehensive Plan relates to air, water, and land resources quality. Within this Goal, section 4 provides guidance regarding noise control. Policy 3 indicates that new public facilities be designed to meet DEQ and City noise standards, and Policy 4 requires a statement from a licensed acoustical engineer declaring that all applicable noise standards can be met. This report fulfills such requirements.

4.6 WLMC 5.487 Sound Levels and Noise

The noise regulation within the West Linn Municipal Code is a nuisance code. It indicates that “loud, disturbing, and unnecessary noises” are prohibited, but it does not set any quantifiable limits on such noise. This is a subjective regulation without any measurable limits, but the ambient degradation portion of the DEQ code (see §4.2) could be used as a proxy for this regulation.

5. Proposed WLPWOC Site Operations

5.1 Site Location

The proposed new Public Works operations facility site is located on approximately 16.4 acres of land in Tax Lot 21E35D 05400 (Parcel 05038855) of West Linn. The site address is 23800 Salamo Road, West Linn, OR, 97068.

5.2 Overview of Site Activities

The proposed Department of Public Works Operations Center site includes office space, vehicle storage and maintenance bays, materials storage, and shop space.

- Operation Hours
  - In typical operation, employees will generally arrive onsite between 6:30 a.m. and 7 a.m. The various vehicles are prepared for the work day, generally starting up after 7 a.m., although some specific vehicles may be started up before 7 a.m. Based on needs and schedule, work vehicles will leave the site throughout the morning and return in the afternoon. Activity in the shops and storage area would occur during daytime hours.
  - In emergency situations such as snow days, activity may occur at night. However, this work would be specifically exempt from the noise regulations [OAR 340-035-0035(5)(a) and CCC 6.05.050.B].
- Vehicle Use
  - Various types of vehicles are stored at the site. These include a vacuum truck, street sweeper, dump/haul trucks, van and small box trucks, and pickup trucks for small work crews.
    - Most specialty trucks and some pickups and trailers will be stored inside of Building A (west building in the lower parking lot). Some pickups will be stored in the lower lot under the canopy.
    - Trucks will typically be started up and left to idle for several minutes while they come up to temperature and confirm proper operation – this may occur inside or outside of the enclosed parking bays. Then, they will be driven offsite.
    - Pickup trucks are used for various work crews. Crews will load the pickups as needed. Handheld equipment (such as leaf blowers, chainsaws, etc.) are tested briefly onsite before being loaded into the truck.
    - The vacuum and sweeper trucks use the decant area in the upper lot for offloading.
    - The haul and dump trucks use the upper lot for loading and unloading material at the storage piles.
    - Fueling and truck washing occur at the upper lot for all vehicles.
- Storage Area
  - The large storage pens in the upper lot include stockpiles of various materials such as gravel, as well as temporary waste storage such as excavated dirt. Front-end loaders are used to move this material and to load it into trucks as needed.
- Maintenance Shop
  - Part of Building B (east building in the lower lot) is used as a maintenance shop for fleet vehicles and equipment. This includes equipment such as an air compressor, grinder,

and saw, which are located inside the building. An emergency generator is also located in this vicinity, which would be tested monthly during the day.

6. Future Noise Level Analysis

6.1 Noise Prediction Methodology

A computer modeling software package called "SoundPLAN" was used to predict the noise levels that will radiate from the facility operations at the site. SoundPLAN calculates the sound pressure level at a receiver caused by any number of noise sources, accounting for the attenuation (reduction) due to distance, topography, barriers, ground absorption, atmospheric conditions, and vegetation, and uses accepted international standard procedures in the modeling and calculation of noise levels.

The following assumptions were used to predict the loudest hourly and maximum statistical noise levels that might radiate from the WLPWOC site with typical operations occurring:

- Calculations were made using SoundPLAN with the ISO 9613 methodology[3].
- Activity on the site will occur as described in §5.2.
- The topography of the site is modelled using satellite elevation data for the surrounding neighborhood, and final site grading elevation lines as provided by the civil engineer.
- The surrounding land is assumed to be a mix of asphalt road and lawn, with an average Ground Factor of 0.3 (ISO 9613 parameters). Areas of dense trees are assumed to behave as foliage attenuation areas as defined in ISO 9613.
- The area surrounding the proposed site is assumed to be scrubland with a Ground Factor of 0.4 (ISO 9613 parameters), while the site itself is paved with a Ground Factor of 0.05.
- The effects of atmospheric absorption and topography on sound propagation are included in the model where appropriate. 70% humidity and 50° Fahrenheit are assumed in predicting the noise levels because those conditions result in the highest amount of sound transmission through the air. The predicted noise level at the receivers would be slightly quieter with lower humidity or higher temperature (i.e., during daytime summer operations).
- The noise model assumes downwind propagation for all calculations. Downwind propagation is considered a favorable condition for sound propagation in that it typically results in the minimum amount of sound attenuation. Upwind propagation can result in significantly higher amounts of attenuation, and thus significantly lower noise levels at a receiver.
- Statistical and peak noise levels from all sources have been calculated individually for every floor at each receiver, and the maximum received level from any source is selected from these results. ABD observed that sources at the existing Norfolk St. site typically did not operate concurrently, except for brief periods.

[3] International Organization for Standardization, ISO 9613-2:1996 – Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation

- It should be noted that replacing any of the equipment with equipment producing similar noise levels is not anticipated to significantly change the conclusions of this report. Using newer models could reduce the predicted noise levels, since newer equipment tends to be quieter than older equipment.

6.2 Prediction Locations

Future hourly noise levels were predicted at 10 receivers located in the vicinity of the site. The receivers selected for analysis represent the nearest residences in each general direction of the site that have the greatest potential of receiving noise levels from the operations. Figure 4 shows the locations of the receivers included in the analysis (yellow targets).

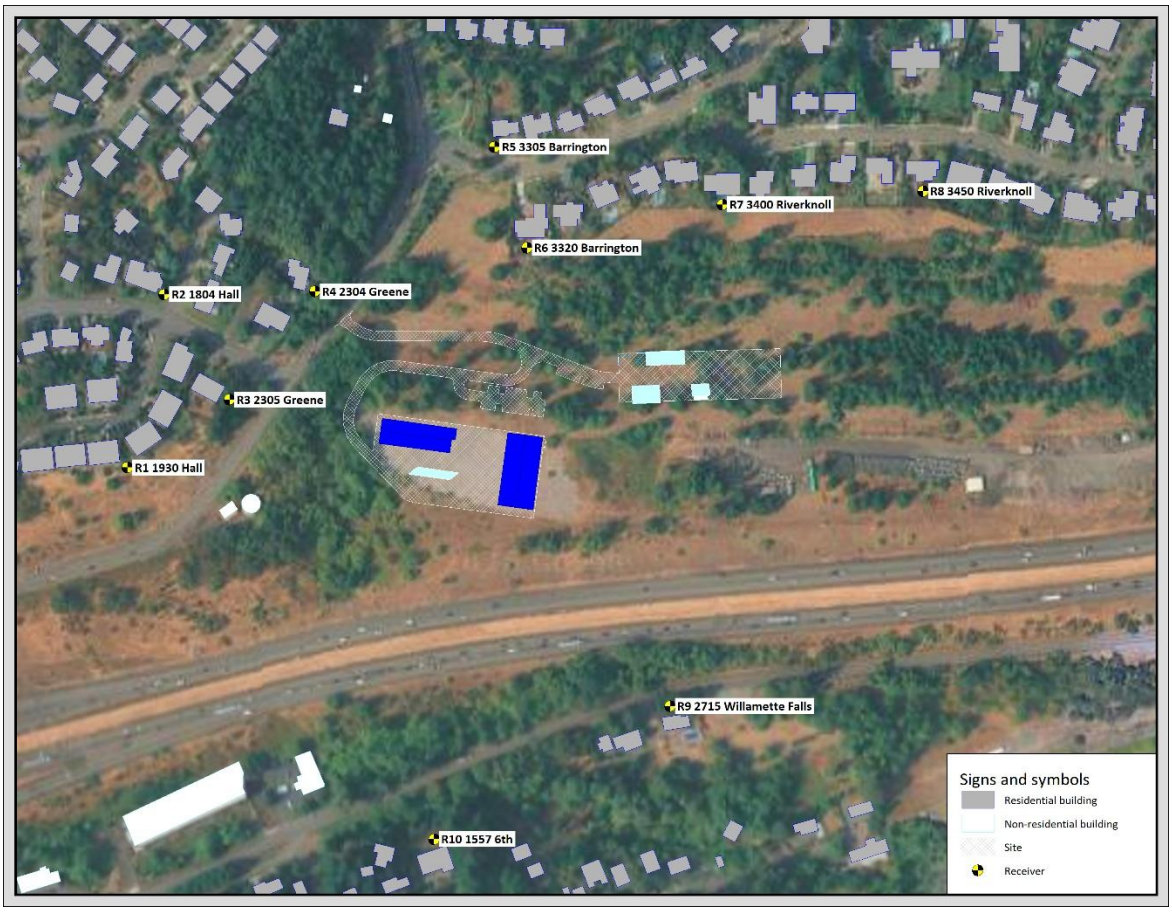


Figure 4. Map of receiver locations used in analysis

6.3 Predicted Future Noise Levels

It is emphasized that the assumptions used in this analysis (see §6.1) provide for a very conservative prediction of the noise levels that will be generated by activities at the site. During a majority of the lifetime of the site, the actual noise levels are expected to be significantly lower than the values given here because equipment will move around the site, and this analysis presents the loudest levels at any time. Since this study is intended to determine the feasibility of allowing operations without significant noise impacts, it is generally more protective to assume the loudest or "worst-case" conditions.

To compare noise levels against the relevant criteria, the various sources were grouped into types that would be relevant to each of the noise limits. These are discussed below.

6.3.1 Existing Source and Background Measurements

To assist in the modeling efforts, ABD visited the existing Norfolk St. facility on March 27, 2026, to observe typical operations and measure representative equipment. The measured levels used in the analysis are presented in the following sections.

ABD visited the proposed future WLPWOC site on April 16-17, 2026, to observe the site layout and take measurements of the existing background ambient noise level at representative locations; these data are presented in Appendix A at the end of this report.

6.3.2 Idling Vehicles (L_{10} and L_{50})

As previously noted, most noise sources on the Operations Center site occur only for short durations. The only typical sources present for longer than 6 minutes were idling vehicles (the emergency generator is addressed separately in §6.3.3 below). These vehicles generally do not idle for more than about 10 minutes, but due to the number of vehicles present, the total time vehicles may be idling onsite may exceed 30 minutes; therefore, noise from these sources are compared to both the L_{10} and the L_{50} limits from the DEQ regulation. Table 2 presents the measured sound pressure levels and corresponding measurement distance for all sources that could be expected to meet the qualifications for the L_{10} and L_{50} limits.

Table 2. Equipment reference sound pressure levels, L_{10} and L_{50}

Noise levels expressed in decibels (dB) re. 20 µPa

Source	Ref. Dist. (ft)	Octave Band Center Frequency (Hz) SPL (dB)								Total (dBA)
		63	125	250	500	1000	2000	4000	8000	
Pickup idling (Ford F350) [1]	24	78	66	60	53	53	54	48	43	61
Dump truck idling (FL 114SD+)	27	69	75	71	73	71	67	64	54	75
Vac truck idling [2] (Vactor)	28	74	70	59	65	64	61	54	46	68

Note 1: Multiple pickup trucks were measured – the data used in the analysis is for the loudest of these vehicles to be conservative – most pickup trucks are quieter than this.

Note 2: Levels were measured in several directions around the truck, and this directivity was applied to the levels in the analysis.

While not typical, some vehicles could start up before 7 a.m., which would be considered nighttime for the purposes of the noise regulations. Therefore, limits for both daytime and nighttime are considered for both DEQ and CCC. The measured ambient levels at the proposed site were used to calculate the corresponding ambient degradation limits. These limits are compiled in Table 3, along with the most restrictive limit at each receiver. Ambient noise levels used for the DEQ ambient degradation criteria are presented in Appendix A at the end of this report.

The sources given in Table 2 above were placed in the SoundPLAN model. Because they could idle at different locations, levels for the vacuum and dump trucks were calculated for both the upper and lower lot. Pickup trucks could idle at either lot, as well as in the

middle employee lot and between Building A and B. The loudest instance of each of these sources at each receiver is shown in Table 3. As shown, the noise from the site is calculated to be in compliance with the DEQ hourly noise criteria and the CCC maximum noise criteria at all residences and at all hours with the current site design (the Calculated Hourly Sound Levels are less than the Most Restrictive Noise Regulation Limit for all rows). Even if all three sources were active at their loudest locations for a full hour, the logarithmic sum of all sources would still be less than the most restrictive sound level limit.

Figure 5 presents a visual representation of the loudest L_{10} or L_{50} sound levels – this could be considered a more detailed view of the results in the table. The green contours are quieter than the orange and red contours. Receivers are shown with the target points for reference. The dotted magenta line indicates the most restrictive limit level of 50 dBA – outside of that line, levels would be in compliance with the most restrictive regulation; because this boundary does not encroach within 25 feet of any noise-sensitive building, this confirms that the WLPWOC site would be in compliance with the regulations at every potential receiver location.

Table 3. Predicted hourly L_{10} and L_{50} metrics and associated limits at nearest receivers

Receiver	Calculated Hourly L_{10} or L_{50} Sound Level (dBA)			Noise Regulation Limits (dBA)			
	Pickup Truck	Dump Truck	Vac Truck	DEQ Amb. Deg.[1] L_{10}	DEQ Amb. Deg.[1] L_{50}	Max. Allowable	Most Restrictive
R1 1930 Hall	29	45	37	*74*	*73*	*DEQ L_{10} day: 60 night: 55 DEQ L_{50} day: 55 night: 50 CCC day: 60 night: 50*	**50**
R2 1804 Hall	29	44	36				**50**
R3 2305 Greene	33	46	41	*72*	*69*		**50**
R4 2304 Greene	29	45	37				**50**
R5 3305 Barrington	18	27	23	*75*	*65*		**50**
R6 3320 Barrington	29	44	38	*69*	*67*		**50**
R7 3400 Riverknoll	23	37	25				**50**
R8 3450 Riverknoll	22	27	32				**50**
R9 2715 Willamette Falls	22	36	32	*75*	*73*		**50**
R10 1557 6th	22	37	31				**50**

Note 1: Quietest ambient hourly level between 6:00 a.m. and 6:00 p.m. as measured near the proposed site, plus 10 dB. The quietest hour is typically 2:00 p.m., with the exception of location M-D (representing R5), which occurred at 6:00 a.m.

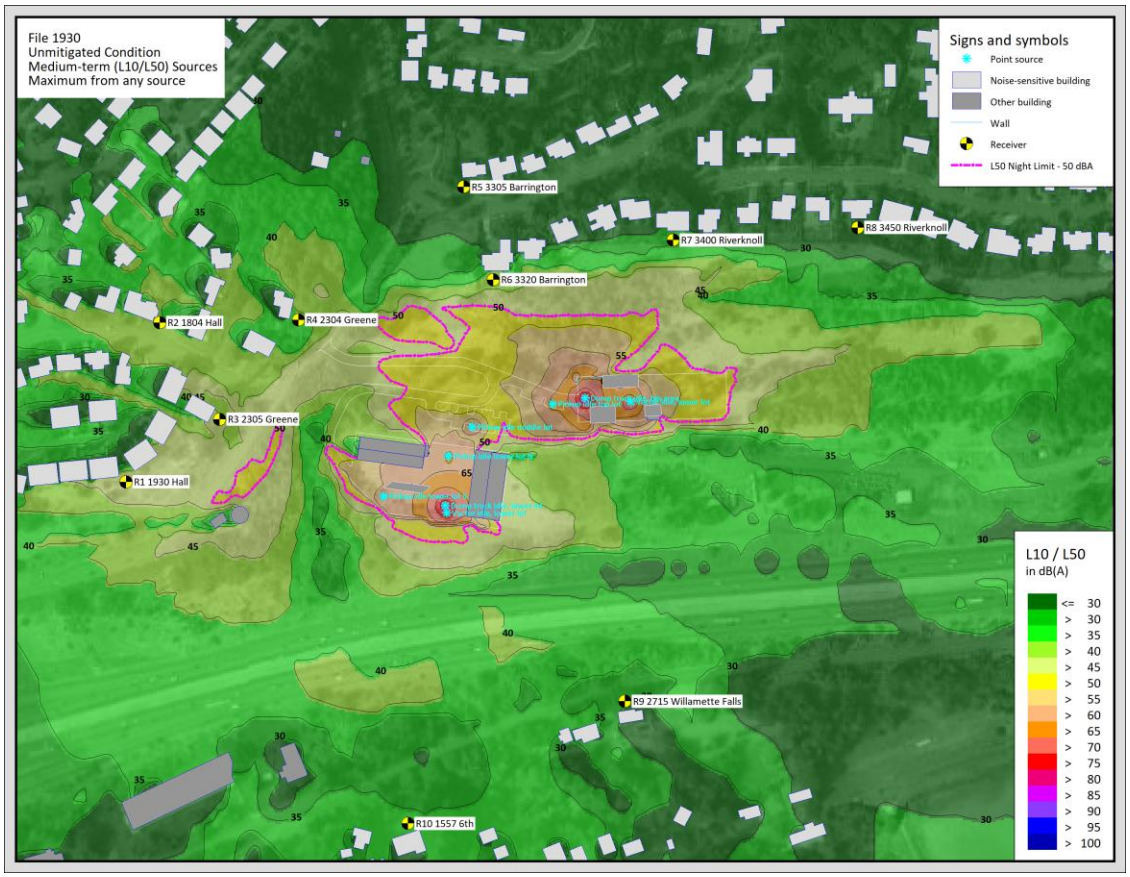


Figure 5. Map of predicted L_{10} or L_{50} levels from WLPWOC site

6.3.3 Generator (L_{50})

The emergency generator would be exercised monthly in a no-load condition. This test would likely run for at least 30 minutes, and would thus be limited by the L_{50} criterion. However, it would only occur during daytime hours, unlike the idling vehicles discussed in §6.3.2 above, which could potentially occur at night. Table 4 presents the reference sound pressure levels and corresponding measurement distance as provided by the manufacturer.

Table 4. Equipment reference sound pressure levels, L_{50}

Noise levels expressed in decibels (dB) re. 20 µPa

Source	Ref. Dist. (ft)	Octave Band Center Frequency (Hz) SPL (dB)								Total (dBA)
		63	125	250	500	1000	2000	4000	8000	
Generator [1, 2]	23	49	58	61	62	61	56	51	43	67

Note 1: Kohler/Rehlko 250REOZJE, No Load (testing/exercise) condition, Weather enclosure.
Note 2: Levels were given in several directions around the generator, and this directivity was applied to the levels in the analysis.

Since the monthly generator testing would only occur during the daytime, only the daytime limits are considered for the DEQ and CCC regulations (any nighttime use of the generator would only occur during a power outage, and would thus be exempt from the noise limits as emergency use). The generator could potentially run for more than 30 minutes during the testing, so it would be considered under both the L_{10} and L_{50} limits

– of these, the L_{50} limit is more restrictive. The limits, including the ambient degradation criterion during the day, are compiled in Table 5, along with the most restrictive limit at each receiver. Ambient noise levels used for the DEQ ambient degradation criterion are presented in Appendix A at the end of this report.

The generator was placed in the SoundPLAN model at the appropriate location in the lower lot. The loudest level at each receiver is shown in Table 5. As shown, the noise from the site is calculated to be in compliance with the DEQ hourly noise criteria and the CCC maximum noise criteria at all residences and at all daytime hours with no further mitigation.

Figure 6 presents a visual representation of the loudest L_{50} sound levels from the generator. The dotted magenta line indicates the most restrictive limit level of 55 dBA – this confirms that the site would be in compliance with the regulations at every potential receiver location.

Table 5. Predicted hourly L_{50} metrics and associated limits at nearest receivers

Receiver	Calculated Hourly L_{50} Sound Level (dBA)	Noise Regulation Limits (dBA)		
	Generator	DEQ Amb. Deg.[1]	Max. Allowable	Most Restrictive
R1 1930 Hall	42	*73*	*DEQ L_{10} day: 60* *DEQ L_{50} day: 55* *CCC day: 60*	**55**
R2 1804 Hall	45			**55**
R3 2305 Greene	47	*69*		**55**
R4 2304 Greene	41			**55**
R5 3305 Barrington	26	*71*		**55**
R6 3320 Barrington	44	*67*		**55**
R7 3400 Riverknoll	39			**55**
R8 3450 Riverknoll	36			**55**
R9 2715 Willamette Falls	24	*73*		**55**
R10 1557 6th	33			**55**

Note 1: Quietest ambient hourly L_{50} level between 7:00 a.m. and 6:00 p.m. as measured near the proposed site, plus 10 dB. The quietest hour was typically 2:00 p.m.

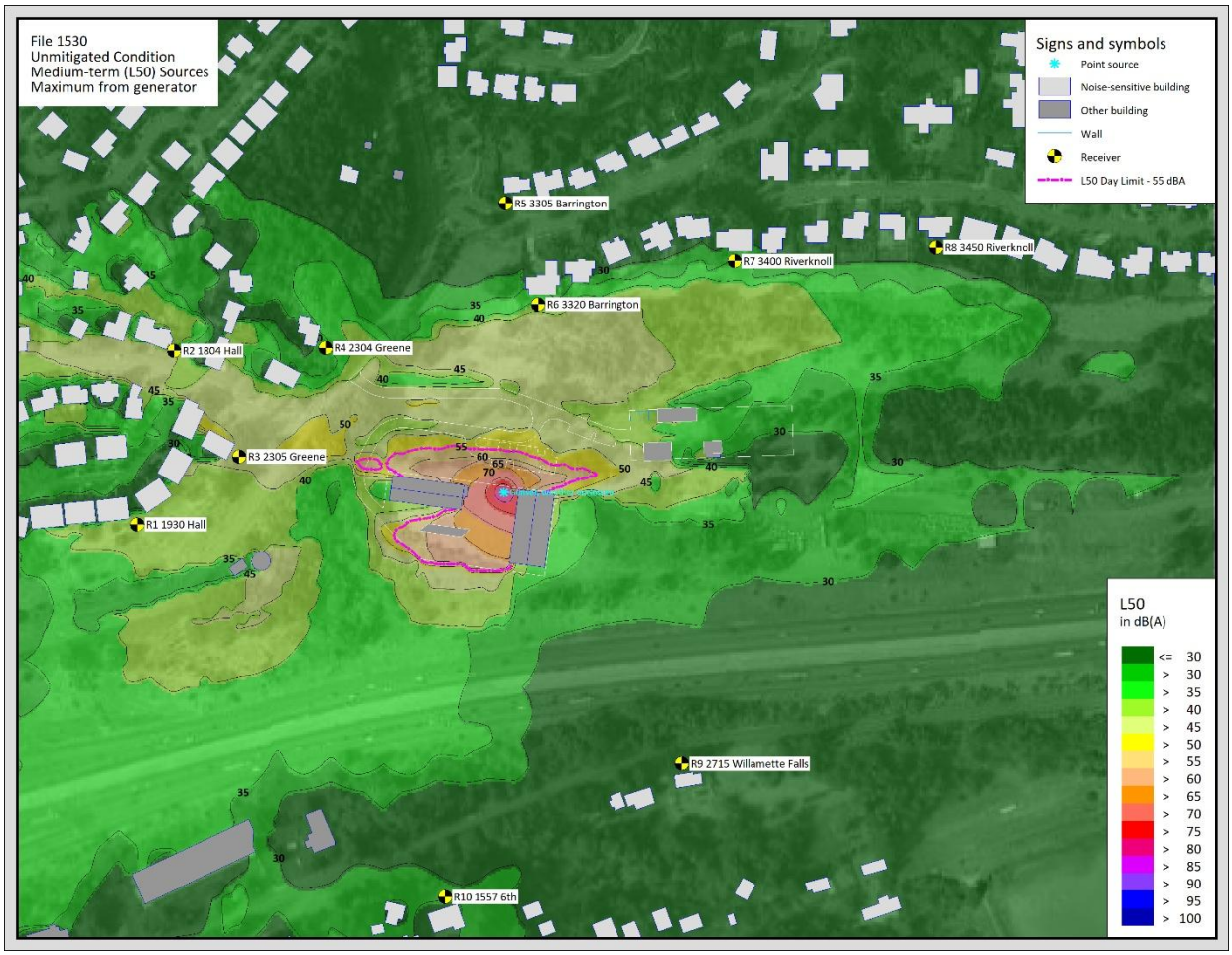


Figure 6. Map of predicted L_{50} levels from generator on WLPWOC site

6.3.4 Short Term Sources (L_1)

ABD observed a number of short-term noise sources at the existing facility, including moving and reversing equipment and trucks, vehicle startups, and handheld equipment testing. These sources would be active for at least 36 seconds either individually or as a group, but for less than 6 minutes. Therefore, noise from these sources are compared to the L_1 limit from the DEQ regulation, as well as the CCC maximum level limit. Table 6 presents the measured sound pressure levels and corresponding measurement distance for all sources that could be expected to meet the qualifications for the L_1 limits.

Table 6. Equipment reference sound pressure levels, L_1

Noise levels expressed in decibels (dB) re. 20 µPa

Source	Ref. Dist. (ft)	Octave Band Center Frequency (Hz) SPL (dB)								Total (dBA)
		63	125	250	500	1000	2000	4000	8000	
Small backhoe moving (JD 50G)	42	80	68	62	58	80	75	54	43	82
Small FEL moving material (JD 444K)	21	70	76	72	84	70	67	63	55	80
Large FEL moving material (CAT 416D)	33	74	78	81	80	82	77	70	59	84
Pickup startup (F350)	24	65	68	60	57	57	74	62	50	76
Dump truck reversing (FL 114SD+)	15	69	66	66	69	77	73	64	55	79
Sweeper hydraulic motor (Elgin Crosswind) [1]	18	71	70	77	70	69	69	64	53	75
Gas-powered chainsaw test	11	79	89	80	87	86	89	92	88	96
Gas-powered weed whacker test	11	80	83	79	85	80	81	83	82	89
Gas-powered leaf blower test	16	75	84	78	87	89	83	78	78	91

Note 1: Levels were measured in several directions around the sweeper, and this directivity was applied to the levels in the analysis.

Very few vehicles would start up before 7 a.m., so nighttime vehicle startup noise would not exceed 36 seconds. Likewise, none of the other equipment would be used before 7 a.m. Therefore, only the limits for daytime are considered for both DEQ and CCC regulations. The DEQ daytime limit is an L_1 of 75 dBA, and the CCC daytime limit is an $L_{max\text{-}1s}$ of 60 dBA. The DEQ ambient degradation limits do not apply to the L_1 metric.

The sources given in Table 6 above were placed in the SoundPLAN model. The majority of large vehicle startups and handheld equipment testing would occur in the lower lot – while it is likely these will occur inside Building A, the modeling assumes all activity occurs outside to be conservative. Pickup truck startups could occur at both the middle and lower lots. Front-end loaders (FEL) are used in the upper lot to move material in the storage bins. Reversing vehicles could occur in the lower lot, or in the upper lot near the truck wash and decant areas. The loudest instance of each of these sources at each receiver is shown in Table 7. As shown, the noise from the site is calculated to be in compliance with the DEQ hourly noise criteria and the CCC maximum noise criteria at all residences and at all hours with no further mitigation. These sources are all present for short periods of time – the chances of multiple short-term sources being active simultaneously at the corresponding loudest potential locations is extremely unlikely.

Figure 7 presents a visual representation of the loudest L_1 sound levels. The dotted magenta line indicates the most restrictive limit level of 60 dBA – this confirms that the site would be in compliance with the regulations at every potential receiver location.

Table 7. Predicted hourly L_1 metric and associated limits at nearest receivers

Receiver	Calculated Hourly L_1 Sound Level (dBA)								Noise Regulation Limits (dBA)
	Pickup	Reversing Truck	Backhoe	FEL	Sweeper Motor	Chain saw	Leaf blower	Weed Whacker	
R1 1930 Hall	44	45	57	51	37	55	57	50	*DEQ L_1 day: 75* **CCC day: 60**
R2 1804 Hall	43	41	52	52	37	53	55	47	
R3 2305 Greene	47	47	59	53	41	58	58	50	
R4 2304 Greene	45	39	52	53	37	54	56	50	
R5 3305 Barrington	28	22	34	32	21	35	38	31	
R6 3320 Barrington	44	42	53	41	38	57	56	50	
R7 3400 Riverknoll	36	37	47	42	29	42	49	42	
R8 3450 Riverknoll	36	34	43	44	20	32	43	33	
R9 2715 Willamette Falls	35	19	43	39	32	48	47	42	
R10 1557 6th	36	32	45	42	31	48	49	42	

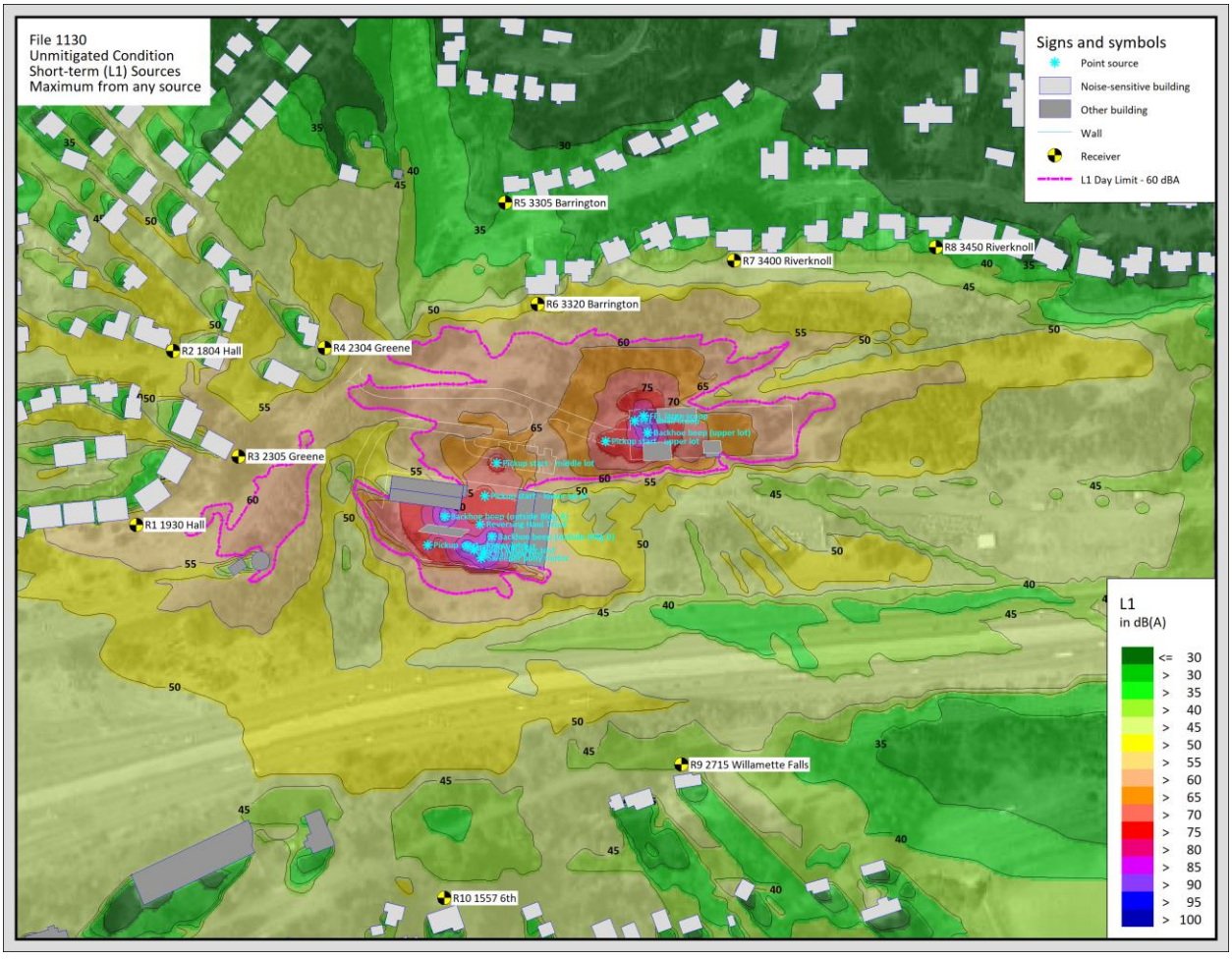


Figure 7. Map of predicted L_1 levels from WLPWOC site

6.3.5 Impulse Sources (L_{pk} and $L_{max\text{-}1s}$)

ABD observed a number of impulsive noise sources at the existing facility, including reversing equipment, equipment handling noise, and metal clangs. These sources were on the order of 1 second or less. Therefore, the L_{pk} level from these sources are compared to the L_{pk} limit from the DEQ regulation. The 1-second maximum L_{eq} level for the same sources are compared to the CCC $L_{max\text{-}1s}$ maximum level limits. Table 8 presents the measured sound pressure levels and corresponding measurement distance for all sources that could be expected to meet the qualifications for the L_{pk} and $L_{max\text{-}1s}$ limits. Some sources, such as the backup beepers, do not meet the definition of an impulsive sound, so they are compared only to the CCC $L_{max\text{-}1s}$ limit, but not to the DEQ L_{pk} limit.

Table 8. Equipment reference sound pressure levels, $L_{max\text{-}1s}$ and L_{pk}

Noise levels expressed in decibels (dB) re. 20 µPa

Source	Ref. Dist. (ft)	Octave Band Center Frequency (Hz) SPL (dB)								$L_{max\text{-}1s}$ (dBA)	L_{pk} (dBZ)
		63	125	250	500	1000	2000	4000	8000		
Equipment loading in pickup bed	21	61	67	64	62	61	60	64	63	69	96
FEL loading rubble into dump truck	18	86	89	88	88	86	83	78	70	91	114
Chain handling on trailer	34	57	60	59	67	69	70	71	65	77	99
Dump truck brake squeak	27	66	65	68	78	77	71	67	66	80	99
Dump truck airbrake	96	61	60	61	69	68	64	69	68	75	92
Sweeper airbrake release	15	63	62	62	63	68	77	84	85	88	106
Dump truck reversing	15	69	66	66	69	77	73	64	55	79	*n/a*
Sweeper reversing	18	68	69	67	71	66	79	73	59	81	*n/a*
Vacuum truck reversing	18	71	67	65	66	89	85	65	56	91	*n/a*
Moving haul truck, 15 mph [1]	30	83	72	67	70	72	69	65	58	76	*n/a*

Note 1: The data used in the analysis is for the loudest measured vehicle (the haul truck) to be conservative – most vehicles are significantly quieter than this. The given level and distance are for the closest point from a vehicle pass-by.

None of these sources would occur before 7 a.m. Therefore, only the daytime limits are considered for both DEQ and CCC. The DEQ daytime limit is an L_{pk} of 100 dBZ, and the CCC daytime limit is an $L_{max\text{-}1s}$ of 60 dBA. The DEQ ambient degradation limits do not apply to the L_{pk} metric.

The sources given in Table 8 above were placed in the SoundPLAN model. Airbrakes, brake squeaks, and backup beepers can occur in either lot. The trailer chains would only occur in the lower lot, and FELs loading rubble would only occur in the upper lot. Trucks can move between lots, or from either lot to the street. The loudest instance of

each of these sources at each receiver is shown in Table 9 and Table 10. As shown, the noise from the site is calculated to be in compliance with the DEQ L_{pk} noise criterion and the CCC $L_{max\text{-}1s}$ noise criterion at all residences and at all hours for the site as designed with no further mitigation.

Figure 8 presents a visual representation of the loudest L_{pk} sound levels – the dotted magenta line indicates the DEQ limit level of L_{pk} 100 dBZ. Figure 9 presents a similar representation for the 1-second maximum level, with the magenta line representing the CCC limit level of $L_{max\text{-}1s}$ 60 dBA. Figure 10 presents the sound levels from the moving haul truck at all possible points in its travel path while within the WLPWOC property lines compared to the CCC limit level (outside of the property lines, vehicles are governed by DOT and DEQ motor vehicle regulations, not by site noise regulations). This confirms that the site would be in compliance with the regulations at every potential receiver location.

Table 9. Predicted L_{pk} metric and associated limits at nearest receivers

Receiver	Calculated L_{pk} Sound Level (dBZ)					Noise Regulation Limits (L_{pk} dBZ)
	Sweeper airbrake	Dump truck airbrake	Dump truck brake squeal	Chain clang	FEL dump rubble	
R1 1930 Hall	63	70	69	68	75	**DEQ day: 100**
R2 1804 Hall	60	69	67	62	75	
R3 2305 Greene	65	72	70	73	78	
R4 2304 Greene	64	68	68	54	78	
R5 3305 Barrington	40	51	46	44	57	
R6 3320 Barrington	66	69	67	55	68	
R7 3400 Riverknoll	54	62	61	47	68	
R8 3450 Riverknoll	57	64	55	44	64	
R9 2715 Willamette Falls	54	63	58	54	65	
R10 1557 6th	55	63	61	57	68	

Table 10. Predicted $L_{max\text{-}1s}$ metric and associated limits at nearest receivers

Receiver	Calculated $L_{max\text{-}1s}$ Sound Level (dBA)									Noise Regulation Limits ($L_{max\text{-}1s}$ dBA)
	Sweeper airbrake	Dump truck airbrake	Dump truck brake squeal	Chain clang	FEL dump rubble	Dump truck backup beep	Sweeper backup beep	Vac truck backup beep	Moving haul truck	
R1 1930 Hall	45	53	50	46	51	45	48	56	49	**CCC day: 60**
R2 1804 Hall	42	52	48	40	51	37	40	54	49	
R3 2305 Greene	47	55	52	51	54	47	50	59	54	
R4 2304 Greene	46	51	50	32	54	38	43	55	60	
R5 3305 Barrington	22	34	28	22	33	19	24	35	40	
R6 3320 Barrington	48	53	49	34	44	33	33	57	46	
R7 3400 Riverknoll	36	45	43	25	44	35	36	49	40	
R8 3450 Riverknoll	39	47	37	22	40	39	27	41	42	
R9 2715 Willamette Falls	36	47	40	32	41	32	31	49	37	
R10 1557 6th	37	46	42	36	44	34	34	49	41	

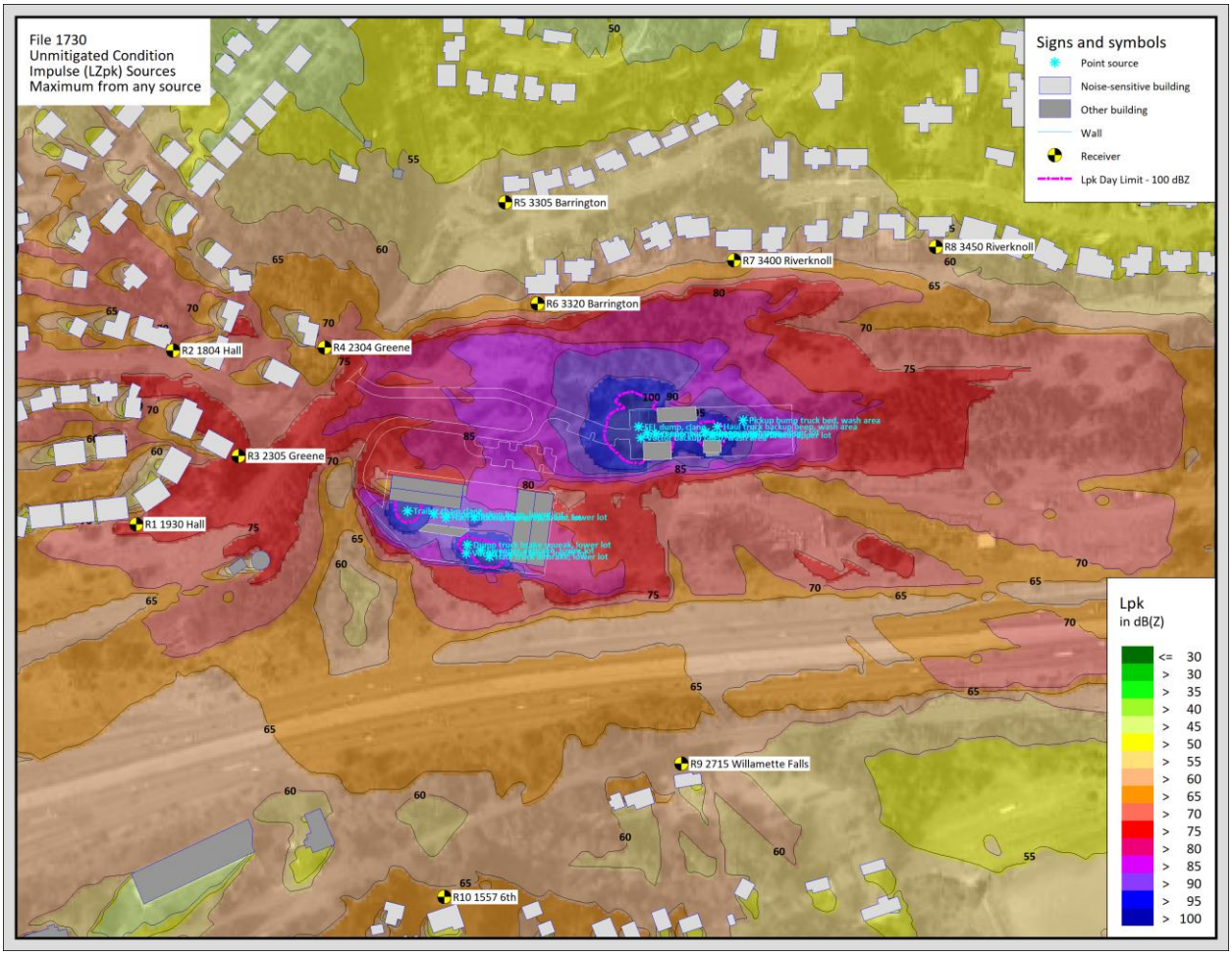


Figure 8. Map of predicted L_{pk} levels from WLPWOC site

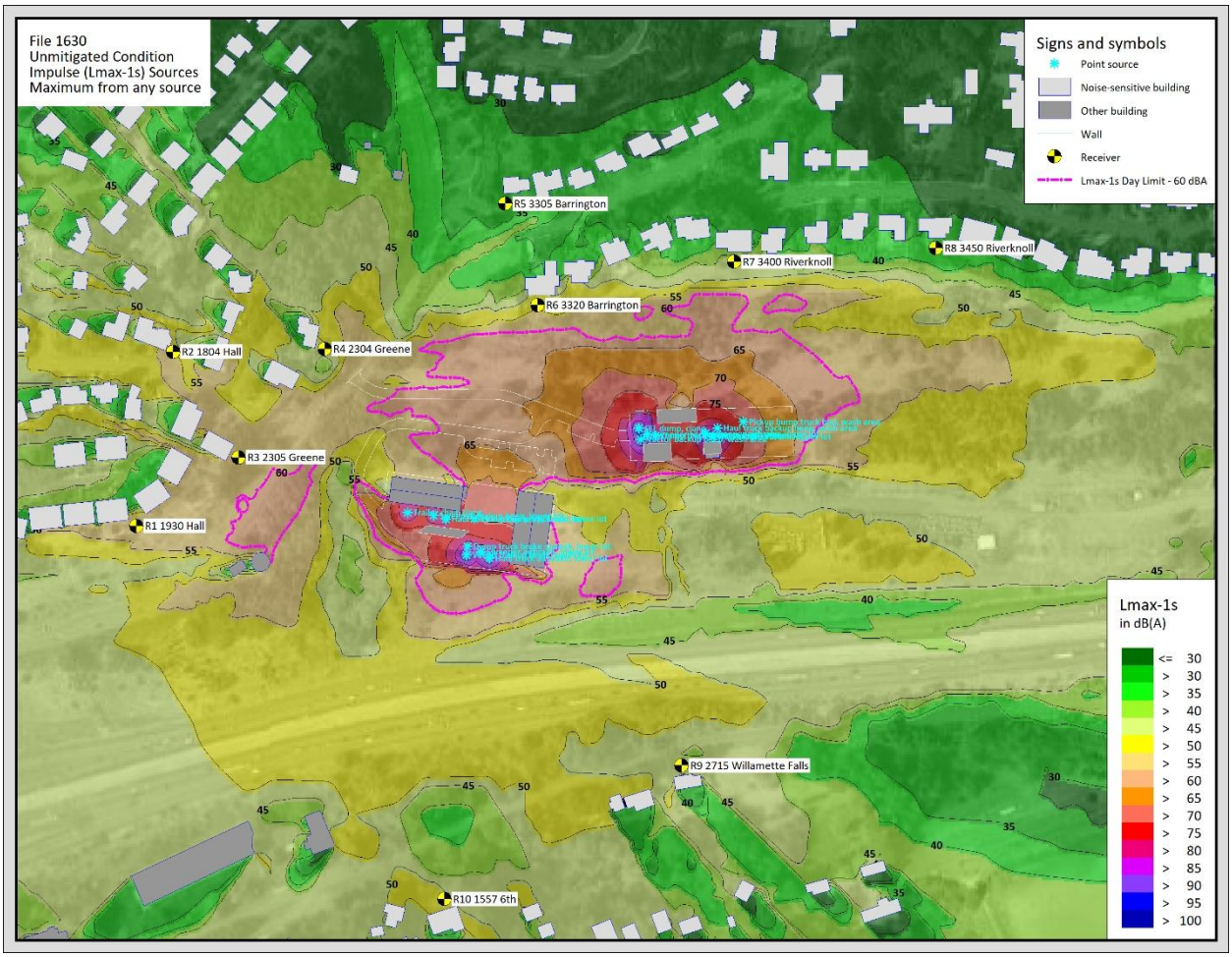


Figure 9. Map of predicted $L_{max\text{-}1s}$ levels from WLPWOC site

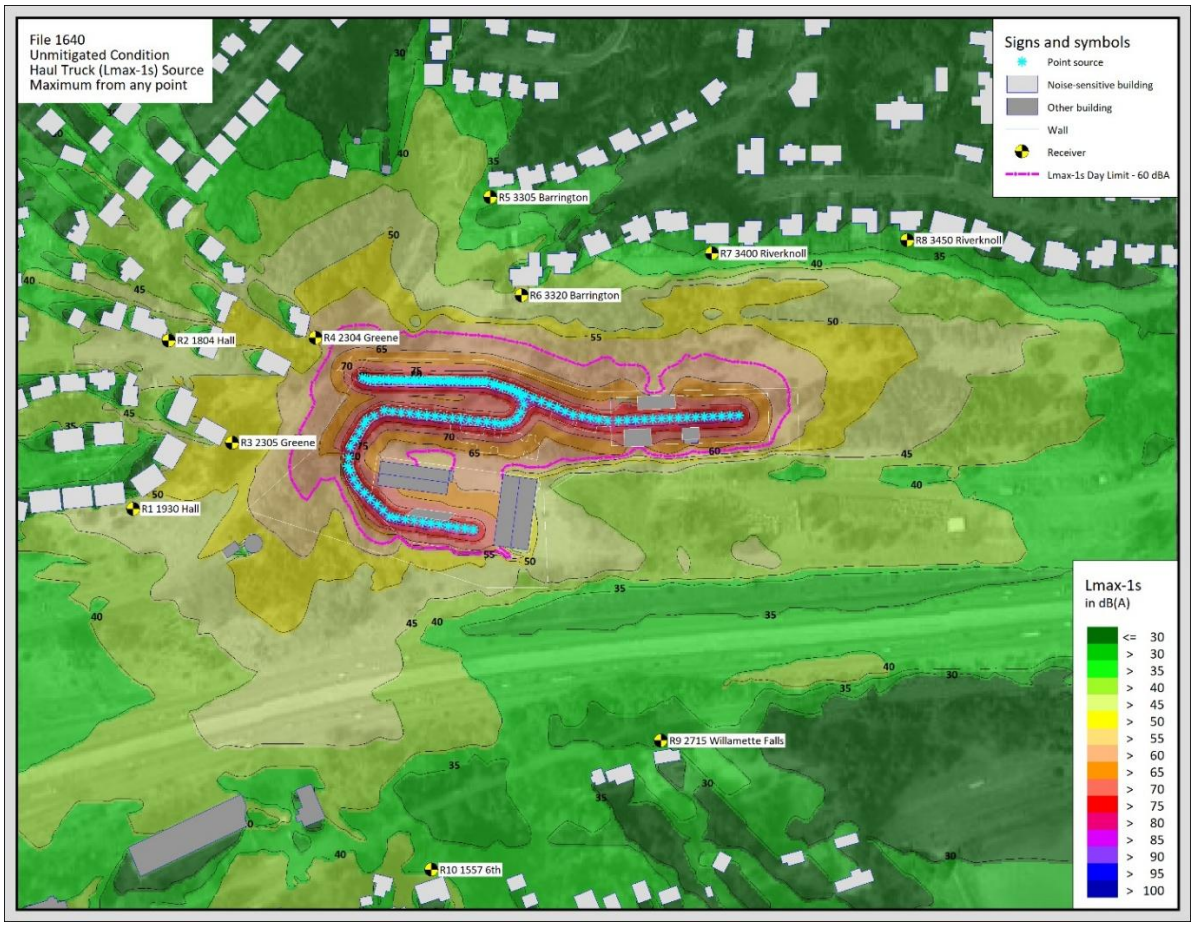


Figure 10. Map of predicted $L_{max\text{-}1s}$ levels from loudest moving vehicle on WLPWOC site

6.4 Allowable to Add Mitigation

As discussed above, it is ABD's conclusion that the site will be in compliance with all noise regulations using the proposed operating procedures, and therefore no additional mitigation measures are required. However, if it is desired to add additional mitigation measures, this would be acceptable for acoustics.

7. Conclusions

Based on the results of the study conducted by ABD, the noise associated with the proposed WLPWOC facility site is predicted to comply with the DEQ and CCC noise limits and would thus be in compliance with all applicable noise regulations, even when multiple sources are active simultaneously (see §3 above). This is the case even though the site is likely exempt from many of these regulations. No additional noise mitigation measures are necessary to maintain these levels. Different equipment that has similar or quieter noise levels may be used without changing the results of this study.

It is also noted that the predicted sound levels generated by the proposed WLPWOC facility are expected to be quieter than existing background noise levels at most times. Most typical activity is expected to be very quiet, and noise that is audible is only expected to occur for short periods. The facility is not expected to significantly increase ambient noise levels within the surrounding neighborhoods.

Appendix A
Ambient Noise Measurement Data

4/16/2026 – 4/17/2026

Vicinity of Proposed New WLPWOC Site

For comparison to the DEQ ambient degradation criterion, a study of existing ambient noise was conducted around the proposed new WLPWOC site. Ambient noise was measured at representative locations near residences around the site to establish a baseline for existing ambient noise levels.

Ambient noise was measured over a period of 24 hours; measurements were conducted from the afternoon of Thursday, April 16, 2026, through the afternoon of Friday, April 17, 2026. During the measurement period, no activity occurred at the site, but traffic on nearby roads and neighborhood activity was normal. These measurements are representative of the existing ambient noise levels.

Ambient noise levels were measured at 5 locations around the site. The measurement locations were determined to be representative of groups of receivers. The measurement locations are identified with yellow targets as Locations M-A through M-E in Figure A-1.

Figure A-1. Ambient noise measurement locations

All meters met the ANSI requirements for Type 2 sound level meters or better. The meters were programmed to capture the average sound level every 1 second during the measurement period using a fast meter response, and to store statistical and maximum noise levels on an hourly basis.

ABD personnel made attended observations at each of the measurement locations at the beginning and end of the measurement period. In addition, audio recordings were taken throughout the measurement period at Location M-B. Based on these observations, the primary noise sources at each location are summarized in Table A-1.

For reference, graphs of the hourly L_{50} and L_{10} ambient noise data measured by ABD at each of the five measurement locations are presented in Figure A-2 through Figure A-6 below. The L_1 ambient data is also presented for reference, although it is not used for any noise regulation criteria. The magenta lines indicate hours when the WLPWOC could potentially be active (6 a.m. to 6 p.m.), and the gray areas indicate nighttime hours (10 p.m. to 7 a.m.).

Table A-1. Primary ambient noise sources noted by ABD

Measurement Location	Primary Noise Sources
M-A	This location is representative of receivers near the site that have direct line-of-sight to I-205 (R1). I-205 is the primary source, with high short-term levels from traffic on Salamo Road.
M-B	This location is representative of receivers along Salamo Road that are partially or fully barriered from I-205 (R2 – R4). Noise from Salamo Road is the loudest source, with more continuous levels attributable to traffic on I-205 and wind. Bird noise was also present.
M-C	This location is representative of receivers along the edge of the bluff (R6 – R8). The primary noise source was Salamo Road, particularly larger vehicles traveling uphill, although traffic noise from I-205 was audible (the topography blocks line-of-sight to I-205 noise for these receivers). Train noise from the track along the south side of the Willamette River was occasionally audible. More continuous noise was traffic on I-205 and wind.
M-D	This location is representative of receivers north of the site that are set farther back from the edge of the bluff (R5). Noise from Salamo Road is the loudest source, with I-205 and wind noise present.
M-E	This location was used as a reference for direct line-of-sight to I-205. It is generally representative of receivers along the south side of I-205 (R9 – R10). Noise from I-205 is the primary source. Train and wind noise were also audible.

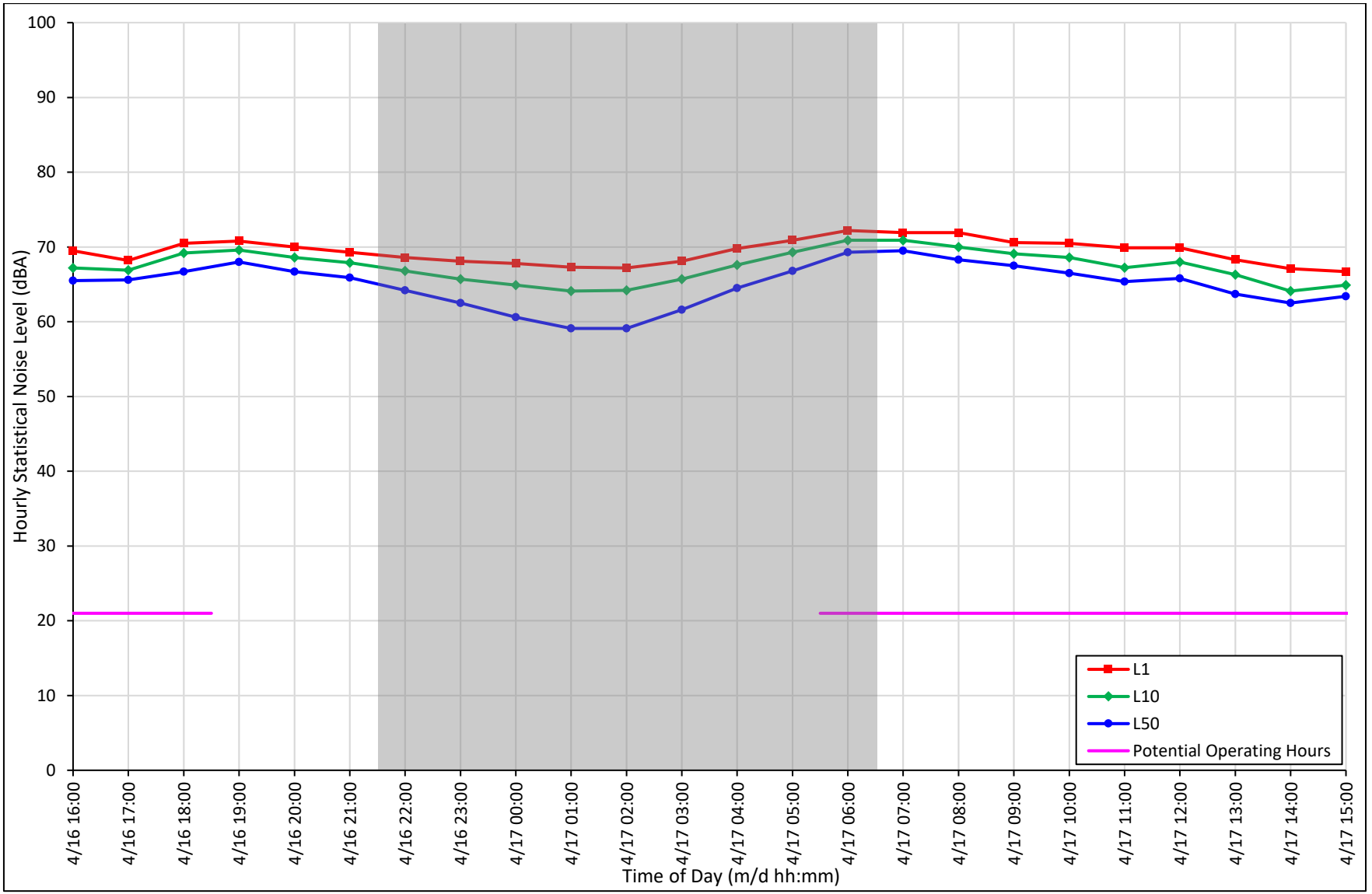


Figure A-2. Measured hourly ambient sound level data at Measurement Location M-A

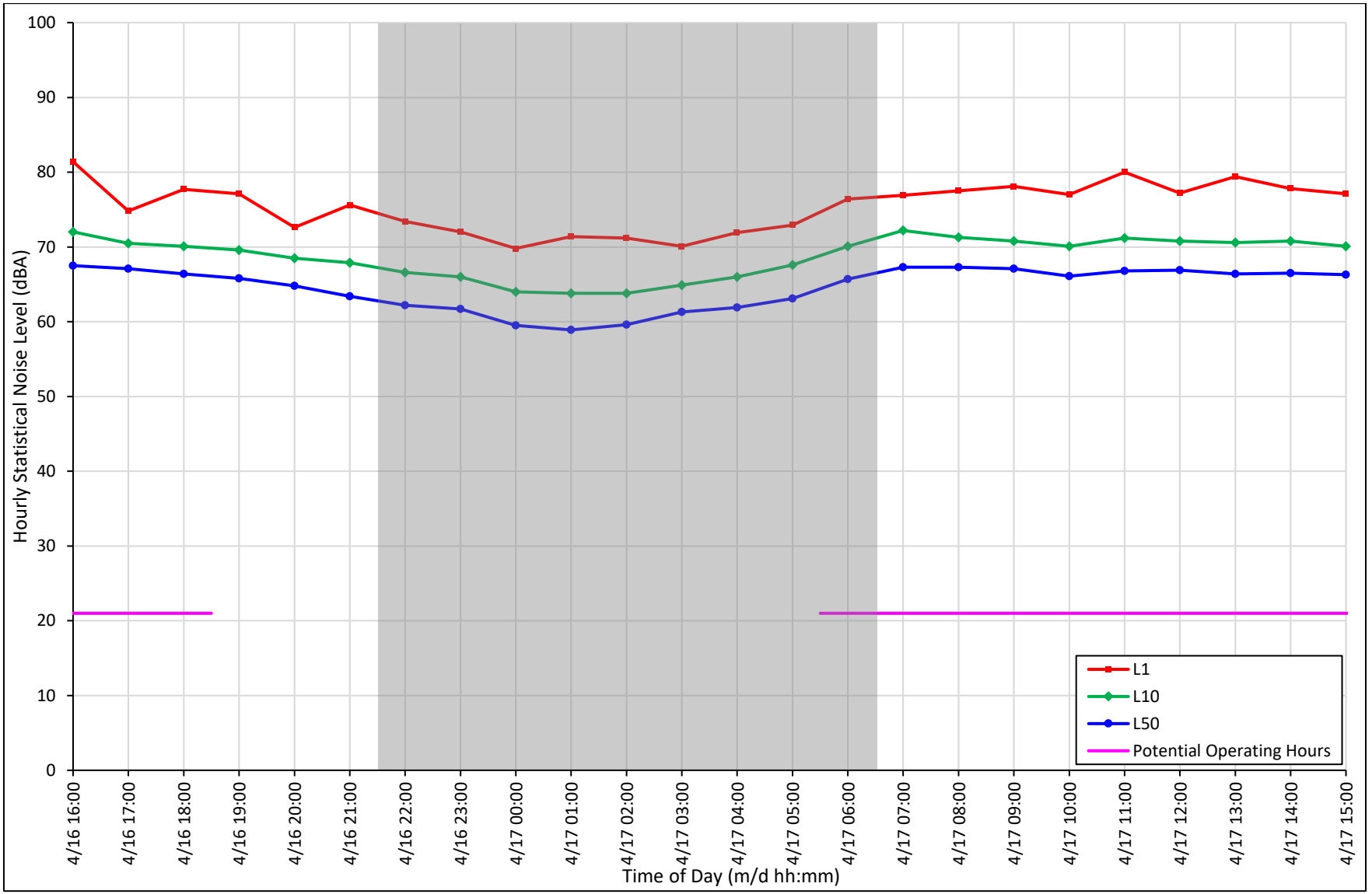


Figure A-3. Measured hourly ambient sound level data at Measurement Location M-B

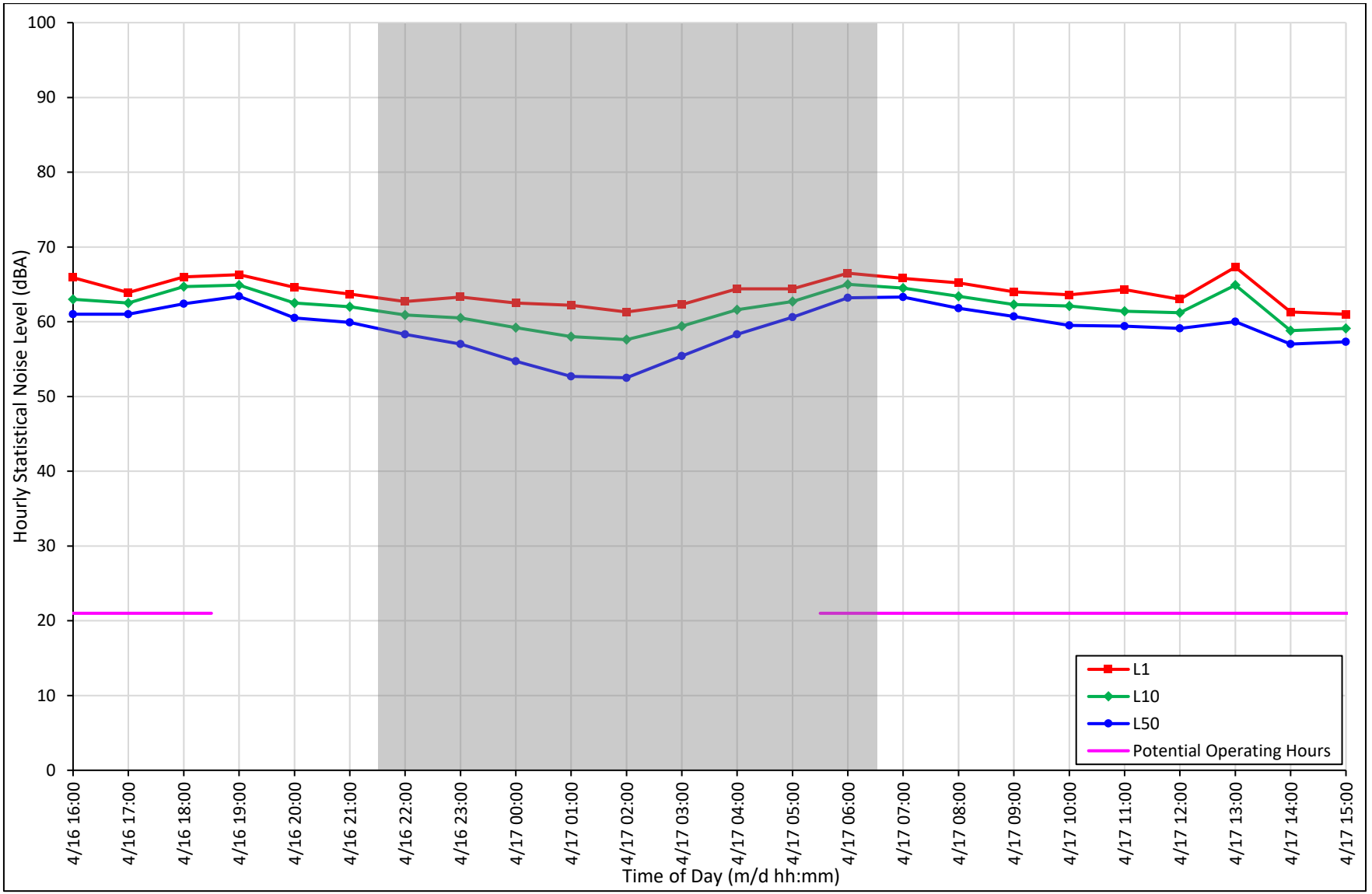


Figure A-4. Measured hourly ambient sound level data at Measurement Location M-C

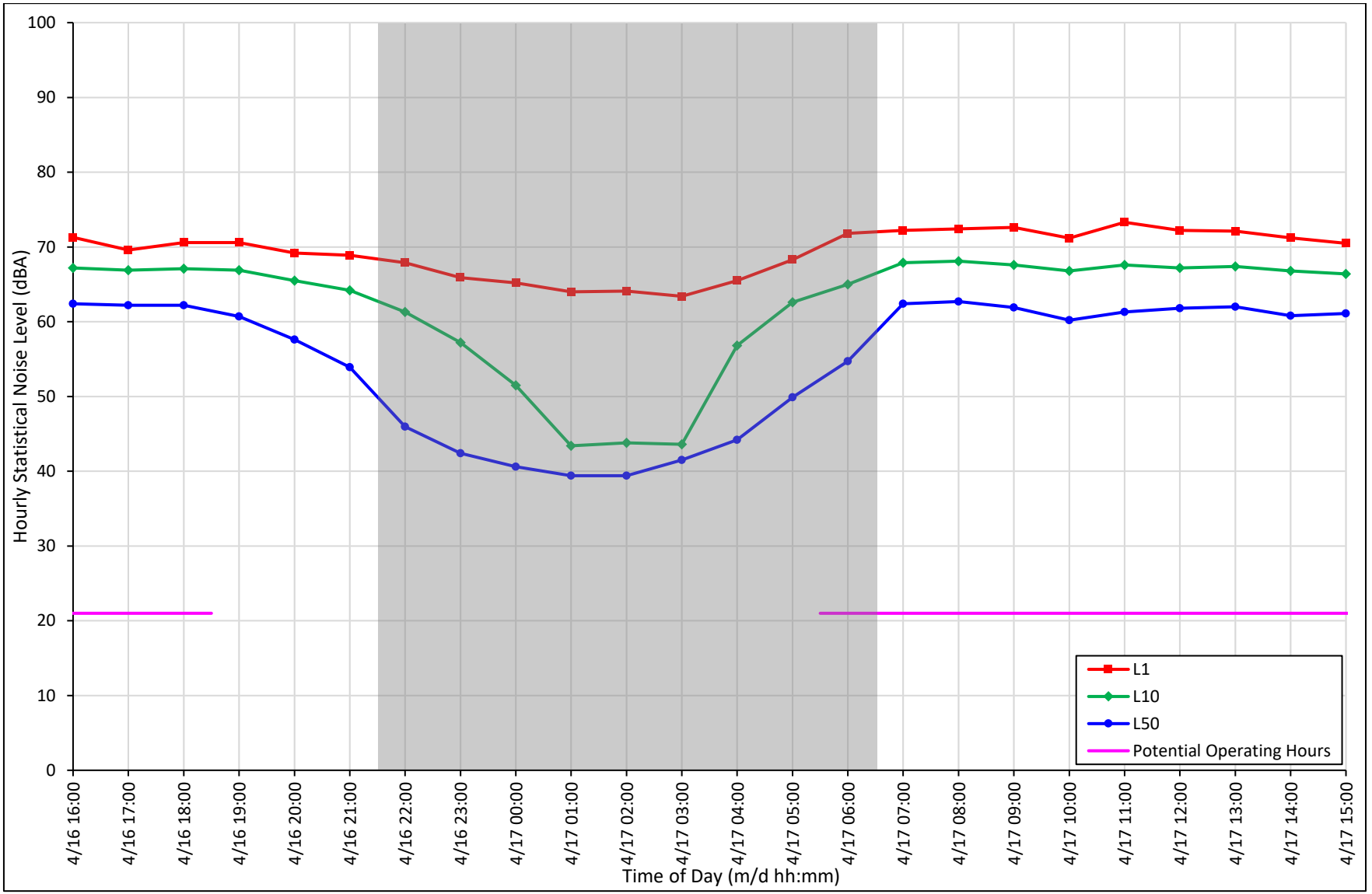


Figure A-5. Measured hourly ambient sound level data at Measurement Location M-D

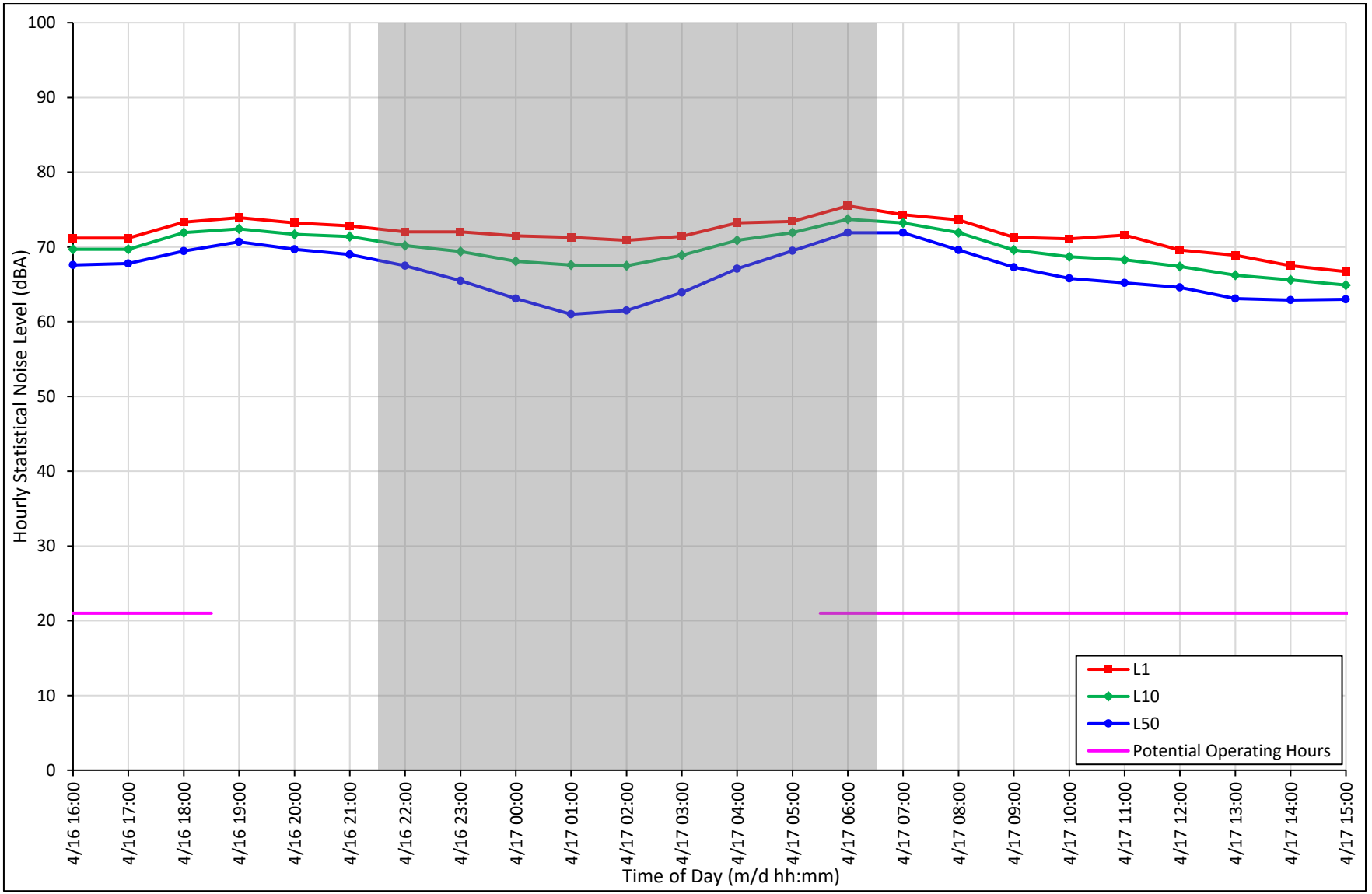


Figure A-6. Measured hourly ambient sound level data at Measurement Location M-E

KITTELSON & ASSOCIATES
851 S.W. 6th Avenue, Suite 600
Portland, OR 97204
P 503.228.5230

TECHNICAL MEMORANDUM

May 22, 2026

Project# 32260.001

To: Erich Lais, PE
City of West Linn
22500 Salamo Road
West Linn, OR 97068

From: Matt Bell, Andrew Mancini, and Marc Butorac, PE, PTOE, PMP

RE: West Linn Public Works Operations Complex – Traffic Impact Analysis

Introduction

The City of West Linn ("City") is proposing to relocate its existing Public Works Operations Complex from Norfolk Street to a new location on Salamo Road. The existing facility will be closed, and all public works and parks maintenance staff, along with associated fleet vehicles, will be relocated to the new site. The new facility is not expected to increase staffing, vehicle fleet size, nor overall operational capacity. Access to the new facility will be provided by a new driveway on the east side of Salamo Road. The driveway will be gated; however, the gate will remain open during business hours. Construction of the proposed operations complex is expected to begin in 2026 with full build-out and occupancy in 2028. Figure 1 illustrates the site vicinity map, and Figure 2 depicts the conceptual site plan.

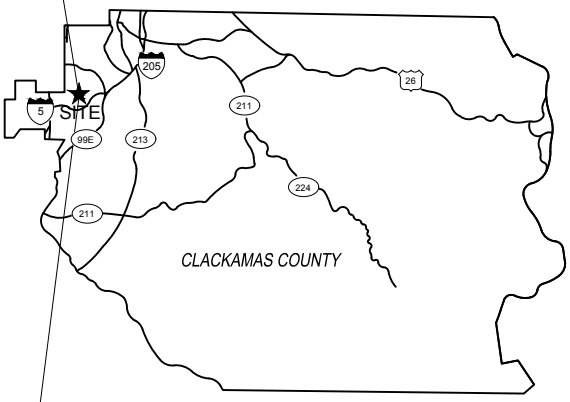
The results of this study indicate that the Public Works Operations Complex can be constructed at the Salamo Road site, while maintaining acceptable traffic operations at the study intersection and site-access driveway. The following recommended mitigation measures have been incorporated into the project design:

- Landscaping, above-ground utilities, and signing should be located and maintained along the site frontage and throughout the site in a manner that preserves adequate intersection sight distance for turning movements onto Salamo Road.
- Adequate vehicular storage between Salamo Road and the property gate is shown in the 100% construction drawings to be approximately 50 feet. This will accommodate the largest anticipated fleet vehicles that may arrive during periods when the facility gate is closed and will avoid vehicles queuing back onto Salamo Road while the gate is opening.

Additional details of the study methodology, findings, and recommendations are provided in this report.

SCOPE OF THE REPORT

This report documents the transportation-related impacts associated with the proposed Public Works Operations Complex and was prepared in accordance with the City's Traffic Impact Analysis (TIA) requirements and analysis procedures per Community Development Code (CDC) 85.170(B)(2) (Reference 1). The scope of work for this TIA was reviewed and approved by the City Engineer. *Appendix "A" responds to CDC 85.170(B)(2)(g) to show how this TIA meets City requirements.*



Study Intersection

Site Vicinity Map
West Linn, OR

Figure
1

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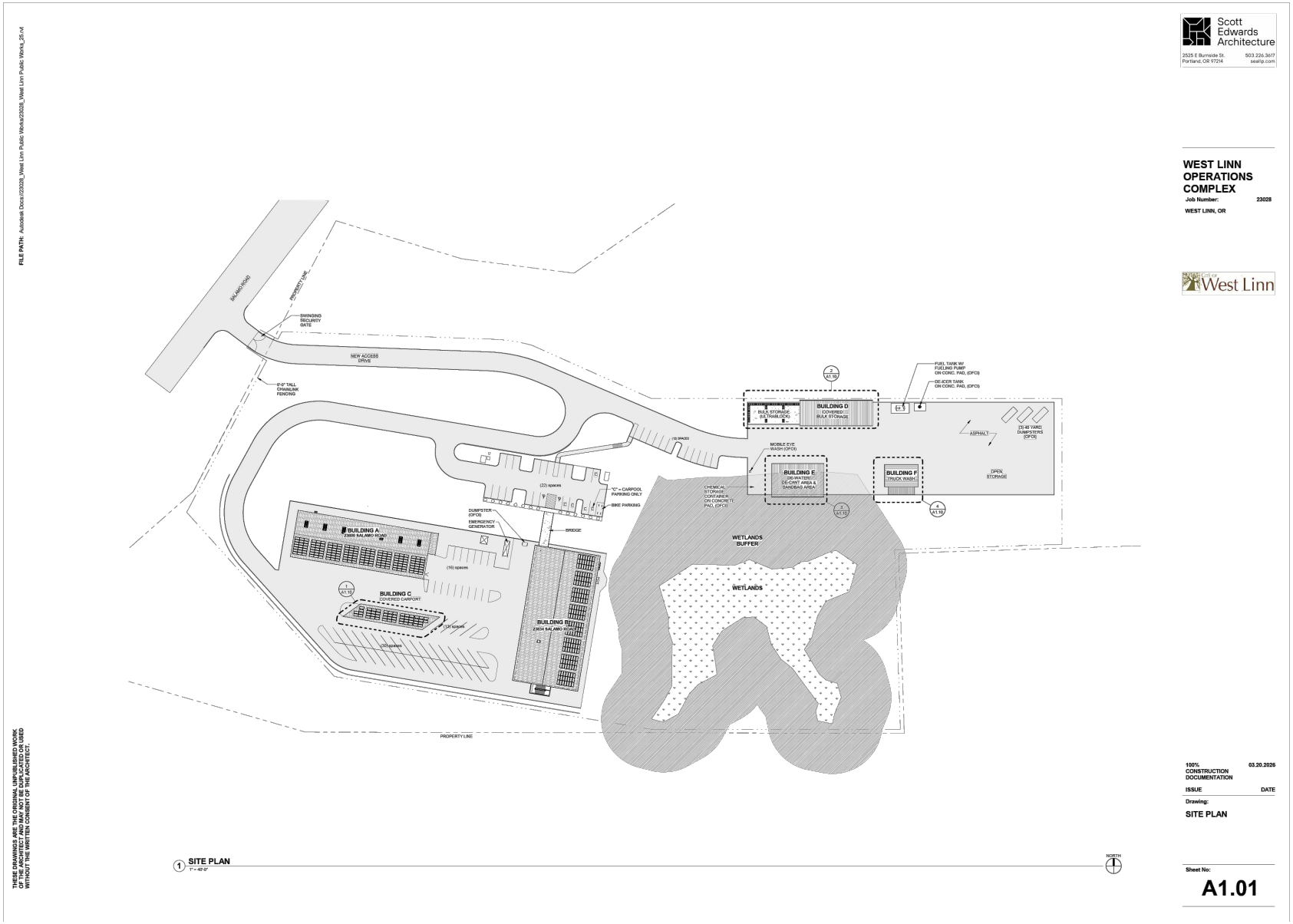
H:\32\32260 - City of West Linn 2025-27 On-Call\001 - West Linn Operations Building\report\figs\32260.001 Proposed Site Plan.dwg May 05, 2026 - 4:45pm - amancini Layout Tab: Site Vicinity Map



Received from Scott Edwards Architecture (March 2026)

Conceptual Site Plan
West Linn, OR

Figure
2

KITTELSON & ASSOCIATES

Accordingly, operational analyses were performed at the following locations:

1. Salamo Road/Barrington Drive
2. Salamo Road/Site-Access Driveway

Per CDC 85.170(B)(2), this TIA will evaluate the following transportation issues:

- Existing land-use and transportation-system conditions at the study intersection during the weekday AM and PM peak hours;
- Approved but not yet constructed developments and transportation improvements planned in the study area;
- Build-out year 2028 background traffic conditions (without the proposed operations complex) at the study intersection during the weekday AM and PM peak hours;
- Trip generation and distribution estimates for the proposed operations complex;
- Build-out year 2028 total traffic conditions (with the proposed operations complex) at the study intersection and site-access driveway during the weekday AM and PM peak hours;
- On-site circulation and site-access operations; and
- Potential mitigation measures.

Performance Measures and Mobility Targets

Both the study intersection and site-access driveway are under the jurisdiction of the City. As such, performance measures are based on those set forth in West Linn's *Public Works Design Standards* (Reference 2), Section 5.0014(G). This requires all intersections within the study area to maintain an acceptable level of service (LOS) upon build-out of the proposed land use action. The minimum acceptable LOS for non-signalized intersections is "E" or better for the poorest operating approach and with no movement serving more than 20 peak hour vehicles operating at worse than LOS "E." LOS "F" will be tolerated for minor movements during a peak hour.

Analysis Tools and Methodology

The intersection operational analysis under existing, background, and total traffic conditions was conducted using the procedures outlined in the *Highway Capacity Manual, 7th Edition* (Reference 3), using Synchro 12 software.

Existing Conditions

The existing conditions analysis identifies the site conditions and current physical and operational characteristics of roadways within the study area. These conditions will be compared with future conditions later in this report.

SITE CONDITIONS AND ADJACENT LAND USES

The proposed operations complex is located along the east side of Salamo Road, within West Linn city limits. It is zoned Single-Family Residential Detached (R10), which permits public support facilities as a

conditional use. West and northeast of the site are Single-Family Residential Detached (R10) zones, with General Commercial (GC) zones south of the site, on the opposite side of Interstate 205 (I-205). Existing land uses are generally consistent with their underlying zoning designations.

TRANSPORTATION FACILITIES

Table 1 summarizes the characteristics of roadways within the site vicinity.

Table 1. Existing Transportation Facilities

Roadway	Functional Classification[1]	Number of Vehicle Lanes	Posted Speed *(mph)*	Sidewalks Provided?	Bicycle Lanes Provided?	On Street Parking Provided?
Salamo Road	Minor Arterial	2	35	Yes[2]	Yes[2]	No
Barrington Drive	Neighborhood Route	2	25	Yes	No	Yes
Greene Street	Local Road	2	25	Yes	No	Yes

[1]Source: West Linn Transportation System Plan (TSP, Reference 4)
[2]Shared-use path along west side of Salamo Road, south of Barrington Drive; sidewalk along east side of Salamo Road, north of site access driveway to Barrington Drive.

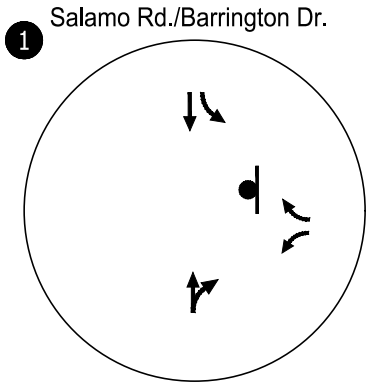
Roadway Facilities

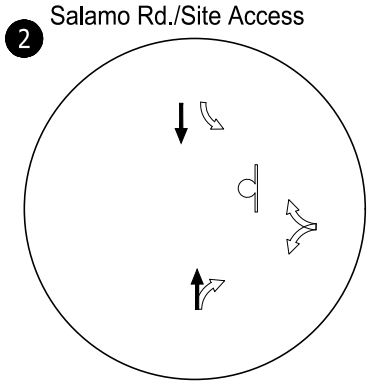
Salamo Road is located on the west side of the proposed operations complex, linking the site to 10th Street to the southwest. 10th Street connects with I-205 and West Linn's downtown core and general commercial district. Northeast of the proposed operations complex, Salamo Road connects various residential neighborhoods, apartment complexes, and a local middle school and adult community center. Barrington Drive serves as a neighborhood route, serving primarily residential uses. The Barrington Drive approach to the Salamo Road/Barrington Drive intersection is striped for one shared left–right turn lane, but field observations revealed this approach is commonly treated as separate left and right turn lanes, due to the width of the approach, which is greater than 25 feet. The forthcoming analysis reflects these field observations.

Figure 3 identifies the existing and future lane configurations and traffic control devices at the study intersection and site-access driveway.

Bicycle and Pedestrian Facilities

As shown in Table 1, streets surrounding the proposed operations complex include facilities for people walking and biking. The newly completed Salamo Road shared-use path offers a 0.5-mile-long protected connection between 10th Street and Barrington Drive on the west side of Salamo Road. This is paralleled by a newly constructed sidewalk connection on the east side of Salamo Road, between the Site Access and Barrington Drive. North of Barrington Drive, bicyclists are accommodated via on-street bicycle lanes; pedestrians can use the sidewalk on the east side of Salamo Road. Continuous sidewalks are provided on both sides of Barrington Drive, branching off from Salamo Road. An enhanced crosswalk is also provided across the north leg of the Salamo Road/Barrington Drive intersection, which includes high-visibility pavement marking, signs, and rectangular rapid flashing beacons (RRFBs).





Existing and Future Lane Configurations and Traffic Control Devices West Linn, OR

Figure 3

Study Intersection
Existing Lane
Existing Stop Sign
Proposed Lane
Proposed Stop Sign

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Transit Facilities

West Linn is served by TriMet, which operates one bus route nearby the proposed operations complex. Route 153 operates between downtown West Linn and the Lake Oswego Transit Center, via Salamo Road and Rosemont Road. It runs on weekdays from roughly 6:00 AM to 6:00 PM, with 60-minute headways at all hours. No weekend service is provided. The nearest stop is approximately 0.1 miles from the proposed operations complex, at the Salamo Road/Barrington Drive intersection.

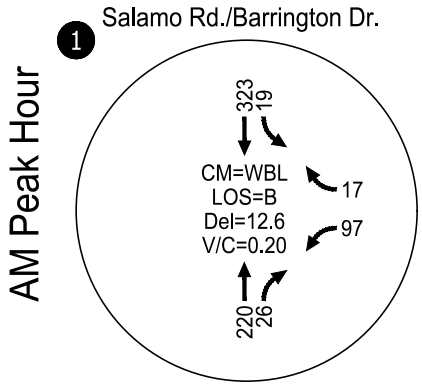
At the time of this report's preparation, TriMet was evaluating significant changes in service levels, including the potential elimination of Route 153. It is also noted that TriMet's Forward Together report identifies further service reductions within West Linn over time.

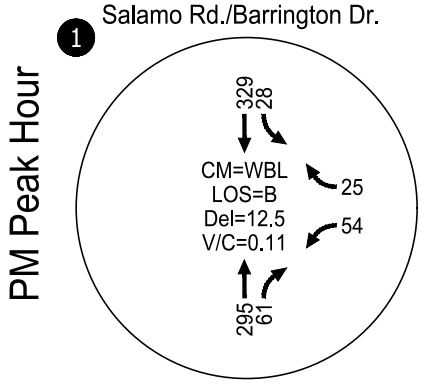
TRAFFIC VOLUMES AND PEAK HOUR OPERATIONS

Vehicle turning movement, pedestrian, and bicycle counts were collected at the existing study intersection in March 2026. The counts were conducted on a typical mid-week day during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods while local schools were in session. On the day of the counts, the AM peak hour occurred between 7:40 AM and 8:40 AM, and the PM peak hour occurred between 5:00 PM and 6:00 PM. *Appendix "B" contains the traffic count worksheets*.

Traffic Operations

Figure 4 summarizes the results of the existing traffic conditions analysis during the weekday AM and PM peak hours. As shown, the study intersection currently meets the City's LOS requirements. *Appendix "C" contains the existing traffic conditions worksheets.*





CA = Critical Approach
CM = Critical Movement
LOS = Critical Approach/Movement Level of Service
Del = Critical Approach/Movement Control Delay
V/C = Critical Approach/Movement V/C Ratio

Year 2026 Existing Traffic Conditions
Weekday AM and PM Peak Hours
West Linn, OR

Figure
4

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TRAFFIC SSAFETY

Crash data was obtained from ODOT for the five-year period from January 1, 2020, through December 31, 2024. Table 2 summarizes the crash data for the study intersection, including the number, type, and severity of crashes over the five-year period. Crash rates per million entering vehicles (MEV) were developed for the intersection. The crash rates were compared to the 90th-percentile rates for similar facilities provided in Table 4-1 of the ODOT APM. Per the APM, an intersection with a crash rate equal to or greater than the corresponding 90th-percentile rate is recommended for further analysis.

Table 2. Study Intersection Crash Summary (January 1, 2020–December 31, 2024)

Intersection	Crash Type				Crash Severity			Total	Crash Rate (Crashes/ MEV)	ODOT 90th-Percentile Rate
	Turn	Fixed Object	Ped./ Bike	Other	PDO	Injury	Fatal			
Salamo Road/ Barrington Drive	2	3	0	0	3	2	0	5	0.34	0.293

Note: PDO = Property Damage Only; MEV = Million Entering Vehicles

As shown in Table 2, the observed crash rate at the Salamo Road/Barrington Drive intersection exceeds the ODOT 90th-percentile crash rate for similar facilities. A review of crashes at this intersection found that two of the five reported crashes were turning crashes, in which a vehicle turning left from Barrington Drive to southbound Salamo Road collided with a straight-moving vehicle on Salamo Road. In one case, the vehicle on Salamo Road was travelling northbound, and in another case the vehicle was travelling southbound. Additionally, the other three crashes at this intersection involved vehicles travelling on Salamo Road which collided with a fixed object; in some cases, this was noted to be the median.

One observed crash occurred when a vehicle turning left from Barrington Drive, onto southbound Salamo Road, collided with a northbound vehicle on Salamo Road. The left-turning vehicle failed to yield the right-of-way. The left-turning driver experienced serious injuries, while the northbound vehicle experienced property damage only. In 2024, the City reconstructed portions of Salamo Road, including removing the median along Salamo Road south of Barrington Drive and repainting this as a striped median. Given these recent modifications, no additional crash-based mitigations are recommended as part of the development. *Appendix "D" contains the crash summary worksheets obtained from ODOT.*

Traffic Impact Analysis

The traffic impact analysis identifies how the study intersection and site-access driveway will operate in the year the proposed development is expected to be fully built, 2028. The impact of traffic generated by the proposed development was examined as follows:

- Developments and transportation improvements planned in the site vicinity were identified and reviewed in coordination with City staff.
- Year 2028 background traffic conditions were analyzed at the study intersection during weekday AM and PM peak hours.

- Site-generated trips were estimated for the proposed development based on the observed trip generation of the existing site.
- A trip distribution pattern was developed, and the site-generated trips were distributed to the study area roadways and assigned to the study intersection and site-access driveway.
- Year 2028 total traffic conditions were analyzed at the study intersection and site-access driveway during the weekday AM and PM peak hours, assuming full build-out and occupancy of the proposed development.
- On-site circulation issues and site-access operations were evaluated.

YEAR 2028 BACKGROUND TRAFFIC CONDITIONS

The year 2028 background traffic conditions analysis identifies how the study intersection will operate in the year the proposed development is expected to be complete. This analysis includes traffic attributed to planned developments and general growth in the region but does not include traffic from the proposed development.

Planned Developments and Transportation Improvements

Per discussions with City staff, no planned developments or transportation improvements are expected to be completed within the site vicinity prior to full build-out and occupancy of the proposed development.

Traffic Volumes

The West Linn TSP includes traffic volumes from 2014 for vehicles traveling on Salamo Road at the Salamo Road–Blankenship Road/10th Street intersection, nearby to the project site. Counts for the same approaches in 2025 were compared, in order to determine an annual growth rate used to reflect growth in local and regional traffic volumes within the study area. This growth rate was calculated at 1.3 percent per year. *Appendix "E" contains the traffic count worksheets from 2014 and 2025.*

This growth rate was applied to the existing traffic volumes shown in Figure 4. Figure 5 illustrates the year 2028 background traffic volumes during the weekday AM and PM peak hours.

Traffic Operations

Figure 5 summarizes the results of the year 2028 background traffic conditions analysis during the weekday AM and PM peak hours. As shown, the study intersection is forecast to continue to meet the City's LOS requirements. *Appendix "F" contains the year 2028 background traffic conditions worksheets.*

PROPOSED DEVELOPMENT PLAN

The proposed development plan includes relocating the Public Works Operations Complex to the parcel off Salamo Road. Access to the development will be provided by a driveway on the east side of Salamo Road, approximately 400 feet south of the Salamo Road/Barington Drive intersection. Construction of the proposed development is expected to begin in 2026 with full build-out and occupancy in 2028.

Trip Generation

The *Trip Generation Manual, 12th Edition* published by the Institute of Transportation Engineers (ITE) does not include a land use category that reflects the unique characteristics of the proposed operations complex, including public works fleet operations, vehicle storage, maintenance activities, and staggered employee shifts. Therefore, a trip generation study was conducted at the existing West Linn Public Works facility on Norfolk Street to establish representative trip rates for the proposed development.

Traffic counts were collected at the existing facility over three consecutive days in September 2025 (Tuesday through Thursday). The counts include the total number of vehicles that entered and exited the site-access driveways and off-site parking areas over the 72-hour period. The counts indicate that the existing facility generates an average of 256 daily trips, including 31 trips (8 inbound, 23 outbound) during the morning peak hour and 8 trips (1 inbound, 7 outbound) during the evening peak hour. The morning and evening peak hours were identified based on the peak periods of adjacent street traffic, which typically occur from 7:00 to 9:00 AM and 4:00 to 6:00 PM, respectively. *Appendix "G" contains the traffic counts collected at the existing facility.* As shown by the count data, many employees and fleet vehicles operate outside the typical commuter peak periods, resulting in relatively low trip generation during the weekday PM peak hour compared to the AM peak hour.

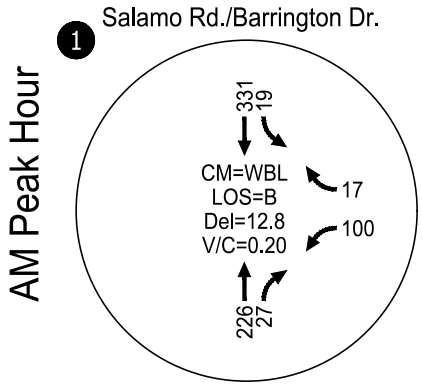
Given that the proposed operations complex will replace the existing facility by relocating existing public works operations to the new site without expanding operational capacity, staffing, or fleet size, the trip generation estimates for the proposed operations complex are based on the trip generation data collected at the existing facility. Table 3 summarizes the trip generation estimates for the daily, weekday AM, and weekday PM peak hours.

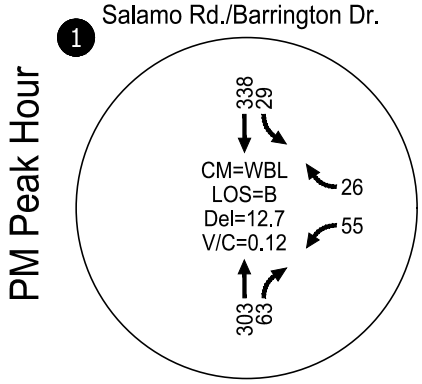
Table 3. Trip Generation Estimate

Site	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Total	In	Out	Total	In	Out
Existing Public Works Facility	256	31	8	23	8	1	7

Site Trip Distribution and Trip Assignment

The site-generated trips shown in Table 3 were distributed onto the study area roadways based on a review of existing traffic patterns and the location of major trip origins and destinations in the site vicinity. Figure 6 illustrates the estimate trip distribution pattern for the proposed development and the site-generated trips that are expected to use the study intersection and site-access driveway during the weekday AM and PM peak hours.





CA = Critical Approach
CM = Critical Movement
LOS = Critical Approach/Movement Level of Service
Del = Critical Approach/Movement Control Delay
V/C = Critical Approach/Movement V/C Ratio

Year 2028 Background Traffic Conditions
Weekday AM and PM Peak Hours
West Linn, OR

Figure
5

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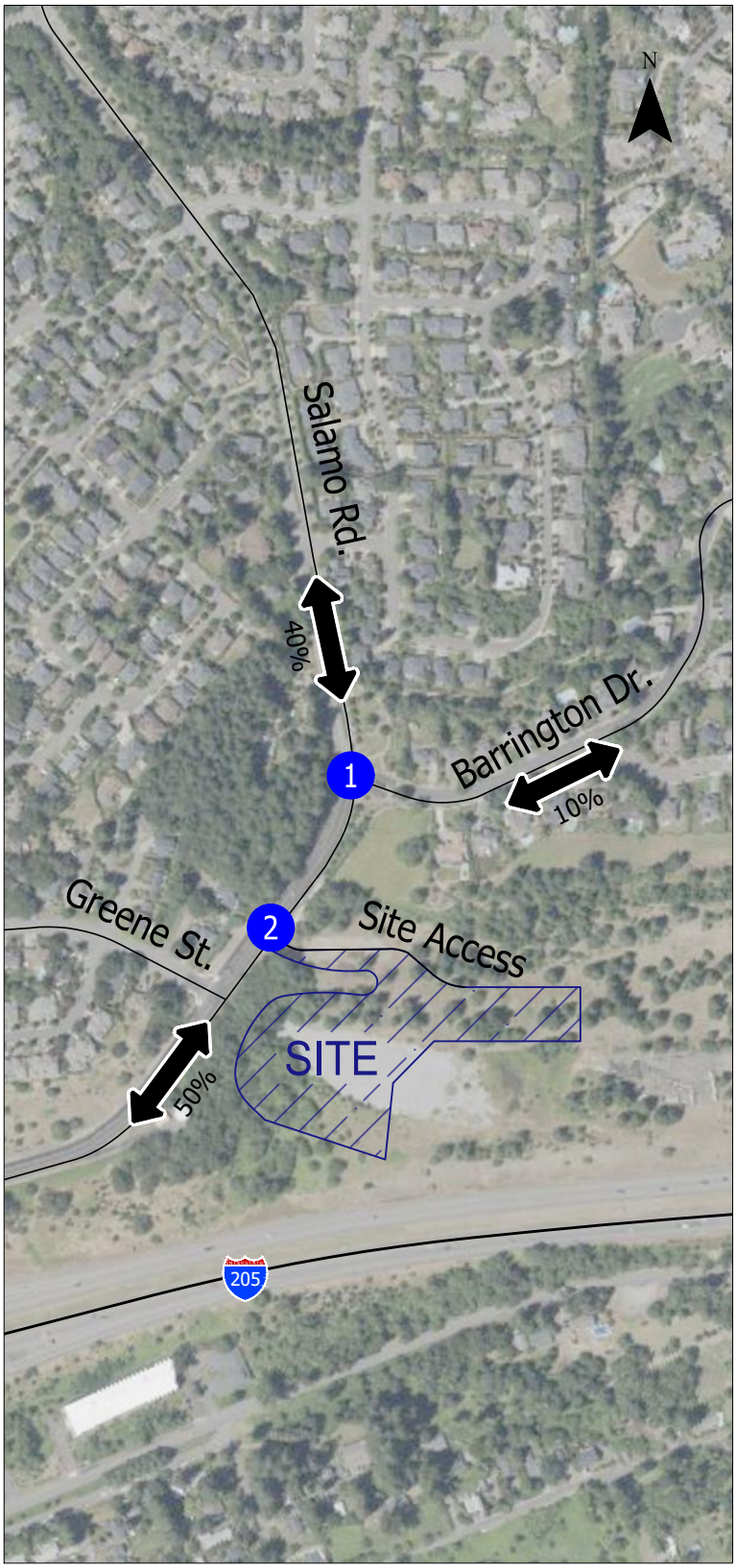

Estimated Trip Distribution Pattern & Site-Generated Trip Assignment
Weekday AM and PM Peak Hours
West Linn, OR

XX% Trip Distribution Percentage

Figure 6

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YEAR 2028 TOTAL TRAFFIC CONDITIONS

The year 2028 total traffic conditions analysis forecasts how the study intersection and site-access driveway will operate with traffic generated by full build-out of the proposed operations complex. The year 2028 background traffic volumes shown in Figure 5 were added to the site-generated traffic shown in Figure 6 to arrive at the year 2028 total traffic volumes, shown in Figure 7.

Traffic Operations

Figure 7 summarizes the results of the year 2028 total traffic conditions analysis during the weekday AM and PM peak hours. As shown, the study intersection and site-access driveway meet the City's LOS requirement assuming the public works facility is relocated. *Appendix "H" contains the year 2028 total traffic conditions worksheets.*

INTERSECTION AND SITE ACCESS QUEUING ANALYSIS

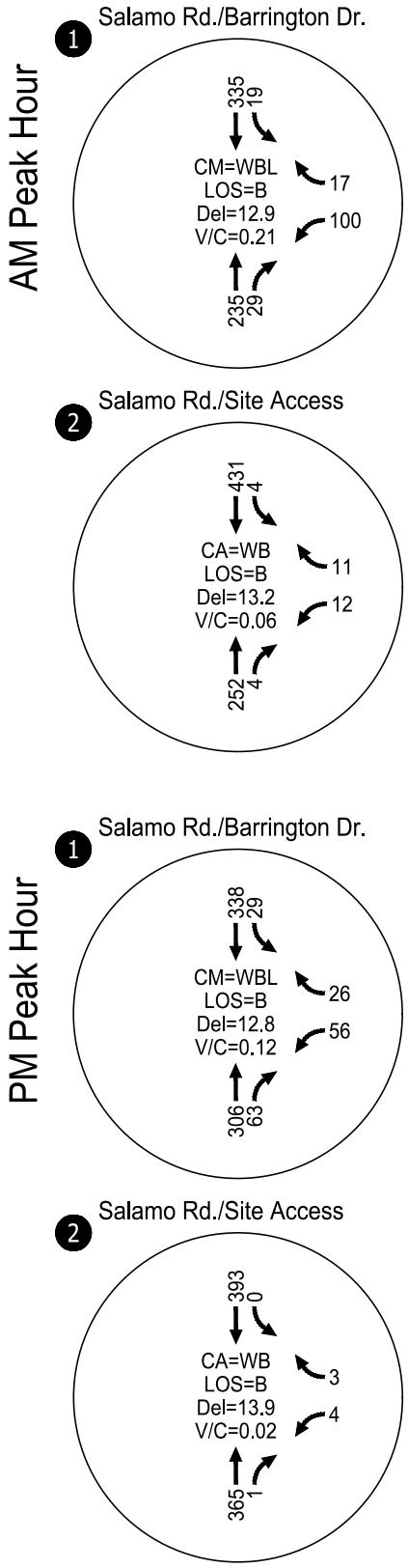
A queuing analysis was performed in Synchro for the study intersection and site-access driveway. Table 4 summarizes the existing and future 95th-percentile queues for each movement during the weekday AM and PM peak hours, assuming a peak 15-minute flow rate. Queues are rounded up to the nearest vehicle length; each vehicle was assumed to occupy approximately 25 feet.

As shown, all queues can be accommodated as proposed.

Table 4. 95th-Percentile Queue Summary

Intersection	Movement	Storage *(ft.)*	95th-Percentile Queue *(ft.)*						Adequate Storage Provided?
			AM Peak Hour			PM Peak Hour			
			EX	BK	TT	EX	BK	TT	
Salamo Road/ Barrington Drive	NBTR	>200	0	0	0	0	0	0	Yes
	SBT	>200	0	0	0	0	0	0	Yes
	SBL	150	25	25	25	25	25	25	Yes
	WBL	>200	25	25	25	25	25	25	Yes
	WBR	>200	25	25	25	25	25	25	Yes
Salamo Road/ Site Access	NBTR	>200	N/A	N/A	0	N/A	N/A	0	Yes
	SBT	>200	N/A	N/A	0	N/A	N/A	0	Yes
	SBL	75	N/A	N/A	50	N/A	N/A	0	Yes
	WBLR	>200	N/A	N/A	25	N/A	N/A	25	Yes

Note: "TR" denotes through–right.



CA = Critical Approach
CM = Critical Movement
LOS = Critical Approach/Movement Level of Service
Del = Critical Approach/Movement Control Delay
V/C = Critical Approach/Movement V/C Ratio

Year 2028 Total Traffic Conditions
Weekday AM and PM Peak Hours
West Linn, OR

Figure
7

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On-Site Circulation and Site Access Operations

Figure 2 illustrates the conceptual site plan. As shown, access to the proposed development will be provided by a new driveway on the east side of Salamo Road, between the Salamo Road/Barrington Drive and Salamo Road/Greene Street intersections. Per the year 2028 total traffic conditions analysis described above, the new site access connection is expected to operate acceptably under stop control with the proposed development during the weekday AM and PM peak hours. Vehicle queues at the new driveway connection are expected to be, on average, fewer than two vehicles entering and exiting the site.

During weekday and weekend periods when the Operations Complex gate is closed, vehicles entering the site will need adequate space to wait while the gate opens. To prevent these vehicles from queuing back onto Salamo Road, sufficient storage is provided between the roadway and the gate of approximately 50 feet. This should accommodate the largest anticipated fleet vehicle.

Intersection sight distance was evaluated at the future driveway along Salamo Road. For this assessment, sight distance measurements were evaluated based on an eye height of 3.5 feet, an object height of 2.0 feet, and an observation point located 14.5 feet from the edge of the cross-street travel lane. The posted speed along this section of Salamo Road is 35 mph. However, given that the posted speed limit along Salamo Road transition from 40 mph to 35 mph directly south of the site driveway, and from 35 mph to 40 mph directly north of the driveway, 40 mph was used to determine the sight distance requirements As noted in *A Policy on Geometric Design of Highways and Streets* (Reference 5), the minimum intersection sight distance requirement for a 40-mph design speed is 445 feet (left-turn from stop) and 385 feet (right-turn from stop). Preliminary intersection sight distance was evaluated at the approximate location of the proposed site access driveway along Salamo Road. As shown below, from this location, there appears to be adequate sight distance looking to the south and north along Salamo Road. To confirm continued adequate sight distance, it is recommended that a final sight distance evaluation be performed post construction and prior to occupancy of the complex.

Looking South along Salamo Road

Looking north along Salamo Road

Conclusions and Recommendations

As discussed herein, the proposed Public Works Operations Complex can be constructed at the Salamo Road site, while maintaining acceptable traffic operations at the study intersection and site-access driveway. The following recommended mitigation measures have been incorporated into the project design:

- Landscaping, above-ground utilities, and signing should be located and maintained along the site frontage and throughout the site in a manner that preserves adequate intersection sight distance for turning movements onto Salamo Road.
- Adequate vehicular storage between Salamo Road and the property gate is shown in the 100% construction drawings to be approximately 50 feet. This will accommodate the largest anticipated fleet vehicles that may arrive during periods when the facility gate is closed and will avoid vehicles queuing back onto Salamo Road while the gate is opening.

Please let us know if you need any additional information as part of your review.

References

1. City of West Linn. *Community Development Code*. 2026.
2. City of West Linn. *City of West Linn Public Works Design Standards*. 2025.
3. Transportation Research Board. *Highway Capacity Manual, 7th Edition*. 2022.
4. City of West Linn. *West Linn Transportation System Plan.* 2016.
5. American Association of State Highway and Transportation Officials. *Policy on Geometric Design of Highways and Streets*. 2018.

Appendix

A. CDC 84.170(B)(2)(g) Responses
B. Traffic Count Worksheets
C. Year 2026 Existing Traffic Conditions Worksheets
D. ODOT Crash Summary Worksheets
E. Historical Traffic Count Worksheets for Background Growth
F. Year 2028 Background Traffic Conditions Worksheets
G. Existing Facility Traffic Counts
H. Year 2028 Total Traffic Conditions Worksheets

Appendix A CDC 84.170(B)(2)(g) Responses

CDC 84.170(B)(2)(g) Responses

This section provides responses to the approval criteria presented in Community Development Code (CDC) 84.170(B)(2)(g). The approval criteria are presented below in *italics* with responses shown in **bold**.

g. Approval criteria (discretionary review). The following criteria apply to development applications that do not propose any new dwelling units, or for applications that include dwellings and that elect to use the TIA process outlined in subsection (B)(2)(d) of this section:

> *1) Criteria. When a traffic impact analysis is required, approval of the development proposal requires satisfaction of the following criteria:*
>
> > *(A) The traffic impact analysis was prepared by a professional traffic engineer qualified under OAR 734-051-0040; and*

Response: The traffic impact analysis was prepared by Marc Butorac, PE, PTOE. Marc is a registered professional engineer (PE) in Oregon (PE 57986).

Note that OAR 734-051-0040 was repealed in 2012 and OAR 734-051-1070 provides the replacement "Definitions" administrative rule. However, OAR 734-051-1070 does not specifically provide any definitions that relate to qualifications of traffic engineers. In other portions of the state's rules, it is clear that a TIA should be prepared by a "Professional Engineer (PE)" OAR 734-051-3030. Marc Butorac is a PE. **This standard is met.**

> > *(B) If the proposed development shall cause one or more of the effects in subsection (B)(2) of this section, or other traffic hazard or negative impact to a transportation facility, the Traffic Impact Analysis includes mitigation measures that meet the City's level of service and are satisfactory to the City Engineer, and ODOT when applicable; and*

Response: The proposed project will not cause any of the effects in subsection (B)(2) nor any other traffic hazard or negative impact to a transportation facility. The project does not propose any zoning or plan amendment change, ODOT has not expressed any operational or safety concerns along a State highway, nor would the project meet thresholds to warrant ODOT review. As explained in Exhibit PC-E, page 2, of the land use record, the City Engineer did not require a TIA because (1) the trips associated with the existing facility did not meet the City's threshold on two of the three count days, (2) the three day average was only six trips above the threshold, and (3) the weekday PM peak hour trips would have a negligible impact on traffic operations along Salamo Road. The project will not increase the use of vehicles exceeding the 20,000 pound gross vehicles weights by 10 vehicles or more per day. At the site-access driveway, sight distance is sufficient, vehicles are not restricted entering or leaving the property, and vehicles will not queue or hesitate on Salamo Road or create a safety hazard, adequate vehicular storage between Salamo Road and the property gate (approximately 50 feet) will accommodate the largest anticipated fleet vehicles that may arrive during periods when the facility gate is closed, which will avoid vehicles queuing back onto Salamo Road while the gate is opening. The site access driveway is located approximately 400 feet south of Barrington Drive and 200 feet north of Green Street, which meets City access spacing standards for Salamo Road. The project does not propose internal traffic patterns that may cause safety problems, backup onto Salamo Road, or traffic crashes. No crashes have been observed within the vicinity of the site-access driveway over the five year period from 2020 to 2024. The traffic impact analysis shows that the Salamo Road/Barrington Drive intersection and site-access driveway are

expected to operate acceptably under year 2028 traffic conditions with and without the proposed project. Previously recommended mitigation measures (such as providing 50 feet of vehicular storage between Salamo Road and the property gate) have been incorporated into the project design. Therefore, no mitigation measures are required to support the development. **This standard is met.**

> *(C) The proposed site design and traffic and circulation design and facilities, for all transportation modes, including any mitigation measures, are designed to:*
>
> *(1) Have the least negative impact on all applicable transportation facilities; and*

Response: The traffic impact analysis shows that the Salamo Road/Barrington Drive intersection and site-access driveway are expected to operate acceptably under year 2028 traffic conditions with and without the proposed operation complex. Therefore, the proposed project design will have the least negative impact on applicable transportation facilities. **This standard is met.**

> *(2) Accommodate and encourage non-motor vehicular modes of transportation to the extent practicable; and*

Response: The proposed project site is located along Salamo Road, which includes sidewalks on the east side of the street from the site-access driveway to the north and a shared use path on the west side of the street from Barrington Drive to the south. There is also an enhanced crosswalk at Barrington Drive with high visibility crosswalk signs, pavement markings, and rectangular rapid flashing beacons. There are also public transit stops located at Barrington Drive on both sides of the enhanced crosswalk. Therefore, the proposed project design accommodates and encourages non-motor vehicular modes of transportation to the extent practicable. **This standard is met.**

> *(3) Make the most efficient use of land and public facilities as practicable; and*

Response: The project design makes an efficient use of land considering the site constraints. The proposed development site is located along Salamo Road, which is a minor arterial and designed to accommodate the anticipated increase in traffic generated by the proposed development. Therefore the proposed project design makes the most efficient use of the public facilities (the public streets) as practicable. **This standard is met.**

> *(4) Provide the most direct, safe and convenient routes practicable between on-site destinations, and between on-site and off-site destinations; and*

Response: The proposed development site is located along Salamo Road, which is a minor arterial that provides access to other minor arterials to the north and south, including 10th Street, which provides access to and across I-205. On-site destinations are connected by logical, direct, safe, and convenient routes. The site access provides a direct, safe, and convenient access onto Salamo Road. **This standard is met.**

> *(5) Otherwise comply with applicable requirements of the City of West Linn Community Development Code.*

Response: The traffic impact analysis was prepared in accordance with City requirements per Section 84.170(B)(2), which are the applicable requirements of the code. The scope of work for the traffic impact analysis was reviewed and approved by the City Engineer as being compliant with the requirements of the code. **This standard is met.**

Appendix B Traffic Count Worksheets

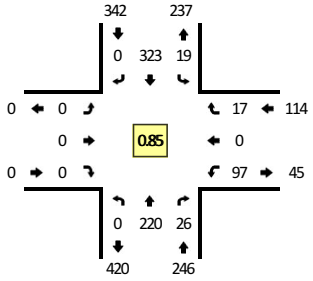
Type of peak hour being reported: Intersection Peak

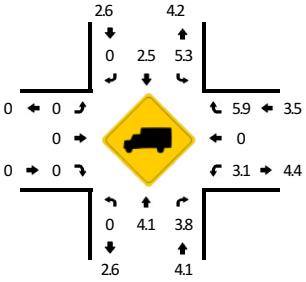
Method for determining peak hour: Total Entering Volume

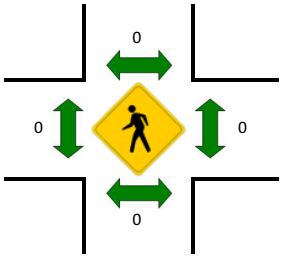
LOCATION: Salamo Rd -- Barrington Dr
CITY/STATE: West Linn, OR

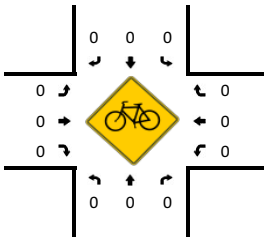
QC JOB #: 17497601
DATE: Thu, Mar 12 2026

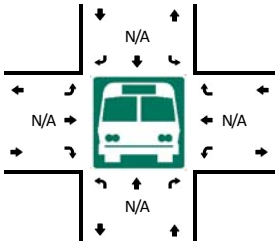
Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 8:10 AM -- 8:25 AM

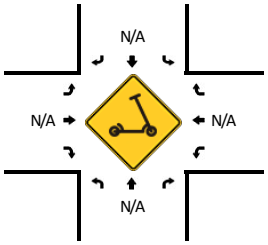












5-Min Count Period Beginning At	Salamo Rd (Northbound)				Salamo Rd (Southbound)				Barrington Dr (Eastbound)				Barrington Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	10	0	0	0	21	0	0	0	0	0	0	4	0	1	0	36	
7:05 AM	0	13	1	0	0	14	0	0	0	0	0	0	3	0	2	0	33	
7:10 AM	0	13	0	0	1	29	0	0	0	0	0	0	7	0	1	0	51	
7:15 AM	0	14	0	0	0	30	0	0	0	0	0	0	8	0	2	0	54	
7:20 AM	0	13	3	0	0	20	0	0	0	0	0	0	8	0	1	0	45	
7:25 AM	0	19	1	0	0	17	0	0	0	0	0	0	9	0	2	0	48	
7:30 AM	0	11	0	0	1	18	0	0	0	0	0	0	8	0	1	0	39	
7:35 AM	0	12	0	0	0	20	0	0	0	0	0	0	7	0	3	0	42	
7:40 AM	0	18	1	0	2	35	0	0	0	0	0	0	7	0	3	0	66	
7:45 AM	0	18	1	0	2	31	0	0	0	0	0	0	9	0	1	0	62	
7:50 AM	0	9	2	0	3	24	0	0	0	0	0	0	14	0	1	0	53	
7:55 AM	0	13	4	0	4	30	0	0	0	0	0	0	9	0	0	0	60	589
8:00 AM	0	18	5	0	0	18	0	0	0	0	0	0	4	0	3	0	48	601
8:05 AM	0	21	3	0	1	28	0	0	0	0	0	0	9	0	0	0	62	630
8:10 AM	0	24	1	0	2	25	0	0	0	0	0	0	7	0	3	0	62	641
8:15 AM	0	22	1	0	2	32	0	0	0	0	0	0	7	0	0	0	64	651
8:20 AM	0	34	3	0	2	34	0	0	0	0	0	0	6	0	2	0	81	687
8:25 AM	0	21	2	0	0	23	0	0	0	0	0	0	8	0	1	0	55	694
8:30 AM	0	17	1	0	1	18	0	0	0	0	0	0	4	0	2	0	43	698
8:35 AM	0	5	2	0	0	25	0	0	0	0	0	0	13	0	1	0	46	702
8:40 AM	0	22	3	0	1	27	0	0	0	0	0	0	5	0	2	0	60	696
8:45 AM	0	19	5	0	1	21	0	0	0	0	0	0	6	0	1	0	53	687
8:50 AM	0	17	0	0	1	27	0	0	0	0	0	0	8	0	6	0	59	693
8:55 AM	0	16	6	0	2	29	0	0	0	0	0	0	3	0	3	0	59	692

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	320	20	0	24	364	0	0	0	0	0	0	80	0	20	0	828
Heavy Trucks	0	16	0		0	12	0		0	0	0		0	0	0		28
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2026 9:35 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

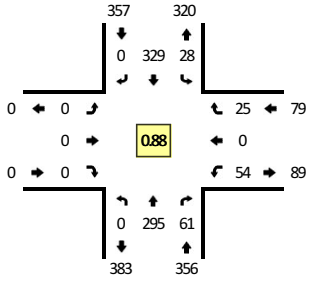
Type of peak hour being reported: Intersection Peak

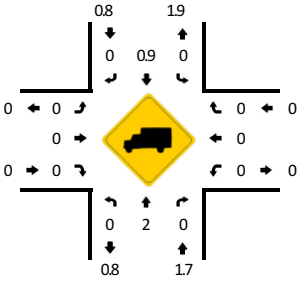
Method for determining peak hour: Total Entering Volume

LOCATION: Salamo Rd -- Barrington Dr
CITY/STATE: West Linn, OR

QC JOB #: 17497602
DATE: Thu, Mar 12 2026

Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:10 PM -- 5:25 PM





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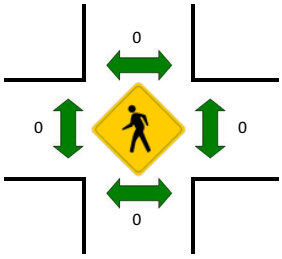
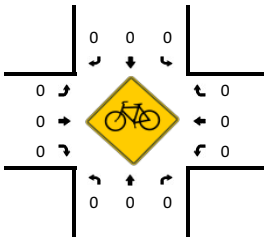
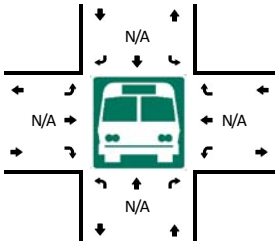
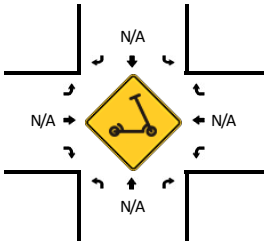








5-Min Count Period Beginning At	Salamo Rd (Northbound)				Salamo Rd (Southbound)				Barrington Dr (Eastbound)				Barrington Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	24	6	0	4	27	0	0	0	0	0	0	5	0	2	0	68	
4:05 PM	0	23	5	0	3	34	0	0	0	0	0	0	5	0	0	0	70	
4:10 PM	0	31	5	0	2	22	0	0	0	0	0	0	6	0	3	0	69	
4:15 PM	0	17	4	0	5	28	0	0	0	0	0	0	3	0	0	0	57	
4:20 PM	0	20	2	0	1	27	0	0	0	0	0	0	10	0	2	0	62	
4:25 PM	0	12	2	0	3	24	0	0	0	0	0	0	2	0	2	0	45	
4:30 PM	0	17	6	0	2	19	0	0	0	0	0	0	4	0	2	0	50	
4:35 PM	0	27	7	0	3	22	0	0	0	0	0	0	5	0	1	0	65	
4:40 PM	0	24	6	0	1	23	0	0	0	0	0	0	1	0	1	0	56	
4:45 PM	0	21	4	0	2	23	0	0	0	0	0	0	7	0	2	0	59	
4:50 PM	0	15	9	0	3	21	0	0	0	0	0	0	3	0	2	0	53	
4:55 PM	0	22	2	0	1	15	0	0	0	0	0	0	5	0	3	0	48	702
5:00 PM	0	25	4	0	3	23	0	0	0	0	0	0	3	0	0	0	58	692
5:05 PM	0	14	3	0	4	35	0	0	0	0	0	0	7	0	3	0	66	688
5:10 PM	0	32	4	0	2	33	0	0	0	0	0	0	8	0	0	0	79	698
5:15 PM	0	26	5	0	5	24	0	0	0	0	0	0	5	0	1	0	66	707
5:20 PM	0	36	6	0	2	28	0	0	0	0	0	0	4	0	3	0	79	724
5:25 PM	0	14	5	0	3	28	0	0	0	0	0	0	2	0	1	0	53	732
5:30 PM	0	20	5	0	2	24	0	0	0	0	0	0	5	0	2	0	58	740
5:35 PM	0	33	10	0	4	32	0	0	0	0	0	0	2	0	1	0	82	757
5:40 PM	0	27	3	0	1	29	0	0	0	0	0	0	9	0	1	0	70	771
5:45 PM	0	23	5	0	1	25	0	0	0	0	0	0	2	0	5	0	61	773
5:50 PM	0	23	7	0	1	23	0	0	0	0	0	0	6	0	3	0	63	783
5:55 PM	0	22	4	0	0	25	0	0	0	0	0	0	1	0	5	0	57	792

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	376	60	0	36	340	0	0	0	0	0	0	68	0	16	0	896
Heavy Trucks	0	12	0		0	4	0		0	0	0		0	0	0		16
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2026 9:35 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix C Year 2026 Existing Traffic Conditions Worksheets

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	97	17	220	26	19	323
Future Vol, veh/h	97	17	220	26	19	323
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-10	-	8	-	-	-8
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	6	4	4	5	2
Mvmt Flow	114	20	259	31	22	380

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	699	274	0	0	289	0
Stage 1	274	-	-	-	-	-
Stage 2	425	-	-	-	-	-
Critical Hdwy	4.43	5.26	-	-	4.15	-
Critical Hdwy Stg 1	3.43	-	-	-	-	-
Critical Hdwy Stg 2	3.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.354	-	-	2.245	-
Pot Cap-1 Maneuver	597	815	-	-	1255	-
Stage 1	896	-	-	-	-	-
Stage 2	833	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	586	815	-	-	1255	-
Mov Cap-2 Maneuver	586	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	818	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	12.16	0	0.44
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	586	815	1255	-
HCM Lane V/C Ratio	-	-	0.195	0.025	0.018	-
HCM Ctrl Dly (s/v)	-	-	12.6	9.5	7.9	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.1	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	25	295	61	28	329
Future Vol, veh/h	54	25	295	61	28	329
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-10	-	8	-	-	-8
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	61	28	335	69	32	374

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	807	370	0	0	405	0
Stage 1	370	-	-	-	-	-
Stage 2	438	-	-	-	-	-
Critical Hdwy	4.4	5.2	-	-	4.1	-
Critical Hdwy Stg 1	3.4	-	-	-	-	-
Critical Hdwy Stg 2	3.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	553	754	-	-	1165	-
Stage 1	864	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	538	754	-	-	1165	-
Mov Cap-2 Maneuver	538	-	-	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	813	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	11.73	0	0.64
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	538	754	1165	-
HCM Lane V/C Ratio	-	-	0.114	0.038	0.027	-
HCM Ctrl Dly (s/v)	-	-	12.5	10	8.2	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	0.1	-

Appendix D ODOT Crash Summary Worksheets

CITY OF WEST LINN, CLACKAMAS COUNTY **SALAMO RD and Intersectional Crashes at SALAMO RD, City of West Linn, Clackamas County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2020 to 12/31/2024**

1 - 5 of 5 Crash records shown.

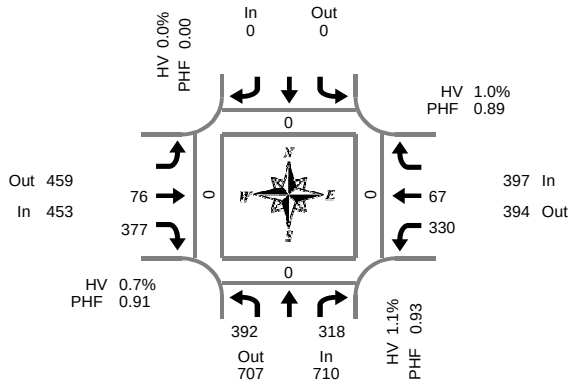
SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02688	N	N	N	N			09/11/2021	16	BARRINGTON DR	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT											02
NONE							SA	0	SALAMO RD	CN		STOP SIGN	N	DRY	TURN		N/A	N -S									000		00
N							5P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 7.09	-122 38 35.76																UNK					
																02	NONE 9	TURN-L											
																	N/A	E -S									015		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
04675	N	N	N	N	N	N	12/17/2024	16	BARRINGTON DR	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-L											02
CITY							TU	0	SALAMO RD	CN		STOP SIGN	N	WET	TURN		PRVTE	SE-SW									015		00
N							2P			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	17	F	OR-Y		028	000		02
N							45 21 7.09	-122 38 35.76																OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	SW-NE									000		00
																	PSNGR CAR		01	DRVR	INJA	72	F	OR-Y		000	000		00
																								OR<25					
00003	N	N	N	N	N	N	01/01/2020	16	SALAMO RD	STRGHT		Y	Y	CLD	FIX OBJ	01	NONE 9	STRGHT										129,128,053	17
CITY							WE	50	BARRINGTON DR	NE	(RSDMD)	NONE	N	WET	FIX		N/A	SW-NE									000		00
N							5P			07			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 7.65	-122 38 35.81			(02)													UNK					
04169	N	N	N	N	N	Y	11/30/2023	16	SALAMO RD	CURVE		N	Y	RAIN	FIX OBJ	01	NONE 9	STRGHT										100	11,22,05
CITY							TH	150	BARRINGTON DR	SW	(NONE)	UNKNOWN	N	WET	FIX		N/A	NE-SW									000		00
Y							12P			08			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 5.34	-122 38 36.42			(02)													UNK					
01267	Y	Y	N	N	N	N	05/14/2020	16	SALAMO RD	CURVE		N	N	UNK	OTH OBJ	01	NONE 0	STRGHT										044	30
CITY							TH	175	BARRINGTON DR	SW	(RSDMD)	NONE	N	DRY	FIX		PRVTE	NE-SW									000	044	00
Y							7A			07			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	21	M	OR-Y		050,079	000		30
N							45 21 5.44	-122 38 36.36			(02)													OR<25					

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

Appendix E Historical Traffic Count Worksheets for Background Growth

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

10th St & Salamo Rd

Wednesday, April 16, 2014
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes		T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	98		84	0				0		32	113	0	80	11		0	418	0	0	0	0
4:15 PM	76		70	0				0		24	105	0	93	15		0	383	0	0	0	0
4:30 PM	73		74	0				0		25	100	1	61	19		0	352	0	0	0	0
4:45 PM	83		87	0				0		27	102	0	74	19		0	392	0	0	0	0
5:00 PM	88		70	0				0		18	104	0	83	14		0	377	0	0	0	0
5:15 PM	105		77	0				0		26	87	0	81	21		0	397	0	0	0	0
5:30 PM	90		89	0				0		12	82	0	91	20		0	384	0	0	0	0
5:45 PM	109		82	0				0		20	104	0	75	12		0	402	0	0	0	0
Total Survey	722		633	0				0		184	797	1	638	131		0	3,105	0	0	0	0

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	710	707	1,417	0	0	0	0	0	453	459	912	0	397	394	791	0	1,560	0	0	0	0
%HV	1.1%				0.0%				0.7%				1.0%				1.0%				
PHF	0.93				0.00				0.91				0.89				0.97				

By Movement	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	392		318	710				0		76	377	453	330	67		397	1,560
%HV	1.0%	NA	1.3%	1.1%	NA	NA	NA	0.0%	NA	0.0%	0.8%	0.7%	1.2%	0.0%	NA	1.0%	1.0%
PHF	0.90		0.89	0.93				0.00		0.73	0.91	0.91	0.91	0.80		0.89	0.97

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 10th St				Southbound 10th St				Eastbound Salamo Rd				Westbound Salamo Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes		T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	330		315	0				0		108	420	1	308	64		0	1,545	0	0	0	0
4:15 PM	320		301	0				0		94	411	1	311	67		0	1,504	0	0	0	0
4:30 PM	349		308	0				0		96	393	1	299	73		0	1,518	0	0	0	0
4:45 PM	366		323	0				0		83	375	0	329	74		0	1,550	0	0	0	0
5:00 PM	392		318	0				0		76	377	0	330	67		0	1,560	0	0	0	0

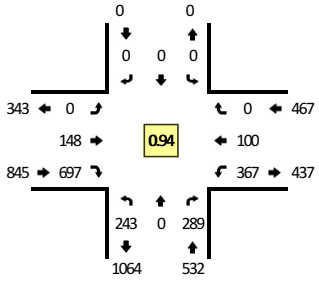
Type of peak hour being reported: Intersection Peak

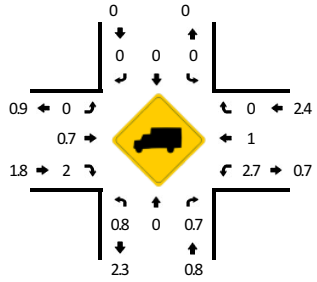
Method for determining peak hour: Total Entering Volume

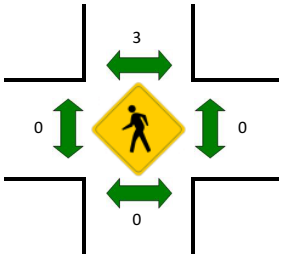
LOCATION: 10th St -- Blankenship Rd/Salamo Rd
CITY/STATE: West Linn, OR

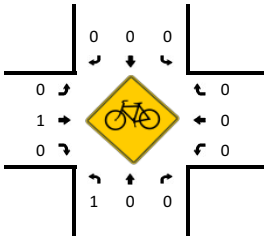
QC JOB #: 17268004
DATE: Tue, Sep 30 2025

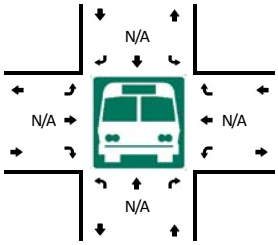
Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 4:55 PM -- 5:10 PM

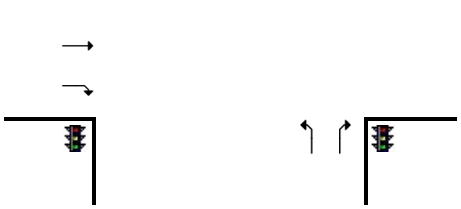


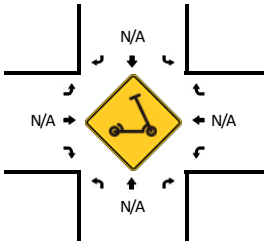












R* = RTOR

5-Min Count Period Beginning At	10th St (Northbound)					10th St (Southbound)					Blankenship Rd/Salamo Rd (Eastbound)					Blankenship Rd/Salamo Rd (Westbound)					Total	Hourly Totals
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*		
4:00 PM	19	0	18	0	0	0	0	0	0	0	0	15	44	0	2	33	4	0	0	0	135	
4:05 PM	20	0	24	0	1	0	0	0	0	0	0	12	62	0	0	26	6	0	0	0	151	
4:10 PM	26	0	16	0	1	0	0	0	0	0	0	9	58	0	0	35	3	0	0	0	148	
4:15 PM	13	0	16	0	1	0	0	0	0	0	0	22	52	0	0	41	7	0	0	0	152	
4:20 PM	23	0	14	0	0	0	0	0	0	0	0	9	54	0	1	30	5	0	0	0	136	
4:25 PM	25	0	18	0	0	0	0	0	0	0	0	17	52	0	1	30	6	0	0	0	149	
4:30 PM	19	0	24	0	0	0	0	0	0	0	0	12	62	0	3	25	3	0	0	0	148	
4:35 PM	15	0	11	0	0	0	0	0	0	0	0	11	56	0	3	24	8	0	0	0	128	
4:40 PM	18	0	20	0	0	0	0	0	0	0	0	8	51	0	3	15	4	0	0	0	119	
4:45 PM	18	0	23	0	0	0	0	0	0	0	0	6	56	0	3	22	4	0	0	0	132	
4:50 PM	17	0	21	0	0	0	0	0	0	0	0	8	60	0	3	28	5	0	0	0	142	
4:55 PM	16	0	16	0	1	0	0	0	0	0	0	13	57	0	1	44	18	0	0	0	166	1706
5:00 PM	19	0	17	0	1	0	0	0	0	0	0	14	73	0	2	33	15	0	0	0	174	1745
5:05 PM	13	0	26	0	1	0	0	0	0	0	0	17	58	0	0	30	4	0	0	0	149	1743
5:10 PM	23	0	36	0	6	0	0	0	0	0	0	9	51	0	2	29	4	0	0	0	160	1755
5:15 PM	33	0	28	0	2	0	0	0	0	0	0	12	45	0	1	32	8	0	0	0	161	1764
5:20 PM	15	0	23	0	2	0	0	0	0	0	0	6	64	0	1	29	9	0	0	0	149	1777
5:25 PM	20	0	19	0	0	0	0	0	0	0	0	13	60	0	1	33	12	0	0	0	158	1786
5:30 PM	18	0	16	0	0	0	0	0	0	0	0	11	46	0	3	36	8	0	0	0	138	1776
5:35 PM	26	0	20	0	1	0	0	0	0	0	0	17	62	0	1	18	5	0	0	0	150	1798
5:40 PM	20	0	24	0	0	0	0	0	0	0	0	12	59	0	0	31	4	0	0	0	150	1829
5:45 PM	16	0	24	0	1	0	0	0	0	0	0	15	43	0	6	21	10	0	0	0	136	1833
5:50 PM	24	0	23	0	2	0	0	0	0	0	0	9	61	0	0	31	3	0	0	0	153	1844
5:55 PM	17	0	26	0	0	0	0	0	0	0	0	13	42	0	0	41	7	0	0	0	146	1824

Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound					Total
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	
All Vehicles	192	0	248	0	12	0	0	0	0	0	0	176	764	0	12	428	148	0	0	0	1980
Heavy Trucks	4	0	4			0	0	0			0	0	20			12	4	0			44
Buses																					
Pedestrians		0					0					0					0				0
Bicycles	0	0	0			0	0	0			0	0	0			0	0	0			0
Scooters																					

Comments:

Report generated on 3/24/2026 10:44 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix F Year 2028 Background Traffic Conditions Worksheets

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	100	17	226	27	19	331
Future Vol, veh/h	100	17	226	27	19	331
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-10	-	8	-	-	-8
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	6	4	4	5	2
Mvmt Flow	118	20	266	32	22	389

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	716	282	0	0	298	0
Stage 1	282	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Critical Hdwy	4.43	5.26	-	-	4.15	-
Critical Hdwy Stg 1	3.43	-	-	-	-	-
Critical Hdwy Stg 2	3.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.354	-	-	2.245	-
Pot Cap-1 Maneuver	589	809	-	-	1247	-
Stage 1	893	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	578	809	-	-	1247	-
Mov Cap-2 Maneuver	578	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	814	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	12.34	0	0.43
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	578	809	1247	-
HCM Lane V/C Ratio	-	-	0.204	0.025	0.018	-
HCM Ctrl Dly (s/v)	-	-	12.8	9.6	7.9	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0.1	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	55	26	303	63	29	338
Future Vol, veh/h	55	26	303	63	29	338
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-10	-	8	-	-	-8
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	63	30	344	72	33	384

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	830	380	0	0	416	0
Stage 1	380	-	-	-	-	-
Stage 2	450	-	-	-	-	-
Critical Hdwy	4.4	5.2	-	-	4.1	-
Critical Hdwy Stg 1	3.4	-	-	-	-	-
Critical Hdwy Stg 2	3.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	543	746	-	-	1154	-
Stage 1	859	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	528	746	-	-	1154	-
Mov Cap-2 Maneuver	528	-	-	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	11.86	0	0.65
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	528	746	1154	-
HCM Lane V/C Ratio	-	-	0.118	0.04	0.029	-
HCM Ctrl Dly (s/v)	-	-	12.7	10	8.2	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	0.1	-

Appendix G Existing Facility Traffic Counts

	Sussex, South Entrance, EB Volumes			Sussex, South Entrance, WB Volumes			Sussex, Center Entrance, EB Volumes			Sussex, Center Entrance, WB Volumes			Sussex, North Entrance, EB Volumes			Sussex, North Entrance, WB Volumes			Norfolk, Sou
Start Time	Tue	Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu	Tue
	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25
12:00 AM	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	7	8	7	0	2	0	0	3	1	0	0	0	0	0	0	0	0	0	0
6:00 AM	1	3	0	3	3	0	0	1	0	0	1	0	0	0	0	0	2	0	0
7:00 AM	8	1	0	16	16	13	1	0	1	2	1	1	0	0	1	1	1	1	9
8:00 AM	6	8	4	4	4	9	0	0	3	0	0	2	2	0	2	2	2	2	0
9:00 AM	9	5	17	7	2	7	2	0	1	3	2	1	0	0	0	2	1	0	2
10:00 AM	8	9	6	4	7	4	3	0	0	0	0	1	1	1	1	2	0	0	2
11:00 AM	8	6	13	7	4	5	0	0	2	0	1	0	0	1	2	1	0	1	2
12:00 PM	9	9	7	6	3	9	3	0	2	2	1	3	2	3	0	1	0	2	3
1:00 PM	7	6	4	1	5	6	1	1	3	0	2	2	0	0	2	2	2	3	4
2:00 PM	13	9	12	3	1	5	0	2	2	0	0	0	2	1	2	0	4	3	3
3:00 PM	8	10	5	8	8	5	0	0	0	0	0	0	0	1	0	0	0	0	4
4:00 PM	3	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
5:00 PM	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	1	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day Total	88	77	78	61	57	66	10	8	15	7	8	10	7	7	10	11	14	13	32
ADT	88	77	78	61	57	66	10	8	15	7	8	10	7	7	10	11	14	13	32

ıth Entrance, EB Volumes		Norfolk, South Entrance, WB Volumes			Norfolk, North Entrance, EB Volumes			Norfolk, North Entrance, WB Volumes			TOTAL			INBOUND			OUTBOUND		
Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu	Tue	Wed	Thu
24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25	23-Sep-25	24-Sep-25	25-Sep-25
0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	2	0	0	2
0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	2	1	1	2	8	14	12	8	12	10	0	2	2
1	1	3	3	4	0	1	0	3	2	3	10	17	8	7	9	7	3	8	1
2	3	1	2	1	0	2	1	1	5	2	39	30	24	11	8	5	28	22	19
0	1	0	0	0	2	0	1	0	2	1	16	16	25	8	10	10	8	6	15
1	4	1	1	1	0	3	0	0	1	1	26	16	32	12	7	20	14	9	12
4	3	0	1	1	1	3	2	1	1	3	22	26	21	13	12	11	9	14	10
2	3	1	0	1	2	1	1	0	0	3	21	15	31	9	7	21	12	8	10
2	1	1	1	1	0	2	2	0	0	1	27	21	28	15	13	11	12	8	17
3	2	0	0	2	0	1	5	0	0	3	15	20	32	8	7	14	7	13	18
1	1	1	0	1	2	2	1	0	2	1	24	22	28	16	14	18	8	8	10
7	3	0	1	1	2	3	1	0	0	0	22	30	15	8	12	6	14	18	9
3	4	0	0	0	2	3	3	0	0	0	10	8	7	3	1	0	7	7	7
0	0	0	0	0	0	1	1	0	1	2	1	3	3	1	2	2	0	1	1
0	0	0	0	0	0	0	0	1	1	0	1	3	3	1	2	1	0	1	2
0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	1
0	0	0	0	0	1	0	0	1	1	1	2	1	1	1	1	1	1	0	0
0	0	0	0	0	0	0	0	0	1	0	0	3	0	0	2	0	0	1	0
0	0	0	0	0	1	0	0	1	0	0	2	0	0	1	0	0	1	0	0
0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0
26	26	8	9	14	13	23	21	9	18	23	246	247	276	122	119	140	124	128	136
26	26	8	9	14	13	23	21	9	18	23	246	247	276	122	119	140	124	128	136
												Average Dailly	256						
												Average AM Peak	31		Average AM Peak	8		Average AM Peak	23
												Average PM Peak	8		Average PM Peak	1		Average PM Peak	7

Appendix H Year 2028 Total Traffic Conditions Worksheets

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	100	17	235	29	19	335
Future Vol, veh/h	100	17	235	29	19	335
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-10	-	8	-	-	-8
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	6	4	4	5	2
Mvmt Flow	118	20	276	34	22	394

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	732	294	0	0	311	0
Stage 1	294	-	-	-	-	-
Stage 2	439	-	-	-	-	-
Critical Hdwy	4.43	5.26	-	-	4.15	-
Critical Hdwy Stg 1	3.43	-	-	-	-	-
Critical Hdwy Stg 2	3.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.354	-	-	2.245	-
Pot Cap-1 Maneuver	581	799	-	-	1233	-
Stage 1	888	-	-	-	-	-
Stage 2	827	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	570	799	-	-	1233	-
Mov Cap-2 Maneuver	570	-	-	-	-	-
Stage 1	888	-	-	-	-	-
Stage 2	812	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	12.46	0	0.43
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	570	799	1233	-
HCM Lane V/C Ratio	-	-	0.206	0.025	0.018	-
HCM Ctrl Dly (s/v)	-	-	12.9	9.6	8	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0.1	0.1	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	11	252	4	4	431
Future Vol, veh/h	12	11	252	4	4	431
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	8	-	-	-8
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	4	2	2	2
Mvmt Flow	14	13	296	5	5	507

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	815	299	0	0	301	0
Stage 1	299	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	347	741	-	-	1260	-
Stage 1	752	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	346	741	-	-	1260	-
Mov Cap-2 Maneuver	346	-	-	-	-	-
Stage 1	752	-	-	-	-	-
Stage 2	597	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	13.24	0	0.07
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	464	1260	-
HCM Lane V/C Ratio	-	-	0.058	0.004	-
HCM Ctrl Dly (s/v)	-	-	13.2	7.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	56	26	306	63	29	338
Future Vol, veh/h	56	26	306	63	29	338
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-10	-	8	-	-	-8
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	64	30	348	72	33	384

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	834	384	0	0	419	0
Stage 1	384	-	-	-	-	-
Stage 2	450	-	-	-	-	-
Critical Hdwy	4.4	5.2	-	-	4.1	-
Critical Hdwy Stg 1	3.4	-	-	-	-	-
Critical Hdwy Stg 2	3.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	542	744	-	-	1151	-
Stage 1	858	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	526	744	-	-	1151	-
Mov Cap-2 Maneuver	526	-	-	-	-	-
Stage 1	858	-	-	-	-	-
Stage 2	806	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	11.91	0	0.65
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	526	744	1151	-
HCM Lane V/C Ratio	-	-	0.121	0.04	0.029	-
HCM Ctrl Dly (s/v)	-	-	12.8	10	8.2	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	3	365	1	0	393
Future Vol, veh/h	4	3	365	1	0	393
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	8	-	-	-8
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	0	2	1
Mvmt Flow	5	3	415	1	0	447

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	862	415	0	0	416	0
Stage 1	415	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	326	637	-	-	1143	-
Stage 1	666	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	326	637	-	-	1143	-
Mov Cap-2 Maneuver	326	-	-	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	13.91	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	412	1143	-
HCM Lane V/C Ratio	-	-	0.019	-	-
HCM Ctrl Dly (s/v)	-	-	13.9	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Legislative History of "Public Support Facilities"

BACKGROUND

The City of West Linn ("**City**") Community Development Code ("**CDC"**) Section 2.030 defines "public support facilities" as:

> **Public support facilities.** Public services that deal directly with citizens, to include meeting and hearing rooms, together with incidental storage and maintenance of necessary vehicles, and exclude commercial use type "professional and administrative services." Typical use types are associated with governmental offices.

Appellants argue that the City's proposed Operations Complex ("**Proposed Facility**") does not meet the definition of a public support facility because: (1) the Proposed Facility does not "deal with the public on a daily basis" and (2) the Proposed Facility will be used for more than "incidental storage and maintenance of necessary vehicles." Appeal at 3.

Appellants misinterpret the definition of "public support facilities" in CDC Section 2.030.

THE "USE TYPE" WILL "DEAL DIRECTLY WITH CITIZENS"

First, the Proposed Facility is being built for the very purpose (or, in the words of the definition, the "use type") of providing "public services that deal directly with citizens." The Proposed Facility will house the City's Public Works Department (Water, Environmental Services, and Streets Divisions), Parks Maintenance, Facilities Maintenance, and Fleet Maintenance. These departments and divisions provide services (including essential services) directly to, and directly for the benefit of, citizens. Public Works, for example, maintains vital public utility systems that serve all West Linn citizens, including, but not limited to, potable drinking water, sanitary sewer, stormwater management, public roadways (including transportation signage and traffic lights), and landscape management in City-owned rights-of-way. In addition, City staff from the departments and divisions to be housed in the Proposed Facility respond directly to individual citizen requests, questions, and complaints on a daily basis. Examples include, but are not limited to, being dispatched to respond to and detect water service line leaks called in by citizens, meter re-reads, pothole repairs, removal of roadkill, tree trimming and tree removal in City rights-of-way and City parks, public trail and park maintenance, and replacement or addition of new traffic signs. After receiving a call from a concerned citizen about a water leak, troublesome pothole, or overgrown vegetation, City Staff will travel to the site to deal directly with the citizen and the issue.

MAINTENANCE OF VEHICLES IS "INCIDENTAL" TO OVERALL USE

Second, appellants argue that the City's intended use of the Proposed Facility for "primary fleet repair services" conflicts with "incidental storage and maintenance of necessary vehicles" in the CDC 2.030 definition.

The storage and maintenance of vehicles that will occur on-site at the Proposed Facility *is incidental* to the services provided by the Proposed Facility. Although this will be a primary location for fleet repair services – those repair services are clearly incidental to the primary use of the Proposed Facility as a whole.

Here, the storage and maintenance of vehicles is but one of many purposes of the Proposed Facility, incidental to the functioning of the departments housed at the Proposed Facility and the services (water, sewer, stormwater, environmental, street, parks maintenance, facilities maintenance) provided by those departments and divisions. Fleet repair services are just one of a long list of functions of the Proposed Facility. For example, the Proposed Facility will maintain City public utilities and the fleet shop equips, repairs, and maintains all vehicles that respond to public emergencies in service to the public. That includes police vehicles, snowplows to maintain roads during inclement weather, mowers that maintain the public park systems, and other related equipment meant to maintain public utilities recreation areas accessed daily by residents.

LEGISLATIVE HISTORY

We have reviewed all available legislative history the City could find regarding the CDC 2.030 definition. The relevant documents are attached to this memorandum (see Exhibits A and B).

"Public support facilities" has been a defined and regulated use under the CDC since its adoption in 1983. The initial 1983 legislative history does not reveal any insights into the correct interpretation of the definition. The definition did not initially in 1983 include the "meeting and hearing room" language:

> Public support facilities. Public Services that deal directly with the citizen, together with incidental storage and maintenance of necessary vehicles, and excludes commercial use type, "Professional and Administrative Services". Typical use types are associated with governmental offices.

In 1995, the definition of "public support facilities" was amended, adding the "to include meeting and hearing rooms" language.

In 1995, **Ordinance 1378** amended the definition, adding "to include meeting and hearing rooms":

> Public support facilities. Public services that deal directly with citizens, **to include meeting and hearing rooms**, together with incidental storage and maintenance of necessary vehicles, and excludes commercial use types, "professional and administrative services. Typical use types are associated with governmental offices.

Ordinance 1378 also prohibited "religious institutions"[1] and "lodges, fraternal, and civic assembly uses"[2] from commercial zones. Prior to Ordinance 1378, religious institutions were a conditional use in the office business center zone and "lodges, fraternal, and civic assembly" were a permitted use in the office business center and general commercial zones.[3]

A staff memo (Agenda Bill 95-07-11, attached as Exhibit A) to Ordinance 1377 and 1378 noted the concern that, given the new prohibition on religious institutions and civic assembly uses in

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[1] Ordinance 1378 renamed "religious assembly" as "religious institutions" and defined "religious institutions" as: "A building constructed or utilized primarily for worship, together with its accessory uses, and buildings where persons regularly assemble for religious worship and which is controlled by a religious body organized to sustain worship." The definition is the same today.

[2] As of 1983, "lodge, fraternal, and civic assembly" was defined as: "Meetings and activities primarily conducted for the members of a particular group. Excluded from this use types are uses classified as "Group Residential", "Residential Care Facilities " and "Transient Lodging". Typical uses include meeting places for civic clubs, lodges, or fraternal or veteran organizations."

As of 1999, "lodge, fraternal and civic assembly" was defined as: "Meetings and activities primarily conducted for the members of a particular group. Excluded from this use types are uses classified as "group residential," "residential care facilities," "senior centers," and "transient lodging." Typical uses include meeting places for civic clubs, community centers, lodges, or fraternal or veteran organizations."

Today, "lodge, fraternal, community center and civic assembly" is defined as: "Meetings and activities primarily conducted for the members of a particular group. Excluded from this use type are uses classified as "group residential," "residential care facilities," "senior centers," and "transient lodging." Typical uses include meeting places for civic clubs, community centers, lodges, or fraternal or veteran organizations."

[3] Note that Ordinance 1377 was passed at the same time as Ordinance 1378. Of potential relevance here, Ordinance 1377 also:

1. Made public support facilities conditional uses in residential zones (R-20, R-15, R-10, R-7, R-5, R-4.5, R-3, R-2.1), rather than outright permitted uses.
2. Removed the term "community building" from the definition of "community recreation" as follows: "Community recreation. Recreational, social, or multi-purpose uses typically associated with parks, play-fields, **or** golf courses ~~or community buildings~~." Community building is defined as "A building operated by the public or a non-profit group, neighborhood or association for public assembly for meetings, arts, crafts or similar uses. Examples of a community building are a senior center or arts center."

commercial zones, meeting rooms—such as a future Council Chambers—could not be located in commercial zones and would thus prohibit future "civic center" plans. To resolve that concern, the staff memo explains that the definition of "public support facilities" would be simultaneously amended by Ordinance 1378 to "state specifically that meeting and hearing rooms are an allowed use," ensuring a future City Council Chamber would also fall within the definition of "public support facility" and could be sited in a commercial zone.

This legislative history indicates that the "meeting and hearing room" language was added to *expand* the definition of public support facilities – not to impose an in-person public-interaction requirement.

CONCLUSION

Appellants misconstrue the text of the definition of "public support facilities." Public support facilities do not have "to deal with the public on a daily basis" in the manner that appellants contend. Appeal at 3. Rather, public support facilities must provide *public services* that deal directly with citizens. This Proposed Facility does just that: it will provide water, sewer, emergency response, parks maintenance, and more services that deal directly with citizens and support daily life in West Linn. The legislative history of the definition supports the interpretation that a public support facility does not need to invite citizens to meet, or hold hearings, on-site. Rather, the definition was originally intended to capture facilities such as the proposed operations center, and was later expanded to ensure it also captures facilities like a city council chamber.

EXHIBIT A to Legislative History of "Public Support Facilities"

AGENDA BILL

95-07-11

For Council: August 14, 1995

Public Hearing Yes ✔ No___

Subject:

Code and Comprehensive Plan Amendments (MISC-95-06)

Department: Planning & Development

Michael Butts, Planning Director

Dept. Head Initials: MB

Budget Impact: None

Expenditures	**Amount**	**Appropriation**
Required $ -0-	**Budgeted $** -0-	**Needed $** -0-

Summary:

The outstanding code amendment issues include #6, Remove churches from uses permitted in Office Business Center Zone, and #17, Signs (specifically, banners and an electronic changeable copy sign for the high school).

The concerns raised regarding Issue #6 included: 1) the constitutionality of excluding religious assembly from commercial zones; 2) how religious assembly is defined; and 3) given that "lodges, fraternal, and civic assembly" and "religious assembly" are like uses, should they be treated the same. Additionally, it was noted that given any change, the City must be assured that meeting rooms, such as the Council Chambers, be allowed in the General Commercial zone to accommodate future "civic center" plans.

Planning staff is proposing a number of amendments to respond to the above identified concerns. First, findings are put forth which, based upon City Attorney consultation, present our argument that there is an overriding benefit to the general welfare to exclude religious institutions in commercial zones versus the restrictions placed on the right of freedom of worship and assembly (see "Comprehensive Plan Inventories"). Secondly, borrowing from Washington County, staff proposes to replace the term "religious assembly," with "religious institutions," and provides a definition. "Lodges, fraternal, and civic assembly" has been removed from the commercial zones and allowed as a conditional use in residential zones. Finally, "public support services," which is allowed in commercial zones as a permitted use (and proposed as a conditional use under Issue #19, Community Buildings), has been amended to state specifically that meeting and hearing rooms are an allowed use.

Issue #17, Sign Code, focused on banners across roadways and allowing electronic changeable copy signs for public and semi-public uses. The attached Exhibit B discusses the constitutional conflicts with both banners and the electronic changeable copy signs. In summary, the City cannot restrict the content of a sign (e.g., allow only "time and temperature" or prohibit sponsor logos on banners), and cannot limit such signs for the exclusive use of public or semi-public organizations. Consequently, if a public agency can use electronic changeable copy signs, so can businesses. Given the unanticipated impact of this change, staff recommends that the allowance for banners remain essentially unchanged, and that electronic changeable copy signs not be allowed at this point in time, and that the Planning Commission be directed to conduct a comprehensive review of the City's sign ordinance regarding the issue of content.

Recommended Action:

Hold public hearing.

Council Action Taken:
Approved:
Denied:
Continued:

c:\agendab

EXHIBIT B to Legislative History of "Public Support Facilities"

CITY OF WEST LINN
COMMUNITY DEVELOPMENT CODE
PROPOSED AMENDMENTS
JUNE 1995

Additions and corrections are underlined and **emphasized**; deletions are [-bracketed-] with dashes and **emphasized**.

ISSUES #6: REMOVE CHURCHES FROM USES PERMITTED IN OFFICE BUSINESS CENTER ZONE

COMPREHENSIVE PLAN INVENTORIES

LAND USE 2, page 16, Add the following after page 10:

Land suitable for additional commercial development in West Linn is very limited due to steep topography. The existing commercial zones along Highway 43, as an example, have narrow lot depth, due to steep cross slopes. In order to meet the requirements of the Transportation Planning Rule (which calls for reducing the vehicle miles traveled per person) and carry out the West Linn Vision, the establishment of commercial services locally is critical. Therefore, preserving commercially zoned land for the exclusive use of commercial uses is needed. Disallowing religious institutions, lodges, fraternal institutions, etc. in commercial zones is appropriate because the benefit to the general welfare and safety, due to reduced use of the automobile, outweighs the restrictions which such regulations place upon the right of freedom of worship and assembly.

COMPREHENSIVE PLAN

Page 46, GENERAL POLICIES, add the following:

7. **Assure non-commercial uses are prohibited on land zoned for commercial uses.**

COMMUNITY DEVELOPMENT CODE

SECTION 02.000 DEFINITIONS, Page 02-20, add the following:

Religious Institutions. A building consturcted or utilized primarily for public worship, together with its accessory uses, and buildings where persons regularly assemble for

religious worship and which is controlled by a religious body organized to sustain public worship.

SECTION 10.030, GENERAL COMMERCIAL, Page 19-2, delete the following:

[-17. **Lodge, fraternal and civic assembly.-]**

SECTION 21.030 AND 21.060, OFFICE BUSINESS CENTER, delete the following respectively:

[- 7. **Lodges, fraternal and civic assembly.-]**

[- 9. **Religious assembly.-]**

SECTION 8.000 R-40, SECTION 9.000 R-20, SECTION 10.000 R-15, SECTION 11.000 R-10, SECTION 12.000 R-7, SECTION 14.000 R-4.5, SECTION 15.000 R-3, and SECTION 16.000 R-2.1, amend conditional uses as follows:

[-Religious Assembly.-] Religious Institution.

Lodge, fraternal and civic assembly.

SECTION 13.060, amend as follows:

Children's day care.
Public safety facilities.
Lodge, fraternal and civic assembly
Schools.
Utilities, major.

SECTION 02.030, Page 02-20, amend as follows:

Public support facilities. Public services that deal directly with citizens, **to include meeting and hearing rooms,** together with incidental storage and maintenance of necessary vehicles, and excludes commercial use types, "professional and administrative services". Typical use types are associated with governmental offices. (Also see Issue #19, Community Buildings.)

ISSUE 17: CLARIFICATIONS TO SIGN CODE (CHAPTER 52)

The sign code as currently written is a difficult ordinance to enforce because it deals with ambiguous and intangeable issues such as "aesthetic character" and "visual quality." To make this code easier to understand and interpret, this amendment proposes four changes. First, the

Agenda Bill 2026-04-14-03

Date Prepared:	April 8, 2026
For Meeting Date:	April 14, 2026
To:	Rory Bialostosky, Mayor West Linn City Council
From:	John Williams, City Manager JRW
Subject:	Delegation of Council's Appellate Authority over the Planning Commission's Decision on Project ID CUP-25-02/DR-25-02/WAP-25-01 to a Hearings Officer

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Purpose:
To discuss the City Council's authority to delegate its appellate authority over a Planning Commission's decision to a Hearings Officer.

Question(s) for Council:
Does the Council wish to delegate its appellate authority over the Planning Commission's decision on Project ID CUP-25-02/DR-25-02/WAP-25-01 to a Hearings Officer?

Public Hearing Required:
None Required.

Background & Discussion:

Factual Background
The West Linn Planning Commission ("Planning Commission") held a quasi-judicial public hearing on February 4, 2026 on Project ID CUP-25-02/DR-25-02/WAP-25-01 to consider a Conditional Use Permit, Class 2 Design Review, and a Water Resource Area Permit, for the construction of a new City Operations Complex at 23800 and 23834 Salamo Road (the "Project"). The hearing was continued to February 18, 2026.

At the Planning Commission's March 4, 2026 meeting, the Commission voted to approve the City's application for a Conditional Use Permit, Class 2 Design Review, and Water Resource Area Permit for the Project. The decision approving the permits with conditions was issued on March 11, 2026, and can be viewed here:
https://westlinnoregon.gov/sites/default/files/fileattachments/planning/project/57318/cup-25-02_dr-25-02_wap-25-01_final_decision_and_order.pdf.

An appeal of the Planning Commission's decision on the Project was filed by the Savanna Oaks Neighborhood Association on March 23, 2026.

Legal Background

Pursuant to local law, the West Linn City Council has the authority to hear an appeal of the decision made by the Planning Commission. CDC 99.060(C)(3); CDC 99.240. Any person that has standing may appeal a decision of the Planning Commission. CDC 99.140(A). Standing is established by appearing before the Planning Commission and complying with the requirements of CDC 99.140(B).

The City Council has two options. It can hear and decide the appeal, or it can delegate its appellate authority over the Planning Commission's decision on the Project to a hearings officer. Charter, Section 6. WLMC section 1.100 defines a hearings officer, in relevant part, as "an outside party not affiliated with the City that is hired or selected by the City Manager to conduct an appeals proceeding."

Per the West Linn City Charter, the City Council is vested with all powers of the City that are not expressly provided to another party, or otherwise reserved by the Oregon Constitution. Charter, Section 6. Because City code (WLMC and CDC) does not prohibit the Council from delegating its quasi-judicial authority to deliberate on and decide an appeal of a Planning Commission decision, the City Council may delegate its authority to a hearings officer if it so chooses.

Discussion

Staff presents this memo to ensure that the Council is aware of its options for hearing appeals of Planning Commission decisions. The case on appeal is unique because the City is the applicant, and the public should feel confident in the final decision, including that it is impartial and fair. To avoid any public perception of bias in the appellate decision, the Council could consider delegating its appellate authority to review this quasi-judicial appeal to a hearings officer trained in land use law that is well-equipped to handle a complex and voluminous record, like this case.

Budget Impact:

A hearings officer is estimated to cost approximately $4,000-9,000, and this money would come from the City Council Budget in the General Fund.

Sustainability Impact:

Not applicable.

Council Options:

1. Approve Resolution 2026-03, delegating the City Council's appellate authority over the Planning Commission's decision on Project ID CUP-25-02/DR-25-02/WAP-25-01 to a hearings officer.
2. Reject the Resolution, and the City Council will hear and decide the appeal of the Planning Commission's decision on Project ID CUP-25-02/DR-25-02/WAP-25-01.

Staff Recommendation:

Staff recommends the Council consider the factors identified in the "Discussion Point" section carefully before making a decision on Resolution 2026-03.

Potential Motion:

Option 1 Motion to Approve the Resolution

I move to approve Resolution 2026-03, delegating the City Council's appellate authority over the Planning Commission's decision on Project ID CUP-25-02/DR-25-02/WAP-25-01 to a hearings officer.

Option 2 Motion to Reject the Resolution

I move to reject Resolution 2026-03, delegating the City Council's appellate authority over the Planning Commission's decision on Project ID CUP-25-02/DR-25-02/WAP-25-01 to a hearings officer.

Attachments:

1. Resolution 2026-03 delegating the City Council's appellate authority over the Planning Commission's decision on Project ID CUP-25-02/DR-25-02/WAP-25-01 to a hearings officer.

RESOLUTION 2026-03

A RESOLUTION DELEGATING THE CITY COUNCIL'S APPELLATE DECISION-MAKING AUTHORITY OVER THE PLANNING COMMISSION'S DECISION ON PROJECT ID CUP-25-02/DR-25-02/WAP-25-01 TO A HEARINGS OFFICER

WHEREAS, the West Linn Community Development Code ("CDC") section 99.060(C)(3) provides the West Linn City Council with authority to consider an appeal of a decision made by the Planning Commission; and

WHEREAS, the West Linn Municipal Code ("WLMC") section 1.100 defines a hearings officer as "an outside party not affiliated with the City that is hired or selected by the City Manager to conduct an appeals proceeding," and the definitions provided in the WLMC apply to the CDC; and

WHEREAS, the West Linn City Charter ("Charter") Section 6 vests all powers in the City Council, except as otherwise expressly provided in the Charter or as provided by the Oregon Constitution; and

WHEREAS, the Planning Commission held a quasi-judicial public hearing on February 4, 2026 on Project ID CUP-25-02/DR-25-02/WAP-25-01, which was continued to subsequent dates, to consider a Conditional Use Permit, Class 2 Design Review, and a Water Resource Area Permit, for the construction of a new City Operations Complex at 23800 and 23834 Salamo Road (the "Project"); and

WHEREAS, on March 11, 2026, the Planning Commission approved with conditions the request by the City of West Linn for a Conditional Use Permit, Class 2 Design Review, and Water Resource Area Permit for the Project; and

WHEREAS, the Savanna Oaks Neighborhood Association appealed the Planning Commission's decision on this project on March 23, 2026, which is a timely filed appeal; and

WHEREAS, taking into account that the City of West Linn is the applicant, the voluminous and complex record associated with the Planning Commission decision, and the desire of the City Council and City staff for the public to have confidence in the fairness of a final decision on the appeal, the City Council desires to delegate authority to a hearings officer to review and decide this appeal in the City Council's stead.

NOW, THEREFORE, THE CITY OF WEST LINN RESOLVES AS FOLLOWS:

SECTION 1. The City Council delegates its appellate authority over an appeal of the Planning Commission's decision on Project ID CUP-25-02/DR-25-02/WAP-25-01 to a hearings officer.

SECTION 2. The City Council authorizes and directs the City Manager to select and hire a hearings officer to consider an appeal of the Planning Commission's decision on Project ID CUP-25-02/DR-25-02/WAP-25-01.

This resolution was PASSED and ADOPTED this 14th day of April, 2026, and takes effect upon passage.

RORY BIALOSTOSKY, MAYOR

ATTEST:

KATHY MOLLUSKY, CITY RECORDER

APPROVED AS TO FORM:

KAYLIE KLEIN, CITY ATTORNEY