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Planning Division Development Permit Application

Final action on development application or zone change is required within 120 days per ORS 227.175 or as otherwise required by state or federal law for specific application types.

A pre application conference may be required.

The City will not accept applications for wireless communication facilities or similar facilities without a completed copy of a Wireless Facility Review Worksheet.

The City will not schedule incomplete applications for public hearing or send administrative public notice until all of the required materials are submitted.

Applicant:

Name: Burke Wardle
 Company: PIVOT Architecture
 Mailing Address: 44 W Broadway
 City, State, Zip: Eugene, Or. 97401
 Phone: 541-762-1631 Fax: _____
 E-mail: bwardle@pivotarchitecture.com

Authorized Representative:

Name: Kelsey Lewis
 Company: SMART - City of Wilsonville
 Mailing Address: 28879 SW Boberg Rd
 City, State, Zip: Wilsonville, Or. 97070
 Phone: 503-682-4523 Fax: _____
 E-mail: klewis@ridesmart.com

Property Owner:

Name: _____
 Company: SMART - City of Wilsonville
 Mailing Address: 28879 SW Boberg Rd
 City, State, Zip: Wilsonville, Or. 97070
 Phone: _____ Fax: _____
 E-mail: _____

Property Owner's Signature:

Kelsey Lewis
 Printed Name: Kelsey Lewis Date: 5/6/24

Applicant's Signature: (if different from Property Owner)

Burke Wardle
 Printed Name: Burke Wardle Date: 5/6/24

Site Location and Description:

Project Address if Available: 28879 SW Boberg Rd. Wilsonville, Or. 97070 Suite/Unit _____
 Project Location: _____
 Tax Map #(s): 31W14A01600 Tax Lot #(s): 00810153 County: Washington Clackamas

Request:

Review of proposed project to expand existing bus fleet parking, add bus wash building with water treatment system, and installing infrastructure for future expansion of electric bus chargers.

Project Type: Class I Class II Class III

Residential Commercial Industrial Other: _____

Application Type(s):

- | | | | |
|--|--|--|---|
| <input type="checkbox"/> Annexation | <input type="checkbox"/> Appeal | <input type="checkbox"/> Comp Plan Map Amend | <input type="checkbox"/> Parks Plan Review |
| <input type="checkbox"/> Final Plat | <input type="checkbox"/> Major Partition | <input type="checkbox"/> Minor Partition | <input type="checkbox"/> Request to Modify Conditions |
| <input type="checkbox"/> Plan Amendment | <input checked="" type="checkbox"/> Planned Development | <input type="checkbox"/> Preliminary Plat | <input type="checkbox"/> Site Design Review |
| <input type="checkbox"/> Request for Special Meeting | <input type="checkbox"/> Request for Time Extension | <input type="checkbox"/> Signs | <input type="checkbox"/> Stage II Final Plan |
| <input type="checkbox"/> SROZ/SRIR Review | <input type="checkbox"/> Staff Interpretation | <input type="checkbox"/> Stage I Master Plan | <input type="checkbox"/> Variance |
| <input type="checkbox"/> Type C Tree Removal Plan | <input checked="" type="checkbox"/> Tree Permit (B or C) | <input type="checkbox"/> Temporary Use | <input type="checkbox"/> Other (describe) |
| <input type="checkbox"/> Villebois SAP | <input type="checkbox"/> Villebois PDP | <input type="checkbox"/> Villebois FDP | |
| <input type="checkbox"/> Zone Map Amendment | <input type="checkbox"/> Waiver(s) | <input type="checkbox"/> Conditional Use | |



Project: SMART – Facility Improvements
Date: July 25, 2024
To: City of Wilsonville
From: Burke Wardle, PIVOT Architecture
Subject: Development Permit Application for SMART Facility Improvements

SUMMARY OF PROPOSAL

The existing SMART Operations & Administration Building located on an approximately 192,000 square foot site, proposes to expand fleet parking and construct a new bus wash building. The proposed project would develop an additional 32,530 square feet of the existing site.

Site development will consist of 30,730 square feet for additional bus parking and maneuvering area, with new infrastructure for electrical charging equipment. Storm water will be treated and detained in the existing pond type facility in the SW corner of the site that was originally sized to accommodate the expansion of the site.

Building component consists of a new 1,800 square foot enclosed bus wash building, which is located on the far west side of the site. The wash equipment is enclosed inside the building, which utilizes a water reclamation system and underground tanks. The filtration system is cleaned through a backwash process that will require draining to city sewer through the existing onsite oil/water separation system.

Site is zoned Planned Development Industrial (PDI) and based on the pre-application review process; the proposed project will require Class II review and Site Design review by the Development Review Board. The following narrative outlines design compliance for review.

Table A: Surrounding Land Use

Location	Zoning Type	Land Use
North	PDI	Wilsonville Public Works
South	PDI	Heart of the City – Office Building & Classic Manufacturing
East	PDI	H.D. Fowler Company, Industrial Plumbing Supply
West	PDI	TriMet Commuter Rail Maintenance Facility

Figure 1: Zoning Designation – PDI, and SROZ



Zoning

Section 4.117. - Standards Applying to Industrial Developments in any Zone.

(.01) All industrial developments, uses, or activities are subject to performance standards. If not otherwise specified in the Planning and Development Code, industrial developments, uses, and activities shall be subject to the performance standards specified in Section 4. 135 (.05) (PDI Zone).

Response: This development application proposes to add 30,730 square feet for additional bus parking (17 spaces) and maneuvering area, with new infrastructure for electrical charging equipment. Also proposed new 1,800 square foot enclosed bus wash building, which is located on the far west (rear) side of the property which conform to applicable standards.

Section 4.118. - Standards Applying to all Planned Development Zones

(.03) Underground Utilities shall be governed by Sections 4.300 to 4.320. All utilities above ground shall be located so as to minimize adverse impacts on the site and neighboring properties.

Response: All new utilities (water & electrical) will be located underground.

(.03) Notwithstanding the provisions of Section 4.140 to the contrary, the Development Review Board, in order to implement the purposes and objectives of Section 4.140, and based on findings of fact supported by the record may:

A. Waive the following typical development standards:

1. Minimum lot area;
2. Lot width and frontage;
3. Height and yard requirements;
4. Lot coverage;
5. Lot depth;
6. Street widths;
7. Sidewalk requirements;
8. Height of buildings other than signs;
9. Parking space configuration and drive aisle design;
10. Minimum number of parking or loading spaces;
11. Shade tree islands in parking lots, provided that alternative shading is provided;
12. Fence height;
13. Architectural design standards;
14. Transit facilities;
15. On-site pedestrian access and circulation standards;
16. Solar access standards, as provided in section 4.137;
17. Open space in the Residential Neighborhood zone; and

18. Lot orientation.

Response: As outlined in this narrative and the attached proposed plans, the development standards outlined above were previously approved and will be maintained. The applicable pieces of this section for the new development are:

Lot Coverage: No limit

Fence Height: Existing 8' tall wood fence will maintain screening of expanded bus parking and new bus wash building.

Architectural design standards: New Bush Wash building will be composed of dark gray architectural grade CMU block, and single slope standing seam metal roofing.

B. The following shall not be waived by the Board, unless there is substantial evidence in the whole record to support a finding that the intent and purpose of the standards will be met in alternative ways:

1. Open space requirements in residential areas
2. Minimum density standards of residential zones
3. Minimum landscape, buffering, and screening standards

Response: This proposed development is not requesting a waiver to this section. Proposed landscaping & screening complies as noted in section 4.176 below.

C. The following shall not be waived by the Board, unless there is substantial evidence in the whole record to support a finding that the intent and purpose of the standards will be met in alternative ways:

1. Maximum number of parking spaces;
2. Standards for mitigation of trees that are removed;
3. Standards for mitigation of wetlands that are filled or damaged; and
4. Trails or pathways shown in the Parks and Recreation Master Plan.

Response: This proposed development is not requesting a waiver to this section. A tree removal permit, Type C, will be filed for this project. No wetlands or trails are within the project area.

D. Locate individual building, accessory buildings, off-street parking and loading facilities, open space and landscaping and screening without reference to lot lines; and

Response: This proposed development was oriented to utilize the existing storm retention pond and natural site drainage while fitting the context the surrounding developments

E. Adopt other requirements or restrictions, inclusive of, but not limited to, the following, except that no additional requirements or restrictions can conflict with established clear and objective standards for residential development or be grounds for denying a residential development proposal when the applicant has selected the clear and objective path for approval

Response: The existing development and proposed expansion will maintain compliance with this section.

Section 4.135. - PDI—Planned Development Industrial Zone

(.03) Uses that are typically permitted:

Response: The existing administration office and bus maintenance facility complies with uses listed in Section 4.135.03, subsection E, support offices, vehicle washes, and repair shops.

(.04) Block and access standards. The PDI zone shall be subject to the same block and access standards as the PDC zone, Section 4.131(.02) and (.03).

Response: The existing facility complies. The proposed project, does not affect the requirements of this section.

(.05) Performance Standards. The following performance standards apply to all industrial properties and sites within the PDI Zone, and are intended to minimize the potential adverse impacts of industrial activities on the general public and on other land uses or activities. They are not intended to prevent conflicts between different uses or activities that may occur on the same property.

A. All uses and operations except storage, off-street parking, loading and unloading shall be confined, contained, and conducted wholly within completely enclosed buildings, unless outdoor activities have been approved as part of Stage II, Site Design or Administrative Review.

B. *Vibration*. Every use shall be so operated that the ground vibration inherently and recurrently generated from equipment other than vehicles is not perceptible without instruments at any boundary line of the property on which the use is located.

I. *Noise*. Noise generated by the use, with the exception of traffic noises from automobiles, trucks, and trains, shall not violate any applicable standards adopted by the Oregon Department of Environmental Quality and W.C. 6.204 governing noise control in the same or similar locations.

M. Storage:

1. Outdoor storage must be maintained in an orderly manner at all times.
2. Outdoor storage area shall be gravel surface or better and shall be suitable for the materials being handled and stored. If a gravel surface is not sufficient to meet the performance standards for the use, the area shall be suitably paved.
3. Any open storage that would otherwise be visible at the property line shall be concealed from view at the abutting property line by a sight obscuring fence or planting not less than six feet in height.

Response: The existing SMART operations were previously approved and currently meet the performance standards outlined in this section and will continue to meet the requirements. Daily operations will remain the same, with the addition of new fleet parking, which is located at the rear of the property behind the existing building and screened fence.

The bus storage yard will be screened by a combination of landscaping and retaining walls. The north side of the property is screened by existing landscaping at the SROZ and trees spaced not greater than 30' apart. There is also a 6' retaining wall at the north.

The west side of the property will be screened by a retaining wall that varies from 6' to 9' tall as the grade varies along the west side of the property.

The south side of the property will be screened by new landscaping, complying with "High Screen Landscaping Standards" and at least 6' tall, trees spaced not greater than 30' apart.

The new indoor Bus Wash building and system will be primary washing location for vehicles instead of the existing covered outdoor manual pressure wash system that will remain but seldom used. All Bus Wash equipment and tanks are either located underground or inside the Bus Wash building.

(.06) Other Standards:

Response: Setbacks: A thirty-foot rear and side yard building setback are required and have been met with the new development. See Site Plan.

No changes to existing staff parking area on east side of Admin Building.

Bicycle Parking: No changes to existing bicycle parking area as Bicycle parking spaces are not required for accessory buildings.

Off street loading: None

Signage: No new signage is proposed.

Section 4.139.00. - Significant Resource Overlay Zone (SROZ) Ordinance

Section 4.139.02. - Where these Regulations Apply.

(.02) Impact Area. The "Impact Area" is the area adjacent to the outer boundary of a Significant Resource within which development or other alteration activities may be permitted through the review of an SRIR (Significant Resource Impact Report). Where it can be clearly determined by the Planning Director that development is only in the Impact Area and there is no impact to the

Significant Resource, development may be permitted without SRIR review. The impact area is 25 feet wide unless otherwise specified in this ordinance or by the decision making body.

Response: The north end of the site abuts an SROZ. As required all development has been set back 50' from the edge of the SROZ stream, with an additional 25' setback for hardscapes, site retaining walls, and buildings. Minor grade alterations and landscaping will be within the 25' impact zone, and the storm water conveyances to the creek will pass through. Disturbed areas in the impact zone will be repaired with native plantings. See Landscape Planting Plan and plant list.

Section 4.140. - Planned Development Regulations

(.04) Professional Design:

A. The applicant for all proposed Planned Developments shall certify that the professional services of the appropriate professionals have been utilized in the planning process for development.

Response: The owner/applicant has retained a licensed design team consisting of PIVOT Architecture, Greenworks, and WSP.

(.05) Planned Development Permit Process:

Response: Per the Pre-Application conference held on May 2nd, 2024 the proposed project requires an application for a Class II review and Site Design review by the DRB. The proposed design described in this narrative and attached exhibits outlines how the project scope meets the required development standards.

Section 4.155. - General Regulations—Parking, Loading and Bicycle Parking

(.02) General Provisions:

K. All areas used for parking and maneuvering of cars shall be surfaced with asphalt, concrete, or other surface, such as pervious materials (i. e. pavers, concrete, asphalt) that is found by the City's authorized representative to be suitable for the purpose. In all cases, suitable drainage, meeting standards set by the City's authorized representative shall be provided.

Response: The proposed new concrete paving for the bus yard storage will drain into the existing stormwater drainage basin that was sized for this expansion. See attached Stormwater Report.

Section 4.176. - Landscaping, Screening, and Buffering

(.02) Landscaping and Screening Standards:

C. General Landscaping Standard:

1. Intent. The General Landscaping Standard is a landscape treatment for areas that are generally open. It is intended to be applied in situations where distance is used as the principal means of separating uses or developments and landscaping is required to enhance the intervening space. Landscaping may include a mixture of ground cover, evergreen and deciduous shrubs, and coniferous and deciduous trees.
2. Required materials. Shrubs and trees, other than street trees, may be grouped. Ground cover plants must fully cover the remainder of the landscaped area (see Figure 21: General Landscaping). The General Landscaping Standard has two different requirements for trees and shrubs:
 - a. Where the landscaped area is less than 30 feet deep, one tree is required for every 30 linear feet.
 - b. Where the landscaped area is 30 feet deep or greater, one tree is required for every 800 square feet and two high shrubs or three low shrubs are required for every 400 square feet.

Response: The proposed bus yard expansion was planning for and the existing landscaping around the perimeter of the proposed project, including the storm drainage swale will be maintained. Any existing landscaping that will be disturbed as part of this project will be repaired and replaced in accordance with the requirements of Section 4.176. The landscape areas on the north and south edges are greater than 30 deep and contain at least 1 tree every 30 feet. The landscape area on the west side is greater less than 30 deep See Landscape Plans.

- (.04) Buffering and Screening. Additional to the standards of this subsection, the requirements of the Section 4.137.5 (Screening and Buffering Overlay Zone) shall also be applied, where applicable.
- A. All intensive or higher density developments shall be screened and buffered from less intense or lower density developments.
 - B. Activity areas on commercial and industrial sites shall be buffered and screened from adjacent residential areas. Multi-family developments shall be screened and buffered from single-family areas.
 - C. All exterior, roof and ground mounted, mechanical and utility equipment shall be screened from ground level off-site view from adjacent streets or properties.
 - D. All outdoor storage areas shall be screened from public view, unless visible storage has been approved for the site by the Development Review Board or Planning Director acting on a development permit.
 - E. In all cases other than for industrial uses in industrial zones, landscaping shall be designed to screen loading areas and docks, and truck parking.
 - F. In any zone any fence over six feet high measured from soil surface at the outside of fence line shall require Development Review Board approval.

Response: The proposed bus yard storage is screened with a combination of a 6' tall concrete retaining wall and landscape areas with trees. See response above in Section 4.135 (.05) M.

Section 4.154. - On-site Pedestrian Access and Circulation

Response: No change to existing sidewalks used for public accommodation which meet ADA accessibility and local Code. There are no new public pathways planned for this project.

Section 4.199.40. - Lighting Systems Standards for Approval.

(.01) Non-Residential Uses and Common Residential Areas.

C. *Performance Option.* If the lighting is to comply with the Performance Option, the proposed lighting design shall be submitted by the applicant for approval by the City meeting all of the following:

1. The weighted average percentage of direct upright lumens shall be less than the allowed amount per Table 9.
2. The maximum light level at any property line shall be less than the values in Table 9, as evidenced by a complete photometric analysis including horizontal illuminance of the site and vertical illuminance on the plane facing the site up to the mounting height of the luminaire mounted highest above grade. The Building Official or designee may accept a photometric test report, demonstration or sample, or other satisfactory confirmation that the luminaire meets the shielding requirements of Table 7. Luminaires shall not be mounted so as to permit aiming or use in any way other than the manner maintaining the shielding classification required herein:

Response: Project is within Lighting Overlay Zone: LZ 2. Fleet Parking areas will receive new lighting and bus wash building has exterior downlights. See "Site Photo Metric Plan" which outlines compliance via the performance option.

Section 4.440. - Procedure

(.01) Submission of Documents. A prospective applicant for a building or other permit who is subject to site design review shall submit to the Planning Department, in addition to the requirements of Section 4.035, the following:

- A. A site plan, drawn to scale, showing the proposed layout of all structures and other improvements including, where appropriate, driveways, pedestrian walks, landscaped areas, fences, walls, off-street parking and loading areas, and railroad tracks. The site plan shall indicate the location of entrances and exits and direction of traffic flow into and out of off-street parking and loading areas, the location of each parking space and each loading berth and areas of turning and maneuvering vehicles. The site plan shall indicate how utility service and drainage are to be provided.

Response: The architectural site plan calls out the location and approximate height of concrete retaining walls on the west side of the bus yard expansion. Landscape and Civil plans show grading, drainage, and existing and proposed landscaping to be maintained and repaired.

Section 4.600.30. - Tree Removal Permit Required.

- (.01) Requirement Established. No person shall remove any tree without first obtaining a Tree Removal Permit (TRP) as required by this subchapter.
- (.02) Tree Removal Permits will be reviewed according to the standards provided for in this subchapter, in addition to all other applicable requirements of Chapter 4.
- (.03) Although tree activities in the Willamette River Greenway are governed by WC 4.500—4.514, the application materials required to apply for a conditional use shall be the same as those required for a Type B or C permit under this subchapter, along with any additional materials that may be required by the Planning Department. An application for a Tree Removal Permit under this section shall be reviewed by the Development Review Board.

Section 4.610.40 - Type C Permit

Type C. Where the site is proposed for development necessitating site plan review or plat approval by the Development Review Board, the Development Review Board shall be responsible for granting or denying the application for a Tree Removal Permit, and that decision may be subject to affirmance, reversal or modification by the City Council, if subsequently reviewed by the Council. For site development applications subject to a Class II administrative review process in the Coffee Creek Industrial Design Overlay District, the Planning Director shall be responsible for the granting or denial of the Tree Removal Permit application.

Response: The proposed project requires removal of existing trees onsite. An arborist report, drawing, and tree protection plan is attached showing location and description of trees to be removed.

The majority of the original trees planted under the original approval (2011) of the SMART Facility did not survive. To maintain the original approval, the trees surrounding the new area of development will be replanted to match the original approval.

- Existing Trees Surveyed: 103
- Existing Trees To Be Retained: 85
- Existing Trees To Be Removed And Replaced: 18
- Proposed New Trees: 69

**Table B: Site Area Table
(includes new and existing development)**

NAME	PROPOSED (SF)	PROPOSED COVERAGE (%)	TOTAL (SF)	TOTAL COVERAGE (%)
BUILDING AREA	1,800	1%	17,207	9%
PARKING AND DRIVES	30,730	16%	96,760	50%
LANDSCAPE	8,040	4%	78,033	41%
TOTAL AREA			192,000	100%

Conclusion

As outlined in the narrative and attached supporting documentation, the proposed SMART Bus yard expansion project complies with the development requirements per City of Wilsonville. The applicant respectfully requests the Development Review Board’s review and approval of the proposed project application which requires a Class II Application Review and Site Design Reivew.

STORMWATER HYDRAULIC REPORT

Wilsonville SMART Base Expansion

City of Wilsonville

Wilsonville, Oregon

Patrick Vandenberg, P.E.

Engineer

Julia Lewis

Engineer

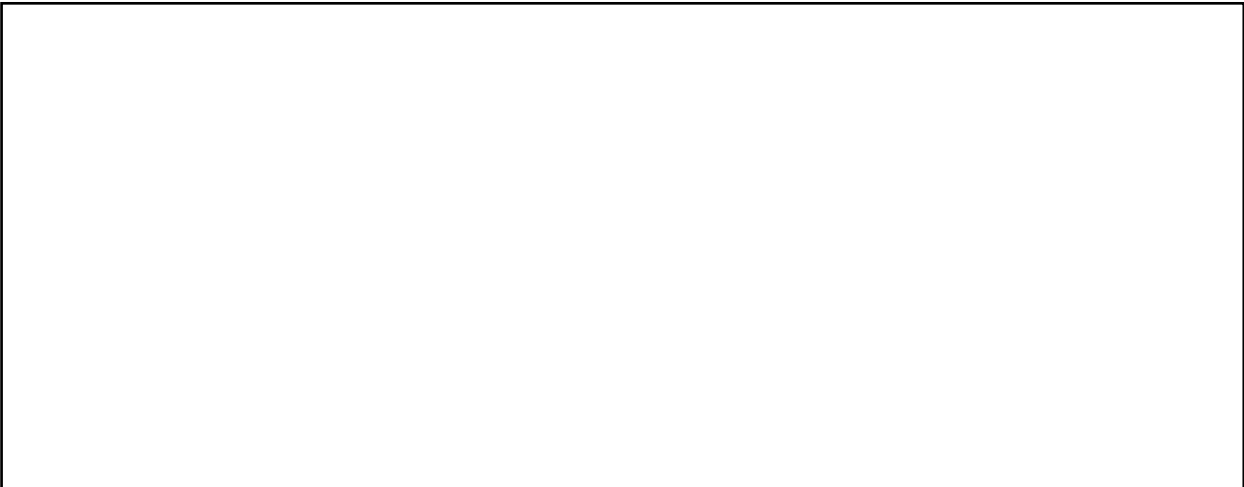


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1. Project Overview

1.1 SITE LOCATION

In Wilsonville, Oregon, the project is located north of SW Barber St. and west of SW Boberg Rd at 28879 SW Boberg Rd. A community chapel and a small industrial park are located to the south of the project site, the WES commuter rail maintenance facility is located to the west, and a sizable area of grassy and forested land is located to the north. Refer to Figure 1-1 for a site vicinity map.

1.2 VICINITY MAP



Figure 1-1: Vicinity Map

The SMART Bus Maintenance Facility offers SMART bus fleet repair as well as administrative office services. It is situated at 28879 SW Boberg Rd. (Tax ID 31W14A 01600).

1.3 SCOPE OF WORK

The SMART Bus Maintenance Facility site upgrades will include the expansion of impermeable surface area by around 35,000 square feet in order to accommodate increased vehicle parking capacity. The project's three primary tasks—schematic design, design development and construction documents, and construction support—will provide design support from concept development through construction. See Figure 1-2 for a map of the existing and proposed areas on site.

The current stormwater management facility will be evaluated to see if it was sized sufficiently to handle the increased flow from the project's new impervious area. The analysis will use the City of Wilsonville's proprietary BMP sizing tool, which is utilized to size facilities.

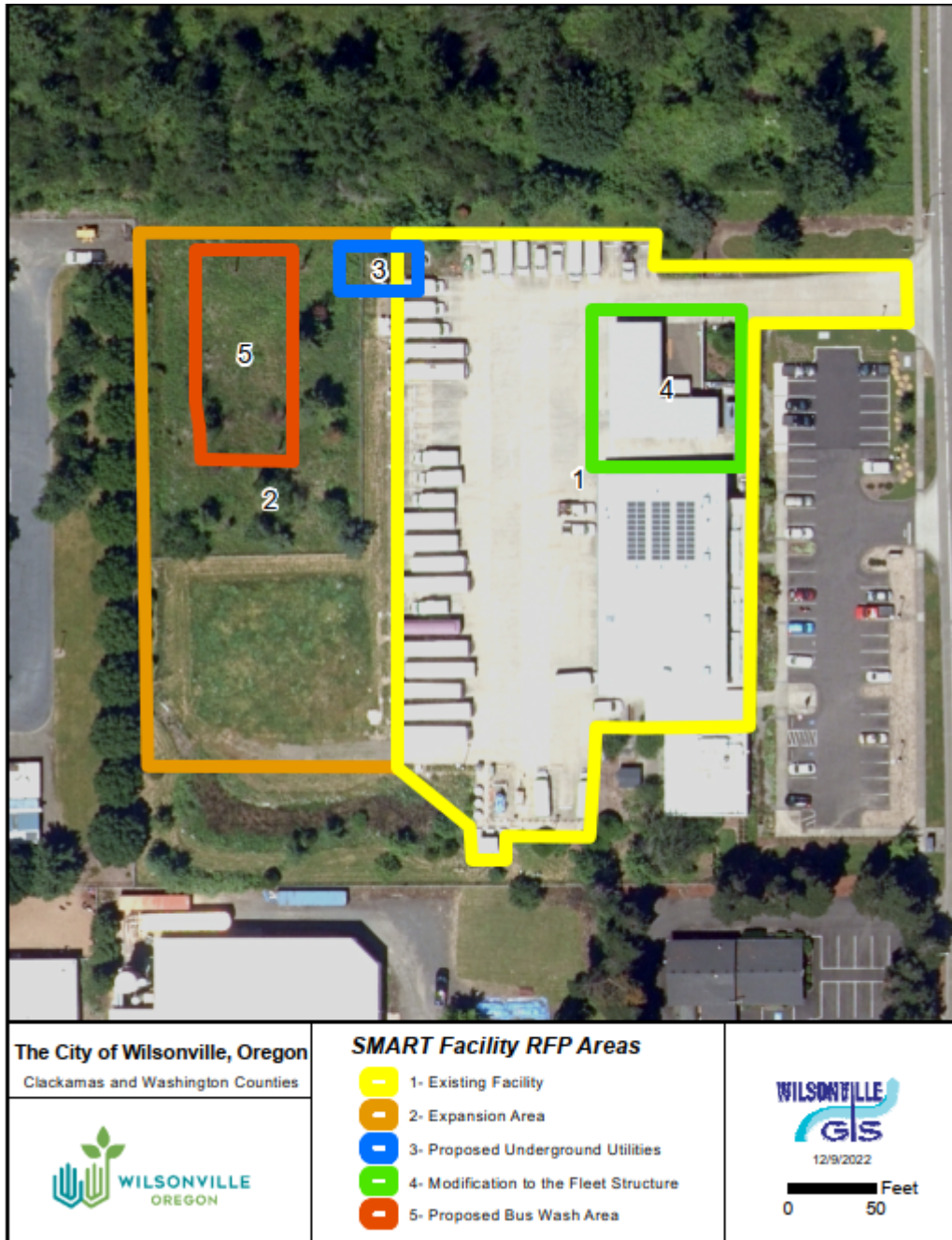


Figure 1-2: SMART Facility Existing and Proposed Areas Map

2. Site Conditions

2.1 EXISTING CONDITIONS

The South Tributary of Coffee Lake Creek borders the property to the south, while zoned Planned Development Industrial (PDI) land surrounds the other sides. The South Tributary not only acts as the site's natural point of runoff discharge, but it also prevents runoff from entering the property's northern boundary. To the south and west, about 75% of the adjacent properties are impermeable. Based on site observations and review of existing stormwater utilities and topography, it appears that none of these properties are currently contributing off-site runoff to the project site.

Where the extension will occur, the current surface conditions on the property are characterized by a grass meadow with a few scattered trees and a few tiny areas of forested stands. Office buildings and impermeable surfaces occupy the remaining portion of the property. There are not many densely forested regions in the area, according to a review of the site and the nearby undeveloped areas. Although it is uncertain if the area was ever forested before any development occurred, it is certain that the current site has been that way for a significant amount of time, and it is possible that the natural drainage systems have adjusted to the current land cover.

2.2 EXISTING HYDRAULIC FEATURES

Currently, the City's needs for managing site runoff are satisfied by a detention pond. The current design has a total storage volume of 17,300 cubic feet, including free board but omitting the water quality permanent pool. There is also a 7,100 square foot perimeter space at the top of the berm. The berm is intended to have a minimum top width of 6 feet and side slopes of 3:1; nevertheless, it is broader along the north side of the pond to allow for maintenance access.

The pond's release rate is regulated by an outlet structure that has horizontal orifices attached to manholes, downturned bends, and right angles. As an upgrade to the previous ditch that was in place at that location, the pond flows into a conveyance ditch that runs along the western boundary of the property. Runoff is also collected by the ditch and released into the South Tributary. See Figure 3 below for the stormwater facility plan sheet.

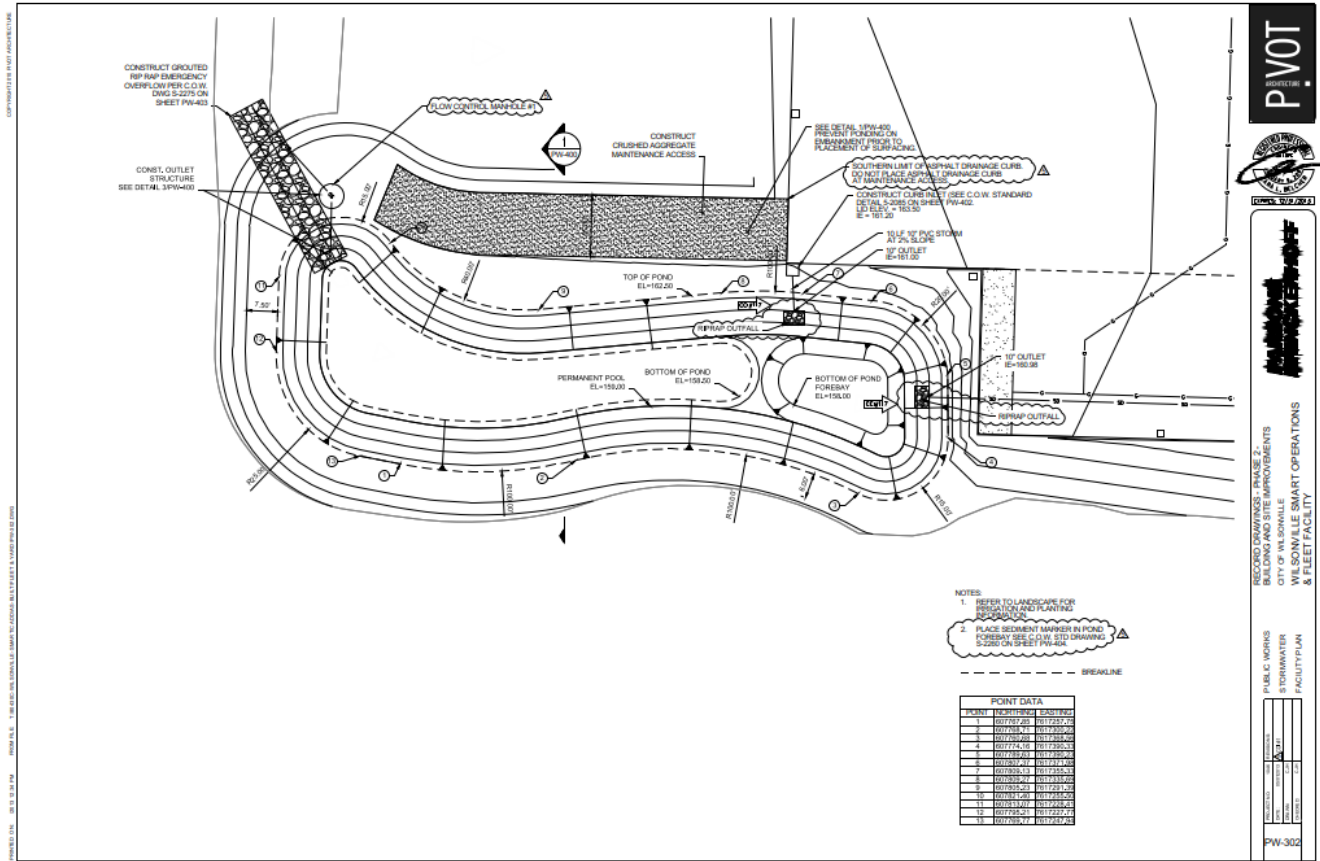


Figure 2-1: Public Works Stormwater Facility Plan

2.3 SOILS

Soil at the site is primarily Willamette silt loam. A detailed NRCS soil report is included in Appendix A-1.

3. Design Standards

3.1 DESIGN FREQUENCY

The BMP Sizing Tool provided by the City of Wilsonville sizes facilities based on the 10-year peak flow.

3.2 STORMWATER MANAGEMENT GUIDELINES

As this project seeks to add impervious area to an existing site, the existing stormwater management facility, a detention pond, was assessed to determine if it was sized appropriately to manage the increased flow. This analysis is described in Section 5.

3.2.1 RUNOFF TREATMENT

The stormwater detention pond is sized such that the appropriate design storm is contained within its volume. No additional runoff treatment is proposed.

3.3 RETROFIT ANALYSIS

The stormwater detention pond is sized such that the appropriate design storm is contained within its volume. No additional facilities or changes to the existing facility is proposed.

3.4 DOWNSTREAM ANALYSIS

The proposed development will not alter the impacts on the downstream system, as flow from the proposed development will be contained within the existing detention pond. Any existing downstream impacts are expected to stay the same.

4. Developed Site Conditions

4.1 DRAINAGE BASINS

The drainage basins analyzed for the stormwater assessment consisted of two areas:

- The existing impervious area: 2.27 acres, slope of 0.005, roughness of 0.02, consisting of asphalt paved parking lots, concrete paved lots, and a few buildings. This region and its runoff will remain unchanged from the current site layout.
- The proposed impervious area: 0.83 acres, slope of 0.005, roughness of 0.02, consisting of concrete paved lots. This region will be converted from a highly pervious undeveloped surface and will result in a net increase in runoff into the stormwater facility.

4.2 POST-DEVELOPED DRAINAGE PATTERNS

As the project seeks to contain any additional drainage flow in the stormwater facility, there will be no change in post-developed drainage patterns.

5. Hydrologic and Hydraulic Design

5.1 CALCULATIONS

The City of Wilsonville provided a stormwater BMP sizing tool intended to be used for sizing the detention pond. The tool provides a recommended facility size based on the 10-year peak flow (which was developed using a continuous simulation HSPF model). Drainage management areas (DMAs) were created using the area and soil type of the existing and proposed impervious surface. These areas were then linked to a Detention Pond BMP, which was sized automatically using the tool. Figures 5-1 through 5-3 below show screenshots of the model.

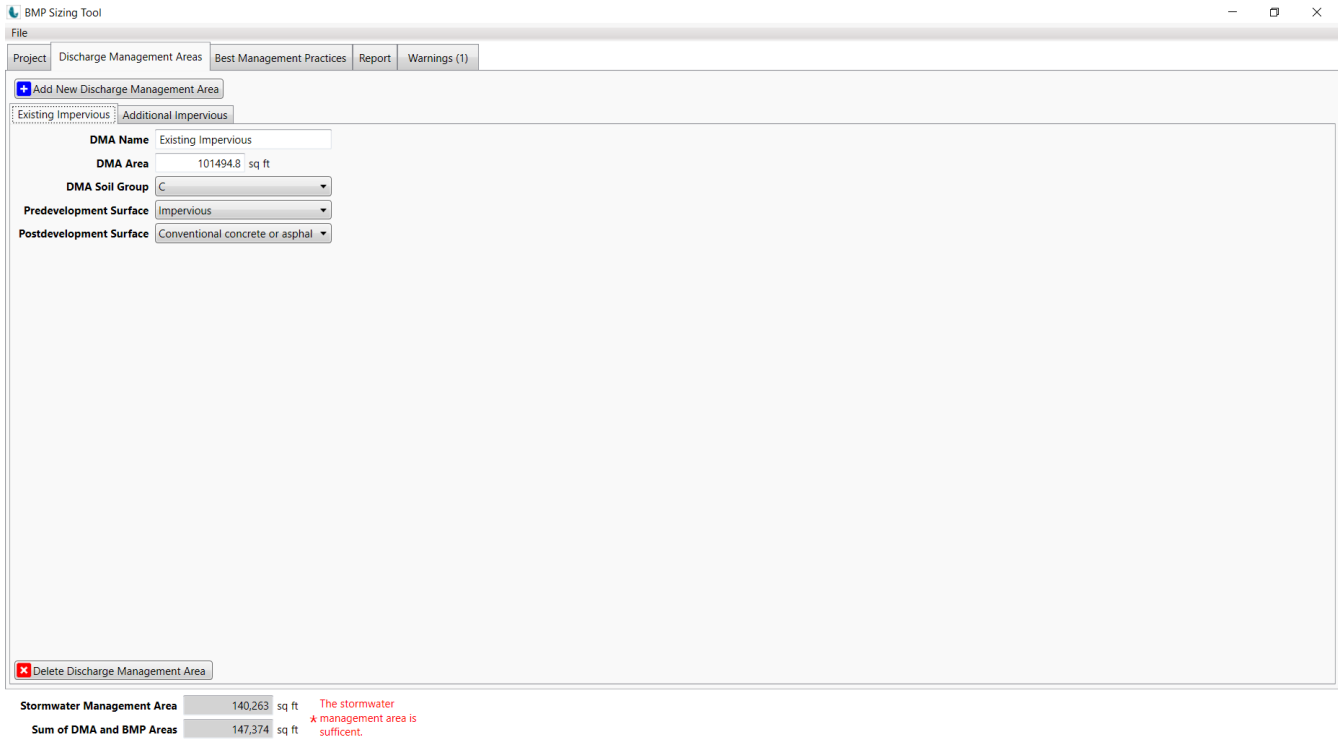


Figure 5-1: Existing Impervious DMA

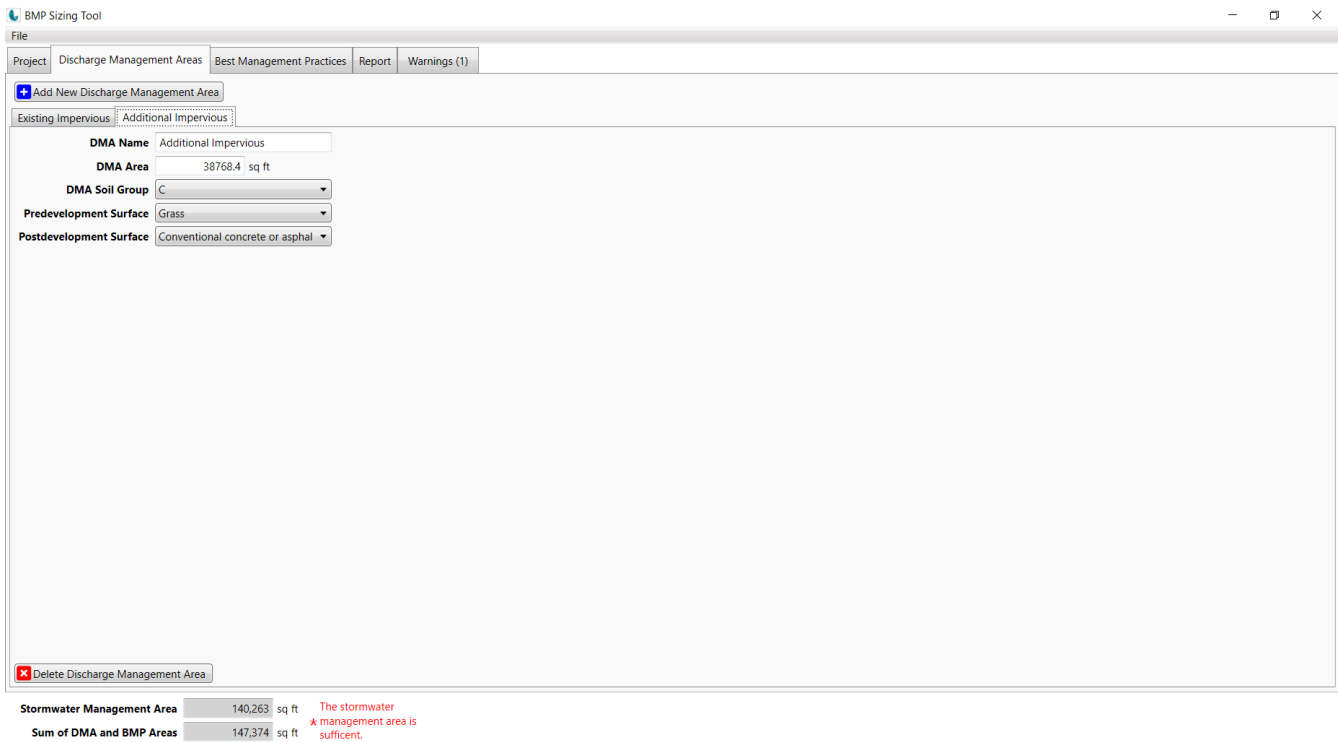


Figure 5-2: Additional Impervious DMA

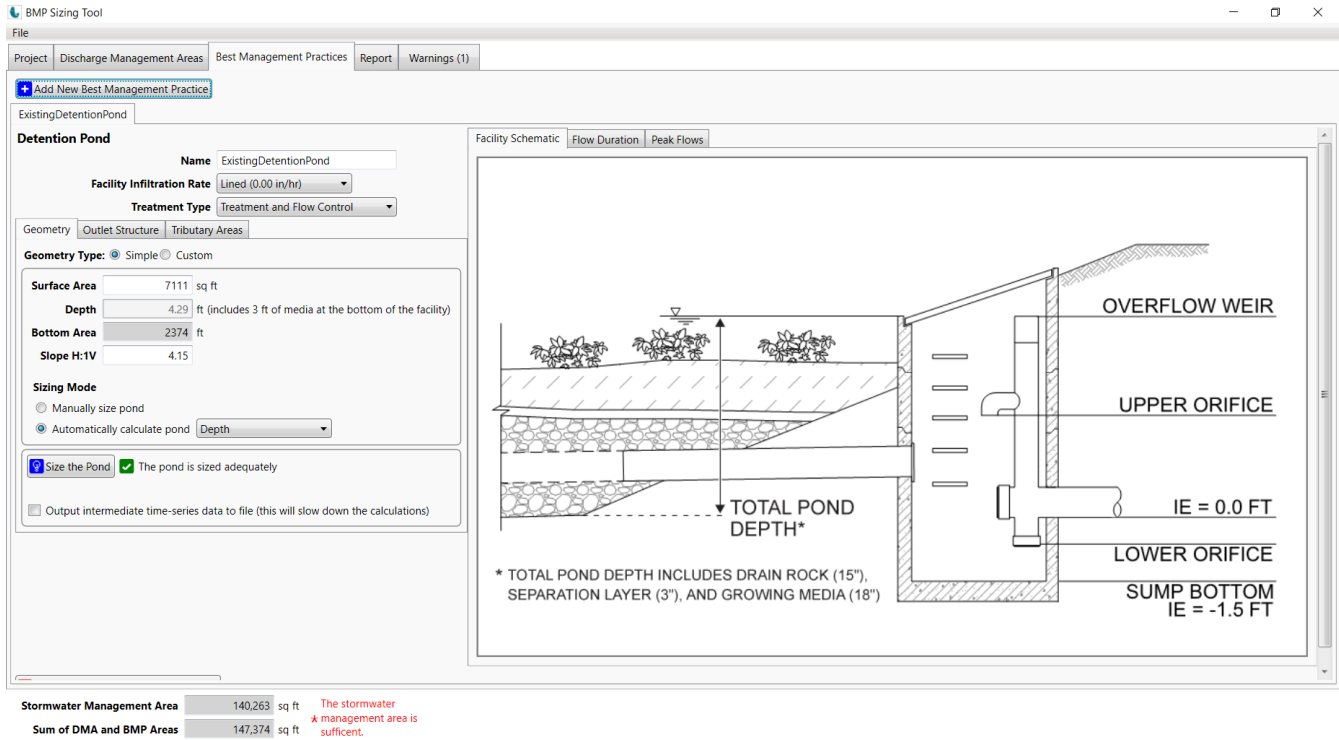


Figure 5-3: Existing Detention Pond BMP

The tool assumes a layer of planting and filtration media at the bottom of the pond, which is described in the manual as having a depth of 3 feet and a porosity of 0.4. The existing detention pond does not use this design, so the actual detention volume recommended by the tool was calculated. This value (13,000 cubic feet) was less than the total volume of the current detention pond (17,800 cubic feet). Suppressing any facility infiltration in the sizing tool further bolsters confidence that the current detention pond is adequately sized.

It is likely that the increased flow to the pond may necessitate upsized capacity in the conveyance infrastructure. Determining the extent of that increase is outside the scope of this report.

Note that the tool was used to determine the flow for 3 different layout options. Options 1 and 2 added 0.89 acres of impervious area, while Option 3 added 0.80 acres of impervious area. For this reason, only the calculations relating to Option 1 are shown in this report. However, the sizing tool suggests that the facility is appropriately sized for any of the 3 options.

APPENDICES

The following Appendices are included for this report:

- A-1 NRCS Soil Survey**
- A-2 BMP Sizing Tool Report – Options 1 and 2**
- A-3 BMP Sizing Tool Report – Option 3**

A-1 NRCS Soil Survey

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Clackamas County Area, Oregon

88A—Willamette silt loam, wet, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 227q

Elevation: 150 to 350 feet

Mean annual precipitation: 40 to 50 inches

Mean annual air temperature: 52 to 54 degrees F

Frost-free period: 165 to 210 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Willamette, wet, and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willamette, Wet

Setting

Landform: Terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Stratified glaciolacustrine deposits

Typical profile

H1 - 0 to 14 inches: silt loam

H2 - 14 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 30 to 42 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C

Ecological site: R002XC008OR - Valley Terrace Group

Forage suitability group: Moderately Well Drained < 15% Slopes (G002XY004OR)

Other vegetative classification: Moderately Well Drained < 15% Slopes (G002XY004OR)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Clackamas County Area, Oregon

Survey Area Data: Version 20, Sep 7, 2023

A-2 BMP Sizing Tool Report – Options 1 and 2

WES BMP Sizing Report

Project Information

Project Name	Wilsonville Drainage (Option 1)
Project Type	Addition
Location	28879 SW Boberg Rd, Wilsonville, OR 97070
Stormwater Management Area	140263.2
Project Applicant	Julia
Jurisdiction	OutofDistrict

Drainage Management Area

Name	Area (sq-ft)	Pre-Project Cover	Post-Project Cover	DMA Soil Type	BMP
Existing Impervious	101,495	Impervious	Conventional Concrete	C	Existing Detention Pond
Additional Impervious	38,768	Grass	Conventional Concrete	C	Existing Detention Pond

LID Facility Sizing Details

Pond Sizing Details

Pond ID	Design Criteria(1)	Facility Soil Type	Max Depth (ft)(2)	Top Area (sq-ft)	Side Slope (1:H)	Facility Vol. (cu-ft)(3)	Water Storage Vol. (cu-ft)(4)	Adequate Size?
Existing Detention Pond	FCWQT	Lined	4.29	7,111.0	4.15	19,439.0	12,610.3	Yes

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only

2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).

3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.

4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.

Custom Pond Geometry Configuration

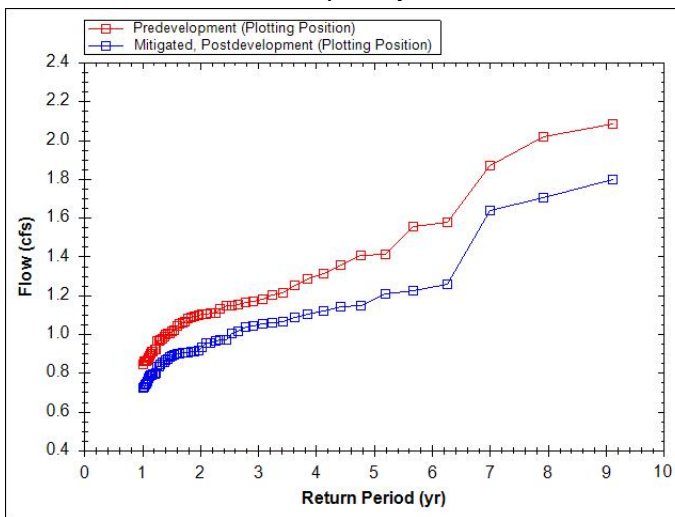
Pond ID: ExistingDetentionPond

Design: FlowControlAndTreatment

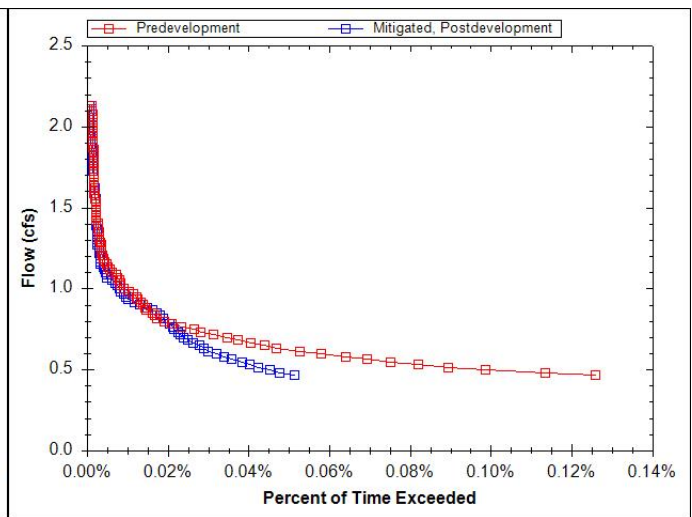
Shape Curve

Depth (ft)	Area (sq ft)	Discharge (cfs)
.0	3,054.0	.0
3.5	7,111.0	100.0

Flow Frequency Chart



Flow Duration Chart



A-3 BMP Sizing Tool Report – Option 3

WES BMP Sizing Report

Project Information

Project Name	Wilsonville Drainage (Option 3)
Project Type	Industrial
Location	
Stormwater Management Area	0
Project Applicant	Julia Lewis
Jurisdiction	OutofDistrict

Drainage Management Area

Name	Area (sq-ft)	Pre-Project Cover	Post-Project Cover	DMA Soil Type	BMP
Existing Impervious	101,495	Impervious	Conventional Concrete	C	Existing Detention Pond
Additional Impervious	34,848	Grass	Conventional Concrete	C	Existing Detention Pond

LID Facility Sizing Details

Pond Sizing Details

Pond ID	Design Criteria(1)	Facility Soil Type	Max Depth (ft)(2)	Top Area (sq-ft)	Side Slope (1:H)	Facility Vol. (cu-ft)(3)	Water Storage Vol. (cu-ft)(4)	Adequate Size?
Existing Detention Pond	FCWQT	Lined	4.23	7,111.0	4.15	19,293.1	12,355.4	Yes

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only

2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).

3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.

4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.

Custom Pond Geometry Configuration

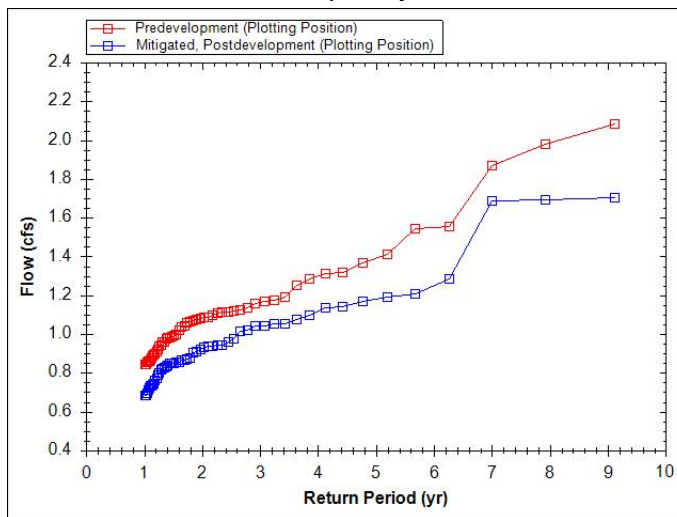
Pond ID: ExistingDetentionPond

Design: FlowControlAndTreatment

Shape Curve

Depth (ft)	Area (sq ft)	Discharge (cfs)
.0	3,054.0	.0
3.5	7,111.0	100.0

Flow Frequency Chart



Flow Duration Chart

