WINDSOR
ENGINEERS

PRELIMINARY STORMWATER

TECHNICAL INFORMATION REPORT

JUNE 29, 2023

748 Homestead Washington Street

City of Woodland, Washington

Submitted by
Windsor Engineers
Civil, Mechanical & Electrical Engineers
27300 NE 10th Avenue
Ridgefield, WA 98642
360.610.4931

Prepared for
City of Woodland
230 Davidson Avenue
Woodland, WA 98674

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1.0 CERTIFICATION PAGE

CERTIFICATE OF THE ENGINEER

Title: Preliminary Stormwater Technical Information Report

Project: 748 Homestead Washington Street

This Technical Information Report (TIR) has been prepared under my supervision and meets the standard of care for similar documents within this community. The TIR includes the required information per the below references and complies with the code. The proposed stormwater design is feasible.

References:

2019 Stormwater Management Manual for Western Washington (The 2019 SWMMWW) – Department of Ecology, State of Washington

Windsor Engineers LLC

Reviewed By: Emily Stephens, PE
Designed By: Dan Koistinen, EIT

2.0 REFERENCES

Clean Water Act. (n.d.). Retrieved from https://www.epa.gov/laws-regulations/summary-clean-water-act

Department of Ecology. (n.d.). Western Washington Stormwater Manual (WWSWM). Retrieved from https://www.clark.wa.gov/public-works/stormwater-code-and-manual

DOE Water Quality Permits. (n.d.). Retrieved from https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits

National Pollutant Discharge Elimination System (NPDES). (n.d.). Retrieved from https://www.epa.gov/npdes

Washington Department of Ecology. (n.d.). Construction Stormwater General Permit. Retrieved from https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit

Washington State Department of Ecology. (n.d.). DOE Stormwater Manuals. Retrieved from https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals

3.0 PROJECT TEAM

Jurisdiction

City of Woodland
230 Davidson Avenue
Woodland, WA 98674

Developer

Homestead, LLC
PO Box 255
Yacolt, WA 98675
roger.foley505@gmail.com
360.667.8477

Civil Engineer

Windsor Engineers LLC
27300 NE 10th Avenue
Ridgefield, WA 98642
360.610.4931

Reviewed By:
Emily Stephens, PE, Civil Engineer
estephens@windsorengineers.com

Designed By:
Dan Koistinen, EIT
dkoistinen@windsorengineers.com

4.0 GENERAL

4.1 Purpose and Scope

The purpose of this report is to demonstrate preliminary feasibility of stormwater management associated with the construction of 748 Homestead Washington Street. This report will evaluate and describe the proposed stormwater conveyance, water quality, and water quantity design.

4.2 Project Location

Address	748 Washington Street, Woodland WA 98674
Parcels	50346
Area	0.75 acre
Section-Township-Range	24-5N-1W
Jurisdiction	City of Woodland

4.3 Project Description

The project site is located on a 0.75-acre parcel (50346) at 748 Washington Street, Woodland WA 98674 in the City of Woodland (Figure 1). The developer plans to construct 5 single-family homes. There is currently an existing single-family residence and driveway on the parcel accounting for approximately 2,600 square feet (SF) of existing impervious area. The current existing single-family residence and driveway will be demolished as part of the development.

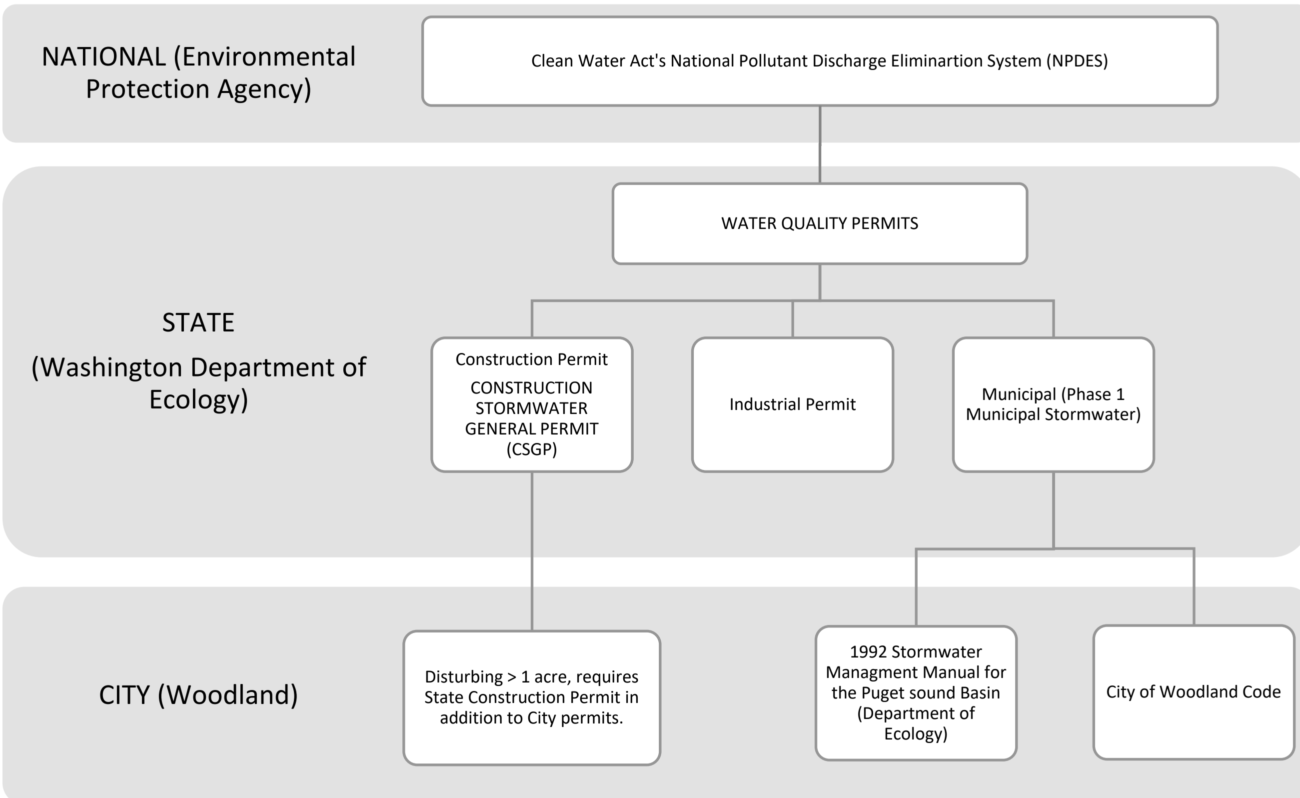
The site topography is generally flat with slopes of 0 - 5 percent (%). The development site is an oversized lot in an existing subdivision lot that was previously graded. A geotechnical analysis is currently in progress for the site; and will be included with the final TIR. A geotechnical report by Jolma Design, LLC for an adjacent site has been included in Appendix B. For the preliminary modeling, 3.27 in/hr for a design infiltration rate was used from this geotechnical report. According to the Natural Resource Conservation Service (NRCS), soil types near the site are primarily Clato Silt Loam and Newberg Fine Sandy Loam. Soil data from Web Soil Survey is included in Appendix B. There are no critical areas mapped near the site according to Cowlitz County GIS.

For the purposes of this report and stormwater, the project site is defined as the entire 0.75-acre parcel. Site grading will be done in a manner that will drain runoff away from the homes. Runoff from the roofs, driveways, and lots will primarily drain individual lot Best Management Practices (BMPs).

Figure 1: Project Location via Lewis County GIS Base Map

4.4 Applicable Codes and Standards

To protect our Country's waters, legislature was enacted starting very broadly as the Clean Water Act of 1972, administered by the Environmental Protection Agency (EPA) as the National Pollutant Discharge Elimination System (NPDES) and subsequently delegated to the local (state) authority as a Washington Department of Ecology (DOE) Water Quality Permit, and finally managed as the Construction Stormwater General Permit (CSGP). Washington State implements the CSGP through the Washington DOE Stormwater Manual and municipalities/counties may adopt portions of this manual or an equivalent.



The calculations and stormwater management edition methods in the report are based on the following references:

2019 Stormwater Management Manual for Western Washington (SWMMWW)

4.5 Determination of Applicable Minimum Requirements

The 0.75-acre project will construct 5 single family homes, driveways, frontage improvements to Washington Street, utilities, and stormwater facilities. It is assumed that 0.75 acres will be disturbed.

- Total Site Area: 0.75 acres
- Disturbed Area: 0.75 acres
- Existing Impervious: 0.06 acres
- Proposed Impervious: 0.41 acres

The project proposes more than 5,000 SF of new impervious surfaces. All minimum requirements (MRs) #1-9 will apply to the project sites new and replaced hard surfaces.

Assumptions included in the calculations and MGS Flood modeling described in this report include the values listed in Table 1:

Table 1: Modeling Land Cover and Impervious Assumptions

Land-Disturbing Activity	Area (SF)	Area (Acres)
Total Parcel Size	32,721	0.751
Existing Hard Surface	6,700	0.154
Proposed Hard Surface	17,750	0.407
Vegetation Converted to Lawn or Landscaping	14,971	0.344
New Non-PGHS Surfaces: Proposed Patio/Sidewalk	0	0.000
New Non-PGHS Surfaces: Proposed House Roof	10,000	0.230
New PGHS Surfaces: Proposed Driveway	7,750	0.178
Total Non-pollution Generating Surfaces	10,000	0.230
Total Pollution Generating Surfaces	22,721	0.522
Total Amount of Land-Disturbing Activity	**32,721**	0.751

5.0 MINIMUM REQUIREMENTS

This site triggers minimum requirements (MRs) #1-9 because it will add more than 5,000 SF of impervious surface. The following best management practices (BMP) are proposed to be incorporated into the site and will be discussed with each applicable MR in the sections below:

- Lawn and Landscape Areas – BMP T5.13 Post Construction Soils Depth and Quality
  - The area converted to lawn and landscape is under ¾ of an acre. The green space will be constructed to meet the Department of Ecology's BMP T5.13 and will fully disperse or soils meeting BMP T5.13.
  - The dispersion element/facility (BMP T5.13 dispersion area) is represented in the MGS Flood model by a long, shallow pond with a maximum depth of 0.15 feet. The length represents the flow path dispersion area, that is constructed to BMP T5.13 standards. The width of the pond was determined by measuring the width of the lawn. The runoff from the lawn area flows through the soils meeting BMP 5.13.
- Driveway – BMP T5.13 Post Construction Soils Depth and Quality, and BMP T7.40 CAVFS
  - The CAVFS System will follow the contour of the driveway and parking area for an approximate length of each driveway with an approximate width of 1.5 feet (ft). The CAVFS system will be built to the DOE Standard for BMP T7.40 CAVFS and will have a total amended soil depth of 12 inches. The CAVFS System serving the sidewalk area is 3 ft wide.
  - The modeling for the driveway surface areas are modeled as impervious area flowing into a CAVFS element/facility. Each impervious area will meet the treatment standards of the 2019 SWMMWW. The driveway runoff flows through a 1 ft flow spreader, CAVFS and then through area drains to a center infiltration gallery for each lot.
- Roofs and Driveways – BMP T7.20
  - The infiltration trenches will receive runoff treated from CAVFS and from roof tops to provide flow control.
  - The proposed BMP T7.20 Infiltration Trenches will meet the standard set by the 2019 SWMMWW. The proposed trenches are 40 ft long x 4.0 ft wide x 3.5 ft deep.

Typical details for a the BMPs can be found in **Appendix D**. This will be included with the final engineering plans, and final TIR.

5.1 Minimum Requirement #1: Preparation of Stormwater Site Plans

A site stormwater plan is included in the preliminary engineering plans. A preliminary stormwater concept has been included in **Appendix A** along with the preliminary stormwater calculations and assumptions to accompany the preliminary plat application.

5.2 Minimum Requirement #2: Construction Stormwater Pollution Prevention

The project results in more than 2,000 SF of new impervious and less than one acre of disturbed area; therefore, a Construction Stormwater Pollution Prevention Plan (SWPPP) is required but the NPDES Permit is not required. The SWPPP is included in the Engineering Plans as Sheet C110 Erosion Control Plan.

Should clearing, grading and other soil disturbing activities occur between October 1 through April 30th, additional measures, as needed, will be taken to satisfy the SWMMWW seasonal work limitations.

5.3 Minimum Requirement #3: Source Control of Pollution

The residential site consists of frontage improvements, driveways, single family homes, utilities, and stormwater BMPs. The driveways and streets are considered pollutant generating hard surfaces (PGHS). All PGHS within the project site will be routed over CAVFS to provide treatment meet a low impact development (LID) approach and basic treatment requirements.

5.4 Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls

Mass grading of the site will not be performed. The lot is an already graded lot located within a subdivision.

5.5 Minimum Requirement #5: On-site Stormwater Management

The project is within the City of Woodland limits and is less than 1 acre in size; therefore, based on the SWMMWW, LID standards are required to be met by using "*any Flow Control BMPs desired to achieve the LID Performance Standard, and applying BMP T5.13: Post-Construction Soil Quality and Depth*." The LID performance standard is being met using a combination of BMP T7.40 CAVFS, BMP T7.20 Infiltration Trenches, and BMP T5.13 Post Construction Soils Depth and Quality. The driveway runoff is conveyed to the BMP T7.20 infiltration trenches after passing over the BMP T7.20 CAVFS to help meet flow control requirements. See **Appendix C** for MGSFlood model inputs and results.

Table 2: Individual Lot Area Break Down

MGS Flood Areas								
Lot Number	Lot Area		Paved/Concrete Area		Roof Area		Green Space	
	sf	ac	sf	ac	sf	ac	sf	ac
Lot1	6,004	0.14	600	0.013	2,000	0.046	3,404	0.078
Lot2	6,004	0.14	600	0.013	2,000	0.046	3,404	0.078
Lot3	6,315	0.14	1,900	0.042	2,000	0.046	2,415	0.055
Lot4	6,318	0.15	1,900	0.042	2,000	0.046	2,418	0.056
Lot5	6,320	0.15	1,900	0.042	2,000	0.046	2,420	0.056
Right of Way	1,760	0.04	850	0.019	-	-	910	0.021
Total	**32,721**	**0.75**	**7,750**	**0.17**	**10,000**	**0.23**	**14,971**	**0.34**

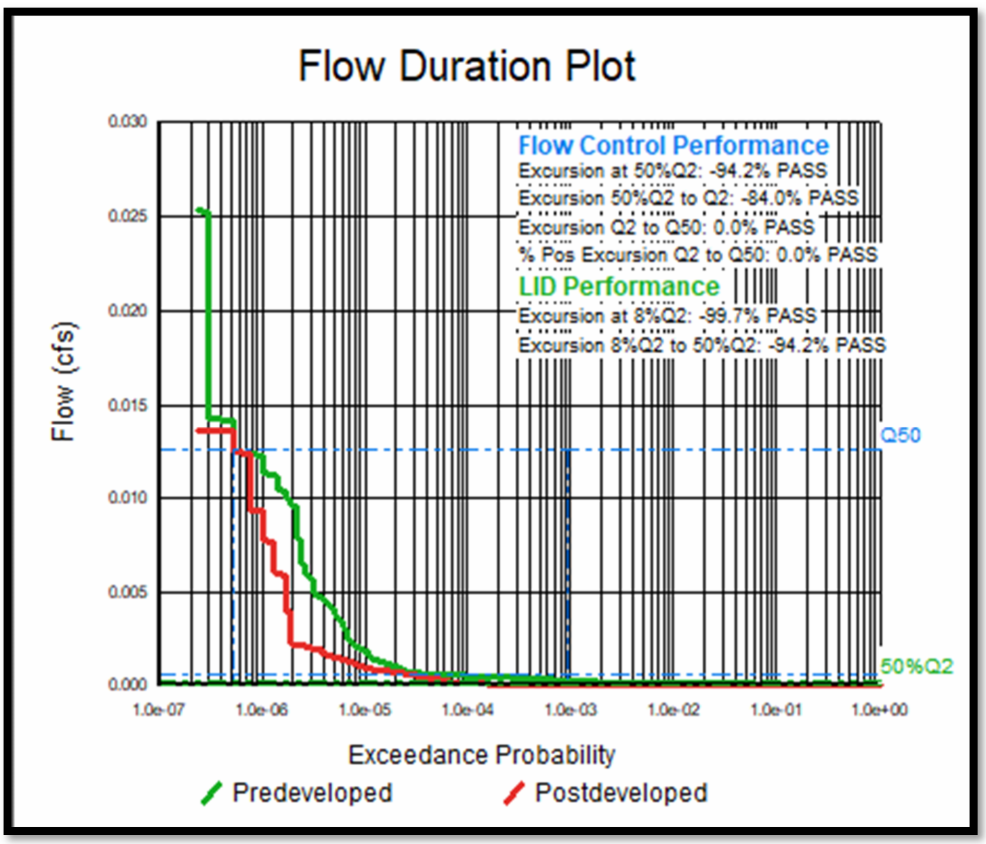


Figure 2: MGSFlood Results Showing for LID and Flow Control Requirements

5.6 Minimum Requirement #6: Runoff Treatment

MR #6 is applicable to threshold discharge areas (TDAs) that have more than 5,000 SF of PGHS. The project proposes approximately 17,800 SF (0.41 acres) of new impervious surfaces from the frontage improvements, roofs and driveways; therefore, MR #6 applies. All new PGHS will be routed over CAVFs to achieve a minimum treatment level of 91% with continuous stormwater modeling. The runoff will then be captured and routed to an infiltration trench via area drains for flow control. Roof runoff will first be routed directly to the same infiltration trench for infiltration and flow control.

5.6.1 Modeling

MGS Flood was used to model compliance with the requirements of the 2019 SWMMWW. This is a single-family residential development; therefore, enhanced treatment is not required.

An estimated infiltration rate of 3.27 inches per hour (in/hr) was used in these preliminary calculations. Due to the current pending status of the geotechnical analysis and report, this rate is an estimate based off the findings from recent geotechnical studies completed in the surrounding area with similar soils. Once the geotechnical findings are completed, the actual infiltration rates will be updated to reflect the findings.

5.7 Minimum Requirement #7: Flow Control

Developed discharge durations must match pre-developed durations for the range of pre-developed discharge rates from 50% of the 20-year peak flow up to the full 50-year peak flow. The infiltration basins located on each lot provide adequate flow control. All new PGHS will be routed over CAVFs to achieve a minimum treatment level of 91% with continuous stormwater modeling. The runoff will then be captured and routed to an infiltration trench via area drains for flow control. Roof runoff will first be routed to the same infiltration trench for dispersion. See **Appendix C** for MGSFlood results that demonstrate flow control provided by the BMPs.

5.8 Minimum Requirement #8: Wetlands Protection

There are no critical areas or wetlands found within the immediate vicinity of the site.

5.9 Minimum Requirement #9: Operation and Maintenance

The individual lot stormwater system will be privately owned, operated, and maintained. See Volume V of the SWMMWW. The City of Woodland will assume ownership for the CAVFS that treat runoff associated with the frontage improvements.

6.0 CONVEYANCE SYSTEMS ANALYSIS AND DESIGN

All stormwater piping shall meet the minimum requirements of the Woodland City Code. All storm sewer conveyance calculations will be completed with the final stormwater TIR and managed following the 2019 SWMMWW, making the potential impact on the downstream properties and conveyances systems minimal.

7.0 ADDITIONAL REQUIREMENTS

7.1 Offsite Analysis

No offsite analysis has been complete at this stage. The site is located in an established subdivision with slopes from 0-5%. Flow from adjacent parcels will be very minimal.

7.2 Closed Depression Analysis

This site is not classified as a closed depression; therefore, this section does not apply.

7.3 Other Permits

A NPDES permit will be required due to more than one acre of disturbance and will be applied for prior to construction.

7.4 Approval Conditions Summary

All conditions from the site plan review will be addressed in the final TIR.

7.5 Special Reports and Studies

The following analysis have been, or will be completed:

Geotechnical – To be completed

8.0 APPENDICES

Appendix A – Stormwater Calculation Assumptions and Stormwater Concept

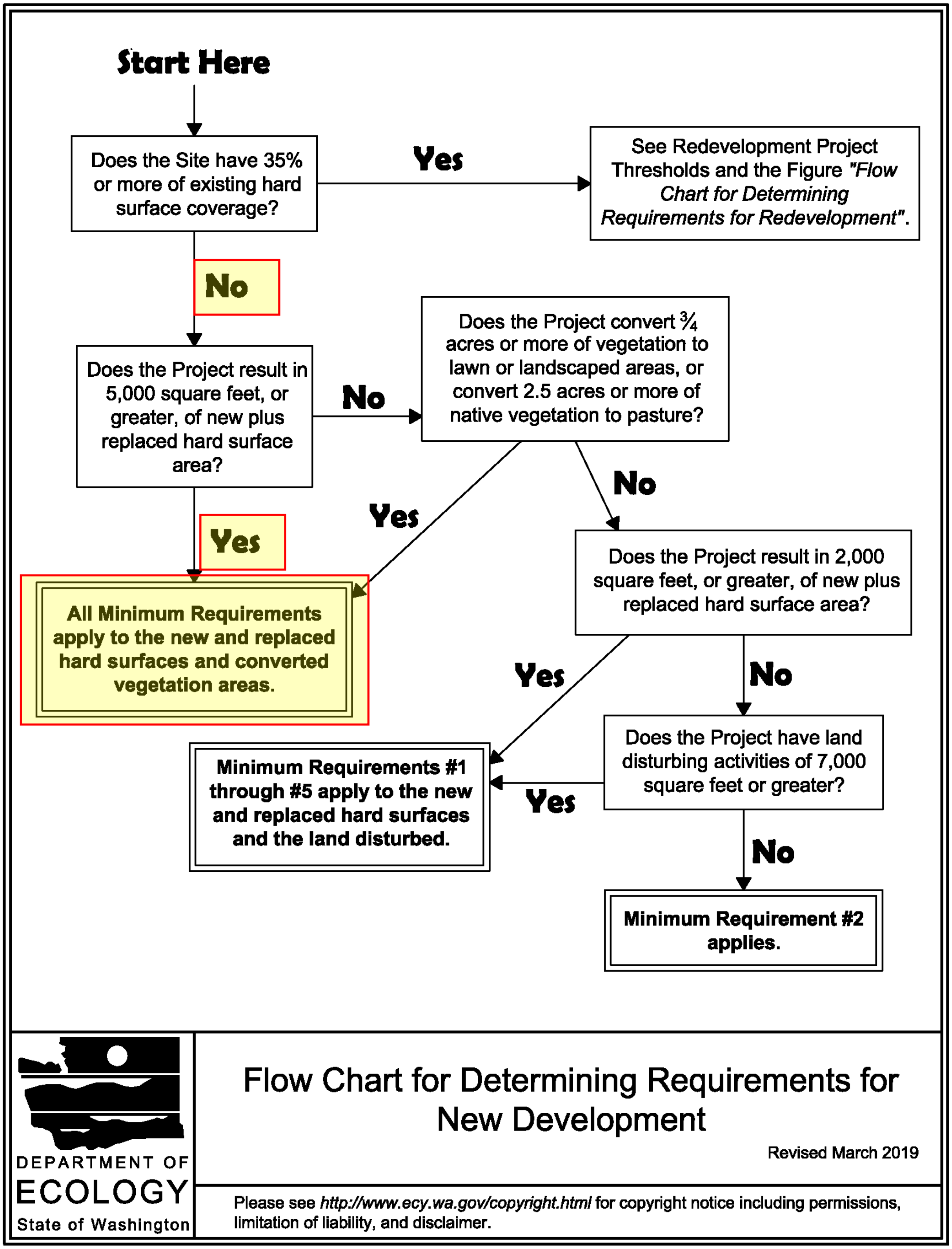
Appendix B – Geotechnical Information

Appendix C – MGS Flood Modeling Results

Appendix D – BMP Details

APPENDIX A: STORMWATER CALCULATION ASSUMPTIONS AND STORMWATER CONCEPT

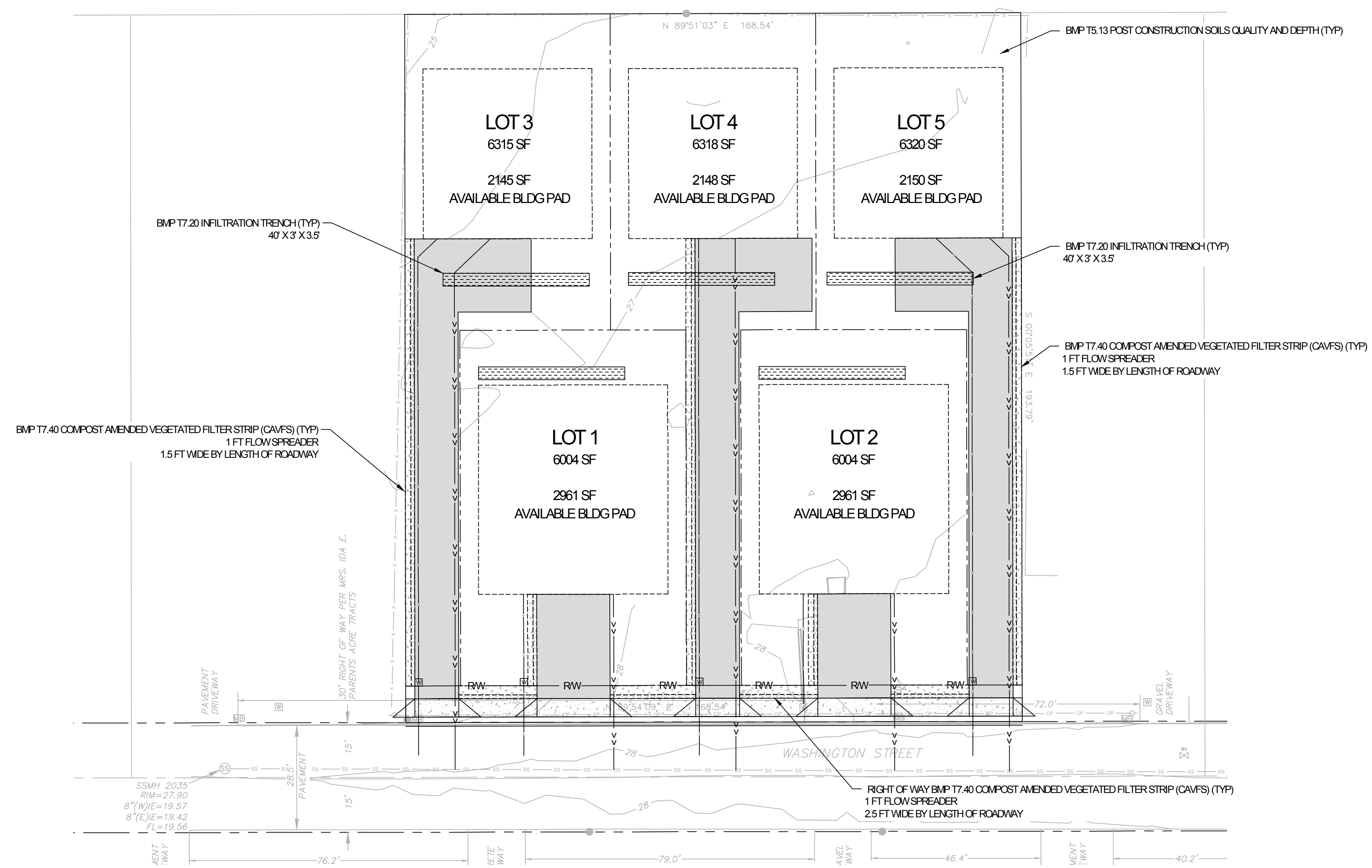
Figure I-3.1: Flow Chart for Determining Requirements for New Development



STORMWATER KEYNOTES:

A. STORMWATER FACILITIES THAT ARE PRIVATELY OWNED SHALL BE MAINTAINED BY THE LANDOWNER

B. ALL INFILTRATION SHALL BE AT LEAST 10 FEET FROM ANY STRUCTURE, PROPERTY LINE, OR SENSITIVE AREA (EXCEPT SLOPES OVER 40%)



STORMWATER PLAN

SCALE: 1" = 20'

0 20' 40'

N

811. Know what's **below.** **Call** before you dig.

CALL 2 BUSINESS DAYS BEFORE YOU DIG. CAUTION: UTILITY INFORMATION IS APPROXIMATE. VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION.

Revisions:

LINE IS 1" ON FULL SCALE DRAWING

WINDSOR ENGINEERS

Ridgefield, WA
Duluth + Minneapolis, MN
www.windsorengineers.com

PRELIMINARY

748 HOMESTEAD
748 WASHINGTON STREET, WOODLAND, WA 98674

SITE PLAN REVIEW

Project No: 21035.1
Issue Date: 6/28/2023

Project Manager DCK
Drawn by CKJ / CK
Checked by TWT

STORMWATER PLAN

C390

ISSUED FOR SITE PLAN REVIEW

APPENDIX B: GEOTECHNICAL INFORMATION

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Cowlitz County, Washington

June 19, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map


122° 45' 10" W
122° 45' 7" W
45° 54' 30" N
45° 54' 27" N
519160
519170
519180
519190
519200
519210
519220
5083910
5083900
5083890
5083880
5083870
5083860
5083850
5083840
5083830
32
141
Washington St
Soil Map may not be valid at this scale.
N
Map Scale: 1:444 if printed on A portrait (8.5" x 11") sheet.
Meters
0 5 10 20 30
Feet
0 20 40 80 120
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cowlitz County, Washington
Survey Area Data: Version 23, Aug 31, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 26, 2019—Jun 11, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
32	Clato silt loam, 0 to 3 percent slopes	0.3	31.0%
141	Newberg fine sandy loam, 0 to 3 percent slopes	0.6	69.0%
Totals for Area of Interest		**0.8**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

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

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

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

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

Cowlitz County, Washington

32—Clato silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2fch
Elevation: 30 to 300 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 160 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Clato and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clato

Setting

Landform: Flood plains
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: 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: More than 80 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F002XB004WA - Portland Basin Forest
Forage suitability group: Soils with Few Limitations (G002XV502WA)
Other vegetative classification: Soils with Few Limitations (G002XV502WA)
Hydric soil rating: No

Minor Components

Newberg

Percent of map unit: 5 percent
Landform: Alluvial cones
Hydric soil rating: No

141—Newberg fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2f3d
Elevation: 10 to 1,500 feet
Mean annual precipitation: 18 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Newberg and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Newberg

Setting

Landform: Flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 28 inches: very fine sandy loam
H3 - 28 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A
Ecological site: F002XA008WA - Puget Lowlands Riparian Forest
Forage suitability group: Soils with Few Limitations (G002XV502WA)
Other vegetative classification: Soils with Few Limitations (G002XV502WA)
Hydric soil rating: No

Minor Components

Chehalis

Percent of map unit: 5 percent

Hydric soil rating: No

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SOILS ANALYSIS REPORT

WASHINGTON STREET SHORT PLAT

& CC STREET SHORT PLAT

FEBRUARY 13, 2020

PREPARED FOR:
ROGER FOLEY
35909 NE 251ST AVENUE
PO BOX 99
YACOLT, WA 98675
ROGER.FOLEY505@GMAIL.COM
(360) 901-0056

PREPARED BY:
JOLMA DESIGN, LLC
PO BOX 1281
BATTLE GROUND, WA 98604
ADMIN@JOLMADESIGN.COM
(360) 723-0392

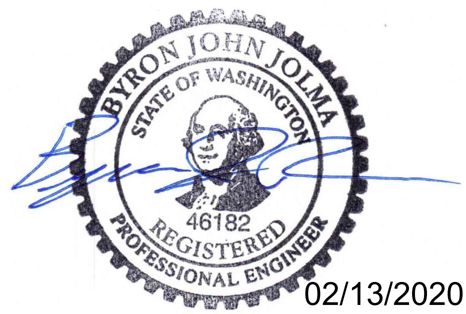
JOLMA DESIGN, LLC

SOILS ANALYSIS REPORT

WASHINGTON STREET SHORT PLAT
& CC STREET SHORT PLAT

THE MATERIAL AND DATA IN THIS REPORT WERE PREPARED UNDER THE SUPERVISION AND DIRECTION OF THE UNDERSIGNED.

JOLMA DESIGN, LLC



02/13/2020

BYRON JOLMA, PE
PRINCIPAL ENGINEER

CONTENTS

1 INTRODUCTION

1.1 Site Location & Description

The project site is comprised of two (2) tax lots located at 437 Washington Street and 438 CC Street, Woodland, Washington 98674.

Both sites have an existing house and garage. Each site currently contains its own existing driveway located on the property.

1.2 Proposed Development

The client is proposing to divide these two parcels, approximately 1.1-acres total, zoned low density residential (LDR-6) under City of Woodland short plat land division procedures. This project will be divided into two (2) short plat applications and this process will require a boundary line adjustment.

2 SOILS DESCRIPTION

2.1 Mapped Soil Type

According to the Cowlitz County GIS at the site of 438 CC street and 437 Washington Street in Woodland, Washington. Onsite soils primary consists of Newberg sandy loam (NbB), 0 to 3 percent slopes.

The Newberg series generally consists of very deep, somewhat excessively drained soils formed in loamy and sandy alluvium from sedimentary and basic igneous rocks on flood plains having 0 to 4 percent slopes. NbB soils typically have moderately rapid permeability, slow runoff, and are classified under Hydrologic Soil Group.

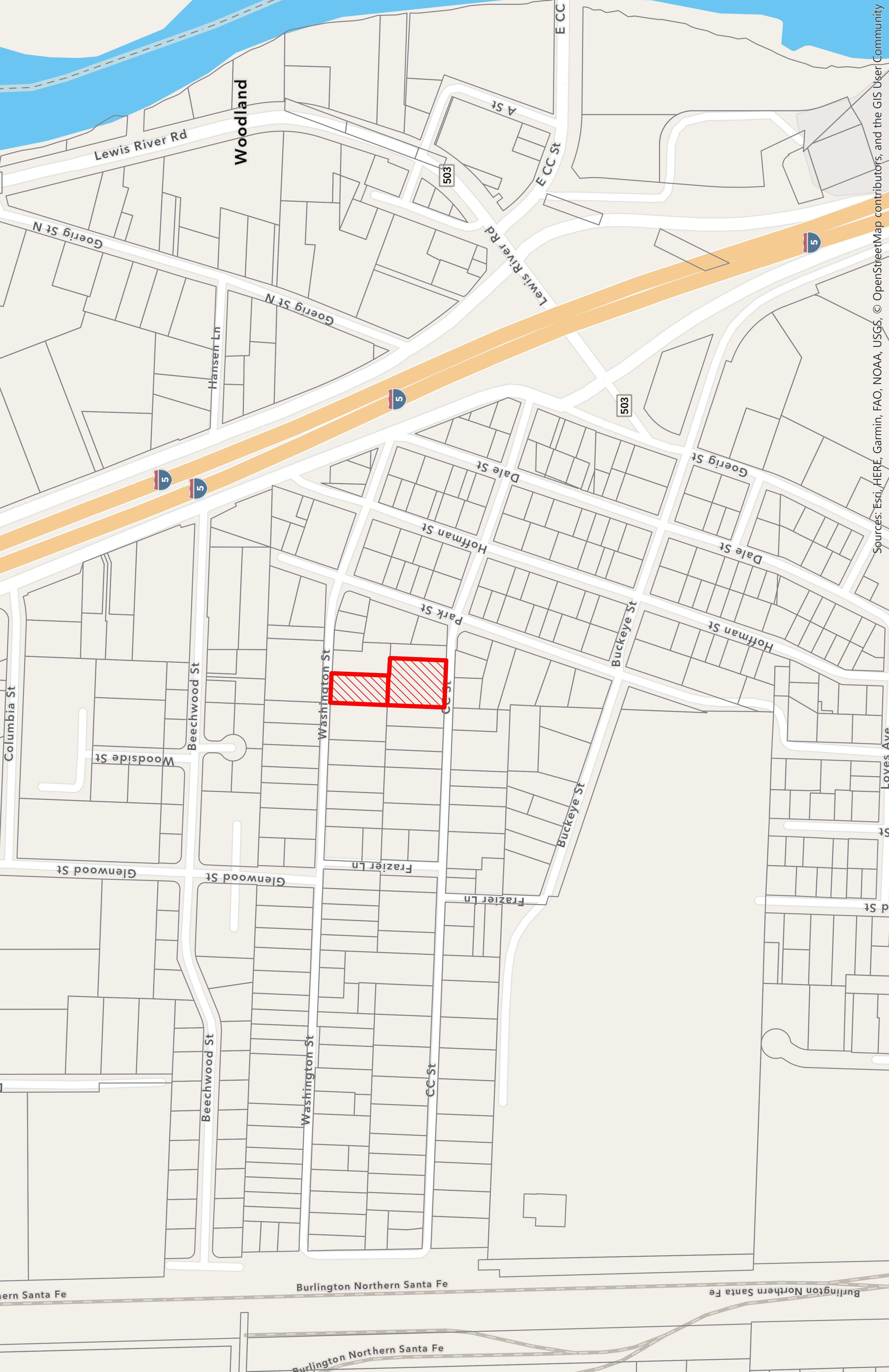
2.2 Infiltration Testing

An infiltration test was conducted on January 2, 2020. There were two (2) tests at approximately 6" depth that were performed along Washington Street (IT-01) and CC Street (IT-02). The infiltration test results are included in the appendix of this report.

2.3 Conclusions and Recommendations

JD recommends infiltration to near-surface soils downgradient of dispersion BMPs be used to meet the flow control requirements.

FIGURES


Woodland
Lewis River Rd
Goerig St N
Goerig St N
Hansen Ln
A St
E CC St
E CC
503
Lewis River Rd
5
503
Goerig St
Dale St
Hoffman St
Park St
Dale St
Hoffman St
Buckeye St
Washington St
CC St
Columbia St
Beechwood St
Woodside St
Glenwood St
Glenwood St
Frazier Ln
Frazier Ln
Buckeye St
Loves Ave
Beechwood St
Washington St
CC St
Burlington Northern Santa Fe
Burlington Northern Santa Fe
Burlington Northern Santa Fe
Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

ATTACHMENT 1

INFILTRATION TEST RESULTS

INFILTRATION TEST DATA SHEET

Project Information

Project Name:	CC Street Short Plat	***Project No.:***	19166
Project Address:	438 CC Street & 437 Washington Street Woodland, WA 98674		
Test Hole No.:	IT-01	***Tested By:***	DRR
Test Hole Depth:	6"	***Date:***	1/2/2020
Depth to Groundwater	>5 ft	***Weather:***	Cloudy, 46°

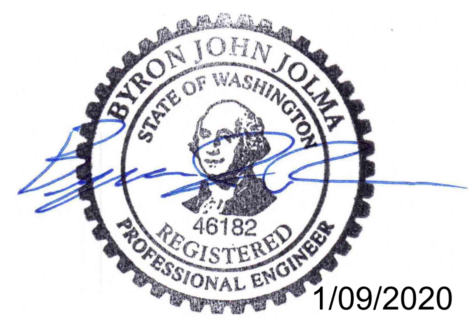
Calculations

Parameters

Parameter	Description	Equation	Value
L	Length of Flow/Embedment Depth (in)	n/a	6
t	Elapsed Drawdown Time (hr)	Stop Time - Start Time	Varies
k_T	Tested Coefficient of Permeability (in/hr)	k_T =(L/t)*ln(h_i /h_f)	Varies
k_{AVG}	Avg. Tested Coefficient of Permeability (in/hr)	k_{AVG}=k $_{T1+T2+...Tn}$/No. of Trials	6.55
CF	Correction Factor		2
k_{DES}	Design Coefficient of Permeability (in/hr)	k_{DES}=k_{AVG}/ CF_{TOT}	3.27

Notes:

This test was an adjacent to Washington Street.



1/09/2020

Field Data

Trial No.	Start Time	Stop Time	Elapsed Drawdown Time, t (hr)	Initial Depth to Water (in)	Final Depth to Water (in)	Initial Height of Water, h_i (in)	Final Height of Water, h_f (in)	k_T (in/hr)
1	11:21 AM	12:21 PM	1:00	0.00	6.25	9.00	2.75	7.11
2	12:21 PM	1:21 PM	1:00	0.00	6.13	9.00	2.88	6.85
3	1:21 PM	1:41 PM	0:20	0.00	2.44	9.00	6.56	5.69

INFILTRATION TEST DATA SHEET

Project Information

Project Name:	CC Street Short Plat	***Project No.:***	19166
Project Address:	438 CC Street & 437 Washington Street Woodland, WA 98674		
Test Hole No.:	IT-02	***Tested By:***	DRR
Test Hole Depth:	6"	***Date:***	1/2/2020
Depth to Groundwater	>5 ft	***Weather:***	Cloudy, 46°

Calculations

Parameters

Parameter	Description	Equation	Value
L	Length of Flow/Embedment Depth (in)	n/a	6
t	Elapsed Drawdown Time (hr)	Stop Time - Start Time	Varies
k_T	Tested Coefficient of Permeability (in/hr)	$k_T = (L/t) \cdot \ln(h_i/h_f)$	Varies
k_{AVG}	Avg. Tested Coefficient of Permeability (in/hr)	$k_{AVG} = k_{T1+T2+ \ldots Tn}$/No. of Trials	13.18
CF	Correction Factor		2
k_{DES}	Design Coefficient of Permeability (in/hr)	$k_{DES} = k_{AVG}/CF_{TOT}$	6.59

Notes:

This test was adjacent to CC Street.

BYRON JOHN JOLMA
STATE OF WASHINGTON
46182
REGISTERED
PROFESSIONAL ENGINEER

1/09/2020

Field Data

Trial No.	Start Time	Stop Time	Elapsed Drawdown Time, t (hr)	Initial Depth to Water (in)	Final Depth to Water (in)	Initial Height of Water, h_i (in)	Final Height of Water, h_f (in)	k_T (in/hr)
1	11:33 AM	12:08 PM	0:35	0.00	6.63	9.00	2.38	13.70
2	12:08 PM	12:43 PM	0:35	0.00	6.50	9.00	2.50	13.18
3	12:43 PM	1:18 PM	0:35	0.00	6.38	9.00	2.63	12.67

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Cowlitz County, Washington

CC Street Short Plat Soils Report

December 18, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:1,330 if printed on A landscape (11" x 8.5") sheet.

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 LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cowlitz County, Washington
Survey Area Data: Version 20, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 26, 2019—Jun 11, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
141	Newberg fine sandy loam, 0 to 3 percent slopes	6.6	100.0%
Totals for Area of Interest		**6.6**	**100.0%**

Map Unit Descriptions

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

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

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

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

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

Cowlitz County, Washington

141—Newberg fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2f3d
Elevation: 10 to 1,500 feet
Mean annual precipitation: 18 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Newberg and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Newberg

Setting

Landform: Flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 28 inches: very fine sandy loam, sandy loam, fine sandy loam
H2 - 10 to 28 inches: fine sandy loam, loamy fine sand, loamy very fine sand
H2 - 10 to 28 inches:
H3 - 28 to 60 inches:
H3 - 28 to 60 inches:
H3 - 28 to 60 inches:

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water storage in profile: Very high (about 20.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A
Forage suitability group: Soils with Few Limitations (G002XV502WA)
Hydric soil rating: No

Minor Components

Chehalis

Percent of map unit: 5 percent
Hydric soil rating: No

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APPENDIX C: MGS FLOOD MODELING RESULTS

MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.58
Program License Number: 202010002
Project Simulation Performed on: 06/20/2023 3:37 PM
Report Generation Date: 06/20/2023 3:37 PM

Input File Name: 748 Homestead - Prelim.fld
Project Name: 438 Homestead
Analysis Title: Preliminary
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 15

Extended Precipitation Time Series Selected

Full Period of Record Available used for Routing

Climatic Region Number: 26
Precipitation Station : 97004805 Vancouver 48 in_5min 10/01/1939-10/01/2060
Evaporation Station : 971048 Vancouver 48 in MAP

Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : Ecology Default

********** Default HSPF Parameters Used (Not Modified by User) ***************

********************** WATERSHED DEFINITION ***********************

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post Developed
Total Subbasin Area (acres)	0.750	0.731
Area of Links that Include Precip/Evap (acres)	0.000	0.020
Total (acres)	0.750	0.751

----------------------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------
-------Area (Acres) --------
A/B, Forest, Flat 0.750

Subbasin Total 0.750

----------------------SCENARIO: POSTDEVELOPED
Number of Subbasins: 16

---------- Subbasin : Lot 1 Roof ----------
-------Area (Acres) --------
ROOF TOPS/FLAT 0.046

Subbasin Total 0.046

---------- Subbasin : Right of Way ----------
-------Area (Acres) --------
ROADS/FLAT 0.040

Subbasin Total 0.040

-------Area (Acres) --------
ROOF TOPS/FLAT 0.046

Subbasin Total 0.046

---------- Subbasin : Lot 3 Roof ----------
-------Area (Acres) --------
ROOF TOPS/FLAT 0.046

Subbasin Total 0.046

---------- Subbasin : Lot 4 Roof ----------
-------Area (Acres) --------
ROOF TOPS/FLAT 0.046

Subbasin Total 0.046

---------- Subbasin : Lot 5 Roof ----------
-------Area (Acres) --------
ROOF TOPS/FLAT 0.046

Subbasin Total 0.046

---------- Subbasin : Lot 5 Driveway ----------
-------Area (Acres) --------
DRIVEWAYS/FLAT 0.042

Subbasin Total 0.042

---------- Subbasin : Lot 4 Driveway ----------
-------Area (Acres) --------
DRIVEWAYS/FLAT 0.042

Subbasin Total 0.042

---------- Subbasin : Lot 3 Driveway ----------
-------Area (Acres) --------
DRIVEWAYS/FLAT 0.042

Subbasin Total 0.042

---------- Subbasin : Lot 2 Driveway ----------
-------Area (Acres) --------
DRIVEWAYS/FLAT 0.013

Subbasin Total 0.013

---------- Subbasin : Lot 1 Driveway ----------
-------Area (Acres) --------
DRIVEWAYS/FLAT 0.013

Subbasin Total 0.013

---------- Subbasin : Lot 1 Lawn ----------
-------Area (Acres) --------
A/B, Lawn, Flat 0.078

Subbasin Total 0.078

---------- Subbasin : Lot 2 Lawn ----------
-------Area (Acres) --------
A/B, Lawn, Flat 0.078

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---------- Subbasin : Lot 3 Lawn ----------
-------Area (Acres) --------
A/B, Lawn, Flat 0.051

Subbasin Total 0.051

---------- Subbasin : Lot 4 Lawn ----------
-------Area (Acres) --------
A/B, Lawn, Flat 0.051

Subbasin Total 0.051

---------- Subbasin : Lot 5 Lawn ----------
-------Area (Acres) --------
A/B, Lawn, Flat 0.051

Subbasin Total 0.051

**************************** LINK DATA *******************************

----------------------SCENARIO: PREDEVELOPED
Number of Links: 0

**************************** LINK DATA *******************************

----------------------SCENARIO: POSTDEVELOPED
Number of Links: 17

Link Name: POC
Link Type: Copy
Downstream Link: None

Link Name: Lot 1 - BMP T5.10C
Link Type: Infiltration Trench
Downstream Link Name: POC

Trench Type : Trench on Embankment Sideslope
Trench Length (ft) : 40.00
Trench Width (ft) : 4.00
Trench Depth (ft) : 3.50
Trench Bottom Elev (ft) : 100.00
Trench Rockfill Porosity (%) : 30.00

Constant Infiltration Option Used
Infiltration Rate (in/hr): 3.27

Link Name: Lot 2 - BMP T5.10C
Link Type: Infiltration Trench
Downstream Link Name: POC

Trench Type : Trench on Embankment Sideslope
Trench Length (ft) : 40.00
Trench Width (ft) : 4.00
Trench Depth (ft) : 3.50
Trench Bottom Elev (ft) : 100.00
Trench Rockfill Porosity (%) : 30.00

Constant Infiltration Option Used
Infiltration Rate (in/hr): 3.27

Link Name: Lot 3 - BMP T5.10C
Link Type: Infiltration Trench
Downstream Link Name: POC

Trench Type : Trench on Embankment Sideslope
Trench Length (ft) : 40.00
Trench Width (ft) : 4.00
Trench Depth (ft) : 3.50
Trench Bottom Elev (ft) : 100.00
Trench Rockfill Porosity (%) : 30.00

Constant Infiltration Option Used
Infiltration Rate (in/hr): 3.27

Link Name: Lot 4 - BMP T5.10C
Link Type: Infiltration Trench
Downstream Link Name: POC

Trench Type : Trench on Embankment Sideslope
Trench Length (ft) : 40.00
Trench Width (ft) : 4.00
Trench Depth (ft) : 3.50
Trench Bottom Elev (ft) : 100.00
Trench Rockfill Porosity (%) : 30.00

Constant Infiltration Option Used
Infiltration Rate (in/hr): 3.27

Link Name: Lot 5 - BMP T5.10C
Link Type: Infiltration Trench
Downstream Link Name: POC

Trench Type : Trench on Embankment Sideslope
Trench Length (ft) : 40.00
Trench Width (ft) : 4.00
Trench Depth (ft) : 3.50
Trench Bottom Elev (ft) : 100.00
Trench Rockfill Porosity (%) : 30.00

Constant Infiltration Option Used
Infiltration Rate (in/hr): 3.27

Link Name: Lot 5 CAVFS
Link Type: Compost Amended Vegetated Filter Strip (CAVFS)
Downstream Link Name: Lot 5 - BMP T5.10C

Compost Thickness (ft) : 1.000
Compost Porosity (%) : 10.000
Compost Hydraulic Conductivity (in/hr) : 1.000
CAVFS Length (ft) : 122.000
CAVFS Width (ft) : 1.500
CAVFS Slope, Z (ft/ft) : 100.000
Gravel Spreader Width (ft) : 1.000
Gravel Hydraulic Conductivity (in/hr) : 2.000
Gravel Porosity (%) : 30.000
Soil Infiltration Rate (in/hr) : 3.270
Precipitation and Evaporation Applied to Surface of CAVFS

Link Name: Lot 4 CAVFS
Link Type: Compost Amended Vegetated Filter Strip (CAVFS)
Downstream Link Name: Lot 4 - BMP T5.10C

Compost Thickness (ft) : 1.000
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CAVFS Length (ft) : 122.000
CAVFS Width (ft) : 1.500
CAVFS Slope, Z (ft/ft) : 100.000
Gravel Spreader Width (ft) : 1.000
Gravel Hydraulic Conductivity (in/hr) : 2.000
Gravel Porosity (%) : 30.000
Soil Infiltration Rate (in/hr) : 3.270
Precipitation and Evaporation Applied to Surface of CAVFS

--
Link Name: Lot 3 CAVFS
Link Type: Compost Amended Vegetated Filter Strip (CAVFS)
Downstream Link Name: Lot 3 - BMP T5.10C

Compost Thickness (ft) : 1.000
Compost Porosity (%) : 10.000
Compost Hydraulic Conductivity (in/hr) : 1.000
CAVFS Length (ft) : 122.000
CAVFS Width (ft) : 1.500
CAVFS Slope, Z (ft/ft) : 100.000
Gravel Spreader Width (ft) : 1.000
Gravel Hydraulic Conductivity (in/hr) : 2.000
Gravel Porosity (%) : 30.000
Soil Infiltration Rate (in/hr) : 3.270
Precipitation and Evaporation Applied to Surface of CAVFS

--
Link Name: Lot 2 CAVFS
Link Type: Compost Amended Vegetated Filter Strip (CAVFS)
Downstream Link Name: Lot 2 - BMP T5.10C

Compost Thickness (ft) : 1.000
Compost Porosity (%) : 10.000
Compost Hydraulic Conductivity (in/hr) : 1.000
CAVFS Length (ft) : 25.000
CAVFS Width (ft) : 1.500
CAVFS Slope, Z (ft/ft) : 100.000
Gravel Spreader Width (ft) : 1.000
Gravel Hydraulic Conductivity (in/hr) : 2.000
Gravel Porosity (%) : 30.000
Soil Infiltration Rate (in/hr) : 3.270
Precipitation and Evaporation Applied to Surface of CAVFS

--
Link Name: Lot 1 CAVFS
Link Type: Compost Amended Vegetated Filter Strip (CAVFS)
Downstream Link Name: Lot 1 - BMP T5.10C

Compost Thickness (ft) : 1.000
Compost Porosity (%) : 10.000
Compost Hydraulic Conductivity (in/hr) : 1.000
CAVFS Length (ft) : 25.000
CAVFS Width (ft) : 1.500
CAVFS Slope, Z (ft/ft) : 100.000
Gravel Spreader Width (ft) : 1.000
Gravel Hydraulic Conductivity (in/hr) : 2.000
Gravel Porosity (%) : 30.000
Soil Infiltration Rate (in/hr) : 3.270
Precipitation and Evaporation Applied to Surface of CAVFS

--
Link Name: ROW CAVFS
Link Type: Compost Amended Vegetated Filter Strip (CAVFS)
Downstream Link Name: POC

Compost Thickness (ft) : 1.000
Compost Porosity (%) : 10.000
Compost Hydraulic Conductivity (in/hr) : 2.000
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CAVFS Slope, Z (ft/ft) : 100.000
Gravel Spreader Width (ft) : 0.500
Gravel Hydraulic Conductivity (in/hr) : 2.000
Gravel Porosity (%) : 30.000
Soil Infiltration Rate (in/hr) : 3.270
Precipitation and Evaporation Applied to Surface of CAVFS

Link Name: Lot 1 BMP T5.13
Link Type: Structure
Downstream Link Name: POC

Prismatic Pond Option Used
Pond Floor Elevation (ft) : 100.00
Riser Crest Elevation (ft) : 100.10
Max Pond Elevation (ft) : 100.15
Storage Depth (ft) : 0.10
Pond Bottom Length (ft) : 54.0
Pond Bottom Width (ft) : 15.0
Pond Side Slopes (ft/ft) : Z1= 3.00 Z2= 3.00 Z3= 3.00 Z4= 3.00
Bottom Area (sq-ft) : 810.
Area at Riser Crest El (sq-ft) : 852.
(acres) : 0.020
Volume at Riser Crest (cu-ft) : 83.
(ac-ft) : 0.002
Area at Max Elevation (sq-ft) : 873.
(acres) : 0.020
Vol at Max Elevation (cu-ft) : 126.
(ac-ft) : 0.003

Constant Infiltration Option Used
Infiltration Rate (in/hr): 3.27

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 24.00
Common Length (ft) : 0.000
Riser Crest Elevation : 100.10 ft

Hydraulic Structure Geometry

Number of Devices: 1

---Device Number 1 ---
Device Type : Circular Orifice
Control Elevation (ft) : 100.00
Diameter (in) : 1.00
Orientation : Horizontal
Elbow : Yes

Link Name: Lot 2 BMP T5.13
Link Type: Structure
Downstream Link Name: POC

Prismatic Pond Option Used
Pond Floor Elevation (ft) : 100.00
Riser Crest Elevation (ft) : 100.10
Max Pond Elevation (ft) : 100.15
Storage Depth (ft) : 0.10
Pond Bottom Length (ft) : 54.0
Pond Bottom Width (ft) : 15.0
Pond Side Slopes (ft/ft) : Z1= 3.00 Z2= 3.00 Z3= 3.00 Z4= 3.00
Bottom Area (sq-ft) : 810.
Area at Riser Crest El (sq-ft) : 852.
(acres) : 0.020
Volume at Riser Crest (cu-ft) : 83.
(ac-ft) : 0.002
Area at Max Elevation (sq-ft) : 873.
(acres) : 0.020
Vol

Constant Infiltration Option Used
Infiltration Rate (in/hr): 3.27

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 24.00
Common Length (ft) : 0.000
Riser Crest Elevation : 100.10 ft

Hydraulic Structure Geometry

Number of Devices: 1

---Device Number 1 ---
Device Type : Circular Orifice
Control Elevation (ft) : 100.00
Diameter (in) : 1.00
Orientation : Horizontal
Elbow : Yes

Link Name: Lot 3 BMP T5.13
Link Type: Structure
Downstream Link Name: POC

Prismatic Pond Option Used
Pond Floor Elevation (ft) : 100.00
Riser Crest Elevation (ft) : 100.10
Max Pond Elevation (ft) : 100.15
Storage Depth (ft) : 0.10
Pond Bottom Length (ft) : 54.0
Pond Bottom Width (ft) : 15.0
Pond Side Slopes (ft/ft) : Z1= 3.00 Z2= 3.00 Z3= 3.00 Z4= 3.00
Bottom Area (sq-ft) : 810.
Area at Riser Crest El (sq-ft) : 852.
(acres) : 0.020
Volume at Riser Crest (cu-ft) : 83.
(ac-ft) : 0.002
Area at Max Elevation (sq-ft) : 873.
(acres) : 0.020
Vol at Max Elevation (cu-ft) : 126.
(ac-ft) : 0.003

Constant Infiltration Option Used
Infiltration Rate (in/hr): 3.27

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 24.00
Common Length (ft) : 0.000
Riser Crest Elevation : 100.10 ft

Hydraulic Structure Geometry

Number of Devices: 1

---Device Number 1 ---
Device Type : Circular Orifice
Control Elevation (ft) : 100.00
Diameter (in) : 1.00
Orientation : Horizontal
Elbow : Yes

Link Name: Lot 4 BMP T5.13
Link Type: Structure
Downstream Link Name: POC

Prismatic Pond Option Used
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Max Pond Elevation (ft) : 100.15
Storage Depth (ft) : 0.10
Pond Bottom Length (ft) : 70.0
Pond Bottom Width (ft) : 15.0
Pond Side Slopes (ft/ft) : Z1= 3.00 Z2= 3.00 Z3= 3.00 Z4= 3.00
Bottom Area (sq-ft) : 1050.
Area at Riser Crest El (sq-ft) : 1,101.
(acres) : 0.025
Volume at Riser Crest (cu-ft) : 108.
(ac-ft) : 0.002
Area at Max Elevation (sq-ft) : 1127.
(acres) : 0.026
Vol at Max Elevation (cu-ft) : 163.
(ac-ft) : 0.004

Constant Infiltration Option Used
Infiltration Rate (in/hr): 3.27

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 24.00
Common Length (ft) : 0.000
Riser Crest Elevation : 100.10 ft

Hydraulic Structure Geometry

Number of Devices: 1

---Device Number 1 ---
Device Type : Circular Orifice
Control Elevation (ft) : 100.00
Diameter (in) : 1.00
Orientation : Horizontal
Elbow : Yes

Link Name: Lot 5 BMP T5.13
Link Type: Structure
Downstream Link Name: POC

Prismatic Pond Option Used
Pond Floor Elevation (ft) : 100.00
Riser Crest Elevation (ft) : 100.10
Max Pond Elevation (ft) : 100.15
Storage Depth (ft) : 0.10
Pond Bottom Length (ft) : 68.0
Pond Bottom Width (ft) : 15.0
Pond Side Slopes (ft/ft) : Z1= 3.00 Z2= 3.00 Z3= 3.00 Z4= 3.00
Bottom Area (sq-ft) : 1020.
Area at Riser Crest El (sq-ft) : 1,070.
(acres) : 0.025
Volume at Riser Crest (cu-ft) : 105.
(ac-ft) : 0.002
Area at Max Elevation (sq-ft) : 1096.
(acres) : 0.025
Vol at Max Elevation (cu-ft) : 159.
(ac-ft) : 0.004

Constant Infiltration Option Used
Infiltration Rate (in/hr): 3.27

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 24.00
Common Length (ft) : 0.000
Riser Crest Elevation : 100.10 ft

Hydraulic Structure Geometry

Number of Devices: 1

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Control Elevation (ft) : 100.00
Diameter (in) : 1.00
Orientation : Horizontal
Elbow : Yes

**********************FLOOD FREQUENCY AND DURATION STATISTICS*******************

---------------------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

---------------------SCENARIO: POSTDEVELOPED
Number of Subbasins: 16
Number of Links: 17

********** **Subbasin: Lot 1 Roof** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.981E-02
5-Year	2.636E-02
10-Year	3.083E-02
25-Year	3.794E-02
50-Year	4.228E-02
100-Year	5.433E-02
200-Year	6.098E-02
500-Year	6.977E-02

********** **Subbasin: Right of Way** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.722E-02
5-Year	2.292E-02
10-Year	2.681E-02
25-Year	3.299E-02
50-Year	3.677E-02
100-Year	4.724E-02
200-Year	5.302E-02
500-Year	6.067E-02

********** **Subbasin: Lot 2 Roof** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.981E-02
5-Year	2.636E-02
10-Year	3.083E-02
25-Year	3.794E-02
50-Year	4.228E-02
100-Year	5.433E-02
200-Year	6.098E-02
500-Year	6.977E-02

********** **Subbasin: Lot 3 Roof** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.981E-02

25-Year	3.794E-02
50-Year	4.228E-02
100-Year	5.433E-02
200-Year	6.098E-02
500-Year	6.977E-02

********** **Subbasin: Lot 4 Roof** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.981E-02
5-Year	2.636E-02
10-Year	3.083E-02
25-Year	3.794E-02
50-Year	4.228E-02
100-Year	5.433E-02
200-Year	6.098E-02
500-Year	6.977E-02

********** **Subbasin: Lot 5 Roof** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.981E-02
5-Year	2.636E-02
10-Year	3.083E-02
25-Year	3.794E-02
50-Year	4.228E-02
100-Year	5.433E-02
200-Year	6.098E-02
500-Year	6.977E-02

********** **Subbasin: Lot 5 Driveway** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.808E-02
5-Year	2.407E-02
10-Year	2.815E-02
25-Year	3.464E-02
50-Year	3.861E-02
100-Year	4.960E-02
200-Year	5.567E-02
500-Year	6.370E-02

********** **Subbasin: Lot 4 Driveway** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.808E-02
5-Year	2.407E-02
10-Year	2.815E-02
25-Year	3.464E-02
50-Year	3.861E-02
100-Year	4.960E-02
200-Year	5.567E-02
500-Year	6.370E-02

********** **Subbasin: Lot 3 Driveway** **********

Flc

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.808E-02
5-Year	2.407E-02
10-Year	2.815E-02
25-Year	3.464E-02
50-Year	3.861E-02
100-Year	4.960E-02
200-Year	5.567E-02
500-Year	6.370E-02

********** **Subbasin: Lot 2 Driveway** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	5.598E-03
5-Year	7.450E-03
10-Year	8.713E-03
25-Year	1.072E-02
50-Year	1.195E-02
100-Year	1.535E-02
200-Year	1.723E-02
500-Year	1.972E-02

********** **Subbasin: Lot 1 Driveway** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	5.598E-03
5-Year	7.450E-03
10-Year	8.713E-03
25-Year	1.072E-02
50-Year	1.195E-02
100-Year	1.535E-02
200-Year	1.723E-02
500-Year	1.972E-02

********** **Subbasin: Lot 1 Lawn** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.151E-03
5-Year	4.602E-03
10-Year	6.994E-03
25-Year	1.448E-02
50-Year	1.655E-02
100-Year	2.131E-02
200-Year	3.157E-02
500-Year	4.514E-02

********** **Subbasin: Lot 2 Lawn** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.151E-03
5-Year	4.602E-03
10-Year	6.994E-03
25-Year	1.448E-02
50-Year	1.655E-02

500-Year   4.514E-02

********** **Subbasin: Lot 3 Lawn** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	7.525E-04
5-Year	3.009E-03
10-Year	4.573E-03
25-Year	9.470E-03
50-Year	1.082E-02
100-Year	1.393E-02
200-Year	2.064E-02
500-Year	2.951E-02

********** **Subbasin: Lot 4 Lawn** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	7.525E-04
5-Year	3.009E-03
10-Year	4.573E-03
25-Year	9.470E-03
50-Year	1.082E-02
100-Year	1.393E-02
200-Year	2.064E-02
500-Year	2.951E-02

********** **Subbasin: Lot 5 Lawn** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	7.525E-04
5-Year	3.009E-03
10-Year	4.573E-03
25-Year	9.470E-03
50-Year	1.082E-02
100-Year	1.393E-02
200-Year	2.064E-02
500-Year	2.951E-02

********** Link: POC ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.450E-04
5-Year	6.429E-04
10-Year	1.135E-03
25-Year	3.477E-03
50-Year	1.255E-02
100-Year	1.361E-02
200-Year	1.362E-02
500-Year	1.363E-02

********** Link: Lot 1 - BMP T5.10C ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)
Tr (yrs)   Flood Peak (cfs)
===
2

5-Year	2.889E-02
10-Year	3.622E-02
25-Year	4.548E-02
50-Year	5.218E-02
100-Year	6.848E-02
200-Year	7.741E-02
500-Year	8.921E-02

********** Link: Lot 1 - BMP T5.10C ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.254E-06
5-Year	3.051E-06
10-Year	4.821E-06
25-Year	6.494E-06
50-Year	7.441E-06
100-Year	8.278E-06
200-Year	8.793E-06
500-Year	9.474E-06

********** Link: Lot 1 - BMP T5.10C ********** Link WSEL Stats

WSEL Frequency Data(ft)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	100.017
1.11-Year	100.026
1.25-Year	100.062
2.00-Year	100.251
3.33-Year	100.465
5-Year	100.610
10-Year	100.964
25-Year	101.299
50-Year	101.488
100-Year	101.655

********** Link: Lot 2 - BMP T5.10C ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	2.068E-02
5-Year	2.889E-02
10-Year	3.622E-02
25-Year	4.548E-02
50-Year	5.218E-02
100-Year	6.848E-02
200-Year	7.741E-02
500-Year	8.921E-02

********** Link: Lot 2 - BMP T5.10C ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.254E-06
5-Year	3.051E-06
10-Year	4.821E-06
25-Year	6.494E-06
50-Year	7.441E-06
100-Year	8.278E-06
200-Year	8.793E-06
5	

********** Link: Lot 2 - BMP T5.10C ********** Link WSEL Stats
WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	100.017
1.11-Year	100.026
1.25-Year	100.062
2.00-Year	100.251
3.33-Year	100.465
5-Year	100.610
10-Year	100.964
25-Year	101.299
50-Year	101.488
100-Year	101.655

********** Link: Lot 3 - BMP T5.10C ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.982E-02
5-Year	2.669E-02
10-Year	3.438E-02
25-Year	5.199E-02
50-Year	6.195E-02
100-Year	6.380E-02
200-Year	6.470E-02
500-Year	6.590E-02

********** Link: Lot 3 - BMP T5.10C ********** Link Outflow 1 Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.161E-06
5-Year	2.484E-06
10-Year	4.527E-06
25-Year	7.541E-06
50-Year	8.303E-06
100-Year	9.782E-06
200-Year	1.007E-05
500-Year	1.044E-05

********** Link: Lot 3 - BMP T5.10C ********** Link WSEL Stats
WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	100.017
1.11-Year	100.026
1.25-Year	100.062
2.00-Year	100.232
3.33-Year	100.380
5-Year	100.497
10-Year	100.905
25-Year	101.508
50-Year	101.660
100-Year	101.957

********** Link: Lot 4 - BMP T5.10C ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
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Tr (

2-Year	1.982E-02
5-Year	2.669E-02
10-Year	3.438E-02
25-Year	5.199E-02
50-Year	6.195E-02
100-Year	6.380E-02
200-Year	6.470E-02
500-Year	6.590E-02

********** Link: Lot 4 - BMP T5.10C ********** Link Outflow 1 Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.161E-06
5-Year	2.484E-06
10-Year	4.527E-06
25-Year	7.541E-06
50-Year	8.303E-06
100-Year	9.782E-06
200-Year	1.007E-05
500-Year	1.044E-05

********** Link: Lot 4 - BMP T5.10C ********** Link WSEL Stats
WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	100.017
1.11-Year	100.026
1.25-Year	100.062
2.00-Year	100.232
3.33-Year	100.380
5-Year	100.497
10-Year	100.905
25-Year	101.508
50-Year	101.660
100-Year	101.957

********** Link: Lot 5 - BMP T5.10C ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.982E-02
5-Year	2.669E-02
10-Year	3.438E-02
25-Year	5.199E-02
50-Year	6.195E-02
100-Year	6.380E-02
200-Year	6.470E-02
500-Year	6.590E-02

********** Link: Lot 5 - BMP T5.10C ********** Link Outflow 1 Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.161E-06
5-Year	2.484E-06
10-Year	4.527E-06
25-Year	7.541E-06
50-Year	8.303E-06

500-Year	1.044E-05

********** Link: Lot 5 - BMP T5.10C ********** Link WSEL Stats
WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	100.017
1.11-Year	100.026
1.25-Year	100.062
2.00-Year	100.232
3.33-Year	100.380
5-Year	100.497
10-Year	100.905
25-Year	101.508
50-Year	101.660
100-Year	101.957

********** Link: Lot 5 CAVFS ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.808E-02
5-Year	2.407E-02
10-Year	2.815E-02
25-Year	3.464E-02
50-Year	3.861E-02
100-Year	4.960E-02
200-Year	5.567E-02
500-Year	6.370E-02

********** Link: Lot 5 CAVFS ********** Link Outflow 1 Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.216E-05
5-Year	3.093E-05
10-Year	6.072E-03
25-Year	1.867E-02
50-Year	2.071E-02
100-Year	2.489E-02
200-Year	2.491E-02
500-Year	2.493E-02

********** Link: Lot 4 CAVFS ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.808E-02
5-Year	2.407E-02
10-Year	2.815E-02
25-Year	3.464E-02
50-Year	3.861E-02
100-Year	4.960E-02
200-Year	5.567E-02
500-Year	6.370E-02

********** Link: Lot 4 CAVFS ********** Link Outflow 1 Frequency Stats
Flood Frequency Data(cfs)
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Tr (

2-Year	1.216E-05
5-Year	3.093E-05
10-Year	6.072E-03
25-Year	1.867E-02
50-Year	2.071E-02
100-Year	2.489E-02
200-Year	2.491E-02
500-Year	2.493E-02

********** Link: Lot 3 CAVFS ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.808E-02
5-Year	2.407E-02
10-Year	2.815E-02
25-Year	3.464E-02
50-Year	3.861E-02
100-Year	4.960E-02
200-Year	5.567E-02
500-Year	6.370E-02

********** Link: Lot 3 CAVFS ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.216E-05
5-Year	3.093E-05
10-Year	6.072E-03
25-Year	1.867E-02
50-Year	2.071E-02
100-Year	2.489E-02
200-Year	2.491E-02
500-Year	2.493E-02

********** Link: Lot 2 CAVFS ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	5.598E-03
5-Year	7.450E-03
10-Year	8.713E-03
25-Year	1.072E-02
50-Year	1.195E-02
100-Year	1.535E-02
200-Year	1.723E-02
500-Year	1.972E-02

********** Link: Lot 2 CAVFS ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.029E-03
5-Year	4.135E-03
10-Year	5.687E-03
25-Year	8.354E-03
50-Year	9.895E-03
100-Year	1.415E-02
200-Year	1.643E-02
5	

********** Link: Lot 1 CAVFS ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	5.598E-03
5-Year	7.450E-03
10-Year	8.713E-03
25-Year	1.072E-02
50-Year	1.195E-02
100-Year	1.535E-02
200-Year	1.723E-02
500-Year	1.972E-02

********** Link: Lot 1 CAVFS ********** Link Outflow 1 Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.029E-03
5-Year	4.135E-03
10-Year	5.687E-03
25-Year	8.354E-03
50-Year	9.895E-03
100-Year	1.415E-02
200-Year	1.643E-02
500-Year	1.944E-02

********** Link: ROW CAVFS ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.722E-02
5-Year	2.292E-02
10-Year	2.681E-02
25-Year	3.299E-02
50-Year	3.677E-02
100-Year	4.724E-02
200-Year	5.302E-02
500-Year	6.067E-02

********** Link: ROW CAVFS ********** Link Outflow 1 Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	2.123E-06
5-Year	1.251E-05
10-Year	2.343E-05
25-Year	3.551E-05
50-Year	1.251E-02
100-Year	1.357E-02
200-Year	1.358E-02
500-Year	1.359E-02

********** Link: Lot 1 BMP T5.13 ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.151E-03
5	
1	

25-Year	1.448E-02
50-Year	1.655E-02
100-Year	2.131E-02
200-Year	3.157E-02
500-Year	4.514E-02

********** Link: Lot 1 BMP T5.13 ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	3.829E-05
5-Year	1.510E-04
10-Year	2.352E-04
25-Year	4.932E-04
50-Year	5.424E-04
100-Year	7.202E-04
200-Year	1.039E-03
500-Year	1.460E-03

********** Link: Lot 1 BMP T5.13 ********** Link WSEL Stats

WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	-1.000E+03
1.11-Year	-1.000E+03
1.25-Year	-1.000E+03
2.00-Year	-1.000E+03
3.33-Year	-1.000E+03
5-Year	-1.000E+03
10-Year	-1.000E+03
25-Year	-1.000E+03
50-Year	-1.000E+03
100-Year	-1.000E+03

********** Link: Lot 2 BMP T5.13 ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.151E-03
5-Year	4.602E-03
10-Year	6.994E-03
25-Year	1.448E-02
50-Year	1.655E-02
100-Year	2.131E-02
200-Year	3.157E-02
500-Year	4.514E-02

********** Link: Lot 2 BMP T5.13 ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	3.829E-05
5-Year	1.510E-04
10-Year	2.352E-04
25-Year	4.932E-04
50-Year	5.424E-04
100-Year	7.202E-04
200-Year	1.039E-03
500-Year	1.460E-03

********** Link: Lot 2 BMP T5.13 ********** Link WSEL Stats
WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	-1.000E+03
1.11-Year	-1.000E+03
1.25-Year	-1.000E+03
2.00-Year	-1.000E+03
3.33-Year	-1.000E+03
5-Year	-1.000E+03
10-Year	-1.000E+03
25-Year	-1.000E+03
50-Year	-1.000E+03
100-Year	-1.000E+03

********** Link: Lot 3 BMP T5.13 ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	7.525E-04
5-Year	3.009E-03
10-Year	4.573E-03
25-Year	9.470E-03
50-Year	1.082E-02
100-Year	1.393E-02
200-Year	2.064E-02
500-Year	2.951E-02

********** Link: Lot 3 BMP T5.13 ********** Link Outflow 1 Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	2.504E-05
5-Year	9.872E-05
10-Year	1.538E-04
25-Year	3.225E-04
50-Year	3.546E-04
100-Year	4.709E-04
200-Year	6.792E-04
500-Year	9.546E-04

********** Link: Lot 3 BMP T5.13 ********** Link WSEL Stats
WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	-1.000E+03
1.11-Year	-1.000E+03
1.25-Year	-1.000E+03
2.00-Year	-1.000E+03
3.33-Year	-1.000E+03
5-Year	-1.000E+03
10-Year	-1.000E+03
25-Year	-1.000E+03
50-Year	-1.000E+03
100-Year	-1.000E+03

********** Link: Lot 4 BMP T5.13 ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)
Tr (yrs) Flood Peak (cfs)
===

2·

5-Year	3.009E-03
10-Year	4.573E-03
25-Year	9.470E-03
50-Year	1.082E-02
100-Year	1.393E-02
200-Year	2.064E-02
500-Year	2.951E-02

********** Link: Lot 4 BMP T5.13 ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.946E-05
5-Year	7.675E-05
10-Year	1.196E-04
25-Year	2.508E-04
50-Year	2.757E-04
100-Year	3.662E-04
200-Year	5.280E-04
500-Year	7.420E-04

********** Link: Lot 4 BMP T5.13 ********** Link WSEL Stats

WSEL Frequency Data(ft)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	-1.000E+03
1.11-Year	-1.000E+03
1.25-Year	-1.000E+03
2.00-Year	-1.000E+03
3.33-Year	-1.000E+03
5-Year	-1.000E+03
10-Year	-1.000E+03
25-Year	-1.000E+03
50-Year	-1.000E+03
100-Year	-1.000E+03

********** Link: Lot 5 BMP T5.13 ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	7.525E-04
5-Year	3.009E-03
10-Year	4.573E-03
25-Year	9.470E-03
50-Year	1.082E-02
100-Year	1.393E-02
200-Year	2.064E-02
500-Year	2.951E-02

********** Link: Lot 5 BMP T5.13 ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	2.002E-05
5-Year	7.895E-05
10-Year	1.230E-04
25-Year	2.579E-04
50-Year	2.836E-04
100-Year	3.766E-04
200-Year	5.432E-04
5	

********** Link: Lot 5 BMP T5.13 ********** Link WSEL Stats

WSEL Frequency Data(ft)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	-1.000E+03
1.11-Year	-1.000E+03
1.25-Year	-1.000E+03
2.00-Year	-1.000E+03
3.33-Year	-1.000E+03
5-Year	-1.000E+03
10-Year	-1.000E+03
25-Year	-1.000E+03
50-Year	-1.000E+03
100-Year	-1.000E+03

***********Groundwater Recharge Summary *************

Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin 1	209.680
Total:	209.680

Total Post Developed Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Lot 1 Roof	0.000
Subbasin: Right of Way	0.000
Subbasin: Lot 2 Roof	0.000
Subbasin: Lot 3 Roof	0.000
Subbasin: Lot 4 Roof	0.000
Subbasin: Lot 5 Roof	0.000
Subbasin: Lot 5 Driveway	0.000
Subbasin: Lot 4 Driveway	0.000
Subbasin: Lot 3 Driveway	0.000
Subbasin: Lot 2 Driveway	0.000
Subbasin: Lot 1 Driveway	0.000
Subbasin: Lot 1 Lawn	25.850
Subbasin: Lot 2 Lawn	25.850
Subbasin: Lot 3 Lawn	16.902
Subbasin: Lot 4 Lawn	16.902
Subbasin: Lot 5 Lawn	16.902
Link: POC	0.000
Link: Lot 1 - BMP T5.10C	19.602
Link: Lot 2 - BMP T5.10C	19.602
Link: Lot 3 - BMP T5.10C	19.592
Link: Lot 4 - BMP T5.10C	19.592
Link: Lot 5 - BMP T5.10C	19.592
Link: Lot 5 CAVFS	19.698
Link: Lot 4 CAVFS	19.698
Link: Lot 3 CAVFS	19.698
Link: Lot 2 CAVFS	5.884
Link: Lot 1 CAVFS	5.884
Link: ROW CAVFS	19.586
Link: Lot 1 BMP T5.13	0.121
Link: Lot 2 BMP T5.13	0.121
Link: Lot 3 BMP T5.13	0.079
Link: Lot 4 BMP T5.13	0.079
Link: Lot 5 BMP T5.13	0.079
Total:	291.314

Total Predevelopment Recharge is Less than Post Developed

Average Recharge Per Year, (Number of Years= 121)

Predeveloped: 1.733 ac-ft/year, Post Developed: 2.408 ac-ft/year

---------------------SCENARIO: PREDEVELOPED

Number of Links: 0

---------------------SCENARIO: POSTDEVELOPED

Number of Links: 17

********** Link: POC **********

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.00 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 0.02
Inflow Volume Including PPT-Evap (ac-ft): 0.02
Total Runoff Infiltrated (ac-ft): 0.00, 0.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.02
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 0.00%

********** Link: Lot 1 - BMP T5.10C **********

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.01 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 19.60
Inflow Volume Including PPT-Evap (ac-ft): 19.60
Total Runoff Infiltrated (ac-ft): 19.60, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.00%

********** Link: Lot 2 - BMP T5.10C **********

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.01 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 19.60
Inflow Volume Including PPT-Evap (ac-ft): 19.60
Total Runoff Infiltrated (ac-ft): 19.60, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.00%

********** Link: Lot 3 - BMP T5.10C **********

2-Year Discharge Rate : 0.000 cfs

15-
On

Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 19.59
Inflow Volume Including PPT-Evap (ac-ft): 19.59
Total Runoff Infiltrated (ac-ft): 19.59, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.00%

********** Link: Lot 4 - BMP T5.10C **********

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.01 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 19.59
Inflow Volume Including PPT-Evap (ac-ft): 19.59
Total Runoff Infiltrated (ac-ft): 19.59, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.00%

********** Link: Lot 5 - BMP T5.10C **********

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.01 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 19.59
Inflow Volume Including PPT-Evap (ac-ft): 19.59
Total Runoff Infiltrated (ac-ft): 19.59, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.00%

********** Link: Lot 5 CAVFS **********

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.01 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 17.88
Inflow Volume Including PPT-Evap (ac-ft): 19.70
Total Runoff Infiltrated (ac-ft): 19.70, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.02%
Primary Outflow To Downstream System (ac-ft): 0.01
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.03%

********** Link: Lot 4 CAVFS **********

2-\

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.01 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 17.88
Inflow Volume Including PPT-Evap (ac-ft): 19.70
Total Runoff Infiltrated (ac-ft): 19.70, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.02%
Primary Outflow To Downstream System (ac-ft): 0.01
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.03%

********** Link: Lot 3 CAVFS **********

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.01 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 17.88
Inflow Volume Including PPT-Evap (ac-ft): 19.70
Total Runoff Infiltrated (ac-ft): 19.70, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.02%
Primary Outflow To Downstream System (ac-ft): 0.01
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.03%

********** Link: Lot 2 CAVFS **********

2-Year Discharge Rate : 0.001 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.00 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 5.53
Inflow Volume Including PPT-Evap (ac-ft): 5.90
Total Runoff Infiltrated (ac-ft): 5.88, 99.69%
Total Runoff Filtered (ac-ft): 0.00, 0.02%
Primary Outflow To Downstream System (ac-ft): 0.02
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 99.71%

********** Link: Lot 1 CAVFS **********

2-Year Discharge Rate : 0.001 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.00 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 5.53
Inflow Volume Including PPT-Evap (ac-ft): 5.90
Total Runoff Infiltrated (ac-ft): 5.88, 99.69%
Total Runoff Filtered (ac-ft): 0.00, 0.02%
Primary Outflow To Downstream System (ac-ft): 0.02
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 99.71%

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.01 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 17.03
Inflow Volume Including PPT-Evap (ac-ft): 19.58
Total Runoff Infiltrated (ac-ft): 19.59, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.01%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.03%

********** Link: Lot 1 BMP T5.13 **********

Basic Wet Pond Volume (91% Exceedance): 62. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 93. cu-ft

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.01 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 0.12
Inflow Volume Including PPT-Evap (ac-ft): 0.12
Total Runoff Infiltrated (ac-ft): 0.12, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.00%

********** Link: Lot 2 BMP T5.13 **********

Basic Wet Pond Volume (91% Exceedance): 62. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 93. cu-ft

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.01 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 0.12
Inflow Volume Including PPT-Evap (ac-ft): 0.12
Total Runoff Infiltrated (ac-ft): 0.12, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.00%

********** Link: Lot 3 BMP T5.13 **********

Basic Wet Pond Volume (91% Exceedance): 40. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 61. cu-ft

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.00 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Inf

Inflow Volume (ac-ft): 0.08
Inflow Volume Including PPT-Evap (ac-ft): 0.08
Total Runoff Infiltrated (ac-ft): 0.08, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.00%

********** Link: Lot 4 BMP T5.13 **********

Basic Wet Pond Volume (91% Exceedance): 40. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 61. cu-ft

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.00 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 0.08
Inflow Volume Including PPT-Evap (ac-ft): 0.08
Total Runoff Infiltrated (ac-ft): 0.08, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.00%

********** Link: Lot 5 BMP T5.13 **********

Basic Wet Pond Volume (91% Exceedance): 40. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 61. cu-ft

2-Year Discharge Rate : 0.000 cfs

15-Minute Timestep, Water Quality Treatment Design Discharge
On-line Design Discharge Rate (91% Exceedance): 0.00 cfs
Off-line Design Discharge Rate (91% Exceedance): 0.00 cfs

Infiltration/Filtration Statistics--------------------
Inflow Volume (ac-ft): 0.08
Inflow Volume Including PPT-Evap (ac-ft): 0.08
Total Runoff Infiltrated (ac-ft): 0.08, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 100.00%

***********Compliance Point Results *************

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Link: POC

*** **Point of Compliance Flow Frequency Data** ***
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	5.835E-04	2-Year	1.450E-04
5-Year	6.024E-04	5-Year	6.429E-04
10-Year	1.616E-03	10-Year	1.135E-03
25-Year	9.601E-03	25-Year	3.477E-03
50-Year	1.261E-02	50-Year	1.255E-02
100-Year	1.690E-02	100-Year	1.361E-02
2			
5			

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

**** **Flow Duration Performance** ****

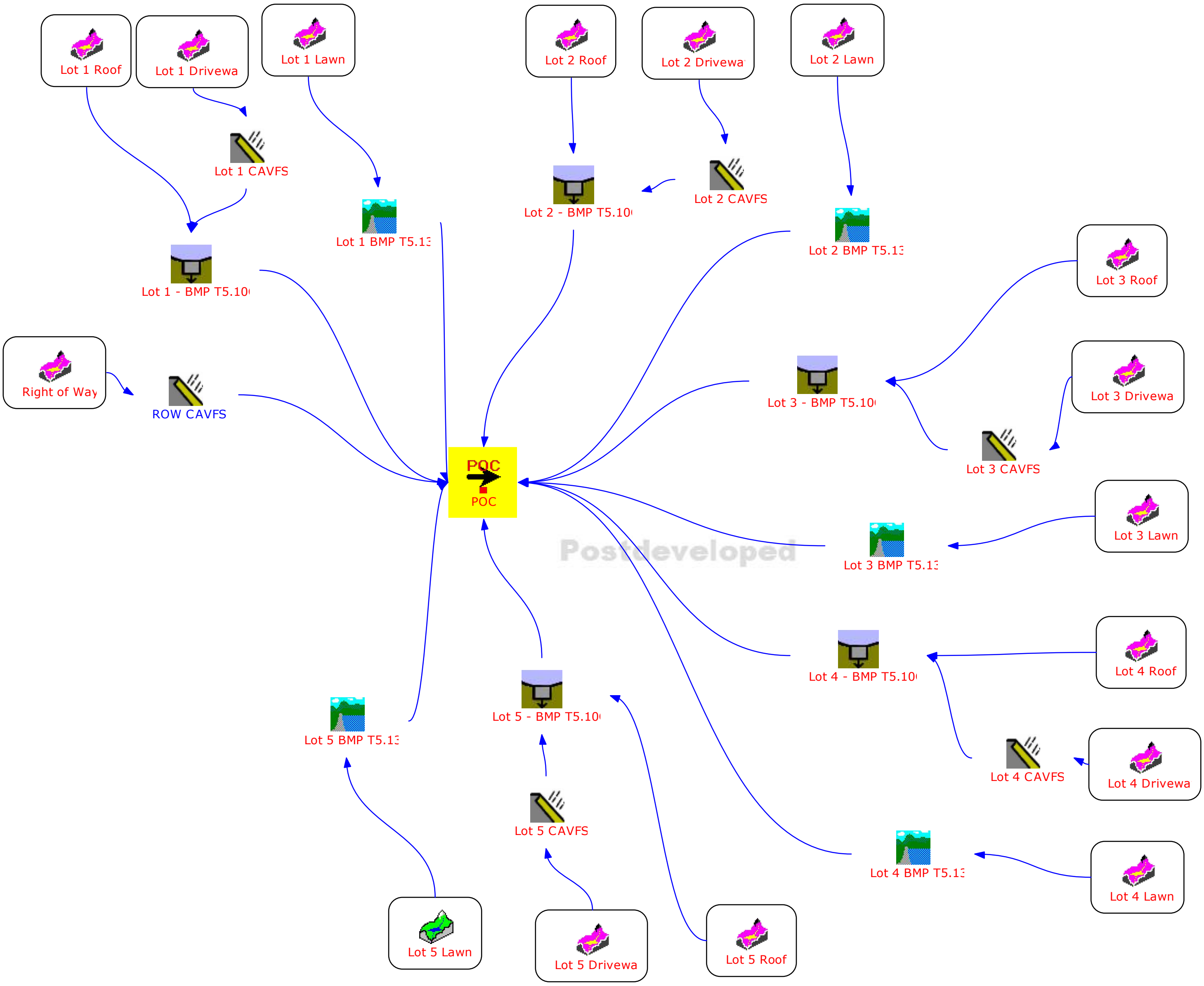
Excursion at Predeveloped 50%Q2 (Must be Less Than or Equal to 0%):	-94.2%	PASS
Maximum Excursion from 50%Q2 to Q2 (Must be Less Than or Equal to 0%):	-84.0%	PASS
Maximum Excursion from Q2 to Q50 (Must be less than 10%):	0.0%	PASS
Percent Excursion from Q2 to Q50 (Must be less than 50%):	0.0%	PASS

MEETS ALL FLOW DURATION DESIGN CRITERIA: PASS

**** **LID Duration Performance** ****

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	-99.7%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	-94.2%	PASS

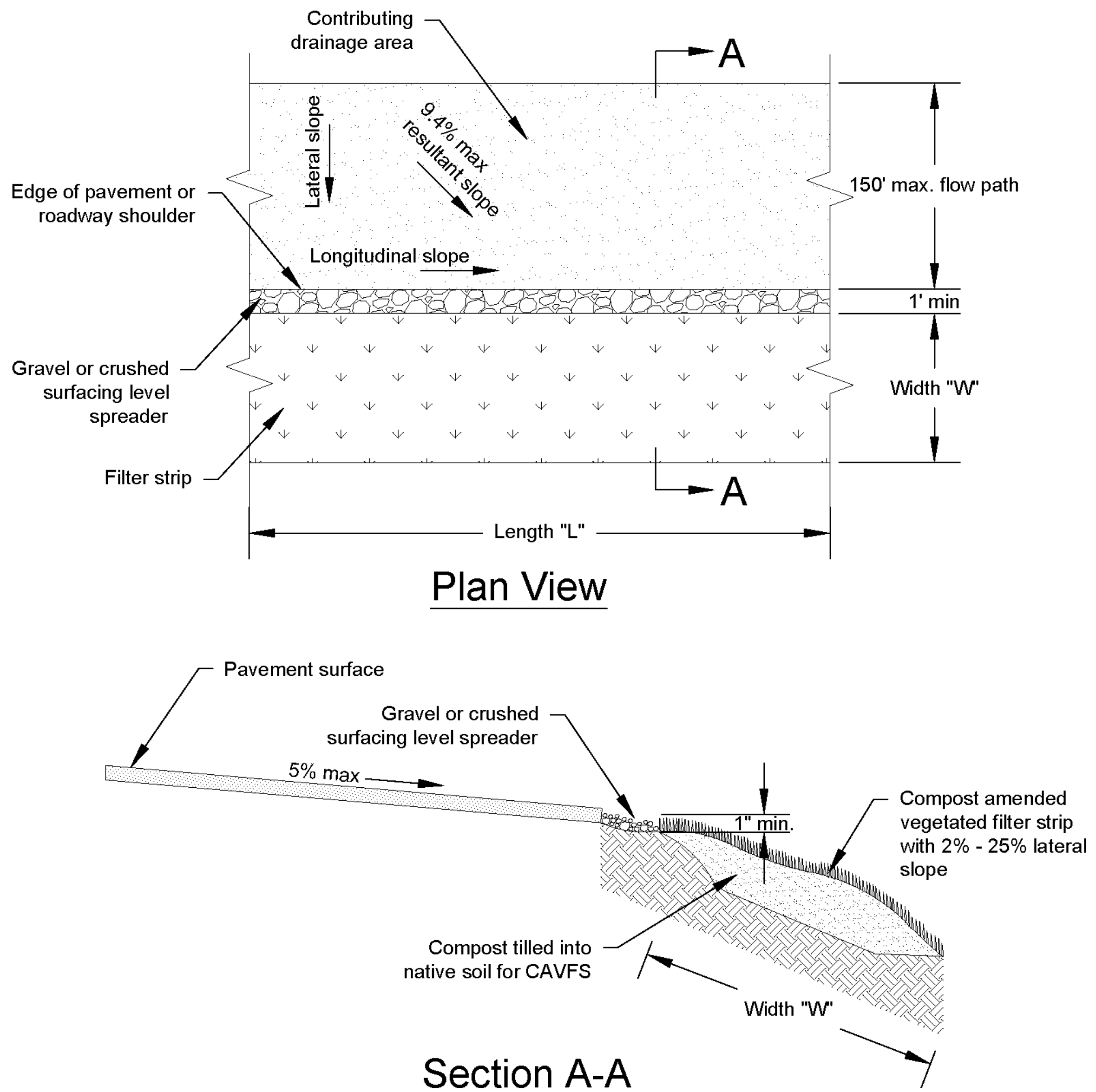
MEETS ALL LID DURATION DESIGN CRITERIA: PASS


Lot 1 Roof
Lot 1 Drivewa
Lot 1 Lawn
Lot 2 Roof
Lot 2 Drivewa
Lot 2 Lawn
Lot 1 CAVFS
Lot 2 CAVFS
Lot 2 - BMP T5.10
Lot 1 BMP T5.13
Lot 2 BMP T5.13
Lot 1 - BMP T5.10
Lot 3 Roof
Right of Way
ROW CAVFS
Lot 3 Drivewa
Lot 3 - BMP T5.10
POC
POC
Lot 3 CAVFS
Lot 3 Lawn
Postdeveloped
Lot 3 BMP T5.13
Lot 4 Roof
Lot 4 - BMP T5.10
Lot 5 - BMP T5.10
Lot 5 BMP T5.13
Lot 4 CAVFS
Lot 4 Drivewa
Lot 5 CAVFS
Lot 4 BMP T5.13
Lot 4 Lawn
Lot 5 Lawn
Lot 5 Drivewa
Lot 5 Roof

Predeveloped

APPENDIX D: BMP DETAILS

Figure V-7.1: Example of a Compost Amended Vegetated Filter Strip (CAVFS)



This drawing is only an example that needs to be adjusted and revised for each project.

NOT TO SCALE

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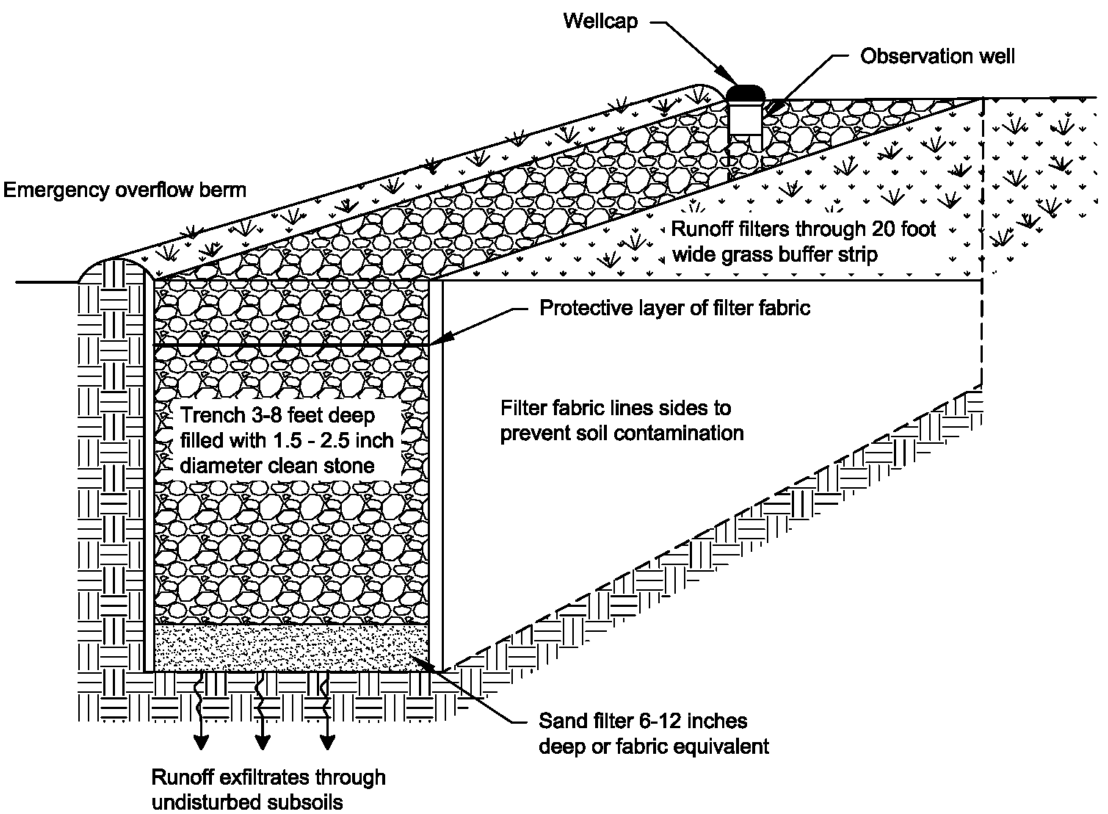
Example of a Compost Amended Vegetated Filter Strip (CAVFS)

Revised June 2016

Figure V-5.5: Schematic of an Infiltration Trench



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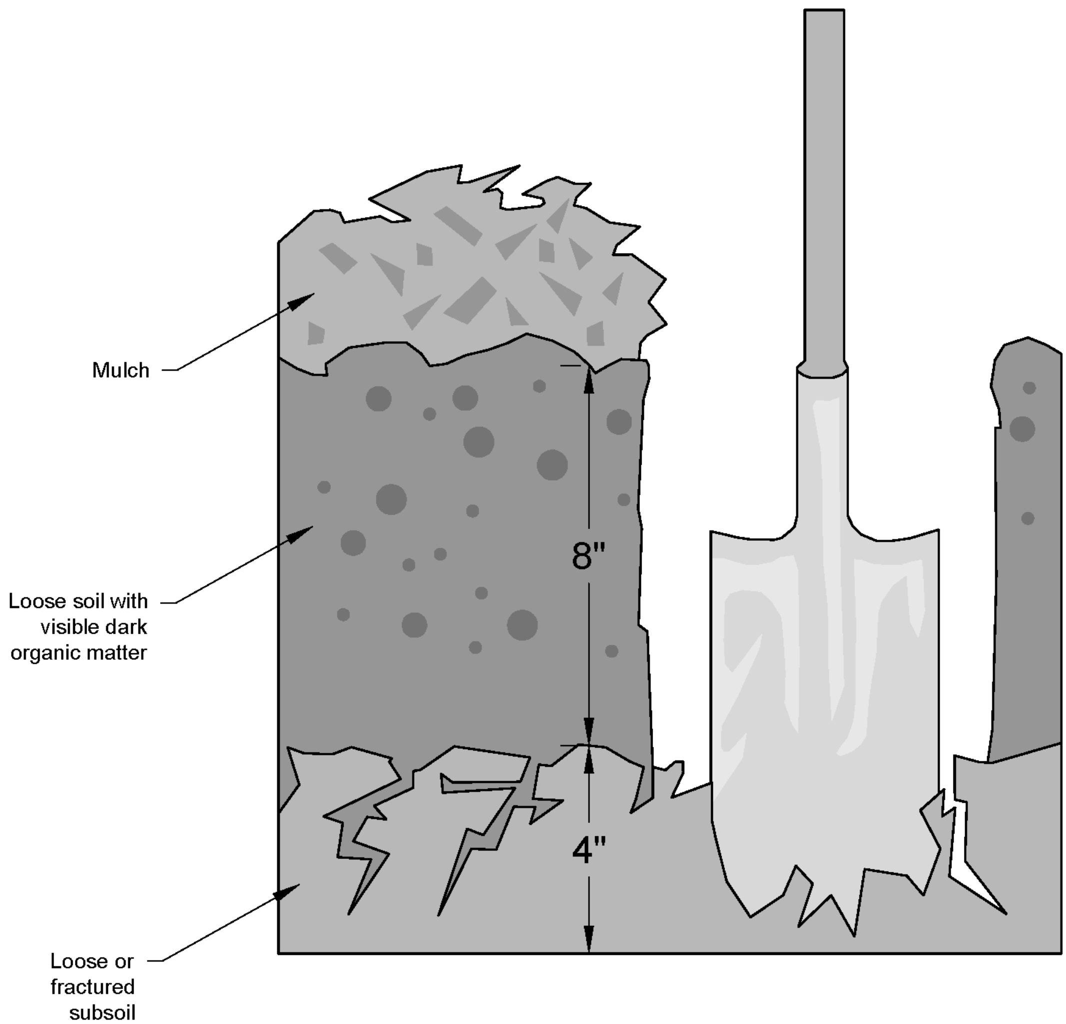
Schematic of an Infiltration Trench

Revised May 2019

Figure V-11.1: Planting Bed Cross-Section



Reprinted from *Guidelines and Resources For Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington*, 2010, Washington Organic Recycling Council

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Planting Bed Cross-Section

Revised June 2016