LAND TECHNOLOGIES, INC.
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Smokey Point Industrial LLC

3505 188th Ave NE, Arlington, WA 98223

PLN#_____

1st Submittal: February 2024

Stormwater Site Plan Report for -SMARTCAP- SMOKEY POINT INDUSTRIAL

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Section 1 **– Summary and Minimum Requirements**

1.1 Project Description

SMARTCAP - Smokey Point Industrial, a light industrial warehousing complex with two buildings, will reside on a 19.44-*acre* lot in the City of Arlington. The development is located on Parcel Number 310516-003-005-00 and bears the address 3505 188th Ave NE, Arlington, WA 98223. The development will contain 8.89-*acres* impervious surface of which 4.89-*acres* will be pollution generating and 4.00-*acres* will be non-pollution generating impervious surface.

The project will utilize bioretention swales for stormwater mitigation of driveway, aisle, and parking. Swales will be located around the perimeter for stormwater infiltration. Stormwater will sheet flow radially from the building to the swales. Stormwater generated from the rooftop will be directed to an Infiltration trench within the truck court. Stormwater generated from the truck court will also be captured, conveyed, and infiltrated within this system.

The development of the parcel will consist of customer and employee parking spaces and conform to the requirements set forth in Arlington Municipal Code (AMC).

1.2 Project Data Summary:

Existing and proposed project areas are presented in Table 2 for determination of stormwater management requirements based on prescribed thresholds as outlined in the AMC 13.28.

1.3 Construction Activities

The site has been historically a single family residence with presumed agricultural activities. The original home was constructed in 1926 and the site is cleared pasture with a barn. An additional home was constructed in 1996 adjacent to the steep slope area onsite. The proposal will retain this existing home but all other structures are planned for demolition.

The site is relatively flat and minimal excavation will occur except for utility and stormwater management installations. A large volume of fill material will be brought into the site to permit access to 188th St in the SE corner and permit sewer service of the buildings. Gravel base and asphalt will be imported to create the parking and driveways. The organic strippings stockpiled on site will be used for soil amendments.

Project disturbance area is 10.83-*acres*. A separate document titled **Construction Stormwater Pollution Prevention Plan for SMARTCAP - Smokey Point Industrial** will detail construction methods for eliminating pollution.

Table 1 – Project Location Data

Project Data:	
Applicant	Smokey Point Industrial LLC
Project Name	SMARTCAP - Smokey Point Industrial
Project T.S.R. Location	SW 1/4 of Section 16, Township 31 N, Range 5 W
Project Address	3505 188th Ave NE, Arlington, WA 98223
Parcel ID(s)	310516-003-005-00
Watershed	Mainstem Stillaguamish
WRIA number	5
Basin	Stillaguamish
Sub-Basin	Portage Creek

Table 2 - Project Theshhold Data Summary

Project Data:		
Project Name	SMARTCAP - Smokey Point Industrial	
Existing Conditions:		
Total Site Area	846,691	sf (19.44ac)
Existing Impervious Area (ROW)	6,173	sf (0.14 ac)
Proposed Activity:		
Proposed Activity	Light Industrial - Warehousing	
Proposed Clearing Area (Total)	471,926	sf (10.83 ac)
Proposed Grading Area (Total)	471,926	sf (10.83 ac)
Proposed New NPGIS (Total)	174,213	sf (4.00 ac)
Proposed New PGIS (Total)	213,215	sf (4.89 ac)
Proposed Replaced Impervious Area	0	sf (0.0000 ac)
Native Vegetation convert to Lawn	0	sf (0.0000 ac)
Native Vegetation convert to Pasture	0	sf (0.0000 ac)
Total New Impervious Area (Total)	**387,428**	**sf (8.89 ac)**
Proposed Disturbance Area	**471,926**	**sf (10.83 ac)**
Project Qualification:		
Development Type	**New Development**	
Minimum Requirements	**1 thru 10**	

1.4 Minimum Requirements and Thresholds

The project qualifies as new development under Volume I, Chapter 2 of the 2019 DOE Stormwater Management Manual for Western Washington (SMMWW). The SMMWW is specified as the governing document for stormwater management per AMC 13.28.150. This specifies compliance with Minimum Requirements 1-10 of the SMMWW.

SMARTCAP - Smokey Point Industrial requires a full stormwater site plan and compliance with the minimum requirements set forth in the SMMWW.

A full construction SWPPP is required. The SWPPP is provided as a separate stand-alone document titled **Construction Stormwater Pollution Prevention Plan for SMARTCAP - Smokey Point Industrial**

Minimum Requirements

1. Preparation of Stormwater Site Plans
2. Construction Stormwater Pollution Prevention
3. Source Control of Pollution
4. Preservation of Natural Drainage Systems and Outfalls
5. On-site Stormwater Management
6. Runoff Treatment
7. Flow Control
8. Wetlands Protection
9. Operation and Maintenance

Minimum Requirements are addressed sequentially in this document.

Section 2 - **MR-1: PREPARE STORMWATER SITE PLAN**

2.1 Existing Site Conditions

2.1.1 Site Location

The project is located in the southeast quarter of Section 16 in Township 31 North, Range 5 West. The site's address is 3505 188th Ave NE, Arlington, WA 98223.

The location of the site is shown in Figure 1 below. The parcel is located at the approximate address of 3505 188th Ave NE, Arlington, WA 98223 at the corner of 35th Ave NE and 188th St NE. The project is located in the Stillaguamish watershed (WRIA-5), in the Portage Creek Sub-Basin.

2.1.2 Site Description

The site has a total area of 846,691-*square feet* (19.44-*acres*). The property is zoned Business Park and its current use is listed as 'Other'.

2.1.3 Vegetative Cover

The development area is predominately pasture. Some trees are located in the north, west, and south side of the parcel. An aerial photo can be seen in Section 11.1 as Figure 2.

2.1.4 Topography

The pre-developed existing topography both onsite and offsite was evaluated using LiDAR generated surfaces. The average slope as indicated by the LiDAR model is 0.8% through the flat portion of the parcel.

The site topography is generally flat within the development area. A steep slope occurs to the north and is identified as a Landslide Hazard Area. A 75-foot building setback will be recognized from top of slope.

2.1.5 Critical Areas

No critical areas occur on site. A wetland area is located to the north associated with the Portage Creek and the Stillaguamish River floodplain.

An existing conditions map is presented in Figure 2.

2.1.6 Soils

The NRCS Soil mappings for the site consist of Lynnwood loamy sand. NRCS aerial photograph of the soil mappings can be seen in Figure 3.

Lynnwood loamy sand soils with a weathered layer represents “A” type hydrologic soils that range in depth from about 0 to 29 *inches*. Below that is recessional outwash sand.

Soil log locations are shown in Figure 4. Analysis of the site indicates a loamy sand layer underlain by coarse to medium sand and then gravel. This is typical of geologic studies of the site area which define the site as the Marysville Sand Member consisting of well-drained outwash sand.

Soil explorations of the area corroborate with the NRCS soil mappings. A geotechnical report by the Riley Group indicates medium to coarse sand at a depth of about 1-2 feet. (Riley Group, 2022) Groundwater elevation is deep and wet season monitoring is ongoing. PIT test was conducted. Soils were consistent throughout the site. Long-term infiltration rate with correction is 20.0 inches/hour.

2.1.7 **Existing Basin Analysis**

The project falls within the Stillaguamish Basin that is a portion of the Mainstem Stillaguamish Watershed. The project falls within the Portage Creek Sub-Basin. The development area lies in what is colloquially called the Marysville Trough. The trough runs north to south and encompasses flat terrain west of Highway 9 and East of the Lakewood/Tulalip areas. The site is situated in the northern extent of this system.

It is assumed and highly likely that the entirety of this area is drained through groundwater and the groundwater gradient to these stream systems. No discrete drainage systems drain the site but surface flow is to the south – south east. The site will drain to Edgecomb Creek on the east side 51st Ave that was created during agricultural development in the area. Edgecomb creek drains to Quilceda Creek before reaching Puget Sound.

Edgecomb Creek has no known drainage issues immediately downstream of the parcel.

There are no known flooding or erosion concerns adjacent to the site.

2.1.8 **Upstream Analysis**

There is no upstream area to the site. The area is flat. Small portions of run-on may occur from the site perimeter.

2.1.9 **Existing Drainage**

The site topography trends northward. Due to the presence of “A” type soils, surface runoff is not expected to occur. There is no existing discrete drainage on-site or offsite.

2.1.10 **Downstream Analysis**

The site will largely infiltrate all stormwater except for extremely large storms following storm events that overwhelm an already saturated groundwater system. The following is a theoretical assessment of the drainage pathways assuming surface runoff occurs.

The site drains to the sites north boundary associated with the steep slope. A small portion of the site and 35th Ave ROW drains to the neighboring parcel to the west within a low-point in the center of that parcel. Ultimately, stormwater from the site, parcel to the west, and infiltrated stormwater reaches the steep slope to the north. Stormwater will continue north to the base of steep slope and

associated agricultural ditches of Portage Creek. Portage Creek flows west before reaching the Stillaguamish River. The Stillaguamish River floodplain extends to the base of the steep slope.

There are no known drainage issues immediately downstream.

The project is not expected to alter hydrology to Portage Creek while discernibly posing no altered hydrology to the Stillaguamish River/Puget Sound.

Emergency overflow is connected to base of the steep slope.

Section 3 **– MR-2: Stormwater Pollution Prevention Plan**

3.1 Storm Water Pollution Prevention Plan

A Storm Water Pollution Prevention Plan (SWPPP) has been prepared for this project and presented as a separate document titled "**Stormwater Pollution Prevention Plan for SMARTCAP - Smokey Point Industrial**", **26-Feb-2024**

Section 4 **- MR-3: Source Control of Pollution**

Per the 2019 SMWW Volume-I, Ch-2.5.3, source control BMPs are required for all development projects for the intended purpose to prevent stormwater from coming in contact with pollutants. The activities and the associated source control BMPs are listed in Volume-IV of the manual. These are primarily commercial industrial developments that involve significant pollutant generation potential. The proposed stormwater facilities addressed in this report manage stormwater generated from passenger vehicle parking and non-pollution generating rooftop. No source control BMPs apply to these facilities controlling stormwater from these surfaces.

No Volume-IV source control BMPs are specified.

For construction activities, source control BMPs prescribed in Volume-II are specified and described in the construction SWPPP per MR#2.

Section 5 **- MR-4: Preserve Natural Drainage Systems and Outfalls**

All drainage courses are to be preserved to the maximum extent feasible. All outfalls will remain in their current locations. Natural drainage patterns as they once existed shall be retained. Pre-developed conditions experience a sheet flow drainage pattern to the sites northern boundary and infiltration. The developed site is designed to direct flows to maintain the hydrology at the same boundary while infiltrating a vast majority of stormwater flows. Stormwater flows will be infiltrated.

Section 6 **- MR-5: On-site Stormwater Management**

Minimum Requirement #5 specifies requirements for on-site stormwater BMPs. This requirement mandates that on-site stormwater runoff be infiltrated, dispersed, and/or retained to the maximum extent feasible without causing flooding or erosion impacts. Projects triggering Minimum Requirements 1 through 5 must use On-site stormwater management BMPs from List #1 for all surfaces or demonstrate compliance with the LID Performance Standard. Projects triggering Minimum Requirements 1 through 9 must meet the requirements of Table 2.5.1 in Vol. 1 of the 2019 SMMWW. Table 2.5.1 specifies the requirements for new or redevelopment depending on UGA and parcel size to meet the requirements of the LID Performance Standard and/or List #2. List #1 and List #2 specify stormwater BMPs in order of preference. The first BMP determined feasible is required.

This project trigger MR's 1-9. This project is within the City's UGA. This project is required to adhere to the LID Performance Standard or List #2 per Table 2.5.1.

List #1 and #2 contain appropriate BMPs to mitigate a particular developed surface. The surfaces included in the list are Lawn and Landscaped Areas, Roofs, and other hard surfaces (road/driveway/parking).

Lawn/Landscape is required to utilize BMP T5.13, Post-Construction Soil Quality and Depth.

Roofs are required to employ BMP T5.30 Full Dispersion or Downspout Infiltration, Rain Gardens or Bioretention, BMP T5.10A Downspout Dispersion Systems, or perforated stub-out connections. The first feasible BMP in this list must be used.

Other Hard surfaces (Roads, Driveways, Parking Lots, Etc.) must utilize BMP T5.30 Full Dispersion, BMP T5.15 Permeable Pavement, Bioretention, Sheet Flow Dispersion, or Concentrated Flow Dispersion. The first feasible BMP in this list must be used.

Roofs will not be able to provide BMP T5.30 Full Dispersion. Full Dispersion requires 100 *foot* flow paths within native areas. The project will not be able to maintain 65% open space while also complying with the Growth Management Act and the City's comprehensive plan. There is not adequate space for the Full Dispersion requirements while meeting other facets of code. Roofs will be routed to Downspout Infiltration facilities which is the next feasible alternative.

Driveways and parking will be routed to Bioretention areas. Bioretention used to meet MR #5 is to be designed in accordance with BMP T7.30 per Page 7-3 of Vol. V of the 2019 SMMWW. Bioretention under BMP T7.30 is to be designed per the parameters of BMP T7.30 for infeasibility and design criteria as well as hydrologic modeling credits. Stormwater is released to the bioretention cells through sheet flow or a conveyance system.

Permeable pavement will not be used as the site will be largely industrial development and occasionally subjected to heavy axle loads.

A site plan showing the stormwater management and development can be seen in Figure 4.

Section 7 **- MR-6: Runoff Treatment**

Minimum Requirement #6 specifies the requirements for providing runoff treatment. The threshold for requiring a treatment BMP is 5,000 *square feet* of PGIS (Pollution Generating Impervious Surface) or a total of more than ¾ of an acre of PGPS (Pollution Generating Pervious Surface).

This project is expected to generate 213,215 *square feet* (4.89 *acres*) of PGIS based on road and driveway areas, therefore treatment facility BMPs are required for this project.

Runoff treatment facility selection is outlined in Vol. I, Ch. 4.2, Step V of the 2019 SMMWW. Step V outlines the treatment facility selection flow chart based on the intended use of a project. Treatment selection is based on if the site is a high-use site, if the downstream receiving waters are phosphorous sensitive, and/or if the site is required to provide enhanced treatment. The definitions of high-use, phosphorous control, and enhanced treatment can be found in Step V in Section 4.2 of the 2019 SMMWW.

The project is not a high use site.

The project is not required to treat for phosphorous.

Enhanced treatment is not required for the project.

Basic treatment is required per Vol. I, Ch. 2 & 4 of the 2019 SMMWW.

Enhanced and Basic treatment is provided through the use of a bioretention facility per Vol. III Section 3.3.12 of the 2019 SMMWW. The bioretention specified will provide enhanced treatment. The bio-cell treats stormwater through the infiltration of stormwater through soils and their ability to absorb pollutants. Soils have a CEC of greater than 5 meg/100g to a depth of 12 *inches*. On-site soils are suitable for use. See Vol III. Section 3.3.12 of the 2019 SMMWW for specific soil design criteria.

Road, Driveway, and Parking Area

The project has PGIS areas exceeding the threshold for simple treatment BMPs. Therefore, the development is required to employ basic treatment for its respective road, driveway, and parking areas.

The project utilizes bioretention swale for treatment. The bioretention swale mitigates polluted stormwater through physical, chemical, and biological treatment processes. The treatment process reduces pollutant loads to downstream receiving waters. Pretreatment (flow entrance and presettling) is controlled by 5/8" clean chip located adjacent to the edge of asphalt along its entire length to prevent channelization of storm inflow. Stormwater then percolates through compost amended soils and plantings to obtain treatment. Stormwater flows through this part of the cell at a rate of 12.0 *inches/hour*. Infiltration is accounted for below the bio-cell at a rate of 20 *inches/hour*. This infiltration rate accounts for stormwater that will rehydrate and restore pre-developed groundwater channels and accurately reflect the built condition. The total percolated runoff through the bio-cell's amended soils is well over the 91% total runoff volume treatment requirement, at 100%. See Section 12.6 A portion of the truck court will unable to be routed

to bioretention areas and will be infiltrated within the rock infiltration trench along with rooftop generated stormwater. The native soils exceed the CEC requirement to provide treatment therefore the only physical treatment requirement of stormwater runoff is to prevent siltation of the infiltration trenches. Further, the Basic Treatment requirement to remove 80% TSS is accommodated in the filtering systems by default.

Section 8 **- MR-7: Flow Control**

8.1 Flow Control

Minimum Requirement #7 specifies the requirements for runoff flow control. The threshold for requiring Minimum Requirement #7 is 5,000 *square feet* of impervious surface. Flow control shall be provided if the project creates more than 10,000 *square feet* of effective impervious area in a threshold discharge area, converts ¾ of an acre or more of native vegetation to lawn, 2.5 *acres* or more native vegetation is converted to pasture, or a combination of impervious and converted pervious surfaces cause a 0.1 *cfs* increase in the 100-*year* flow frequency from a continuous simulation runoff model.

The project exceeds this requirement and is required to provide flow control.

A total of 7,400 *square feet* of bioretention swale is proposed for stormwater facilities for the PGIS. The bioretention swale varies in width at its base and is surrounded by 3:1 slopes that rise 1.0 *feet*. The swale consists of 0.5 *feet* of ponded water depth and 0.5 *feet* of freeboard. The swale is constructed using 1.5 *feet* of amended soils. Sand may be made up of the existing onsite soils. A rate of 20 *inches/hour* is measured below the facilities and it should be confirmed during construction that stormwater BMPs make a continuous connection with these soils.

The bioretention swale design and construction specification follows 2019 DOE SMMWW BMP T7.30.

The bioretention swale infiltrates 100% of stormwater design for the impervious areas draining to them. Overflow is directed to the rock infiltration and an emergency overflow system is provided for both systems simultaneously to prevent any surface ponding from occurring.

Rooftops on site are routed to an infiltration trench. The infiltration trench is designed to be 2 *foot* thick, 40 *feet* wide and 312.5 *feet* long. Downspouts are discharged to a series of Catch Basin's with screen filters and baffles prior to discharging to the gravel filled trench. The loading dock areas are connected to this catch basin system for equivalent treatment. The rock bed is sized to accommodate the entirety of the projects impervious areas.

Hydrologic Analysis was conducted using the latest version of the WWHM software. Software reports are in Section 12.6. Supplementary information for the continuous simulation models is presented in Section 12.4. A site plan showing the location of bioretention swale can be seen in Section 11.1.

Section 9 **- MR-8: Wetlands Protection**

There is no detention or treatment in critical areas. Wetlands shall not be disturbed by the project. Protective and mitigation measures are employed through the construction stormwater pollution prevention plans.

Section 10 **- MR-9: Operation and Maintenance**

Minimum Requirement #9 contains requirements for inspection, operation and maintenance of stormwater facilities and BMPs. Specific maintenance standards and requirements are outlined in Volume V of the 2019 SMMWW. The 2019 SMMWW requires the regular maintenance and inspection of drainage facilities.

The Operations and Maintenance manual has been prepared for this project and presented as a separate document titled "**Operations and Maintenance manual for SMARTCAP - Smokey Point Industrial**", **26-Feb-2024.**

Section 11 - **Support Data**

11.1 Maps & Figures

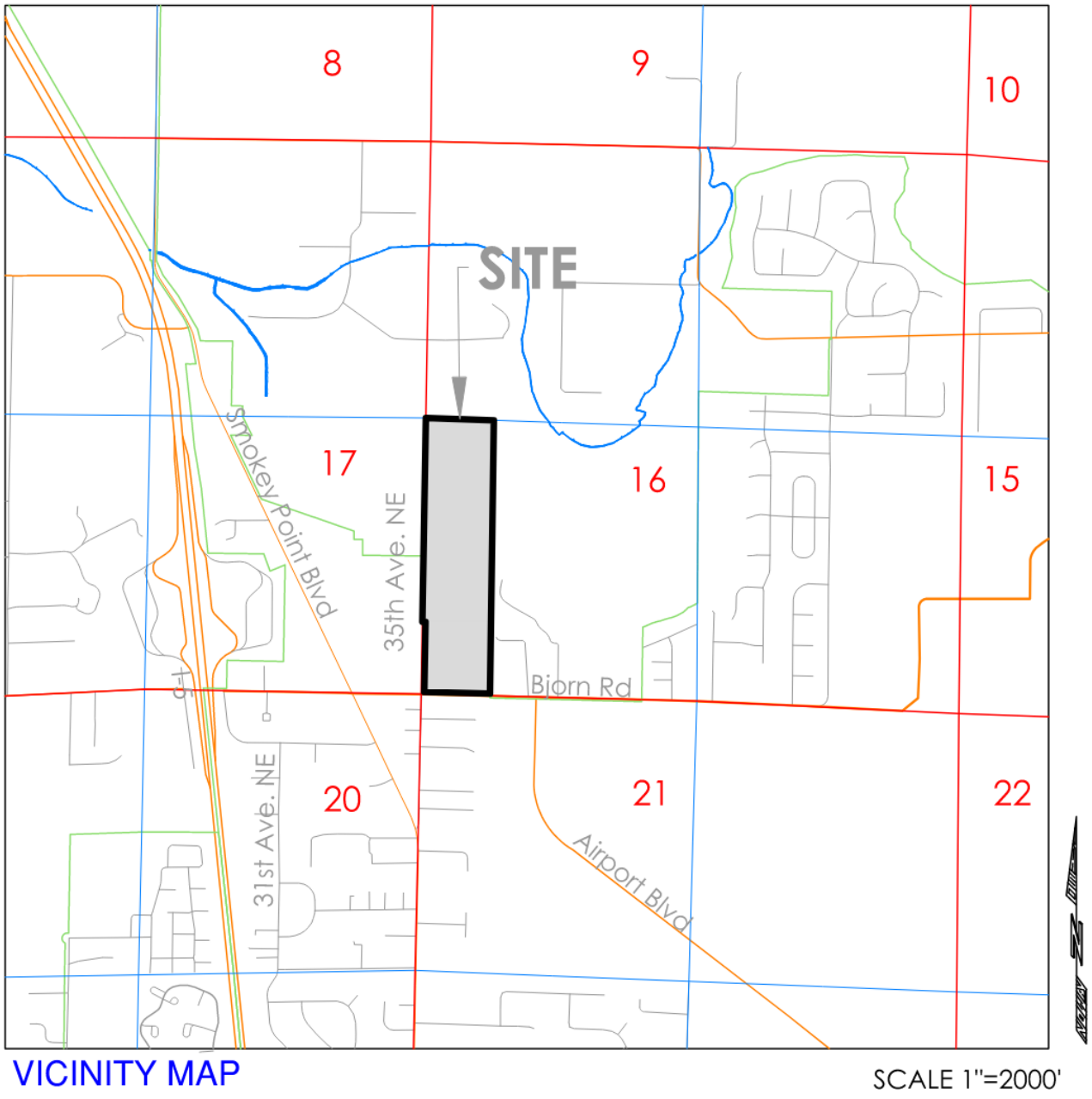

Figure 1 - Vicinity Map

Figure 2 - Existing Conditions

Figure 3 - NRCS Soil Map (Not to Scale)

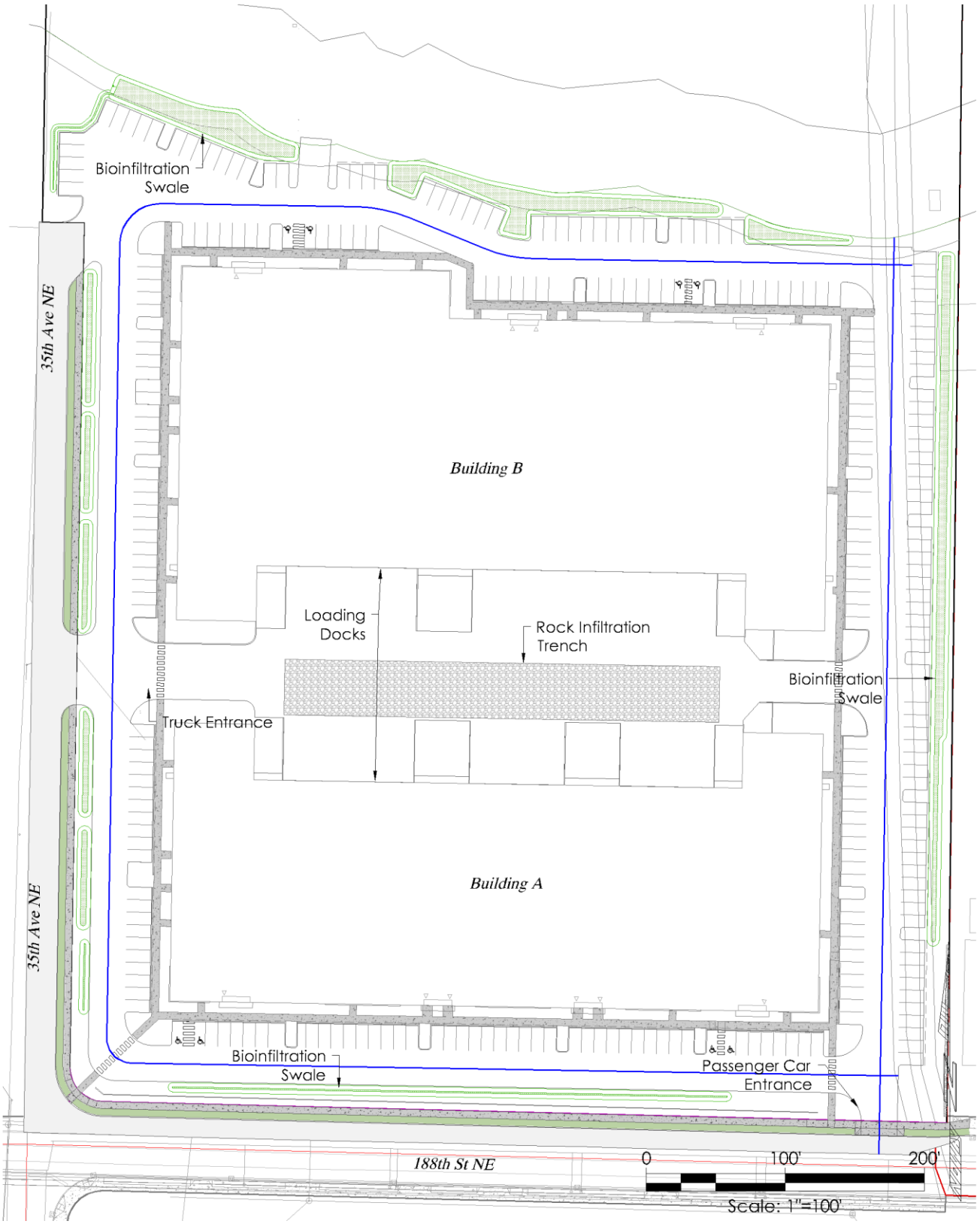

Figure 4 - Site Plan

Section 12 **Support Data**

This appendix contains the following support data as applicable to this report:

- Soils Data
- Reference Documents
- Topographic Data
- Continuous Simulation Modeling
- Software Output

12.1 Soils

The following data was extracted from Web Soil Survey, National Cooperative Soil Survey:

Table 3 - Soil Table

30—Lynnwood loamy sand, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 2hym
Elevation: 50 to 600 feet
Mean annual precipitation: 40 to 65 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 180 to 200 days
Farmland classification: Prime farmland if irrigated
Map Unit Composition
Lynnwood and similar soils: 85 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Lynnwood
Setting
Landform: Outwash plains, terraces
Parent material: Glacial outwash
Typical profile
H1 - 0 to 1 inches: loamy sand
H2 - 1 to 29 inches: loamy sand
H3 - 29 to 60 inches: sand
Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively 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: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.8 inches)
Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Other vegetative classification: Droughty Soils (G002XN402WA)
Hydric soil rating: No
Minor Components
Custer
Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Natural Resources Conservation Service
Web Soil Survey, National Cooperative Soil Survey
7/23/2014
Soil Survey Area: Arlington, Washington (Snohomish County)

12.2 Reference Documents

Department of Ecology. (2005). Surface Water Management Manual for Western Washington. WA: Department of Ecology.

Federal Emergency Management Agency. (1999, November 8). Flood Insurance Rate Map Number 392 of 1575. *Snohomish County, Washington and Incorporated Areas*, Panel 1061 of 1575. Arlington, Washington.

Puget Sound Action Team. (2005, January). Low Impact Development Technical Guidance Manual for Puget Sound. *Publication No. PSAT 05-03*. Washington: Washington State University - Pierce County Extension.

Puget Sound LIDAR Consortium. (2003, April). LIDAR Bare Earth DEM File. q47121h24be.e00. Snohomish County, Washington. Retrieved May 2013, from http://pugetsoundlidar.ess.washington.edu/index.htm

Riley Group. (2022). *Geotechnical Engineering Report - Poortinga Property.* Bothell: Riley Group.

12.3 Topographic Data

- Snohomish County 2005 LiDAR survey was used to augment the existing site topography and the downstream and surrounding areas. Citation: LiDAR Bare Earth DEM Files: be_48122b22.zip. Available: Puget Sound LiDAR Consortium, Seattle, WA

- Modeled coordinate system: Lateral - Washington State Plan Plane - North, FIPS 4601; Vertical – NAVD 88

12.4 Continuous Simulation Modeling

12.4.1 Continuous Simulation Background

HSPF based continuous simulation modeling was used to evaluate the hydrologic performances of the pre-developed and developed sub-basins in order to accurately assess flow rates.

The currently adopted continuous simulation models use the HSPF (Hydraulic Simulation Program in FORTRAN) software engine. The HSPF model uses a robust and detail accounting of the 'water budget', including evaporation, evapotranspiration, interception, interflow, and groundwater. The modeling accounts for and assesses land segment areas that include vegetation or impervious cover, soil types, and slopes. The modeling also utilizes over 50 years of continuous rainfall data (precipitation) and evaporation data for the area. The HSPF continuous modeling is considered the best available science for hydrologic analysis.

12.5 Modeling Methodology

HSPF modeling was managed via the Western Washington Hydrology Model (WWHM) interface program. The current professional version of WWHM by Clearcreek Solutions, Inc., WWHM-2012 was used. The current data precipitation and evaporation set provided by DOE with the WWHM-2012 software interface was used that includes quantized data in 15-minute time steps from October 1948 to October 2009.

The WWHM program comes packaged with generic, well considered HSPF modeling parameters. These settings allow for the modeling of the majority of the topological conditions found in the Puget Sound area. Where conditions fall reasonably outside the range of the default HSPF parameters, adjustments should be made to more accurately reflect those conditions. These is generally limited to the pervious land segments (IMPLNDS) and are mostly limited to slopes (SLSUR), infiltration rates (INFILT), and length of flow path (LSUR). For this project, HSPF parameters were not adjusted to reflect site conditions.

12.5.1 Existing Conditions

The surface vegetative cover is assumed forested with a flat slope. The NRCS soil maps indicate Lynnwood soils throughout the project area. For hydrologic modeling, Lynnwood soils are A type soils. Note: the predeveloped scenario for the site is included but not required since the project is complying with 100% infiltration. The comparison of predeveloped flows is for discharges to downstream conveyances. The existing site is pasture. Outside of the disturbance area, there is no land conversion.

12.5.2 Developed Conditions

The site is flat and grading will consist of stripping existing soils. Roof and driveway area will be added to the developed site. These areas are accounted for and used in the WHMM program. The

remaining area of the site will be used for stormwater management. The stormwater bioretention cells will be excavated down below the sealed surface layer to allow stormwater to readily infiltrate. The bio-swale areas are accounted for in the WWHM bio-retention element and are therefore discounted from the basin area. The preceding section contains input and output of parameters relevant to the existing and developed site to achieve 100% infiltration meeting current DOE standards. CAS areas are modeled as pasture as allowed and recommended by DOE.

12.6 Software Output

WWHM2012
PROJECT REPORT

Project Name: Smartcap - SPI biocell & rock
Site Name:
Site Address:
City : Arlington
Report Date: 2/22/2024
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2023/03/31
Version : 4.2.19

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No
GroundWater: No

Pervious Land Use	acre
A B, Forest, Flat	10.715
Pervious Total	10.715

Impervious Land Use	acre
ROADS FLAT	0.142
Impervious Total	0.142

Basin Total 10.857

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Roof & Truck Court
Bypass: No
GroundWater: No

Pervious Land Use	acre
Pervious Total	0

Impervious Land Use	acre
ROADS FLAT	1.42
ROOF TOPS FLAT	4
Impervious Total	5.42

Basin Total **5.42**

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 1	Gravel Trench Bed 1	

Name : Gravel Trench Bed 1
Bottom Length: 450.00 ft.
Bottom Width: 16.00 ft.
Trench bottom slope 1: 0.1 To 1
Trench Left side slope 0: 0.1 To 1
Trench right side slope 2: 0.1 To 1
Material thickness of first layer: 2
Pour Space of material for first layer: 0.42
Material thickness of second layer: 0
Pour Space of material for second layer: 0
Material thickness of third layer: 0
Pour Space of material for third layer: 0
Infiltration On
Infiltration rate: 20
Infiltration safety factor: 1
Wetted surface area On
Total Volume Infiltrated (ac-ft.): 1048.613
Total Volume Through Riser (ac-ft.): 0.086
Total Volume Through Facility (ac-ft.): 1048.699
Percent Infiltrated: 99.99
Total Precip Applied to Facility: 0
Total Evap From Facility: 0
Discharge Structure
Riser Height: 1.75 ft.
Riser Diameter: 12 in.

Element Flows To:

Outlet 1	Outlet 2

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.165	0.000	0.000	0.000
0.0222	0.165	0.001	0.000	3.334
0.0444	0.165	0.003	0.000	3.335
0.0667	0.165	0.004	0.000	3.336
0.0889	0.165	0.006	0.000	3.337
0.1111	0.165	0.007	0.000	3.338
0.1333	0.165	0.009	0.000	3.339
0.1556	0.165	0.010	0.000	3.340
0.1778	0.165	0.012	0.000	3.341
0.2000	0.165	0.013	0.000	3.342
0.2222	0.165	0.015	0.000	3.342
0.2444	0.165	0.017	0.000	3.343
0.2667	0.165	0.018	0.000	3.344
0.2889	0.165	0.020	0.000	3.345
0.3111	0.166	0.021	0.000	3.346
0.3333	0.166	0.023	0.000	3.347
0.3556	0.166	0.024	0.000	3.348
0.3778	0.166	0.026	0.000	3.349

0.4000	0.166	0.027	0.000	3.350
0.4222	0.166	0.029	0.000	3.351
0.4444	0.166	0.030	0.000	3.352
0.4667	0.166	0.032	0.000	3.353
0.4889	0.166	0.034	0.000	3.354
0.5111	0.166	0.035	0.000	3.355
0.5333	0.166	0.037	0.000	3.356
0.5556	0.166	0.038	0.000	3.357
0.5778	0.166	0.040	0.000	3.358
0.6000	0.166	0.041	0.000	3.359
0.6222	0.166	0.043	0.000	3.360
0.6444	0.166	0.044	0.000	3.361
0.6667	0.166	0.046	0.000	3.362
0.6889	0.166	0.048	0.000	3.363
0.7111	0.166	0.049	0.000	3.364
0.7333	0.166	0.051	0.000	3.365
0.7556	0.166	0.052	0.000	3.365
0.7778	0.167	0.054	0.000	3.366
0.8000	0.167	0.055	0.000	3.367
0.8222	0.167	0.057	0.000	3.368
0.8444	0.167	0.058	0.000	3.369
0.8667	0.167	0.060	0.000	3.370
0.8889	0.167	0.062	0.000	3.371
0.9111	0.167	0.063	0.000	3.372
0.9333	0.167	0.065	0.000	3.373
0.9556	0.167	0.066	0.000	3.374
0.9778	0.167	0.068	0.000	3.375
1.0000	0.167	0.069	0.000	3.376
1.0222	0.167	0.071	0.000	3.377
1.0444	0.167	0.073	0.000	3.378
1.0667	0.167	0.074	0.000	3.379
1.0889	0.167	0.076	0.000	3.380
1.1111	0.167	0.077	0.000	3.381
1.1333	0.167	0.079	0.000	3.382
1.1556	0.167	0.080	0.000	3.383
1.1778	0.167	0.082	0.000	3.384
1.2000	0.167	0.084	0.000	3.385
1.2222	0.167	0.085	0.000	3.386
1.2444	0.168	0.087	0.000	3.387
1.2667	0.168	0.088	0.000	3.388
1.2889	0.168	0.090	0.000	3.389
1.3111	0.168	0.091	0.000	3.389
1.3333	0.168	0.093	0.000	3.390
1.3556	0.168	0.094	0.000	3.391
1.3778	0.168	0.096	0.000	3.392
1.4000	0.168	0.098	0.000	3.393
1.4222	0.168	0.099	0.000	3.394
1.4444	0.168	0.101	0.000	3.395
1.4667	0.168	0.102	0.000	3.396
1.4889	0.168	0.104	0.000	3.397
1.5111	0.168	0.105	0.000	3.398
1.5333	0.168	0.107	0.000	3.399
1.5556	0.168	0.109	0.000	3.400
1.5778	0.168	0.110	0.000	3.401
1.6000	0.168	0.112	0.000	3.402
1.6222	0.168	0.113	0.000	3.403
1.6444	0.168	0.115	0.000	3.404
1.6667	0.168	0.117	0.000	3.405

1.6889	0.168	0.118	0.000	3.406
1.7111	0.169	0.120	0.000	3.407
1.7333	0.169	0.121	0.000	3.408
1.7556	0.169	0.123	0.004	3.409
1.7778	0.169	0.124	0.049	3.410
1.8000	0.169	0.126	0.118	3.411
1.8222	0.169	0.128	0.205	3.412
1.8444	0.169	0.129	0.306	3.413
1.8667	0.169	0.131	0.418	3.413
1.8889	0.169	0.132	0.540	3.414
1.9111	0.169	0.134	0.670	3.415
1.9333	0.169	0.135	0.804	3.416
1.9556	0.169	0.137	0.942	3.417
1.9778	0.169	0.139	1.080	3.418
2.0000	0.169	0.140	1.217	3.419

Name : Bioretention 1
Bottom Length: 1850.00 ft.
Bottom Width: 4.00 ft.
Material thickness of first layer: 1.5
Material type for first layer: SMMWW 12 in/hr
Material thickness of second layer: 0
Material type for second layer: Sand
Material thickness of third layer: 0
Material type for third layer: GRAVEL
Infiltration On
Infiltration rate: 20
Infiltration safety factor: 1
Total Volume Infiltrated (ac-ft.): 776.008
Total Volume Through Riser (ac-ft.): 0.002
Total Volume Through Facility (ac-ft.): 776.01
Percent Infiltrated: 100
Total Precip Applied to Facility: 38.129
Total Evap From Facility: 18.144
Underdrain not used
Discharge Structure
Riser Height: 0.5 ft.
Riser Diameter: 12 in.

Element Flows To:
Outlet 1 **Outlet 2**

Bioretention 1 Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.1699	0.0000	0.0000	0.0000
0.0275	0.1699	0.0021	0.0000	0.0000
0.0549	0.1699	0.0043	0.0000	0.0000
0.0824	0.1699	0.0064	0.0000	0.0000
0.1099	0.1699	0.0085	0.0000	0.0000
0.1374	0.1699	0.0107	0.0000	0.0004
0.1648	0.1699	0.0128	0.0000	0.0093
0.1923	0.1699	0.0149	0.0000	0.0134
0.2198	0.1699	0.0171	0.0000	0.0185
0.2473	0.1699	0.0192	0.0000	0.0246
0.2747	0.1699	0.0213	0.0000	0.0317
0.3022	0.1699	0.0235	0.0000	0.0399
0.3297	0.1699	0.0256	0.0000	0.0492
0.3571	0.1699	0.0277	0.0000	0.0598

0.3846	0.1699	0.0299	0.0000	0.0716
0.4121	0.1699	0.0320	0.0000	0.0847
0.4396	0.1699	0.0341	0.0000	0.0991
0.4670	0.1699	0.0363	0.0000	0.1149
0.4945	0.1699	0.0384	0.0000	0.1322
0.5220	0.1699	0.0406	0.0000	0.1509
0.5495	0.1699	0.0427	0.0000	0.1711
0.5769	0.1699	0.0448	0.0000	0.1928
0.6044	0.1699	0.0470	0.0000	0.2161
0.6319	0.1699	0.0491	0.0000	0.2411
0.6593	0.1699	0.0512	0.0000	0.2677
0.6868	0.1699	0.0534	0.0000	0.2960
0.7143	0.1699	0.0555	0.0000	0.3260
0.7418	0.1699	0.0576	0.0000	0.3577
0.7692	0.1699	0.0598	0.0000	0.3913
0.7967	0.1699	0.0619	0.0000	0.4266
0.8242	0.1699	0.0640	0.0000	0.4639
0.8516	0.1699	0.0662	0.0000	0.5030
0.8791	0.1699	0.0683	0.0000	0.5440
0.9066	0.1699	0.0704	0.0000	0.5869
0.9341	0.1699	0.0726	0.0000	0.6319
0.9615	0.1699	0.0747	0.0000	0.6788
0.9890	0.1699	0.0768	0.0000	0.7278
1.0165	0.1699	0.0790	0.0000	0.7788
1.0440	0.1699	0.0811	0.0000	0.8319
1.0714	0.1699	0.0832	0.0000	0.8871
1.0989	0.1699	0.0854	0.0000	0.9444
1.1264	0.1699	0.0875	0.0000	1.0039
1.1538	0.1699	0.0896	0.0000	1.0656
1.1813	0.1699	0.0918	0.0000	1.1295
1.2088	0.1699	0.0939	0.0000	1.1956
1.2363	0.1699	0.0960	0.0000	1.2640
1.2637	0.1699	0.0982	0.0000	1.3346
1.2912	0.1699	0.1003	0.0000	1.4075
1.3187	0.1699	0.1024	0.0000	1.4826
1.3462	0.1699	0.1046	0.0000	1.5601
1.3736	0.1699	0.1067	0.0000	1.6398
1.4011	0.1699	0.1088	0.0000	1.7218
1.4286	0.1699	0.1110	0.0000	1.8059
1.4560	0.1699	0.1131	0.0000	1.8921
1.4835	0.1699	0.1152	0.0000	1.9795
1.5000	0.1699	0.1165	0.0000	2.7407

Surface retention 1 Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Wetted Surface
1.5000	0.1699	0.1165	0.0000	2.0556	0.0000
1.5275	0.1769	0.1213	0.0000	2.0556	0.0000
1.5549	0.1839	0.1262	0.0000	2.1309	0.0000
1.5824	0.1909	0.1314	0.0000	2.1685	0.0000
1.6099	0.1980	0.1367	0.0000	2.2061	0.0000
1.6374	0.2050	0.1423	0.0000	2.2438	0.0000
1.6648	0.2120	0.1480	0.0000	2.2814	0.0000
1.6923	0.2190	0.1539	0.0000	2.3191	0.0000
1.7198	0.2260	0.1600	0.0000	2.3567	0.0000
1.7473	0.2331	0.1663	0.0000	2.3944	0.0000
1.7747	0.2401	0.1728	0.0000	2.4320	0.0000
1.8022	0.2471	0.1795	0.0000	2.4697	0.0000
1.8297	0.2542	0.1864	0.0000	2.5073	0.0000

1.8571	0.2612	0.1935	0.0000	2.5450	0.0000
1.8846	0.2682	0.2008	0.0000	2.5826	0.0000
1.9121	0.2753	0.2082	0.0000	2.6203	0.0000
1.9396	0.2823	0.2159	0.0000	2.6579	0.0000
1.9670	0.2893	0.2237	0.0000	2.6956	0.0000
1.9945	0.2964	0.2318	0.0000	2.7332	0.0000
2.0220	0.3034	0.2400	0.0346	2.7407	0.0000
2.0495	0.3104	0.2485	0.1165	2.7407	0.0000
2.0769	0.3175	0.2571	0.2257	2.7407	0.0000
2.1044	0.3245	0.2659	0.3555	2.7407	0.0000
2.1319	0.3316	0.2749	0.5015	2.7407	0.0000
2.1593	0.3386	0.2841	0.6597	2.7407	0.0000
2.1868	0.3457	0.2935	0.8261	2.7407	0.0000
2.2143	0.3527	0.3031	0.9966	2.7407	0.0000
2.2418	0.3598	0.3129	1.1671	2.7407	0.0000
2.2692	0.3668	0.3229	1.3333	2.7407	0.0000
2.2967	0.3739	0.3331	1.4914	2.7407	0.0000
2.3242	0.3809	0.3434	1.6378	2.7407	0.0000
2.3516	0.3880	0.3540	1.7695	2.7407	0.0000
2.3791	0.3950	0.3647	1.8845	2.7407	0.0000
2.4066	0.4021	0.3757	1.9818	2.7407	0.0000
2.4341	0.4091	0.3868	2.0620	2.7407	0.0000
2.4615	0.4162	0.3982	2.1274	2.7407	0.0000
2.4890	0.4233	0.4097	2.1826	2.7407	0.0000
2.5000	0.4261	0.4144	2.2635	2.7407	0.0000

Name : Surface retention 1

Element Flows To:

Outlet 1	**Outlet 2**
Bioretention 1	

Name : Perim Site & PGIS
Bypass: No
GroundWater: No

Pervious Land Use	**acre**
C, Pasture, Flat	**1.456**
Pervious Total	**1.456**

Impervious Land Use	**acre**
ROADS FLAT	**0.552**
DRIVEWAYS FLAT	**2.371**
SIDEWALKS FLAT	**0.413**
Impervious Total	**3.336**
Basin Total	**4.792**

Element Flows To:

Surface	**Interflow**	**Groundwater**
Surface retention 1	Surface retention 1	

ANALYSIS RESULTS
Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:10.715
Total Impervious Area:0.142

Mitigated Landuse Totals for POC #1
Total Pervious Area:1.456
Total Impervious Area:8.756

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.081618
5 year	0.120145
10 year	0.151479
25 year	0.198527
50 year	0.239554
100 year	0.286211

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Stream Protection Duration
POC #1
The Facility PASSED
The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0408	1079	3	0	Pass
0.0428	899	3	0	Pass
0.0448	773	3	0	Pass
0.0468	645	3	0	Pass
0.0488	531	3	0	Pass
0.0508	459	3	0	Pass
0.0529	389	3	0	Pass
0.0549	341	3	0	Pass
0.0569	297	3	1	Pass
0.0589	257	3	1	Pass
0.0609	230	3	1	Pass
0.0629	203	3	1	Pass
0.0649	182	3	1	Pass
0.0669	164	3	1	Pass
0.0689	150	3	2	Pass
0.0709	132	3	2	Pass
0.0729	115	3	2	Pass
0.0749	106	3	2	Pass
0.0769	101	3	2	Pass
0.0790	95	3	3	Pass
0.0810	87	3	3	Pass
0.0830	80	3	3	Pass
0.0850	74	3	4	Pass

0.0870	65	3	4	Pass
0.0890	58	3	5	Pass
0.0910	57	3	5	Pass
0.0930	52	3	5	Pass
0.0950	47	3	6	Pass
0.0970	44	3	6	Pass
0.0990	42	3	7	Pass
0.1010	41	3	7	Pass
0.1030	36	3	8	Pass
0.1050	35	3	8	Pass
0.1071	29	3	10	Pass
0.1091	27	3	11	Pass
0.1111	27	3	11	Pass
0.1131	26	3	11	Pass
0.1151	25	3	12	Pass
0.1171	24	3	12	Pass
0.1191	23	3	13	Pass
0.1211	23	3	13	Pass
0.1231	22	3	13	Pass
0.1251	21	3	14	Pass
0.1271	18	3	16	Pass
0.1291	17	3	17	Pass
0.1311	17	3	17	Pass
0.1332	16	3	18	Pass
0.1352	16	3	18	Pass
0.1372	15	3	20	Pass
0.1392	15	3	20	Pass
0.1412	15	3	20	Pass
0.1432	15	3	20	Pass
0.1452	15	3	20	Pass
0.1472	15	3	20	Pass
0.1492	15	3	20	Pass
0.1512	12	3	25	Pass
0.1532	11	3	27	Pass
0.1552	11	3	27	Pass
0.1572	10	3	30	Pass
0.1593	10	3	30	Pass
0.1613	9	3	33	Pass
0.1633	9	3	33	Pass
0.1653	9	3	33	Pass
0.1673	8	3	37	Pass
0.1693	8	3	37	Pass
0.1713	8	3	37	Pass
0.1733	8	3	37	Pass
0.1753	7	3	42	Pass
0.1773	7	3	42	Pass
0.1793	7	3	42	Pass
0.1813	7	3	42	Pass
0.1833	7	3	42	Pass
0.1854	7	3	42	Pass
0.1874	7	3	42	Pass
0.1894	6	3	50	Pass
0.1914	5	3	60	Pass
0.1934	5	3	60	Pass
0.1954	5	3	60	Pass
0.1974	5	3	60	Pass
0.1994	5	3	60	Pass
0.2014	5	3	60	Pass

0.2034	5	3	60	Pass
0.2054	5	3	60	Pass
0.2074	5	3	60	Pass
0.2094	5	3	60	Pass
0.2114	5	3	60	Pass
0.2135	5	3	60	Pass
0.2155	5	3	60	Pass
0.2175	5	3	60	Pass
0.2195	4	3	75	Pass
0.2215	4	3	75	Pass
0.2235	4	3	75	Pass
0.2255	4	3	75	Pass
0.2275	3	3	100	Pass
0.2295	3	3	100	Pass
0.2315	3	3	100	Pass
0.2335	3	3	100	Pass
0.2355	3	3	100	Pass
0.2375	3	3	100	Pass
0.2396	3	3	100	Pass

Perlnd and Implnd Changes
No changes have been made.

12.6.1 Site with 100% runoff to rock infiltration (No bio-cell)

WWHM2012
PROJECT REPORT

Project Name: Smartcap - SPI single infilt chamber
Site Name:
Site Address:
City :
Report Date: 2/22/2024
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2023/03/31
Version : 4.2.19

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No
GroundWater: No

Pervious Land Use	acre
A B, Forest, Flat	10.715
Pervious Total	10.715

Impervious Land Use	acre
ROADS FLAT	0.142
Impervious Total	0.142

Basin Total 10.857

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Gravel Trench Bed 1
Bottom Length: 312.80 ft.
Bottom Width: 40.00 ft.
Trench bottom slope 1: 0.1 To 1
Trench Left side slope 0: 0.1 To 1
Trench right side slope 2: 0.1 To 1
Material thickness of first layer: 2
Pour Space of material for first layer: 0.42
Material thickness of second layer: 0
Pour Space of material for second layer: 0
Material thickness of third layer: 0
Pour Space of material for third layer: 0
Infiltration On
Infiltration rate: 20
Infiltration safety factor: 1
Wetted surface area On
Total Volume Infiltrated (ac-ft.): 1804.815
Total Volume Through Riser (ac-ft.): 0.1
Total Volume Through Facility (ac-ft.): 1804.915
Percent Infiltrated: 99.99
Total Precip Applied to Facility: 0
Total Evap From Facility: 0
Discharge Structure
Riser Height: 1.75 ft.
Riser Diameter: 12 in.

Element Flows To:

Outlet 1	Outlet 2

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.287	0.000	0.000	0.000
0.0222	0.287	0.002	0.000	5.793
0.0444	0.287	0.005	0.000	5.794

0.0667	0.287	0.008	0.000	5.795
0.0889	0.287	0.010	0.000	5.795
0.1111	0.287	0.013	0.000	5.796
0.1333	0.287	0.016	0.000	5.797
0.1556	0.287	0.018	0.000	5.798
0.1778	0.287	0.021	0.000	5.799
0.2000	0.287	0.024	0.000	5.800
0.2222	0.287	0.026	0.000	5.800
0.2444	0.287	0.029	0.000	5.801
0.2667	0.287	0.032	0.000	5.802
0.2889	0.287	0.034	0.000	5.803
0.3111	0.287	0.037	0.000	5.804
0.3333	0.287	0.040	0.000	5.805
0.3556	0.287	0.042	0.000	5.805
0.3778	0.287	0.045	0.000	5.806
0.4000	0.288	0.048	0.000	5.807
0.4222	0.288	0.051	0.000	5.808
0.4444	0.288	0.053	0.000	5.809
0.4667	0.288	0.056	0.000	5.810
0.4889	0.288	0.059	0.000	5.810
0.5111	0.288	0.061	0.000	5.811
0.5333	0.288	0.064	0.000	5.812
0.5556	0.288	0.067	0.000	5.813
0.5778	0.288	0.069	0.000	5.814
0.6000	0.288	0.072	0.000	5.814
0.6222	0.288	0.075	0.000	5.815
0.6444	0.288	0.077	0.000	5.816
0.6667	0.288	0.080	0.000	5.817
0.6889	0.288	0.083	0.000	5.818
0.7111	0.288	0.086	0.000	5.819
0.7333	0.288	0.088	0.000	5.819
0.7556	0.288	0.091	0.000	5.820
0.7778	0.288	0.094	0.000	5.821
0.8000	0.288	0.096	0.000	5.822
0.8222	0.288	0.099	0.000	5.823
0.8444	0.288	0.102	0.000	5.824
0.8667	0.288	0.104	0.000	5.824
0.8889	0.288	0.107	0.000	5.825
0.9111	0.288	0.110	0.000	5.826
0.9333	0.289	0.112	0.000	5.827
0.9556	0.289	0.115	0.000	5.828
0.9778	0.289	0.118	0.000	5.829
1.0000	0.289	0.121	0.000	5.829
1.0222	0.289	0.123	0.000	5.830
1.0444	0.289	0.126	0.000	5.831
1.0667	0.289	0.129	0.000	5.832
1.0889	0.289	0.131	0.000	5.833
1.1111	0.289	0.134	0.000	5.834
1.1333	0.289	0.137	0.000	5.834
1.1556	0.289	0.139	0.000	5.835
1.1778	0.289	0.142	0.000	5.836
1.2000	0.289	0.145	0.000	5.837
1.2222	0.289	0.148	0.000	5.838
1.2444	0.289	0.150	0.000	5.838
1.2667	0.289	0.153	0.000	5.839
1.2889	0.289	0.156	0.000	5.840
1.3111	0.289	0.158	0.000	5.841
1.3333	0.289	0.161	0.000	5.842

1.3556	0.289	0.164	0.000	5.843
1.3778	0.289	0.167	0.000	5.843
1.4000	0.289	0.169	0.000	5.844
1.4222	0.289	0.172	0.000	5.845
1.4444	0.289	0.175	0.000	5.846
1.4667	0.289	0.177	0.000	5.847
1.4889	0.290	0.180	0.000	5.848
1.5111	0.290	0.183	0.000	5.848
1.5333	0.290	0.185	0.000	5.849
1.5556	0.290	0.188	0.000	5.850
1.5778	0.290	0.191	0.000	5.851
1.6000	0.290	0.194	0.000	5.852
1.6222	0.290	0.196	0.000	5.853
1.6444	0.290	0.199	0.000	5.853
1.6667	0.290	0.202	0.000	5.854
1.6889	0.290	0.204	0.000	5.855
1.7111	0.290	0.207	0.000	5.856
1.7333	0.290	0.210	0.000	5.857
1.7556	0.290	0.213	0.004	5.858
1.7778	0.290	0.215	0.049	5.858
1.8000	0.290	0.218	0.118	5.859
1.8222	0.290	0.221	0.205	5.860
1.8444	0.290	0.223	0.306	5.861
1.8667	0.290	0.226	0.418	5.862
1.8889	0.290	0.229	0.540	5.863
1.9111	0.290	0.232	0.670	5.863
1.9333	0.290	0.234	0.804	5.864
1.9556	0.290	0.237	0.942	5.865
1.9778	0.290	0.240	1.080	5.866
2.0000	0.290	0.242	1.217	5.867

Name : Basin 2
Bypass: No
GroundWater: No

Pervious Land Use	**acre**
C, Pasture, Flat	**1.456**
Pervious Total	**1.456**

Impervious Land Use	**acre**
ROADS FLAT	**1.972**
ROOF TOPS FLAT	**4**
DRIVEWAYS FLAT	**2.371**
SIDEWALKS FLAT	**0.413**
Impervious Total	**8.756**
Basin Total	**10.212**

Element Flows To:

Surface	**Interflow**	**Groundwater**
Gravel Trench Bed 1	Gravel Trench Bed 1	

ANALYSIS RESULTS
Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:10.715
Total Impervious Area:0.142

Mitigated Landuse Totals for POC #1
Total Pervious Area:1.456
Total Impervious Area:8.756

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.081618
5 year	0.120145
10 year	0.151479
25 year	0.198527
50 year	0.239554
100 year	0.286211

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Stream Protection Duration
POC #1
The Facility PASSED
The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0408	1079	3	0	Pass
0.0428	899	3	0	Pass
0.0448	773	3	0	Pass
0.0468	645	3	0	Pass
0.0488	531	3	0	Pass
0.0508	459	3	0	Pass
0.0529	389	3	0	Pass
0.0549	341	3	0	Pass
0.0569	297	3	1	Pass
0.0589	257	3	1	Pass
0.0609	230	3	1	Pass
0.0629	203	3	1	Pass
0.0649	182	3	1	Pass
0.0669	164	3	1	Pass
0.0689	150	3	2	Pass
0.0709	132	3	2	Pass
0.0729	115	3	2	Pass
0.0749	106	3	2	Pass
0.0769	101	3	2	Pass
0.0790	95	3	3	Pass
0.0810	87	3	3	Pass
0.0830	80	3	3	Pass
0.0850	74	3	4	Pass

0.0870	65	3	4	Pass
0.0890	58	3	5	Pass
0.0910	57	3	5	Pass
0.0930	52	3	5	Pass
0.0950	47	3	6	Pass
0.0970	44	3	6	Pass
0.0990	42	3	7	Pass
0.1010	41	3	7	Pass
0.1030	36	3	8	Pass
0.1050	35	3	8	Pass
0.1071	29	3	10	Pass
0.1091	27	3	11	Pass
0.1111	27	3	11	Pass
0.1131	26	3	11	Pass
0.1151	25	3	12	Pass
0.1171	24	3	12	Pass
0.1191	23	3	13	Pass
0.1211	23	3	13	Pass
0.1231	22	3	13	Pass
0.1251	21	3	14	Pass
0.1271	18	3	16	Pass
0.1291	17	3	17	Pass
0.1311	17	3	17	Pass
0.1332	16	3	18	Pass
0.1352	16	3	18	Pass
0.1372	15	3	20	Pass
0.1392	15	3	20	Pass
0.1412	15	3	20	Pass
0.1432	15	3	20	Pass
0.1452	15	3	20	Pass
0.1472	15	3	20	Pass
0.1492	15	3	20	Pass
0.1512	12	3	25	Pass
0.1532	11	3	27	Pass
0.1552	11	3	27	Pass
0.1572	10	3	30	Pass
0.1593	10	3	30	Pass
0.1613	9	3	33	Pass
0.1633	9	3	33	Pass
0.1653	9	3	33	Pass
0.1673	8	3	37	Pass
0.1693	8	3	37	Pass
0.1713	8	3	37	Pass
0.1733	8	3	37	Pass
0.1753	7	3	42	Pass
0.1773	7	3	42	Pass
0.1793	7	3	42	Pass
0.1813	7	3	42	Pass
0.1833	7	3	42	Pass
0.1854	7	3	42	Pass
0.1874	7	3	42	Pass
0.1894	6	3	50	Pass
0.1914	5	3	60	Pass
0.1934	5	3	60	Pass
0.1954	5	3	60	Pass
0.1974	5	3	60	Pass
0.1994	5	3	60	Pass
0.2014	5	3	60	Pass

0.2034	5	3	60	Pass
0.2054	5	3	60	Pass
0.2074	5	3	60	Pass
0.2094	5	3	60	Pass
0.2114	5	3	60	Pass
0.2135	5	3	60	Pass
0.2155	5	3	60	Pass
0.2175	5	3	60	Pass
0.2195	4	3	75	Pass
0.2215	4	3	75	Pass
0.2235	4	3	75	Pass
0.2255	4	3	75	Pass
0.2275	3	3	100	Pass
0.2295	3	3	100	Pass
0.2315	3	3	100	Pass
0.2335	3	3	100	Pass
0.2355	3	3	100	Pass
0.2375	3	3	100	Pass
0.2396	3	3	100	Pass

Perlnd and Implnd Changes

No changes have been made.