INSIGHT ENGINEERING CO.

STORMWATER SITE PLAN
For
Boys and Girls Club Snohomish

Prepared for
The City of Snohomish
116 Union Avenue
Snohomish, WA 98290-2943
360.568.3115

RECEIVED
02/06/2020
PLANNING

Project Site Location:
402 Second Street,
Snohomish, WA 98290

Applicant:
City of Snohomish
116 Union Avenue
Snohomish, WA 98290

Contact:
IECO
P.O. Box 1478
Everett, WA98206
425-303-9363

Tax Id: 28061800402200, 00475700100000

IECO Project: 19-1019

Certified Erosion and Sedimentation Control Lead:
To be named by contractor

Stormwater Site Plan Prepared By:

Ryan J. Korte

Stormwater Site Plan Preparation Date:

January 21, 2020

Approximate Construction Date:

May 1, 2020

BRIAN R. KALAB
STATE OF WASHINGTON
36499
REGISTERED
PROFESSIONAL ENGINEER

01/21/2020

P.O Box 1478 ♦ Everett, WA98206 ♦ P: 425.303.9363
info@insightengineering.net

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Acronyms and Abbreviations

BMP	Best Management Practices
DOE	Department of Ecology
EDDS	Engineering Design and Development Standards
ESC	Erosion and Sediment Control
IECO	Insight Engineering Company
MR	Minimum Requirement
SFDU	Single Family Unit Development
SWPPP	Stormwater Pollution Prevention Plan
SWMMWW	Stormwater Management Manual for Western Washington
TESC	Temporary Erosion and Sediment Control
WWHM	Western Washington Hydrology Model
NRCS	National Resource Conservation Service

1.0 Executive Summary - Attachment "A"

The proposed project ***Boys and Girls Club Snohomish*** is located at 402 Second St, Snohomish, WA 98290. More generally; the site is in Section 01, Township 28 North, and Range 5 East of the Willamette Meridian in Snohomish County, Washington. Please refer to the Vicinity Map attached later in the section. This report follows the City of Snohomish's requirements and the requirements defined in the 2012 SWMMWW manual.

The site contains 2.50 acres and the proposed clearing limit for the project is 0.17 acres. The site is currently developed with an existing Boys and Girls Club building, a parking lot with access from second street, a skate park, and a playground. The remainder of the site is covered with lawn and landscaping. The site contains one drainage basins that slopes to the east. Please refer to the downstream analysis map for more details. Per NRCS survey of Snohomish County, the project site contains Tokul soils that have a hydrologic classification of Type "C". Please refer to the soils map and descriptions attached later in this report for more details.

The proposal is to add a 3,585-SF addition (roof area) to the existing Boys and Girls Club along with 160-SF of concrete sidewalk. An outdoor bathroom is shown for future development on the north side of the addition; the roof area for the bathrooms has been included in the design calculations for the infiltration system. Access will remain unchanged from Second Street.

Per Figure 2.4.1, (flow chart for new development requirements) Volume I of the 2012/2014 SWMMWW, Minimum requirements #1 through 5 shall apply for this project. See attachment C for Minimum Requirements Summary included later in this report.

Per Minimum Requirement #5 (Section 2.5.5 of the SWMMWW), the following roof BMP's shall be applied to provide onsite stormwater management and must be considered in the following order per List #1 full dispersion or downspout infiltration, rain gardens, basic dispersion, and then perforated stub-out connections. Full infiltration is feasible. Existing site impervious was designed to fully infiltrate on site. According to original drainage report used to

design the existing drainage system, a sandy gravel layer exists at 5-feet below grade. The runoff from the roof will be collected via roof drains that will be conveyed to an onsite infiltration trench. The following BMP's shall be applied to the other hard surfaces: full dispersion, permeable pavement or bioretention, and sheet flow dispersion. Full dispersion is infeasible as the site cannot preserve the required native vegetation. Permeable pavement and bioretention have not considered as the proposed project is exempt from flow control. Sheet flow dispersion is feasible and will be used. Post-construction soil quality and depth BMP T.5.13 is proposed to provide onsite stormwater management for the pervious areas of the site.

Figure 1 - Minimum Requirements (MR's) for New Development Projects

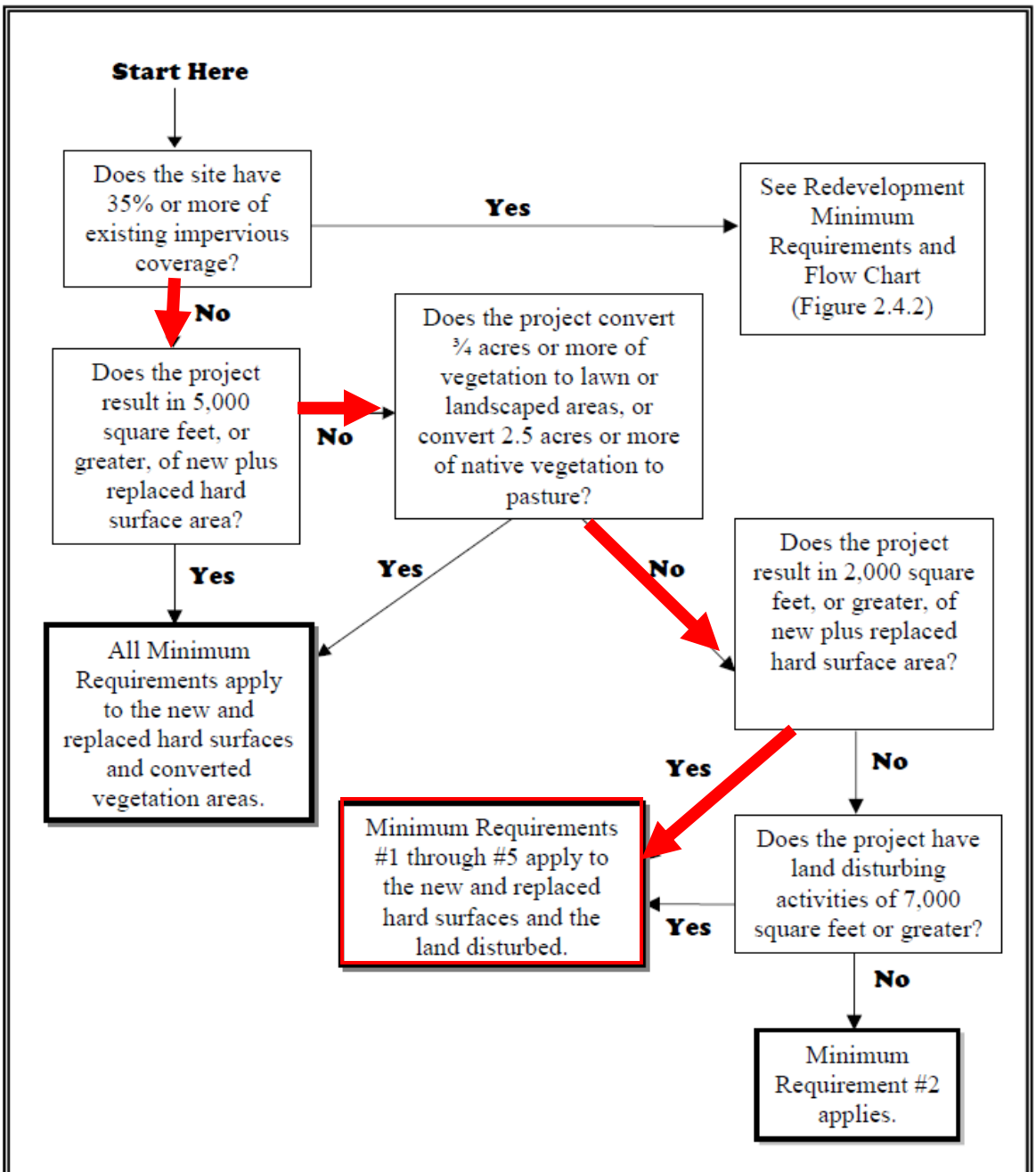


Figure 2.4.1 – Flow Chart for Determining Requirements for New Development

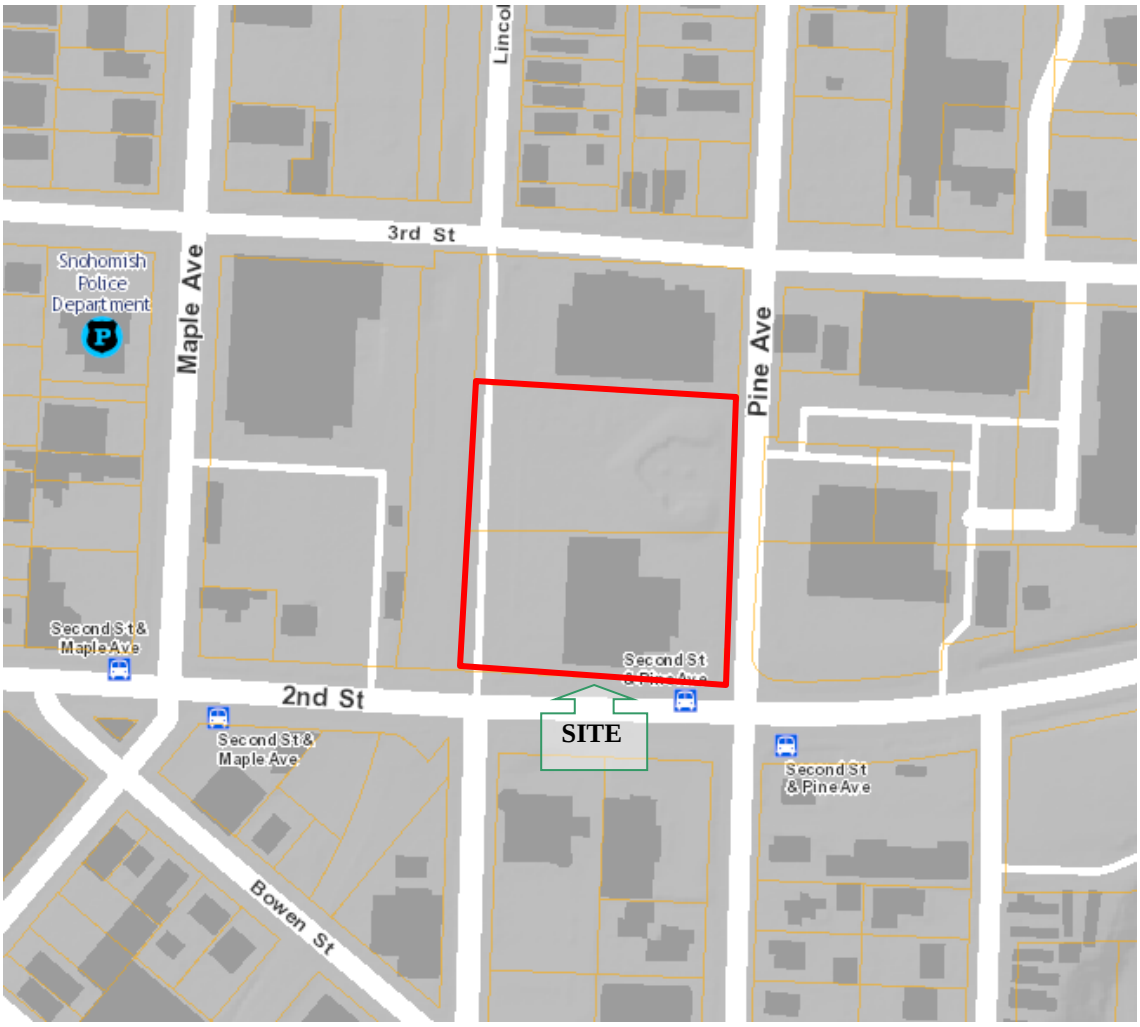
1.1 Drainage Information Summary - Attachment "B" Report Summary

Project Name: **Boys and Girls Club Snohomish** Project Engineer: **INSIGHT ENGINEERING COMPANY** Project Applicant: City of Snohomish Project Site Area**: 2.50 Ac** Project Development Area: **0.17 Ac**	Number of Units: **NA**

Summary Table

Drainage Basin Information		*Individual Basin Designation*			
		A	*B*	*C*	*D*
On-site Sub-basin Area (Acres)		**0.31**			
Type of Storage Proposed		**Infiltration**			
Approximate Storage Volume (CF)		**NA**			
Soil types(Natural Resource Conservation Service)		**Tokul (Type C)**			
Pre-developed Runoff Rate					
Q (cfs)	2-year	**NA**			
	10-year	**NA**			
	50-year	**NA**			
Post-developed Runoff Rate (without quantity controls)					
Q (cfs)	2-year	**NA**			
	10 year	**NA**			
	50 year	**NA**			
Post-developed Runoff Rate (with quantity controls)					
Q (cfs)	2-year	**NA**			
	10 year	**NA**			
	50 year	**NA**			
Offsite Upstream Area					
Number of acres		**NA**			
Offsite Downstream Flow					
Q (cfs)	*50 yr*	*NA*			

FIGURE 2. VICINITY MAP



Taken from Snohomish County PDS Map Portal

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Figure 2 -Vicinity Map
Boys and Girls Club Sno
Snohomish, Washington

SCALE: NTS	**DATE:** 1/21/20	**JOB #:** 19-1019
BY: RJK	**FILE NAME:** 19-1019/stormwater site plan	

1.2 Minimum Requirements Summary - Attachment "C"

MR : Minimum Requirement

SWPPP : Stormwater Pollution Prevention Plan

MR #1 Stormwater Site Plan Narrative: This report follows the City of Snohomish's requirements and the requirements defined in the 2014 DOE manual. Refer to the executive summary within Section 1 Attachment "A".

MR #2 SWPPP Narrative: A SWPPP has been provided in Appendix B of this report.

MR #3 Water Pollution Source Control for New Development: No source control pollutants pertain to the proposed project; therefore, no BMP's are required after construction.

MR #4 Preservation of Natural Drainage Systems and Outfalls: Error! Reference source not found. The outlet from Basin-1 and the frontage basin will be connected to the existing drainage system along Bickford Ave. The outlet from the Basn-2 will be connected to the wetland located int the north eastern corner of the site.

MR #5 Onsite Stormwater Management: Per Minimum Requirement #5 (Section 2.5.5 of the SWMMWW), the following roof BMP's shall be applied to provide onsite stormwater management and must be considered in the following order per List #1 full dispersion or downspout infiltration, rain gardens, basic dispersion, and then perforated stub-out connections. Full infiltration is feasible. Existing site impervious was designed to fully infiltrate on site. According to original drainage report used to design the existing drainage system, a sandy gravel layer exists at 5-feet below grade. The runoff from the roof will be collected via roof drains that will be conveyed to an onsite infiltration trench. The following BMP's shall be applied to the other hard surfaces: full dispersion, permeable pavement or bioretention, and sheet flow dispersion. Full dispersion is infeasible as the site cannot preserve the required native vegetation. Permeable pavement and bioretention have not considered as the proposed project is exempt

from flow control. Sheet flow dispersion is feasible and will be used. Post-construction soil quality and depth BMP T.5.13 is proposed to provide onsite stormwater management for the pervious areas of the site.

2.0 Existing Conditions

The proposed project ***Boys and Girls Club Snohomish*** is located at 402 Second St, Snohomish, WA 98290. More generally; the site is in Section 01, Township 28 North, and Range 5 East of the Willamette Meridian in Snohomish County, Washington. Please refer to the Vicinity Map attached later in the section.

The site contains 2.50 acres and the proposed clearing limit for the project is 0.17 acres. The site is currently developed with an existing Boys and Girls Club building, a parking lot with access from second street, a skate park, and a playground. The remainder of the site is covered with lawn and landscaping. The site contains one drainage basins that slopes to the east. Please refer to the downstream analysis map for more details. Per NRCS survey of Snohomish County, the project site contains Tokul soils that have a hydrologic classification of Type “C”. Please refer to the soils map and descriptions attached later in this report for more details.

FIGURE 3. SOIL MAP

SOILS LEGEND

72 Tokul Gravelly Medial Loam 0 to 8% slopes

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Figure 3 - Soil Map
Boys and Girls Club Sno
Snohomish, Washington

SCALE: NONE	**DATE:** 1/21/20	**JOB #:** 19-1019
BY: RJK	**FILE NAME:** 19-1019/doc/stormwater site plan	

Snohomish County Area, Washington

72—Tokul gravelly medial loam, 0 to 8 percent slopes

Map Unit Setting

- National map unit symbol: 2t61k
- Elevation: 160 to 1,150 feet
- Mean annual precipitation: 45 to 70 inches
- Mean annual air temperature: 46 to 52 degrees F
- Frost-free period: 140 to 200 days
- Farmland classification: All areas are prime farmland

Map Unit Composition

- Tokul and similar soils: 85 percent
- Minor components: 15 percent
- Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tokul

Setting

- Landform: Till plains, hillslopes
- Landform position (two-dimensional): Toeslope
- Landform position (three-dimensional): Side slope, tread
- Down-slope shape: Convex
- Across-slope shape: Convex
- Parent material: Volcanic ash mixed with loess over glacial till

Typical profile

- Oi - 0 to 1 inches: slightly decomposed plant material
- Oa - 1 to 2 inches: highly decomposed plant material
- A - 2 to 6 inches: gravelly medial loam
- Bs1 - 6 to 9 inches: gravelly medial loam
- Bs2 - 9 to 17 inches: gravelly medial loam

- Bs3 - 17 to 24 inches: gravelly medial loam
- BC - 24 to 33 inches: gravelly medial fine sandy loam
- 2Bsm - 33 to 62 inches: cemented material

Properties and qualities

- Slope: 0 to 8 percent
- Depth to restrictive feature: 20 to 39 inches to cemented horizon; 20 to 39 inches to densic material
- Natural drainage class: Moderately well drained
- Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
- Depth to water table: About 18 to 36 inches
- Frequency of flooding: None
- Frequency of ponding: None
- Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

- Land capability classification (irrigated): None specified
- Land capability classification (nonirrigated): 3s
- Hydrologic Soil Group: B
- Forage suitability group: Limited Depth Soils (G002XF303WA), Limited Depth Soils (G002XN302WA)
- Hydric soil rating: No

Minor Components

Pastik

- Percent of map unit: 5 percent
- Landform: Terraces
- Landform position (three-dimensional): Tread
- Down-slope shape: Linear
- Across-slope shape: Linear

- Hydric soil rating: No

Barneston

- Percent of map unit: 5 percent
- Landform: Eskers, kames, moraines
- Landform position (two-dimensional): Summit, shoulder
- Landform position (three-dimensional): Interfluve, crest
- Down-slope shape: Convex
- Across-slope shape: Convex
- Hydric soil rating: No

Norma

- Percent of map unit: 3 percent
- Landform: Depressions, drainageways
- Landform position (three-dimensional): Dip
- Down-slope shape: Concave, linear
- Across-slope shape: Concave
- Hydric soil rating: Yes

Mckenna

- Percent of map unit: 2 percent
- Landform: Depressions, drainageways
- Landform position (three-dimensional): Dip
- Down-slope shape: Concave, linear
- Across-slope shape: Concave
- Hydric soil rating:

3.0 Offsite Analysis

A site reconnaissance was performed by Brian Kalab of Insight Engineering on January 2, 2020 to verify the downstream flow paths and observe any drainage problems downstream of the site. The cloudy and raining with a temperature of 42 degrees.

The site contains 2.50 acres and the proposed clearing limit for the project is 0.17 acres. The site is currently developed with an existing Boys and Girls Club building, a parking lot with access from second street, a skate park, and a playground. The remainder of the site is covered with lawn and landscaping. The site contains one drainage basins that slopes to the east. Please refer to the downstream analysis map for more details. Per NRCS survey of Snohomish County, the project site contains Tokul soils that have a hydrologic classification of Type "C". Please refer to the soils map and descriptions attached later in this report for more details.

3.1 Upstream Analysis

Based on the site reconnaissance and the topographic survey of the site, the upstream flows appear to be minimal.

3.2 Downstream Analysis

Refer to the Downstream Analysis Map on the next page for a visual description of the downstream flow.

The site contains one basin that slopes to the east. Any runoff that leaves the site will be collected by a catch basin located near the southeast corner of the site at the intersection of Second and Pine. The flow then travels across Second Street about 60-feet to then heads east for abut 680-feet via 18-inch pipe to reach the Pilchuck River. There does not appear to be any restrictions or erosion problems within ¼ mile of the site.

FIGURE 4. DOWNSTREAM ANALYSIS MAP-1

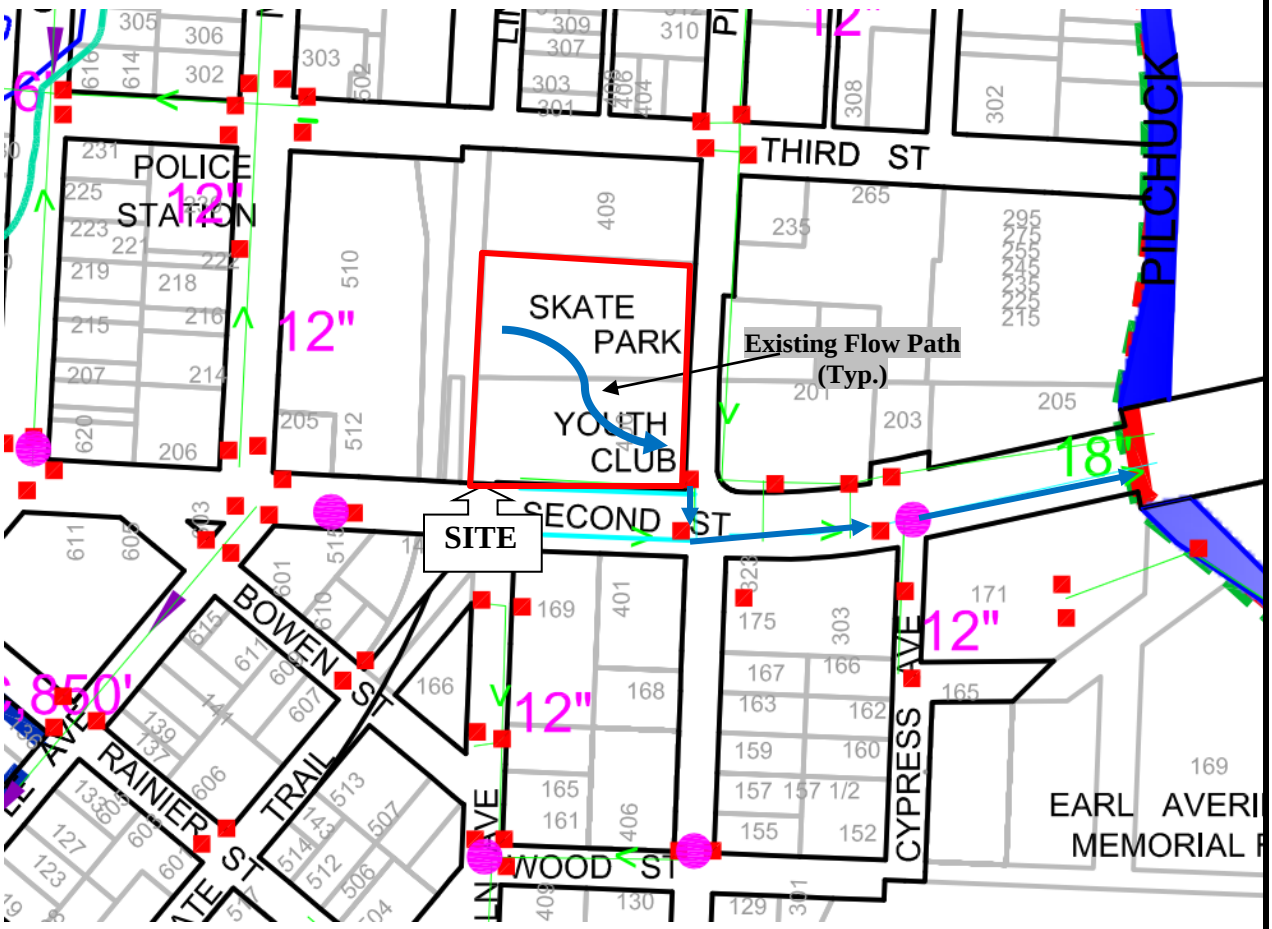

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Figure 4 - Downstream Analysis Map-1
Boys and Girls Club Sno
Snohomish, Washington

SCALE: NONE	**DATE:** 1/21/20	**JOB #:** 19-1013
BY: RJK	**FILE NAME:** 19-1013\docs\drainage report	

4.0 Developed Conditions

The proposed project ***Boys and Girls Club Snohomish*** is located at 402 Second St, Snohomish, WA 98290. More generally; the site is in Section 01, Township 28 North, and Range 5 East of the Willamette Meridian in Snohomish County, Washington. Please refer to the Vicinity Map attached later in the section. Per NRCS survey of Snohomish County, the project site contains Tokul soils that have a hydrologic classification of Type "C".

The proposal is to add a 3,585-SF addition (roof area) to the existing Boys and Girls Club along with 160-SF of concrete sidewalk.

Per Figure 2.4.1, (flow chart for new development requirements) Volume I of the 2012/2014 SWMMWW, Minimum requirements #1 through 5 shall apply for this project. See attachment C for Minimum Requirements Summary included later in this report.

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5.0 Site Hydraulic Conditions

Per NRCS survey of Snohomish County, the project site contains Tokul soils that have a hydrologic classification of Type "C".

Site Area	= 2.50 Acres
Clearing Area	= 0.17 Acres
Total Study Area	*=0.17 Acres*

5.1 Existing Basin Summary

Total Study Area	*= 0.17 Acres*
Pervious:	= 0.17 Acres

Refer to the Existing Basin Map at the end of this section for basin representation.

5.2 Developed Basin Summary

Total Study Area *= 0.17 Acres*

Impervious Areas:

Roof	=	3,585 SF (0.08 Acres)
Future Bathroom Addition	=	340 SF (0.01 Acres)
Sidewalk	=	160 SF (0.00 Acres)
Total Impervious	=	4,085 SF (0.09 Acres)

Pervious Areas: 0.17- 0.09 = 0.08 Acres

Refer to the Existing Basin Map at the end of this section for basin representation.

Infiltration Trench Sizing Calculations:

Fine Sand/Loamy Sands are present at the trench's proposed depth. The trench has been sized per Vol III – 3.1.1 of the SWMMWW.

3,925 SF / 1,000 = 3.925 x 75 = 294.38 LF
295 / 4 = 73.75 LF

Four 74'x 2'x 2' infiltration trenches will be provided for a total length of 296-feet.

6.0 Appendix

A. SWPPP
B. Old Site Drainage Report
C. Soil Amendment Calculation

A. STORMWATER POLLUTION PREVENTION PLAN

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared as part of the Construction stormwater permit requirements for ***Boys and Girls Club Snohomish*** located at 402 Second St, Snohomish, WA 98290. More generally; the site is in Section 01, Township 28 North, and Range 5 East of the Willamette Meridian in Snohomish County, Washington.

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trench. The following BMP's shall be applied to the other hard surfaces: full dispersion, permeable pavement or bioretention, and sheet flow dispersion. Full dispersion is infeasible as the site cannot preserve the required native vegetation. Permeable pavement and bioretention have not considered as the proposed project is exempt from flow control. Sheet flow dispersion is feasible and will be used. Post-construction soil quality and depth BMP T.5.13 is proposed to provide onsite stormwater management for the pervious areas of the site.

The purpose of this SWPPP is to describe the proposed construction activities and all temporary and permanent erosion and sediment control (TESC) measures, pollution prevention measures, inspection/monitoring activities, and recordkeeping that will be implemented during the proposed construction project. The objectives of the SWPPP are to:

1. Implement Best Management Practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. Prevent violations of surface water quality, ground water quality, or sediment management standards.

3. Prevent, during the construction phase, adverse water quality impacts including impacts on beneficial uses of the receiving water by controlling peak flow rates and volumes of stormwater runoff at the Permittee's outfalls and downstream of the outfalls.

This SWPPP was prepared using the Ecology SWPPP Template. This SWPPP was prepared based on the requirements set forth in the Construction Stormwater General Permit and in the Stormwater Management Manual for Western Washington (SWMMWW 2012).

The 13 BMP Elements

Element #1 – Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin.

Element #2 – Establish Construction Access

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads, and wheel washing, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters.

Install the temporary construction entrance, according to the approved construction plans, prior to any clearing or grading activities. Maintain until the access road is paved.

Element #3 – Control Flow Rates

In order to protect the properties and waterways downstream of the project site, stormwater discharges from the site will be controlled. In general, discharge rates of stormwater from the site will be controlled where increases in impervious area or soil compaction during construction could lead to downstream erosion, or where necessary to meet local agency stormwater discharge requirements.

Element #4 – Install Sediment Controls

Install silt fencing, according to the approved plans, prior to any clearing or grading activities. Maintain until all construction activities are completed.

Install catch basin filters, according to the approved construction plans, as catch basins become operable. Maintain until all construction activities are completed.

Element #5 – Stabilize Soils

Exposed and un-worked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project.

Apply temporary hydro-seed to exposed and un-worked soils, according to the approved construction plans, as needed to prevent erosion during site grading. Apply permanent hydro-seed to areas at final grade as site grading is completed.

Apply mulching to exposed and un-worked soils, according to the approved construction plans, as needed to prevent erosion during site grading. Maintain until site grading is completed and permanent hydro-seed is applied.

Cover stockpiles with plastic sheeting, according to the approved construction plans, as needed to prevent erosion during site grading. Maintain until stockpiles are removed from site.

Element #6 – Protect Slopes

All cut and fill slopes will be designed, constructed, and protected in a manner than minimizes erosion. The following specific BMPs will be used to protect slopes for this project.

Element #7 – Protect Drain Inlets

All storm drain inlets and culverts made operable during construction shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep street wash water separate from entering storm drains until treatment can be provided.

Element #8 – Stabilize Channels and Outlets

Where site runoff is to be conveyed in channels, or discharged to a stream or some other natural drainage point, efforts will be taken to prevent downstream erosion.

Element #9 – Control Pollutants

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well-organized, and free of debris.

Element #10 – Control Dewatering

There will be no dewatering expected as part of this proposal. If it occurs, Baker tanks will be used for dewatering.

Element #11 – Maintain BMPs

All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with each particular BMP's specifications. Visual monitoring of the BMPs will be conducted at least once every calendar week and within 24 hours of any rainfall event that causes a discharge from the site. If the site becomes inactive, and is temporarily stabilized, the inspection frequency will be reduced to once every month. All temporary erosion and sediment control BMPs shall be removed within 30 days after the final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on site. Disturbed soil resulting from removal of BMPs or vegetation shall be permanently stabilized.

Element #12 – Manage the Project

Erosion and sediment control BMPs for this project have been designed based on the following principles:

Design the project to fit the existing topography, soils, and drainage patterns; Emphasize erosion control rather than sediment control; Minimize the extent and duration of the area exposed; Keep runoff velocities low; Retain sediment on site; Thoroughly monitor site and maintain all ESC measures and Schedule major earthwork during the dry season. The SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within seven (7) days following the inspection.

Element #13 – Protect On-site Stormwater Management BMPs for Runoff from Roofs and Other Hard Surfaces

On-site stormwater management BMPs used for runoff from roofs and other hard surfaces include: full dispersion, roof downspout full infiltration or dispersion systems, perforated stub-out connections, rain gardens, bioretention systems, permeable pavement, sheetflow dispersion, and concentrated flow dispersion. The areas on the site to be used for these BMPs shall be protected from siltation and compaction during construction by sequencing the construction in a fashion to install these BMPs at the latter part of the construction grading operations, by excluding equipment from the BMPS and the associated areas, and by using the erosion and sedimentation control BMPs listed below. Additional requirements for protecting these BMPs during the construction process, testing functionality, and restoring functionality are needed at the final stage of the construction process.

Relevant BMPs

BMP C102: Buffer Zone BMP

C103: High Visibility Fence BMP

C200: Interceptor Dike and Swale BMP

C201: Grass-lined Channels BMP

C207: Check Dams BMP

C208: Triangular Silt Dike BMP

C231: Brush Barrier BMP

C233: Silt Fence BMP

C234: Vegetated Strip

B. OLD SITE DRAINAGE REPORT

Cavassa & Associates, Inc.

Civil Engineers

SITE DRAINAGE REPORT

Prepared for

Snohomish Youth Center

Snohomish, WA

September 26, 2002

PAUL CAVASSA, JR.
STATE OF WASHINGTON
18498
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 6/9/04

Prepared by:
Matt Gibb, E.I.T.

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Section 2	Drainage Plans and Details
Section 3	Drainage Calcs
Section 4	Backup Documentation

Section 1

SITE DRAINAGE REPORT
Snohomish Youth Center
Snohomish, WA

PROJECT OVERVIEW

This 1.5-acre site is located in Section 18, Township 28 North, Range 6 East, at the intersection of Pine Street and 2nd Street. It is adjacent to the Snohomish Skate Park to the north, 2nd Street to the south, Pine Street to the east, and an abandoned spur of the BNSF railroad to the west. It is proposed to construct a 16,000 sq-ft youth center on the east side of the site and pave 18,500 sq-ft of parking lot on the west side.

SOIL CHARACTERISTICS

The Soil Survey of Snohomish County Area, Washington identifies the soil as "Tokul gravelly loam" (hydrologic group C) and describes it as a "moderately deep, moderately well-drained soil". Four pits were excavated in the area of the proposed infiltration system to determine the actual soil conditions. The soils encountered are identified as an upper layer of organic silty sandy loam over a silty clay layer overlaying a loosely cemented sandy gravel. Below this silty gravel was encountered. The surficial silty sand layer was 24 inches deep. The second silty clay layer was 36 inches thick. The sandy gravel was encountered at a depth of 60 inches. The lower gravel strata encountered at a depth of 96 inches had a higher silt content evidenced by the lack of caving in the sides of the trench. No ground water was encountered in any of the trenches.

UPSTREAM ANALYSIS

The site collects no runoff from the neighboring lots.

DOWNSTREAM ANALYSIS

All site runoff will be infiltrated. There will be no downstream impacts.

RETENTION/DETENTION ANALYSIS

EXISTING SITE HYDROLOGY: The site is currently a grass field with a gravel/grass parking area. The entire site infiltrates or drains to the southeast into a catch basin at the intersection of Pine and 2nd.

DEVELOPED SITE HYDROLOGY: Two impervious areas will be added. The rooftop runoff from the proposed building is considered non-polluting, so no water quality treatment will be required. The runoff from the parking lot will be collected by two catch

basins. The catch basins will have two outlets, and the lower outlet will be metered to allow only the peak flow rate for a 0.5 in/hr storm to flow to an oil-water separator (OWS). The OWS outlets and the catch basin overflow pipes, the roof drains and foundation drains will all be collected and infiltrated by Invisible Structures Rainstore3 units. The facility was sized to completely infiltrate the 25-yr, 24-hr storm (2.6 inches of rainfall). A percolation rate of 7.25 min/in was assumed. A runoff analysis indicates a peak storage volume of 1300 cu-ft. A 30% safety factor required by current DOE regulations results in a required storage volume of 1690 cu-ft. The proposed Rainstore3 detention units have a total storage capacity of 1754 cu-ft.

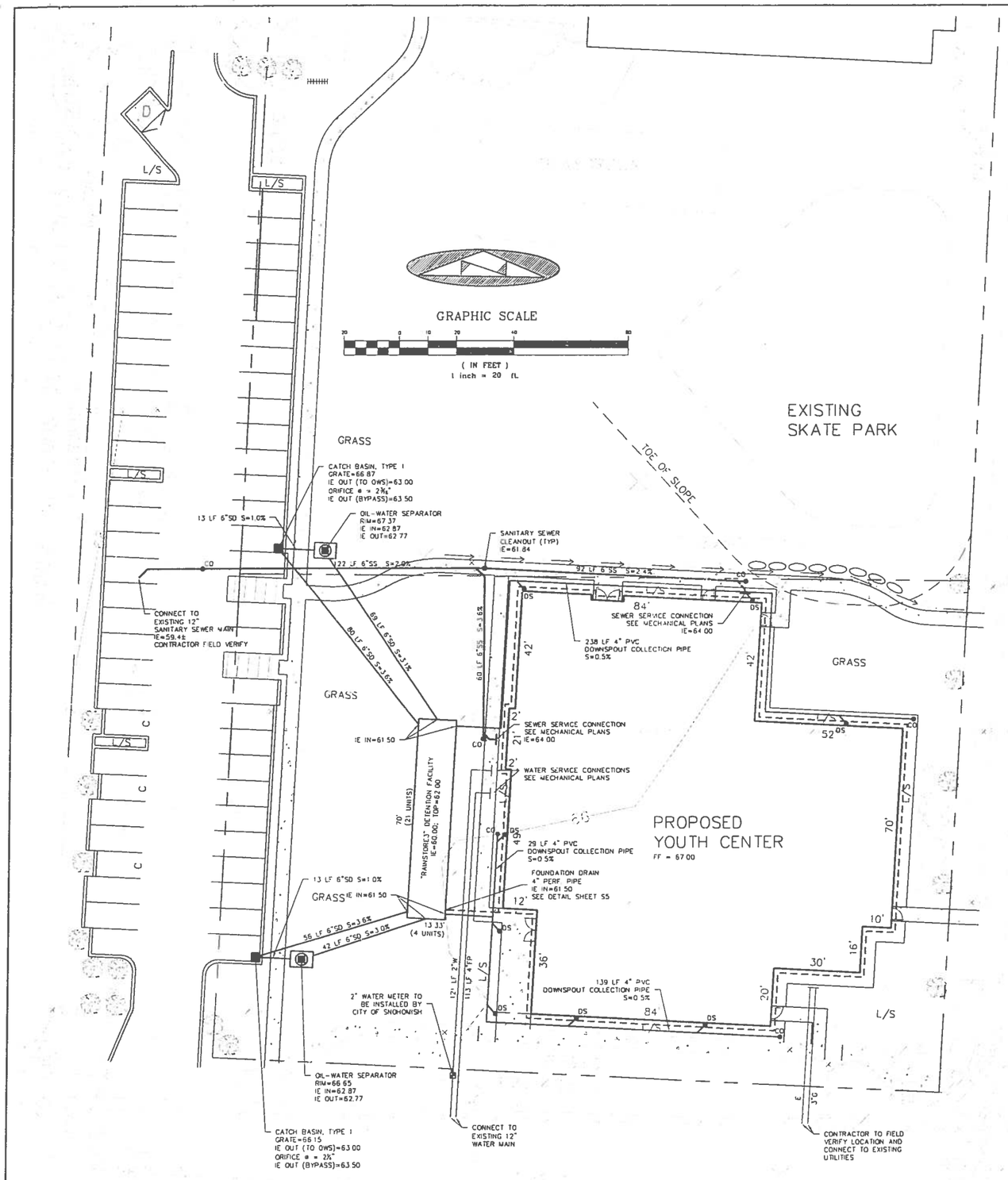
HYDROLOGIC ANALYSIS: Runoff volumes were developed using the SBUH program found in the 1990 King County Surface Water Design Manual. The 25-year, 24-hour storm event was analyzed for infiltration.

EROSION/SEDIMENTATION CONTROL DESIGN

Erosion control for this site will consist of a gravel construction entrance and silt fencing along the clearing limits. Catch basins shall be protected from silt buildup during and after installation.

END OF REPORT

Section 2

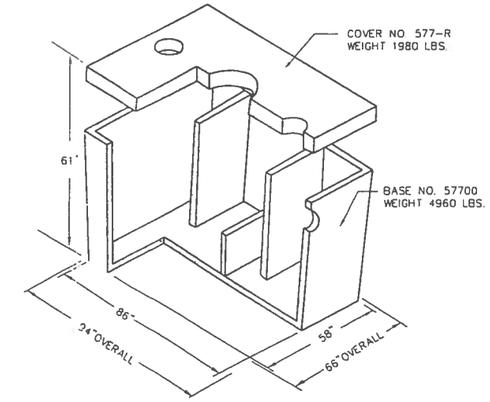


NOTE:

SEE SHEET 4 OF 4 FOR ADDITIONAL UTILITY DETAILS.

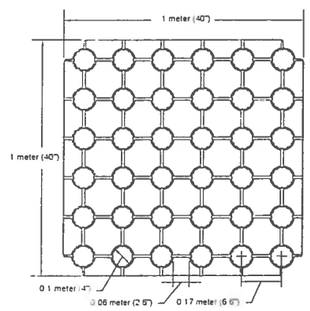
LEGEND:

- EXISTING TREE
- L/S — LANDSCAPE PLANTER
- D — DUMPSTER ENCLOSURE
- ASPHALT PAVING
- CATCH BASIN
- OIL-WATER SEPARATOR
- DOWNSPOUT
- CLEANOUT

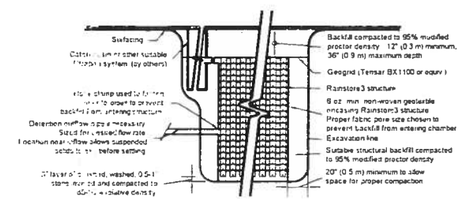


OIL/WATER SEPARATOR-CUZ 575

NTS

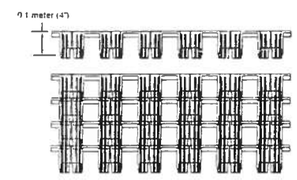


Rainstore3 Unit Dimensions



Rainstore3 System

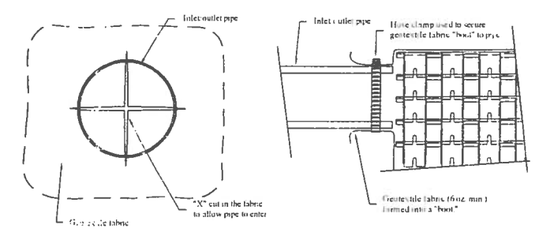
Typical RS3 installation below paving



Rainstore3 Unit Detail

Single Rainstore3 injection molded unit geometry and dimensions

End view of pipe/fabric connection. Cut an X in the fabric slightly larger than pipe, pull the fabric around the pipe to create the "boot" and then secure with a hose-clamp



End View

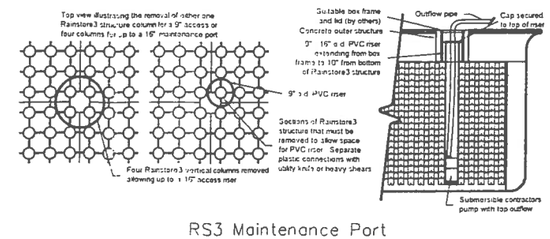
Side View

20100 EAST 35th DRIVE
AURORA, COLORADO 80011
800-233-1398 FAX
303-375-1723
www.rainstoreStructures.com

Rainstore3 Inlets/Outlets With Fabric

NOT TO SCALE

Connecting pipe to the Rainstore3 structure



RS3 Maintenance Port

Method for providing inspection and cleanout access

SHEET 2 OF 4

JOB# 0203025

avassa & Associates, Inc.
Civil Engineers
321 N. Lewis St. P.O. Box 298
Monroe, WA. 98272
Phone: (425) 794-7266
Fax: (425) 794-1911
e-mail@avassa.com

DESIGN: D. MG
DRAWN: MG
CHECKED: P.C. JR
REVISION: 9-26-02

OWNER/DEVELOPER:
SVAC & CITY OF SNOHOMISH
116 UNION AVENUE
SNOHOMISH, WA 98290
PHONE (360) 568-3115

PROJECT:
SNOHOMISH YOUTH ACTIVITIES CENTER
DRAINAGE AND UTILITIES PLAN

Section 3

```
SBUH/SCS METHOD FOR COMPUTING RUNOFF HYDROGRAPH

STORM OPTIONS:

1 - S.C.S. TYPE-1A
2 - 7-DAY DESIGN STORM
3 - STORM DATA FILE

SPECIFY STORM OPTION:
1

S.C.S. TYPE-1A RAINFALL DISTRIBUTION
ENTER: FREQ(YEAR), DURATION(HOUR), PRECIP(INCHES)
 25  24.00   2.60
----------------------------------------------------------------------
******************** S.C.S. TYPE-1A DISTRIBUTION ********************
*********  25-YEAR  24-HOUR STORM  ****  2.60" TOTAL PRECIP. *********
                        DEVELOPED CONDITIONS
----------------------------------------------------------------------
ENTER: A(PERV), CN(PERV), A(IMPERV), CN(IMPERV), TC FOR BASIN NO.  1
     .6    68.0      .9    98.0     5.0

DATA PRINT-OUT:

  AREA(ACRES)     PERVIOUS     IMPERVIOUS   TC(MINUTES)
                 A     CN     A     CN
       1.5        .6  68.0     .9  98.0        5.0

  PEAK-Q(CFS)   T-PEAK(HRS)    VOL(CU-FT)
       .64          7.67           9083

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
25YR.TXT

SPECIFY: C - CONTINUE, N - NEWSTORM, P - PRINT, S - STOP
                                  S
Stop - Program terminated.
```

```
RESERVOIR ROUTING INFLOW/OUTFLOW ROUTINE

SPECIFY [d:][path]filename[.ext] OF ROUTING DATA
RT.TXT
 DISPLAY ROUTING DATA (Y or N)?
Y

ROUTING DATA:

STAGE(FT)   DISCHARGE(CFS)   STORAGE(CU-FT)   PERM-AREA(SQ-FT)
    .00            .00                .0            700.0
   1.00            .00             658.0            700.0
   2.00            .00            1316.0            700.0

AVERAGE PERM-RATE:   7.3 MINUTES/INCH
SATURATED PERM-RATE:    7.3 MINUTES/INCH
GROUND STORAGE BEFORE SATURATION:   .00 CU-FT/SQ-FT

ENTER [d:][path]filename[.ext] OF COMPUTED HYDROGRAPH:
25YR.TXT

INFLOW/OUTFLOW ANALYSIS:

  PEAK-INFLOW(CFS)   PEAK-OUTFLOW(CFS)   OUTFLOW-VOL(CU-FT)
         .64                 .00                    0

  INITIAL-STAGE(FT)  TIME-OF-PEAK(HRS)   PEAK-STAGE-ELEV(FT)
       63.00              10.67                 64.98

  PEAK STORAGE:     1300 CU-FT

  INFILTRATED VOLUME:     9038 CU-FT

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
25RT.TXT

SPECIFY: C - CONTINUE, N - NEWJOB, P - PRINT, S - STOP, R - REVISE
S
Stop - Program terminated.
```

CB #1 Orifice sizing calculations for Snohomish Youth Center

Q = C*A*SQRT(2gh)		
Bottom of tank elev.	63.41	
IE out =	63.41	ft
max elev =	63.91	ft
C =	0.62	for a sharp drilled orifice
g =	32.2	ft/sec^2 - gravitational force
h =	0.5	ft
Q =	0.09	cfs
A =	0.026	sf
D=	0.18	ft.
D=	2.17	in.
D=	2 3/16	in.

CB #2 Orifice sizing calculations for Snohomish Youth Center

Q = C*A*SQRT(2gh)		
Bottom of tank elev.	63.23	
IE out =	63.23	ft
max elev =	63.73	ft
C =	0.62	for a sharp drilled orifice
g =	32.2	ft/sec^2 - gravitational force
h =	0.5	ft
Q =	0.1	cfs
A =	0.028	sf
D=	0.19	ft.
D=	2.28	in.
D=	2 1/4	in.

RUNOFF FOR OWS #1 USING RATIONAL METHOD

Q=CIA where:	I=	0.5	from Snohomish city code
	A=	0.20	acres
	C=	0.9	from runoff factors table for pavement
Q=		0.09	cfs

RUNOFF FOR OWS #2 USING RATIONAL METHOD

Q=CIA where:	I=	0.5	from Snohomish city code
	A=	0.23	acres
	C=	0.9	from runoff factors table for pavement
Q=		0.1035	cfs

OIL WATER SEPARATOR #1 SIZING

6-MONTH STORM
Q= 0.09 CFS

CUZ CONCRETE 586 OWS

CAPACITY 800 GALLONS

RETENTION TIME = V/Q

RT= 20 min.

OIL WATER SEPARATOR #2 SIZING

6-MONTH STORM
Q= 0.1 CFS

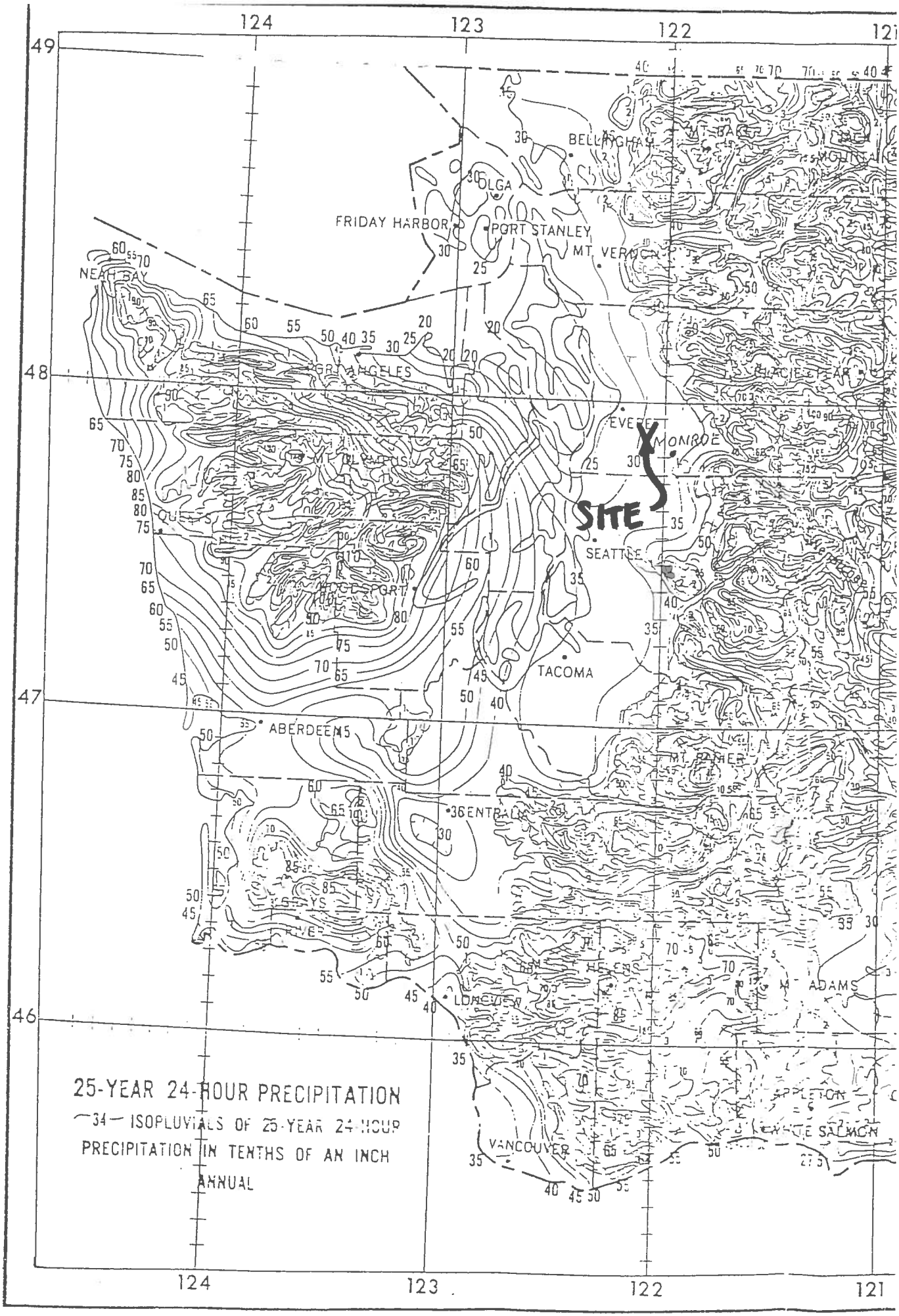
CUZ CONCRETE 575 OWS

CAPACITY 800 GALLONS

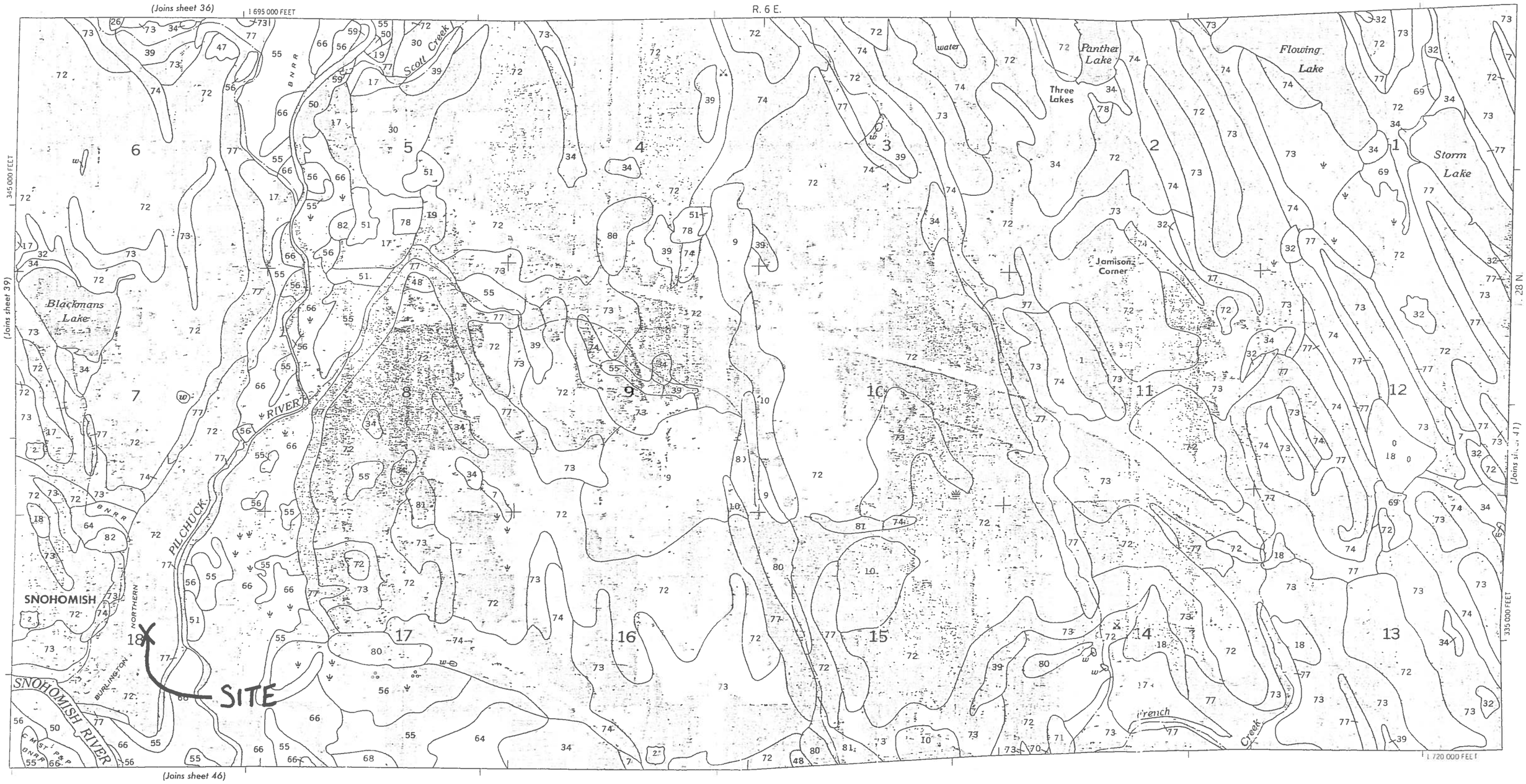
RETENTION TIME = V/Q

RT= 18 min.

Section 4


124
123
122
121
49
48
47
46
BELLINGHAM
OLGA
FRIDAY HARBOR
PORT STANLEY
MT. VERNON
NEAH BAY
GRAYS HARBOR
EVERETT
MONROE
SITE
SEATTLE
TACOMA
ABERDEEN
CENTRALIA
MT. RAINIER
LONGVIEW
MT. ADAMS
VANCOUVER
25-YEAR 24-HOUR PRECIPITATION
—34— ISOPLUVIALS OF 25-YEAR 24-HOUR PRECIPITATION IN TENTHS OF AN INCH ANNUAL

SOIL SURVEY OF SNOHOMISH COUNTY AREA, WASHINGTON — SHEET NUMBER 40



1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

fertilizer are needed for maximum quality of forage. Legumes benefit from applications of agricultural lime. In some years supplemental irrigation is needed. Subsoiling may be effective in breaking through the hardpan.

The main limitation for homesites is the seasonal high water table. Wetness can be reduced by installing drain tile around footings. The main limitations for septic tank absorption fields are the depth to the hardpan and wetness. Onsite sewage disposal systems often fail or do not function properly during periods of high rainfall.

This map unit is in capability subclass IIIe.

71—Tokul silt loam, 8 to 15 percent slopes. This moderately deep, moderately well drained soil is on till plains. It formed in glacial till and volcanic ash. Areas are 10 to 40 acres in size. The native vegetation is mainly conifers. Elevation is 200 to 800 feet. The average annual precipitation is about 55 inches, the average annual air temperature is about 46 degrees F, and the average frost-free season is 140 to 200 days.

Typically, the surface is covered with a mat of leaves, twigs, and decomposed litter about 2 inches thick. The surface layer is dark brown silt loam about 12 inches thick. The subsoil is brown, strong brown, and dark yellowish brown gravelly loam about 10 inches thick. The substratum is light olive brown gravelly fine sandy loam about 9 inches thick. A hardpan is at a depth of about 31 inches. Depth to the hardpan ranges from 20 to 40 inches. In some areas the surface layer is gravelly loam or the soil does not have a hardpan but is underlain by glacial till at a depth of 20 to 40 inches.

Included in this unit are areas of Pastik soils on terraces. Included areas make up about 25 percent of the total acreage.

Permeability of this Tokul soil is moderate. Effective rooting depth is limited by a seasonal perched water table that is at a depth of 18 to 36 inches from November to May. Runoff is medium, and hazard of water erosion is moderate.

This unit is used mainly as woodland and for hay and pasture. It is also used for homesite development.

Douglas-fir and western hemlock are the main woodland species on this unit. On the basis of a 100-year site curve, the mean site index is 173 for Douglas-fir and 166 for western hemlock. On the basis of a 50-year site curve, the mean site index is 131 for Douglas-fir and 117 for western hemlock. The mean annual increment at culmination (CMAI) is 184 cubic feet for Douglas-fir at age 60 and 266 cubic feet per acre for western hemlock at age 50.

Among the trees of limited extent are western redcedar, red alder, and bigleaf maple. Among the common forest understory plants are western swordfern, brackenfern, red huckleberry, salal, and trailing blackberry.

The main limitation for the harvesting of timber is seasonal soil wetness, which restricts the use of equipment to dry periods. Use of wheeled and tracked equipment when the soil in this unit is wet produces ruts, compacts the soil, and damages the roots of trees. Unsurfaced roads and skid trails are soft when wet, and they may be impassable during rainy periods. Logging roads require suitable surfacing for year- round use. Rock for road construction is not readily available on this unit.

Brush competition is the main limitation for the production of timber. Reforestation can be accomplished by planting Douglas-fir seedlings. If seed trees are present, natural reforestation of cutover areas by red alder occurs readily and natural reforestation by western hemlock occurs periodically. When openings are made in the canopy, invading brushy plants, if not controlled, can prevent reforestation.

Because the rooting depth is restricted by the hardpan, trees are occasionally subject to windthrow. Western hemlock, a shallow-rooted tree, is more commonly subject to windthrow than are more deeply rooted trees.

This unit is suited to hay and pasture. The main limitations are wetness and the hardpan, which reduces the yield of deep-rooted plants. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture in good condition and to protect the soil from erosion.

Periodic mowing and spreading of droppings help to maintain uniform growth and discourage selective grazing. Proper grazing practices, weed control, and fertilizer are needed for maximum quality of forage. Legumes benefit from applications of agricultural lime. In some years supplemental irrigation is needed. Subsoiling may be effective in breaking through the hardpan.

The main limitation for homesites is the seasonal high water table. Wetness can be reduced by installing drain tile around footings. The main limitations for septic tank absorption fields are the depth to the hardpan and wetness. Onsite sewage disposal systems often fail or do not function properly during the periods of high rainfall because of the restrictive layer.

This map unit is in capability subclass IIIe.

72—Tokul gravelly loam, 0 to 8 percent slopes. This moderately deep, moderately well drained soil is on till plains. It formed in glacial till and volcanic ash. Areas are long and narrow and are oriented from northwest to southeast. They are 40 to 100 acres in size. The native vegetation is mainly conifers. Elevation is 200 to 800 feet. The average annual precipitation is about 55 inches, the average annual air temperature is about 46 degrees F, and the average frost-free season is 140 to 200 days.

Typically, the surface is covered with a mat of leaves, twigs, and decomposed litter about 2 inches thick. The surface layer is dark brown gravelly loam about 4 inches thick. The subsoil is brown, strong brown, and dark yellowish brown gravelly loam about 18 inches thick. The substratum is light olive brown gravelly fine sandy loam

ıbout 9 inches thick. A hardpan is at a depth of about 11 inches. Depth to the hardpan ranges from 20 to 40 ıches. In some areas the surface layer is cobbly loam ır the soil does not have a hardpan but is underlain by :ompact glacial till at a depth of 20 to 40 inches.

Included in this unit are areas of soils that have slopes ıf more than 8 percent, McKenna and Norma soils in lepressional areas along drainageways on till plains, 'erric Medisaprists in depressional areas on till plains, Vinston and Pastik soils on terraces and outwash plains, ınd Ragnar soils on outwash plains. Included areas nake up about 25 percent of the total acreage.

Permeability of this Tokul soil is moderate above the ıardpan and very slow through it. Available water :apacity is moderate. Effective rooting depth is limited by ı seasonal perched water table that is at a depth of 18 ɔ 36 inches from November to May. Runoff is slow, and he hazard of water erosion is slight.

This unit is used mainly as woodland. It is also used or urban development and for hay and pasture.

Douglas-fir and western hemlock are the main voodland species on this unit. On the basis of a 100-'ear site curve, the mean site index is 173 for Douglas-fir ınd 166 for western hemlock. On the basis of a 50-year ;ite curve, the mean site index is 131 for Douglas-fir and 17 for western hemlock. The mean annual increment at :ulmination (CMAI) is 184 cubic feet per acre for)ouglas-fir at age 60 and 266 cubic feet per acre for vestern hemlock at age 50.

Among the trees of limited extent are western edcedar, red alder, and bigleaf maple. Among the :ommon forest understory plants are western swordfern, ırackenfern, red huckleberry, salal, and trailing ılackberry.

The main limitation for the harvesting of timber is ·easonal soil wetness, which limits the use of equipment ɔ dry periods. Use of wheeled and tracked equipment vhen the soil in this unit is wet produces ruts, compacts he soil, and damages the roots of trees. Unsurfaced oads and skid trails are soft when wet, and they may be mpassable during rainy periods. Logging roads require :uitable surfacing for year-round use. Rock for road :onstruction is not readily available on this unit.

Brush competition is the main limitation in the ırodıuction of timber. Reforestation can be accomplished ıy planting Douglas-fir seedlings. If seed trees are ırresent, natural reforestation of cutover areas by red ılder occurs readily and natural reforestation by western ıemlock occurs periodically. When openings are made in he canopy, invading brushy plants, if not controlled, can ırrevent reforestation.

Because the rooting depth is restricted by the ıardpan, trees are occasionally subject to windthrow. Vestern hemlock, a shallow-rooted tree, is more :ommonly subject to windthrow than are more deeply ɔoted trees.

The main limitations for hay and pasture are wetness nd the depth to the hardpan, which reduces the yield of deep-rooted plants. Excess water can be removed by open ditches or tile drains. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture in good condition.

Periodic mowing and spreading of droppings help to maintain uniform growth and discourage selective grazing. Proper grazing practices, weed control, and fertilizer are needed for maximum quality of forage. Legumes benefit from applications of agricultural lime. In some years supplemental irrigation is needed. Small stones may interfere with tillage operations. Subsoiling may be effective in breaking through the hardpan.

The main limitation for homesites is wetness, which can be reduced by installing drain tile around footings.

The main limitations for septic tank absorption fields are the depth to the hardpan and wetness. Onsite sewage disposal systems often fail or do not function properly during periods of high rainfall.

This map unit is in capability subclass IIIe.

73—Tokul gravelly loam, 8 to 15 percent slopes. This moderately deep, moderately well drained soil is on till plains. It formed in glacial till and volcanic ash. Areas are oriented from northwest to southeast and are 40 to 100 acres in size. The native vegetation is mainly conifers. Elevation is 200 to 800 feet. The average annual precipitation is about 55 inches, the average annual air temperature is about 46 degrees F, and the average frost-free season is 140 to 200 days.

Typically, the surface is covered with a mat of leaves, twigs, and decomposed litter about 2 inches thick. The surface layer is dark brown gravelly loam about 4 inches thick. The subsoil is brown, strong brown, and dark yellowish brown gravelly loam about 18 inches thick. The substratum is light olive brown gravelly fine sandy loam about 9 inches thick. A hardpan is at a depth of about 31 inches. Depth to the hardpan ranges from 20 to 40 inches. In some areas the surface layer is cobbly or the soil does not have a hardpan but is underlain by compact glacial till at a depth of 20 to 40 inches.

Included in this unit are small areas of Pastik and Winston soils on terraces and outwash plains; Nargar soils on high terraces, terrace escarpments, and outwash plains; and Ragnar soils on outwash plains. Included areas make up about 25 percent of the total acreage.

Permeability of this Tokul soil is moderate to the hardpan and very slow through it. Available water capacity is moderate. Effective rooting depth is limited by a seasonal perched water table that is at a depth of 18 to 36 inches from November to May. Runoff is slow, and the hazard of water erosion is slight.

This unit is used mainly as woodland. It is also used for homesite development and for hay and pasture.

Douglas-fir and western hemlock are the main woodland species on this unit. On the basis of a 100-year site curve, the mean site index is 173 for Douglas-fir and 166 for western hemlock. On the basis of a 50-year

TABLE 3.5.2B SCS WESTERN WASHINGTON RUNOFF CURVE NUMBERS

SCS WESTERN WASHINGTON RUNOFF CURVE NUMBERS (Published by SCS in 1982)					
Runoff curve numbers for selected agricultural, suburban and urban land use for Type 1A rainfall distribution, 24-hour storm duration.					
LAND USE DESCRIPTION		CURVE NUMBERS BY HYDROLOGIC SOIL GROUP			
		A	B	C	D
Cultivated land(1):	winter condition	86	91	94	95
Mountain open areas:	low growing brush and grasslands	74	82	89	92
Meadow or pasture:		65	78	85	89
Wood or forest land:	undisturbed or older second growth	42	64	76	81
Wood or forest land:	young second growth or brush	55	72	81	86
Orchard:	with cover crop	81	88	92	94
Open spaces, lawns, parks, golf courses, cemeteries, landscaping.					
good condition:	grass cover on 75% or more of the area	68	80	86	90
fair condition:	grass cover on 50% to 75% of the area	77	85	90	92
Gravel roads and parking lots		76	85	89	91
Dirt roads and parking lots		72	82	87	89
Impervious surfaces, pavement, roofs, etc.		98	98	98	98
Open water bodies:	lakes, wetlands, ponds, etc.	100	100	100	100
Single Family Residential (2)					
Dwelling Unit/Gross Acre	% Impervious (3)	Separate curve number shall be selected for pervious and impervious portion of the site or basin			
1.0 DU/GA	15				
1.5 DU/GA	20				
2.0 DU/GA	25				
2.5 DU/GA	30				
3.0 DU/GA	34				
3.5 DU/GA	38				
4.0 DU/GA	42				
4.5 DU/GA	46				
5.0 DU/GA	48				
5.5 DU/GA	50				
6.0 DU/GA	52				
6.5 DU/GA	54				
7.0 DU/GA	56				
Planned unit developments, condominiums, apartments, commercial business and industrial areas.	% impervious must be computed				

(1) For a more detailed description of agricultural land use curve numbers refer to National Engineering Handbook, Section 4, Hydrology, Chapter 9, August 1972.
(2) Assumes roof and driveway runoff is directed into street/storm system.
(3) The remaining pervious areas (lawn) are considered to be in good condition for these curve numbers.

TABLE 3.5.2C "n" AND "k" VALUES USED IN TIME CALCULATIONS FOR HYDROGRAPHS

"n_s" Sheet Flow Equation Manning's Values (For the initial 300 ft of travel)	n_s*
Smooth surfaces (concrete, asphalt, gravel, or bare hard packed soil)	0.011
Fallow fields or loose soil surface (no residue)	0.05
Cultivated soil with residue cover (s < = 0.20 ft/ft)	0.06
Cultivated soil with residue cover (S > 0.20 ft/ft)	0.17
Short prairie grass and lawns	0.15
Dense grasses	0.24
Bermuda grass	0.41
Range (natural)	0.13
Woods or forest with light underbrush	0.40
Woods or forest with dense underbrush	0.80

*Manning values for sheet flow only, from Overton and Meadows 1976 (See TR-55, 1986)

"k" Values Used in Travel Time/Time of Concentration Calculations

Shallow Concentrated Flow (After the initial 300 ft. of sheet flow, R = 0.1)	k_s
1. Forest with heavy ground litter and meadows (n = 0.10)	3
2. Brushy ground with some trees (n = 0.060)	5
3. Fallow or minimum tillage cultivation (n = 0.040)	8
4. High grass (n = 0.035)	9
5. Short grass, pasture and lawns (n = 0.030)	11
6. Nearly bare ground (n = 0.025)	13
7. Paved and gravel areas (n = 0.012)	27

Channel Flow (Intermittent) (At the beginning of visible channels: R = 0.2)	k_c
1 Forested swale with heavy ground litter (n = 0.10)	5
2 Forested drainage course/ravine with defined channel bed (n = 0.050)	10
3 Rock-lined waterway (n = 0.035)	15
4 Grassed waterway (n = 0.030)	17
5 Earth-lined waterway (n = 0.025)	20
6 CMP pipe (n = 0.024)	21
7 Concrete pipe (0.012)	42
8 Other waterways and pipes	0.508/n

Channel Flow (Continuous stream, R = 0.4)	k_c
9. Meandering stream with some pools (n = 0.040)	20
10. Rock-lined stream (n = 0.035)	23
11 Grass-lined stream (n = 0.030)	27
12. Other streams, man-made channels and pipe	0.807/n**

**See ~~Chapter 5, Table 5.3.6C~~ for additional Mannings "n" values for open channels

Table III-3.1 Soil Properties Classified by Soil Texture

Texture Class	Infiltration Rate Hydrologic (inches/hr.) min/inch	Cation Exchange Capacity (milliequivalents/ 100 grams)	Effective Water Capacity (inches per inch)	Hydrologic Soil Group
Coarse Sands or Cobbles	20.00 3.00	<5.0	—	A
Sand	8.27 7.25	<5.0	0.35	A
Loamy Sand	2.41 25	5.0	0.31	A
Sandy Loam	1.02 60	>5.0	0.25	B
Loam	0.52 115	>5.0	0.19	B
Silt Loam	0.27 225	>5.0	0.17	C
Sandy Clay Loam	0.17 353	>5.0	0.14	C
Clay Loam	0.09 667	>5.0	0.14	D
Silty Clay Loam	0.06 1000	>5.0	0.11	D
Sandy Clay	0.05 1200	>5.0	0.09	D
Silty Clay	0.04 1500	>5.0	0.09	D
Clay	0.02 3000	>5.0	0.08	D

Source (except for cation exchange capacity): Rawls, Brakensiek, and Saxton, 1982 (16)

Cation exchange capacity values are estimated from Buckman and Brady, 1969, (23)

C. SOIL AMENDMENT CALCULATION

Compost and Topsoil Calculation Worksheet for the Pre-approved Amendment Rate

NOTE: For Options 2 and 3, use this worksheet if you plan to use the pre-approved compost amendment rate of 2 inches. This worksheet should not be used if a custom compost amendment rate is selected for Options 2 and/or 3.

Option 1

Leave native soil undisturbed, and protect from compaction during construction.

- Enter lettered areas from site plan where this option will be used:

_____ _____ _____ _____ _____ _____

No calculations for compost or topsoil are necessary for this option.

Option 2

Amend existing soil in-place (2-inch layer of compost).

- Enter lettered areas from site plan where this option will be used:

_____ _____ _____ _____ _____ _____

- Enter combined square footage of lettered areas in thousands _____ — (example: for 4,525 sq ft, enter 4.525; for 500 sq ft, enter 0.5)

- Multiply combined square footage by **6.2** and enter product in box A :

A	=Cubic Yards

AMOUNT OF COMPOST NEEDED FOR THESE AREAS

Note: MR 5 is triggered on sites with more than 2,000 sq. ft. of new, replaced, or new plus replaced impervious surface, or 7,000 sq. ft. or greater of land disturbing activity.

Option 3

Native Soil – stockpile site duff and topsoil and reapply after grading and construction.

- Enter lettered areas from site plan where this option will be used:

_____ _____ _____ _____ _____ _____

- Enter combined square footage of lettered areas in thousands 3.18
(example: for 4,525 sq ft, enter 4.525; for 500 sq ft, enter 0.5)

- Multiply **combined square footage** by **25** and enter product in box B :

B	80 =Cubic Yards

AMOUNT OF TOPSOIL TO BE STOCKPILED AND REAPPLIED IN THESE AREAS

Option 4

Import topsoil.

- Enter lettered areas from site plan where this option will be used:

_____ _____ _____ _____ _____ _____

- Enter combined square footage of lettered areas in thousands _____
(example: for 4,525 sq ft, enter 4.525; for 500 sq ft, enter 0.5)

- Multiply **combined square footage** by **25** and enter product in box C:

C	=Cubic Yards

AMOUNT OF IMPORTED TOPSOITHESE NEEDED FOR THESE AREAS

Order

Order These Amounts:

- Enter amount in Box **A:** _____**Cubic Yards of Compost**

- Enter amount in Box **C :** _____**Cubic Yards of Topsoil**

Note: MR 5 is triggered on sites with more than 2,000 sq. ft. of new, replaced, or new plus replaced impervious surface, or 7,000 sq. ft. or greater of land disturbing activity.