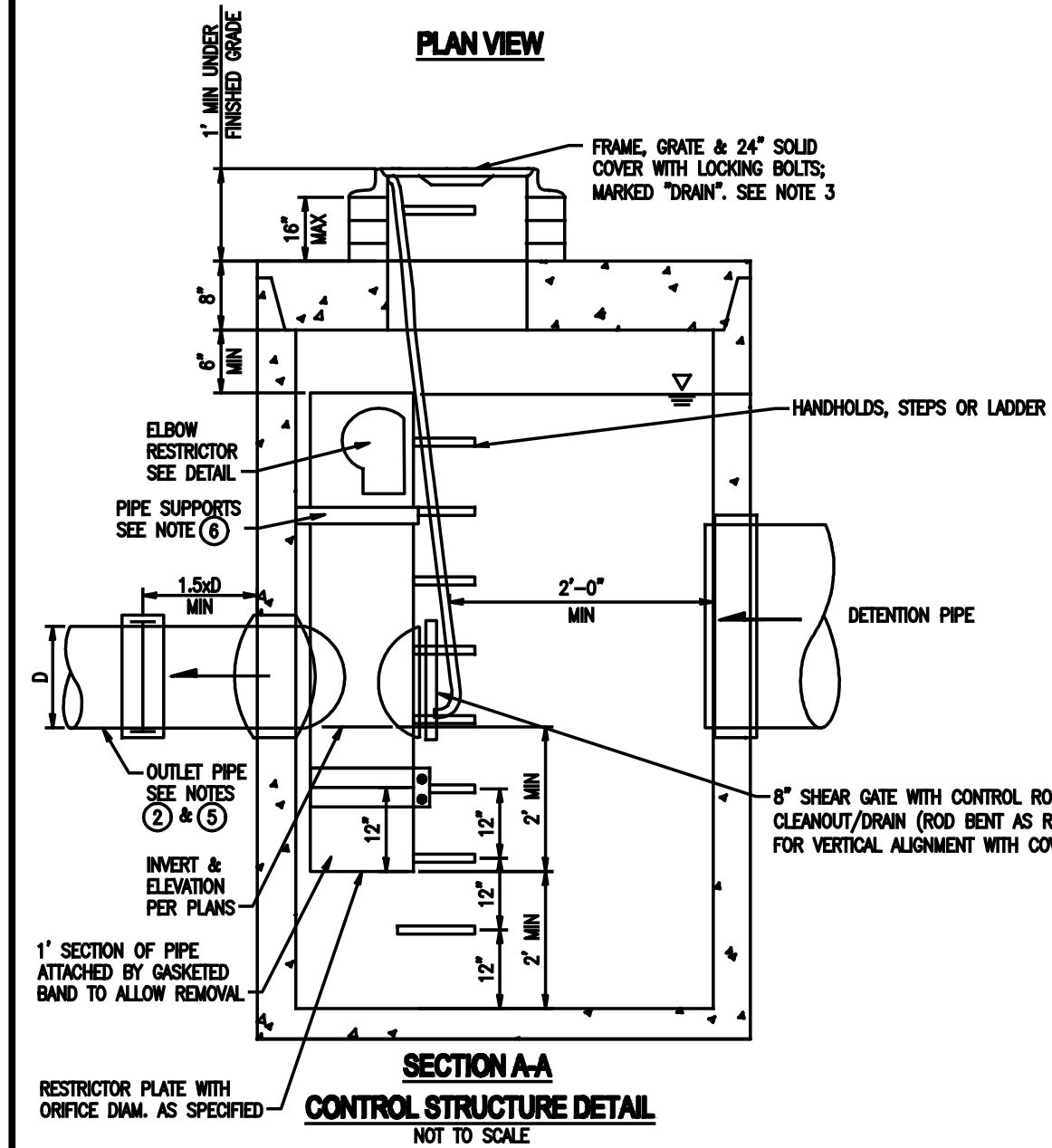
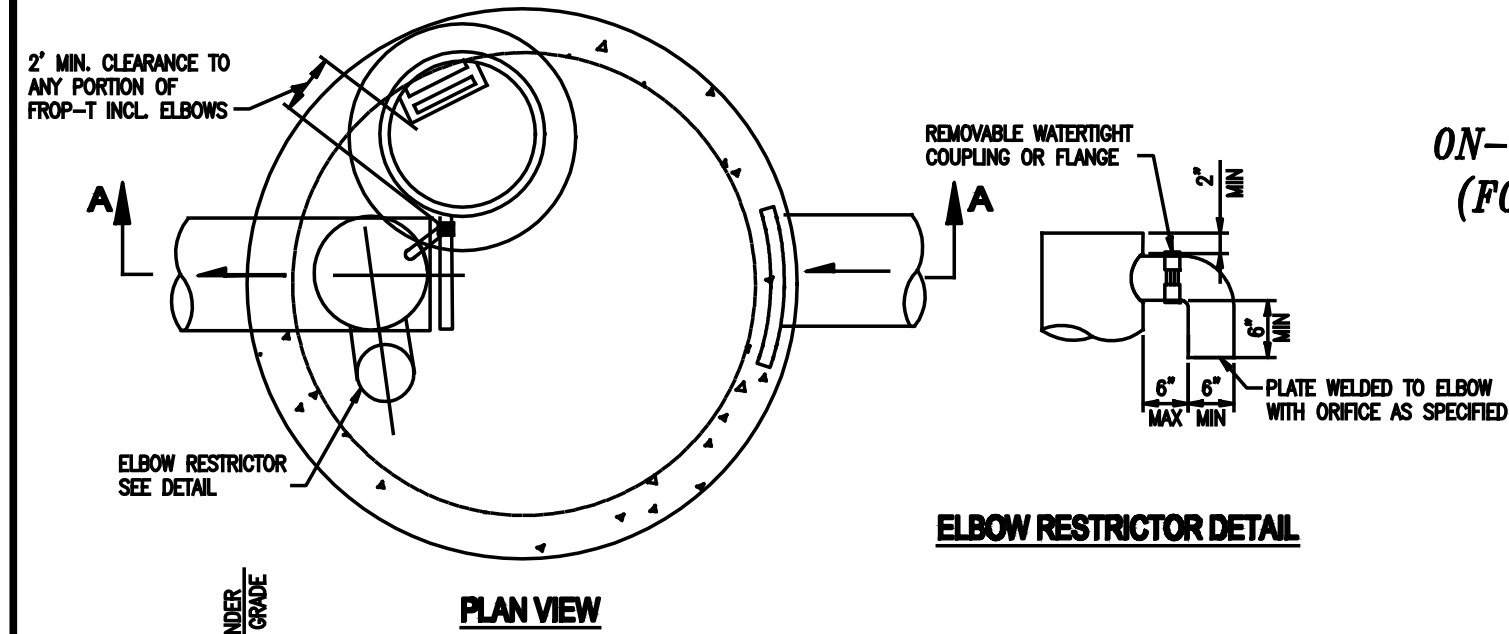


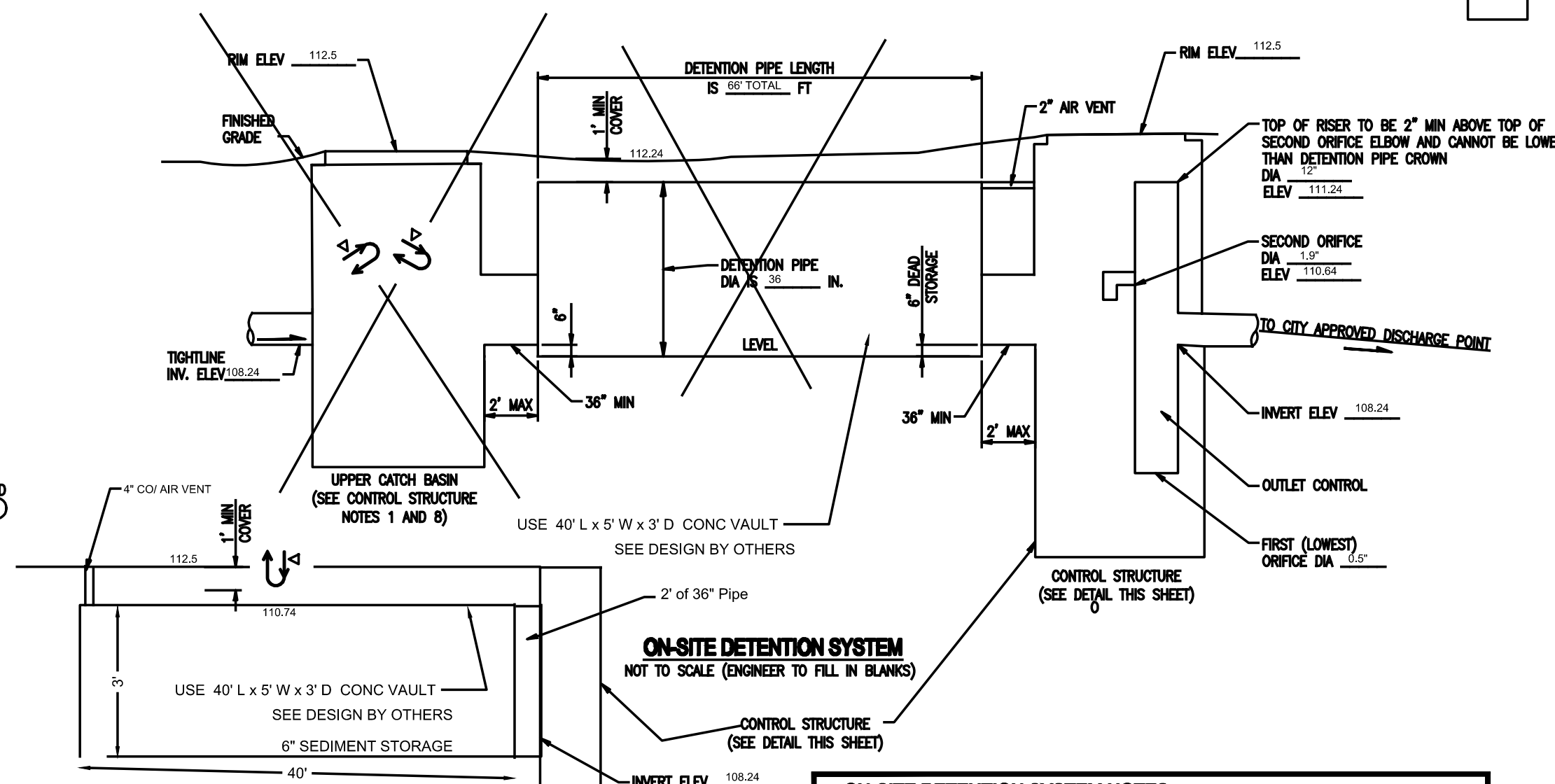
# ATTACHMENT 1 CITY OF MERCER ISLAND ON-SITE DETENTION SYSTEM WORKSHEET (FOR NEW PLUS REPLACED IMPERVIOUS AREA OF 9,500 SF OR LESS)



### CONTROL STRUCTURE NOTES:

- USE A MINIMUM OF A 54 IN. DIAM. TYPE 2 CATCH BASIN. THE ACTUAL SIZE IS DEPENDENT ON CONNECTING PIPE MATERIAL AND DIAMETER.
- OUTLET PIPE: MIN. 6 INCH.
- METAL PARTS: CORROSION RESISTANT. NON-GALVANIZED PARTS PREFERRED. GALVANIZED PIPE PARTS TO HAVE ASPHALT TREATMENT 1.
- FRAME AND LADDER OR STEPS OFFSET SO:
  - A. CLEANOUT GATE IS VISIBLE FROM TOP;
  - B. CLEAR-DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE;
  - C. FRAME IS CLEAR OF CURB.
- IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE, OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS 1/4 IN.
- PROVIDE AT LEAST ONE 3 X 0.090 GAUGE SUPPORT BRACKET ANCHORED TO CONCRETE WALL WITH 5/8 IN. STAINLESS STEEL EXPANSION BOLTS OR EMBEDDED SUPPORTS 2 IN. INTO CATCH BASIN WALL (MAXIMUM 3'-0" VERTICAL SPACING).
- THE SHEAR GATE SHALL BE MADE OF ALUMINUM ALLOY IN ACCORDANCE WITH ASTM B 26M AND ASTM B 275, DESIGNATION 2832M; OR CAST IRON IN ACCORDANCE WITH ASTM A 48, CLASS 30B. THE LIFT HANDLE SHALL BE MADE OF A SIMILAR METAL TO THE GATE (TO PREVENT GALVANIC CORROSION). IT MAY BE OF SOLID ROD OR HOLLOW TUBING, WITH ADJUSTABLE HOOK AS REQUIRED. A NEOPRENE RUBBER GASKET IS REQUIRED BETWEEN THE RISER MOUNTING FLANGE AND THE GATE FLANGE. INSTALL THE GATE SO THAT THE LEVEL-LINE MARK IS LEVEL WHEN THE GATE IS CLOSED. THE MATING SURFACES OF THE LID AND THE BODY SHALL BE MACHINED FOR PROPER FIT. ALL SHEAR GATE BOLTS SHALL BE STAINLESS STEEL.
- THE UPPER CATCH BASIN IS REQUIRED IF THE LENGTH OF THE DETENTION PIPE IS GREATER THAN 50 FT.

OWNER: YONG ADDRESS: 2423 63RD AVE SE PREPARED BY: ANSTEY ENGINEERING  
 PERMIT #: MERCER ISLAND, WA PHONE: 206-303-7639  
 DATE: 8-17-2020  
 NEW PLUS REPLACED IMPERVIOUS SURFACE AREA (SF): DETENTION PIPE DIA (INCH): 36" DETENTION PIPE LENGTH (FT): 66" ORIFICE #1 DIA 0.5" INCH, ELEV. 108.24  
 SOIL TYPE: ALDERWOOD TYPE C PIPE MATERIAL: LCPPE ORIFICE #2 DIA 1.5" INCH, ELEV. 110.64



### ON-SITE DETENTION SYSTEM NOTES:

- CALL DEVELOPMENT SERVICES (206-275-7825) 24 HOURS IN ADVANCE FOR A DETENTION SYSTEM INSPECTION BEFORE BACKFILLING AND FOR FINAL INSPECTIONS.
- RESPONSIBILITY FOR OPERATION AND MAINTENANCE OF DRAINAGE SYSTEMS ON PRIVATE PROPERTY IS RESPONSIBILITY OF THE PROPERTY OWNER. MATERIAL ACCUMULATED IN THE STORAGE PIPE MUST BE REMOVED FROM CATCH BASINS TO ALLOW PROPER OPERATION. THE OUTLET CONTROL ORIFICE MUST BE KEPT OPEN AT ALL TIMES.
- PIPE MATERIAL, JOINT, AND PROTECTIVE TREATMENT SHALL BE IN ACCORDANCE WITH SECTION 7.04 AND 9.05 OF THE WSDOT STANDARD SPECIFICATION FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, LATEST VERSION. SUCH MATERIALS INCLUDE THE FOLLOWING: LINED CORRUGATED POLYETHYLENE PIPE (LOPE), ALUMINIZED TYPE 2 CORRUGATED STEEL PIPE AND PIPE ARCH (MEETS ASHTO DESIGNATIONS M274 AND M36), CORRUGATED OR SPIRAL RIB ALUMINUM PIPE, OR REINFORCED CONCRETE PIPE. CORRUGATED STEEL PIPE IS NOT ALLOWED.
- FOOTING DRAINS SHALL NOT BE CONNECTED TO THE DETENTION SYSTEM.

New and Replaced Impervious Surface Area (sf)	Detention Pipe Diameter (in)	Detention Pipe Length (ft)		Lowest Orifice Diameter (in) <sup>(1)</sup>		Distance from Outlet Invert to Second Orifice (ft)		Second Orifice Diameter (in)	
		B soils	C soils	B soils	C soils	B soils	C soils	B soils	C soils
500 to 1,000 sf	36"	22	0.5	0.5	2.2	2.0	0.5	0.8	
	48"	18	1.1	0.5	3.3	3.2	0.9	0.8	
	60"	11	7	0.5	4.7	3.4	0.5	0.6	
1,001 to 2,000 sf	36"	66	4.3	0.5	2.2	2.3	0.9	1.4	
	48"	34	23	0.5	3.2	3.3	0.9	1.2	
	60"	22	14	0.5	4.3	3.6	0.9	0.9	
2,001 to 3,000 sf	36"	90	6.6	0.5	2.2	2.4	0.9	1.9	
	48"	48	36	0.5	3.1	2.8	0.9	1.5	
	60"	30	20	0.5	4.2	3.7	0.9	1.1	
3,001 to 4,000 sf	36"	120	7.8	0.5	2.4	2.2	1.4	1.6	
	48"	62	42	0.5	2.8	2.9	0.8	1.3	
	60"	42	26	0.5	3.8	3.9	0.9	1.3	
4,001 to 5,000 sf	36"	134	9.1	0.5	2.8	2.2	1.7	1.5	
	48"	73	49	0.5	3.6	2.9	1.6	1.5	
	60"	46	31	0.5	4.6	3.5	1.6	1.3	
5,001 to 6,000 sf	36"	162	10.9	0.5	3.2	2.7	1.8	1.6	
	48"	90	5.9	0.5	3.5	2.9	1.7	1.5	
	60"	54	37	0.5	4.6	3.6	1.6	1.4	
6,001 to 7,000 sf	36"	192	12.8	0.5	2.7	2.2	1.9	1.8	
	48"	102	68	0.5	3.7	2.9	1.9	1.6	
	60"	66	43	0.5	4.6	3.6	1.8	1.5	
7,001 to 8,000 sf	36"	218	14.6	0.5	2.8	2.2	2.0	1.9	
	48"	119	7.9	0.5	3.8	2.9	2.2	1.7	
	60"	73	4.9	0.5	4.5	3.6	2.0	1.6	
8,001 to 8,500 sf <sup>(2)</sup>	36"	228	15.5	0.5	2.8	2.2	2.1	1.9	
	48"	124	8.4	0.5	3.7	2.9	1.9	1.8	
	60"	77	5.3	0.5	4.6	3.6	2.0	1.6	
8,501 to 9,000 sf	36"	NA <sup>(3)</sup>	16.4	0.5	NA <sup>(3)</sup>	2.2	NA <sup>(3)</sup>	1.9	
	48"	NA <sup>(3)</sup>	8.9	0.5	NA <sup>(3)</sup>	2.9	NA <sup>(3)</sup>	1.9	
	60"	NA <sup>(3)</sup>	5.5	0.5	NA <sup>(3)</sup>	3.6	NA <sup>(3)</sup>	1.7	
9,001 to 9,500 sf <sup>(4)</sup>	36"	NA <sup>(3)</sup>	17.4	0.5	NA <sup>(3)</sup>	2.2	NA <sup>(3)</sup>	2.1	
	48"	NA <sup>(3)</sup>	9.4	0.5	NA <sup>(3)</sup>	2.9	NA <sup>(3)</sup>	2.0	
	60"	NA <sup>(3)</sup>	5.8	0.5	NA <sup>(3)</sup>	3.7	NA <sup>(3)</sup>	1.7	

Notes:  
 • Minimum Requirement #7 (Flow Control) is required when the 100-year flow frequency causes a 0.15 cubic feet per second increase (when modeled in WWHM with a 15-minute timestep). Breakpoints shown in this table are based on a flat slope (0-5%). The 100-year flow frequency will need to be evaluated on a site-specific basis for projects on moderate (5-15%) or steep (>15%) slopes.  
 • Slope includes a Volume Correction Factor of 1.20x.  
 • Soil type to be determined by geotechnical analysis or soil map.  
 • Upper bound contributing area used for sizing.  
 • On Type B soils, new plus replaced impervious surface areas exceeding 8,500 sf trigger Minimum Requirement #7 (Flow Control).  
 • On Type C soils, new plus replaced impervious surface areas exceeding 9,500 sf trigger Minimum Requirement #7 (Flow Control).  
 • Minimum orifice diameter = 0.5 inches.  
 • in = inch  
 • ft = feet  
 • sf = square feet

Basis of Sizing Assumptions:  
 Based per ARRS in the Stormwater Management Manual for Puget Sound Basin (1992 Ecology Manual), SBUH, Type 1A, 24-hour hydrograph:  
 2-year, 24-hour storm = 2 in; 10-year, 24-hour storm = 3 in; 100-year, 24-hour storm = 4 in  
 Predeveloped - second growth forest (CN = 72 for Type B soils; CN = 81 for Type C soils)  
 Developed = impervious (CN = 98)  
 0.5 foot of sediment storage in detention pipe  
 Overland slope = 5%

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 Internet #100187441  
 Store SKU #302950

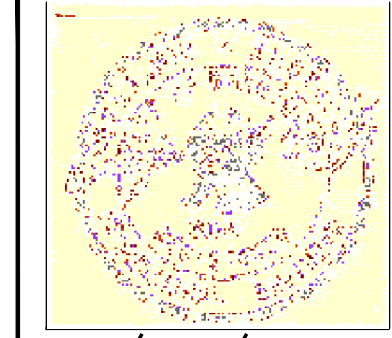


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NO	DATE	BY	APPR	REVISIONS

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 Bothell, WA 98011  
 Ph: 206-303-7639  
 Email: benanstey@ansteyengineering.com



8/17/2020

Approved By  
 BPA 12/17/19  
 DESIGNED BY DATE  
 BPA 12/17/19  
 DRAWN BY DATE  
 CHECKED BY DATE

MINGQIN LI & SUN YONG  
 2423 63RD AVE SE  
 MERCER ISLAND, WA 98040

**SITE & DRAINAGE  
 PLAN DETAILS**  
 AE2019-84 SHT 2 OF 2