

**Stormwater Drainage Report
4450 84th Avenue SE
Mercer Island, Washington
KC Tax Parcel #759810-0760
Permit #: 25xx-xxx**

Prepared For:

**Mercer Partners, LLC
Attn.: Vann Lanz
317 4th Street
Kirkland, Washington 98033
206-499-1277
Vann@lnlbuilds.com**

March 24, 2025

Prepared By:

**Offe Engineers, PLLC
Darrell Offe, P.E.
13932 SE 159th Place
Renton, Washington 98058
425-260-3412
Darrell.Offe@comcast.net**



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Section 1: Project Narrative:

The subject property is located within the Central area of Mercer Island. The subject property abuts 84th Avenue SE along the easterly side, but does not take access from 84th Avenue SE. Vehicular access to the subject property is off of Island Crest Way at SE 45th Street, then turning north on a gravel driveway. and takes access from the 61st Avenue SE on the west side of the property. The subject property has an existing house structure, a detached shed, and long gravel driveway. The existing house is located on the westerly side of the property.

The subject property has a ridge (high point) located at the existing house where the property slopes west and east. The westerly portion of the property slopes towards 84th Avenue SE; while the easterly portion of the property slopes to a low point in the northeast corner. The existing drainage sheet flows in tow direction, west and east.

The site soils are characterized between Vashon Glacial Till and infeasible for infiltration type BMPs as indicated within the City of Mercer Island website. City of Mercer Island staff has determined that on-site detention is required for the new impervious surfaces on the property. The new detention system will be located in the northeast corner of the property and connecting via conveyance pipe to the existing public storm system within 84th Avenue SE.

The property was visited in March 2025 to verify runoff patterns and possible storm water discharge options. The project will be evaluated for storm water treatment and control using the Amended December 2014 SWMMWW (DOE Manual).

VICINITY MAP



SUBJECT
PROPERTY

Mercer Island

Section 2: Site Evaluation

Total Lot Area = 9,600 square feet (0.2204 acres)

EXISTING CONDITIONS

Impervious:

House roof area = 713 sq. feet

Shed roof area = 67 sq. feet

Walkway/patio = 320 sq. feet

Gravel driveway area = 1,657 sq. feet ((PGHS))

Subtotal: 2,757 sq. feet

Pervious:

Lawn, trees, landscaping = *6,843 sq. feet*

DEVELOPED CONDITIONS

Impervious (hard) surfaces:

House roof areas w/overhang = 1,554 sq. feet

Uncovered driveway = 178 sq. feet ((PGHS))

Uncovered deck area = 166 sq. feet

Uncovered walkway = 148 sq. feet

Total New Impervious (Hard) Surfaces = 2,046 sq. feet

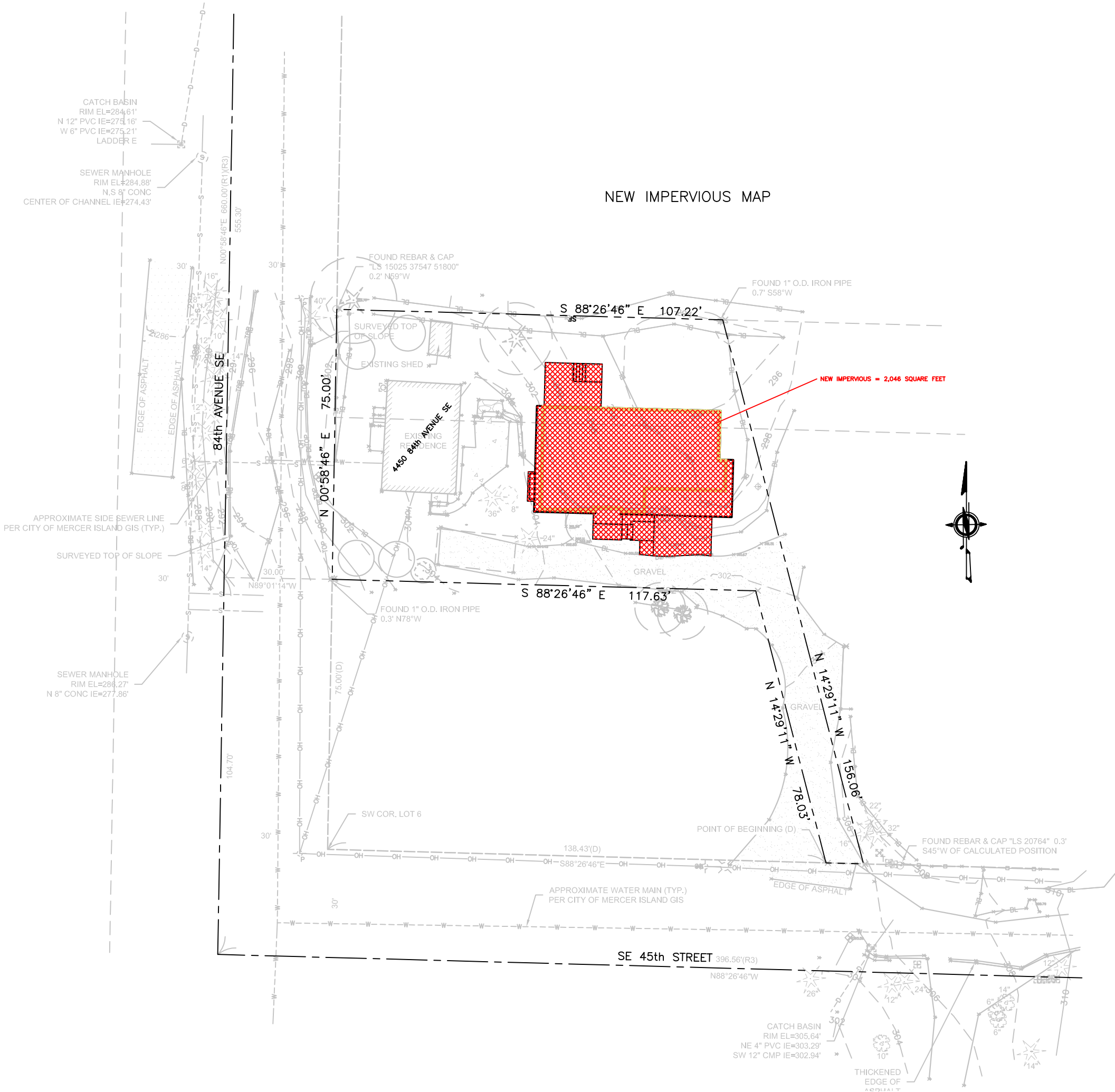
((PGHS)) -Pollution Generating Hard Surface

Summary of Project Information

Project Site Area	9,600 square feet
Existing Impervious Area	2,757 sq. feet
Existing Impervious Coverage	28.7%
New Impervious Area	2,046 sq. feet
Replaced Impervious Area	0 sq. feet (see attached New Impervious Map – next page)
New plus Replaced Impervious	2,046 square feet
Total Site Impervious Area	4,803 square feet
Converted pervious: Native to lawn	0 sq. feet
Converted pervious: Native to pasture	0 sq. feet
Total Area of Land Disturbance	4,660 square feet

The existing property has less than 35% (28.7%) imperious coverage and the total proposed project new plus replaced impervious surfaces will be less than 5,000 (2,046) square feet; using Figure I-2.4.1 – "Flow Chart for Determining Minimum Requirements for New Development" page 37, 2014 Stormwater Management Manual for Western Washington, Minimum Requirements #1 – #5 apply to this project.

NEW IMPERVIOUS MAP



FLOW CHART FIGURE II-2.4.1

Figure I-2.4.1 Flow Chart for Determining Requirements for New Development

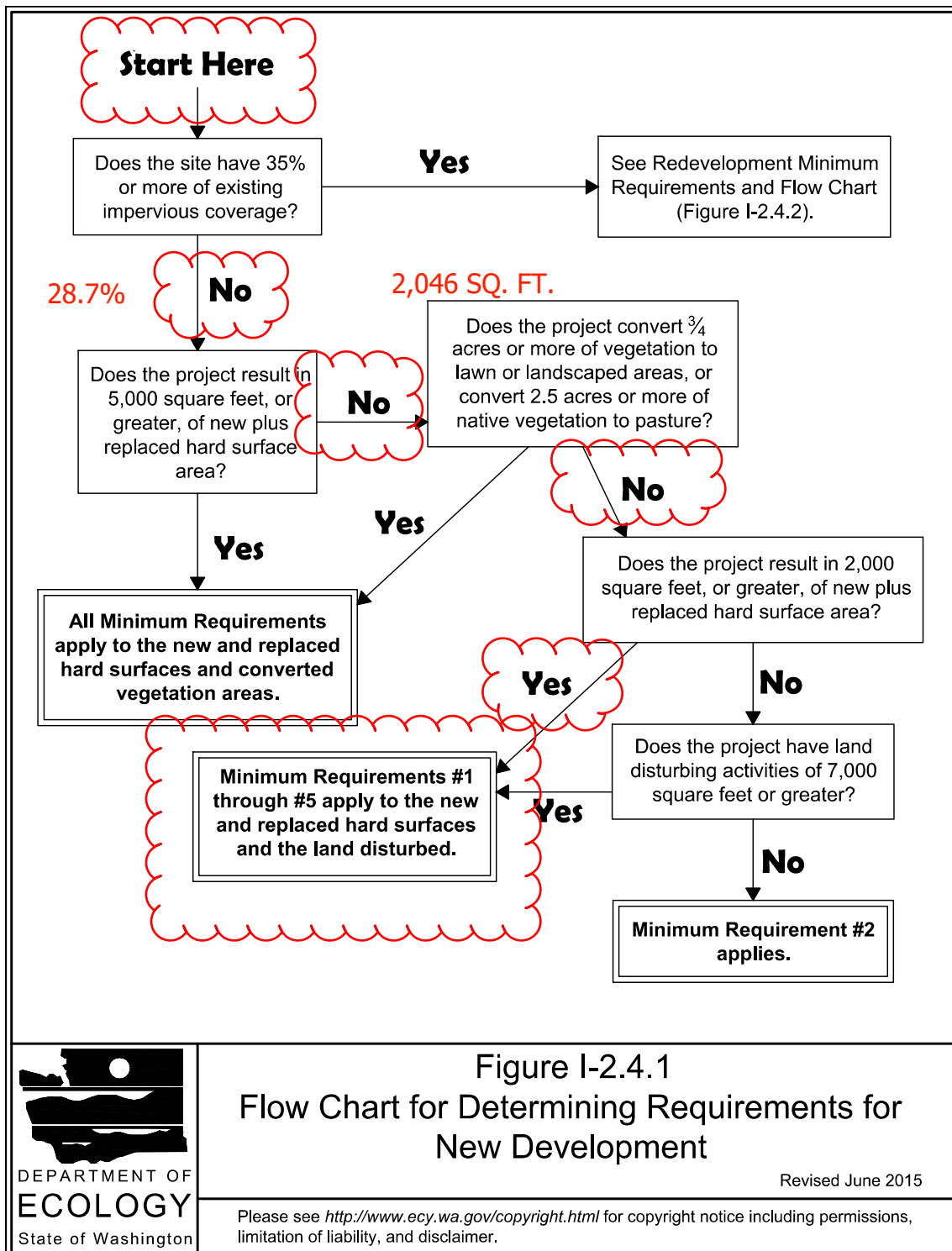


Figure I-2.4.1
Flow Chart for Determining Requirements for New Development

Revised June 2015



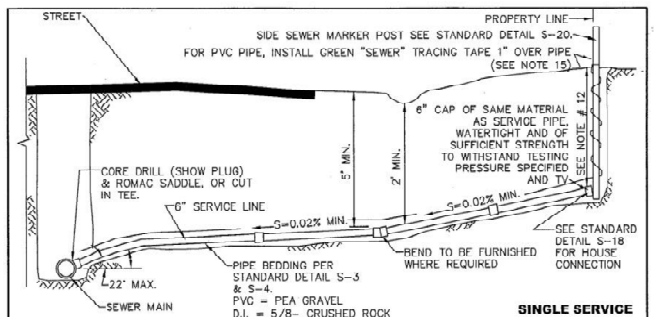
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Section 3: Minimum Requirements

Based upon the Flow Chart Figure I-2.4.1 and I-2.4.2 (Amended December 2014 SWMMWW, DOE Manual), all Minimum Requirements 1-5 apply to this project.

Section I-2.5.1 Minimum Requirement #1 – Preparation of Stormwater Site Plans

A Stormwater site plan (drainage plan) has been prepared for this project together with construction details for installation of the proposed drainage control system. The Stormwater site plans and drainage narrative shall be submitted and reviewed by the City of Mercer Island as part of the building permit application.



SINGLE SERVICE

NOTES

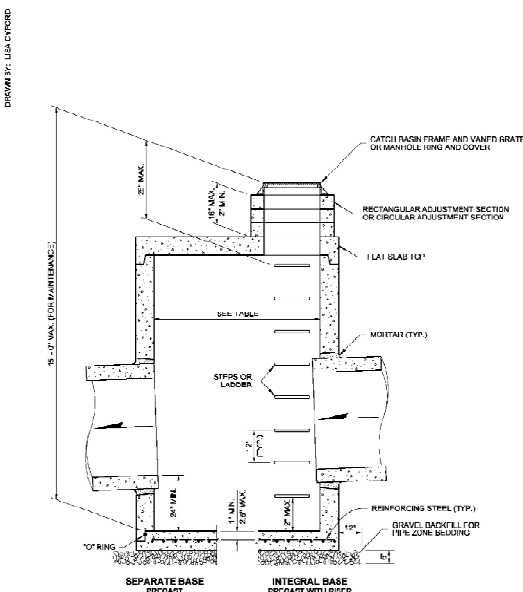
1. ELBOWS SHALL NOT BE GREATER THAN 45 DEGREES.
2. CLEAN OUT IS REQUIRED FOR EACH PIPE LENGTH GREATER THAN 100' AND FOR EACH 90° ACCUMULATED ELBOW/100'.
3. RIGHT-OF-WAY RESTORATION SHALL MATCH OR EXCEED THE ORIGINAL CONDITION AND BE IN ACCORDANCE WITH CITY STANDARDS.
4. ALL TRENCH BACKFILL IN PUBLIC RIGHT-OF-WAY OR ROADWAY AREAS SHALL BE CRUSHED SURFACING PER WSDOT 9-09.8(3) OR BANK RUN GRAVEL PER WSDOT 9-03.10, COMPACTED IN 4" LIFTS OR MAY BE COP WHEN DIRECTED BY THE CITY ENGINEER (SEE DETAIL 9-3).
5. LAY PIPE IN STRAIGHT LINE BETWEEN BENDS. MAKE ALL CHANGES IN GRADE OR LINE WITH 1/8" BEND OR WYE. 90° CHANGE WITH 1/8" BEND AND WYE.
6. 6" SEWER PIPE MINIMUM SIZE IN RIGHT-OF-WAY, AND ELSEWHERE AS DIRECTED BY ENGINEER. 2% MIN. GRADE (UNLESS DIRECTED BY ENGINEER), 50% MAXIMUM.
7. ALL A.C. MANHOLES TO BE TAPPED IN ACCORDANCE WITH WAC 295-52-00775 STATE/FEDERAL CODES/LAWS AND CLARIFICATION.
8. CONSTRUCTION IN RIGHT-OF-WAY MUST BE DONE BY A REGISTERED AND LICENSED CONTRACTOR.
9. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT CITY SEWER ORDINANCES.
10. WHERE CITY ENGINEER ALLOWS SIDE SEWER CONNECTIONS TO MANHOLE INVERT OF SIDE SEWER SHALL BE EQUAL TO OR ABOVE MAIN SEWER CROWN, BUT NOT TO EXCEED 18" ABOVE INVERT OF MAIN SEWER.
11. UNLESS OTHERWISE INDICATED ON PLAN, SIDE SEWER SHALL BE MIN. OF 6" DEEP AT PROPERTY LINE, OR 5" LOWER THAN THE LOWEST ELEVATION, WHICH EVER IS LOWER.
12. ALL PIPE MATERIALS NOT TO STANDARDS WILL BE ABANDONED AND REPLACED WITH DUCTILE IRON OR PVC PIPE OF THE SAME SIZE.
13. IF A BUILDING SEWER IS TO SERVE MORE THAN ONE PROPERTY, BY JOINT AGREEMENT OF THE OWNERS, AN APPROVED EASEMENT INSURING THAT ALL PROPERTIES INVOLVED SHALL HAVE PERPETUAL USE OF THE SIDE SEWER, HAVING PROVIDED FOR OPERATION, MAINTENANCE, RECONSTRUCTION AND FOR ACCESS FOR REPAIR PURPOSES, SHALL BE SIGNED BY THE OWNERS. THIS EASEMENT SHALL BE RECORDED WITH THE COUNTY AUDITOR. A SIX INCH (MINIMUM) DIAMETER PIPE SHALL BE USED FOR THE COMMON LINE AND A SIX INCH (MINIMUM) DIAMETER PIPE SHALL BE PROVIDED AT THE WYE. WINGS, THE UPPER LEGS, CONNECTIONS AND MADE. BACKWATER VALVES SHALL BE INSTALLED ON SERVICE LINES UPSTREAM OF THE CONNECTION TO THE SHARED SIDE SEWER.
14. THE CITY ENGINEER MAY REQUIRE BACKWATER VALVES ON SIDE SEWERS WHEN DEEMED NECESSARY. THE EFFECTIVE OPERATION AND MAINTENANCE OF ANY BACKWATER VALVE SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE SIDE SEWER.
15. UTILITY PIPE TRACER TAP SHALL BE DETECTABLE BELOW GROUND SURFACE, COLOR CODED, WITH UTILITY NAME PRINTED ON TAPE. CONDUCTIVE WARNING TAPE REQUIRED OVER ALL WATER PIPE. TAPE SHALL BE MANUFACTURER'S STANDARD PERMANENT, BRIGHT-COLORED, CONTINUOUS PRINTED PLASTIC TAPE. ALUMINUM BACKED, INTENDED FOR DIRECT-BURIAL SERVICE. TAPE SHALL BE NOT LESS THAN 6" WIDE X 4 MILS THICK.

DOUBLE SERVICE

CITY OF MERCER ISLAND STANDARD DETAILS SEWER SIDE SEWER CONNECTION AND STUB

6-5-2009 NO SCALE **S-17**

REV. DATE: _____ APPROVED: _____



CATCH BASIN DIMENSIONS

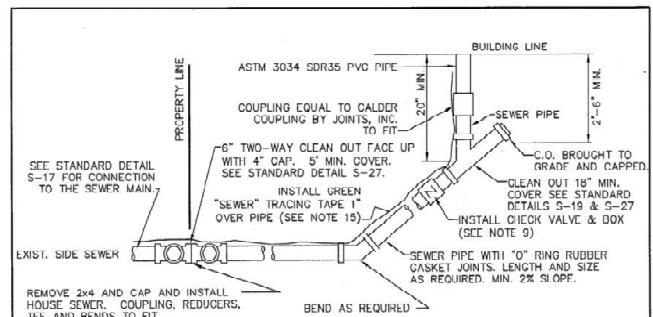
CATCH BASIN DIAMETER	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	8"	30"	8"
54"	4.5"	10"	42"	8"
60"	6"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	10"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	90"	12"
144"	12"	12"	108"	12"

PIPE ALLOWANCES

CATCH BASIN DIAMETER	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER	CONCRETE	ALL METAL	CPSP	SOLID WALL, PVC	PROFILE WALL, PVC
48"	24"	30"	24"	30"	30"	30"
54"	30"	36"	30"	36"	36"	36"
60"	30"	42"	30"	42"	42"	42"
72"	42"	54"	42"	48"	48"	48"
84"	51"	60"	51"	54"	54"	54"
96"	60"	72"	60"	60"	60"	60"
120"	66"	84"	60"	66"	66"	66"
144"	78"	96"	60"	78"	78"	78"



CATCH BASIN TYPE 2
STANDARD PLAN B-10.20-01
 SHEET 1 OF 1 SHEET
 APPROVED FOR PUBLICATION
Pasco Bakotich III 02-07-12
 REGISTERED PROFESSIONAL ENGINEER
 Washington State Department of Transportation



BUILDING CONNECTION

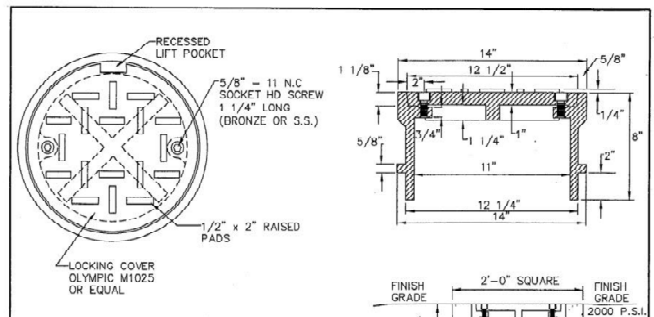
NOTES

1. ELBOWS SHALL NOT BE GREATER THAN 45 DEGREES.
2. CLEAN OUT IS REQUIRED FOR EACH PIPE LENGTH GREATER THAN 100' AND FOR EACH 90° ACCUMULATED ELBOW/100'.
3. ALL HOUSE PLUMBING UTILITIES MUST BE CONNECTED TO THE SEWER. NO DOWN SPOUTS OR STORM DRAINAGE MAY BE CONNECTED TO THE SEWER SYSTEM.
4. 18" MINIMUM COVERAGE OVER PIPE.
5. LAY PIPE IN STRAIGHT LINE BETWEEN BENDS. MAKE ALL CHANGES IN GRADE OR LINE WITH 1/8" BEND OR WYE. 90° CHANGE WITH 1/8" BEND AND WYE.
6. 4" SEWER PIPE MINIMUM SIZE ON PROPERTY. 2% MINIMUM GRADE.
7. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT SEWER ORDINANCES.
8. ALL CONSTRUCTION REQUIRES A PLAN SHOWING PROPERTY AND DIMENSIONS AND COMPLETION OF SIDE SEWER APPLICATION AND MAINTENANCE AGREEMENT, AS NEEDED.
9. BACK WATER VALVE (CHECK VALVE) IS REQUIRED:
 - A. IF CONNECTED TO A SHARED SIDE SEWER.
 - B. IF CONNECTION AT HOUSE IS LOWER THAN BOTH UPSTREAM AND DOWNSTREAM MANHOLE.
 - C. SEE S-23 & S-24 FOR LAKE LINE REQUIREMENTS.
10. AS-BUILT DRAWING SHOWING LOCATION OF SIDE SEWER & ALL BENDS, C.O. ETC., IN RELATION TO THE HOUSE IS REQUIRED AFTER INSPECTION & INSTALLATION. SEE STANDARD DETAIL S-38 FOR A TYPICAL "AS BUILT".
11. THE MINIMUM PIPE SIZE FOR SIDE SEWERS SHALL BE:
 - A. 4" - WITHIN THE PUBLIC RIGHT-OF-WAY.
 - B. 4" - SINGLE FAMILY RESIDENCES.
 - C. 6" - 2 TO 6 SINGLE FAMILY RESIDENCES.
 - D. 6" - BUILDINGS OTHER THAN SINGLE FAMILY RESIDENCES.
12. UTILITY PIPE TRACER TAP SHALL BE DETECTABLE BELOW GROUND SURFACE, COLOR CODED, WITH UTILITY NAME PRINTED ON TAPE. CONDUCTIVE WARNING TAPE REQUIRED OVER ALL WATER PIPE. TAPE SHALL BE MANUFACTURER'S STANDARD PERMANENT, BRIGHT-COLORED, CONTINUOUS PRINTED PLASTIC TAPE. ALUMINUM BACKED, INTENDED FOR DIRECT-BURIAL SERVICE. TAPE SHALL BE NOT LESS THAN 6" WIDE X 4 MILS THICK.

CITY OF MERCER ISLAND STANDARD DETAILS SEWER HOUSE SEWER CONNECTION

6-5-2009 NO SCALE **S-18**

REV. DATE: _____ APPROVED: _____



CLEAN OUT DETAIL

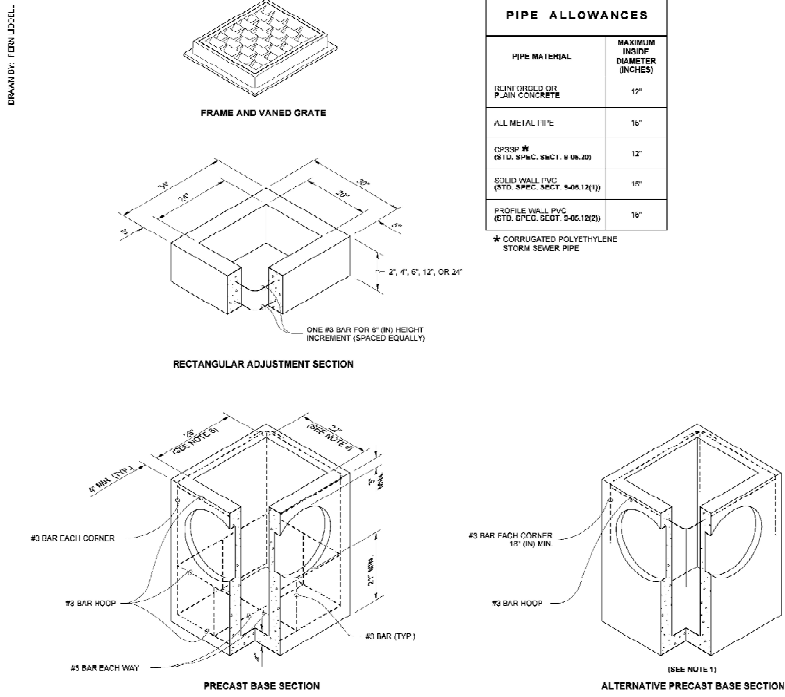
NOTES

1. SEE S-27 FOR INSTALLATION DETAILS.

CITY OF MERCER ISLAND STANDARD DETAILS SEWER CLEAN OUT DETAIL

6-5-2009 NO SCALE **S-19**

REV. DATE: _____ APPROVED: _____



PIPE ALLOWANCES

PIPE MATERIAL	MAXIMUM INSIDE DIAMETER (INCHES)
PLAIN CONCRETE OR PLAN CONCRETE	18"
ALL METAL PIPE	18"
CPSP #8 (D.I. SPEC. 9-03.10)	12"
SOLID WALL PVC (D.I. SPEC. 9-03.10)	18"
PROFILE WALL PVC (D.I. SPEC. 9-03.10)	18"

* CORRUGATED POLYETHYLENE STORM SEWER PIPE

NOTES

1. An acceptable alternative to the grate shown in the PRECAST BASE SECTION, shall be a grate having a minimum area of 0.12 square inches per foot shall be used with the minimum required manhole in the ALL-TERRAIN PRECAST BASE SECTION. The grate shall not be placed in the knockouts.
2. The knockout diameter shall not be greater than 20" (6"). Knockouts shall have a wall thickness of 2" (6") minimum to 2.5" (6") maximum. Provide a 1/2" (12") minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with Standard Specification Section 9-04.3.
3. The maximum depth from the finished grade to the lowest pipe invert shall be 5' (5').
4. The frame and grate may be installed with the flange down, or integrally cast into the adjustment section with flange up.
5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1:24 or steeper.
6. The opening shall be measured at the top of the Precast Base Section.
7. All pickup holes shall be grouted full after the basin has been placed.

CATCH BASIN TYPE 1
STANDARD PLAN B-5.20-03
 SHEET 1 OF 1 SHEET
 APPROVED FOR PUBLICATION
Roark, Sieve 03-17-2025
 REGISTERED PROFESSIONAL ENGINEER
 Washington State Department of Transportation

PROJECT: 4450 84th Avenue SE
 CLIENT: Mercer Partners, LLC
 SHEET CONTENT: Details
 DATE: 03/17/2025
 JOB NO.:
 DWG NO.:
 SHEET 3 OF 5

DESIGNED BY: DLO
 DRAWN BY: SLS
 CHECKED BY: DLO

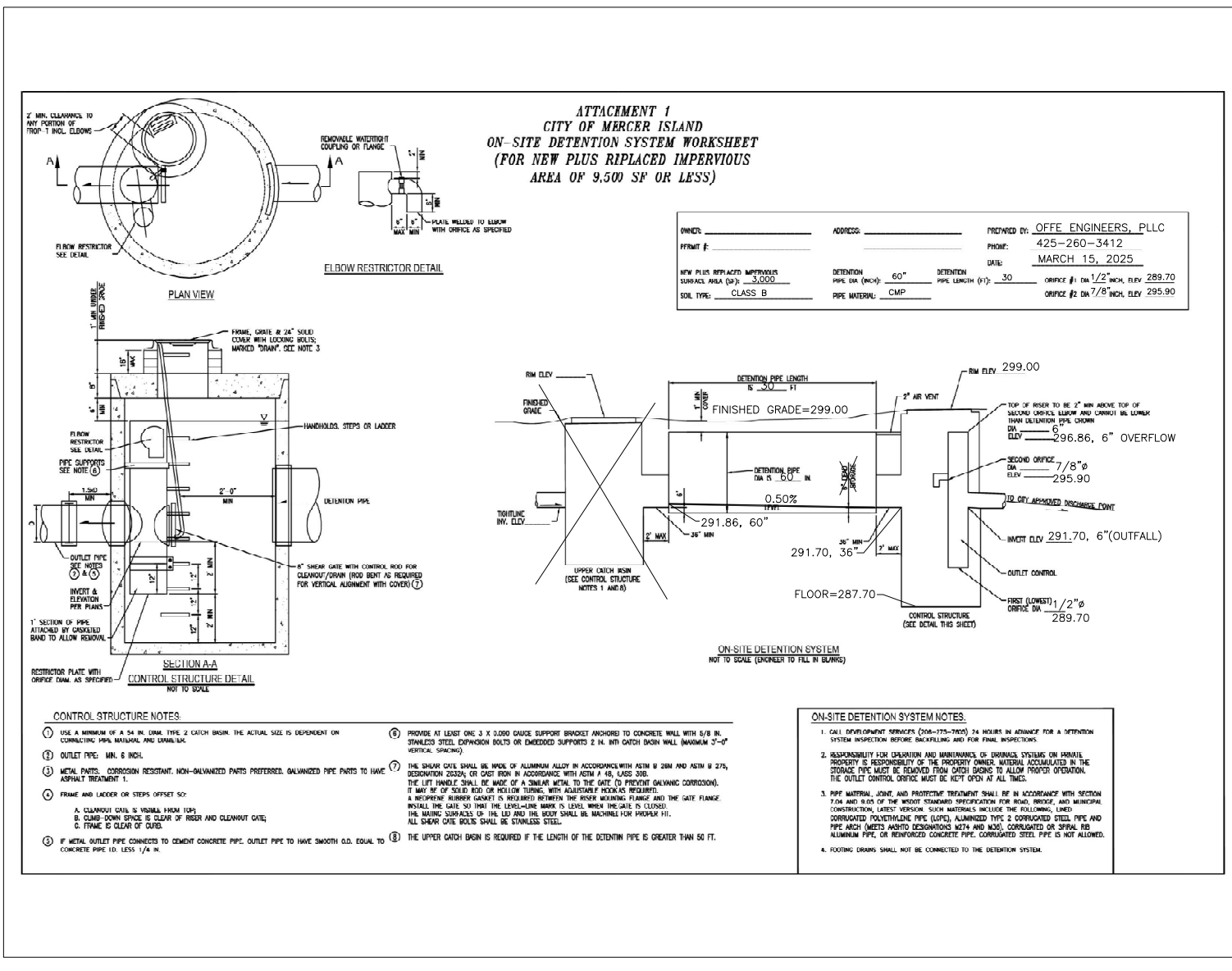
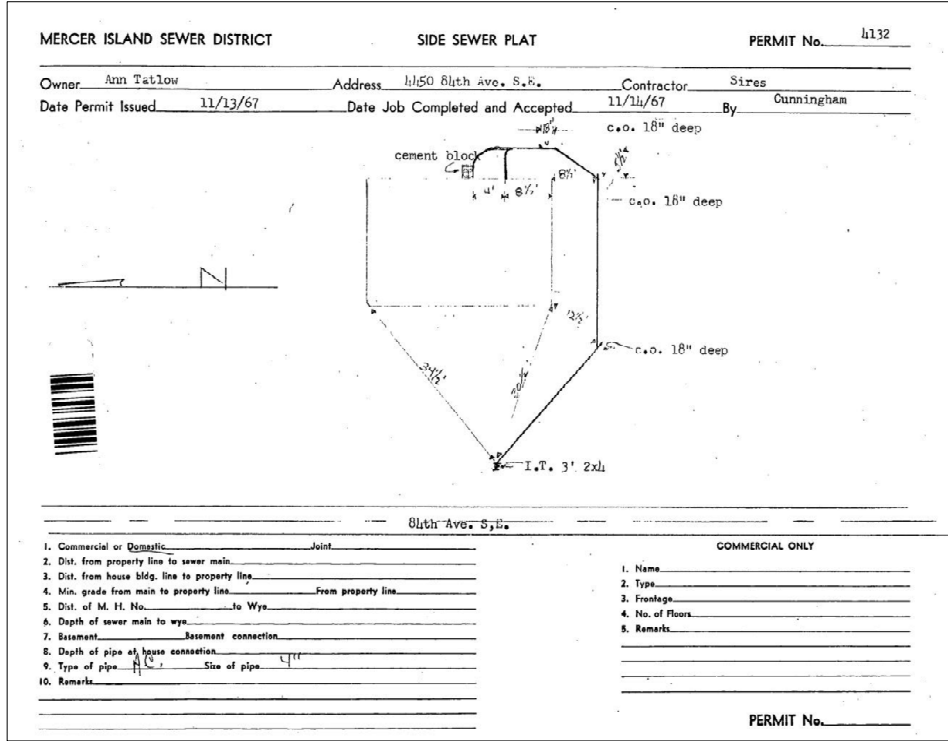
REV. NO. DATE DESCRIPTION

03/17/2025

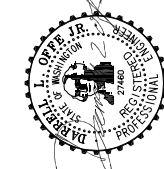
OFFICE ENGINEERS
 4450 84th Avenue SE
 Mercer Partners, LLC
 CONTACT: DANNY L. OFFICE, P.E.
 PHONE: 425-749-5432

OFF

CITY OF MERCER ISLAND
 REGISTERED PROFESSIONAL ENGINEER
 License No. 45574



PROJECT	4450 84th Avenue SE	DESIGNED BY	DLO	CHECKED BY	DLO	REV. NO.	DATE	DESCRIPTION
CLIENT	Mercer Partners, LLC	DRAWN BY	SLS					
SHEET CONTENT	Details							
DATE	03/17/2025							
JOB NO.								
DWG NO.								
SHEET	4	OF	5					



OFFE ENGINEERS
 ENGINEERS ARCHITECTS PLANNERS
 1000 1ST AVENUE, SUITE 1000
 SEATTLE, WASHINGTON 98101
 PHONE: 425-260-3412
 CONTACT: DAVID@OFFE.COM



Section I-2.5.2 Minimum Requirement #2 - Construction Storm Water Pollution Prevention Plan (CSWPP)

A Construction Stormwater Pollution Prevention Plan (CSWPP) has been prepared and included within this Report. The CSWPP plan shall include construction installation of erosion control, establish a construction access, preservation of existing vegetation during construction, and protection of existing drainage inlets. This will include but not limited to: the use of the existing gravel driveway and parking area (on the south side) to provide construction access from 45th Street; installing filter fabric silt fencing along the down gradient property lines (west); installation of filter socks within the public catch basin located within 84th Avenue SE; retention of native vegetated areas including tree/vegetation retention within the side (west and north) yards; and the use straw or chipped materials placed over exposed disturbed soils to prevent runoff from carrying solids.

Section I-2.5.3 Minimum Requirement #3 - Source Control of Pollution

Source control BMP's will be utilized to contain pollution generating runoff. No concrete washout will be allowed on the property during construction. No fuel materials will be placed or stored on site during construction.

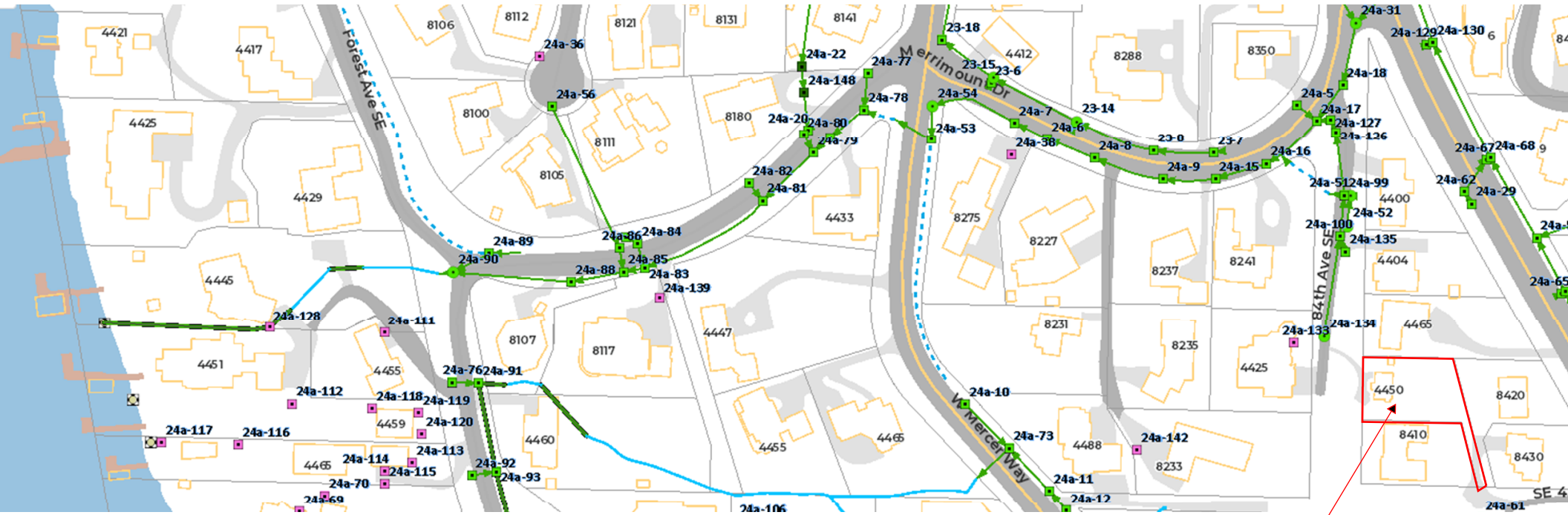
Section I-2.5.4 Minimum Requirement #4 - Preservation of Natural Drainage Systems and Outfalls

The subject property has a ridge (high point) located at the existing house where the property slopes west and east. The westerly portion of the property slopes towards 84th Avenue SE; while the easterly portion of the property slopes to a low point in the northeast corner. The existing drainage sheet flows in tow direction, west and east. The natural outfall from the property is sheet flow towards 84th Avenue SE and sheet flow towards the northeast corner. Overflow from the northeast corner will flow northwest over existing properties before being collected within 84th Avenue SE. The subject property is located within a single Threshold Discharge Area (TDA).

The site soils are characterized between Vashon Glacial Till and infeasible for infiltration type BMPs as indicated within the City of Mercer Island website. City of Mercer Island staff has determined that on-site detention is required for the new impervious surfaces on the property. The new detention system will be located in the northeast corner of the property and connecting via conveyance pipe to the existing public storm system within 84th Avenue SE.

The subject property was visited in March 2025 to review and evaluate on-site drainage patterns and walk and review the downstream system within 84th Avenue SE. The downstream system consists of catch basins and conveyance pipes within 84th Avenue SE. The system within 84th Avenue SE is deep (in excess of 7 feet). The downstream system walked does not show any indications of overtopping or capacity issues.

4450 84th Avenue SE DOWNSTREAM MAP



Subject Property

Subject property and Downstream Photos

Photo #1 – New building pad location on subject property – view from existing driveway



Photo #2 - Existing driveway on subject property – viewing west along south property line



Photo #3 – Northeast corner of subject property



Photo #4 – Viewing north along west side of new building pad



Photo #5 – Viewing south on 84th Avenue SE – subject property to left



Photo #6 – Westerly side of subject property from 84th Avenue SE



Photo #7 – Viewing east from 84th Avenue SE along proposed 6" outfall alignment – power pole is northwest corner on subject property



Section I-2.5.5 Minimum Requirement #5 - On-Site Stormwater Management

The proposed project drainage shall be evaluated using "List #1, On-Site Stormwater Management BMPs for projects triggering Minimum Requirements #1 - #5" – DOE Volume 1, chapter 2, pages 56-57. A Geotechnical Evaluation was prepared and is attached to this Report in Appendix A.

List #1

*Lawn and landscape areas BMP T5.13 – **feasible*** - The use of Post-Construction Soil Quality and Depth shall be implemented within areas of the property that are not covered by hard surfaces and were disturbed during condition.

Roofs:

1.a. *Full Dispersion BMP T5.30 – **infeasible*** due to lack of available 100' of vegetated flow path downgradient from the roof area to the west.

1.b. *Downspout Full Infiltration BMP T5.10A – **infeasible*** due to infeasible soils per City of Mercer Island."

2.a. *Rain Garden/Bioretenion BMP T5.14A – **infeasible*** due to lack of available area on subject property 50 feet from slopes along the westerly side of the property and no space available for this type of BMP.

2.b. *Bioretention Cells BMP T7.30 - **infeasible*** due to lack of available space and no drainage outfall from property.

3. *Downspout Dispersion System BMP T5.10B – **infeasible*** due to lack of available 50' flow path downgradient of the downspout leaders.

4. *Perforated Pipe Connection BMP T5.10C - **infeasible*** - see comment 1.b. above. Impermeable soils.

Other Hard Surfaces:

1. *Full Dispersion BMP T5.30 – **infeasible*** due to lack of available 100' of vegetated flow path downgradient from the other hard surfaces.

2.a. *Permeable Pavement BMP T5.15 – **infeasible*** - see comment 1.b. above. Impermeable soils.

2.b. *Rain Garden/Bioretenion BMP T7.30 – **infeasible*** – see comment 2.b. above.

3.a. *Sheet Flow Dispersion BMP T5.12 – **infeasible*** due to lack of available 25 feet of flow path downgradient from driveway.

3.b. *Concentrated Flow Dispersion BMP T5.11 - **infeasible*** due to lack of available flow path downgradient from other hard surfaces.

There are no available BMPs to provide treatment of the roof area or other hard surfaces. Therefore, a connection to the public storm system within 84th Avenue SE will be provided. The City of Mercer Island staff have determined due to downstream drainage issues that on-site stormwater detention will be required meeting City standards.

Detention Tank sizing per Mercer Island Requirements

Sizing of required for on-site detention system

- (A) The Geotechnical soils indicated within City of Mercer Island website indicate Class B soils;
- (B) Proposed new impervious surface = 2,046 square feet

Using "*City of Mercer Island On-Site Detention Design Requirements, Table 1*", the required detention tank will be 30 linear feet of 60" (5') CMP pipe.

Detention Tank Sizing

Table 1

ON-SITE DETENTION DESIGN FOR PROJECTS BETWEEN 500 SF AND 9,500 SF NEW PLUS REPLACED IMPERVIOUS SURFACE AREA

New and Replaced Impervious Surface Area (sf)	Detention Pipe Diameter (in)	Detention Pipe Length (ft)		Lowest Orifice Diameter (in) ⁽³⁾		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"	30	22	0.5	0.5	2.2	2.0	0.5	0.8
	48"	18	11	0.5	0.5	3.3	3.2	0.9	0.8
	60"	11	7	0.5	0.5	4.2	3.4	0.5	0.6
1,001 to 2,000 sf	36"	66	43	0.5	0.5	2.2	2.3	0.9	1.4
	48"	34	23	0.5	0.5	3.2	3.3	0.9	1.2
	60"	22	14	0.5	0.5	4.3	3.6	0.9	0.9
2,001 to 3,000 sf	36"	90	66	0.5	0.5	2.2	2.4	0.9	1.9
	48"	48	36	0.5	0.5	3.1	2.8	0.9	1.5
	60"	30	20	0.5	0.5	4.2	3.7	0.9	1.1
3,001 to 4,000 sf	36"	120	78	0.5	0.5	2.4	2.2	1.4	1.6
	48"	62	42	0.5	0.5	2.8	2.9	0.8	1.3
	60"	42	26	0.5	0.5	3.8	3.9	0.9	1.3
4,001 to 5,000 sf	36"	134	91	0.5	0.5	2.8	2.2	1.7	1.5
	48"	73	49	0.5	0.5	3.6	2.9	1.6	1.5
	60"	46	31	0.5	0.5	4.6	3.5	1.6	1.3
5,001 to 6,000 sf	36"	162	109	0.5	0.5	2.7	2.2	1.8	1.6
	48"	90	90	0.5	0.5	3.5	2.9	1.7	1.5
	60"	54	37	0.5	0.5	4.6	3.6	1.6	1.4
6,001 to 7,000 sf	36"	192	128	0.5	0.5	2.7	2.2	1.9	1.8
	48"	102	68	0.5	0.5	3.7	2.9	1.9	1.6
	60"	64	43	0.5	0.5	4.6	3.6	1.8	1.5
7,001 to 8,000 sf	36"	216	146	0.5	0.5	2.8	2.2	2.0	1.9
	48"	119	79	0.5	0.5	3.8	2.9	2.2	1.7
	60"	73	49	0.5	0.5	4.5	3.6	2.0	1.6
8,001 to 8,500 sf ⁽¹⁾	36"	228	155	0.5	0.5	2.8	2.2	2.1	1.9
	48"	124	84	0.5	0.5	3.7	2.9	1.9	1.8
	60"	77	53	0.5	0.5	4.6	3.6	2.0	1.6
8,501 to 9,000 sf	36"	NA ⁽¹⁾	164	0.5	0.5	NA ⁽¹⁾	2.2	NA ⁽¹⁾	1.9
	48"	NA ⁽¹⁾	89	0.5	0.5	NA ⁽¹⁾	2.9	NA ⁽¹⁾	1.9
	60"	NA ⁽¹⁾	55	0.5	0.5	NA ⁽¹⁾	3.6	NA ⁽¹⁾	1.7
9,001 to 9,500 sf ⁽²⁾	36"	NA ⁽¹⁾	174	0.5	0.5	NA ⁽¹⁾	2.2	NA ⁽¹⁾	2.1
	48"	NA ⁽¹⁾	94	0.5	0.5	NA ⁽¹⁾	2.9	NA ⁽¹⁾	2.0
	60"	NA ⁽¹⁾	58	0.5	0.5	NA ⁽¹⁾	3.7	NA ⁽¹⁾	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.

- Soil type to be determined by geotechnical analysis or soil map.
- Sizing includes a Volume Correction Factor of 120%.
- Upper bound contributing area used for sizing.

⁽¹⁾ On Type B soils, new plus replaced impervious surface areas exceeding 8,500 sf trigger Minimum Requirement #7 (Flow Control)

⁽²⁾ On Type C soils, new plus replaced impervious surface areas exceeding 9,500 sf trigger Minimum Requirement #7 (Flow Control)

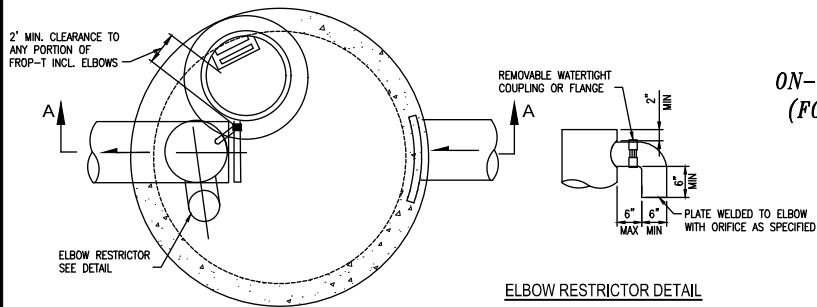
⁽³⁾ Minimum orifice diameter = 0.5 inches

in = inch
ft = feet
sf = square feet

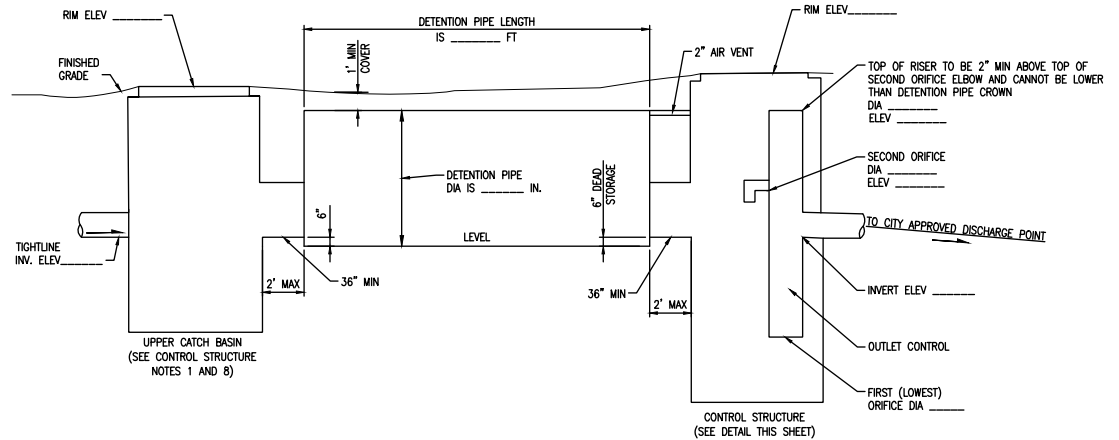
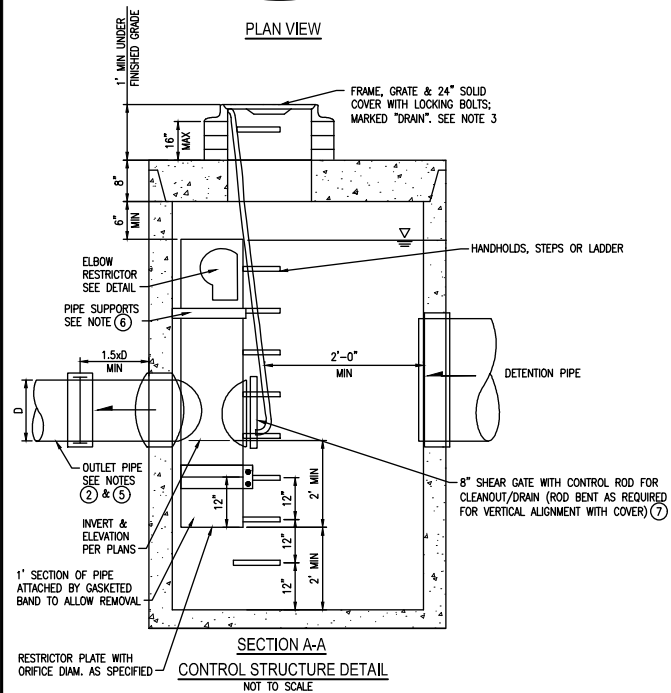
Basis of Sizing Assumptions:

Sized per MR#5 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%

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



OWNER: _____	ADDRESS: _____	PREPARED BY: _____
PERMIT #: _____	PHONE: _____	DATE: _____
NEW PLUS REPLACED IMPERVIOUS SURFACE AREA (SF): _____	DETENTION PIPE DIA (INCH): _____	DETENTION PIPE LENGTH (FT): _____
SOIL TYPE: _____	PIPE MATERIAL: _____	ORIFICE #1 DIA ____ INCH, ELEV _____
		ORIFICE #2 DIA ____ INCH, ELEV _____



ON-SITE DETENTION SYSTEM
 NOT TO SCALE (ENGINEER TO FILL IN BLANKS)

CONTROL STRUCTURE NOTES

- ① USE A MINIMUM OF A 54 IN. DIAM. TYPE 2 CATCH BASIN. THE ACTUAL SIZE IS DEPENDENT ON CONNECTING PIPE MATERIAL AND DIAMETER.
- ② OUTLET PIPE: MIN. 6 INCH.
- ③ METAL PARTS: CORROSION RESISTANT. NON-GALVANIZED PARTS PREFERRED. GALVANIZED PIPE PARTS TO HAVE ASPHALT TREATMENT 1.
- ④ FRAME AND LADDER OR STEPS OFFSET SO:
 - A. CLEANOUT GATE IS VISIBLE FROM TOP;
 - B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE;
 - C. FRAME IS CLEAR OF CURB.
- ⑤ 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.
- ⑥ 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).
- ⑦ THE SHEAR GATE SHALL BE MADE OF ALUMINUM ALLOY IN ACCORDANCE WITH ASTM B 26M AND ASTM B 275, DESIGNATION ZG32A; 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.
- ⑧ THE UPPER CATCH BASIN IS REQUIRED IF THE LENGTH OF THE DETENTION PIPE IS GREATER THAN 50 FT.

ON-SITE DETENTION SYSTEM NOTES:

1. CALL DEVELOPMENT SERVICES (206-275-7605) 24 HOURS IN ADVANCE FOR A DETENTION SYSTEM INSPECTION BEFORE BACKFILLING AND FOR FINAL INSPECTIONS.
2. 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.
3. 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 (LCP), ALUMINIZED TYPE 2 CORRUGATED STEEL PIPE AND PIPE ARCH (MEETS AASHTO DESIGNATIONS M274 AND M36), CORRUGATED OR SPIRAL RIB ALUMINUM PIPE, OR REINFORCED CONCRETE PIPE. CORRUGATED STEEL PIPE IS NOT ALLOWED.
4. FOOTING DRAINS SHALL NOT BE CONNECTED TO THE DETENTION SYSTEM.