

March 21, 2023

City of Mercer Island Planning & Development  
9611 SE 36<sup>th</sup> ST  
Mercer Island, WA 98040

**RE: Moran Development**

This letter includes our responses to comments received from City of Mercer Island regarding the Moran Development project on February 03, 2023. We have reviewed and revised the plan set and associated reports/documents to reflect the changes requested.

**Plan Sheets**

1. Update Tree Protection Plan with all civil information. Including all utilities, all grading and retaining wall should be shown and kept outside of exceptional trees driplines. Show over excavation for retaining wall. HYPERLINK  
"[https://www.mercerisland.gov/sites/default/files/fileattachments/community\\_planning\\_amp\\_development/page/21988/treessubmittalchecklist.pdf](https://www.mercerisland.gov/sites/default/files/fileattachments/community_planning_amp_development/page/21988/treessubmittalchecklist.pdf)"treessubmittalchecklist.pdf (mercerisland.gov)

**Response: Added Tree Protection plan to civil sheets. Utilities, grading, and retaining wall shown and kept outside of exceptional tree driplines. Over excavation for retaining wall shown.**

2. Either move all utilities outside tree protection zones. Or call out tunnel/bore within trees driplines. And move water meter or install with air excavation and arborist supervision. Move tree protection fence at the edge of the utility easement to protect tree 20. Remove grading that is proposed within exceptional tree 20's dripline, grading/excavation can be in the easement. See comment 1, exceptional trees must be protected or protected according to MICC19.10.080. And comment 3 requiring all work and trees to be on one plan.

**Response: Utilities moved outside tree protection zones. Sewer line called out to be excavated using pneumatic or hydro excavation or hand excavation.**

3. This information is shown on C-04 - remove this duplicate sheet.

**Response: Detention tank sizing sheet removed.**

4. Does this note still apply or is work occurring here? Driveway orientation has moved.

**Response: Notes has been removed.**

5. Hardscape/lot coverage and impervious surfaces mean two different things for planning and engineering. Please provide hardscape and lot coverage calculations broken out per the items listed on the site development worksheet. This needs to be shown on the plan set, not just on the Site Development Worksheet. Please note that these calculations are taken from net lot area. It looks like you are using gross lot area on the SUB2 Site Development Worksheet.

Response: Hardscape and lot coverage calculations added per the site Development worksheet.

6. Provide lot slope calculation. This needs to be shown on the plan set, not just on the Site Development Worksheet.

Response: Lot slope calculation provided per Site development Worksheet.

7. Provide Gross Floor Area calculations per the items listed in the Site Development Worksheet. Indicate max allowed GFA. This needs to be shown on the plan set, not just on the Site Development Worksheet.

Response: Gross floor area calculations provided per, Site Development Worksheet.

8. The pump system shall have dual, alternating pumps with emergency on-site, back-up power supply and an external alarm system for system failures. The proposed pump appears to only have a single pump. Provide supporting pump sizing and pump basin sizing calculations. Specify the required pump model and pump basin structure type/size on the plan and detail.

Response: Pumps system updated to have dual, alternating pumps with emergency on-site, back-up power supply and an external alarm system for system failures. Pump sizing and pump basin sizing calculations provided per Pump Technical Memo in Drainage Report. The required pump model and pump basin structure has been specified per detail.

9. Remove note - this is now on sheet C-04.

Response: Note removed.

10. Add the note: If the existing catch basin is not in satisfactory condition, as determined by the City of Mercer Island Inspector, the replacement of the existing catch basin is required.

Response: Note added to plans.

11. Please look into how this connection will be made with the existing power pole and water meter box in the way and clarify on the plan. Will any temporary pole support be required?

Response: Tie-in point to the catch basin has been shifted to the south to avoid existing power pole and water meter box. Temporary pole support will be used as necessary.

12. Double check outlet IE - current design will not gravity.

Response: IE's have been updated to promote gravity flow to outlet IE.

13. Will there be a conflict with gas here? Contractor to pothole and verify prior to constructing this

Response: Added note that contractor to pothole and verify no conflict with the existing gas line.

14. 1) Existing edge of pavement disappeared - please show.

2) New meter location shall be setback 2' from edge of pavement from W Mercer Way and private road - it appears to be over 7' away from the

3) Revise to standard detail W-14.

Response: Existing edge of pavement shown. Water meter location shifted to be 2' from edge of pavement from W Mercer Way and private road. Layout of water meter tie-in to water main has been updated to reflect standard detail W-14.

15. Show the layout and design info for the building footing drain connection from the building. Show IE at the connection to the building. Footing drain shall not be connected to detention system.

Response: Layout and design info, IE, for the building footing drain connection from the building is shown. Footing drain ties into line running from detention tank to existing catch basin.

16. It looks like pipe anchoring is required for this side sewer and several other storm pipes. Provide pipe anchoring design and details for pipes exceeding 20% slope (storm, side sewer, typ.)

Response: Pipe anchoring standard detail has been added. Pipe anchoring added to pipes that exceed 20% slope.

17. For structural and civil: SH-3 detail shows a 4" solid PVC pipe on the west side of the shore wall. This plan shows a 6" perf pipe on the east side. Please clarify if one or both are required. If both, show the design for the solid 4" pipe on this plan.

Response: Storm system updated to show 4" solid PVC pipe on the west side of the shore wall.

18. are not reviewed

Response: Note updated to say "are not reviewed".

19. This note is missing some parts, please update to:

The TV inspection of the existing side sewer to the City sewer main on W Mercer Way is required prior to any work related to the side sewer. If the result of the TV inspection is not in satisfactory condition, as determined by the City of Mercer Island Inspector, the replacement of the existing side sewer is required.

Response: Note updated to say "The TV inspection of the existing side sewer to the City sewer main on W Mercer Way is required prior to any work related to the side sewer. If the result of the TV inspection is not in satisfactory condition, as determined by the City of Mercer Island Inspector, the replacement of the existing side sewer is required."

20. Add the following pump notes:

- 1) AN EMERGENCY ON-SITE, BACK-UP POWER SUPPLY AND AN EXTERNAL ALARM SYSTEM FOR SYSTEM FAILURE AND HIGH WATER LEVEL INDICATOR ARE REQUIRED FOR THE PUMP SYSTEM.
- 2) PRIVATE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR ANY AND ALL CLAIMS FOR INJURIES AND DAMAGE DUE TO THE OPERATION OR NON-OPERATION OF THE PUMP SYSTEM.

Response: An emergency on-site, back-up power supply and external alarm system for system failure and high water level indicator have been added to the pump. See Sheet C-08 and Pump Technical memo in Drainage Report.

21. Measuring the roof area and driveway area on the architectural plans, the impervious surface area is approximately 4,100 SF. Report also indicates over 4000 SF. Please confirm and revise design and report.

Noted that there is a total of 66' detention pipe length which exceeds the required 62' - but we will require the 73' length if the impervious area exceeds 4,000 sf.

Response: The impervious surface area has been updated to 4,039 SF. Design of detention tank system has been updated to have a total of 73.5' detention pipe length, 73' is required.

22. Riser diameter minimum 8" to match 8" shear gate.

Response: Riser diameter updated to 8".

23. 2nd orifice diameter should be 0.8" to match table above (for current impervious area).

Response: 2<sup>nd</sup> orifice diameter updated to be 1.6" to match table

Please feel free to contact us with any questions.

Sincerely,  
**JMJ TEAM**

A handwritten signature in black ink, appearing to read "Justin Jones", with a long horizontal flourish extending to the right.

Justin Jones

---

---

---

# CITY OF MERCER ISLAND

## DEVELOPMENT SERVICES GROUP

9611 SE 36TH STREET | MERCER ISLAND, WA 98040

PHONE: 206.275.7605 | [www.mercergov.org](http://www.mercergov.org)

Inspection Requests: Online: [www.MyBuildingPermits.com](http://www.MyBuildingPermits.com) VM: 206.275.7730

---

---



## ON-SITE DETENTION DESIGN REQUIREMENTS

### General Requirements

This guidance applies only to projects that meet the thresholds specified below in “Is On-site Detention Required for My Project?” if all of the on-site stormwater BMPs included on List #1 and List #2 are determined to be infeasible for roofs and/or other hard surfaces.

### Is On-site Detention Required For My Project?

**YES**, if my project:

- 1) Results in 2,000 square feet, or greater, of new plus replaced hard surface area, or
- 2) Has a land disturbing activity or 7,000 square feet or greater, or
- 3) Results in a **net increase** of impervious surface of 500 square feet or greater.

AND

- 1) All of the on-site stormwater BMPs included on List #1 and List #2 are determined to be infeasible for roofs and/or other hard surfaces, and
- 2) Drainage from the site will be discharged to a storm and surface water system that includes a watercourse or there is a capacity constraint in the system.

**NO**, if my project:

- 1) Results in less than 2,000 square feet of new plus replaced hard surface area, and
- 2) Has a land disturbing activity less than 7,000 square feet, and
- 3) Results in a **net increase of less than 500 square feet** of impervious surface area.
- 4) The project discharges **directly** to Lake Washington, or findings from a ¼-mile downstream analysis confirm that the downstream system is free of capacity constraints.

### Designing Your On-Site Detention System

All on-site detention system designs must be prepared by a professional engineer registered in the State of Washington. The Standard On-site Detention System worksheet (Attachment 1) must be submitted on 18" x 24" (minimum) size sheets.

**Construction that results in 500 to 9,500 square feet of new plus replaced impervious surfaces:**

Size system according to Table 1. The configuration of the on-site detention system shall be as shown on Attachment 1 (Standard On-Site Detention Systems Worksheet) or as specifically designed by the engineer for the site.

**Note:**

- The applicant may pay a fee-in-lieu-of constructing an on-site detention system when allowed by the City Engineer. The fee will not be an option when in the opinion of the City Engineer, undetained runoff from the development may adversely exacerbate an existing problem (MICC 15.11) or if flow control is required by Minimum Requirement #7.
- **Construction that results in more than 9,500 square feet of new plus replaced impervious surfaces and/or exceeds a 100-year flow frequency of 0.15 cubic feet per second (for moderate and steep sloped sites greater than a 5% slope):** Size system according to Minimum Requirement #7 (Flow Control) in the Stormwater Management Manual for Western Washington (Ecology 2014).

**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) <sup>(3)</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"	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	59	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 <sup>(1)</sup>	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 <sup>(1)</sup>	164	0.5	0.5	NA <sup>(1)</sup>	2.2	NA <sup>(1)</sup>	1.9
	48"	NA <sup>(1)</sup>	89	0.5	0.5	NA <sup>(1)</sup>	2.9	NA <sup>(1)</sup>	1.9
	60"	NA <sup>(1)</sup>	55	0.5	0.5	NA <sup>(1)</sup>	3.6	NA <sup>(1)</sup>	1.7
9,001 to 9,500 sf <sup>(2)</sup>	36"	NA <sup>(1)</sup>	174	0.5	0.5	NA <sup>(1)</sup>	2.2	NA <sup>(1)</sup>	2.1
	48"	NA <sup>(1)</sup>	94	0.5	0.5	NA <sup>(1)</sup>	2.9	NA <sup>(1)</sup>	2.0
	60"	NA <sup>(1)</sup>	58	0.5	0.5	NA <sup>(1)</sup>	3.7	NA <sup>(1)</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.

- 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.

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

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

<sup>(3)</sup> Minimum orifice diameter = 0.5 inches

in = inch

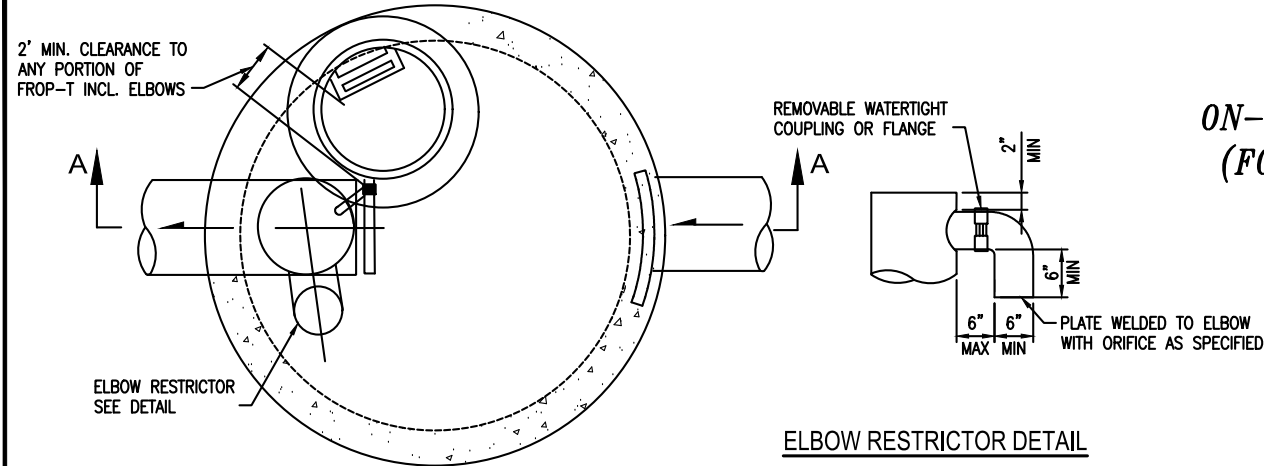
ft = feet

sf = square feet

**Basis of Sizing Assumptions:**

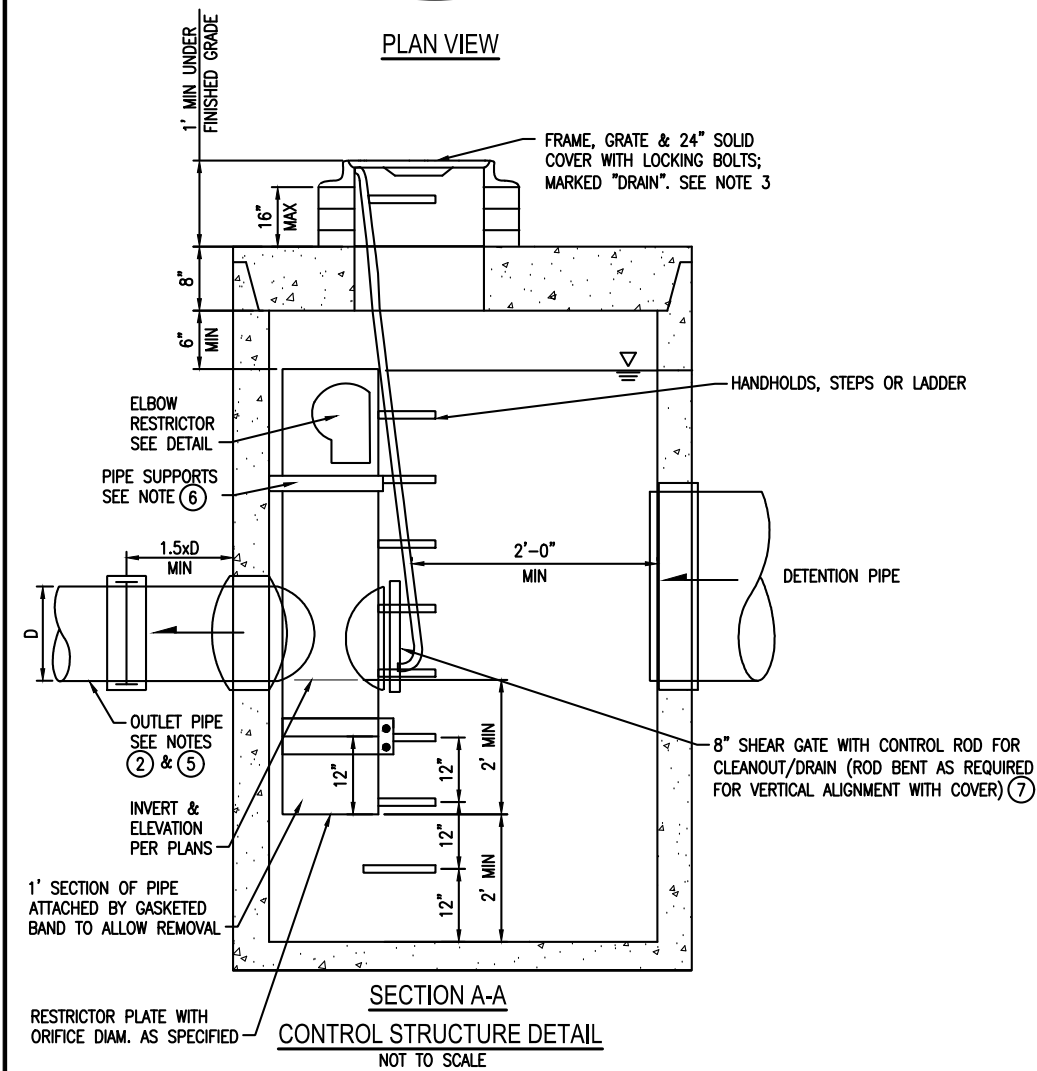
Sized per MR#5 in the Stormwater Management Manual for Puget Sound Basin (1992 Ecology Manual)  
 SBUH, Type 1A, 24-hour hydrograph  
 2-year, 24-hour storm = 2 in; 10-year, 24-hour storm = 3 in; 100-year, 24-hour storm = 4 in  
 Predeveloped = second growth forest (CN = 72 for Type B soils, CN = 81 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)**

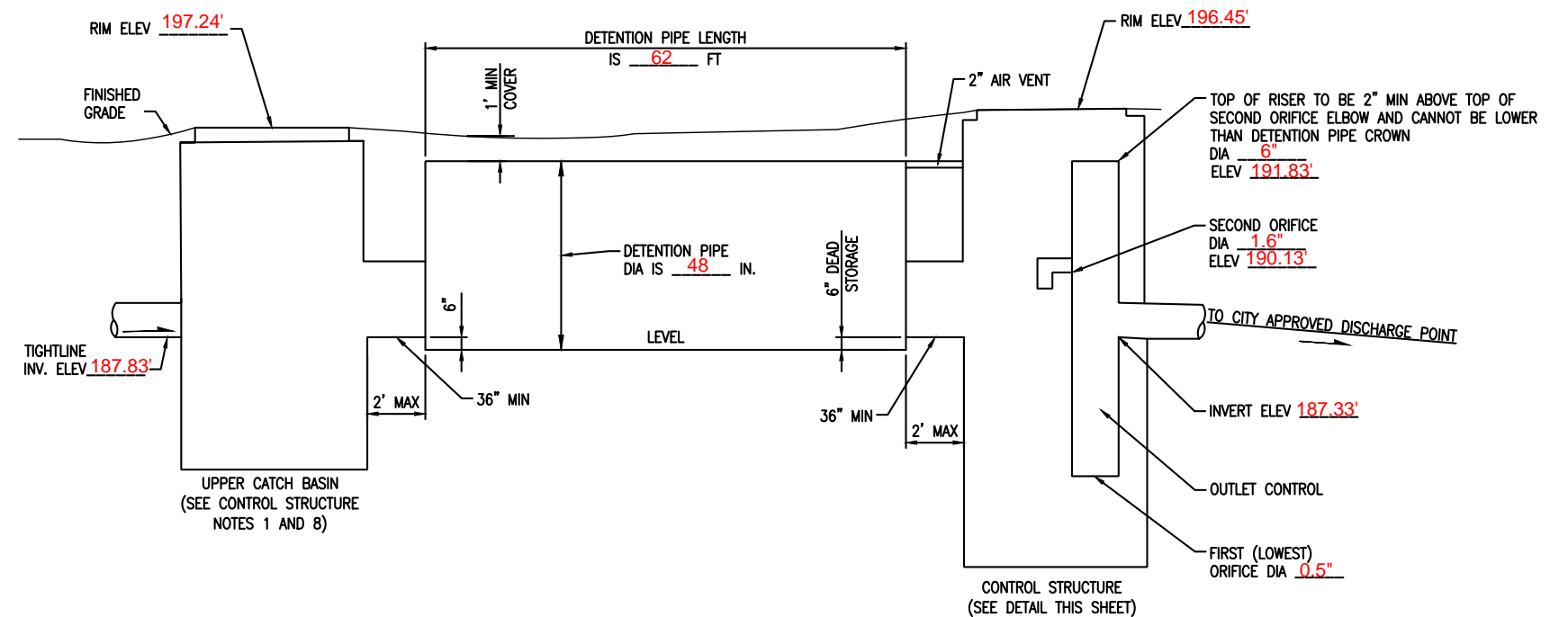


**ELBOW RESTRICTOR DETAIL**

OWNER: <u>Edward &amp; Cathrine Moran</u>	ADDRESS: <u>5000 West Mercer Way</u>	PREPARED BY: <u>Justin Jones</u>	
PERMIT #: _____	<u>Mercer Island, WA</u>	PHONE: <u>206-596-2020</u>	
		DATE: <u>04/20/2022</u>	
NEW PLUS REPLACED IMPERVIOUS SURFACE AREA (SF): <u>3,976 SF</u>	DETENTION PIPE DIA (INCH): <u>48"</u>	DETENTION PIPE LENGTH (FT): <u>62</u>	ORIFICE #1 DIA <u>0.5</u> INCH, ELEV <u>185.19'</u>
SOIL TYPE: <u>Type B</u>	PIPE MATERIAL: <u>HDPE</u>		ORIFICE #2 DIA <u>0.8</u> INCH, ELEV <u>190.79'</u>



**SECTION A-A**  
**CONTROL STRUCTURE DETAIL**  
 NOT TO SCALE



**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 MAINTANANCE 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 (LCPE), 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.



Construction Stormwater General Permit (CSWGP)

# Stormwater Pollution Prevention Plan (SWPPP)

for

## Moran Residence Project

Prepared for:

Pierce County Planning and Public works

Permittee / Owner	Developer	Operator / Contractor
Edward & Catherine Moran		TBD

5000 West Mercer Way, Mercer Island, WA 98040

### Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number

### SWPPP Prepared By

Name	Organization	Contact Phone Number
Justin Jones	JMJ Team	(206) 596-2020

### SWPPP Preparation Date

03/21/23

### Project Construction Dates

Activity / Phase	Start Date	End Date
Begin Construction		

## GENERAL INSTRUCTIONS AND CAVEATS

This template presents the recommended structure and content for preparation of a Construction Stormwater General Permit (CSWGP) Stormwater Pollution Prevention Plan (SWPPP).

The Department of Ecology's (Ecology) CSWGP requirements inform the structure and content of this SWPPP template; however, **you must customize this template to reflect the conditions of your site.**

A Construction Stormwater Site Inspection Form can be found on Ecology's website.  
<https://www.ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit>

### Using the SWPPP Template

Each section will include instructions and space for information specific to your project. Please read the instructions for each section and provide the necessary information when prompted. This Word template can be modified electronically. You may add/delete text, copy and paste, edit tables, etc. Some sections may be completed with brief answers while others may require several pages of explanation.

Follow this link to a copy of the Construction Stormwater General Permit:  
<https://www.ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit>

Table of Contents

List of Tables

List of Appendices

## List of Acronyms and Abbreviations

<b>Acronym / Abbreviation</b>	<b>Explanation</b>
<b>303(d)</b>	Section of the Clean Water Act pertaining to Impaired Waterbodies
<b>BFO</b>	Bellingham Field Office of the Department of Ecology
<b>BMP(s)</b>	Best Management Practice(s)
<b>CESCL</b>	Certified Erosion and Sediment Control Lead
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>CRO</b>	Central Regional Office of the Department of Ecology
<b>CSWGP</b>	Construction Stormwater General Permit
<b>CWA</b>	Clean Water Act
<b>DMR</b>	Discharge Monitoring Report
<b>DO</b>	Dissolved Oxygen
<b>Ecology</b>	Washington State Department of Ecology
<b>EPA</b>	United States Environmental Protection Agency
<b>ERO</b>	Eastern Regional Office of the Department of Ecology
<b>ERTS</b>	Environmental Report Tracking System
<b>ESC</b>	Erosion and Sediment Control
<b>GULD</b>	General Use Level Designation
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NTU</b>	Nephelometric Turbidity Units
<b>NWRO</b>	Northwest Regional Office of the Department of Ecology
<b>pH</b>	Power of Hydrogen
<b>RCW</b>	Revised Code of Washington
<b>SPCC</b>	Spill Prevention, Control, and Countermeasure
<b>su</b>	Standard Units
<b>SWMMEW</b>	Stormwater Management Manual for Eastern Washington
<b>SWMMWW</b>	Stormwater Management Manual for Western Washington
<b>SWPPP</b>	Stormwater Pollution Prevention Plan
<b>TESC</b>	Temporary Erosion and Sediment Control
<b>SWRO</b>	Southwest Regional Office of the Department of Ecology
<b>TMDL</b>	Total Maximum Daily Load
<b>VFO</b>	Vancouver Field Office of the Department of Ecology
<b>WAC</b>	Washington Administrative Code
<b>WSDOT</b>	Washington Department of Transportation
<b>WWHM</b>	Western Washington Hydrology Model

## Project Information (1.0)

Project/Site Name: Moran Residence  
Street/Location: 5000 West Mercer Way  
City: Mercer Island State: WA Zip code: 98040  
Subdivision:  
Receiving waterbody:

## Existing Conditions (1.1)

Total acreage (including support activities such as off-site equipment staging yards, material storage areas, borrow areas).

Total acreage: 0.42 Acres

Disturbed acreage: 0.30 Acres

Existing structures: N/A

Landscape topography: Steep slopes that slope from east to west

Drainage patterns: Overland flow to west side of Property, and flows into an existing ditch along West Mercer Way

Existing Vegetation: Landscaping and Native Vegetation

Critical Areas (wetlands, streams, high erosion risk, steep or difficult to stabilize slopes):  
steep slopes

List of known impairments for 303(d) listed or Total Maximum Daily Load (TMDL) for the receiving waterbody: [Insert text here]

Table 1 includes a list of suspected and/or known contaminants associated with the construction activity.

**Table 1 – Summary of Site Pollutant Constituents**

Constituent (Pollutant)	Location	Depth	Concentration
None	N/A	N/A	N/A

## **Proposed Construction Activities (1.2)**

Description of site development (example: subdivision):

The project includes the construction of a 2,664 SF house, concrete driveway totaling 1,312 SF, 63 SF retaining walls, and 119 SF of permeable Pavers.

Site improvements include the installation of new roof leaders and three new 24.5' x 4' Detention Tanks located on the Northeast portion of the site. A control structure will be installed with this project. New utilities will be installed with this project (i.e. storm detention, sewer, water, power, and communications).

Description of construction activities (example: site preparation, demolition, excavation):

Construction activities include: Clearing and Grubbing, Sawcutting, Building, Excavation, Building construction, Utility Installation, Concrete Installation, Installation of Landscaping, Installation of a Control Structure, and Installation of Detention Tanks.

Description of site drainage including flow from and onto adjacent properties. Must be consistent with Site Map in Appendix A:

The project proposes the construction of new stormwater infrastructure for the conveyance of building roof runoff and driveway runoff. Detention Tanks will be installed to receive the roof, driveway, retaining wall, and foundation runoff. Part of the driveway runoff will be pumped to the detention tank. Runoff will be discharged to an existing catch basin to the northwest through a control structure sized per the Mercer Island Detention Tank Sizing Worksheet.

Description of final stabilization (example: extent of revegetation, paving, landscaping):

Final stabilization of the site includes the following: Revegetation of cleared areas, installation of landscaping, and on-site permeable pavement installation.

*Contaminated Site Information:*

Proposed activities regarding contaminated soils or groundwater (example: on-site treatment system, authorized sanitary sewer discharge):

Construction activities are not anticipated to disturb contaminated soils or groundwater on-site, as none are known to exist in the vicinity of the project.

## **Construction Stormwater Best Management Practices (BMPs) (2.0)**

The SWPPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e. hand-written notes and deletions). Update the SWPPP when the CESCL has noted a deficiency in BMPs or deviation from original design.

### **The 12 Elements (2.1)**

#### **Element 1: Preserve Vegetation / Mark Clearing Limits (2.1.1)**

List and describe BMPs:      BMP C101 – Preserving Natural Vegetation: Prior to beginning land disturbing activities, including clearing and grading, all clearing limits and trees that are to be preserved within construction area shall be clearly marked to prevent damage and off site impacts.  
BMP C103 – High Visibility Plastic or Metal Fence  
Lath & Flagging  
C233 - Silt Fence: Barrier fences shall be constructed as shown on the TESC Plans and in accordance with BMP'S.

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:

## **Element 2: Establish Construction Access (2.1.2)**

List and describe BMPs:      BMP C105 – Stabilized Construction Entrance: The existing driveway shall be utilized as a construction entrance. Equipment tracks and wheels shall be washed to remove dirt from tires/tracks before entering adjacent roadways. If required, sediment shall be removed from adjacent roads by shoveling or pickup sweeping and transported to a controlled sediment disposal area.  
BMP C107 – Construction Road/Parking Area Stabilization: Equipment staging and parking areas shall be stabilized to prevent the erosion of existing soils on site.

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:



### Element 3: Control Flow Rates (2.1.3)

Will you construct stormwater retention and/or detention facilities?

Yes

No

Will you use permanent infiltration ponds or other low impact development (example: rain gardens, bio-retention, porous pavement) to control flow during construction?

Yes

No

List and describe BMPs:      Flows shall be controlled through directing flows through existing adjacent vegetation and the installation of straw bwattles as necessary.

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:

## Element 4: Install Sediment Controls (2.1.4)

List and describe BMPs:      BMP C233 – Silt Fence: A silt fence will be installed along the southern and northern edges of the construction site along existing vegetation to prevent stormwater runoff from leaving the site.

   BMP C235 – Straw Wattles: Straw bale barriers shall be installed as necessary to prevent sediment in construction stormwater from entering existing storm systems.

   Silt fencing will be installed around the perimeter of the construction site as necessary to keep sediment contained within the project limits. Straw wattles shall be placed around disturbed areas as necessary.

Installation Schedules:      [Insert text here]

Inspection and Maintenance plan:      [Insert text here]

Responsible Staff:      [Insert text here]

## Element 5: Stabilize Soils (2.1.5)

### West of the Cascade Mountains Crest

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	May 1 – September 30	7 days
During the Wet Season	October 1 – April 30	2 days

Soils must be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast.

Anticipated project dates:

Start date:

End date:

Will you construct during the wet season?

Yes

No

List and describe BMPs:

BMP C123 – Plastic Covering: Plastic Covering shall be installed to stabilize exposed soils/piles/slopes on site.

BMP C140 – Dust Control:

Exposed soils shall be worked during the week until they have been stabilized. Soil stockpiles will be located within the disturbed area shown on the site development drawings. Soil excavated for the foundation will be backfilled against the foundation and graded to drain away from the building. No soils shall remain exposed and unworked for more than 2 days from October 1 to April 30. Once the disturbed landscape areas are graded, the grass areas will be seeded or sodded. All stockpiles will be covered with plastic or burlap if left unworked.

All disturbed pervious areas shall be stabilized, soil amended, and hydroseeded, strawed, or covered for stability. Exposed soils shall be watered as necessary to prevent dust from leaving site. Areas not immediately improved will be covered in plastic covering.

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:



## Element 6: Protect Slopes (2.1.6)

Will steep slopes be present at the site during construction?

Yes

No

List and describe BMPs:      The potential for erosion exists on the existing site due to the steep slope. Plastic covering, temporary seeding, blankets, or surface roughening can be used to protect the slope as it is cleared.

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:

## **Element 7: Protect Drain Inlets (2.1.7)**

List and describe BMPs:      BMP C220 - Inlet protection will be installed in existing Type 1 catch basin located near the site.

BMP C207 - Check dams shall be installed in ditches located in the right of way to reduce the velocity of concentrated flow and dissipates energy at the check dams.

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:

## Element 8: Stabilize Channels and Outlets (2.1.8)

Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches, will be installed at the outlets of all conveyance systems.

List and describe BMPs: Construction will occur during dry weather. No storm drainage channels or ditches shall be constructed either temporary or permanent. A small swale shall be graded to convey yard drainage around structure using shallow slope; it shall be seeded after grading and stabilized.

No existing drainage channels exist on-site. Stormwater runoff currently sheet flows through existing landscaping. Existing Landscaping on-site shall be preserved during construction.

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:

## Element 9: Control Pollutants (2.1.9)

The following pollutants are anticipated to be present on-site:

**Table 2 – Pollutants**

Pollutant (and source, if applicable)
N/A

List and describe BMPs:

BMP C151 – Concrete Handling

BMP C153 – Material Delivery, Storage Containment

Any and all pollutants, chemicals, liquid products and other materials that have the potential to pose a threat to human health or the environment will be covered, contained and protected from vandalism. All such products shall be kept under cover in a secure location on-site. Concrete handling shall follow

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:

Will maintenance, fueling, and/or repair of heavy equipment and vehicles occur on-site?

Yes

No

List and describe BMPs:

BMP C151 – Concrete Handling

BMP C153 – Material Delivery, Storage Containment

Soil prevention measures will be in place, such as drip pans for heavy equipment repair. Waste materials and demolition debris that occur on site during construction shall be handled and disposed of in a manner that does not cause contamination of



stormwater. Contaminated surfaces will be cleaned immediately following and discharge or spill incident.

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:

Will wheel wash or tire bath system BMPs be used during construction?

Yes  No

List and describe BMPs:

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:

Will pH-modifying sources be present on-site?

Yes  No  If yes, check the source(s).

**Table 3 – pH-Modifying Sources**

	None
	Bulk cement
	Cement kiln dust
	Fly ash
	Other cementitious materials
X	New concrete washing or curing waters
	Waste streams generated from concrete grinding and sawing
	Exposed aggregate processes
	Dewatering concrete vaults
X	Concrete pumping and mixer washout waters
	Recycled concrete
	Other (i.e. calcium lignosulfate) [please describe]

List and describe BMPs:      BMP C151 – Concrete Handling

BMP C153 – Material Delivery, Storage Containment

Any and all pollutants, chemicals, liquid products and other materials that have the potential to pose a threat to human health or the environment will be covered, contained and protected from vandalism. All such products shall be kept under cover in a secure location on-site. Concrete handling shall follow

Soil prevention measures will be in place, such as drip pans for heavy equipment repair. Waste materials and demolition debris that occur on site during construction shall be handled and disposed of in a manner that does not cause contamination of stormwater. Contaminated surfaces will be cleaned immediately following and discharge or spill incident.

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:

Concrete trucks must not be washed out onto the ground, or into storm drains, open ditches, streets, or streams. Excess concrete must not be dumped on-site, except in designated concrete washout areas with appropriate BMPs installed.

## Element 10: Control Dewatering (2.1.10)

Sediment traps and/or baker tanks on site will be used during this project. Dewatering water will be sent to either the baker tanks or sediment traps. Clean water will discharge to an existing catch basin in College St NE.

**Table 4 – Dewatering BMPs**

	Infiltration
	Transport off-site in a vehicle (vacuum truck for legal disposal)
	Ecology-approved on-site chemical treatment or other suitable treatment technologies
	Sanitary or combined sewer discharge with local sewer district approval (last resort)
	Use of sedimentation bag with discharge to ditch or swale (small volumes of localized dewatering)

List and describe BMPs: No dewatering of the project site is anticipated.

Installation Schedules:

Inspection and Maintenance plan:

Responsible Staff:

## **Element 11: Maintain BMPs (2.1.11)**

All temporary and permanent Erosion and Sediment Control (ESC) BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function.

Maintenance and repair shall be conducted in accordance with each particular BMP specification (see *Volume II of the SWMMWW* or *Chapter 7 of the SWMMEW*).

Visual monitoring of all BMPs installed at the site will be conducted at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All temporary ESC BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed.

Trapped sediment shall be stabilized on-site or removed. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized.

Additionally, protection must be provided for all BMPs installed for the permanent control of stormwater from sediment and compaction. BMPs that are to remain in place following completion of construction shall be examined and restored to full operating condition. If sediment enters these BMPs during construction, the sediment shall be removed and the facility shall be returned to conditions specified in the construction documents.

## Element 12: Manage the Project (2.1.12)

The project will be managed based on the following principles:

- Projects will be phased to the maximum extent practicable and seasonal work limitations will be taken into account.
- Inspection and monitoring:
  - Inspection, maintenance and repair of all BMPs will occur as needed to ensure performance of their intended function.
  - Site inspections and monitoring will be conducted in accordance with Special Condition S4 of the CSWGP. Sampling locations are indicated on the [Site Map](#). Sampling station(s) are located in accordance with applicable requirements of the CSWGP.
- Maintain an updated SWPPP.
  - The SWPPP will be updated, maintained, and implemented in accordance with Special Conditions S3, S4, and S9 of the CSWGP.

As site work progresses the SWPPP will be modified routinely to reflect changing site conditions. The SWPPP will be reviewed monthly to ensure the content is current.

**Table 5 – Management**

X	Design the project to fit the existing topography, soils, and drainage patterns
X	Emphasize erosion control rather than sediment control
X	Minimize the extent and duration of the area exposed
X	Keep runoff velocities low
X	Retain sediment on-site
X	Thoroughly monitor site and maintain all ESC measures
X	Schedule major earthwork during the dry season
	Other (please describe)

**Table 6 – BMP Implementation Schedule**

<b>Phase of Construction Project</b>	<b>Stormwater BMPs</b>	<b>Date</b>	<b>Wet/Dry Season</b>
[Insert construction activity]	[Insert BMP]	[MM/DD/YYYY]	[Insert Season]
<b>Phase of Construction Project</b>	<b>Stormwater BMPs</b>	<b>Date</b>	<b>Wet/Dry Season</b>



### **Element 13: Protect Low Impact Development (LID) BMPs (2.1.13)**

Existing and new LID facilities will be protected from sedimentation, heavy equipment will be kept off existing soils in the vicinity of the facilities. LID facilities will be marked with high visibility fencing, and inlets protected with straw wattles. If sediment accumulation occurs during construction, the facilities will be restored to their fully functioning condition.

The proposed site will collect roof runoff from the use of roof leaders and be conveyed to a proposed Type 2 catch basin. The proposed driveway will be collected using the Type 2 catch basin, runoff will then be routed through the proposed 6" PVC storm line and be routed to an outfall located off site across the the private gravel road. Driveway areas not collected will run off and disperse over native vegetation and will have the opportunity to infiltrate into native soils. Inlet protection will be installed to prevent sediment from entering the storm system, a silt fence will be installed per the site development plans to prevent any sediment from leaving the site.

### **Pollution Prevention Team (3.0)**

**Table 7 – Team Information**

<b>Title</b>	<b>Name(s)</b>	<b>Phone Number</b>
<b>Certified Erosion and Sediment Control Lead (CESCL)</b>		
<b>Resident Engineer</b>		
<b>Emergency Ecology Contact</b>		
<b>Emergency Permittee/ Owner Contact</b>		
<b>Non-Emergency Owner Contact</b>		
<b>Monitoring Personnel</b>		
<b>Ecology Regional Office</b>	[Insert Regional Office]	[Insert General Number]



## Monitoring and Sampling Requirements (4.0)

Monitoring includes visual inspection, sampling for water quality parameters of concern, and documentation of the inspection and sampling findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Stormwater sampling data

File a blank form under Appendix D.

The site log book must be maintained on-site within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

Numeric effluent limits may be required for certain discharges to 303(d) listed waterbodies. See CSWGP Special Condition S8 and Section 5 of this template.

Complete the following paragraph for sites that discharge to impaired waterbodies for fine sediment, turbidity, phosphorus, or pH:

The receiving waterbody, insert waterbody name, is impaired for: insert impairment. All stormwater and dewatering discharges from the site are subject to an **effluent limit** of 8.5 su for pH and/or 25 NTU for turbidity.

### Site Inspection (4.1)

Site inspections will be conducted at least once every calendar week and within 24 hours following any discharge from the site. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

The discharge point(s) are indicated on the Site Map (see Appendix A) and in accordance with the applicable requirements of the CSWGP.

### Stormwater Quality Sampling (4.2)

#### Turbidity Sampling (4.2.1)

Requirements include calibrated turbidity meter or transparency tube to sample site discharges for compliance with the CSWGP. Sampling will be conducted at all discharge points at least once per calendar week.

Method for sampling turbidity:

**Table 8 – Turbidity Sampling Method**

	Turbidity Meter/Turbidimeter (required for disturbances 5 acres or greater in size)
X	Transparency Tube (option for disturbances less than 1 acre and up to 5 acres in size)

The benchmark for turbidity value is 25 nephelometric turbidity units (NTU) and a transparency less than 33 centimeters.

If the discharge's turbidity is 26 to 249 NTU or the transparency is less than 33 cm but equal to or greater than 6 cm, the following steps will be conducted:

1. Review the SWPPP for compliance with Special Condition S9. Make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
3. Document BMP implementation and maintenance in the site log book.

If the turbidity exceeds 250 NTU or the transparency is 6 cm or less at any time, the following steps will be conducted:

1. Telephone or submit an electronic report to the applicable Ecology Region's Environmental Report Tracking System (ERTS) within 24 hours.  
<https://www.ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue>
  - Central Region (Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima): (509) 575-2490
  - Eastern Region (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400
  - Northwest Region (King, Kitsap, Island, San Juan, Skagit, Snohomish, Whatcom): (425) 649-7000
  - Southwest Region (Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum,): (360) 407-6300
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period
3. Document BMP implementation and maintenance in the site log book.
4. Continue to sample discharges daily until one of the following is true:
  - Turbidity is 25 NTU (or lower).
  - Transparency is 33 cm (or greater).
  - Compliance with the water quality limit for turbidity is achieved.
    - 1 - 5 NTU over background turbidity, if background is less than 50 NTU
    - 1% - 10% over background turbidity, if background is 50 NTU or greater
  - The discharge stops or is eliminated.

## pH Sampling (4.2.2)

pH monitoring is required for “Significant concrete work” (i.e. greater than 1000 cubic yards poured concrete or recycled concrete over the life of the project). The use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD] or fly ash) also requires pH monitoring.

For significant concrete work, pH sampling will start the first day concrete is poured and continue until it is cured, typically three (3) weeks after the last pour.

For engineered soils and recycled concrete, pH sampling begins when engineered soils or recycled concrete are first exposed to precipitation and continues until the area is fully stabilized.

If the measured pH is 8.5 or greater, the following measures will be taken:

1. Prevent high pH water from entering storm sewer systems or surface water.
2. Adjust or neutralize the high pH water to the range of 6.5 to 8.5 su using appropriate technology such as carbon dioxide (CO<sub>2</sub>) sparging (liquid or dry ice).
3. Written approval will be obtained from Ecology prior to the use of chemical treatment other than CO<sub>2</sub> sparging or dry ice.

Method for sampling pH:

**Table 8 – pH Sampling Method**

	pH meter
	pH test kit
	Wide range pH indicator paper

## Discharges to 303(d) or Total Maximum Daily Load (TMDL) Waterbodies (5.0)

### 303(d) Listed Waterbodies (5.1)

The 303(d) status is listed on the Water Quality Atlas: <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d>

Circle the applicable answer, if necessary:

Is the receiving water 303(d) (Category 5) listed for turbidity, fine sediment, phosphorus, or pH?

Yes                      No

List the impairment(s):

[Insert text here]

The receiving waterbody, **insert waterbody name**, is impaired for: **insert impairment**. All stormwater and dewatering discharges from the site are subject to an **effluent limit** of **8.5 su** for **pH and/or 25 NTU for turbidity**.

If yes, discharges must comply with applicable effluent limitations in S8.C and S8.D of the CSWGP.

Describe the method(s) for 303(d) compliance:

List and describe BMPs:

[Insert text here]

### TMDL Waterbodies (5.2)

Waste Load Allocation for CWSGP discharges:

[Insert text here]

Describe the method(s) for TMDL compliance:

List and describe BMPs:

[Insert text here]

Discharges to TMDL receiving waterbodies will meet in-stream water quality criteria at the point of discharge.

The Construction Stormwater General Permit Proposed New Discharge to an Impaired Water Body form is included in Appendix F.

## **Reporting and Record Keeping (6.0)**

### **Record Keeping (6.1)**

This section does not need to be filled out. It is a list of reminders for the permittee.

#### **Site Log Book (6.1.1)**

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Sample logs

#### **Records Retention (6.1.2)**

Records will be retained during the life of the project and for a minimum of three (3) years following the termination of permit coverage in accordance with Special Condition S5.C of the CSWGP.

Permit documentation to be retained on-site:

- CSWGP
- Permit Coverage Letter
- SWPPP
- Site Log Book

Permit documentation will be provided within 14 days of receipt of a written request from Ecology. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with Special Condition S5.G.2.b of the CSWGP.

#### **Updating the SWPPP (6.1.3)**

The SWPPP will be modified if:

- Found ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site.
- There is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

The SWPPP will be modified within seven (7) days if inspection(s) or investigation(s) determine additional or modified BMPs are necessary for compliance. An updated timeline for BMP implementation will be prepared.

## **Reporting (6.2)**

### **Discharge Monitoring Reports (6.2.1)**

**Cumulative soil disturbance is one (1) acre or larger; therefore,** Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period the DMR will be submitted as required, reporting “No Discharge”. The DMR due date is fifteen (15) days following the end of each calendar month.

DMRs will be reported online through Ecology’s WQWebDMR System.

To sign up for WQWebDMR go to:

<https://www.ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance>

### **Notification of Noncompliance (6.2.2)**

If any of the terms and conditions of the permit is not met, and the resulting noncompliance may cause a threat to human health or the environment, the following actions will be taken:

1. Ecology will be notified within 24-hours of the failure to comply by calling the applicable Regional office ERTS phone number (Regional office numbers listed below).
2. Immediate action will be taken to prevent the discharge/pollution or otherwise stop or correct the noncompliance. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Specific information to be included in the noncompliance report is found in Special Condition S5.F.3 of the CSWGP.

Anytime turbidity sampling indicates turbidity is 250 NTUs or greater, or water transparency is 6 cm or less, the Ecology Regional office will be notified by phone within 24 hours of analysis as required by Special Condition S5.A of the CSWGP.

- Central Region at (509) 575-2490 for Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, or Yakima County

- Eastern Region at (509) 329-3400 for Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, or Whitman County
- Northwest Region at (425) 649-7000 for Island, King, Kitsap, San Juan, Skagit, Snohomish, or Whatcom County
- Southwest Region at (360) 407-6300 for Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, or Wahkiakum

Include the following information:

1. Your name and / Phone number
2. Permit number
3. City / County of project
4. Sample results
5. Date / Time of call
6. Date / Time of sample
7. Project name

In accordance with Special Condition S4.D.5.b of the CSWGP, the Ecology Regional office will be notified if chemical treatment other than CO<sub>2</sub> sparging is planned for adjustment of high pH water.



## Appendix/Glossary

### A. Site Map

The site map must meet the requirements of Special Condition S9.E of the CSWGP

### B. BMP Detail

Insert BMPs specification sheets here.

Download BMPs from the Ecology Construction Stormwater website at:

<https://www.ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals>

### C. Correspondence

Ecology

EPA

Local Government

### D. Site Inspection Form

Create your own or download Ecology's template:

<https://www.ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit>

### E. Construction Stormwater General Permit (CSWGP)

Download CSWGP: <https://www.ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit>

### F. 303(d) List Waterbodies / TMDL Waterbodies Information

Proposed New Discharge to an Impaired Water Body form  
SWPPP Addendum addressing impairment

### G. Contaminated Site Information

Administrative Order

Sanitary Discharge Permit

Soil Management Plan

Soil and Groundwater Reports

Maps and Figures Depicting Contamination

### H. Engineering Calculations

# CITY OF MERCER ISLAND

## COMMUNITY PLANNING & DEVELOPMENT

9611 SE 36TH STREET | MERCER ISLAND, WA 98040

PHONE: 206.275.7605 | [www.mercergov.org](http://www.mercergov.org)

Inspection Requests: Online: [www.mybuildingpermit.com](http://www.mybuildingpermit.com) VM: 206.275.7730



## SITE DEVELOPMENT INFORMATION

*Worksheet for single family residential development*

### PROJECT INFORMATION

Permit Number: \_\_\_\_\_ Parcel Number: \_\_\_\_\_  
Site Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_  
Owner Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature & phone number of Individual who completed this worksheet: \_\_\_\_\_

Signature

Phone Number

### GENERAL INFORMATION

Will any large trees be removed as a result of this development activity? Yes  No

*Large tree- trees with diameter of greater than or equal to 10 inches.*

Do you have an Accessory Dwelling Unit? New ADU  Existing ADU  No

Will you be adding air conditioning to the proposed development? Yes  No

What is the total square footage of all proposed decks  
(covered and uncovered) on the property? \_\_\_\_\_ Square Feet

*This is a worksheet and is not a substitute for the Mercer Island Development Regulations. Please consult the Mercer Island City Code. The City may require additional information to be supplied to document compliance with regulations.*

### LOT SLOPE

According to the Mercer Island City Code, slope is a measurement of the average incline of the lot or other piece of land calculated by subtracting the lowest elevation of the property from the highest elevation and dividing the resulting number by the shortest horizontal distance between these two points. The resulting product is multiplied by 100.

#### LOT SLOPE CALCULATIONS

Highest Elevation Point of Lot: \_\_\_\_\_ Feet  
Lowest Elevation Point of Lot: \_\_\_\_\_ Feet  
Elevation Difference: \_\_\_\_\_ Feet  
Horizontal Distance Between High and Low Points: \_\_\_\_\_ Feet  
**Lot Slope\*** \_\_\_\_\_ %

*\*Lot slope is the elevation difference divided by horizontal distance multiplied by 100.*

Lot slope calculations shown on Sheet # \_\_\_\_\_

**LOT COVERAGE**

For single family residential development, “lot coverage” is the area of a lot that may be covered by a combination of the buildings and vehicular driving surfaces. Lot coverage is based on “net lot area”. Net lot area is the size of the lot minus the area within any access easements on the property that do not provide access to the home on the subject lot. The maximum lot coverage for a specific lot is based upon the lots slope (see above). The area of the lot that cannot be used for lot coverage is “required landscaping area”; the landscaping area is typically improved with either hardscape (see below) or softscape.

**Please note:** Lot coverage is not the same as impervious surface calculations used for drainage review.

Lot Slope	Maximum Lot Coverage (House, driving surfaces, and accessory buildings)	Required Landscaping Area
Less than 15%	40%	60%
15% to less than 30%	35%	65%
30% to 50%	30%	70%
Greater than 50% slope	20%	80%

**ADJUSTMENTS**

A one-time reduction in the required landscaping area and an increase in the allowed maximum lot coverage is allowed if:

- A. The total reduction in required landscaping area shall not exceed 5%, and the total increase in maximum lot coverage shall not exceed 5%; and
- B. The reduction in required landscaping area is associated with:
  - 1. A development proposal that will result in a single-story dwelling with wheelchair accessible entry, and may also include a single-story accessory building; or
  - 2. A development proposal on a flag lot that, after optimizing driveway routing and minimizing driveway width, requires a driveway that is more than the 25% of the allowed lot coverage. The allowed reduction in the required landscaping area and increase in the maximum lot coverage shall not exceed 5% or the area of the driveway in excess of 25% of the lot coverage, whichever is less. For example, a development proposal with a driveway that occupies 27% of the allowed lot coverage, may increase the total lot coverage by 2%
- C. A recorded notice on title, covenant, easement, or other documentation in a form approved by the city, shall be required. The notice on title or other documentation shall describe the basis for the reduced landscaping area an increase in lot coverage.

Does this project include a proposed adjustment? Yes  No

**LOT COVERAGE CALCULATIONS**

- A. Gross Lot Area \_\_\_\_\_ Square Feet
- B. Net Lot Area \_\_\_\_\_ Square Feet
- C. Allowed Lot Coverage Area \_\_\_\_\_ Square Feet
- D. Allowed Lot Coverage \_\_\_\_\_ % of Lot
- E. Existing Lot Coverage:
  - 1. Main Structure Roof Area \_\_\_\_\_ Square Feet
  - 2. Accessory Building Roof Area \_\_\_\_\_ Square Feet
  - 3. Vehicular Use (driveway, paved access easements [portion used by the lot for access], parking \_\_\_\_\_ Square Feet
  - 4. Covered Patios and Covered Decks \_\_\_\_\_ Square Feet

5.	Total Existing Lot Coverage Area (E1+E2+E3+E4)	_____	Square Feet
F.	(Total Lot Coverage Area Removed)	_____	Square Feet
G.	Proposed Adjustment for Single Story (Area)	_____	Square Feet
H.	Proposed Adjustment for Flag Lot	_____	Square Feet
I.	Total New Lot Coverage Area:		
1.	Main Structure Roof Area	_____	Square Feet
2.	Accessory Structure Roof Area	_____	Square Feet
3.	Vehicular Use (driveway, paved access easement [portion used by the lot for access], parking)	_____	Square Feet
4.	Covered Patios and Covered Decks	_____	Square Feet
5.	Total New Lot Coverage Area (I1 + I2 + I3 + I4)	_____	
J.	Total Project Lot Coverage Area = (E5 - F) + I5	_____	Square Feet
K.	Proposed Lot Coverage Area = (J/B) x 100	_____	% of Lot

Lot coverage calculations shown on Plan Sheet # \_\_\_\_\_

## HARDSCAPE

Up to 9% of the net lot area may consist of hardscape areas. For single family residential development, hardscape is the solid, hard, elements or structures that are incorporated into landscaping. The hardscape includes, but is not limited to, structures, paved areas, stairs, walkways, decks, patios, rockeries and retaining walls, and similar constructed elements that do not have a roof. The hardscape within the landscaping area consists of materials such as wood, stone, concrete, gravel, permeable pavements or pavers, and similar materials. Hardscape does not include solid, hard elements or structures that are covered by a minimum of two feet of soil intended for softscape (for example, a septic tank covered with at least two feet of soil and planted shrubs is not hardscape). The hardscape does not include driving surfaces or buildings.

In addition, unused lot coverage may also be improved with hardscape.

### HARDSCAPE CALCULATIONS

A.	Gross Lot Area	_____	Square Feet
B.	Net Lot Area	_____	Square Feet
C.	Area Borrowed from Lot Coverage	_____	Square Feet
D.	Allowed Hardscape Area = 9% of lot area + C	_____	% of Lot
E.	Allowed Hardscape Area	_____	Square Feet
F.	Total Existing Hardscape Area:		
1.	Uncovered Decks	_____	Square Feet
2.	Uncovered Patios	_____	Square Feet
3.	Walkways	_____	Square Feet
4.	Stairs	_____	Square Feet
5.	Rockeries and Retaining Walls	_____	Square Feet
6.	Other _____	_____	Square Feet
7.	Total Existing Hardscape Area (F1+F2+F3+F4+F5+F6)	_____	Square Feet
G.	(Total Hardscape Area Removed)	_____	Square Feet
H.	Total New Hardscape Area:		
1.	Uncovered Decks	_____	Square Feet
2.	Uncovered Patios	_____	Square Feet
3.	Walkways	_____	Square Feet
4.	Stairs	_____	Square Feet
5.	Rockeries and Retaining Walls	_____	Square Feet

6. Other \_\_\_\_\_ Square Feet
7. Total New Hardscape Area  
(H1+H2+H3+H4+H5+H6) \_\_\_\_\_ Square Feet
- I. Total Project Hardscape Area = (F7 - G) + H7 \_\_\_\_\_ Square Feet
- J. Total Project Hardscape Area = (I/B)x100 \_\_\_\_\_ % of Lot

Hardscape calculations shown on Plan Sheet # \_\_\_\_\_

**GROSS FLOOR AREA (GFA)**

For single family residential development, GFA is the total square footage of floor area, bounded by the exterior faces of the building(s). The GFA includes the floor area of the main building, accessory buildings, garages, attached roofed decks on the second or third story of a single family home, staircases, etc. The GFA does not include second- or third-story uncovered decks or uncovered rooftop decks.

The GFA includes the floor area of the main building, accessory buildings, garages, attached roofed decks on the second or third story of a single family home, staircases, etc. The GFA does not include second- or third-story uncovered decks or uncovered rooftop decks. GFA does not include any portion of a building that is below ground (refer to page 6).

**Allowed GFA**

- A. R-8.4: 5,000 square feet or 40% of the lot area, whichever is less.
- B. R-9.6: 8,000 square feet or 40% of the lot area, whichever is less.
- C. R-12: 10,000 square feet or 40% of the lot area, whichever is less.
- D. R-15: 12,000 square feet or 40% of the lot area, whichever is less.
- E. All zones: Lots with a lot area of 7,500 square feet or less, the lesser of 3,000 square feet or 45% of the lot area.
- F. All zones: If an accessory dwelling unit is proposed, the 40% allowed GFA may be increased by the lesser of 5 percentile points, or the floor area of the accessory dwelling unit. Provided, this allowance shall not result in a GFA of more than 4,500 square feet or 45% of the lot area, whichever is less.

**GFA Modifiers**

The GFA calculation for a floor with a ceiling height of 12 to 16 feet, is 150% of the area of the floor.

The GFA calculation for a floor with a ceiling height of more than 16 feet, is 200% of the area of the floor.

The GFA calculation for a stair case shall be counted as a single floor for the first two stories accessed by the stair case. For each additional story above two stories, the stair case shall count as a single floor area.

*\*Floor plans shall identify rooms with a ceiling height of more than 12 feet and rooms with a ceiling height of more than 16 feet.*

All building areas must be identified and labeled on the site plan. Please distinguish all new construction from existing areas on both your drawing and in the calculations you complete below.

Will you be excluding a portion of the basement floor area? Yes  No

If yes, you must provide basement floor area calculations, with your building permit application, that show how you determined what portion of the basement will be excluded. Refer to page 6.

**GROSS FLOOR AREA CALCULATIONS**

Building Area	Existing Area	Removed Area	New/Addition Area	Total
Upper Floor	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.
Main Floor	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.
Gross Basement Area	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.
Garage/ Carport	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.
<b>Total Floor Area</b>	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.
Accessory Buildings	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.	_____ Sq. Ft.

Accessory Dwelling Unit 2 <sup>nd</sup> & 3 <sup>rd</sup> Story Roofed	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.
Decks	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.
Basement Area	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.
Excluded	_____		_____		_____		_____	
150% GFA Modifier* (main and upper floor x2)	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.
200% GFA Modifier* (main and upper floor x2)	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.
Staircase GFA Modifier* (x2 for a three story staircase, x3 for a four story staircase)	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.
<b>TOTAL Building Area</b>	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.	_____	Sq. Ft.

\*Enter the actual room area

- A. Lot Area \_\_\_\_\_ Square Feet
- B. Zone R-8.4  R-9.6  R-12  R-15
- C. Allowed Gross Floor Area (refer to "allowed GFA") \_\_\_\_\_ Square Feet
- D. Allowed Gross Floor Area \_\_\_\_\_ % of Lot
- E. Proposed Gross Floor Area \_\_\_\_\_ Square Feet
- F. Proposed Gross Floor Area \_\_\_\_\_ % of Lot

Gross floor area calculations found on Plan Sheet # \_\_\_\_\_

Basement exclusion calculations found on Plan Sheet # \_\_\_\_\_

### **BUILDING HEIGHT**

All building height measurements must be taken from existing grade or finished grade, whichever is lower. Existing grade refers to ground surface as it exists at the proposed building perimeter before grading or other alterations take place. Finished grade refers to the ground surface as it exists at the building perimeter after grading or other alterations take place.

Single family new construction and additions are limited to a maximum height of 30 ft. above the Average Building Elevation (ABE) – see section on next pages. The height is measured to the top of the structure. On the downhill side of a sloping lot, the wall façade height is also limited to a height of 30 feet measured from existing or finished grade (whichever is lower) to the top of the exterior wall facade supporting the roof framing, rafters, trusses, etc.

A topographic survey is required at permit application when the proposed building height is within 2 ft. of the allowable building height. The survey must include a statement that attests the average contour elevation within the vicinity of the building footprint to be accurate within 6 inches vertically and horizontally from actual elevations.

### **BUILDING HEIGHT CALCULATIONS**

- A. Average Building Elevation (ABE) calculations located on sheet #: \_\_\_\_\_
- B. Allowable Building Height (ABE + 30 ft.) \_\_\_\_\_ Feet
- C. Proposed Building Height \_\_\_\_\_ Feet
- D. Benchmark Elevation\* \_\_\_\_\_ Feet
- E. Describe Benchmark Location (must be undisturbed throughout project) \_\_\_\_\_

- F. Sloping lot (Downhill side)- maximum height of top of exterior wall façade above lowest existing grade (30-ft max) \_\_\_\_\_ Feet
- G. ABE and Allowable Building Height Shown on elevations plan sheet # \_\_\_\_\_
- H. Topo-survey Accuracy Attested on Plan Sheet # \_\_\_\_\_

*Note: survey must attest to accuracy when proposed building height is within 2 feet of the allowable building height. Please see page 8 for more information on calculating Average Building Elevation (ABE)*

\*The benchmark elevation is a fixed elevation point on or off site that will not be disturbed during development activity and is used to verify the final building height.

**BASEMENT FLOOR AREA CALCULATION**

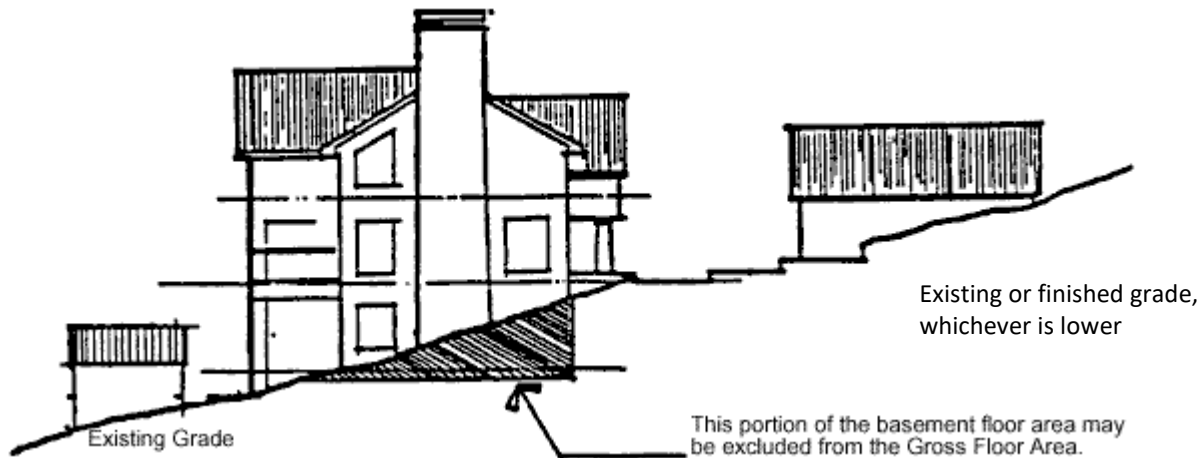
The Mercer Island Development Code allows for the portion of the basement floor area which is below grade to be excluded from the Gross Floor Area. That portion of the basement which will be excluded is calculated as shown:

Portion of Excluded Basement Floor Area = Total Basement Area x

$$\frac{\sum (\text{Wall Segment Coverage} \times \text{Wall Segment Length})}{\text{Total of all Wall Segment lengths}}$$

**Where the terms are defined as follows:**

- Total Basement Area:** The total amount of all basement floor area.
- Wall Segment** The portion of an exterior wall below existing or finished grade, whichever is lower. It is expressed as a percentage. Refer to example below.
- Coverage:**
- Wall Segment Length:** The horizontal length of each exterior wall in feet.



**EXAMPLE OF BASEMENT FLOOR AREA CALCULATION**

This example illustrates how a portion of the basement floor area may be excluded from the Gross Floor Area. In order to complete this example, the following information is needed:

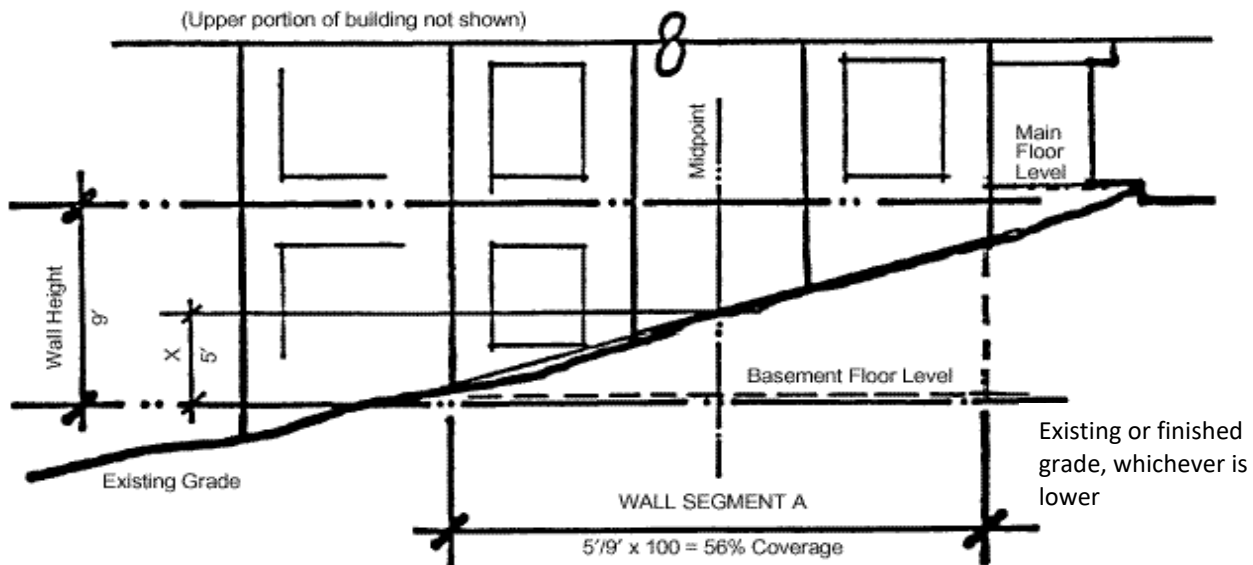
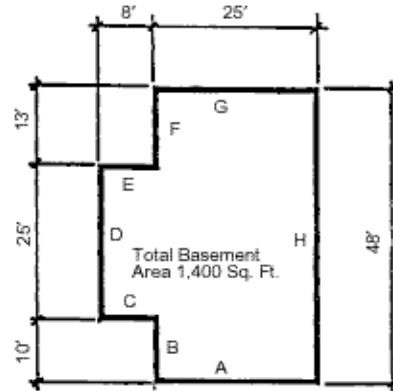
- a. A topographic map of the existing (e) grades and showing proposed finished (f) grades.
- b. Building plans showing dimensions of all exterior wall segments and floor areas.
- c. Building elevations showing the location of existing and finished grades in relation to basement level.

**Step One**

Determine the number and lengths of the Wall Segments.

### Step Two

Determine the Wall Segment Coverage (in %) for each Wall Segment. In most cases this will be readily apparent, for example a downhill elevation which is entirely above existing and finished grade. In other cases, where the existing contours are complex, an averaging system shall be used. Refer to illustration.



### Step Three

Multiply each Wall Segment Length by the percentage of each Wall Segment Coverage and add these results together. Divide that number by the sum of all Wall Segment Lengths. This calculation will result in a percentage of basement wall which is below grade. (This calculation is most easily completed by compiling a table of the information as illustrated below.)

Wall Segment	Length x	Coverage=	Result
A	25'	56%	14%
B	10'	0%	0%
B	8'	0%	0%
D	25'	0%	0%
E	8'	0%	0%
F	13'	0%	0%
G	25'	60%	15%
H	48'	100%	48%
<b>Totals</b>	<b>162'</b>	<b>NA</b>	<b>77%</b>

### Step Four

Multiply the Total Basement Floor Area by the above percentage to determine the Excluded Basement Floor Area. Portion of Excluded Basement Floor Area Calculation below



$$1,400 \text{ Sq. Ft.} \times \frac{(25' \times 56\% + 10' \times 0\% + \dots + 25' \times 60\% + 48' \times 100\%)}{162'}$$

$$= 1,400 \text{ Sq. Ft.} \times 47.53\%$$

$$= 665.42 \text{ Sq. Ft. Excluded from the Gross Floor Area}$$

**CALCULATING AVERAGE BUILDING ELEVATION (ABE)**

No part of a structure may exceed 30 feet in height above the "Average Building Elevation" to the top of the structure, except that on the downhill side of a sloping lot the structure shall not extend to a height greater than 30 feet measured from existing or finished grade to the top plate of the roof; provided the roof ridge does not exceed 30 feet in height above the "Average Building Elevation." ABE is defined as: The elevation established by averaging the elevation at existing or finished grade, whichever is lower, at the center of all exterior walls of the completed building.

**NOTE:**  
**INCOMPLETE**  
**AVERAGE BUILDING**  
**ELEVATION**  
**INFORMATION**  
**COULD**  
**SUBSTANTIALLY**  
**DELAY THE**  
**PROCESSING OF**  
**YOUR APPLICATION**

**AVERAGE BUILDING ELEVATION FORMULA:**

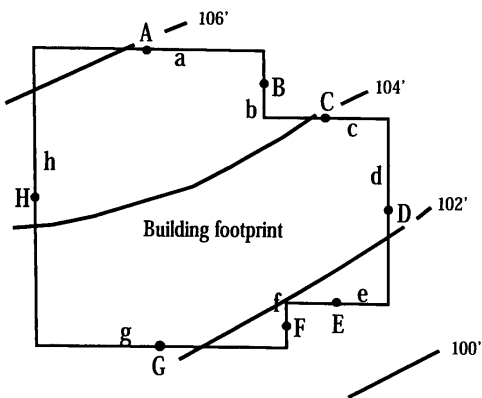
$$\frac{(\text{Mid-point Elevation of Individual Wall Segment}) \times (\text{Length of Individual Wall Segment})}{(\text{Total Length of Wall Segments})}$$

$$\text{—OR—}$$

$$\frac{(Axa)+(Bxb)+(Cxc)+(Dxd)+(Exe)+(Dxd)+(Exe)+(Fxf)+(Gxg)+(Hxh)}{a + b + c + d + e + f + g + h}$$

**WHERE:** A,B,C,D... = Lower of Finished or Existing Ground Elevation at Midpoint of Wall Segment

**AND:** a,b,c,d... = Length of Wall Segment Measured on Outside Wall



MIDPOINT ELEVATION	WALL SEGMENT LENGTH
A = 105.9 feet	a = 30 feet
B = 104.7 feet	b = 9 feet
C = 103.7 feet	c = 17 feet
D = 102.7 feet	d = 25 feet
E = 101.6 feet	e = 13 feet
F = 101.7 feet	f = 6 feet
G = 102.2 feet	g = 34 feet
H = 104.5 feet	h = 40 feet

**ABE CALCULATION:**

$$\frac{(105.9)(30)+(104.7)(9)+(103.7)(17)+(102.2)(25)+(101.6)(13)+(101.7)(6)+(102.2)(34)+(104.5)(40)}{30 + 9 + 17 + 25 + 13 + 6 + 34 + 40}$$

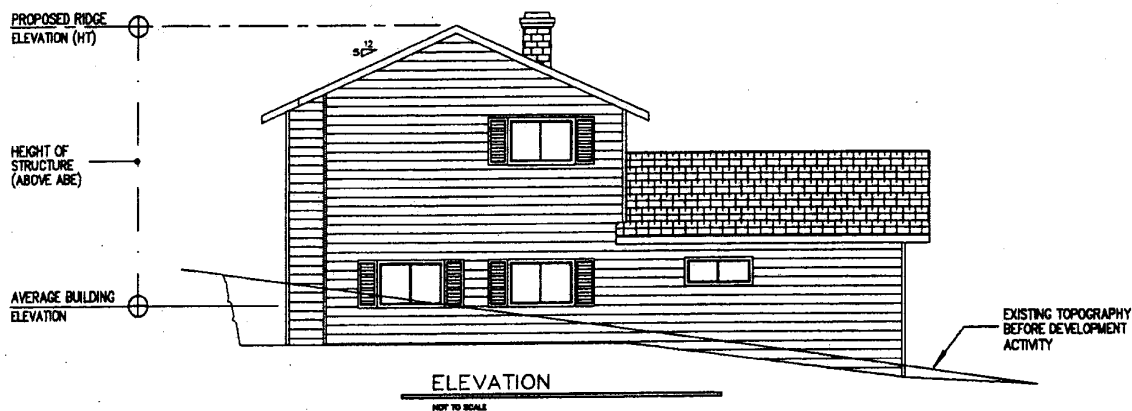
$$\frac{18023'}{174'} = 103.6' \text{ Average Building Elevation (ABE)}$$

*NOTE: This example is not to scale. Site plans submitted to the building department must be to scale.*

**BEFORE SUBMITTING YOUR CONSTRUCTION DRAWINGS, CHECK TO SEE THAT YOU HAVE PROVIDED THE INFORMATION BELOW.**

- The site plan and the elevation drawings must be drawn to scale, for example 1" = 20', and based on a survey.
- Clearly show existing topography on your site plan. Topography should be shown in 2' increments.
- Submit (with the site plan) your average building elevation calculations using the formula provided on page 8.
- Indicate on an elevation drawing where the average building elevation strikes the building and the proposed ridge elevation (see below for example).
- Elevation drawings for all sides of the building.
- Indicate on the site plan the elevation of the finished floor or garage slab.
- Indicate the elevation and location of a fixed point (benchmark) within the ADJACENT RIGHT-OF-WAY or other point approved by the Building Official. The benchmark elevation and location must be provided and cannot be a part of the proposed structure. Note: Benchmark must be established, verified by a licensed surveyor and remain during construction so height can be verified when completed.
- For additions, you must provide an average building elevation calculation for the entire structure.
- If a portion of the basement floor area will be excluded from the gross floor area, provide the exclusion calculations with your site plan. The formula for basement area exclusions is shown on page 6.
- Indicate ceiling heights greater than 12' and greater than 16' on floor plans.

**CROSS-SECTION REPRESENTATION OF ABE**



---

# Drainage Report

---

## 5000 West Mercer Way – Moran Residence

Mercer Island, WA

### Prepared for

Edward & Catherine Moran  
5000 West Mercer Way  
Mercer Island, WA 98040

### Prepared by

JMJ TEAM  
PO Box 2066  
Sumner, WA 98390  
206.596.2020  
Justin Jones, PE

March 21, 2023





## PROJECT ENGINEER'S CERTIFICATION

---

"I hereby state that this Drainage Control Plan for the Moran Residence has been prepared by me or under my supervision and meets minimum standard of care and expertise which is usual and customary in this community for professional engineers. I understand that Pierce County does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by me."



Justin Jones, PE



03-21-2023



## TABLE OF CONTENTS

---

Project Overview and Maps	1
Existing Conditions Summary	2
Proposed Conditions Summary	2
Summary of Minimum Requirements	4

Appendix A:  
Site Development Drawings

Appendix B:  
City of Mercer Island Detention Sizing Handout

Appendix C:  
Technical Memo-Pump System







## EXISTING CONDITIONS SUMMARY

The Moran Residence is an undeveloped 0.42 Acre site with grass and tree vegetation covering most the property. The site has steep slopes that slope from east to west.

The existing project site is pervious. The total impervious coverage allowed for this project is 35% or 6,403 SF.

## PROPOSED CONDITIONS SUMMARY

The Moran Residence project proposes a house, permeable paver walkaway, concrete driveway, and site retaining walls. Site improvements include the construction of the improvements, clearing and grading, and utility service connections for storm detention, sewer, water, power and communication.

Stormwater management was evaluated for both the building roof areas, and the concrete driveway. Detention has been selected to manage stormwater runoff from the site. Roof leaders will route stormwater along the building and connect to a Type 2 catch basin. Runoff from the driveway will be collected through the Type 2 catch basin located north of the house. Stormwater will be collected in the Type 2 catch basin prior to entering the detention tanks. A control structure will be installed to ensure stormwater flows do not exceed 0.15 CFS, flows from the control structure will be routed to an existing Type 1 catch basin located at the corner of W Mercer Way and the private gravel road to the north of the site. Flows from the driveway will be collected using a trench drain located at the bottom of driveway and will be routed to a Grinder Pump System which will be pump the driveway runoff back to the proposed detention tanks. Footing drains will be installed along the footings of the wall and proposed house, the drains will be routed to the 6" PVC pipe located in the proposed driveway and be conveyed to the existing type 1 catch basin. Stormwater collected from the shoring wall and foundation footings will not be routed through the detention tanks.

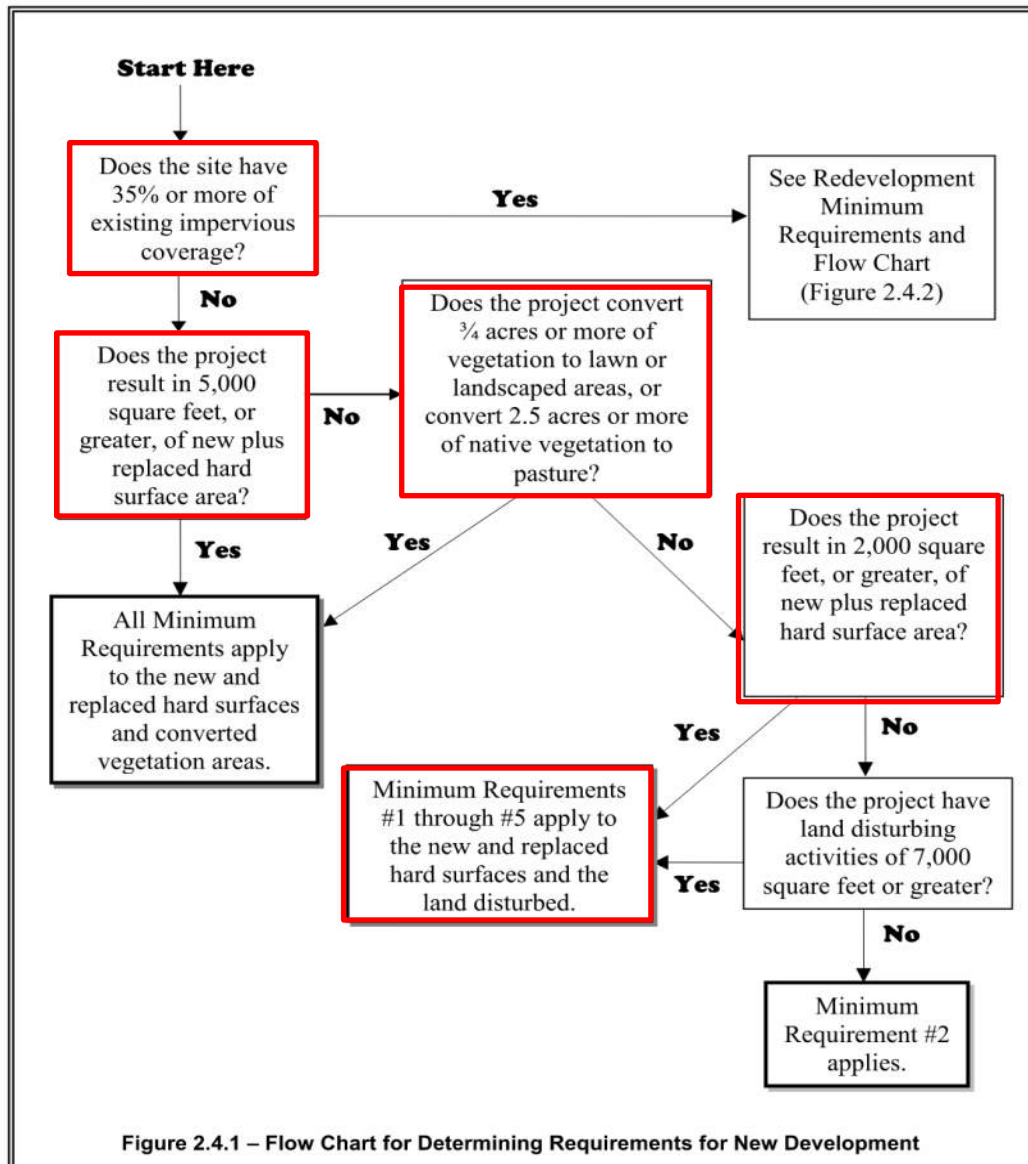
The impervious areas will be 25 percent of the entire site. Below is a summary of the proposed lot coverage.

### LOT COVERAGE

Proposed Lot Coverage		
	Impervious Areas (SF)	Pervious Areas (SF)
<b>Proposed House</b>	2,664	
<b>Proposed Driveway</b>	1,312	
<b>Proposed Retaining Walls</b>	63	
<b>Permeable Pavers</b>		116
<b>Landscaping/Vegetaion</b>		13,722
<b>Totals</b>	<b>4,039</b>	<b>13,838</b>
<b>Lot Size</b>	18,295	
<b>Max Allowed Impervious Coverage</b>	<b>35% (6,403 SF)</b>	
<b>Impervious Lot Coverage</b>	<b>25%</b>	

## SUMMARY OF MINIMUM REQUIREMENTS

The 2014 Stormwater Management Manual for Western Washington describes the minimum requirements for a new development project. Using the flowchart below, Minimum Requirements 1-5 apply to the project site.



### MINIMUM REQUIREMENT 1: PREPARATION OF STORMWATER SITE PLANS

Stormwater Site Plan drawings are submitted with this Permit.

### MINIMUM REQUIREMENT 2: CONSTRUCTION STORMWATER POLLUTION PREVENTION

A Temporary Erosion and Sediment Control Plan is included with this Civil Permit. Construction Stormwater Pollution Prevention measures may include: storm drain inlet protection; construction entrance; silt fence and vegetative filtration. See "Temporary Erosion & Sediment Control Plan" in Appendix A for details.

### MINIMUM REQUIREMENT 3: SOURCE CONTROL OF POLLUTION

Source control BMPs will be implemented to minimize stormwater contamination and help comply with the 2014 Stormwater Management Manual for Western Washington Manual. BMP's for the project may include:

- *Inspect and clean treatment BMPs, conveyance systems, and catch basins as needed, and determine necessary O & M Improvements.*

### MINIMUM REQUIREMENT 4: PRESERVATION OF NATURAL DRAINAGE SYSTEMS AND OUTFALLS

Natural drainage for the site is overland flow from east to west flowing into an existing ditch located along West Mercer Way. Stormwater will be conveyed to detention tanks located in northern portion of the site, stormwater will then outfall to an existing ditch located to the west along West Mercer Way.

### MINIMUM REQUIREMENT 5: ONSITE STORMWATER MANAGEMENT

The Moran project site is 18,295 SF and will be 25% impervious after construction. Several stormwater management techniques were studied for the roof and driveway areas.

- Roofs:
  - Bioretention/Rain Gardens were deemed infeasible based on the geo-tech report, due to steep slopes of the site and impermeable soils at shallow depths infiltration was deemed infeasible.
  - Downspout Dispersion Systems were evaluated and deemed infeasible due to the steepness of the site and site constraints to achieve minimum flow paths.
  - Perforated stub connections were considered infeasible based on the geo-tech report, due to steep slopes of the site and shallow impermeable soils making infiltration infeasible.
  - 65/10 dispersion was deemed to be infeasible as the existing property does not maintain 65% of the site area in a native condition.
  - A Dispersion Trench was considered infeasible due to site constraints and not having adequate space for the placement of a dispersion trench.
  - Infiltration trenches were evaluated and were determined infeasible due to the impermeable soils located on site, based on findings found in the geo-tech report.
  - Detention was evaluated and deemed feasible as the BMP for project site, roof runoff will be collected and routed to on site detention system.

- Other Hard surfaces:
  - Bioretention/Rain Gardens were deemed infeasible based on the geo-tech report, due to steep slopes of the site and impermeable soils at shallow depths infiltration was deemed infeasible.
  - 65/10 dispersion was deemed to be infeasible as the existing property does not maintain 65% of the site area in a native condition.
  - Infiltration trenches were evaluated and were determined infeasible due to the impermeable soils located on site, based on findings found in the geo-tech report.
  - Permeable Pavement was deemed infeasible due to impermeable soils located on site. Making infiltration infeasible.
  - Sheet flow dispersion was deemed infeasible due to site constraints, the site slope is greater than 15%.
  - Concentrated flow dispersion was evaluated and deemed infeasible due to the steep site slopes and site constraints that minimum flow paths can't be met.
  - Detention was reviewed and deemed feasible to manage runoff from the proposed driveway. Runoff will be collected through a Type 2 catch basin and routed to the onsite detention tank systems.

LID standards were evaluated, and the Moran residence does not meet the minimum LID thresholds. The projects proposes more than 2,000 SF of impervious area and has more than a net 500 SF impervious area increase to the project site. Therefore, the project is required to use onsite detention. Detention was sized using the City of Mercer Island Detention Sizing Handout (See Appendix B). Using the control structure, flows leaving the site will not exceed 0.15 CFS of the predeveloped flows of the site. Site flows will be routed to a Type 1 catch basin located on the west corner of the site and outfall to an existing ditch located along West Mercer Way. A Grinder pump system will be used to convey the part of the driveway runoff to the detention tank, see Appendix C for pump sizing.

## **APPENDIX A**



**EASEMENTS**

- EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:  
DISCLOSED BY: DEED  
PURPOSE: ROAD  
RECORDING NO.: 4523171  
AFFECTS: NORTHWESTERLY PORTION AS DESCRIBED THEREIN (PLOTTED)
- EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:  
DISCLOSED BY: DEED  
PURPOSE: ROAD AND UTILITIES  
RECORDING NO.: 4828502  
AFFECTS: NORTHWESTERLY PORTION AS DESCRIBED THEREIN (PLOTTED)
- EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:  
DISCLOSED BY: STATUTORY WARRANTY DEED  
PURPOSE: INGRESS, EGRESS AND UTILITIES  
RECORDING NO.: 5597166  
AFFECTS: NORTH 10 FEET OF SAID PREMISES (PLOTTED)
- EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:  
DISCLOSED BY: STATUTORY WARRANTY DEED  
PURPOSE: ROAD FOR INGRESS AND EGRESS  
RECORDING NO.: 5706728  
AFFECTS: NORTH 10 FEET OF SAID PREMISES (PLOTTED)
- EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:  
GRANTED TO: WASHINGTON NATURAL GAS COMPANY, A WASHINGTON CORPORATION  
PURPOSE: GAS PIPELINE(S)  
RECORDING DATE: NOVEMBER 16, 1994  
RECORDING NO.: 9411160439  
AFFECTS: FIVE FEET ON EITHER SIDE OF THE NATURAL GAS DISTRIBUTION LINE AS CONSTRUCTED OR TO BE CONSTRUCTED WITHIN THE NORTH 20 FEET OF SAID PREMISES (NOT PLOTTED-AS CONSTRUCTED)
- NOTICE OF ADDITIONAL TAP OR CONNECTION THEREOF:  
RECORDING DATE: DECEMBER 6, 1977  
RECORDING NO.: 7712060812 (NOT PLOTTED-NOT SURVEY RELATED)

**TESC NOTES**

- Contractor to install temporary erosion and sediment control measures as necessary to ensure stormwater leaving the site is free of settleable solids.
- Roads shall be cleaned thoroughly as needed to protect stormwater infrastructure and downstream water resources. Sediment shall be removed from roads by shoveling or pickup sweeping and be transported to a controlled sediment disposal area.
- Install storm drain inlet protection in all existing catch basins within the project vicinity per City of Mercer Island Detail 4.2.8.
- Install Stabilized Construction Entrance per City of Mercer Island Detail 4.1.1.
- Install Silt Fence as necessary. See City of Mercer Island Detail 4.2.12.
- Install straw bale barriers, wattles and other TESC measures as necessary.
- Exposed soils shall be watered as necessary to prevent dust from leaving the site.
- Contractor to mark clearing limits with lath and flagging.
- Concrete handling and equipment washing shall in accordance with DOE BMP C151.

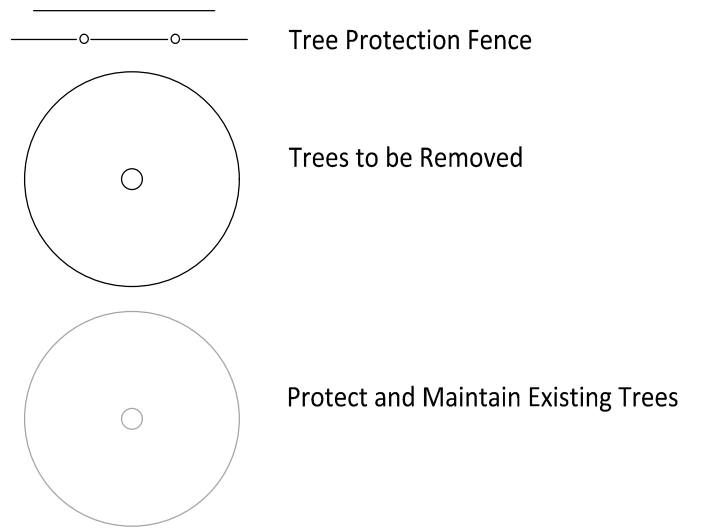
**GENERAL NOTES**

- See Tree Inventory Tables in Arborist Report included in this submittal.

**CONSTRUCTION NOTES**

- The lawn and landscape areas are required to provide Post-Construction Soil Quality and Depth in accordance with BMP T5.13. The project civil engineer must provide a letter of certification to ensure that lawn and landscape areas are Depth Requirements specified on the approved plan set prior to final inspection of the project.
- POST-CONSTRUCTION SOIL MANAGEMENT**
  - Retain & Protect Native Vegetation and Soil
    - Identify Areas of the site that will not be disturbed construction. Fence areas to prevent impacts during construction.
  - loosen Compacted Subsoil
    - In Areas Compacted by Construction Traffic Scarify the top 4-inches of subsoil. Use a Cat-mounted Ripper, tractor-mounted disc, or tiller to mix the first lift of topsoil into the subsoil. Use the equipment listed to scarify soils to a depth of 12-inches before tilling in at least 8-inches of compost.
  - Restore Soils that are Disturbed During Construction
    - Stockpile and reuse existing topsoil (amend if needed to meet 5% organic matter content for turf areas; 10% organic matter content for planting beds).
  - Add Mulch to Planting Beds
    - Spread mulch (coarse bark or wood chips) in the spring or fall (after planting) to control weeds, reduce the need for irrigation and prevent erosion). Apply 1 to 2 inches of mulch on planting beds and around shallow-rooted annuals. Apply 2 to 4 inches of mulch around trees and woody perennials, but make sure to keep mulch 2-3 inches away from tree trunks.
  - Protect Restored Soils from Erosion and Re-Compaction
    - Prevent runoff from roads or open slopes onto amended soil areas. Compost blankets are an approved erosion control Best Management Practice (BMP) that can be used during construction and then tilled into existing soil at the end of the construction process prior to planting. Once soils have been amended, vehicle traffic should be prohibited to prevent recompilation from occurring.

**LEGEND**



Owner/Developer:

Edward & Catherine Moran  
5000 West Mercer Way  
Mercer Island, WA 98040

Architect:

Plan One Fine Home Design  
5125 47th Ave S  
Seattle, WA 98118  
206-612-8511

Engineer:



Justin Jones, PE  
PO Box 2066  
Sumner, WA 98390  
(206) 596-2020

Project:

Moran Residence

ONE INCH AT FULL SCALE.  
IF NOT, SCALE ACCORDINGLY



REV	DATE	DESCRIPTION

SHEET TITLE:

Existing Site & TESC Plan

PROJ. NO: 1576001

DATE: March 21, 2023

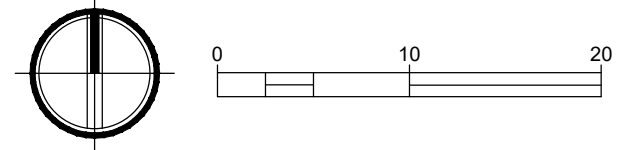
DRAWN BY: DESIGN BY:

SHEET NUMBER:

C-01

DWG.

File: 1576001C-Ex.dwg Path: J:\1576 - Moran\001 - W Mercer Way\CAD Plotted by: JMJ Date: 21-Mar-23 7:57:06am

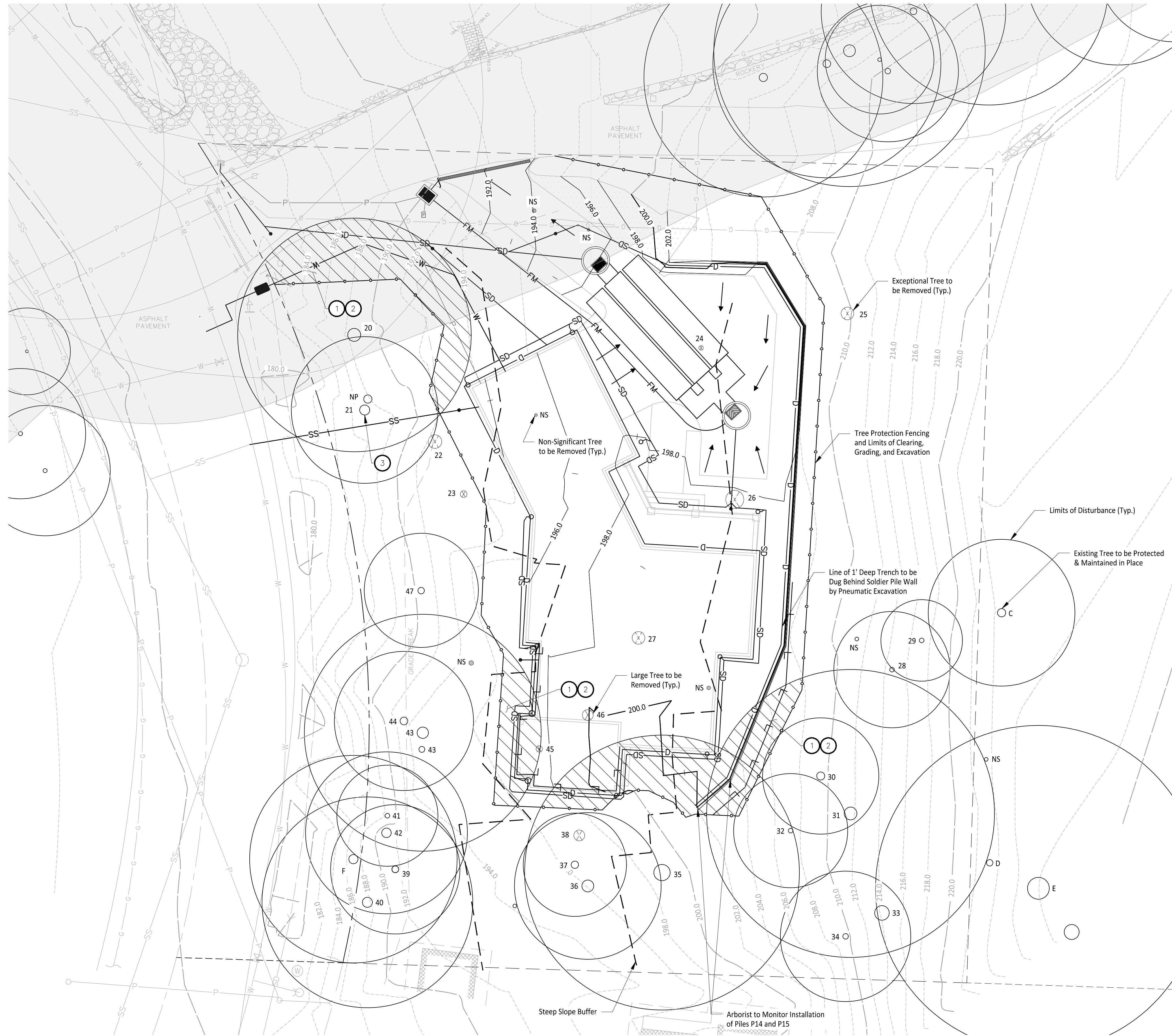


CALL TWO BUSINESS DAYS BEFORE YOU DIG  
1-800-424-5555  
UTILITIES UNDERGROUND LOCATION CENTER









**LEGEND**

- ○ ○ Tree Protection Fencing and Limits of Clearing, Grading, and Excavation
- - - Steep Slope Buffer
- W — Proposed Water Line
- SD — Proposed Storm Line
- D — Proposed Drain Line
- FM — Proposed Storm Force Main
- SS — Proposed Sanitary Sewer Line
- P — Proposed Power Line
- ⊗ Large Tree to be Removed
- ⊗ Exceptional Tree to be Removed
- Non-Significant Tree to be Removed

**CONSTRUCTION NOTES**

- 1 All grading and excavation work within the limits of disturbance as indicated by cross-hatching shall be monitored by project arborist.
- 2 Pneumatic air or hydro excavation to be utilized at foundation locations in conflict with critical root zones and under the supervision of project arborist.
- 3 Utility trenching to be done with hydro or pneumatic methods or by hand excavation if recommended by and under supervision of project arborist.

**TREE PROTECTION FENCING AND SIGN**

1. 6' H Chain Link, wire mesh, or similar open rigid material (No Plywood)
2. Must be installed prior to demolition or ground disturbance
3. Kept in place for the duration of construction
4. No soil disturbance or activity allowed within fenced area; material
5. Modifications of these requirements by approval of SDCI Planner only
6. If roots greater than 2 inch found outside of fencing, protect by hand excavation and, if necessary, cut cleanly and keep moist
7. Use 3 inches or deeper wood chip mulch within tree protection zones as well for all trees impacted within their limits of disturbance

**VEGETATION PROTECTION**

1. Orange mesh or similar open material
2. Minimize construction zone
3. Protect vegetation outside construction zone with fencing as shown
4. Use 3 inches or deeper wood chip mulch outside fenced areas to protect feeder roots

Owner/Developer:

Edward & Catherine Moran  
5000 West Mercer Way  
Mercer Island, WA 98040

Architect:

Plan One Fine Home Design  
5125 47th Ave S  
Seattle, WA 98118  
206-612-8511

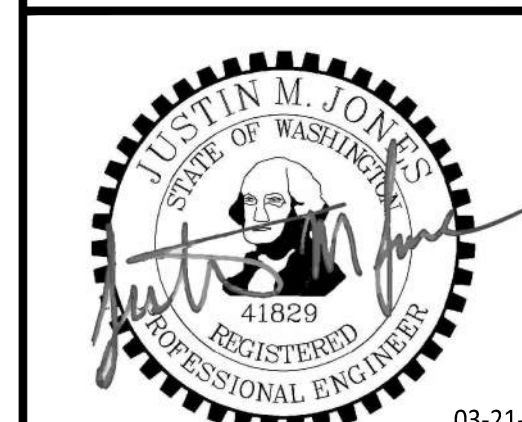
Engineer:

**JMUTEAM**  
Justin Jones, PE  
PO Box 2066  
Sumner, WA 98390  
(206) 596-2020

Project:

Moran Residence

ONE INCH AT FULL SCALE.  
IF NOT, SCALE ACCORDINGLY



REV	DATE	DESCRIPTION

SHEET TITLE

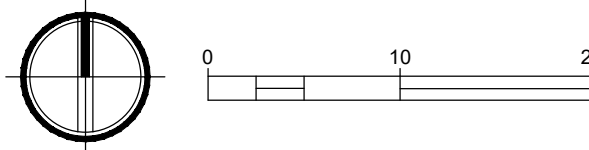
Tree Retention Plan

PROJ. NO. 1576001  
DATE March 21, 2023  
DRAWN BY: DESIGN BY:

SHEET NUMBER  
**C-04**

DNB  
1-800-424-5555  
UTILITIES UNDERGROUND LOCATION CENTER

File: 1576001C-TREE.dwg Path: J:\1576 - Moran\001 - W. Mercer Way\CAD\ Plotted By: JMJ Date: 21-Mar-23 8:08:39am



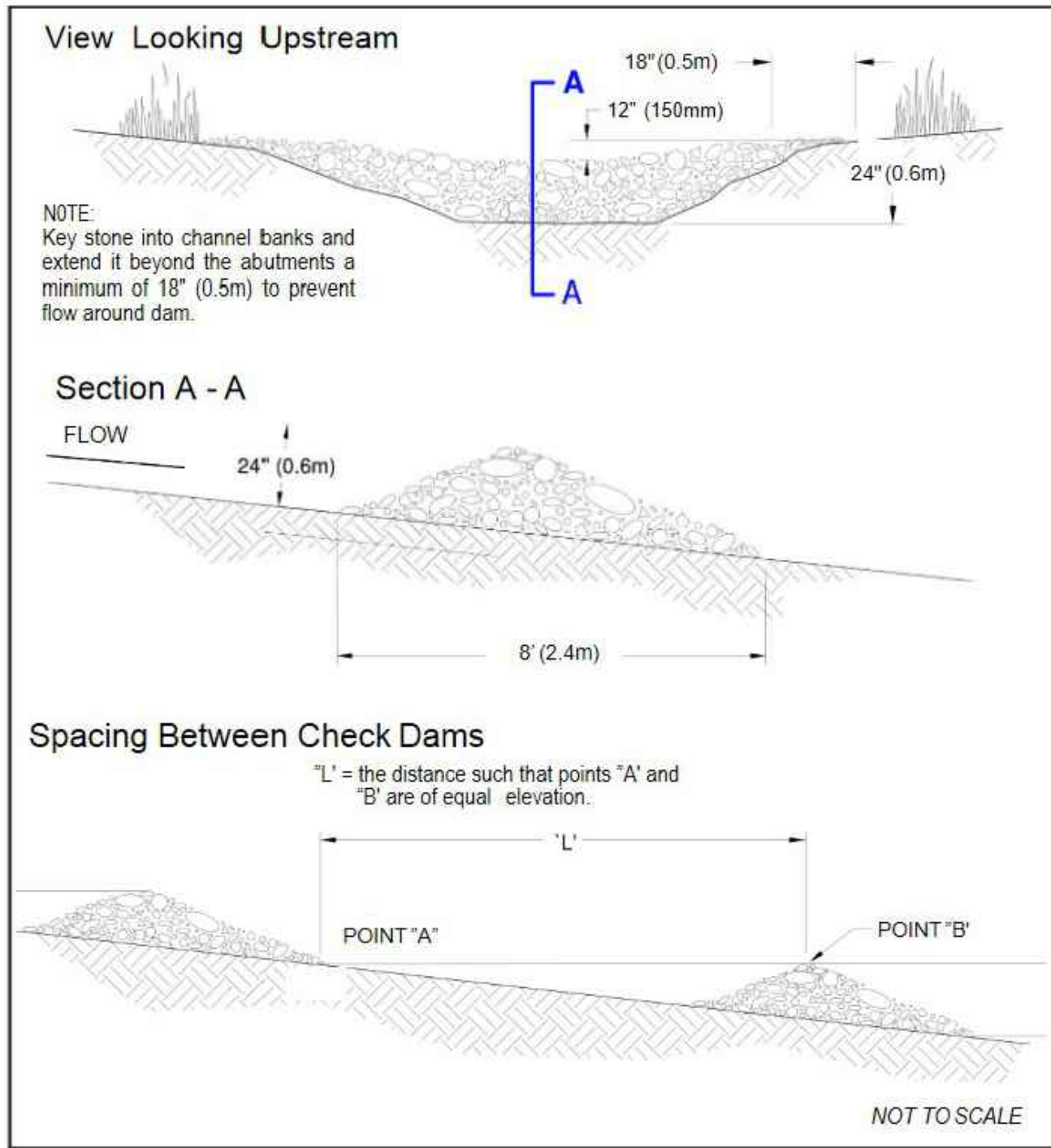


Figure 4.1.1 – Stabilized Construction Entrance

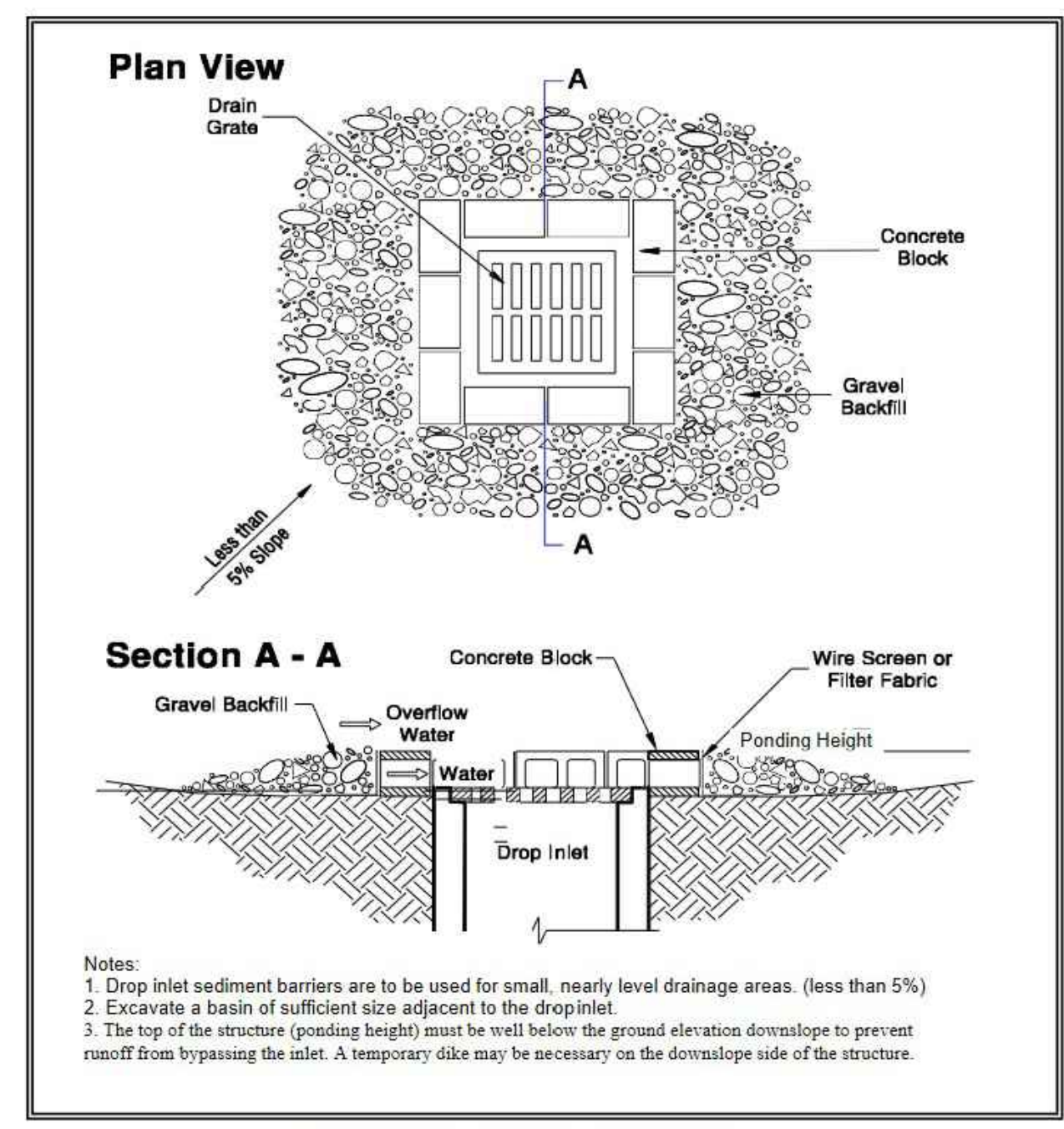
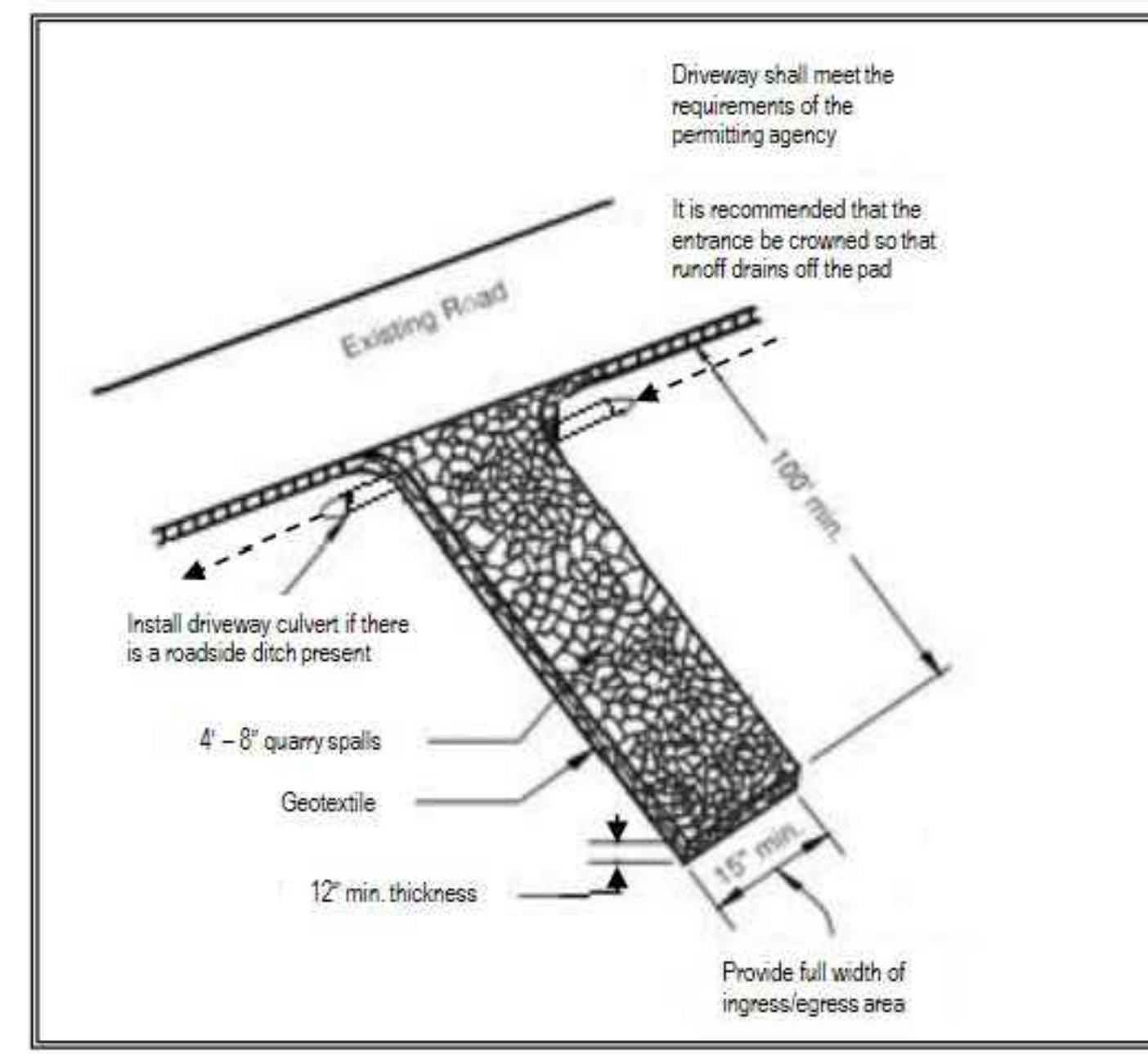


Figure 4.2.8 – Block and Gravel Filter

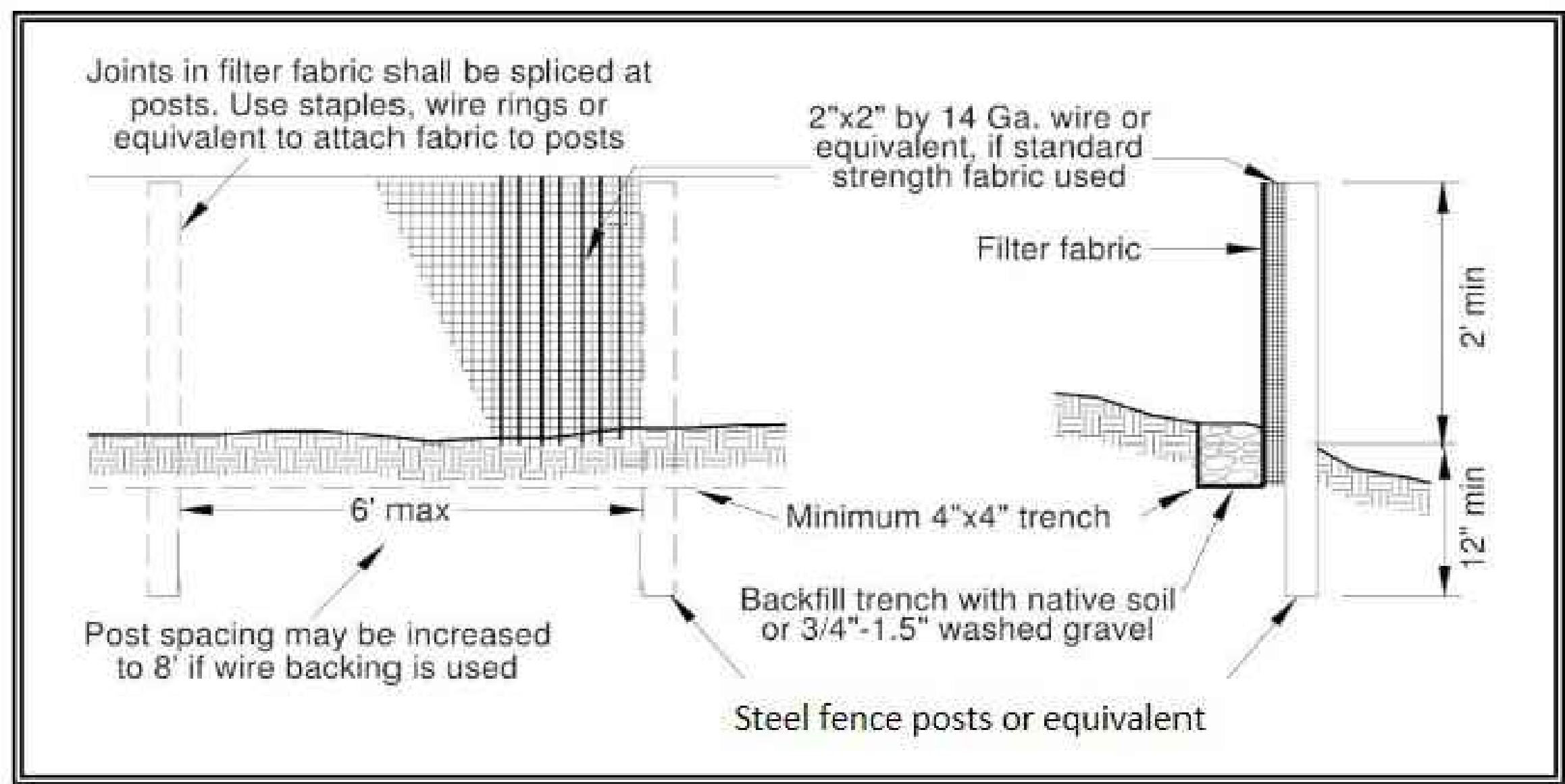
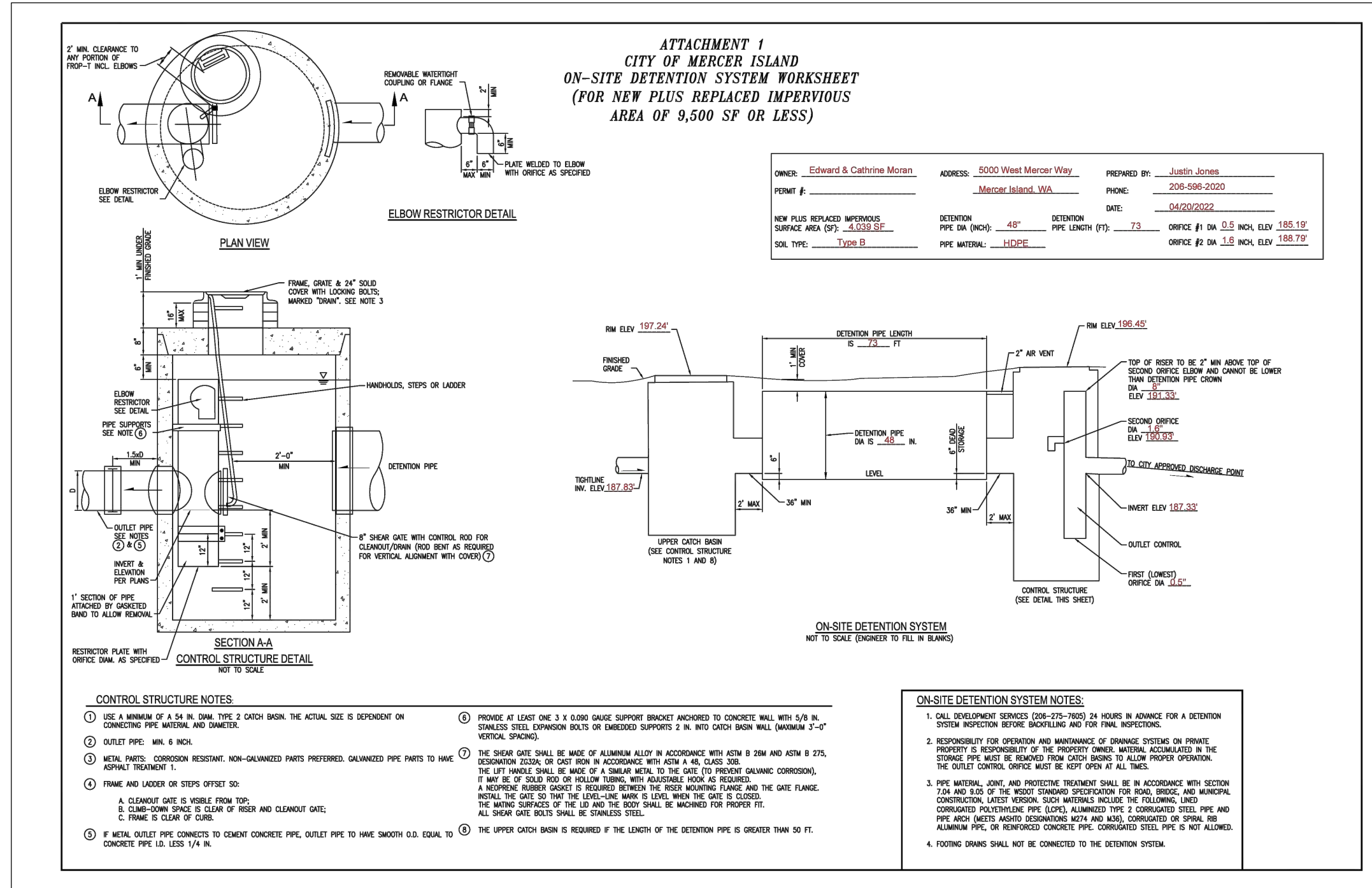


Figure 4.2.12 – Silt Fence

Owner/Developer:

Edward & Catherine Moran  
5000 West Mercer Way  
Mercer Island, WA 98040

Architect:

Plan One Fine Home Design  
5125 47th Ave S  
Seattle, WA 98118  
206-612-8511

Engineer:

JMTEAM  
Justin Jones, PE  
PO Box 2066  
Summer, WA 98390  
(206) 596-2020

Project:

Moran Residence

ONE INCH AT FULL SCALE.  
IF NOT, SCALE ACCORDINGLY



REV	DATE	DESCRIPTION

SHEET TITLE:

Details

PROJ. NO: 1576001

DATE: March 21, 2023

DRAWN BY: DESIGN BY:

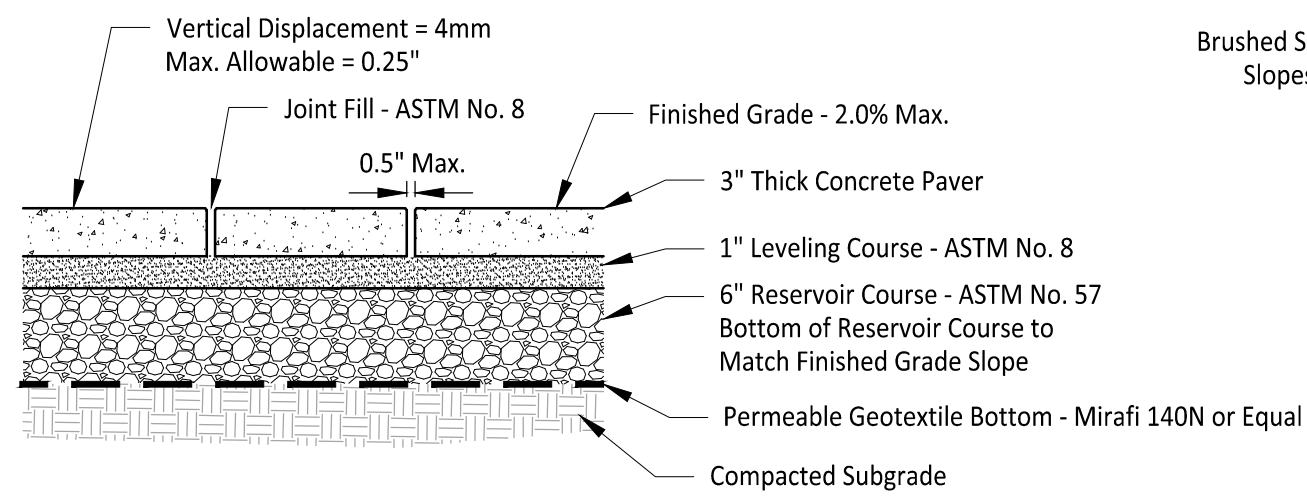
SHEET NUMBER:

C-05

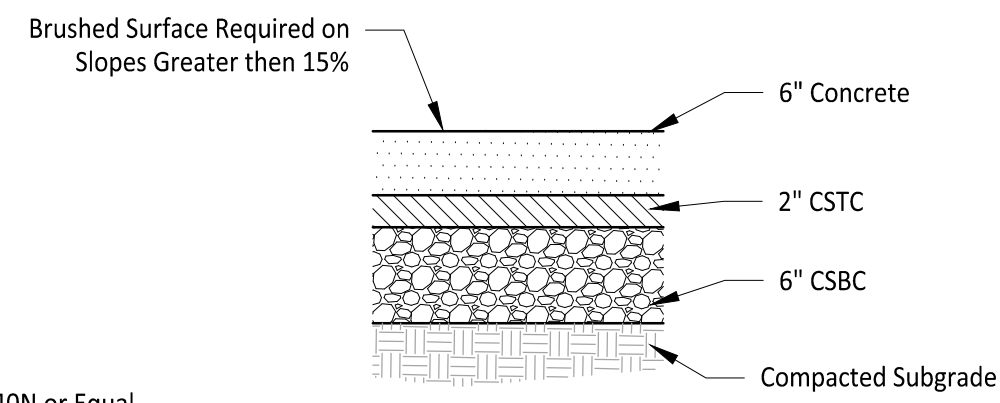
DWG.

CALL TWO BUSINESS DAYS  
BEFORE YOU DIG  
1-800-424-5555  
UTILITIES UNDERGROUND LOCATION CENTER

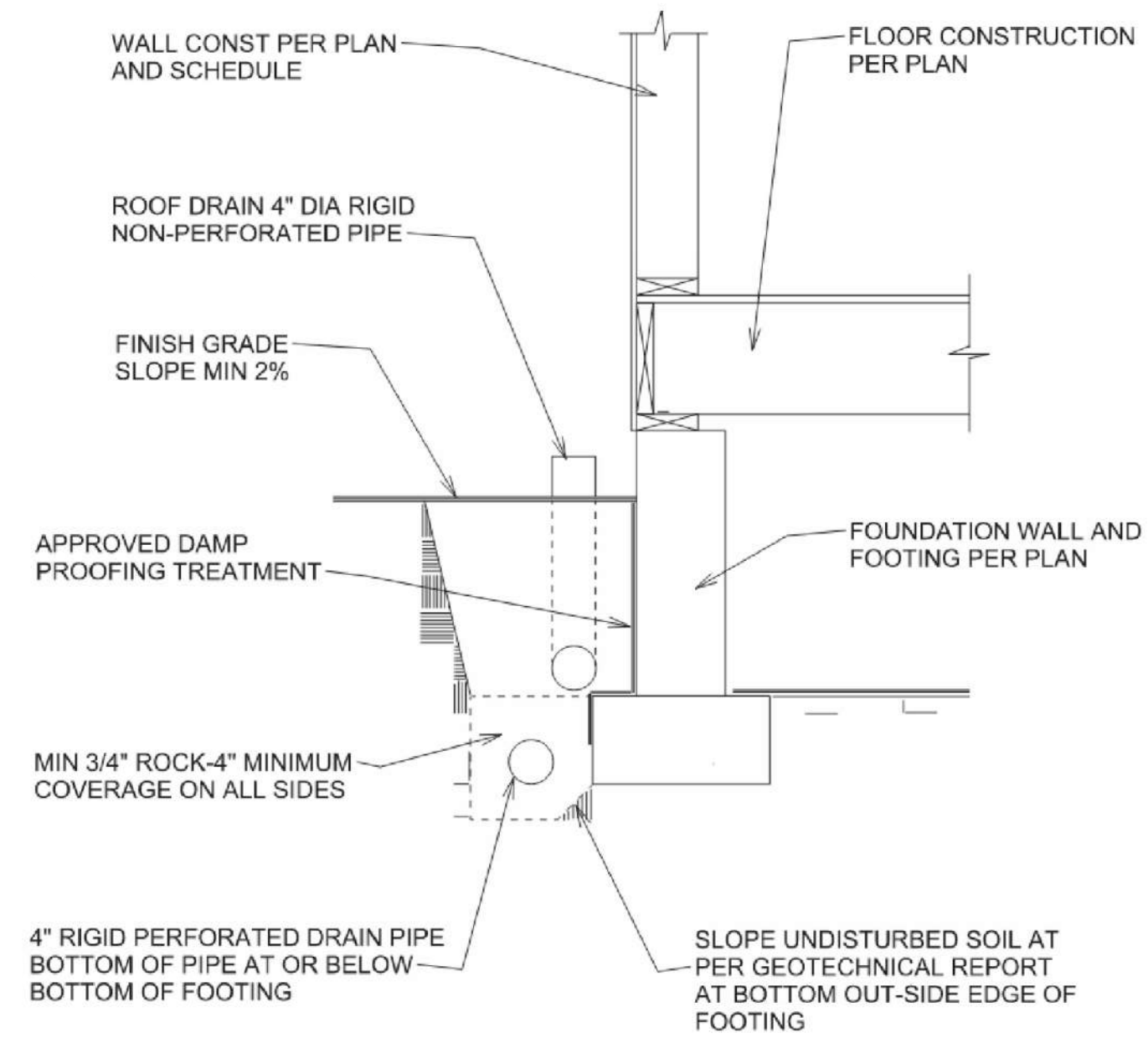
File: 1576001C-DT.dwg Path: J:\1576 - Moran\001 - W. Mercer Way CAD Plotted by: JMD Date: 21-Mar-23 7:48:19am



**PERMEABLE PAVERS SECTION**  
1" = 1' A



**CONCRETE DRIVEWAY SECTION**  
1" = 1' B



**FOOTING DRAIN DETAIL SECTION**  
3/4" = 1' B

## TREE PROTECTION AREA (TPZ)

### KEEP OUT!

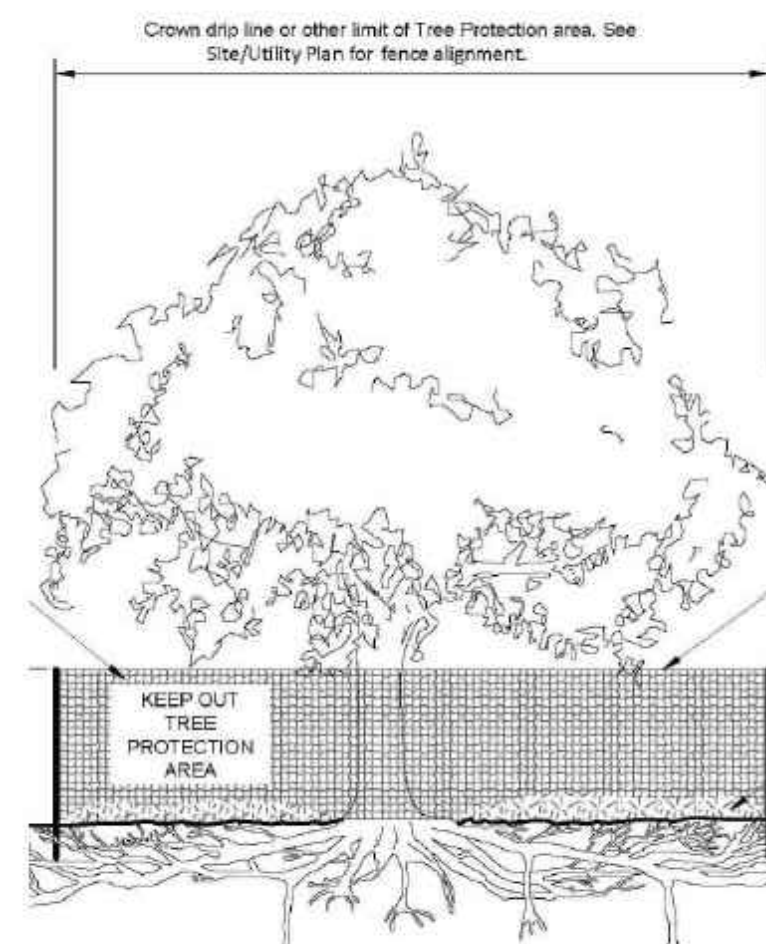
#### DO NOT REMOVE OR ADJUST THE APPROVED LOCATION OF THIS TREE PROTECTION AREA

Trees enclosed by this fence are protected and are subject to the conditions of the tree permit. Violation of tree conditions may lead to:

1. Correction Notices or Stop Work Orders until compliance is achieved
2. RE Inspection Fees
3. Arborist reports recommending mitigation

**Notes**

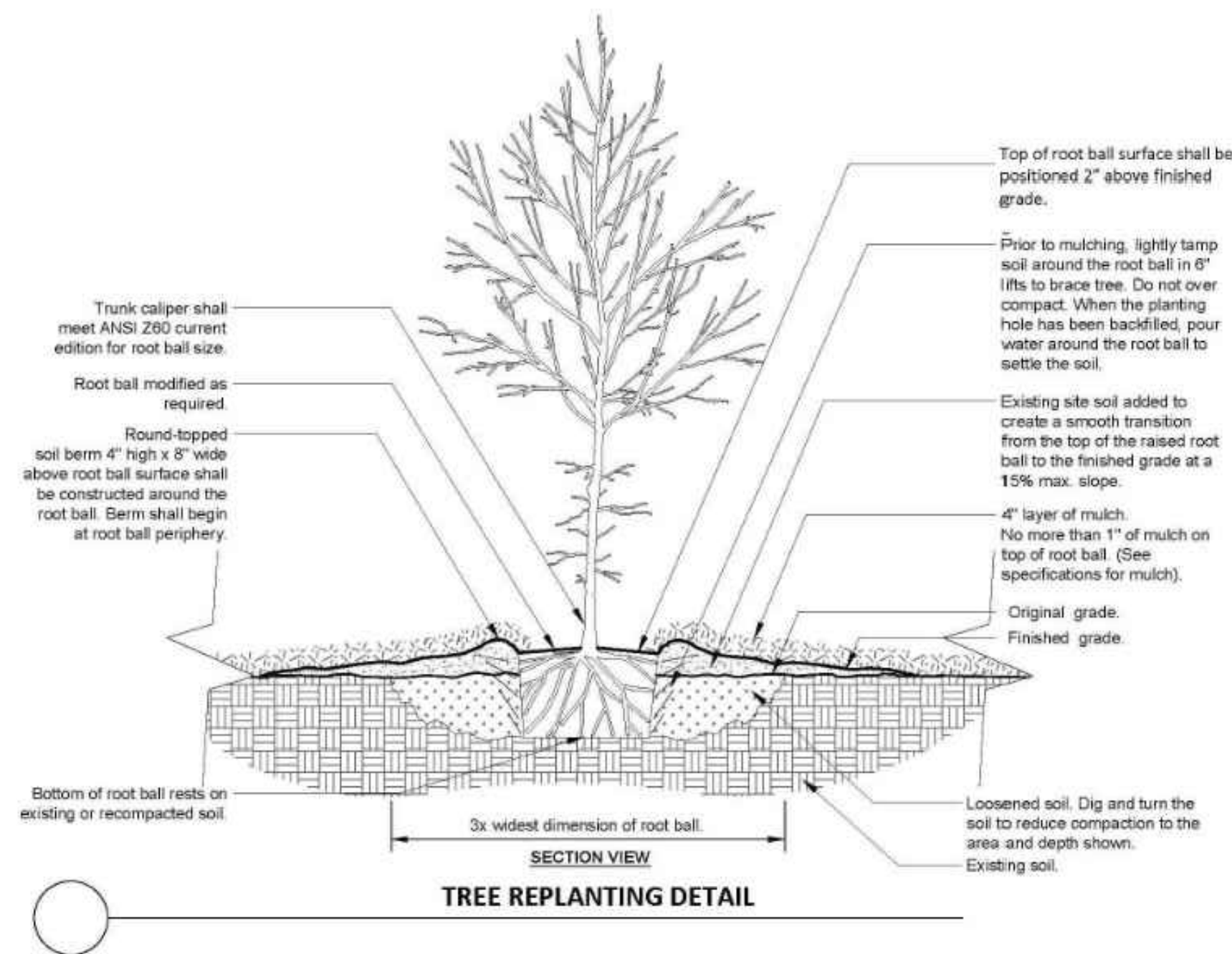
1. No pruning shall be performed unless under the direction of an arborist
2. No equipment shall be stored or operated inside the protective fencing including during fence installation and removal
3. No storage of materials shall occur inside the protective fencing
4. Refer to Site/Utility Plan for allowable modifications to the tree protection area.
5. Unauthorized activities in tree protection area may require evaluation by private arborist to identify impacts and mitigation required
6. Exposed roots: For roots > 1" damaged during construction, make a clean straight cut to remove damaged portion and inform City Arborist



Tree protection fence: 4-6" chain link fence, solidly anchored into the ground, or if authorized High-density polyethylene fencing with 3.5" x 1.5" openings; color orange. Steel posts installed at 8' o.c.

2" x 6" steel posts or approved equal

Maintain existing grade with the tree protection fence unless otherwise indication on the plans



**TREE REPLANTING DETAIL**

Owner/Developer:

Edward & Catherine Moran  
5000 West Mercer Way  
Mercer Island, WA 98040

Architect:

Plan One Fine Home Design  
5125 47th Ave S  
Seattle, WA 98118  
206-612-8511

Engineer:

**JM TEAM**  
Justin Jones, PE  
PO Box 2066  
Sumner, WA 98390  
(206) 596-2020

Project:

Moran Residence

ONE INCH AT FULL SCALE.  
IF NOT, SCALE ACCORDINGLY



REV	DATE	DESCRIPTION

SHEET TITLE:

Details

PROJ. NO. 1576001

DATE March 21, 2023

DRAWN BY: DESIGN BY:

SHEET NUMBER:

C-06

DWG.

CALL TWO BUSINESS DAYS BEFORE YOU DIG  
1-800-424-5555  
UTILITIES UNDERGROUND LOCATION CENTER





## **APPENDIX B**

# 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) <sup>(3)</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"	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	59	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 <sup>(1)</sup>	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 <sup>(1)</sup>	164	0.5	0.5	NA <sup>(1)</sup>	2.2	NA <sup>(1)</sup>	1.9
	48"	NA <sup>(1)</sup>	89	0.5	0.5	NA <sup>(1)</sup>	2.9	NA <sup>(1)</sup>	1.9
	60"	NA <sup>(1)</sup>	55	0.5	0.5	NA <sup>(1)</sup>	3.6	NA <sup>(1)</sup>	1.7
9,001 to 9,500 sf <sup>(2)</sup>	36"	NA <sup>(1)</sup>	174	0.5	0.5	NA <sup>(1)</sup>	2.2	NA <sup>(1)</sup>	2.1
	48"	NA <sup>(1)</sup>	94	0.5	0.5	NA <sup>(1)</sup>	2.9	NA <sup>(1)</sup>	2.0
	60"	NA <sup>(1)</sup>	58	0.5	0.5	NA <sup>(1)</sup>	3.7	NA <sup>(1)</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.

- 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.

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

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

<sup>(3)</sup> 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)

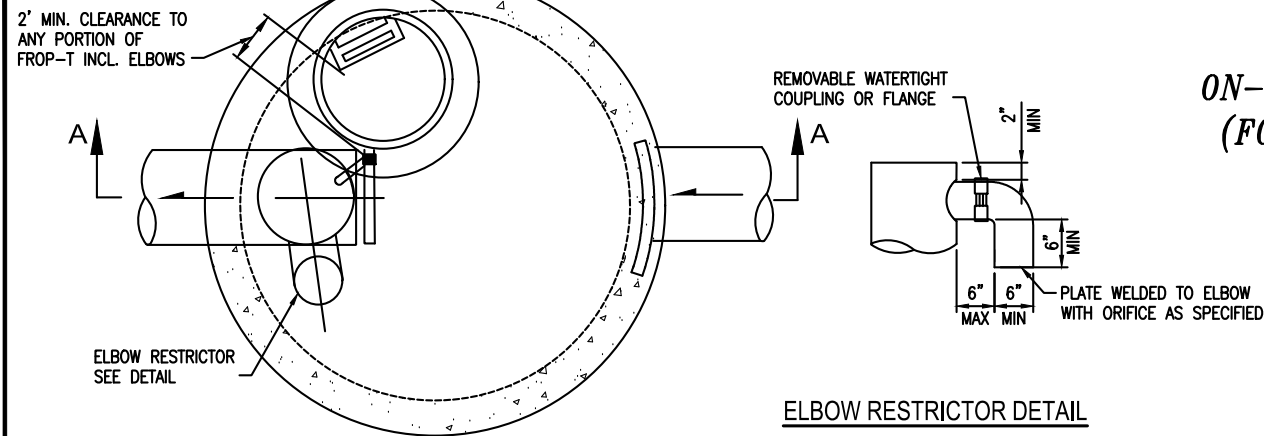
Developed = impervious (CN = 98)

0.5 foot of sediment storage in detention pipe

Overland slope = 5%

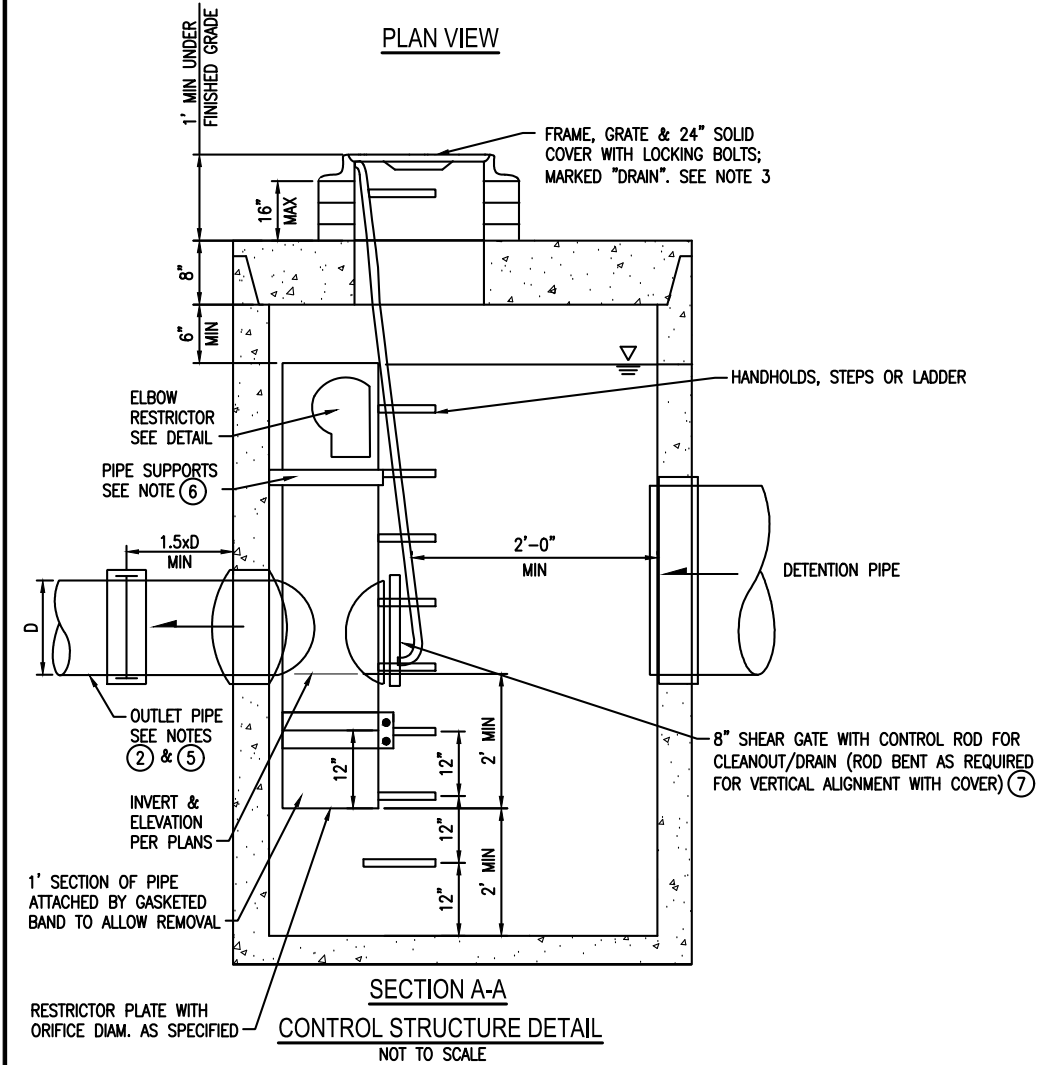


**ATTACHMENT 1**  
**CITY OF MERCER ISLAND**  
**ON-SITE DETENTION SYSTEM WORKSHEET**  
**(FOR NEW PLUS REPLACED IMPERVIOUS**  
**AREA OF 9,500 SF OR LESS)**

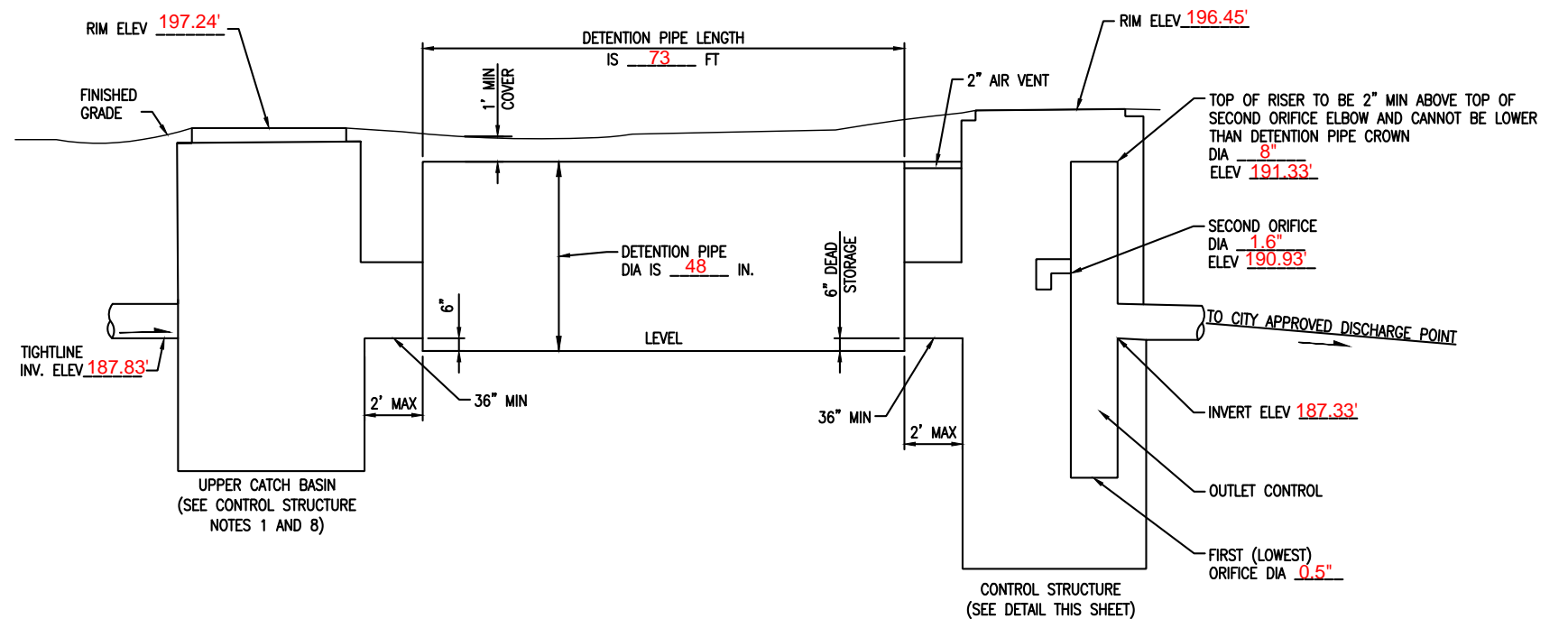


**ELBOW RESTRICTOR DETAIL**

OWNER: <u>Edward &amp; Cathrine Moran</u>	ADDRESS: <u>5000 West Mercer Way</u>	PREPARED BY: <u>Justin Jones</u>	
PERMIT #: _____	<u>Mercer Island, WA</u>	PHONE: <u>206-596-2020</u>	
		DATE: <u>04/20/2022</u>	
NEW PLUS REPLACED IMPERVIOUS SURFACE AREA (SF): <u>4.039 SF</u>	DETENTION PIPE DIA (INCH): <u>48"</u>	DETENTION PIPE LENGTH (FT): <u>73</u>	ORIFICE #1 DIA <u>0.5</u> INCH, ELEV <u>185.19'</u>
SOIL TYPE: <u>Type B</u>	PIPE MATERIAL: <u>HDPE</u>		ORIFICE #2 DIA <u>1.6</u> INCH, ELEV <u>188.79'</u>



**SECTION A-A**  
**CONTROL STRUCTURE DETAIL**  
 NOT TO SCALE



**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 MAINTANANCE 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 (LCPE), 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.

## **APPENDIX C**

# Technical Memorandum

Project: 5000 West Mercer Way, WA 98040  
Mordan Residence

From: Justin Jones, PE

RE: Storm Drainage Report - Driveway  
Pump System

Date: March 21, 2023

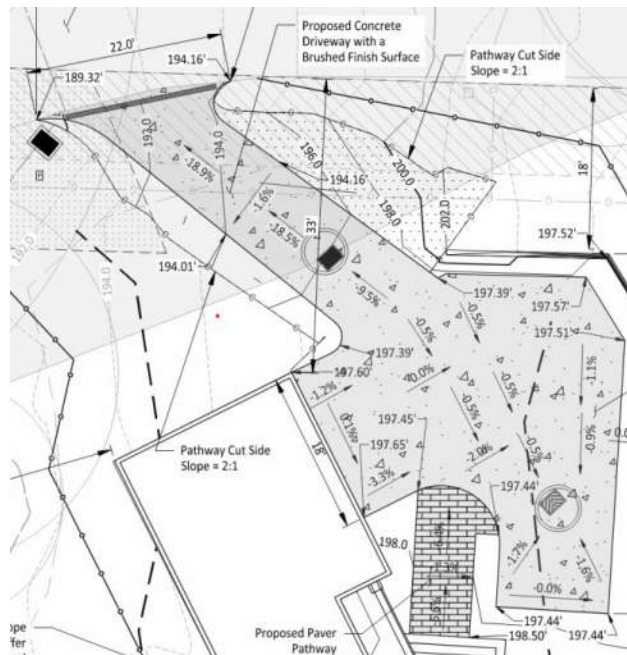


03/21/2023

## Introduction

This memo presents the criteria and methodology used for sizing the storm pump and force main conveying the driveway runoff to the detention pond. The proposed project site is a single-family project with a proposed 2,664 SF house, 1,312 SF driveway, 63 SF of retaining walls, and 119 SF of permeable paver path. The project adds more than 2,000 SF, but less than 5,000 SF of new plus replaced hard surfaces, therefore the runoff from the pollution generating surfaces does not have to be treated. An underground detention tank with a flow control structure will be used to manage stormwater runoff flows. The detention tank and control structure were sized per the City of Mercer Island on-site detention design requirements.

Runoff from part of the driveway will be conveyed to the detention tank using gravity flow through catch basins and storm lines. The remaining driveway runoff will be collected using a trench drain and pumped to the detention tank using a duplex pump system in a fiberglass basin. The pump system was sized based on the developed 100-year peak storm discharge rate, 0.009 cfs, for the portion of the driveway runoff that needs to be pumped to the detention tank, see driveway drainage plan below.



## Existing Site

The existing site has moderate slopes that span the site from east to west. Runoff from the existing landscaping currently flows to the west of the site. The driveway will slope up to the proposed house location. A detention tank will be placed below the driveway portion to the east of the proposed house.

## Proposed Storm Pump System

To maintain the existing stormwater flows, the runoff from the sloped driveway portion will be pumped to the detention tank where a control structure will limit the flows. The 100-year peak release rate of the trench drain is 0.009cfs/4.04 GPM, see WWHM modeling below.

The screenshot displays a software interface for stormwater modeling. On the left is a 'Schematic' window showing a grid with a small icon of a house and a trench drain. On the right is a 'Basin 1 Mitigated' configuration window. This window includes a 'Subbasin Name' field, a 'Designate as Bypass for POC' checkbox, and three tabs for 'Surface', 'Interflow', and 'Groundwater'. Below these are two columns of area types with checkboxes and 'Acres' values. A 'Flow Frequency' table is also present.

Area in Basin		Available Impervious	
Area	Acres	Area	Acres
<input type="checkbox"/> A/B, Forest, Flat	0	<input type="checkbox"/> ROADS/FLAT	0
<input type="checkbox"/> A/B, Forest, Mod	0	<input type="checkbox"/> ROADS/MOD	0
<input type="checkbox"/> A/B, Forest, Steep	0	<input type="checkbox"/> ROADS/STEEP	0
<input type="checkbox"/> A/B, Pasture, Flat	0	<input checked="" type="checkbox"/> ROOF TOPS/FLAT	0
<input type="checkbox"/> A/B, Pasture, Mod	0	<input type="checkbox"/> DRIVEWAYS/FLAT	0
<input type="checkbox"/> A/B, Pasture, Steep	0	<input checked="" type="checkbox"/> DRIVEWAYS/MOD	0
<input type="checkbox"/> A/B, Lawn, Flat	0	<input checked="" type="checkbox"/> DRIVEWAYS/STEEP	0.009
<input type="checkbox"/> A/B, Lawn, Mod	0	<input type="checkbox"/> SIDEWALKS/FLAT	0
<input type="checkbox"/> A/B, Lawn, Steep	0	<input type="checkbox"/> SIDEWALKS/MOD	0
<input type="checkbox"/> C, Forest, Flat	0	<input type="checkbox"/> SIDEWALKS/STEEP	0
<input checked="" type="checkbox"/> C, Forest, Mod	0	<input type="checkbox"/> PARKING/FLAT	0
<input type="checkbox"/> C, Forest, Steep	0	<input type="checkbox"/> PARKING/MOD	0
<input type="checkbox"/> C, Pasture, Flat	0	<input type="checkbox"/> PARKING/STEEP	0
<input type="checkbox"/> C, Pasture, Mod	0	<input type="checkbox"/> POND	0
<input type="checkbox"/> C, Pasture, Steep	0	<input type="checkbox"/> Porous Pavement	0
<input type="checkbox"/> C, Lawn, Flat	0		
<input type="checkbox"/> C, Lawn, Mod	0		
<input type="checkbox"/> C, Lawn, Steep	0		
<input type="checkbox"/> SAT, Forest, Flat	0		
<input type="checkbox"/> SAT, Forest, Mod	0		
<input type="checkbox"/> SAT, Forest, Steep	0		

Flow Frequency	
Flow (cfs)	0801 15m
2 Year	= 0.0042
5 Year	= 0.0054
10 Year	= 0.0062
25 Year	= 0.0072
50 Year	= 0.0080
100 Year	= 0.0088

Summary values from the interface:

- Pervious Total: 0 Acres
- Impervious Total: 0.009 Acres
- Basin Total: 0.009 Acres

A Grinder Pump Package system includes (2) 1/2 HP Grinder Pumps and a 36" x 72" fiberglass basin. The top of the fiberglass basin is at an elevation of 189.75'. The inlet of the pump in the fiberglass basin is at an invert elevation of 184.16' and will eventually discharge at an invert elevation of 190.33' in the Type 2 Catch Basin connected to the detention tank. Below is a summary of the proposed pump cycle and discharge velocity.

- Total Dynamic Head  $\approx$  6.17'
- Discharge Rate = 33 GPM
- Pump Cycle Minimum Storage Volume = 31.94 Gallons
- Time to Fill Minimum Storage Volume = 7.91 minutes
- Time to Discharge Minimum Storage Volume = 1.10 minutes
- Pump Cycle Time = 9.01 minutes
- Pump Cycles per Hour = 6.66

- Outlet Pipe: 1.25" Schedule 80 PVC
- Discharge Velocity = 8.62 ft/s

The proposed Grinder Pump Package system has a storage volume of 31.94 Gallons per pump cycle. Therefore, the pump will start after 7.91 minutes. Once the pump is turned on, the pump will run for 1.10 minutes before the "OFF" water level is reached. Subsequently, the cycle time is 9.01 minutes and there will be 6.66 cycles per an hour. See abbreviated pump specifications below.

Trusted. Tested. Tough.™

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.



SECTION: 2.25.021  
FM2882  
0817  
Supersedes  
0716

U.S. Patent No.  
8,562,287

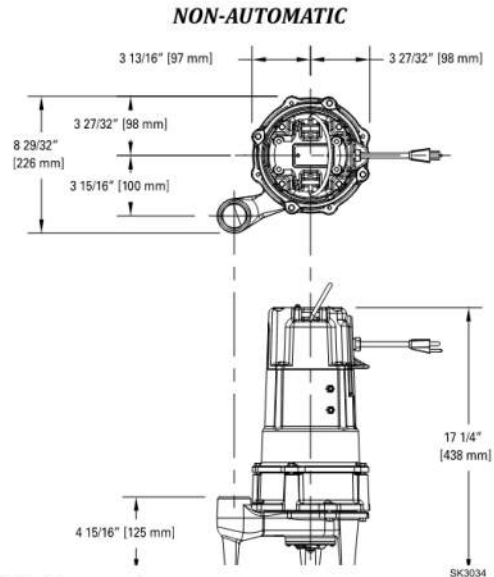
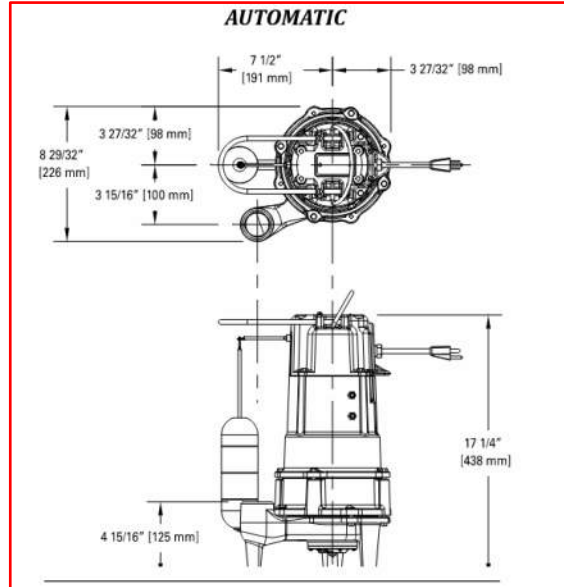
## TECHNICAL DATA SHEET SHARK GRINDER Model 803/805/807 Residential Grinder Pumps

### PRODUCT SPECIFICATIONS

<b>MOTOR</b>	Horse Power	0.5 - 1.0
	Voltage	115/230
	Phase	1 Ph
	Hertz	60 Hz
	RPM	3400
	Type	Capacitor start / Capacitor run
	Insulation	Class B
	Amps	115 V (7-11) / 230 V (3-5)
<b>PUMP</b>	Operation	Automatic & nonautomatic
	Auto On/Off Points	13" (33 cm) / 5-3/4" (14.6 cm)
	Discharge Size	1.25" NPT
	Cord Length	15' (5 m) standard
	Cord Type	UL listed 3-wire plug
	Max. Head	55' (16.8 m)
	Max. Operating Temp.	130° F (54 °C)
	Cooling	Oil
<b>MATERIALS</b>	Motor Protection	Auto reset thermal overload (1 Ph)
	Cover	Cast iron
	Motor housing	Cast iron
	Adapter	Cast iron
	Pump housing	Cast iron
	Upper Bearing	Ball bearing
	Lower Bearing	Ball bearing
	Mechanical Seals	Carbon and ceramic
	Impeller Type	Non-clogging vortex
	Impeller	Engineered plastic
	Hardware	Stainless steel
Motor Shaft	1215 cold rolled steel	
Gasket	Neoprene	
Cutter & Plate	440C Stainless Steel	

NOTE: The sizing of effluent systems normally requires variable level float(s) controls and properly sized basins to achieve required pumping cycles or dosing timers with nonautomatic pumps.

NOTE: See model comparison chart for specific details.

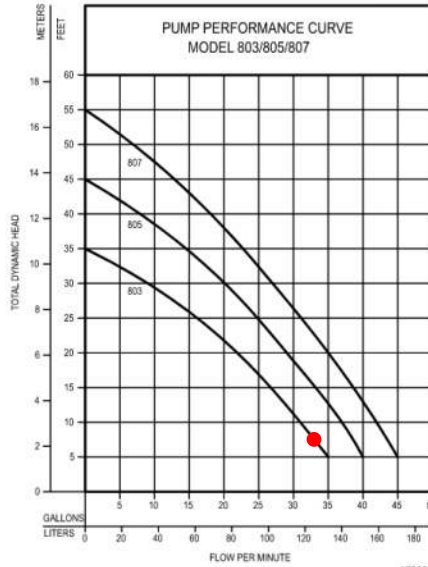


© Copyright 2017 Zoeller® Co. All rights reserved.

502-778-2731 | 800-928-7867 | 3649 Cane Run Road | Louisville, KY 40211-1961 | www.zoeller.com

**TOTAL DYNAMIC HEAD  
FLOW PER MINUTE**

MODEL		803		805		807	
Feet	Meters	Gal.	Liters	Gal.	Liters	Gal.	Liters
5	1.5	35	132	40	151	45	170
10	3.0	31	117	37	140	42	159
20	6.1	22	83	29	110	35	132
30	9.1	9	34	20	76	27	102
40	12.2	--	--	8	30	18	68
50	15.2	--	--	--	--	7	26
Shut-off Head:		35 ft. (10.7 m)		45 ft. (13.7 m)		55 ft. (16.8 m)	



Model	MODEL COMPARISON										
	Seal	Mode	Volts	Ph	Amps	HP	Hz	Lbs.	Kg	Simplex	Duplex
M803	Single	Auto	115	1	7.0	0.5	60	65	29	1	3
N803	Single	Non	115	1	7.0	0.5	60	65	29	2	2 & 3
BN803	Single	Auto	115	1	7.0	0.5	60	65	29	4	3
D803	Single	Auto	230	1	3.0	0.5	60	65	29	1	3
E803	Single	Non	230	1	3.0	0.5	60	65	29	2	2 & 3
BE803	Single	Auto	230	1	3.0	0.5	60	65	29	4	3
M805	Single	Auto	115	1	9.0	0.75	60	65	29	1	3
N805	Single	Non	115	1	9.0	0.75	60	65	29	2	2 & 3
BN805	Single	Auto	115	1	9.0	0.75	60	65	29	4	3
D805	Single	Auto	230	1	4.0	0.75	60	65	29	1	3
E805	Single	Non	230	1	4.0	0.75	60	65	29	2	2 & 3
BE805	Single	Auto	230	1	4.0	0.75	60	65	29	4	3
M807	Single	Auto	115	1	11.0	1.0	60	65	29	1	3
N807	Single	Non	115	1	11.0	1.0	60	65	29	2	2 & 3
BN807	Single	Auto	115	1	11.0	1.0	60	65	29	4	3
D807	Single	Auto	230	1	5.0	1.0	60	65	29	1	3
E807	Single	Non	230	1	5.0	1.0	60	65	29	2	2 & 3
BE807	Single	Auto	230	1	5.0	1.0	60	65	29	4	3

**SELECTION GUIDE**

1. Integral float-operated mechanical switch, no external control required.
2. For automatic use single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
3. See FM0486 for correct model of duplex control panel.
4. Single piggyback switch included.

**CAUTION** All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).



## OUTDOOR BASINS AND ACCESSORIES

### SIMPLEX OUTDOOR BASINS - FIBERGLASS ONLY - NO HOLES DRILLED

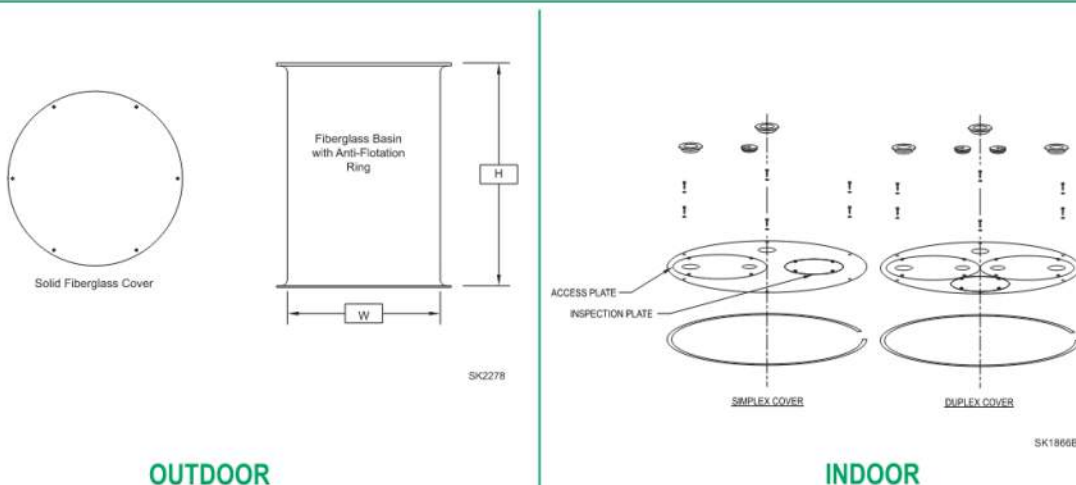
Size	Item No.	Description
24" X 48"	31-0866	Solid Fiberglass Basin with Solid Fiberglass Cover and Anti-Flotation Ring
24" X 60"	31-0946	Solid Fiberglass Basin with Solid Fiberglass Cover and Anti-Flotation Ring
24" X 72"	31-0594	Solid Fiberglass Basin with Solid Fiberglass Cover and Anti-Flotation Ring
30" X 48"	31-1830	Solid Fiberglass Basin with Solid Fiberglass Cover and Anti-Flotation Ring
30" X 60"	31-1831	Solid Fiberglass Basin with Solid Fiberglass Cover and Anti-Flotation Ring
30" X 72"	31-1586	Solid Fiberglass Basin with Solid Fiberglass Cover and Anti-Flotation Ring

All basins include 5 field installed adapta-flex seals - (1) 1¼", (1) 1½", (2) 2" and (1) 4" grommets.

### DUPLIX OUTDOOR BASINS - FIBERGLASS ONLY - NO HOLES DRILLED

Size W X H	Item No.	Description
36" X 48"	31-1450	Solid Fiberglass Basin with Solid Fiberglass Cover and Anti-Flotation Ring
36" X 60"	31-1451	Solid Fiberglass Basin with Solid Fiberglass Cover and Anti-Flotation Ring
36" X 72"	31-1452	Solid Fiberglass Basin with Solid Fiberglass Cover and Anti-Flotation Ring

All basins include 5 field installed adapta-flex seals - (1) 1¼", (1) 1½", (2) 2" and (1) 4" grommets.  
 ADDITIONAL BASIN SIZES WITH OPTIONS (i.e. Rail Studs) ARE AVAILABLE. CONSULT FACTORY.



OUTDOOR

INDOOR

### OUTDOOR TANK VENTS

Item No.	Color	Material	Size	Dimension (W x H)	Pipe Area	Screen Area
10-1753	Black	Plastic	2" Female NPT	4.625" X 3.125"	3.1 sq. in.	6.9 sq. in.
10-1461	Green	Metal	2" Female NPT	4.625" X 3.125"	3.1 sq. in.	6.9 sq. in.
10-1462	Green	Metal	3" Female NPT	6.875" X 4.500"	7.1 sq. in.	19.6 sq. in.
10-1463	Green	Metal	4" Female NPT	9.250" X 5.000"	12.6 sq. in.	35.8 sq. in.
10-1464	Green	Metal	6" Female NPT	11.125" X 6.625"	28.3 sq. in.	42.5 sq. in.



MAIL TO: P.O. BOX 16347 • Louisville, KY 40256-0347  
 SHIP TO: 3649 Cane Run Road • Louisville, KY 40211-1961  
 (502) 778-2731 • 1 (800) 928-PUMP • FAX (502) 774-3624

visit our web site:  
[www.zoeller.com](http://www.zoeller.com)

Your Peace of Mind is Our Top Priority®

© Copyright 2013 Zoeller Co. All rights reserved.

