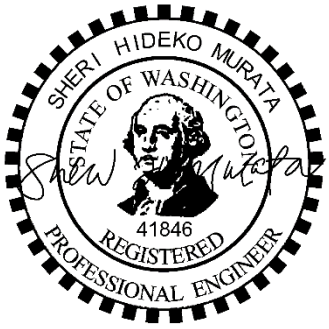
PRELIMINARY

STORM DRAINAGE REPORT

FOR

Cheshire Short Plat

CITY OF MERCER ISLAND, WASHINGTON



6/8/2020

Project Manager:	**Robert West, PLS**
Prepared by:	**Andrew Oh, E.I.T.**
Approved by:	**Sheri H. Murata, P.E.**
Date:	**June 2020**
Revised:	
Core No.:	**19205**

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SECTION 1.Contents

SECTION 1. PROJECT OVERVIEW

The project site is located at 7615 E Mercer Way in the city of Mercer Island. Specifically, the project is located on Section 30, Township 24, Range 5. The site is bordered by single family residentials to the north, south, and west and E Mercer Way to the east. The King County tax parcel ID number is 3024059036.

The lot is 11,154 SF (0.26 ac). The lot currently drains from west to east at approximately 25% towards E Mercer Way. Proposed development of the property will include subdivision of the parcel into two separate lots. One lot will remain as is with the existing structure. The other lot will be developed with a new building, driveway, and associated utilities.

The project will be designed using the guidelines and requirements established in the 2012 Department of Ecology Stormwater Management Manual for Western Washington as amended in December 2014 (2014 SWMMWW). This project will be adding less than 5,000 square feet of new pollution generating impervious surface (PGIS) so water quality treatment will not be required or proposed. See Figure 1.1 Vicinity Map below.

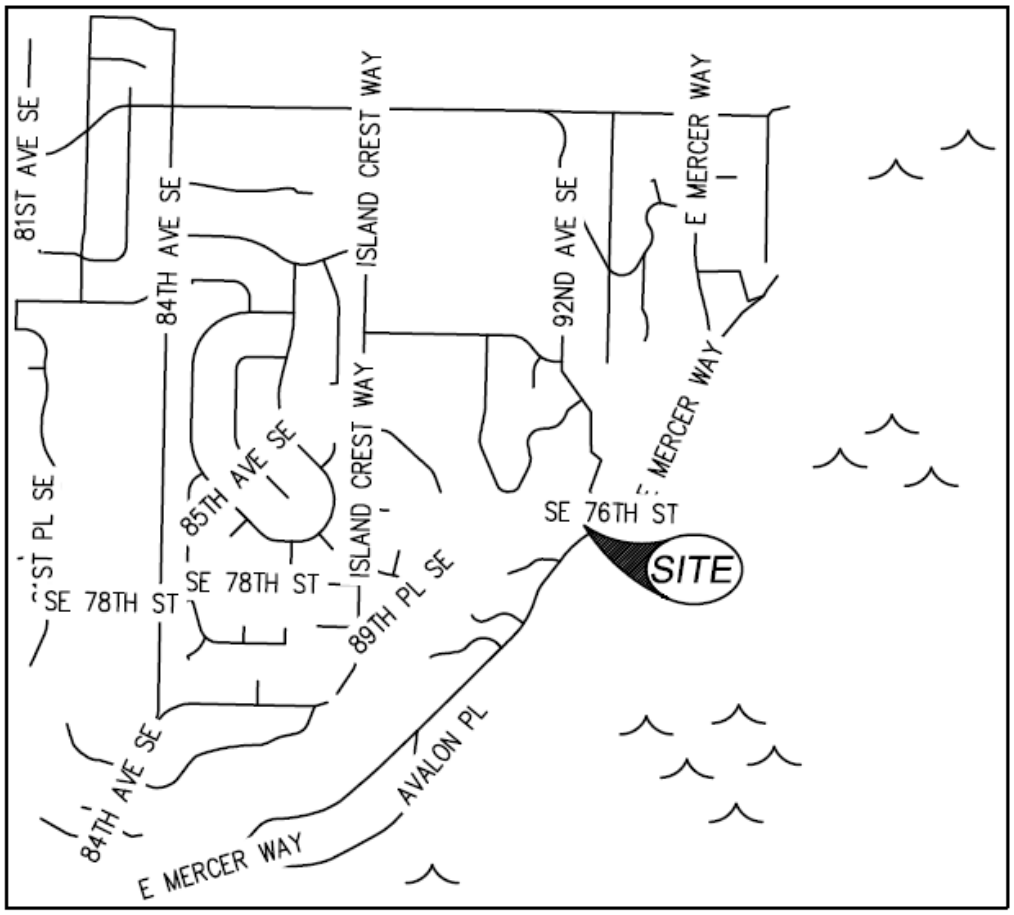


Figure 1.1: Vicinity Map

SECTION 2. CONDITIONS AND REQUIREMENTS SUMMARY

The project has less than 25% of existing impervious coverage, therefore the project is classified as a new development project. Per Figure 2.1 located at the end of this section, the proposed project will only have to address minimum requirements 1 through 5. The applicable minimum requirements and how the project proposes to address each are listed below.

2.1 Minimum Requirements

2.1.1 Minimum Requirement #1: Preparation of Stormwater Site Plans

Civil Plans submitted under separate cover and a Drainage Report herein have been prepared for the subject project.

2.1.2 Minimum Requirement #2: Construction Stormwater Pollution Prevention

The SWPPP will be provided prior to final submittal.

2.1.3 Minimum Requirement #3: Source Control of Pollution

The project is not a commercial project, therefore this requirement does not apply.

2.1.4 Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls

The project will discharge to the existing conveyance system located on E Mercer Way, maintaining the natural discharge location for the site.

2.1.5 Minimum Requirements #5: On-site Stormwater Management

This project triggers minimum requirement 1 through 5 per the 2014 SWMMWW. The project elects to implement BMPs from List #1. A feasibility discussion of BMPs from list #1 can be found below.

List #1

Lawn and Landscaped areas:

- Post-Construction Soil Quality and Depth:
    - BMP T5.13 will be implemented in accordance with the 2014 SWMMWW.

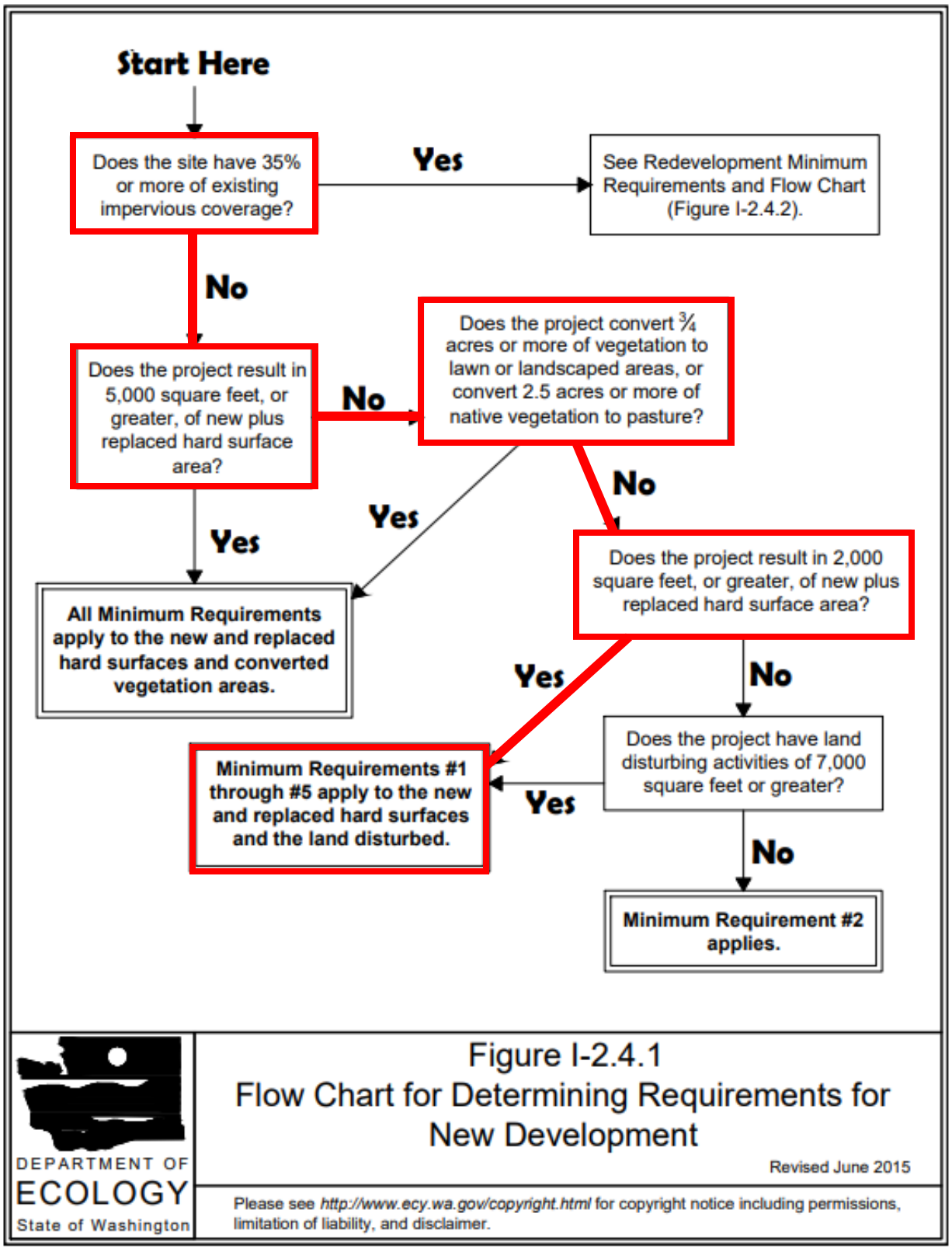
Roofs:

- Full Dispersion:
    - Full dispersion systems are infeasible due to being unable to meet the flow path requirement of 100 ft of native vegetation.
- Downspout Full Infiltration:
    - Per the Geotechnical Report, “subsurface conditions are generally not favorable for infiltration of site stormwater. The native soils observed at the site contain a high percentage of soil fines that would impede any downward migration of site stormwater. Even low impact development (LID) techniques would likely fill up and overtop.” Therefore, infiltration is considered infeasible.
- Rain Gardens:

    - Per the Geotechnical Report, “subsurface conditions are generally not favorable for infiltration of site stormwater. The native soils observed at the site contain a high percentage of soil fines that would impede any downward migration of site stormwater. Even low impact development (LID) techniques would likely fill up and overtop.” Therefore, infiltration is considered infeasible.
- Downspout Dispersion Systems:
    - Downspout dispersion systems are infeasible due to being unable to meet the flow path requirements.
- Perforated Stub-out Connections:
    - A perforated stub-out connection is feasible due to groundwater being found at a typical depth of 10 feet per the geotechnical report. The project will implement 10 feet of perforated pipe in a level 2 foot wide trench backfilled with washed drain rock.

Other Hard Surfaces:

- Full Dispersion:
    - Full dispersion systems are infeasible due to being unable to meet the flow path requirement of 100 ft of native vegetation.
- Permeable pavement:
    - Per the Geotechnical Report, “subsurface conditions are generally not favorable for infiltration of site stormwater. The native soils observed at the site contain a high percentage of soil fines that would impede any downward migration of site stormwater. Even low impact development (LID) techniques would likely fill up and overtop.” Therefore, infiltration is considered infeasible.
- Rain gardens:
    - Per the Geotechnical Report, “subsurface conditions are generally not favorable for infiltration of site stormwater. The native soils observed at the site contain a high percentage of soil fines that would impede any downward migration of site stormwater. Even low impact development (LID) techniques would likely fill up and overtop.” Therefore, infiltration is considered infeasible.
- Bioretention:
    - Per the Geotechnical Report, “subsurface conditions are generally not favorable for infiltration of site stormwater. The native soils observed at the site contain a high percentage of soil fines that would impede any downward migration of site stormwater. Even low impact development (LID) techniques would likely fill up and overtop.” Therefore, infiltration is considered infeasible.
- Sheet Flow Dispersion:
    - Sheet flow dispersion is not allowed per the pre app notes in the Civil Engineering Comments, “No sheet flow is allowed for this site”.


Start Here
Does the site have 35% or more of existing impervious coverage?
Yes
See Redevelopment Minimum Requirements and Flow Chart (Figure I-2.4.2).
No
Does the project result in 5,000 square feet, or greater, of new plus replaced hard surface area?
No
Does the project convert ¾ acres or more of vegetation to lawn or landscaped areas, or convert 2.5 acres or more of native vegetation to pasture?
Yes
Yes
No
All Minimum Requirements apply to the new and replaced hard surfaces and converted vegetation areas.
Does the project result in 2,000 square feet, or greater, of new plus replaced hard surface area?
Yes
No
Minimum Requirements #1 through #5 apply to the new and replaced hard surfaces and the land disturbed.
Yes
Does the project have land disturbing activities of 7,000 square feet or greater?
No
Minimum Requirement #2 applies.
DEPARTMENT OF ECOLOGY
State of Washington
Figure I-2.4.1
Flow Chart for Determining Requirements for New Development
Revised June 2015
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SECTION 3. OFFSITE ANALYSIS

Summary

King County iMap was used to verify that the project site is not within a floodplain and that no drainage complaints have been filed along the downstream path. The City of Mercer Island maps for erosion and landslide hazard areas were consulted, and the project is located within an area of known or suspect to both erosion and landslides. A geotechnical report was consulted for site specific analysis. The Geotechnical report confirmed the site is located in an erosion hazard area and provided erosion and sediment control BMPs to implement to prevent and control erosion. The site is not located in a landslide hazard area. All resources reviewed can be found in Appendix A.

Field Investigation

The site contains a single family residence and the rest of the site is covered in long grass with scattered trees. Currently, stormwater sheet flows to the east and southeast, towards E Mercer Way. Stormwater runoff leaves the site along the east property line and into the flow line along E Mercer Way flowing east. No existing or potential drainage issues were observed on site or along the downstream drainage path. Refer to the drainage description below.

Drainage System Description

Stormwater runoff exits the side along the east property line into the flow line of E Mercer Way. Runoff travels north east briefly until it enters the existing 12” pipe conveyance system. The conveyance system then flows east approximately 200 ft before entering an open water stream for approximately 40 ft. The runoff then enters into another pipe system that continues to flow east before exiting into another open water stream for 60 ft. Finally the stream enters a pipe system and discharges directly into Lake Washington. This is the end of the ¼ mile analysis. A downstream map exhibit can be found below.

Downstream Exhibit

Legend

- Storm Catch Basin
  - CB, City Owned
  - CB, Private
  - CB, Unknown
  - Type 2, City Owned
  - Type 2, Private
  - Type 2, Unknown
- Storm Main
  - Pipe
  - Open Watercourse
  - Piped Watercourse
  - Ditch
  - Culvert
  - Other
- Storm Main - Private
- Storm Discharge Poir
- Address
- Building
- Property Line
- Docks
- Freeway
- Street
- Paved Road
- Paved Driveway
- Paved Parking Area
- Parks
- Lake Washington

1: 1,467

187.1 0 93.54 187.1 Feet

Map Printed: May 21, 2020

Notes

SECTION 4. FLOW CONTROL AND WATER QUALITY DESIGN

The project is exempt from Flow Control and Water Quality Treatment. According to the City of Mercer Island's Stormwater Management Standards, we must check for the need for on-site detention to attenuate flows rather than meet flow control standards.

On-site detention is required if the project:

- Results in 2,000 sf, or greater, of new plus replaced hard surface area, or
- Has a land disturbing activity of 7,000 sf or greater, or
- Results in a net increase of impervious surface of 500 sf or greater.

AND

- All of the on-site stormwater BMPs included on list #1 and #2 are determined to be infeasible for roofs and/or other hard surfaces, and
- 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

Table 4.1 Developed Conditions	
Surface Type	**Areas (SF)**
Impervious	**2,415**
Roof	1,628
Driveway	787
Pervious	**8,815**
Lawn	8,815
Total Area	**11,230**

From Table 4.1, there will be greater than 2,000 SF of new plus replaced hard surface area and all BMPs are determined to be infeasible. The drainage will also be discharged directly to Lake Washington. Therefore, the proposed project requires on-site detention.

The tank will be 60" in diameter and 20' in length. The table below shows the sizing of the required detention tank.

Table 1

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

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

Notes:

▪ Minimum Requirement #7 (Flow Control) is required when the 100-year flow frequency causes a 0.15 cubic feet per second increase (when modeled in WWHM with a 15-minute timestep). Breakpoints shown in this table are based on a flat slope (0-5%). The 100-year flow frequency will need to be evaluated on a site-specific basis for projects on moderate (5-15%) or steep (> 15%) slopes.

▪ Soil type to be determined by geotechnical analysis or soil map.

▪ Sizing includes a Volume Correction Factor of 120%.

▪ Upper bound contributing area used for sizing.

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

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

[3] Minimum orifice diameter = 0.5 inches

in = inch

ft = feet

sf = square feet

Basis of Sizing Assumptions:

Sized per MR#5 in the Stormwater Management Manual for Puget Sound Basin (1992 Ecology Manual)

SBUH, Type 1A, 24-hour hydrograph

2-year, 24-hour storm = 2 in; 10-year, 24-hour storm = 3 in; 100-year, 24-hour storm = 4 in

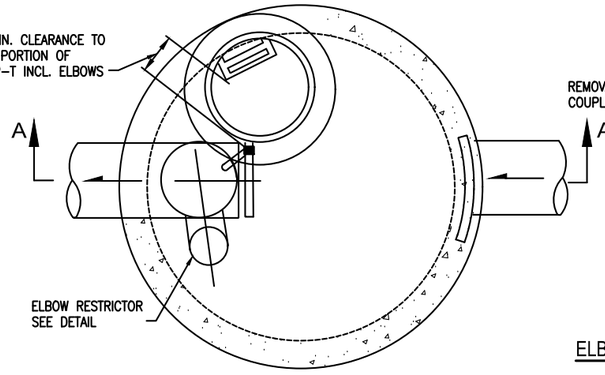
Predeveloped = second growth forest (CN = 72 for Type B soils, CN = 81 for Type C soils)

Developed = impervious (CN = 98)

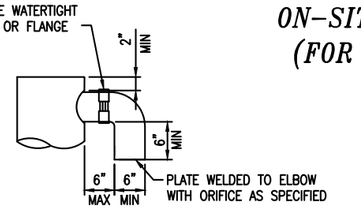
0.5 foot of sediment storage in detention pipe

Overland slope = 5%

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

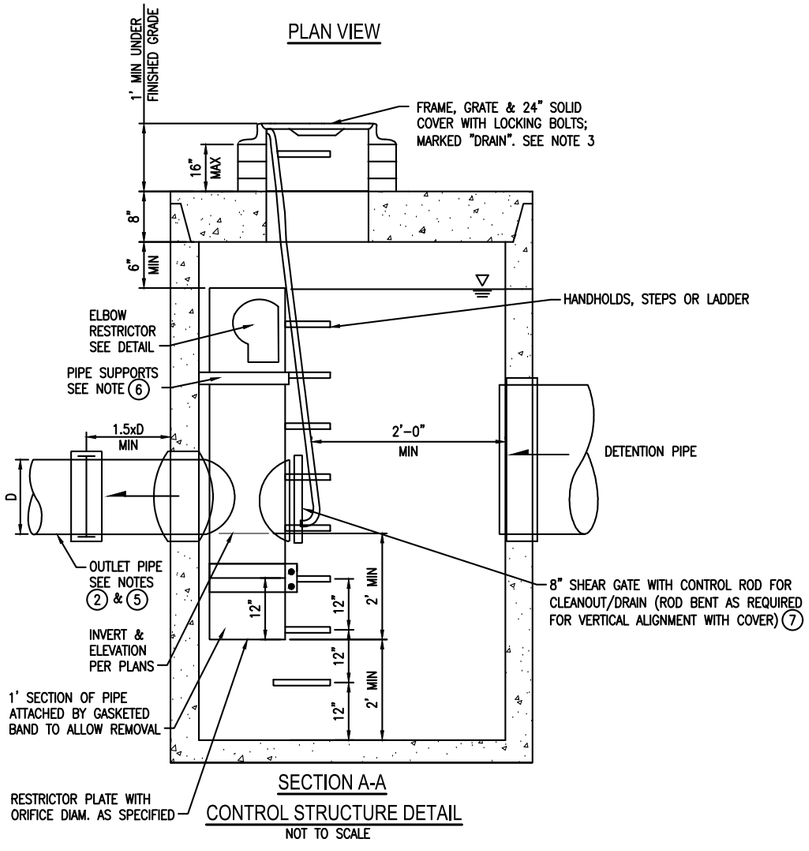


PLAN VIEW



ELBOW RESTRICTOR DETAIL

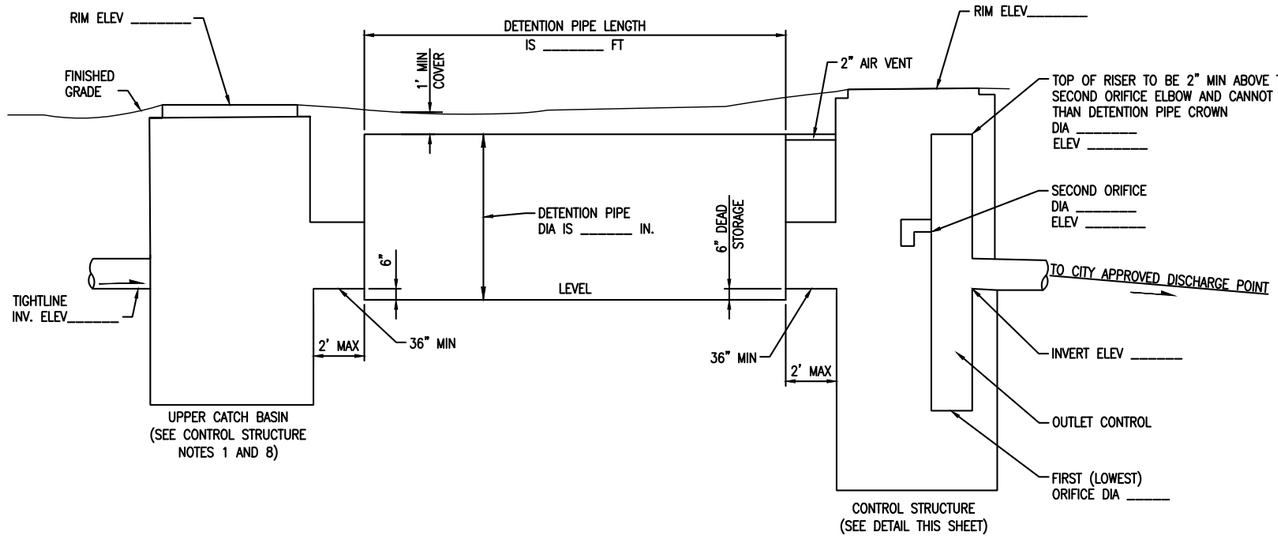
OWNER: _____	ADDRESS: _____	PREPARED BY: _____
PERMIT #: _____	_____	PHONE: _____
		DATE: _____
NEW PLUS REPLACED IMPERVIOUS SURFACE AREA (SF): _____	DETENTION PIPE DIA (INCH): _____	DETENTION PIPE LENGTH (FT): _____
SOIL TYPE: _____	PIPE MATERIAL: _____	



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. STANLESS 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.

SECTION 5.CONVEYANCE SYSTEM ANALYSIS AND DESIGN

Conveyance analysis will be done for final submittal.

SECTION 6. SPECIAL REPORTS AND STUDIES

The following reports and assessments are provided for reference, under separate cover and for informational purposes only. Core Design takes no responsibility or liability for these reports, assessments or designs as they were not completed under the direct supervision of Core Design.

- Geotechnical Engineering Report (Provided under separate cover)
  May 12, 2020
  Prepared for:
  Cheshire Short Plat
  Prepared by:
  Terra Associates, Inc.
  12220 113th Avenue Ne, Ste. 130
  Kirkland, WA 98034

- Arborist Report (Provided under separate cover)
  April 1, 2020
  Prepared for:
  Cheshire Short Plat
  Prepared by:
  A.B.C Consulting Arborists LLC

SECTION 7. OTHER PERMITS

There are no other permits required at this time.

SECTION 8. CSWPPP ANALYSIS AND DESIGN

TESC Analysis and CSWPPP will be provided for final submittal.

SECTION 9. BOND QUANTITIES, FACILITY SUMMARIES, AND DECLARATION OF COVENANT

9.1 Bond Quantities

This will be provided prior to final engineering approval if necessary.

9.2 Facility Summaries

Not applicable.

9.3 Declaration of Covenant

To be submitted prior to final engineering approval.

SECTION 10. OPERATIONS AND MAINTENANCE

The project is exempt from minimum requirement #9 Operations and Maintenance.

Appendix A

Mercer Island Erosion Hazard Assessment

by Kathy G. Troost & Aaron P. Wisher
April 2009

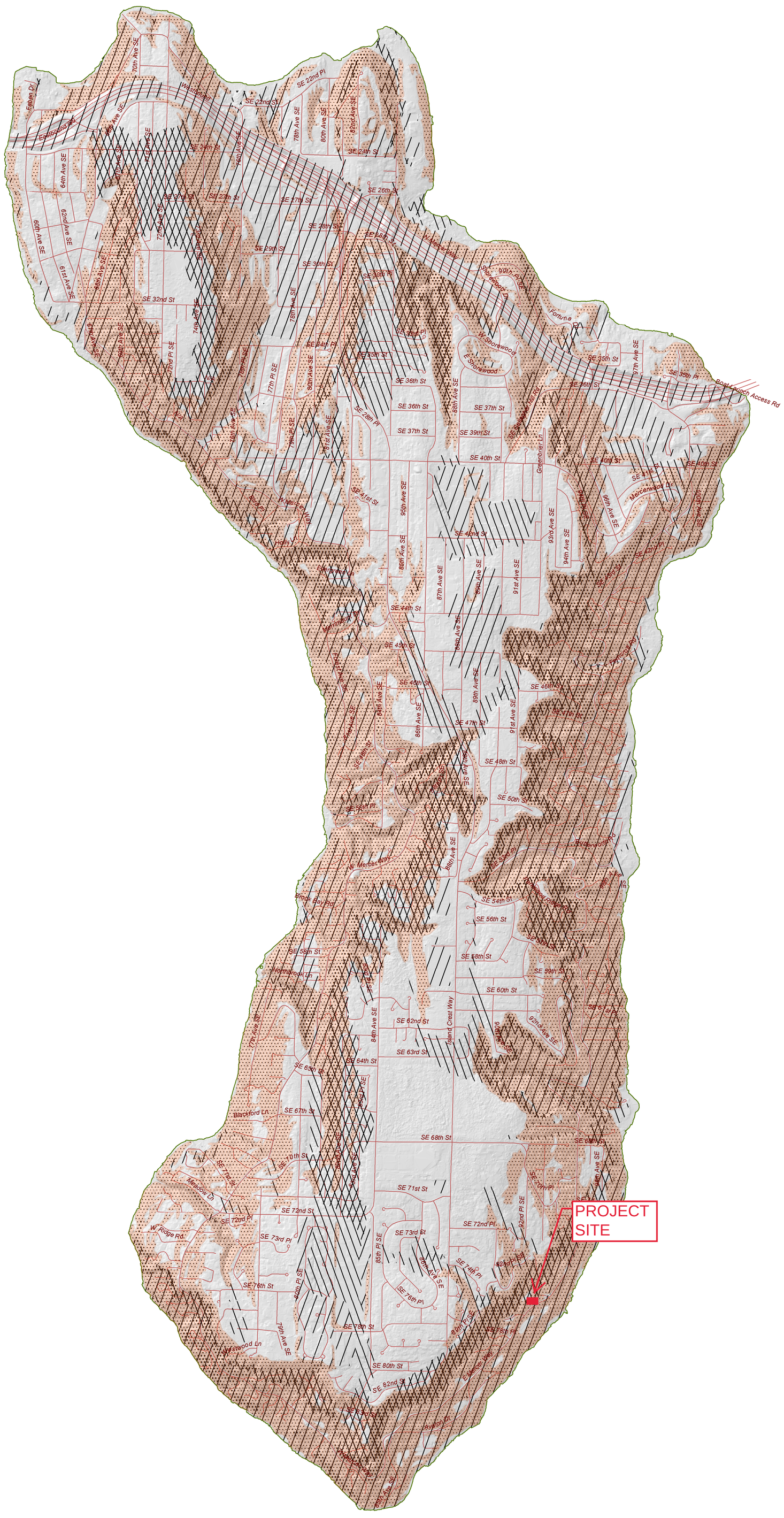
geomapnw.ess.washington.edu

0 0.5 1 Kilometers

0 0.5 1 Miles

1:12,000

T N



EROSION HAZARD AREAS (MICC 19.16.010)

Erosion hazards areas include those areas greater than 15% slope and subject to a severe risk of erosion due to wind, rain, water, slope and other natural agents including those soil types and/or areas identified by the U.S. Department of Agriculture's Natural Resource Conservation Service as having a "severe" or "very severe" rill and inter-rill erosion hazard.

Another factor in evaluating erosion potential is infiltration potential. If sandy material is present at the ground surface, rain water can infiltrate and loosen material for removal by erosion. Therefore the areas of sandy material have also been added to this hazard map for consideration along with the slope and erodible soils subclass.

Contributing factors not shown on the map include rainfall, areas of shallow groundwater, ground cover, wind, impervious surfaces, and changes to the ground surface. These factors and all the categories shown on the map should be used together to assess erosion potential. Individual areas less than 0.3 acres in size have been excluded.

Erosion Hazard

- Erosion Hazard Area (Known or Suspect)

For all other areas, hazard is unknown or unquantified

Supplemental Data

Infiltration Potential

- High - Coarse-grained deposits; e.g. gravel and clean sand
- Medium - Silty, sandy deposits
- Mixed - Interbedded or mixed fine and coarse-grained deposits

Slope Class

- Slope 80+%
- Slope 40-79%
- Slope 15-39%

GENERAL NOTES FOR GEOLOGICAL HAZARDS MAPS

This map is one of a suite of revised Geological Hazard Maps for the City of Mercer Island. This suite includes maps showing Seismic Hazards, Landslide Hazards, and Erosion Hazards.

Other geological and/or natural hazards may exist and geological events may occur on Mercer Island that are not specifically identified on these maps. Examples of geologic hazards and hazardous events that are not identified on these maps include, but are not limited to, tsunamis and seiches in Lake Washington.

These maps are for the sole use of the staff of the City of Mercer Island's Development Services Group (DSG) for the purposes of permit application evaluation. These maps provide DSG staff a general assessment of known or suspect geological hazard areas for which the City will require site and project-specific evaluation by a Washington State-licensed engineer, geologist or engineering geologist prior to issuing a permit for site development. All areas have not been specifically evaluated for geologic hazards and there may be locations that are not correctly represented on these maps. It is the responsibility of individual property owners and map users to evaluate the risk associated with their proposed development. No site-specific assessment of risk is implied or otherwise indicated by the City of Mercer Island by these maps.

The City of Mercer Island is using guidance provided by the State of Washington regarding the definition of geologically hazardous areas in accordance with WAC 365-190-080 and the Growth Management Act. "Geologically hazardous areas", by State definition, "include areas susceptible to erosion, sliding, earthquake, or other geological events. They pose a threat to the health and safety of citizens when incompatible commercial, residential, or industrial development is sited in areas of significant hazard."

This new set of maps represents an update of the 2002 Geologic Hazard Map Series and is based on a review of Best Available Science for the Seattle Fault and related events, a new Geological Map of Mercer Island by Troost and Wisher (2006), and a geologic database of Mercer Island compiled by GeoMapNW at the University of Washington. Information about data used for the maps, references, and data limitations are all described in an associated "Read Me" document. The digital version of these maps is accompanied by a meta data file containing pertinent information about map construction. These data and maps are all available on the City of Mercer Island website.

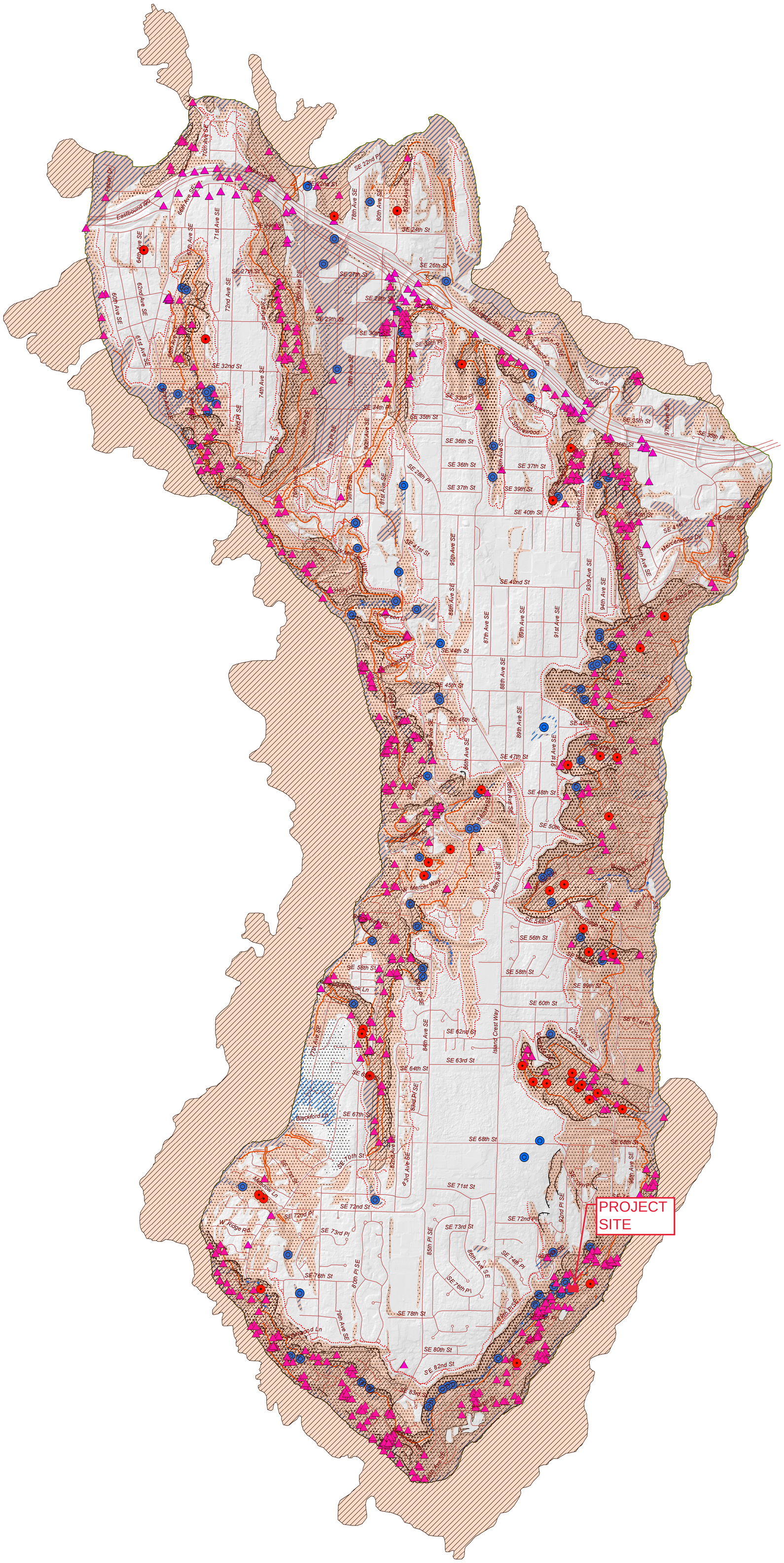
Mercer Island Landslide Hazard Assessment

by Kathy G. Troos & Aaron P. Wisher
April 2009

geomapnw.ess.washington.edu

0 0.5 1 Kilometers 1:12,000
0 0.5 1 Miles

N



LANDSLIDE HAZARD AREAS
(WAC 365-190-080 4d and MICC 19.16.010)

Landslide hazard areas include areas potentially subject to landslides based on a combination of geologic, topographic, and hydrologic factors. They include areas susceptible because of any combination of bedrock, soil, slope (gradient), slope aspect, structure, hydrology, or other factors.

Areas susceptible to landsliding on Mercer Island include:

i. Areas of historic failure or that have been documented on published maps; *See mapped known landslides below*;
ii. Slopes steeper than 15%, intersecting a geologic contact of relatively permeable deposits over relatively impermeable deposits, and with springs or groundwater seepage; *See mapped potential slide areas below*;
iii. Areas that have shown movement during the Holocene epoch (last 10,000 years) or which are covered by Holocene-age mass wasting deposits; *See mapped known landslides below*;
iv. Slopes parallel or sub-parallel to planes of weakness (such as bedding planes, joint systems, and fault planes) in subsurface materials; *None identified on map, but may be locally present;*
v. Slopes having gradients steeper than 80% subject to rockfall during seismic shaking; *See slope classification below*;
vi. Areas potentially unstable as a result of rapid stream incision, stream bank erosion, and undercutting by wave action; *See mapped erosion locations below*;
vii. Areas that show evidence of, or are at risk from snow avalanche; *None identified on Mercer Island*;
viii. Areas located in a canyon or on an active alluvial fan, presently or potentially subject to inundation by debris flows or catastrophic flooding; *None identified on Mercer Island*;
ix. Any area with a slope of 40% or steeper and with a vertical relief of ten or more feet except where composed of consolidated rock; *See slope classification below*.

Landslide hazard areas include the following mapped areas:

Landslide Hazard
- Landslide Hazard Area (Known or Suspect)
- Landslide Hazard Assessment Setback

For all other areas hazard is unknown or unquantified

Supplemental Data

Known Landslides (i,iii)
- Identified Landslide Location
- Scarp
- Landslide and Mass Wasting Deposits; subaerial and subaqueous

Slope (v) Class (ix)
- Slope 80% and higher
- Slope 40-79%

Potential Slide Area (ii)
- Slope 15% and higher, and
- Geologic contact of coarse-grained deposits over fine-grained deposits where slope >= 15%, and
- Area where water less than 10 feet below ground surface based on limited data set (other areas of shallow water present), or
- Spring Locations, or
- Spring lines.

Areas of Rapid Stream Incision (vi)
- Areas of moderate to rapid stream incision/erosion; may result in unstable slopes and/or stream banks

GENERAL NOTES FOR GEOLOGICAL HAZARDS MAPS

This map is one of a suite of revised Geological Hazard Maps for the City of Mercer Island. This suite includes maps showing Seismic Hazards, Landslide Hazards, and Erosion Hazards.

Other geological and/or natural hazards may exist and geological events may occur on Mercer Island that are not specifically identified on these maps. Examples of geologic hazards and hazardous events that are not identified on these maps include, but are not limited to, tsunamis and seiches in Lake Washington.

These maps are for the sole use of the staff of the City of Mercer Island's Development Services Group (DSG) for the purposes of permit application evaluation. These maps provide DSG staff a general assessment of known or suspect geological hazard areas for which the City will require site and project-specific evaluation by a Washington State-licensed engineer, geologist or engineering geologist prior to issuing a permit for site development. All areas have not been specifically evaluated for geologic hazards and there may be locations that are not correctly represented on these maps. It is the responsibility of individual property owners and map users to evaluate the risk associated with their proposed development. No site-specific assessment of risk is implied or otherwise indicated by the City of Mercer Island by these maps.

The City of Mercer Island is using guidance provided by the State of Washington regarding the definition of geologically hazardous areas in accordance with WAC 365-190-080 and the Growth Management Act. "Geologically hazardous areas", by State definition, "include areas susceptible to erosion, sliding, earthquake, or other geological events. They pose a threat to the health and safety of citizens when incompatible commercial, residential, or industrial development is sited in areas of significant hazard."

This new set of maps represents an update of the 2002 Geologic Hazard Map Series and is based on a review of Best Available Science for the Seattle Fault and related events, a new Geological Map of Mercer Island by Troost and Wisher (2006), and a geologic database of Mercer Island compiled by GeoMapNW at the University of Washington. Information about data used for the maps, references, and data limitations are all described in an associated "Read Me" document. The digital version of these maps is accompanied by a meta data file containing pertinent information about map construction. These data and maps are all available on the City of Mercer Island website.