



DE-Civil, PLLC

2306 A Street
Tacoma, WA 98401
(253) 228-0513
www.de-civil.com

July 19, 2019

MK & S Investments
70222 E Mercer Way
Mercer Island, WA 98040

Drainage Plan – Drainage Report
Proposed Residence
4825 E Mercer Way
Mercer Island, Washington
PN: 2162000070
Job: 19-104 Hou.DR.doc

PROJECT DESCRIPTION

We are pleased to submit this “Drainage Plan” and drainage report for the proposed residence to be located at 4825 E Mercer Way in the City of Mercer Island, Washington. The site is currently undeveloped and appears to be forested. Based on our site visit and the plans our office has received, you intend to construct a single-family residence onsite with an access stemming from East Mercer Way. The proposed residence will measure 1,850 sqft in total roof area and the proposed driveway will measure 950 sqft for a total added impervious area of 2,800 sqft. Since this project is adding less than 5,000 sqft of new impervious hard surfacing, “Minimum Requirements” 1 through 5 are required to be addressed. Please refer to the “Minimum Requirements” and other sections of this report for further information.

EXISTING CONDITIONS

The subject parcel is located at 4825 East Mercer Way in the City of Mercer Island, Washington. The parcel is somewhat rectangular in shape and measures approximately 220 feet in length, east to west, by 100 feet in width, north to south, and encompasses 0.61 acres. The site is currently undeveloped and is well forested and is encumbered by a wetland and wetland buffer area that occupies the majority of the site. Along the north boundary line is a ditch that conveys the sheet flow from the property to the east. The site slopes down from south to north at grades ranging between averaging 30 percent. The overall topographic relief across the site is approximately 80 feet. The property is bordered by residential developments on the west, north, and south and by East Mercer Way to the east.

INFILTRATION RATE/SOILS REPORT

A geotechnical report was prepared for the project by Associated Earth Sciences dated July 13, 2017. The report identified the soils, made recommendations concerning the development of the property and addressed critical area requirements related to the steep slopes on the property. Their recommendations have been included in the provided documents. Based on the information found in the report infiltration is not proposed for this project.

WELLS AND SEPTIC SYSTEMS

Sewer will be connected to the public sewer system in E Mercer Way, water is to be provided by an onsite well.

FUEL TANKS

There are no proposed or existing fuel tanks onsite.

SUB-BASIN DESCRIPTION

The lot has limited off-site drainage, existing drainage patterns will not be affected by the proposed development.

ANALYSIS OF THE 100-YEAR FLOOD

There are no flood indicators for this site.

AESTHETIC CONSIDERATIONS FOR FACILITIES

Typical residential landscaping will be installed. No other requirements will be necessary.

FACILITY SIZING AND DOWNSTREAM ANALYSIS

PROPOSED DRAINAGE

Drainage from the proposed development will be addressed following the "List #1" and "List #2" criteria found in the Department of Ecology 2014 Stormwater Management Manual (SWMM) as adopted by the City of Mercer Island.

List #1 is as follows;

Lawn and landscaped areas:

1. Post-Construction Soil Quality and Depth in accordance with BMP T5.13: Post-Construction Soil Quality and Depth (p.911).

Roofs:

1. Full Dispersion in accordance with BMP T5.30: Full Dispersion (p.939), or Downspout Full Infiltration Systems in accordance with BMP T5.10A: Downspout Full Infiltration (p.905)
2. Rain Gardens in accordance with BMP T5.14A: Rain Gardens (p.915), or Bioretention in accordance with BMP T7.30: Bioretention Cells, Swales, and Planter Boxes (p.959). The rain garden or bioretention facility must have a minimum horizontal projected surface area below the overflow which is at least 5% of the area draining to it.
3. Downspout Dispersion Systems in accordance with BMP T5.10B: Downspout Dispersion Systems (p.905)
4. Perforated Stub-out Connections in accordance with BMP T5.10C: Perforated Stub-out Connections (p.905)

Other Hard Surfaces:

1. Full Dispersion in accordance with BMP T5.30: Full Dispersion (p.939)
2. Permeable pavement¹ in accordance with BMP T5.15: Permeable Pavements (p.917), or Rain Gardens in accordance with BMP T5.14A: Rain Gardens (p.915), or Bioretention in accordance with BMP T7.30: Bioretention Cells, Swales, and Planter Boxes (p.959). The rain garden or bioretention facility must have a minimum horizontal projected surface area below the overflow which is at least 5% of the area draining to it.
3. Sheet Flow Dispersion in accordance with BMP T5.12: Sheet Flow Dispersion (p.908), or Concentrated Flow Dispersion in accordance with BMP T5.11: Concentrated Flow Dispersion (p.905).

Lawn and Landscaped Areas:

Soil preservation and amendment BMP's will be incorporated as part of the final landscaping of the proposed development.

Proposed Roof Drainage

The 65/10 method of dispersion is not proposed for this development as the lot does not have sufficient room for the required minimum 100 foot flow paths. Although the lot will be maintained in a largely native condition due to wetland areas being present on site. In this case the project is limited to clearing approximately 20 percent of the site and will have less than 10 percent lot coverage. Infiltration dependent BMP's are not feasible given the steepness of the slopes on site and the clay/silt soils present on the site. Dispersion is proposed for the project in the form of providing three splash blocks for the residence. Although the downhill surface slopes exceed 20 percent grade it is our opinion that the even dispersion of the roof drainage and the limited amount of roof area does not represent a significant adverse impact to the slope, particularly since the slope will retain most of the native vegetation.

Driveway Drainage

The 65/10 method of dispersion is not proposed for this development as the lot does not have sufficient room for the required minimum 100 foot flow paths and for other reasons as described above. Infiltration dependent BMP's are not feasible given the steepness of the slopes on site and the clay/silt soils present on the site. Sheet flow dispersion for the driveway is infeasible due to the retaining walls and driveway grades that are required to provide access to the residence. Given the relatively small amount of driveway surfacing we are proposing to convey the driveway drainage with a curb to the driveway approach and then direct the drainage into a shallow swale that exists along the edge of East Mercer Way.

Erosion control measures will be in place throughout the project. On a temporary basis, they will consist of silt fencing installed along downhill sections of the site and along areas being graded. The site entrance will also have a temporary construction entrance installed (per PCSWMM Appendix C, Detail 4). Permanent erosion control will consist of residential landscaping.

Conveyance System Analysis and Design

No conveyance system is proposed that requires any additional design or analysis.

MINIMUM REQUIREMENTS

Minimum Requirement #1: Preparation of Stormwater Site Plans

This has been addressed by the submittal of the referenced Engineered Plan documents.

Minimum Requirement #2: Construction Stormwater Pollution Prevention

This information has been provided within the included SWPP report prepared by our office dated July 19, 2019.

Minimum Requirement #3: Source Control of Pollution

The implementation of the temporary erosion and sediment control plan along with the provided drainage design is adequate to meet this requirement for construction of this residence.

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

The stormwater runoff will be infiltrated on site, similar to the existing drainage patterns.

Minimum Requirement #5: Onsite Stormwater Management

Onsite stormwater management consists of controlling roof and driveway runoff as described above. The provided plans and design adequately address stormwater management for the proposed site clearing and development.

Minimum Requirement #6: Runoff Treatment

Not applicable to this development.

Minimum Requirement #7: Flow Control

Not applicable to this development.

Minimum Requirement #8: Wetlands Protection

Not applicable to this development.

Minimum Requirement #9: Operation and Maintenance

Not applicable to this development.

OTHER PERMITS OR CONDITIONS PLACED ON THE PROJECT

A building permit will be required for the proposed development.

PROJECT ENGINEER'S CERTIFICATION

I hereby state that this drainage and erosion/sediment control plan for the Hou residence and other members of the design team has been prepared by me or under my supervision and meets the standard of care and expertise which is usual and customary in this community for professional engineers. I understand that City of Mercer Island does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by me.

We trust this is sufficient for your current needs. Should you have any questions, or require additional information, please contact us at your earliest convenience.

Respectfully submitted,

Development Engineering, PLLC


Glen Coad, PE
Owner