



**LEVEL ONE DRAINAGE ANALYSIS
CITY OF MERCER ISLAND**

For

**Bosveld Residence Mercer Grove
38XX West Mercer Way
Mercer Island, WA 98040**

June 23, 2021



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Prepared For:

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LEVEL 1 DOWNSTREAM ANALYSIS

Bosveld Residence Mercer Grove
38XX West Mercer Way
Mercer Island, WA 98040

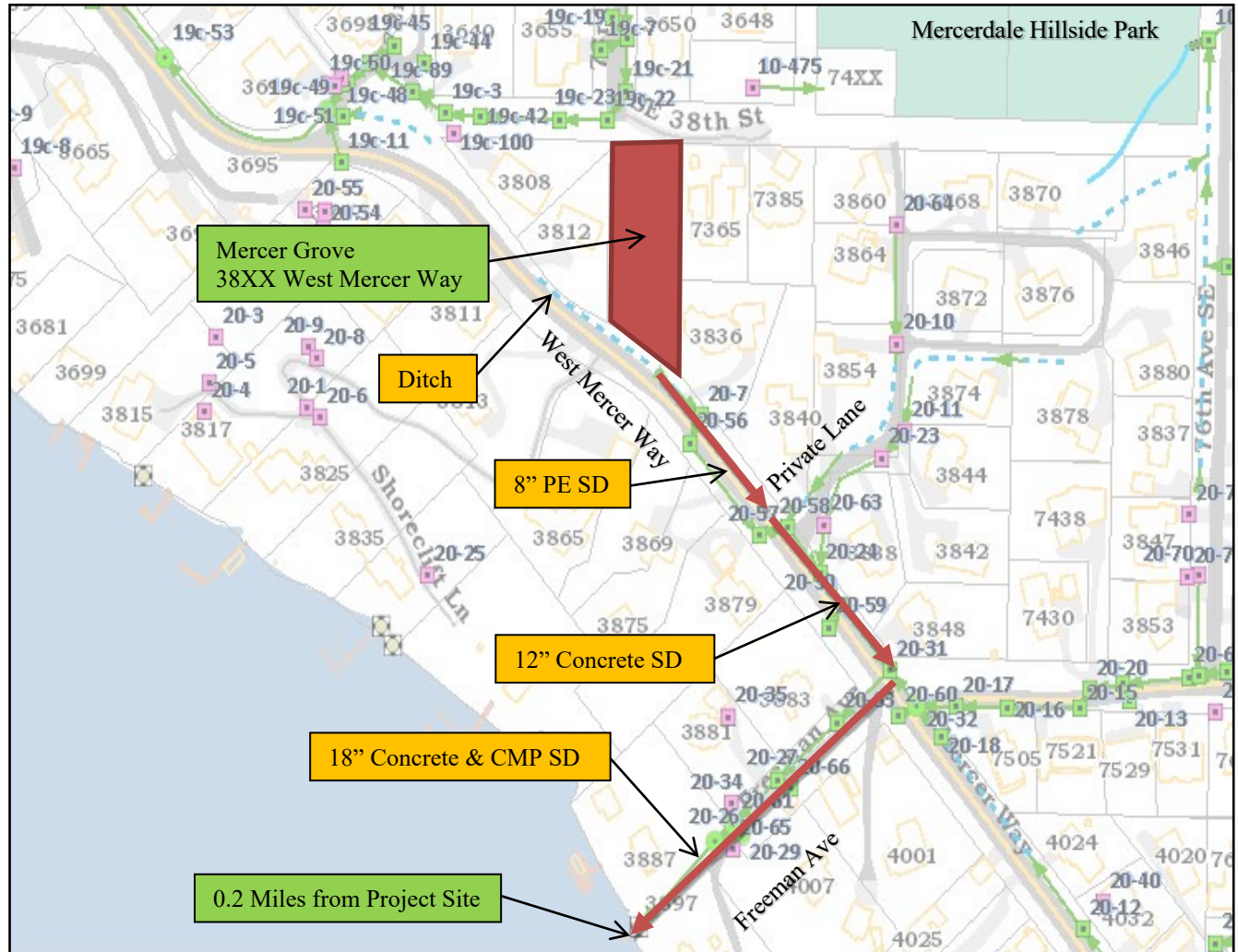
Tax Lot # 362350-0037
June 9, 2021

Site visit and Report by Joanne Lane, Civil Engineer
Report reviewed and edited by Nicole Mecum, PE

Figure 1: Vicinity Map

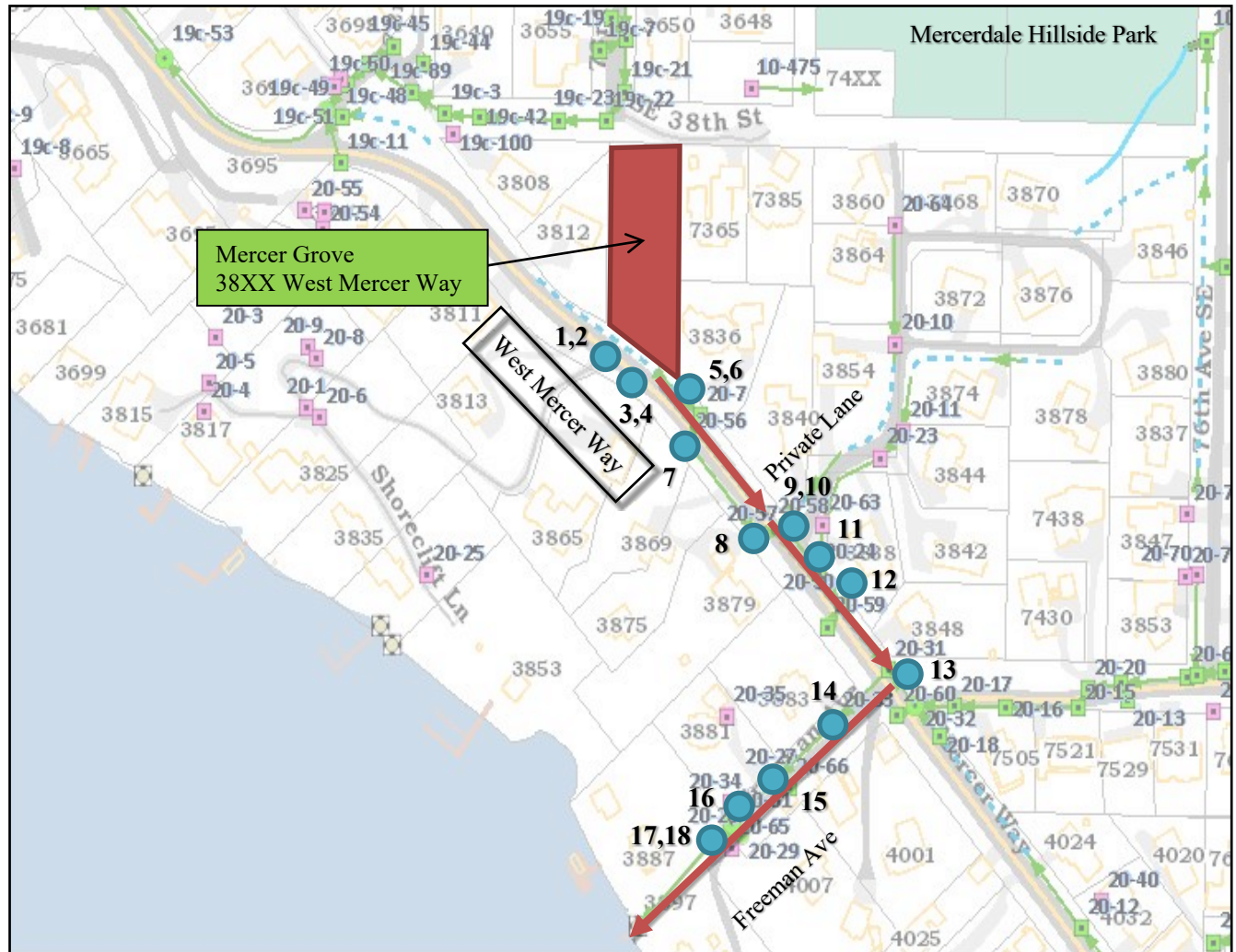


DOWNSTREAM ANALYSIS MAP #1



DOWNSTREAM ANALYSIS MAP #2

Numbers refer to the picture numbers in the report.



TIR SECTION 3 OFFSITE ANALYSIS

Summary

This Level 1 Downstream Analysis is associated with development of a new single family residence at 38XX West Mercer Way on Mercer Island (WA). See Figure 1: Vicinity Map for reference. This project is located in the upper NW quadrant of Mercer Island and south of I-90. The named civil engineer visited the site and performed an analysis of the existing city storm conveyance system downstream of the project for 0.2 miles on June 9, 2021. The downstream storm path is a closed city storm pipe consisting of 8", 12" and 18" diameter pipes. An open ditch is collected by the catch basin at the corner of West Mercer Way and the Private Lane. This downstream analysis is mostly a mapping exercise identifying the conveyance path and pipe diameters. We cannot access the condition of underground pipe without video which typically is not warranted for a level 1. See vicinity map, downstream analysis map #1 & 2 on previous sheets for the location and downstream path that was observed.

The existing storm system identified consists of a series of pipes and typically type 1 catch basins. The total distance to the discharge point at the shore of Lake Washington is 0.2 miles.

In general, the inspected storm drain path appears in good condition without any obvious signs of any blockage or other indicators that flooding or overflowing have occurred. Please see the following pictures that document the downstream storm pipe. Our opinion is that subject redevelopment of this lot will not adversely affect the storm system downstream of this site given low amount of new impervious being proposed.

Flowpath

Storm runoff from this house project will connect to a new catch basin installed in the existing ROW on the north side of West Mercer Way at the subject site (38XX West Mercer Way). The existing open ditch will be filled and a 6' wide gravel shoulder will be installed and graded to provide positive flow to the new catch basin which will be located to pick up the culvert just east of the fire hydrant. A new 12" PVC pipe will be installed to replace the existing 12" CMP pipe under the existing driveway at 3836 West Mercer Way. This new culvert will then connect to existing catch basin 20-7 which then crosses to the south side of West Mercer Way where it travels for approx. 150' before crossing West Mercer Way again continuing on the north side of the street for 220' where it turns south onto Freeman Avenue and travels 475' before discharging into Lake Washington.

The average gradient for subject path is roughly 8% along West Mercer Way to the Private Lane and 1.5% from Private Lane to Freeman Avenue. The gradient along Freeman Avenue to Type 2 MH is approximately 18% and then flows steeply down to discharge into Lake Washington.

It is relevant to mention that a formal research into drainage complaints, drainage related problems or capacity issues downstream was not performed for this Level 1 report. In the absence of formal drainage records to research, we will rely on the City of Mercer Island Review of this report to let us know of any issues.

Downstream Analysis

Task 1. Study area definition and maps

See map on Page 2 of this report, sourced from the City of Mercer Island Mapping Portal.

Task 2. Resource Review

The City of Mercer Island GIS Portal website was primarily utilized to review for basic drainage information for subject site. It is the opinion of G2 Civil that a review of items such as floodplain maps, other drainage studies, wetlands maps, etc. are deemed not relevant in this particular situation given this site is simply discharging into an existing storm system. What is most important is identifying any downstream drainage problems that might be exacerbated by this project.

Task 3. Field Inspection

Offsite-Upstream drainage Inspection

Not warranted for site

Onsite Drainage Inspection

Not warranted for site. Area clearly drains to south of lot onto West Mercer Way.

Offsite-Downstream Drainage Inspection

See maps on Page 2 and 3 of this report. Downstream analysis was started in front of project site along existing ditch on the north side of West Mercer Way.

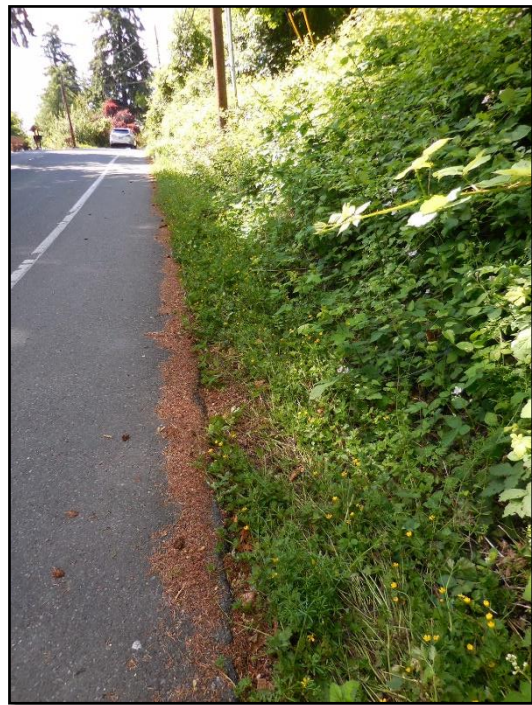
See photos on the following pages for reference. Map on Page 3 of this report outlines photo numbers.

Picture #1: Existing Ditch; West Mercer way, facing east

Approx. 3' wide and 1' deep ditch along south property line with 2:1 or steeper slopes to property.



Picture #2: Existing Ditch; West Mercer way, facing west



Picture #3: Existing Culvert under Fire Hydrant line

A new catch basin will be located just east of hydrant line to pick up this culvert, existing open ditch and storm from new development to the north.



Picture #4: Existing Culvert under Driveway, facing east

A new 12" PVC pipe will replace existing 12" CMP culvert under neighboring driveway.



Picture #5: Existing Culvert under Driveway to CB 20-7 (MI GIS), facing west

This will be the first existing catch basin we connect to with a 12" PVC pipe which replaces the existing culvert under the driveway.



Picture #6: CB 20-7 (Labelled per Mercer Island GIS, Typical)

From this first existing catch basin, an 8" PE pipe crosses West Mercer Way to CB 20-56 on south side of West Mercer Way.



Picture #7: CB 20-56

An 8" PE pipe IN (from north, CB 20-7 across street) and OUT (east) along south side of West Mercer Way to next CB 20-57.



Picture #8: CB 20-57

With an 8" PE pipe IN and 12" PE pipe OUT, the main crosses the street to next CB 20-58.



Picture #9: CB 20-58

Corner of West Mercer Way and private lane. 12" PE pipe IN and 12" Concrete pipe OUT



Picture #10: CB 20-58

Open ditch ties into catch basin (not visible in photo)



Picture #11: CB 20-24
12" Concrete Pipe IN and OUT



Picture #12: CB 20-30
12" Concrete Pipe IN and OUT



Picture #13: CB 20-31

12" Concrete Pipe IN from West Mercer Way and 18" Concrete pipe OUT to Freeman Avenue.



Picture #14: CB 20-33

18" Concrete Pipe IN and OUT



Picture #15: CB 20-27
18" Concrete Pipe IN and OUT



Picture #16: CB 20-61
18" Concrete Pipe IN and 18" CMP OUT



Picture #17: CB 20-26, Manhole Type 2
18" CMP IN and 18" Concrete pipe OUT



Picture #18: CB 20-26, Manhole Type 2
Private Property beyond this point, unable to access. Steep decline to Lake Washington.

