

LEVEL 1 DOWNSTREAM ANALYSIS

Addition for Morgan-Hornsby Residence

6405 West Mercer Way

Mercer Island, WA 98040

Tax Parcel No.:252404-9037

April 24, 2022

Site Review and Report Prepared by:

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1.0 SUMMARY

1.1 Project Drainage Description

The project consists of the construction of an addition and improvements that will add nearly 2,000 sf of impervious surface at 6405 West Mercer Way on the west side of West Mercer Way opposite the intersection of SE 65th St. The map below shows the approximate location of the project.



VICINITY MAP OF PROJECT LOCATION

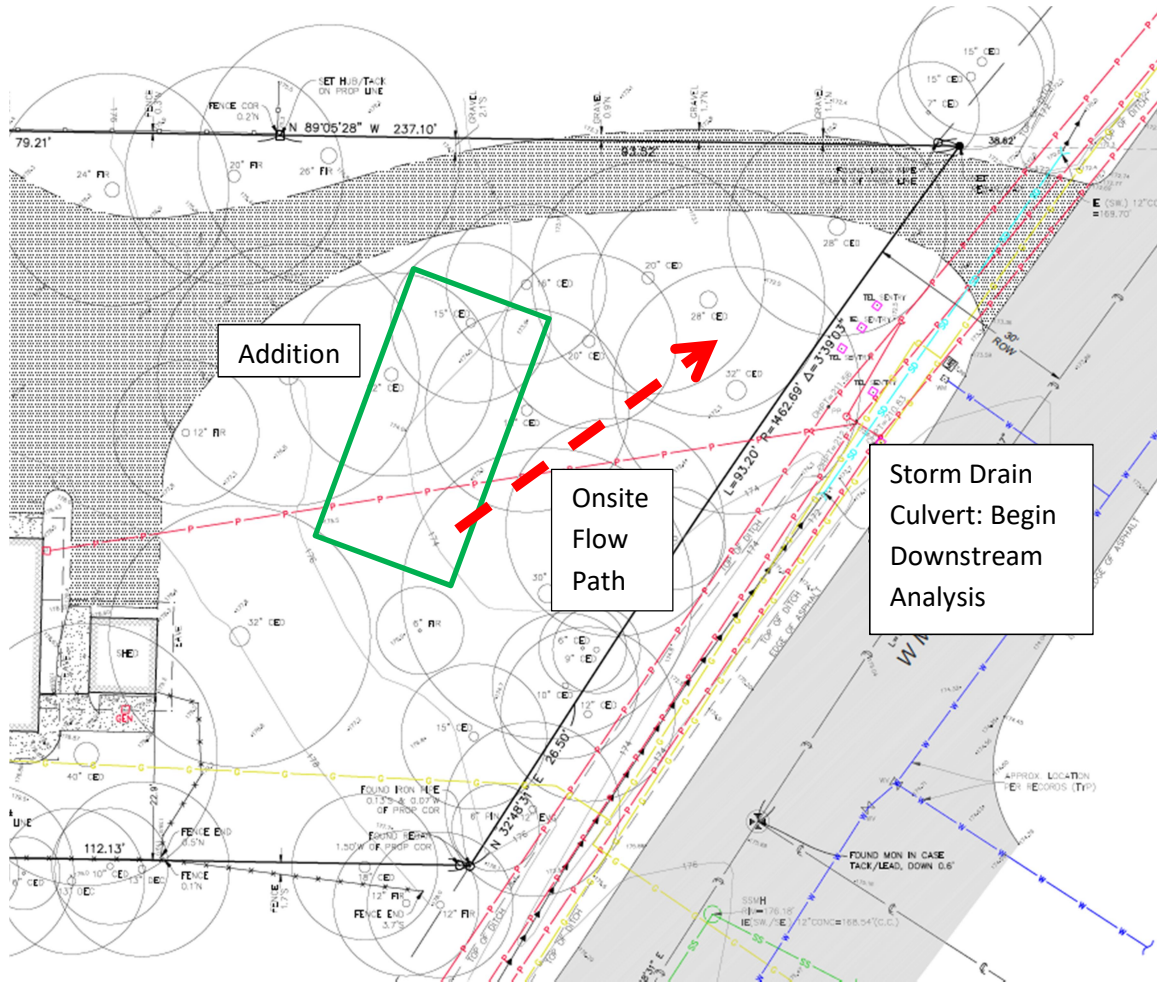
The addition will be located in the open area within a stand of large conifers as shown in the following picture.



PROPOSED BUILDING SITE ON PROPERTY

1.2 Project Drainage Description

The drainage on the site generally flows east and then northeast toward a flat area at the northeast corner of the property adjacent to West Mercer Way. The roof runoff will be directed onto the forest floor with splash blocks. The following portion of the site survey shows the approximate location of the addition and the on-site flowpath toward the NE corner of the property. The City Storm Drain system culvert flowing north along the west side of West Mercer Way is shown as a light blue line. The Downstream Analysis begins at this culvert.



SURVEY BASE AND PROJECT LOCATION

1.3 Flow Path

The flow path follows the developed City Storm drain facilities along 79th Avenue SE, 78th Avenue SE and 77th Ave SE. Except for the short portion of open ditch on the West side of West Mercer Way and another short open section on 77th Ave SE near Lake Washington, the flow path is enclosed in storm drains. The system includes a number of catch basins that were documented by photographs. The photographs are correlated with the CB numbers shown on Mercer Island GIS records.

1.4 Downstream Analysis

The field review was completed on April 14, 2022. The following aerial image shows the project location and the path of the downstream analysis. The red arrows indicate the approximate extent of the ¼" mile downstream path and the yellow arrows show the storm drain route to its discharge into Lake Washington.



PROJECT SITE AND DOWNSTREAM PATH

2.0 Field Review

2.1 Location

The Downstream Analysis began at the subject property at 6504 West Mercer Way. The analysis followed the City of Mercer Island Storm Drain system north on West Mercer Way, north along 79th Avenue SE, south along 78th Ave SE and then a short section north on 77th Avenue SE before it turns due west and discharges into Lake Washington.

The system consists of series of catch basins interconnected with primarily 12" diameter concrete pipe. There are a few sections of other pipe materials (HDPE and Ductile Iron) but those sections are also 12" diameter pipe.

In general the system appears to be in good condition and functioning well. Along the entire route there were no signs of any surface erosion or flooding. Ivy had grown over some of the structures, but did not seem to be impairing their function.

By observation of the pipes through the catch basin grates, it could be seen that the pipe grade generally follows the street grades. The upper portion along 79th Avenue SE is moderately sloped and the road becomes much steeper as it winds around t 78th Ave SE. The section of pipe that connects with 77th Ave SE is very steep and the portion from 77th Ave. SE down to the Lake is even steeper. The main point of these observations is that the gradient of the pipe, particularly in the lower sections will result in good velocities that should keep the pipes clean and free of sediments. Although it was difficult to see through the grates, most sumps appeared to have sediment capacity and there were no signs of any pipe capacity impairment due to sediment or debris in the mainline system.

2.2 City GIS Mapping

The following map is from the City of Mercer Island GIS records and shows the general layout of the storm drains in the vicinity. The red dashed line traces the path of the stormwater discharge from the subject property to Lake Washington. Except for a short section of open ditch on West Mercer Way and another short section on the east side of 77th Ave SE, the flow path is enclosed in pipes. The subject property is noted by the yellow circle around the house number.



GIS MAPPING AND DOWNSTREAM PATH

2.3. Photographs and Description of Downstream Analysis

A downstream analysis was completed on April 14, 2022. The following maps show sections of the GIS map enlarged to show the CB label and the location of each photograph.

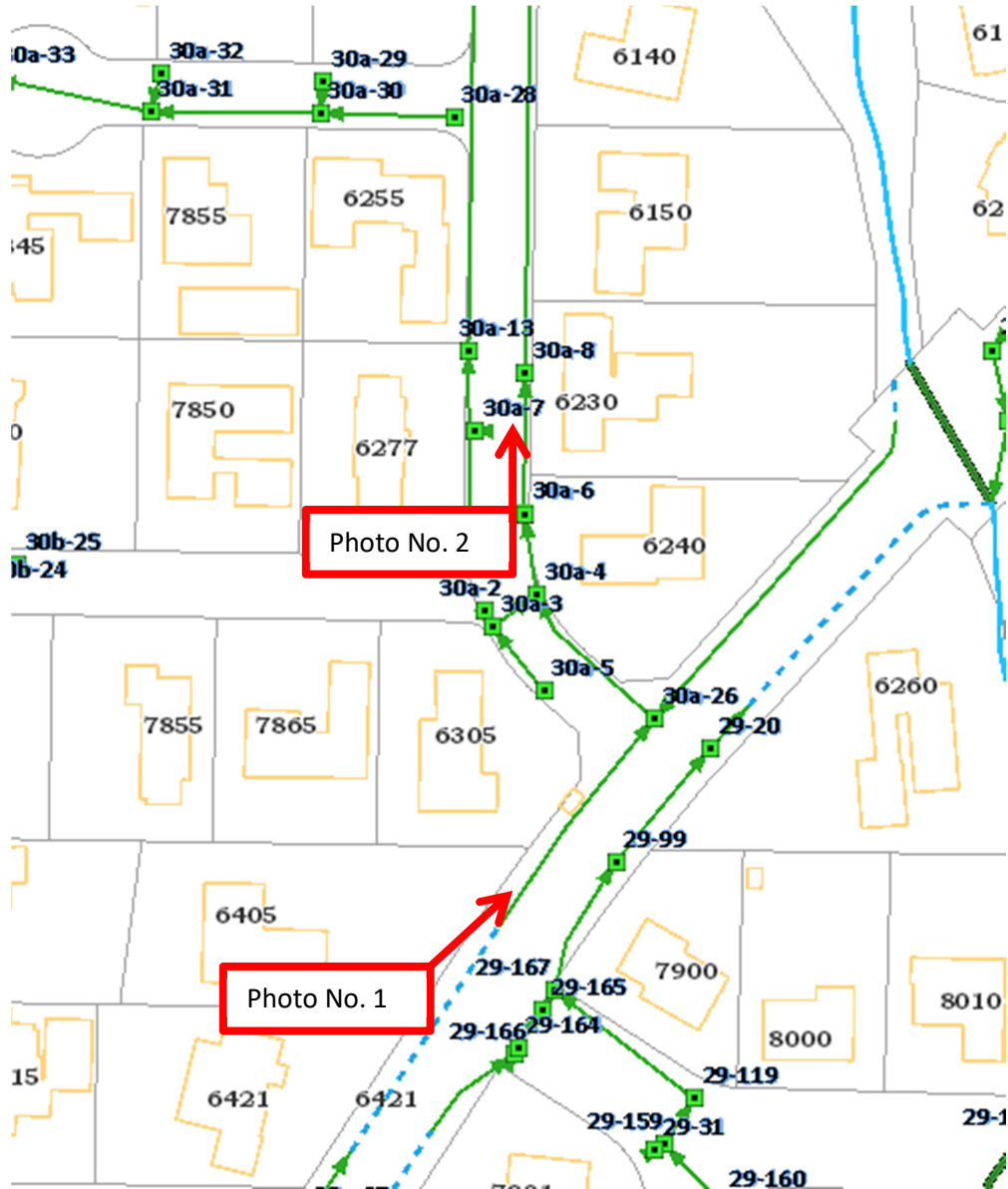




Photo No. 1 Standing adjacent to the site and looking north at the open ditch on the West side of West Mercer Way (toward CB 30a-26)



Photo No. 2 Standing on the east side of 79th Ave. SE, looking north at CB 30a-7 in front of House #6320

line.

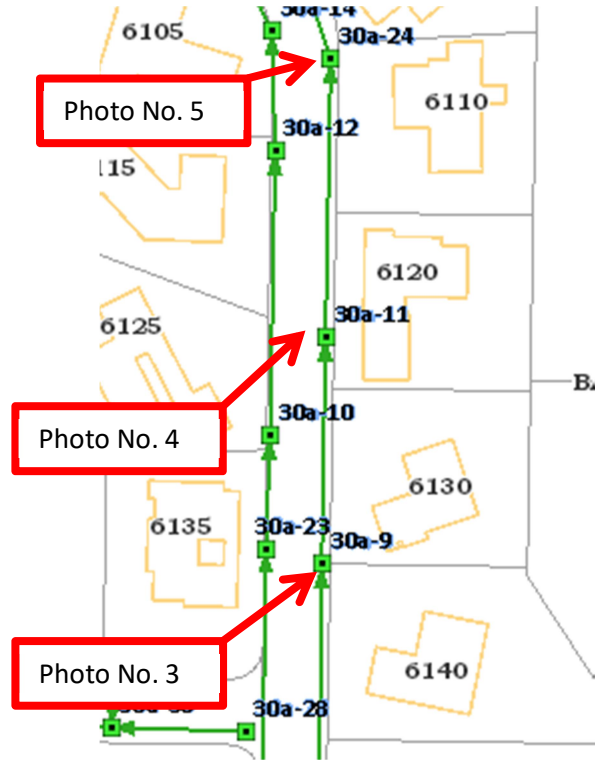


Photo No. 3 Looking northeast at CB 30a-9 between House #6130 and #6140



Photo No. 4 Looking easterly at CB 30a-11 in front of House #6120.



Photo No. 5 Looking east at CB 30a-24 at House #6110.

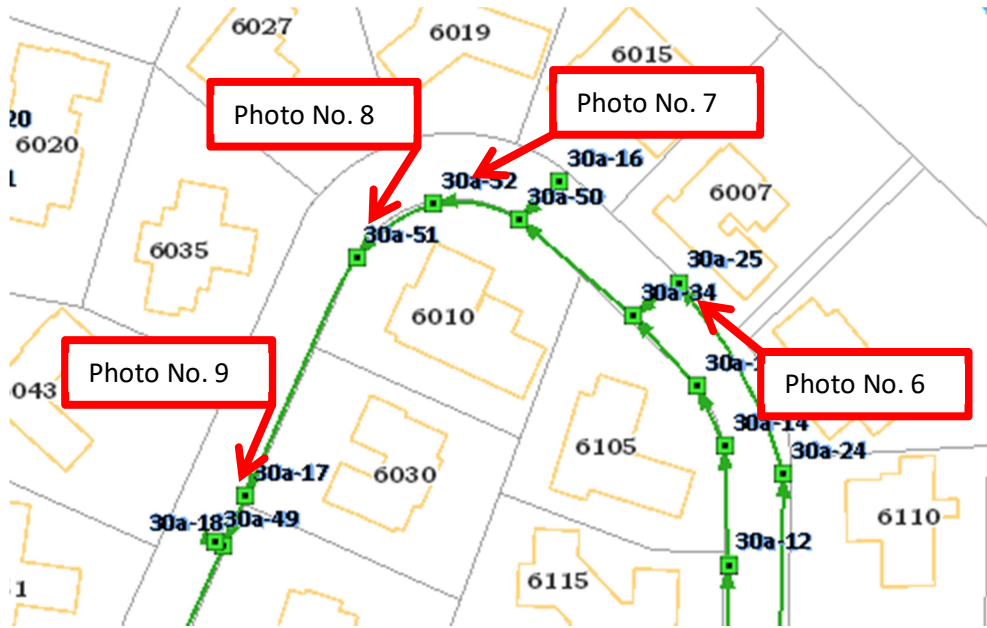


Photo No. 6 Looking northwesterly at CB 30a-25 (solid cover) where the SD crosses to the south side of the street and connects to CB 30a-34.



Photo No. 7 Looking southwesterly at CB30a-52 opposite House #6019 and #6017. Note gravel lip and vaned grate to catch runoff down steep road grade.



Photo No. 8 Looking southerly at CB #30a-51 opposite House #6035. Note accumulation of fir needles, but still appears to be draining well.



Photo No. 9 Looking southerly at CB #30a-17 adjacent House #6030. Note ivy growing over grate, but it appears to be draining and not signs of surface bypass flow. Photo is past end of ¼ mile Downstream Analysis. Further review downstream completed to confirm outfall to Lake Washington.

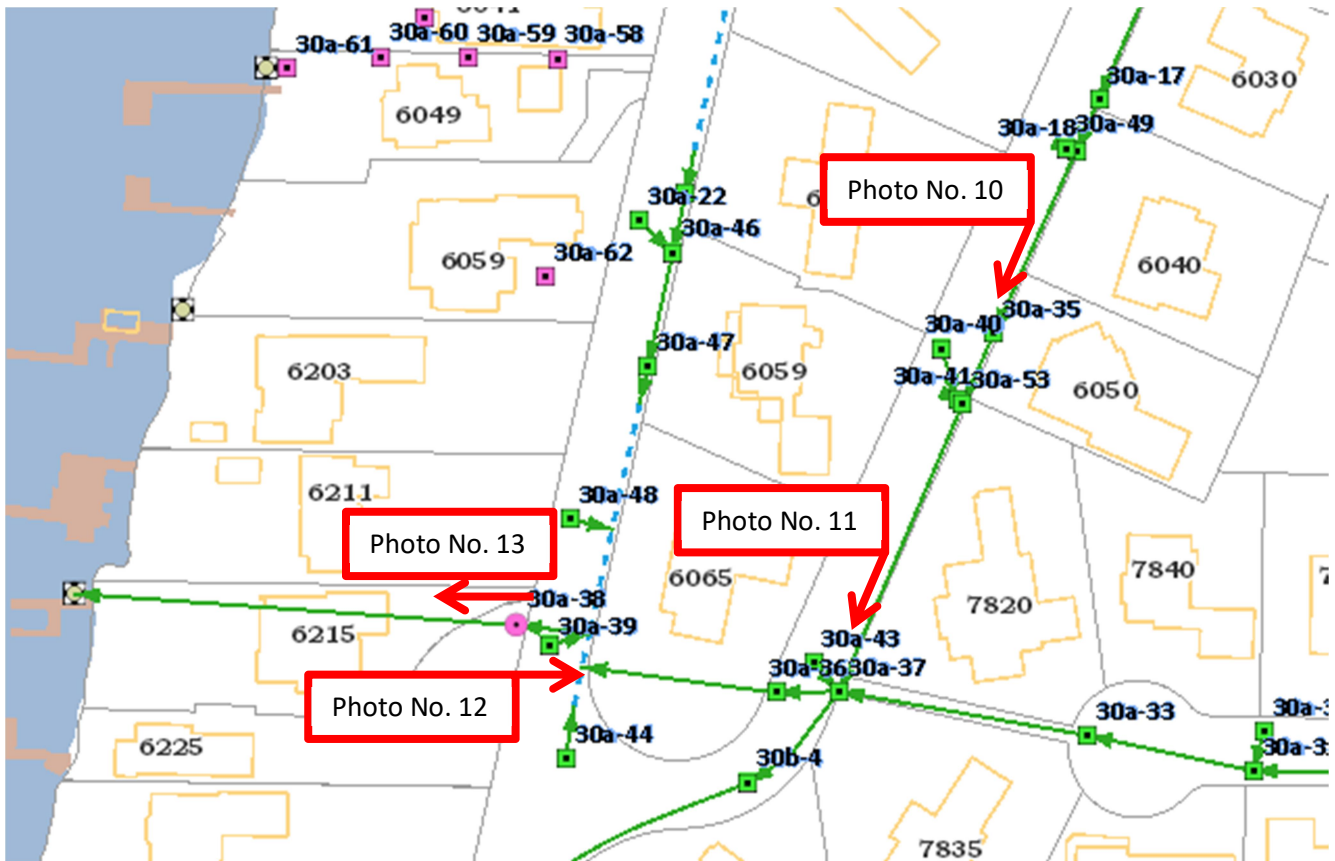




Photo No. 10 Looking southerly at CB #30a-35 adjacent House #6050.



Photo No. 11 Looking southerly at CB #30a-37 just south of House #7820. Note ivy overgrowth but CB appears to be draining. Minor indication of erosion at the pavement edge. Inlet in street appears to be full of sediment (CB#30a-43) not on main line, so no impact to conveyance capacity.



Photo No. 12 Looking east at pipe end discharging to roadside swale just upstream of inlet pipe upstream of CB #30a-38 at House #6065. Swale appears stable with small rock riprap and other cobbles. It appears some of the flow may be diverted south at CBa-37 (see Photo #11) to reduce impacts to this open swale.



Photo No. 13 Looking west at CB #30a-38 adjacent to House #6215. Solid cover next to driveway and outfall to Lake Washington