June 8, 2023
Project No. PS23-20341-C

Don Cole
City of Mercer Island
9611 SE 36th Street
Mercer Island, Washington 98040

Subject: Geotechnical Engineering Site Assessment
Site Construction Suspended
5236 W Mercer Way
Mercer Island, Washington

Dear Don,

This letter summarizes our site reconnaissance; review of the geotechnical, shoring, and civil engineering permitting documents; and recommendations for managing the site until construction resumes. As you requested, we have assessed the current site conditions with regard to stability of the shoring wall, stability of cut slopes, and the potential for erosion due to the construction ground disturbance. We understand that construction was suspended voluntarily (meaning not by City order) during site grading and it is not known when construction will resume, and therefore the City plans to manage the temporary site conditions. Recommendations for managing the site temporarily are provided based on our site observations and review of the permitting documents.

SITE AND PROJECT DESCRIPTION

The site is a residential lot on the east side of W Mercer Way. The ground surface slopes up from Mercer Way with a total elevation gain of about 75 feet from west to east. Prior to any construction, grades ranged up to around 40%. Critical areas were identified on the site as landslide hazard areas due to the steep slopes on the east side of the site, and wetlands along the southern portion of the site.

The permitted construction plans are shown in Figures 1 and 2, the Grading Plan and the TESC Plan, respectively. A three-story house was planned with a basement that would be cut into the slope on the north, east, and south sides. A cantilevered soldier pile wall provided shoring for the excavation and Keystone block retaining walls were planned to support cuts on the south side of the driveway. The construction was positioned on the site to avoid the wetland along the south side of the lot.

DOCUMENTS REVIEWED

The City provided many permitting documents for our review and the most useful documents were the following.

- Stormwater Drainage Report 5236 W Mercer Way, by PACE Engineers, dated May 2, 2018.
- Sheet C1.0 TESC Plan and C2.0 Road, Grading, Storm and Utility Plan, 5236 W Mercer Way, by PACE Engineers, dated July 31, 2018 (reproduced as Figures 1 and 2 in this letter).
- Geotechnical Engineering Report, Proposed Residence 5236 West Mercer Way, by PanGeo, dated October 5, 2017.
- Shoring Plans S-0 through S-3, Mercer Island Residence, by Longitude One Twenty, dated April 20, 2018.

These are the documents utilized for our study.

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SITE RECONNAISSANCE

Current site conditions were observed on April 25, 2023, and documented with the attached Photographs. It appeared that some of the TESC Plan and Grading Plan had been implemented but was now in disrepair. The construction entrance was in place and the driveway had been graded and paved with asphalt up to the location of the house. The soldier pile shoring walls had been installed. The footprint of the house had been excavated down near final grade but some grading remained, and there were stockpiles of soil and two sediment ponds near the northwest and southwest corners of the house.

The perimeter silt fencing was in place but was in need of repair or replacement. The slope above the shoring wall to the east was cut to approximately 2H:1V instead of constructing the gabion basket walls prior to the shoring wall as was shown on the Grading Plan (see Photographs 1 and 5). The Keystone walls for the driveway were not constructed. The drainage swale along the south side of the driveway (drawn on the TESC plan) was not present.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are intended to assist the City with temporary management of the construction site to protect the critical areas and adjacent properties. The recommendations are intended to meet the requirements of the Stormwater Drainage Report to prevent erosion and sediment transport, and to maintain slope stability:

1. Gabion basket walls were supposed to be constructed before the soldier pile walls, but were not. Instead, there is a 2H:1V cut slope of bare soil behind the east wall. The cut slope should be protected with a staked biodegradable erosion control mat and hydroseeding according to WSDOT Standard Plan I-60.10-01.
2. The shoring walls seems to be well constructed and according to plan; however, there are some voids behind the lagging in some locations. The wall should be backfilled with free-draining material (such as pea gravel) to within 1 to 2 feet of the top of the wall. One foot of freeboard should be maintained for catchment of any erosion from the slope above the wall.
3. The basement excavation appears to be near the design elevation. A drainage swale should be constructed along the base of the walls to collect any seepage through the wall. The swale could direct water to the two sediment traps at northwest and southwest ends of the walls (see Photos).
4. The perimeter silt fencing needs to be replaced, improved, and/or maintained to meet the standard details for high visibility silt fence, as shown on C1.1 TESC Details and WSDOT Standard Plan I-30.16-00.
5. Add silt fencing between the north side of the paved driveway and the cut slope to prevent sediment transport on the paved driveway.
6. Remove all construction waste/debris and plastic tarps that no longer function. If not done, the debris could impact the wetland and/or buffer.
7. Install the interceptor swale with check dams along the south side of the driveway as shown on the TESC Plan.
8. Construct a check dam or two on the driveway that slows and diverts surface runoff to the interceptor swale.
9. Regrade the area at the top of the driveway (house footprint) to control surface runoff. Regrade the two small ponds (see photos) for safety (not too deep or steep) and to function as sediment traps. Regrade stockpiles as needed to smooth slopes.
10. Hydroseed the bare ground surface, including cut slopes, and cover stockpiles with tarps.
11. Monitor and maintain on a routine scheduled basis. The site should be monitored once a month and after significant storm events (Note 10 on the TESC Plan).

CLOSURE

It should be noted that our scope of work for this letter was limited to a site reconnaissance and a review of the permitted engineering documents. Our scope did not include exploration of actual subsurface conditions, nor does our review purport to verify the accuracy of the engineering presented within the documents provided. We are only providing the City with recommendations for interim actions to reduce the risk of offsite disturbance due to the suspended construction.

We hope this letter meets your current needs. If you have any questions, please do not hesitate to contact us at your convenience.

Sincerely,

WSP USA Environment & Infrastructure Inc.

Todd D Wentworth, PE, LG
Principal Geotechnical Engineer

David Sorey, PLA
Senior Associate Landscape Architect

Attachments: Photographs
Figure C1.0 TESC and Construction Management Plan
Figure C2.0 Road, Grading, and Storm Plan

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ATTACHMENTS

PHOTOGRAPHS

Photograph 1. Looking east up the driveway at shoring wall and cut slope above.

Photograph 2. North and east shoring walls

PHOTOGRAPHS

Photograph 3. East and south shoring walls

Photograph 4. Looking west from northeast corner of site down driveway to W Mercer Way. Temporary settlement pond below shoring wall

PHOTOGRAPHS

Photograph 5. Cut slope above east shoring wall, looking south.

LEGEND

- SILT FENCE
- CONSTRUCTION LIMITS AND TREE PROTECTION CHAIN LINK FENCE
- INTERCEPTOR SWALE
- TEMPORARY CONSTRUCTION ENTRANCE
- INLET PROTECTION
- TREE PROTECTION LIMITS
- DRIVEWAY BASE COURSE OR ATB PRELEVEL

RECONSTRUCT PERIMETER SILT FENCE

CONSTRUCT SWALE AS SHOWN AND AROUND THE BASE OF THE SHORING WALLS

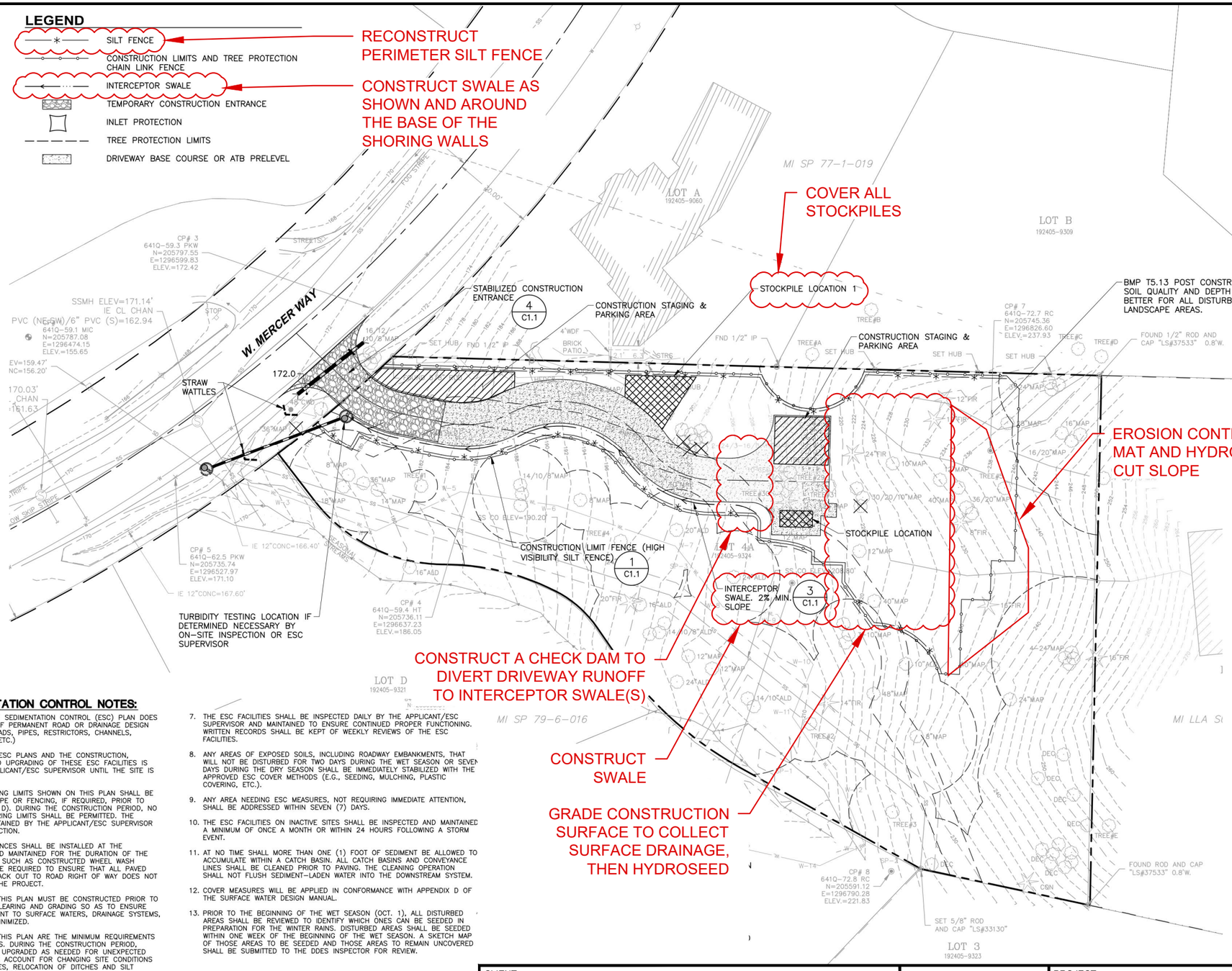
COVER ALL STOCKPILES

EROSION CONTROL MAT AND HYDROSEED CUT SLOPE

CONSTRUCT A CHECK DAM TO DIVERT DRIVEWAY RUNOFF TO INTERCEPTOR SWALE(S)

CONSTRUCT SWALE

GRADE CONSTRUCTION SURFACE TO COLLECT SURFACE DRAINAGE, THEN HYDROSEED



GENERAL NOTES:

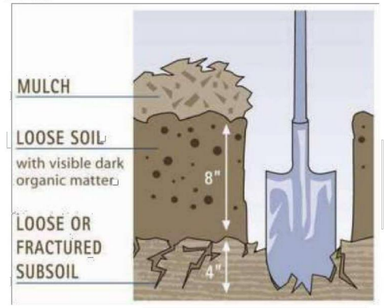
1. TREE REMOVAL TO BE COORDINATED WITH ARBORIST AND THE CITY OF MERCER ISLAND.

CONSTRUCTION SEQUENCE

1. INSTALL CONSTRUCTION LIMITS AND TREE PROTECTION CHAIN LINK FENCE, ALONG IDENTIFIED CONSTRUCTION LIMITS.
2. INSTALL PERMANENT DOWNSTREAM PIPED CONVEYANCE INCLUDING CB5 AND CB2. SEE SHEET C2.0.
3. INSTALL STORM DRAIN INLET PROTECTION.
4. GRADE AND INSTALL CONSTRUCTION ENTRANCE AND PERMANENT DRIVEWAY CULVERT.
5. GRADE AND INSTALL CONSTRUCTION STAGING / PARKING AREA.
6. GRADE AND DESIGNATE STOCKPILE AREAS.
7. INSTALL TEMPORARY INTERCEPTOR SWALE AND SEDIMENT CONTROL MEASURES.
8. BEGIN DRIVEWAY CLEARING AND GRADING.
9. INSTALL UTILITIES LOCATED IN DRIVEWAY CORRIDOR.
10. INSTALL DRIVEWAY, GRADE WALLS, DRIVEWAY ACCESS BASE COURSE OR ATB PRELEVEL.
11. INSTALL GABION BASKET WALLS.
12. INSTALL BUILDING FOUNDATION SHORING.
13. CONSTRUCT BUILDING AND REMAINING HARDSCAPE FEATURES.
14. CONNECT UTILITIES.
15. STABILIZE SITE.
16. REMOVE REMAINING TESC FEATURES.
17. CONDUCT ALL ACTIVITIES IN ACCORDANCE WITH ESC NOTES, THIS SHEET.

BMP T5.13 IMPLEMENTATION NOTES:

1. Leave undisturbed native vegetation and soil, and protect from compaction during construction.
2. Amend existing site topsoil or subsoil either at default "pre-approved" rates, or at custom calculated rates based on tests of the soil and amendment.
3. Stockpile existing topsoil during grading, and replace it prior to planting. Stockpiled topsoil must also be amended if needed to meet the organic matter or depth requirements, either at a default "pre-approved" rate or at a custom calculated rate.
4. Import topsoil mix of sufficient organic content and depth to meet the requirements.
5. More than one method may be used on different portions of the same site. Soil that already meets the depth and organic matter quality standards, and is not compacted, does not need to be amended.



1 DETAIL
NTS

EROSION AND SEDIMENTATION CONTROL NOTES:

1. APPROVAL OF THIS EROSION AND SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
2. THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/ESC SUPERVISOR UNTIL THE SITE IS STABILIZED.
3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED BY SURVEY TAPE OR FENCING, IF REQUIRED, PRIOR TO CONSTRUCTION (SWDM APPENDIX D). DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE CLEARING LIMITS SHALL BE MAINTAINED BY THE APPLICANT/ESC SUPERVISOR FOR THE DURATION OF CONSTRUCTION.
4. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES, SUCH AS CONSTRUCTED WHEEL WASH SYSTEMS OR WASH PADS, MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN AND TRACK OUT TO ROAD RIGHT OF WAY DOES NOT OCCUR FOR THE DURATION OF THE PROJECT.
5. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED PRIOR TO OR IN CONJUNCTION WITH ALL CLEARING AND GRADING SO AS TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
6. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND MODIFIED TO ACCOUNT FOR CHANGING SITE CONDITIONS (E.G. ADDITIONAL COVER MEASURES, RELOCATION OF DITCHES AND SILT FENCES, PERIMETER PROTECTION ETC.).
7. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/ESC SUPERVISOR AND MAINTAINED TO ENSURE CONTINUED PROPER FUNCTIONING. WRITTEN RECORDS SHALL BE KEPT OF WEEKLY REVIEWS OF THE ESC FACILITIES.
8. ANY AREAS OF EXPOSED SOILS, INCLUDING ROADWAY EMBANKMENTS, THAT WILL NOT BE DISTURBED FOR TWO DAYS DURING THE WET SEASON OR SEVEN DAYS DURING THE DRY SEASON SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED ESC COVER METHODS (E.G., SEEDING, MULCHING, PLASTIC COVERING, ETC.).
9. ANY AREA NEEDING ESC MEASURES, NOT REQUIRING IMMEDIATE ATTENTION, SHALL BE ADDRESSED WITHIN SEVEN (7) DAYS.
10. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN 24 HOURS FOLLOWING A STORM EVENT.
11. AT NO TIME SHALL MORE THAN ONE (1) FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM SYSTEM.
12. COVER MEASURES WILL BE APPLIED IN CONFORMANCE WITH APPENDIX D OF THE SURFACE WATER DESIGN MANUAL.
13. PRIOR TO THE BEGINNING OF THE WET SEASON (OCT. 1), ALL DISTURBED AREAS SHALL BE REVIEWED TO IDENTIFY WHICH ONES CAN BE SEEDED IN PREPARATION FOR THE WINTER RAINS. DISTURBED AREAS SHALL BE SEEDED WITHIN ONE WEEK OF THE BEGINNING OF THE WET SEASON. A SKETCH MAP OF THOSE AREAS TO BE SEEDED AND THOSE AREAS TO REMAIN UNCOVERED SHALL BE SUBMITTED TO THE DDES INSPECTOR FOR REVIEW.

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HORIZ. 0 10 20 40
Scale In Feet

CALL BEFORE YOU DIG 811
UNDERGROUND SERVICE (USA)

SOURCE:

PACE
An Engineering Services Company
11255 Kirkland Way, Suite 300
Kirkland, WA 98033
p. 425.827.2014 | f. 425.827.5043
Civil | Structural | Planning | Survey
paceengrs.com

SCALE:	DATE:
AS SHOWN	07/31/2018
DESIGNED BY: DW	CHECKED BY: JS
JOB NUMBER 17387	
SHEET: C1.0	
SHEET 4 OF 11	

CLIENT
City of Mercer Island

WSP USA
Environment & Infrastructure Inc.
4020 Lake Washington Blvd NE, Suite 200
Kirkland, Washington 98033

PROJECT
GEOTECHNICAL ENGINEERING SITE ASSESSMENT
5236 West Mercer Way

TITLE
TESC AND CONSTRUCTION MANAGEMENT PLAN

DATE: MAY 2023
SCALE: AS SHOWN
PROJECT NO.: PS23-20341-C
FIGURE: C1.0

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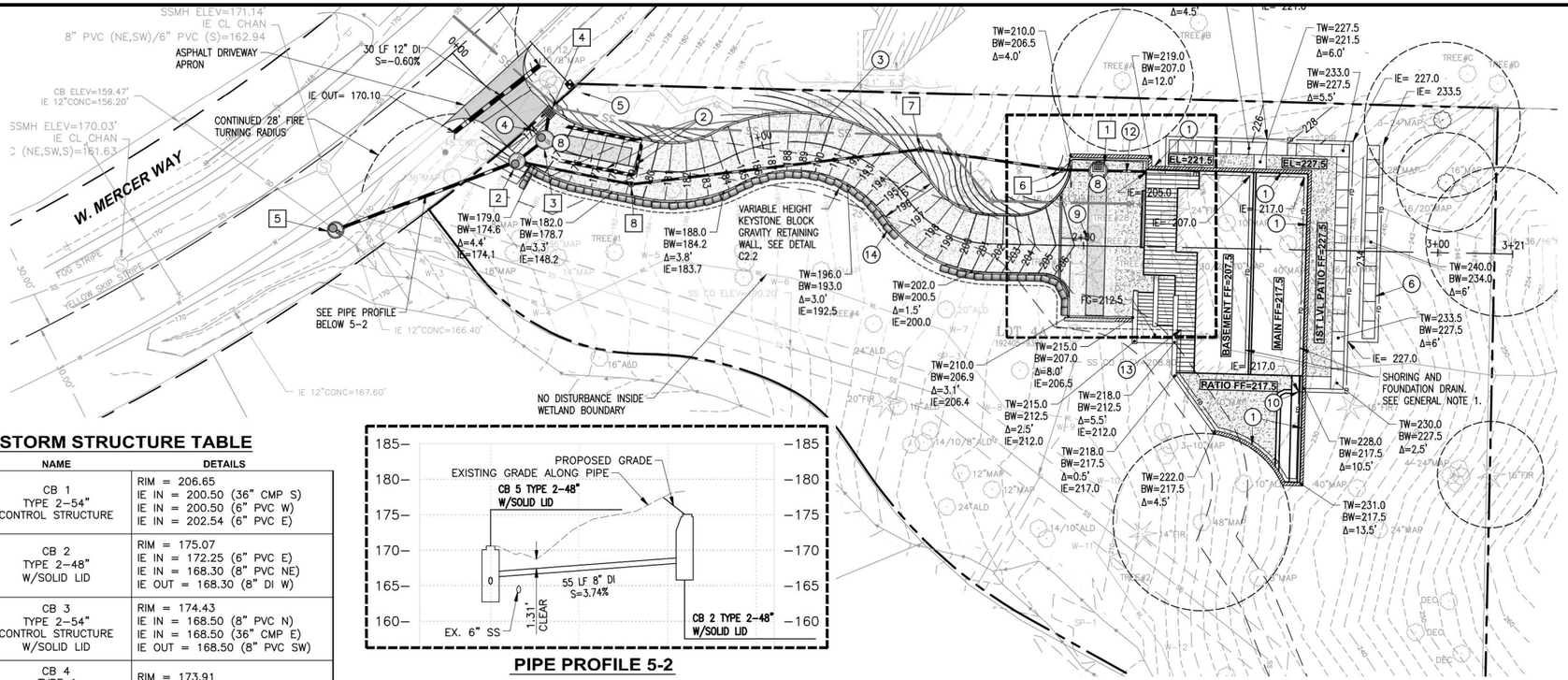
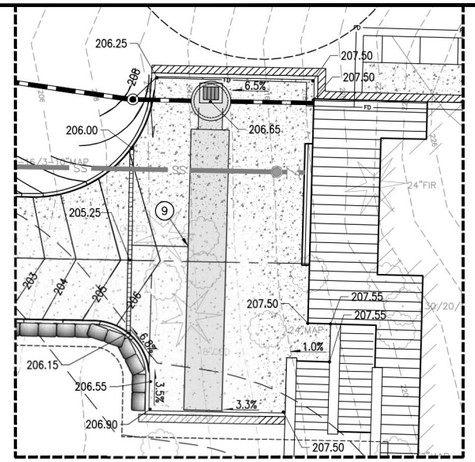
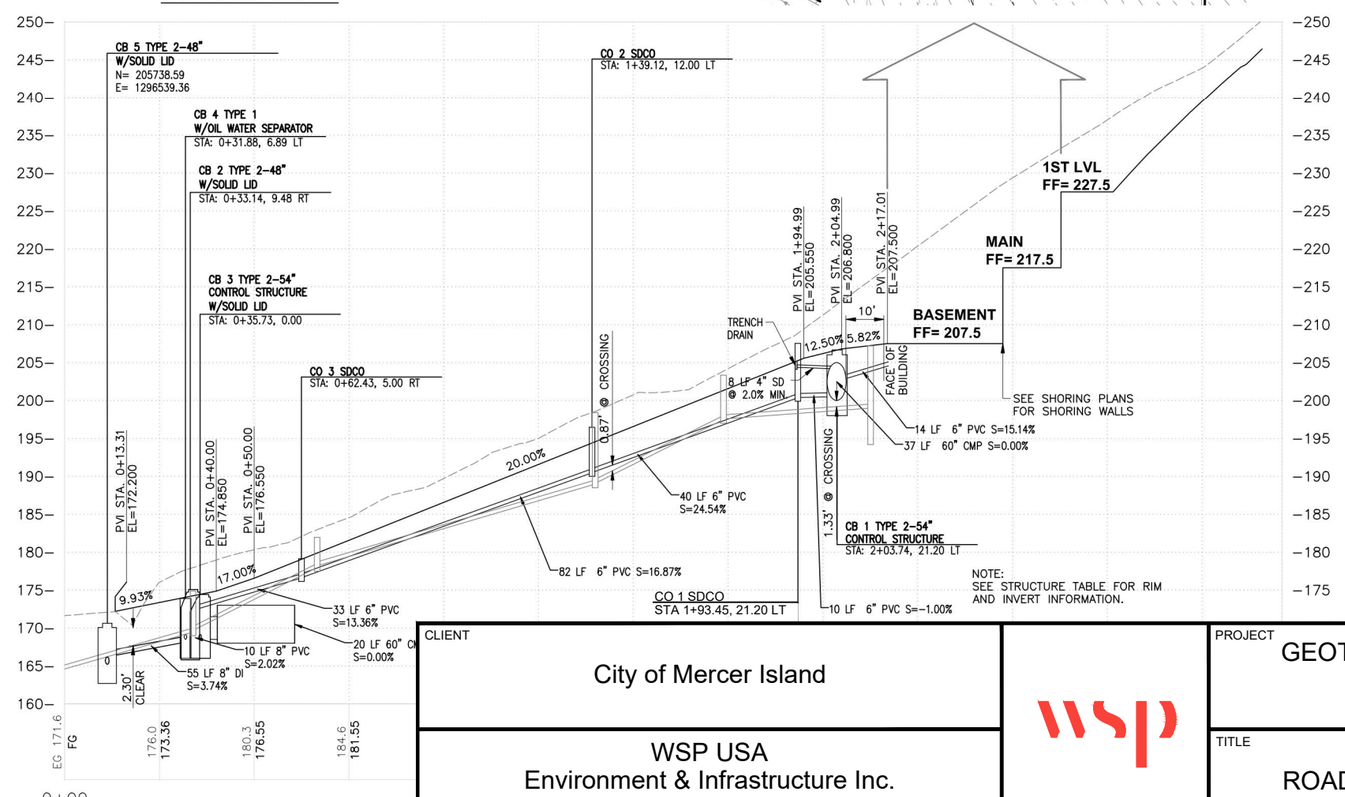




DRIVEWAY GRADING
1"=10'

PIPE PROFILE 5-2



STORM STRUCTURE TABLE

	NAME	DETAILS
1	CB 1 TYPE 2-54" CONTROL STRUCTURE	RIM = 206.65 IE IN = 200.50 (36" CMP S) IE IN = 200.50 (6" PVC W) IE IN = 202.54 (6" PVC E)
2	CB 2 TYPE 2-48" W/SOLID LID	RIM = 175.07 IE IN = 172.25 (6" PVC E) IE IN = 168.30 (8" PVC NE) IE OUT = 168.30 (8" DI W)
3	CB 3 TYPE 2-54" CONTROL STRUCTURE W/SOLID LID	RIM = 174.43 IE IN = 168.50 (8" PVC N) IE IN = 168.50 (36" CMP E) IE OUT = 168.50 (8" PVC SW)
4	CB 4 TYPE 1 W/OIL WATER SEPARATOR	RIM = 173.91 IE OUT = 168.50 (8" PVC S)
5	CB 5 TYPE 2-48" W/SOLID LID	RIM = 170.62 IE IN = 166.25 (8" DI E) IE IN = 165.21 (12" CONC SE) IE OUT = 165.21 (12" CONC NW)
6	CO 1 SDCO	RIM = 207.55 IE OUT = 200.40 (6" PVC E) IE OUT = 200.40 (6" PVC W)
7	CO 2 SDCO	RIM = 196.47 IE IN = 190.50 (6" PVC E) IE OUT = 190.50 (6" PVC W)
8	CO 3 SDCO	RIM = 179.14 IE IN = 176.64 (6" PVC E) IE OUT = 176.64 (6" PVC W)

LEGEND

- PERMANENT SHORING
- TEMP. SHORING
- SANITARY SIDE SEWER — SS
- SS CLEANOUT
- STORM DRAIN
- TRENCH DRAIN
- FOOTING DRAIN — FD
- WALL DRAIN
- SD CLEANOUT
- YARD DRAIN
- CB TYPE 1
- CB TYPE 2 — SD
- CAST-IN-PLACE WALL

HORIZ. 0 10 20 40 Scale In Feet

VERT. 0 5 10 20 Scale In Feet

N

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KEY NOTES

1. PERMANENT SHORING WALLS
2. TEMPORARY SHORING WALLS
3. CONCRETE DRIVEWAY WITH VERTICAL CURB AND GUTTER.
4. VALLEY GUTTER AT EDGE OF ASPHALT. SEE DETAIL 3, SHEET C2.1.
5. 1" WATER METER, MINIMUM.
6. GABION BASKET WALL (TYP), SEE DETAIL 4, SHEET C2.1.
7. NOT USED.
8. CMP DETENTION PIPE, SEE DETAILS ON SHEET C2.1.
9. CONNECT TRENCH DRAIN TO DETENTION SYSTEM VIA 4" SD GRAVITY DRAIN @ 2.0% MINIMUM SLOPE. TRENCH DRAIN FINISHED GRADE ELEVATION MUST NOT BE LESS THAN 205.25.
10. CONNECT GABION BASKET WALL FOOTING DRAINS TO SOLDIER PILE SHORING FOOTING DRAIN.
11. CONNECT WALL DRAIN TO CB.
12. 6" ROOF DRAIN OUTLET, S=2.00% MIN.
13. CONNECT FOOTING DRAIN TO WAIL DRAIN.
14. FINAL WALL DESIGN SHALL BE COMPLETED BY THE BLOCK WALL MANUFACTURER, BASED ON GEOTECTNICAL PARAMETERS PRESENTED IN THE GEOTECHNICAL REPORT, SECTION 6.6.

GENERAL NOTES:

1. REFERENCE SHORING AND STRUCTURAL DETAILS FOR SHORING AND FOUNDATION DRAIN OUTLET DETAILS.
2. BASEMENT FLOOR SHORING-FOUNDATION DRAIN OUTLET SD @ 2.0% MIN.
3. YARD DRAIN OUTLET SD @ 2.0% MIN
4. STORM CONVEYANCE PIPE SHALL BE SDR 35 PVC.
5. GABION BASKET WALL CONSTRUCTED PRIOR TO PERMANENT SHORING CONSTRUCTION. SEE SHORING AND STRUCTURAL PLANS.
6. BMP T5.13 POST CONSTRUCTION SOIL QUALITY AND DEPTH OR BETTER FOR ALL DISTURBED LANDSCAPE AREAS.

SOURCE:

PACE
An Engineering Services Company
11255 Kirkland Way, Suite 300
Kirkland, WA 98033
p. 425.827.2014 | f. 425.827.5043
Civil | Structural | Planning | Survey
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SCALE:	DATE:
AS SHOWN	07/31/2018
DESIGNED BY:	CHECKED BY:
DW	JS

JOB NUMBER 17387

SHEET: C2.0

SHEET 6 OF 11

CLIENT: City of Mercer Island

WSP USA
Environment & Infrastructure Inc.
4020 Lake Washington Blvd NE, Suite 200
Kirkland, Washington 98033

PROJECT: GEOTECHNICAL ENGINEERING SITE ASSESSMENT
5236 West Mercer Way

TITLE: ROAD, GRADING, AND STORM PLAN

DATE: MAY 2023

SCALE: AS SHOWN

PROJECT NO. PS23-20341-C

FIGURE C2.0

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