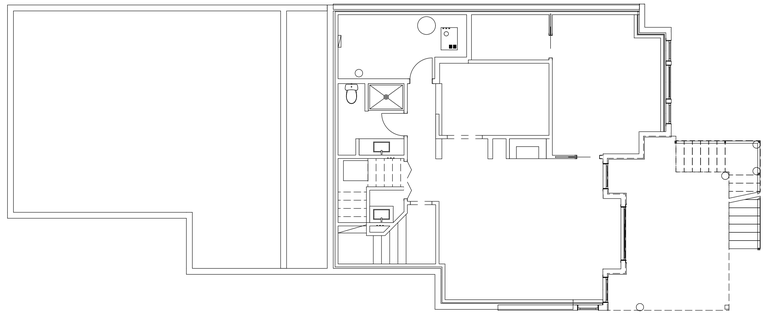
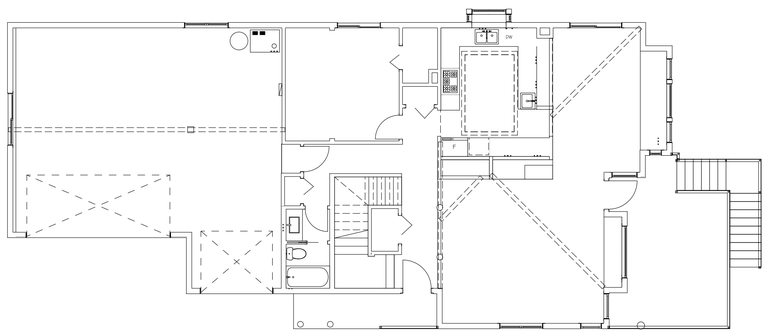


AS BUILT - LOWER FLOOR

SCALE: 1/8" = 1'-0"

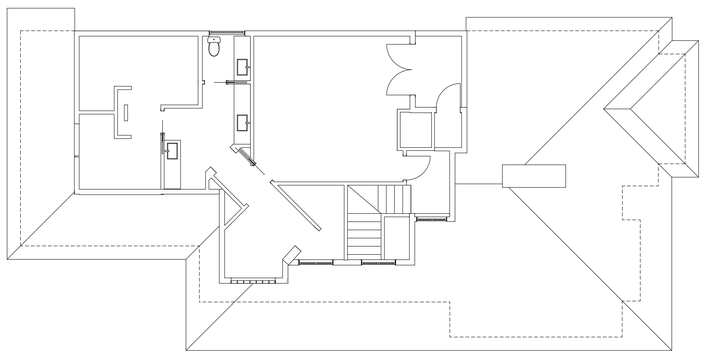
N



AS BUILT - MAIN FLOOR

SCALE: 1/8" = 1'-0"

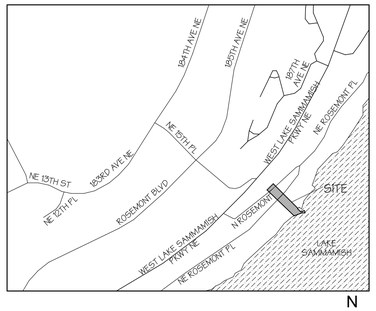
N



AS BUILT - UPPER FLOOR

SCALE: 1/8" = 1'-0"

N



VICINITY MAP (NTS)

N

GENERAL NOTES

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1. CODES/REGULATIONS:
-CONSTRUCTION TO CONFORM TO THE 2015 INTERNATIONAL RESIDENTIAL CODE (IRC), WASHINGTON STATE LAWS AND REGULATIONS, CURRENT WASHINGTON STATE RESIDENTIAL ENERGY CODE AND VARIOUS CODES IMPOSED BY LOCAL AUTHORITIES.
-A SEPARATE PERMIT MAY BE REQUIRED FOR PLUMBING, ELECTRICAL, AND/OR MECHANICAL WORK AS APPLICABLE.
-A COPY OF THE APPROVED PERMIT PLANS MUST BE ON THE JOB SITE DURING CONSTRUCTION.

2. CONTRACTOR'S RESPONSIBILITY:
-PRIOR TO CONSTRUCTION, THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND STRUCTURAL MEMBER SIZES.
-DO NOT SCALE CONTRACT DOCUMENTS.
-IF ANY DISCREPANCIES IN THE DRAWINGS OR FROM THE CODES ARE NOTED, ARCHITECT IS TO BE NOTIFIED IMMEDIATELY.
-ALL CHANGES MADE BY THE CONTRACTOR SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
-THE ARCHITECT SHALL NOT HAVE CONTROL OR CHARGE OF, AND SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS, SAFETY PRECAUTIONS, ACTS OR OMISSIONS OR PERFORMANCE OF THE CONTRACTOR.
-CONTRACTOR SHALL BE RESPONSIBLE FOR THE PERFORMANCE AND WEATHERPROOFING OF THE ENTIRE BUILDING, ITS COMPONENT EQUIPMENT, AND PARTS.
-ALL STRUCTURAL SYSTEMS SUCH AS WOOD TRUSSES WHICH ARE TO BE COMPOSED OF COMPONENTS TO BE FIELD ERECTED SHALL BE SUPERVISED BY THE SUPPLIER DURING MANUFACTURING, DELIVERY, HANDLING, STORAGE, AND ERECTION IN ACCORDANCE WITH INSTRUCTIONS PREPARED BY THE SUPPLIER.
-ALL WORK MUST FOLLOW CURRENT RRP RULES AND REQUIREMENTS AS DEFINED BY THE EPA AND THE STATE OF WASHINGTON.
-ALL WASTE AND REFUSE CAUSED IN CONNECTION WITH THE WORK SHALL BE REMOVED FROM THE PREMISES AND DISPOSED OF BY THE CONTRACTOR. THE PREMISES SHALL BE LEFT CLEAR AND CLEAN TO THE SATISFACTION OF THE OWNER.
-CONTRACTOR SHALL DESIGN AND INSTALL SHORING AS REQUIRED TO PERFORM WORK. ENGINEERING, CONSTRUCTION AND SAFETY OF THE SHORING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
-FOR ALL NEW CONSTRUCTION OR ADDITIONS DESIGNED WITHIN 1'-0" OF THE HEIGHT LIMIT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE SURVEYOR TO VERIFY THE ELEVATION OF THE STRUCTURE AS IT IS BEING BUILT TO VERIFY ANY ELEVATION DISCREPANCIES THROUGHOUT CONSTRUCTION. ELEVATIONS SHOULD BE VERIFIED FOR EACH FLOOR LEVEL PRIOR TO PROCEEDING WITH THE NEXT FLOOR OF FRAMING: TOP OF FOUNDATION, TOP OF SUBFLOOR, TOP PLATE AND RIDGE ELEVATIONS SHOULD BE VERIFIED DURING CONSTRUCTION. CONSULT ARCHITECT FOR CLARIFICATION PRIOR TO CONSTRUCTION.

3. SOILS:
-FOUNDATION DESIGN IS BASED ON AN ASSUMED AVERAGE SOIL BEARING OF 2,000 PSF OR PER GEOTECHNICAL REPORT. ALL FOOTINGS SHALL BE CAST ON UNDISTURBED FIRM NATURAL SOIL OR COMPACTED SOIL OF 2,000 PSF BEARING CAPACITY AT LEAST 1'-6" BELOW LOWEST ADJACENT GRADE, AND FREE OF ORGANIC MATERIALS. FOOTING EXCAVATION SHALL BE FREE OF LOOSE SOILS, DEBRIS, AND FREE WATER AT ALL TIMES. THIS OFFICE TAKES NO RESPONSIBILITY IN VERIFYING THE ACCURACY OF ENGINEERING DATA SUPPLIED BY OTHERS.

4. ATTIC REQUIREMENTS:
-APPLY ROOFING IN ACCORDANCE WITH IRC CHAPTER 9. PROVIDE ATTIC VENTILATION AS INDICATED ON DRAWINGS AND AS OUTLINED IN IRC SEC R806.
-THE NET FREE VENTILATING AREA SHALL BE NOT LESS THAN 1/150 OF THE AREA OF THE SPACE VENTILATED, EXCEPT THAT THE AREA MAY BE 1/300 PROVIDED AT LEAST 50 PERCENT OF THE REQUIRED VENTILATING AREA IS PROVIDED BY VENTILATION LOCATED IN THE UPPER PORTION OF THE SPACE TO BE VENTILATED AT LEAST 3 FEET ABOVE EAVE OF CORNICE VENTS WITH THE BALANCE OF THE REQUIRED VENTILATION PROVIDED BY EAVE OR CORNICE VENTS. (IRC SEC R806).
-ATTIC ACCESS: MINIMUM 22" x 30" WITH MINIMUM 30" HEADROOM, UNOBSTRUCTED, READILY ACCESSIBLE OPENING. IRC SEC R807. ACCESS DOORS SHALL BE WEATHERSTRIPPED AND INSULATED TO A LEVEL EQUIVALENT TO THE INSULATION ON THE SURROUNDING SURFACES.
-IN ROOMS NOT PROVIDED WITH AN OPERABLE WINDOW OF 15 SQ. FT. OR GREATER, A MECHANICAL VENTILATION SYSTEM CAPABLE OF PROVIDING 5 AIR CHANGES PER HOUR SHALL BE PROVIDED.
-VENT DRYER, BATH FANS, AND RANGES/OVENS TO THE OUTSIDE.

5. VENTILATION:
-VENT FANS SHALL TERMINATE AT THE EXTERIOR OF THE BUILDING PER IRC SECTION M1502.3 AND IMC SECTION 501.3.
-INSULATE ALL DUCTS OUTSIDE OF CONDITIONED SPACE PER WA STATE ENERGY CODE.
-KITCHEN RANGE HOODS: RANGE HOODS CAPABLE OF EXHAUSTING MORE THAN 400 CFM REQUIRE MAKE-UP AIR PER IRC M1503.4.

6. GLAZING:
-TO BE IN COMPLIANCE WITH IRC SEC R308 AND WASHINGTON STATE SAFETY GLASS LAW, EXCEPTIONS ARE AS OUTLINED IN IRC SEC R308.
-GLAZING IN LOCATIONS SUBJECT TO HUMAN IMPACT SUCH AS GLASS IN DOORS, GLAZING WITHIN 24" ON EITHER SIDE OF A DOOR OPENING, GLAZING CLOSER THAN 18" TO A FLOOR, SHOWER DOORS AND TUB ENCLOSURES SHALL BE WIRE REINFORCED, TEMPERED GLASS, LAMINATED SAFETY GLASS OR SHATTER RESISTANT PLASTIC.
-SLIDING GLASS DOORS TO BE SAFETY GLAZING, LAMINATED OR TEMPERED GLASS.
-SHOWER ENCLOSURES SHALL BE APPROVED WIRE REINFORCED, TEMPERED OR LAMINATED SAFETY GLASS OR SHATTER RESISTANT PLASTIC.
-GLAZING WITHIN 18" OF FLOOR AND GREATER THAN 18" IN LEAST DIMENSION SHALL COMPLY WITH IMPACT LOADS. SEE PLANS.
-ALL EXTERIOR WALL GLAZING SHALL BE DOUBLE GLAZED, UNLESS NOTED OTHERWISE, AND COMPLY WITH STATE OF WASHINGTON ENERGY CODE.
-EGRESS IN EVERY SLEEPING ROOM SHALL HAVE A MINIMUM NET CLEAR OPENING OF 5.7 SQ. FT. THE MINIMUM NET CLEAR OPENING HEIGHT DIMENSION SHALL BE 24", MINIMUM NET CLEAR OPENING WIDTH OF 20" AND A FINISHED SILL HEIGHT NOT MORE THAN 44" ABOVE THE FLOOR. IRC SEC R310.

7. ENERGY:
-ALL MATERIALS, WORKMANSHIP AND CONSTRUCTION SHALL CONFORM TO IRC REQUIREMENTS AND THE WASHINGTON STATE ENERGY CODE, LATEST EDITION. VERIFY ALL CONDITIONS BEFORE PROCEEDING WITH WORK.
-APPLICATION AND INSTALLATIONS OF INSULATION AND VAPOR BARRIERS SHALL COMPLY WITH STATE OF WASHINGTON THERMAL INSULATION STANDARDS.
-BUILDING AIR LEAKAGE TESTING, PER SEC 502.4.5, IS REQUIRED PRIOR TO FINAL INSPECTION. THE TEST RESULTS SHALL BE POSTED ON THE RESIDENTIAL ENERGY COMPLIANCE CERTIFICATE.
-EACH DWELLING UNIT IS TO HAVE ONE PROGRAMMABLE THERMOSTAT FOR REGULATION OF TEMPERATURE PER SEC 503.8.1.
-A SIGNED AFFADAVIT DOCUMENTING THE DUCT LEAKAGE TEST RESULTS SHALL BE PROVIDED TO THE BUILDING INSPECTOR PRIOR TO AN APPROVED FINAL INSPECTION.
-DUCT LEAKAGE TEST RESULTS SHALL BE PROVIDED TO THE BUILDING INSPECTOR AND HOMEOWNER PRIOR TO AN APPROVED FINAL INSPECTION.
-MINIMUM 75% OF PERMANENTLY INSTALLED LAMPS IN LIGHTING FIXTURES SHALL BE HIGH EFFICACY LAMPS PER SEC 404.1.
-WHERE THE PRIMARY HEATING SYSTEM IS A FORCED-AIR FURNACE, AT LEAST ONE THERMOSTAT PER DWELLING UNIT SHALL BE CAPABLE OF CONTROLLING THE HEATING AND COOLING SYSTEM ON A DAILY SCHEDULE TO MAINTAIN DIFFERENT TEMPERATURE SET POINTS AT DIFFERENT TIMES OF THE DAY. THE THERMOSTAT SHALL ALLOW FOR, AT A MINIMUM, A 5-2 PROGRAMMABLE SCHEDULE (WEEKDAYS/WEEKENDS) AND BE CAPABLE OF PROVIDING AT LEAST TWO PROGRAMMABLE SETBACKS PER DAY.

8. STAIRS:
-MINIMUM HEADROOM 6'-8"; MINIMUM TREAD 10"; MAXIMUM RISER 7 3/4"
-HANDRAIL: REQUIRED AT ALL STAIRS WITH MORE THAN 4 RISERS PER IRC 311.7.8. MINIMUM 34" AND MAXIMUM 38" ABOVE TREAD NOSING. OPEN SIDES OF STAIRS MORE THAN 30" ABOVE ADJACENT FLOOR SHALL HAVE HANDRAILS AND GUARDRAILS. HANDRAIL TO BE 1 1/4"-2" CROSS SECTIONAL DIMENSION AND 1 1/2" AWAY FROM WALL.
-GUARDRAIL: SHALL BE MIN 36" IN HEIGHT WHERE ADJACENT SURFACE OR GRADE IS 30" OR MORE BELOW. RAILINGS SHALL BE SPACED TO NOT ALLOW THE PASSAGE OF A 4" SPHERE PER IRC 312.1.
-INSTALL FIRE BLOCKING AT MID-STRINGER SPAN AND AT WALL ALIGN STRINGER.
-COVER WALLS AND SOFFITS OF USABLE SPACE UNDER STAIR WITH 5/8" TYPE "X" GYPSUM WALLBOARD.

9. INSULATION:
-INSULATION TO MEET THE CURRENT WASHINGTON STATE ENERGY CODE REQTS FOR TABLE R402.1.1, TABLE R402.1.3 AND SECTION R402. REFER TO PRESCRIPTIVE TABLE ON SHEET 01.
-EXISTING WALL AND FLOOR CAVITIES EXPOSED DURING CONSTRUCTION FOUND UNINSULATED, OR WITH DAMAGED INSULATION (DISCOLORED, WET, DAMAGED, OR DETERIORATED) SHALL BE FILLED WITH R-15 INSULATION AT 2X4 FRAMING AND WITH R-21 INSULATION AT 2X6 FRAMING. REF SEC R503.1.1-EXCEPTION 2..
-WALLS TO BE INSULATED WITH MINIMUM R-21 INSULATION. BELOW GRADE WALLS TO BE INSULATED WITH MINIMUM R-21 INSULATION, ALLOW FOR THERMAL BREAK BETWEEN FLOOR SLAB AND BASEMENT WALL UNLESS NOTED OTHERWISE.
-ROOF AND CEILING INSULATED WITH R-49 BLOWN-IN AT FLAT CEILINGS AND R-38 H.D. BATT AT VAULTED AREAS UNLESS NOTED OTHERWISE.
-ROOF: ALLOW FOR A MINIMUM 1" CLEAR BETWEEN TOP OF INSULATION AND BOTTOM OF SHEATHING FOR VENTING UNLESS NOTED OTHERWISE.
-VENTING IS REQUIRED IN EACH JOIST SPACE. WHERE CONTINUOUS VENTING WITH A JOIST SPACE IS INTERRUPTED BY A HEADER (FOR EXAMPLE AT A SKYLIGHT OR HP), PROVIDE (2) 1 1/2" VENTING HOLES AT THE TOP OF THE RAFTER AT THE HEADER TO ALLOW FOR CONTINUOUS THRU-VENTING INTO THE NEXT JOIST SPACE UNLESS NOTED OTHERWISE.
-FLOORS: INSULATED WITH R-30 BATT INSULATION OVER UNHEATED SPACE UNLESS NOTED OTHERWISE.
-SLAB-ON-GRADE: PROVIDE EXTRUDED RIGID CLOSED CELL R-10 INSULATION. INSULATION TO PROVIDE THERMAL BREAK BETWEEN SLAB AND FOOTING AND RUN FROM THE TOP OF THE SLAB TO THE BOTTOM OF THE FOOTING. INSULATION MAY BE INTERRUPTED FOR 6" EVERY 2'-0" TO ALLOW FOR DOWELING TO TIE SLAB AND FOOTING TOGETHER. UNLESS NOTED OTHERWISE.

10. GARAGE SEPARATION:
-REQUIRES 1/2" GWB ON THE GARAGE SIDE. 5/8" TYPE 'X' GWB WHERE THERE IS LIVING SPACE ABOVE. SUPPORTING COLUMNS, WALLS AND BEAMS USE 1/2" GWB PER IRC R302.6
-OPENINGS INTO A GARAGE: OPENINGS INTO A GARAGE SHALL HAVE A SOLID WOOD OR HONEYCOMB-CORE STEEL DOOR NOT LESS THAN 1-3/8" THICK, OR 20-MINUTE FIRE RATING. DOORS SHALL BE EQUIPPED WITH A SELF-CLOSING DEVICE PER IRC R302.5.1.

11. VAPOR BARRIERS:
-AN APPROVED VAPOR BARRIER SHALL BE INSTALLED AT EXTERIOR WALLS AND AT ALL ROOF DECKS, BELOW ENCLOSED JOIST SPACES WHERE CEILING FINISHES ARE DIRECTLY INSTALLED TO JOISTS, AND ANY OTHER WALL OR CEILING SURFACES WHICH RECEIVE INSULATION. THIS VAPOR BARRIER MAY BE A COMPONENT OF THE INSULATION MATERIAL. APPLICATION AND INSTALLATIONS OF INSULATION AND VAPOR BARRIERS SHALL COMPLY WITH STATE OF WASHINGTON THERMAL INSULATION STANDARDS.

12. FIRE SAFETY:
-SMOKE ALARMS/DETECTORS (S.D.): SMOKE ALARMS/DETECTORS SHALL BE INSTALLED IN ALL SLEEPING ROOMS, IN THE AREA OUTSIDE THE SLEEPING ROOM AND IN OTHER LOCATIONS PER IRC R314. POWER SOURCE AND INTERCONNECTION PER IRC.
-CARBON MONOXIDE DETECTORS (C.M.D.): SHALL HAVE AN APPROVED CARBON MONOXIDE ALARM INSTALLED OUTSIDE OF EACH SLEEPING AREA IN DWELLING UNITS AND IN EACH LEVEL IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS PER IRC315. SINGLE STATION CARBON MONOXIDE ALARMS SHALL BE LISTED AS COMPLYING WITH UL2034 AND SHALL BE INSTALLED IN ACCORDANCE WITH THIS CODE, NFPA 720-2012 AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
-CARBON MONOXIDE DETECTION SYSTEMS PER IRC 315.2 THAT INCLUDE CARBON MONOXIDE DETECTORS AND AUDIBLE NOTIFICATION APPLIANCES, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THIS SECTION FOR CARBON MONOXIDE ALARMS AND NFPA 720-2012, SHALL BE PERMITTED. THE CARBON MONOXIDE DETECTORS SHALL BE LISTED AS COMPLYING WITH UL 2075. WHERE A HOUSEHOLD CARBON MONOXIDE DETECTION SYSTEM IS INSTALLED, IT SHALL BECOME A PERMANENT FIXTURE OF THE OCCUPANCY.

13. CERTIFICATE & TESTING
- A PERMANENT CERTIFICATE SHALL BE COMPLETED AND POSTED ON OR WITHIN THREE FEET OF THE ELECTRICAL DISTRIBUTION PANEL BY THE BUILDER OR REGISTERED DESIGN PROFESSIONAL. THE CERTIFICATE SHALL BE COMPLETED BY THE BUILDER OR REGISTERED DESIGN PROFESSIONAL AND SHALL NOT COVER OR OBSTRUCT THE VISIBILITY OF THE CIRCUIT DIRECTORY LABEL, SERVICE DISCONNECT LABEL, OR OTHER REQUIRED LABELS. THE CERTIFICATE SHALL LIST THE PREDOMINANT R-VALUES OF INSULATION INSTALLED IN OR ON CEILING/ROOF WALLS, FOUNDATION (SLAB, BELOW-GRADE WALL, AND/OR FLOOR) AND DUCTS OUTSIDE CONDITIONED SPACES; U-FACTORS FOR FENESTRATION AND THE RESULTS FROM ANY REQUIRED DUCT SYSTEM AND BUILDING ENVELOPE AIR LEAKAGE TESTING DONE ON THE BUILDING. WHERE THERE IS MORE THAN ONE VALUE FOR EACH COMPONENT, THE CERTIFICATE SHALL LIST THE VALUE COVERING THE LARGEST AREA. THE CERTRIFICATE SHALL LIST THE TYPES OF EFFICIENCIES OF HEATING, COOLING, AND SERVICE WATER HEATING EQUIPMENT.
- THE BUILDING OR DWELLING UNIT SHALL BE TESTED AND VERIFIED AS HAVING AN AIR LEAKAGE RATE OF NOT EXCEEDING 5 AIR CHANGES PER HOUR. TESTING SHALL BE CONDUCTED WITH A BLOWER DOOR AT A PRESSURE OF 0.2 INCHES W.G. (50 PASCALS). WHERE REQUIRED BY THE CODE OFFICIAL, TESTING SHALL BE CONDUCTED BY AN APPROVED THIRD PARTY. A WRITTEN REPORT OF THE RESULTS OF THE TEST SHALL BE SIGNED BY THE PARTY CONDUCTING THE TEST AND PROVIDED TO THE CODE OFFICIAL. TESTING SHALL BE PERFORMED AT ANY TIME AFTER CREATION OF ALL PENETRATIONS OF THE BUILDING THERMAL ENVELOPE.

14. FIRE SPRINKLERS
- EXISTING FIRE SPRINKLER SYSTEM TO REMAIN
- EXTEND EXISTING FIRE SPRINKLER SYSTEM TO ALL NEW AREAS OF DWELLING UNIT. DESIGN TO BE PROVIDED BY OTHERS.
- SPRINKLERS SHALL BE LISTED RESIDENTIAL SPRINKLERS AND SHALL BE INSTALLED IN ACCORDANCE WITH THE SPRINKLER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- THE SPRINKLER SYSTEM SHALL BE DESIGNED BY A WASHINGTON STATE CERTIFIED SPRINKLER DESIGNER AND INSTALLED IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION STANDARD

PROJECT INFORMATION

PROJECT OWNER:	ROB DROLLINGER 1250 W LAKE SAMMAMISH PKWY NE BELLEVUE WA 98008
PROJECT ARCHITECT: PROJECT DESIGNER:	HEIDI HELGESON LISA MONTALVO H2D ARCHITECTURE + DESIGN 23020 EDMONDS WAY, #113 EDMONDS, WA 98020
STRUCTURAL ENGINEER:	SANDRO KODAMA, P.E., S.E. QUANTUM CONSULTING ENGINEERS, LLC 1511 THIRD AVENUE, SUITE 323 SEATTLE, WA 98101 206.919.8853
GEOTECHNICAL ENGINEER:	JOHNNY CHEN, P.E. FANGEO, INC 3213 EASTLAKE AVENUE EAST, SUITE B SEATTLE, WA 98102 206.262.0370
PROJECT DESCRIPTION:	UPPER FLOOR ADDITION IN EXISTING FOOTPRINT; NEW DRIVEWAY PARKING AREA AND ENTRY PORCH ADDITION; STEEP SLOPE STABILIZATION
PROJECT ADDRESS:	1250 W LAKE SAMMAMISH PKWY NE
TAX LOT NUMBER:	7430500270
LEGAL DESCRIPTION:	ROSEMONT BEACH ADD TR 53 TGW FOR TR52 DAF: COMM AT MOST WLY COR SD TR 52 TH S 49-50-59 E ALG SWLY LN SD TR 108.12FT TO TPOB TH CONTG ALG SD SWLY LN S 49-50-59 E 45.59FT TH N 02-31-24 E 8017FT TH N 49-50-59 W 40.60FT TH S 40-09-01 W 6047FT TO TPOB LESS FOR SD TR 53 DAF: BEG AT MOST WLY COR SD TR 53 TH S 49-02-23 E ALG SWLY LN SD TR 71.82FT TH N 44-33-51 E 41.94FT TH N 68-56-46 E 5.28FT TO NELY LN SD TR TH N 49-50-59 W ALG SD NELY LN 77.26FT TO MOST NLY COR SD TR SD PT BEING ON A 3213.23FT RADIUS CRV TO RIGHT FROM WCH PT CENTER SD CRV BEARS N 49-50-59 W TH SWLY ALG SD CRV & NWLY LN SD TR THRU C/A OF 00-48-36 ARC DIST OF 45.43FT TO BEG - AKA LOT B CITY OF BELLEVUE BOUNDARY LINE ADJUSTMENT NO 95-1207 REC NO 9506019001. PLAT LOT 52-53; SW-30-25-6

LAND USE CODE COMPLIANCE STATISTICS

*REFER TO 02 SHEET FOR LAND USE CODE COMPLIANCE STATISTICS

SHEET INDEX

01	PROJECT INFORMATION, VICINITY MAP, GENERAL NOTES, AS-BUILT PLANS
02	SITE PLAN
SURV	SURVEY
SURV	SURVEY
C1.0	TESC AND DEMOLITION PLAN
C1.1	TESC AND DEMOLITION DETAILS
C1.2	TESC AND DEMOLITION NOTES
C2.0	GRADING AND DRAINAGE PLAN
C2.1	DRAINAGE DETAILS AND NOTES
C3.0	PAVING AND UTILITIES PLAN
C3.1	PAVING AND UTILITIES DETAILS AND NOTES

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

9716 REGISTERED ARCHITECT
HEIDI MICHELLE HELGESON
STATE OF WASHINGTON

H 2 D
ARCHITECTURE
+
DESIGN

23020 EDMONDS WAY, #113
EDMONDS, WA 98020
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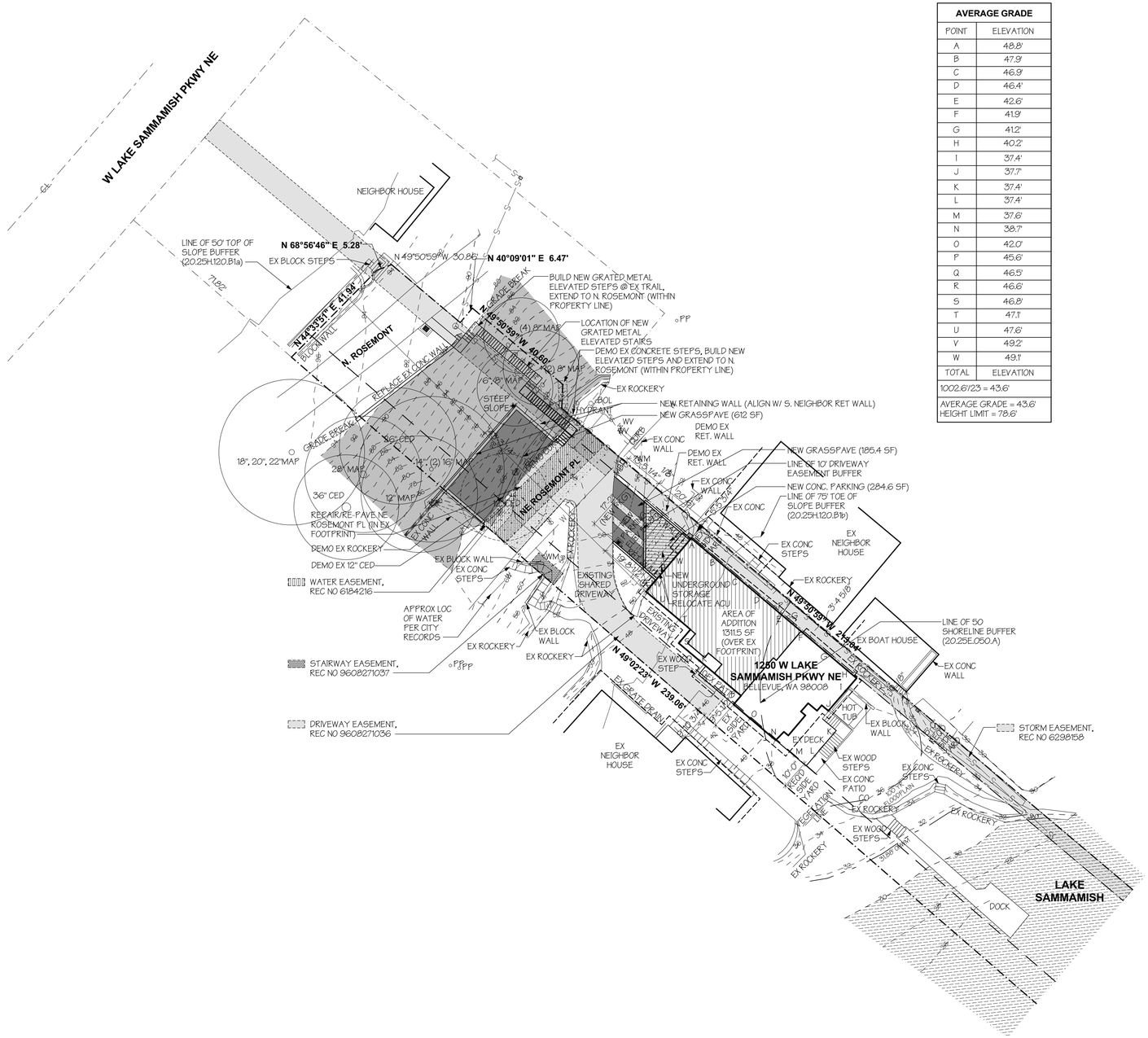
www.h2darchitects.com

DATE: 3/3/2021

CRITICAL AREA LAND USE SUBMITTAL

PROJECT INFORMATION, VICINITY MAP, GENERAL NOTES, AS-BUILT PLANS



AVERAGE GRADE	
POINT	ELEVATION
A	48.8'
B	47.9'
C	46.9'
D	46.4'
E	42.6'
F	41.9'
G	41.2'
H	40.2'
I	37.4'
J	37.7'
K	37.4'
L	37.4'
M	37.6'
N	38.7'
O	42.0'
P	45.6'
Q	46.5'
R	46.6'
S	46.8'
T	47.1'
U	47.6'
V	49.2'
W	49.1'
TOTAL	ELEVATION
1002.6/23 = 43.6'	
AVERAGE GRADE = 43.6' HEIGHT LIMIT = 78.6'	

LAND USE CODE COMPLIANCE STATISTICS

ZONE: R-2.5

CRITICAL AREAS: STEEP SLOPE, SHORELINE

LOT COVERAGE:

LOT AREA:	13,598 SF
(MINUS STEEP SLOPE AREA)	(-2652.8 SF)
TOTAL NET LOT AREA:	10,945.2 SF
EXISTING HOUSE:	1,440.0 SF
NEW ADDITION:	280.0 SF
PROPOSED LOT COVERAGE:	1720.0 SF
ALLOWED LOT COVERAGE:	10495.2 SF X 35% = 3,673.32 SF...OK

EX IMPERVIOUS SURFACE:

LOT AREA:	13,598 SF
EXISTING HOUSE/ROOF:	2,556.5 SF
EX PATIO:	226.3 SF
EX HOT TUB:	82.4 SF
EX CONC. STEPS:	37.4 SF
EX SHARED DRIVEWAY:	1,018.3 SF
EX DRIVEWAY:	154.4 SF
EX PRIVATE ROAD (NE ROSEMONT PL):	753 SF
EX PRIVATE ROAD (N ROSEMONT):	546 SF
TOTAL EXISTING IMPERVIOUS SURFACE:	5,374.3 SF
ALLOWED IMPERVIOUS SURFACE:	13,598 SF X 45% = 6,119.1 SF ... OK

PROPOSED IMPERVIOUS SURFACE:

LOT AREA:	13,598 SF
EXISTING HOUSE/ROOF:	2,556.5 SF
EX PATIO:	226.3 SF
EX HOT TUB:	82.4 SF
EX CONC. STEPS:	37.4 SF
EX SHARED DRIVEWAY:	1,018.3 SF
EX DRIVEWAY:	154.4 SF
EX PRIVATE ROAD (NE ROSEMONT PL):	753 SF
EX PRIVATE ROAD (N ROSEMONT):	546 SF
NEW DRIVEWAY/PARKING AREA:	287.1 SF
TOTAL PROPOSED IMPERVIOUS SURFACE:	5,661.7 SF
ALLOWED IMPERVIOUS SURFACE:	13,598 SF X 45% = 6,119.1 SF ... OK

EX HARDSCAPE:

LOT AREA:	13,598 SF
EXISTING HOUSE/ROOF:	2,556.5 SF
EX PATIO:	226.3 SF
EX HOT TUB:	82.4 SF
EX ROCKERIES:	311.6 SF
EX CONC. RETAINING WALLS:	132.2 SF
EX CONC. STEPS:	37.4 SF
EX SHARED DRIVEWAY:	1,018.3 SF
EX DRIVEWAY:	154.4 SF
EX PRIVATE ROAD (NE ROSEMONT PL):	753 SF
EX PRIVATE ROAD (N ROSEMONT):	546 SF
EX WOOD DOCK:	73.4 SF
EX WOOD STAIRS:	20.3 SF
TOTAL EXISTING HARDSCAPE:	5,911.8 SF
ALLOWED HARDSCAPE:	13,598 SF X 75% = 10,198.5 SF ... OK

PROPOSED HARDSCAPE:

LOT AREA:	13,598 SF
EXISTING HOUSE/ROOF:	2,556.5 SF
EX PATIO:	226.3 SF
EX HOT TUB:	82.4 SF
EX ROCKERIES:	311.6 SF
EX CONC. RETAINING WALLS:	132.2 SF
EX CONC. STEPS:	37.4 SF
EX SHARED DRIVEWAY:	1,018.3 SF
EX DRIVEWAY:	154.4 SF
EX PRIVATE ROAD (NE ROSEMONT PL):	753 SF
EX PRIVATE ROAD (N ROSEMONT):	546 SF
EX WOOD DOCK:	73.4 SF
EX WOOD STAIRS:	20.3 SF
NEW RET. WALL @ DRIVEWAY:	45 SF
NEW CONCRETE DRIVEWAY/PARKING:	287.1 SF
NEW GRASSPAVE:	797.4 SF
TOTAL PROPOSED HARDSCAPE:	7,041.3 SF
ALLOWED HARDSCAPE:	13,598 SF X 75% = 10,198.5 SF ... OK

F.A.R.:

LOT AREA:	13,598 SF
EX GROSS LOWER FLOOR AREA:	998.6 SF
(EXEMPT LOWER FLOOR AREA BELOW GRADE):	(-190.8 SF)
EX GROSS MAIN FLOOR AREA:	1,983.9 SF
EX GROSS UPPER FLOOR AREA:	864.3 SF
TOTAL EXISTING GROSS FLOOR AREA:	3,656 SF
NEW UPPER FLOOR ADDITION AREA:	+ 299.7 SF
NEW FOURTH FLOOR ADDITION AREA:	+1,213.6 SF
TOTAL PROPOSED GROSS FLOOR AREA:	5,169.3 SF
TOTAL ALLOWED GFA:	13,598 SF X 50% =6,799 SF... OK

REQ'D SETBACKS:

FRONT:	20'
REAR SETBACK:	25'
SIDE SETBACK:	5' MIN; 15' COMB.
ACCESS EASEMENT SETBACK:	10'

PARKING: 3 EXISTING GARAGE PARKING SPACES TO REMAIN; 1 PROPOSED NEW UNCOVERED PARKING SPACE

BUILDING HEIGHT INFORMATION: BUILDING HEIGHT LIMIT = 30'/35'
REFER TO SHEET A2.0 AND A2.1 FOR DETAILED HEIGHT INFORMATION

SITE PLAN

SCALE: 1" = 20'

N

NOTES:
1. REFER TO CIVIL ENGINEERING FOR GRADING, DRAINAGE, PAVING, & UTILITIES.
2. REFER TO CRITICAL AREAS REPORT FOR MITIGATION PLAN.

DROLLINGER RESIDENCE

1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

9716 REGISTERED ARCHITECT
HEIDI MICHELLE HELGESON
STATE OF WASHINGTON

H 2 D
ARCHITECTURE
+
DESIGN

23020 EDMONDS WAY, #113
EDMONDS, WA 98020
P. 206.542.3734
www.h2darchitects.com

DATE: 3/3/2021

CRITICAL AREA LAND USE SUBMITTAL

SITE PLAN

TOPOGRAPHIC & BOUNDARY SURVEY

LEGAL DESCRIPTION

(PER STATUTORY WARRANTY DEED RECORDING# 20140219000844)

TRACT 53, ROSEMONT BEACH, ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 34 OF PLATS, PAGE 28, IN KING COUNTY, WASHINGTON;

EXCEPT THAT PORTION DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST WESTERLY CORNER OF SAID TRACT 53;
THENCE SOUTH 49°02'23" EAST, ALONG THE SOUTHWESTERLY LINE OF SAID TRACT, A DISTANCE OF 71.82 FEET;
THENCE NORTH 44°33'51" EAST 41.94 FEET;
THENCE NORTH 68°56'46" EAST 5.28 FEET TO THE NORTHEASTERLY LINE OF SAID TRACT;
THENCE NORTH 49°50'59" WEST, ALONG SAID NORTHEASTERLY LINE, 77.26 FEET TO THE MOST NORTHERLY CORNER OF SAID TRACT 53, SAID POINT BEING ON A 3213.23 FOOT RADIUS CIRCULAR CURVE TO THE RIGHT, FROM WHICH POINT THE CENTER OF SAID CURVE BEARS NORTH 49°50'59" WEST;
THENCE SOUTHWESTERLY ALONG SAID CURVE AND THE NORTHWESTERLY LINE OF SAID TRACT, THROUGH A CENTRAL ANGLE OF 00°48'36" AN ARC DISTANCE OF 45.43 FEET TO THE POINT OF BEGINNING;

TOGETHER WITH THAT PORTION OF TRACT 52, ROSEMONT BEACH, ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 34 OF PLATS, PAGE 28, IN KING COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

COMMENCING AT THE MOST WESTERLY CORNER OF SAID TRACT 52;
THENCE SOUTH 49°50'59" EAST ALONG THE SOUTHWESTERLY LINE OF SAID TRACT, 108.12 FEET TO THE TRUE POINT PF BEGINNING;
THENCE CONTINUING ALONG SAID SOUTHWESTERLY LINE, SOUTH 49°50'59" EAST 45.59 FEET;
THENCE NORTH 02°31'24" EAST 8.17 FEET;
THENCE NORTH 49°50'59" WEST 40.60 FEET;
THENCE SOUTH 40°09'01" WEST 6.47 FEET TO THE TRUE POINT OF BEGINNING;
(ALSO KNOWN AS LOT B, CITY OF BELLEVUE BOUNDARY LINE ADJUSTMENT NUMBER 95-1207, RECORDED UNDER RECORDING NUMBER 9506019001).

SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

BASIS OF BEARINGS

BETWEEN CITY OF BELLEVUE HORIZONTAL STA. 492 AND 493
BEARING = NORTH 38°41'06" EAST PER R1.

REFERENCES

R1. BOUNDARY LINE ADJUSTMENT, REC. NO. 9506019001.

R2. RECORD OF SURVEY, REC. NO. 20151204900006.

VERTICAL DATUM

NAVD88, PER CITY OF BELLEVUE VERTICAL STA. NO.43

CONC MON W/COB BRASS CAP STAMPED "H514" & V493 IN CASE; TOP MON TO TOP RIM CASE 0.29 FEET, 10' EAST E/P W LK SAMMAMISH BLVD NE, 1200' NORTH OF 513 NEAR LARGE BOULDER. ELEVATION = 150.70'

SURVEYOR'S NOTES

1. THE TOPOGRAPHIC SURVEY SHOWN HEREON WAS PERFORMED IN AUGUST OF 2019. THE FIELD DATA WAS COLLECTED AND RECORDED ON MAGNETIC MEDIA THROUGH AN ELECTRONIC THEODOLITE. THE DATA FILE IS ARCHIVED ON DISC OR CD. WRITTEN FIELD NOTES MAY NOT EXIST. CONTOURS ARE SHOWN FOR CONVENIENCE ONLY. DESIGN SHOULD RELY ON SPOT ELEVATIONS.
2. ALL MONUMENTS SHOWN HEREON WERE LOCATED DURING THE COURSE OF THIS SURVEY UNLESS OTHERWISE NOTED.
3. THE TYPES AND LOCATIONS OF ANY UTILITIES SHOWN ON THIS DRAWING ARE BASED ON INFORMATION PROVIDED TO US, BY OTHERS OR GENERAL INFORMATION READILY AVAILABLE IN THE PUBLIC DOMAIN INCLUDING, AS APPLICABLE, IDENTIFYING MARKINGS PLACED BY UTILITY LOCATE SERVICES AND OBSERVED BY TERRANE IN THE FIELD. AS SUCH, THE UTILITY INFORMATION SHOWN ON THESE DRAWINGS ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE RELIED ON FOR DESIGN OR CONSTRUCTION PURPOSES; TERRANE IS NOT RESPONSIBLE OR LIABLE FOR THE ACCURACY OR COMPLETENESS OF THIS UTILITY INFORMATION. FOR THE ACCURATE LOCATION AND TYPE OF UTILITIES NECESSARY FOR DESIGN AND CONSTRUCTION, PLEASE CONTACT THE SITE OWNER AND THE LOCAL UTILITY LOCATE SERVICE (800-424-5555).
4. SUBJECT PROPERTY TAX PARCEL NO. 743050-0270.
5. SUBJECT PROPERTY AREA PER THIS SURVEY IS 13,598 ±S.F. (0.31 ACRES)
6. ALL TITLE INFORMATION SHOWN ON THIS MAP HAS BEEN EXTRACTED FROM FIRST NEXTITLE COMPANY'S "PRELIMINARY REPORT", COMMITMENT NO. NXWA-0130062, DATED JANUARY 8, 2014. IN PREPARING THIS MAP, TERRANE, INC. HAS CONDUCTED NO INDEPENDENT TITLE SEARCH NOR IS TERRANE, INC. AWARE OF ANY TITLE ISSUES AFFECTING THE SURVEYED PROPERTY OTHER THAN THOSE SHOWN ON THE MAP AND DISCLOSED BY THE REFERENCED "SUBDIVISION GUARANTEE". TERRANE, INC. HAS RELIED WHOLLY ON NEXTITLE COMPANY'S REPRESENTATIONS OF THE TITLE'S CONDITION TO PREPARE THIS SURVEY AND TERRANE, INC. QUALIFIES THE MAP'S ACCURACY AND COMPLETENESS TO THAT EXTENT.
7. FIELD DATA FOR THIS SURVEY WAS OBTAINED BY DIRECT FIELD MEASUREMENTS WITH A CALIBRATED ELECTRONIC 5-SECOND TOTAL STATION AND/OR SURVEY GRADE GPS OBSERVATIONS. ALL ANGULAR AND LINEAR RELATIONSHIPS ARE ACCURATE AND MEET THE STANDARDS SET BY WAC 332-130-090.

SCHEDULE B ITEMS

3. EASEMENT AND THE TERMS AND CONDITIONS THEREOF: GRANTEE: PUGET SOUND POWER & LIGHT COMPANY, A MASSACHUSETTS CORPORATION, PURPOSE: ELECTRIC TRANSMISSION AND/OR DISTRIBUTION SYSTEM, AREA AFFECTED: PORTION OF SAID PREMISES, RECORDED: APRIL 28, 1941, UNDER RECORDING NO.: 3161079. (LOCATION NOT SPECIFIC)

SCHEDULE B ITEMS CONT.

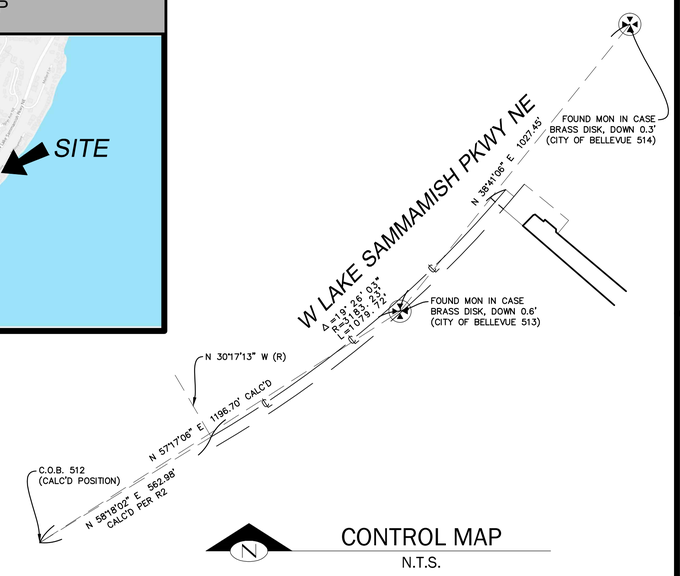
4. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: TWO 40 FOOT EASEMENTS FOR EXISTING PRIVATE ROADWAYS AND A UTILITY EASEMENT ALONG BOTH PRIVATE ROADWAYS; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 3308907. (LOCATION NOT SPECIFIC)
5. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: EXISTING PRIVATE ROADWAYS; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 3764710. (LOCATION NOT SPECIFIC)
6. EASEMENT AND THE TERMS AND CONDITIONS THEREOF: GRANTEE: LAKE HILLS SEWER DISTRICT, PURPOSE: SANITARY SEWER LINE OR LINES, AREA AFFECTED: PORTION OF SAID PREMISES, RECORDED: JUNE 7, 1965, UNDER RECORDING NO.: 5887693. (DOCUMENT NOT LEGIBLE ENOUGH TO PLOT)
7. SIDE SEWER EASEMENT AND THE TERMS AND CONDITIONS THEREOF: 10 FEET IN WIDTH, LOCATED ALONG THE LINE OF THE LAND AS CONSTRUCTED, RECORDED: JUNE 7, 1965; RECORDING NO.: 5887693. (DOCUMENT NOT LEGIBLE ENOUGH TO PLOT)
8. EASEMENT AND THE TERMS AND CONDITIONS THEREOF: GRANTEE: WATER DISTRICT NUMBER 97 A WATER LINE OR LINES AND APPURTENANCES, PURPOSE: PORTION OF SAID PREMISES, AREA AFFECTED: PORTION OF SAID PREMISES, RECORDED: JUNE 2, 1967, UNDER RECORDING NO.: 6184216. (PLOTTED)
9. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: DRAINAGE PIPE; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 6298158. (PLOTTED)
10. EASEMENT AND THE TERMS AND CONDITIONS THEREOF: GRANTEE: WATER DISTRICT NO. 97, KING COUNTY, WASHINGTON, A MUNICIPAL CORPORATION, PURPOSE: WATER LINE, AREA AFFECTED: PORTION OF SAID PREMISES, RECORDED: OCTOBER 3, 1972, UNDER RECORDING NO.: 7210030547. (LOCATION NOT SPECIFIC)
11. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: EXISTING PRIVATE ROADWAY OR ROADWAYS; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 7210030547. (LOCATION NOT SPECIFIC)

SCHEDULE B ITEMS CONT.

12. UNDERGROUND UTILITY EASEMENT AND THE TERMS AND CONDITIONS THEREOF: GRANTEE: WASHINGTON NATURAL GAS COMPANY, A WASHINGTON CORPORATION; PURPOSE: GAS PIPELINE OR PIPELINES; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDED: FEBRUARY 21, 1991; RECORDING NO.: 9102210569. (LOCATION NOT SPECIFIC)
13. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: DRIVEWAY; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 9106050852. (PLOTTED)
14. SIDE SEWER EASEMENT AND THE TERMS AND CONDITIONS THEREOF: 5 FEET IN WIDTH, LOCATED ALONG THE LINE OF THE LAND AS CONSTRUCTED, RECORDED: NOVEMBER 2, 1992; RECORDING NO.: 9211020856. (AS CONSTRUCTED)
15. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: DRIVEWAY; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 9608271036. (PLOTTED)
16. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: STAIRWAY; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 9608271037. (PLOTTED)

VICINITY MAP

N.T.S.



CONTROL MAP

N.T.S.

LEGEND

ACU	AC UNIT		MONUMENT IN CASE (FOUND)
	AREA DRAIN	P	POWER METER
	ASPHALT SURFACE	UP	POWER (UNDERGROUND)
BOL	BOLLARD	PP	POWER POLE
	BUILDING		REBAR AS NOTED (FOUND)
	CENTERLINE ROW		REBAR & CAP (SET)
CO	CLEANOUT		ROCKERY
	CONCRETE SURFACE	SS	SEWER LINE
	RETAINING WALL		SEWER MANHOLE
	DECK		STORM MANHOLE
	FIRE HYDRANT	SD	STORM DRAIN LINE
G	GAS LINE	SIZE TYPE	TREE (AS NOTED)
G	GAS METER	W	WATER LINE
	NAIL AS NOTED	WM	WATER METER
	MAILBOX (RESIDENTIAL)	WV	WATER VALVE
	CB T-1 (SOLID)		STEEP SLOPE AREA

ITEM NO. 8 – WATER EASEMENT, REC. NO. 6184216

ITEM NO. 9 – STORM EASEMENT, REC. NO. 6298158

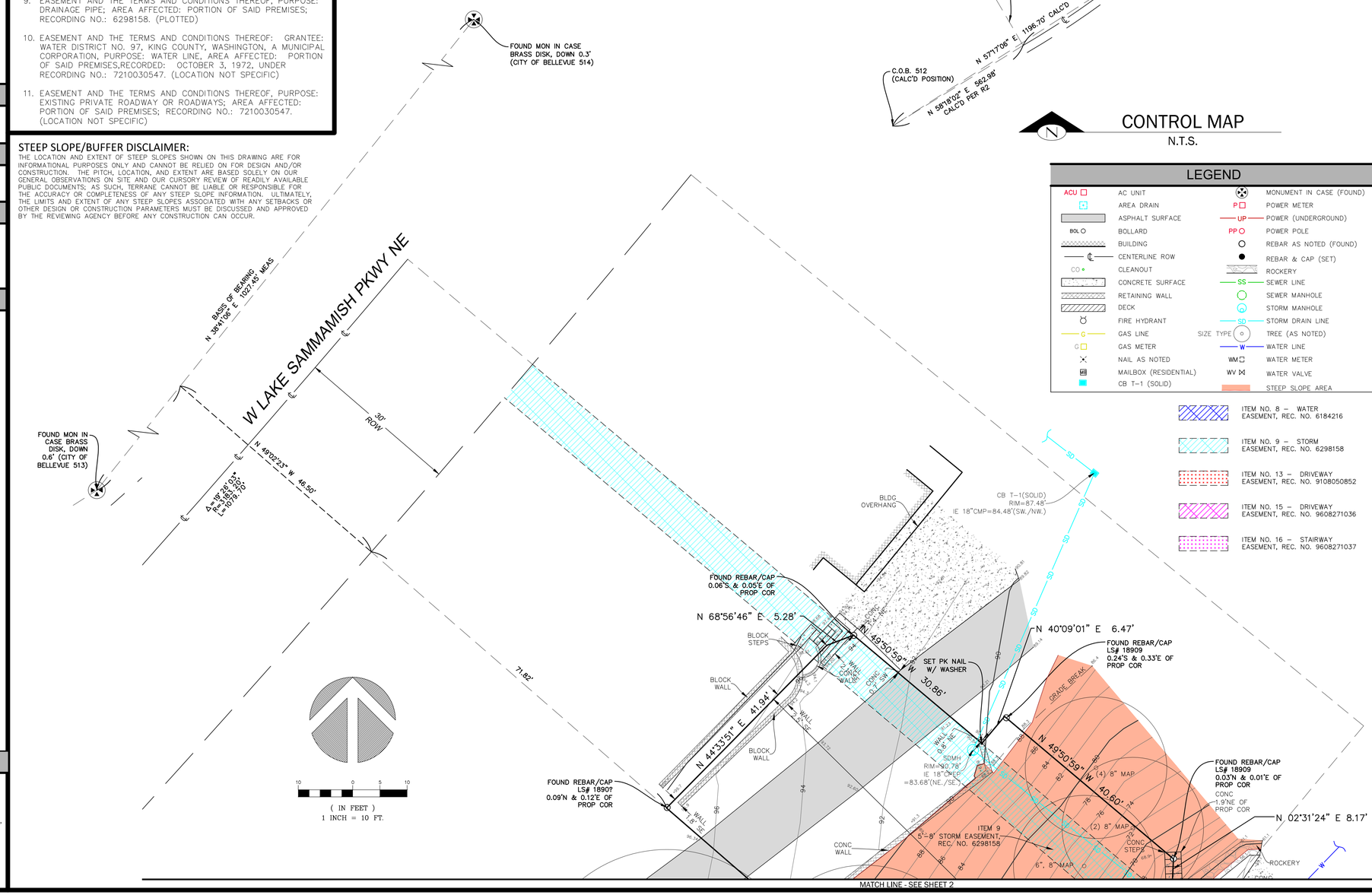
ITEM NO. 13 – DRIVEWAY EASEMENT, REC. NO. 9108050852

ITEM NO. 15 – DRIVEWAY EASEMENT, REC. NO. 9608271036

ITEM NO. 16 – STAIRWAY EASEMENT, REC. NO. 9608271037

STEEP SLOPE/BUFFER DISCLAIMER:

THE LOCATION AND EXTENT OF STEEP SLOPES SHOWN ON THIS DRAWING ARE FOR INFORMATIONAL PURPOSES ONLY AND CANNOT BE RELIED ON FOR DESIGN AND/OR CONSTRUCTION. THE PITCH, LOCATION, AND EXTENT ARE BASED SOLELY ON OUR GENERAL OBSERVATIONS ON SITE AND OUR CURSORY REVIEW OF READILY AVAILABLE PUBLIC DOCUMENTS; AS SUCH, TERRANE CANNOT BE LIABLE OR RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY STEEP SLOPE INFORMATION. ULTIMATELY, THE LIMITS AND EXTENT OF ANY STEEP SLOPES ASSOCIATED WITH ANY SETBACKS OR OTHER DESIGN OR CONSTRUCTION PARAMETERS MUST BE DISCUSSED AND APPROVED BY THE REVIEWING AGENCY BEFORE ANY CONSTRUCTION CAN OCCUR.



MATCH LINE - SEE SHEET 2

measure success

TOPOGRAPHIC & BOUNDARY SURVEY
NE 1/4 OF SW 1/4 SEC 30, TWP. 25N., RGE 06E., W.M.
PARCEL NO. 743050-0270

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE, WA 98008

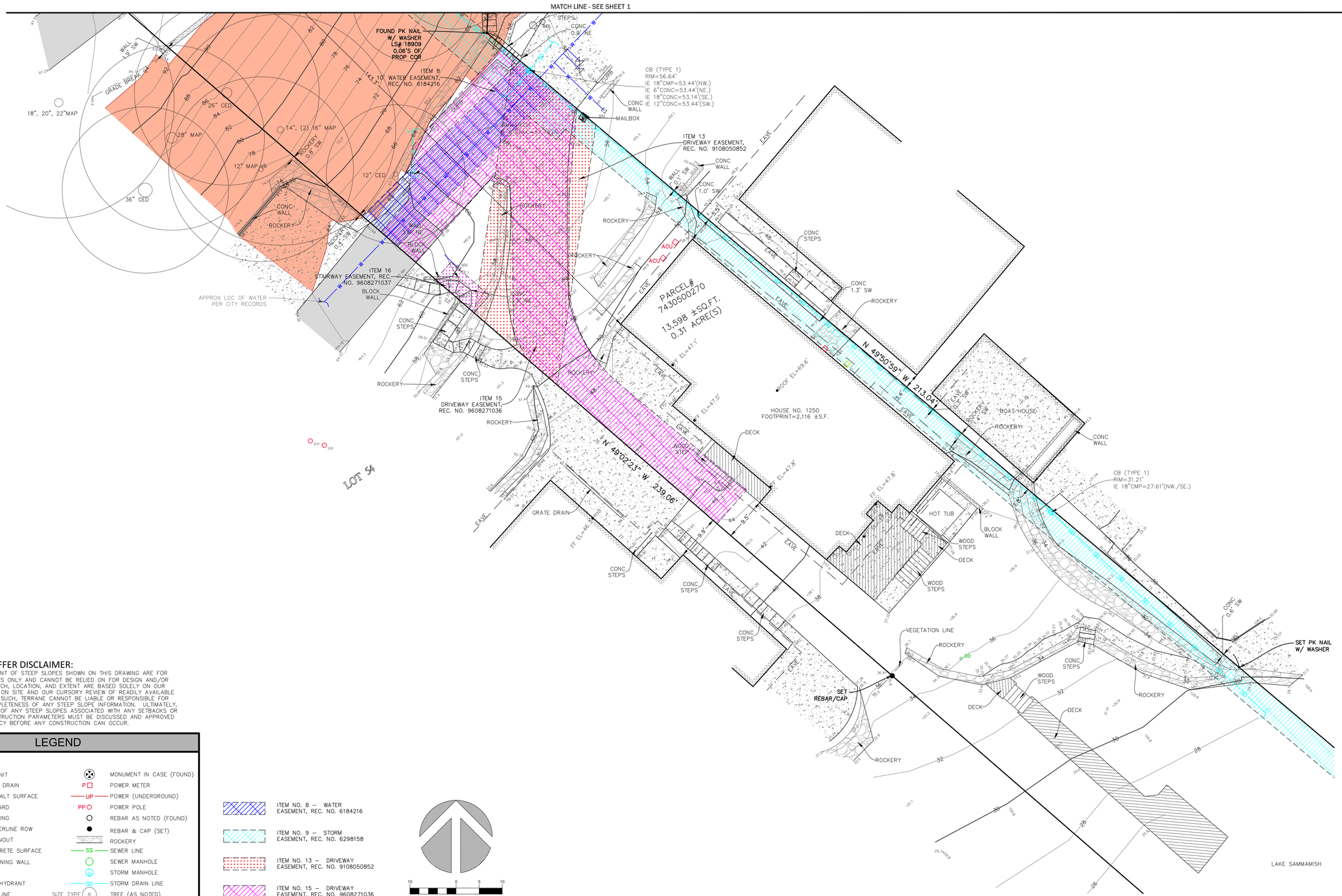
Terrane
10801 Main Street, Suite 102, Bellevue, WA 98004
phone 425.458.4488 support@terrane.net
www.terrane.net

JOB NUMBER:	191168
DATE:	08/28/19
DRAFTED BY:	IDV-GKD
CHECKED BY:	JPS
SCALE:	1" = 10'
REVISION HISTORY	
10/04/19	TITLE REVIEW
11/02/20	ADJUST MATCHLINE

SHEET NUMBER

1 OF 2

TOPOGRAPHIC & BOUNDARY SURVEY



STEEP SLOPE/BUFFER DISCLAIMER:

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LEGEND

ACU	AC UNIT		MONUMENT IN CASE (FOUND)
	AREA DRAIN	P	POWER METER
	ASPHALT SURFACE	UP	POWER (UNDERGROUND)
BOL	BOLLARD	PP	POWER POLE
	BUILDING		REBAR AS NOTED (FOUND)
	CENTERLINE ROW		REBAR & CAP (SET)
CO	CLEANOUT		ROCKERY
	CONCRETE SURFACE	SS	SEWER LINE
	RETAINING WALL		SEWER MANHOLE
	DECK		STORM MANHOLE
	FIRE HYDRANT	SD	STORM DRAIN LINE
G	GAS LINE	SIZE TYPE	TREE (AS NOTED)
G	GAS METER	W	WATER LINE
	NAIL AS NOTED	WM	WATER METER
	MAILBOX (RESIDENTIAL)	WV	WATER VALVE
	CB T-1 (SOLID)		STEEP SLOPE AREA

ITEM NO. 8 – WATER EASEMENT, REC. NO. 6184216

ITEM NO. 9 – STORM EASEMENT, REC. NO. 6298158

ITEM NO. 13 – DRIVEWAY EASEMENT, REC. NO. 9108050852

ITEM NO. 15 – DRIVEWAY EASEMENT, REC. NO. 9608271036

ITEM NO. 16 – STAIRWAY EASEMENT, REC. NO. 9608271037

10 0 5 10

(IN FEET)
1 INCH = 10 FT.

measure success

TOPOGRAPHIC & BOUNDARY SURVEY
NE 1/4 OF SW 1/4 SEC 30, TWP. 30N., RGE 25E., W.M.
TAX PARCEL NO. 7430500270

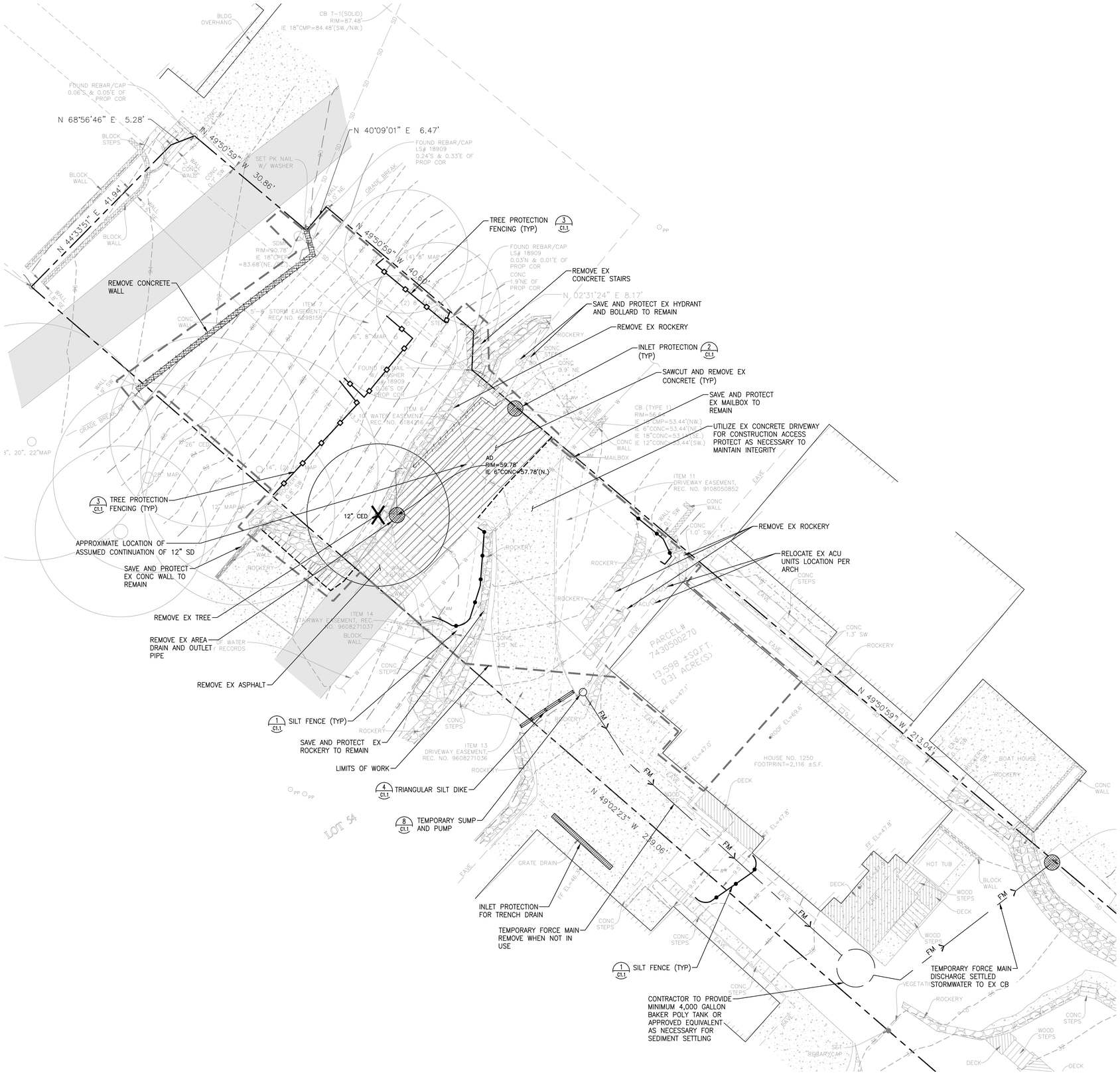
DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE, WA 98008

JEFFREY PASON SAVAGE
STATE OF WASHINGTON
52088
REGISTERED PROFESSIONAL LAND SURVEYOR
11/02/20

Terrane
10801 Main Street, Suite 102, Bellevue, WA 98004
phone 425.458.4488 support@terrane.net
www.terrane.net

JOB NUMBER:	191168
DATE:	08/28/19
DRAFTED BY:	IDV-GKD
CHECKED BY:	JPS
SCALE:	1"=10'
REVISION HISTORY	
10/04/19	TITLE REVIEW
11/02/20	ADJUST MATCHLINE

SHEET NUMBER
2 OF 2



N

Scale 1"=10'

LEGEND

- PROPERTY LINE
- EX CONTOUR (INDEX)
- EX CONTOUR
- EX BUILDING
- PROPOSED BUILDING OUTLINE
- BUILDING/STRUCTURE REMOVAL
- SAWCUT LINE
- ASPHALT REMOVAL
- CONCRETE REMOVAL
- STABILIZED CONSTRUCTION ENTRANCE
- CONSTRUCTION FENCING
- SILT FENCE
- TRIANGULAR SILT DIKE
- TEMP FORCE MAIN
- EX TREE TO REMAIN
- EX TREE TO BE REMOVED
- TREE PROTECTION
- EX CURB TO BE REMOVED
- EX UTILITY TO BE REMOVED
- INLET PROTECTION
- LIMITS OF WORK

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

LAURIE J. PIARR
STATE OF WASHINGTON
30766
REGISTERED
PROFESSIONAL ENGINEER
2-12-2021

LPD engineering pllc
1932 First Ave
Suite 201
Seattle, WA 98101
o. 206.725.1211
f. 206.973.5344
www.lpdengineering.com

DATE: 02/12/2021

PERMIT SET

TESC AND DEMOLITION PLAN

C1.0

811
Know what's below.
Call two business days before you dig.

CITY OF BELLEVUE APPROVAL STAMP

CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

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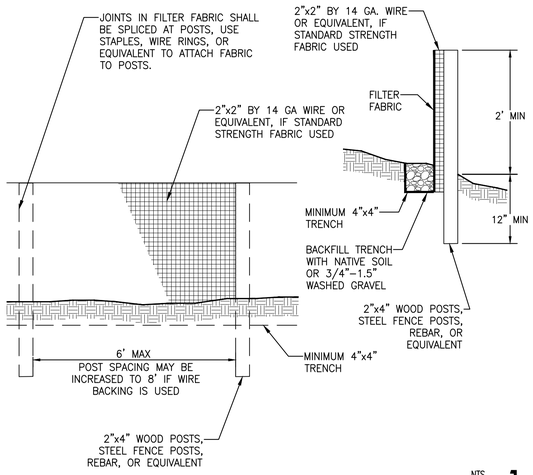
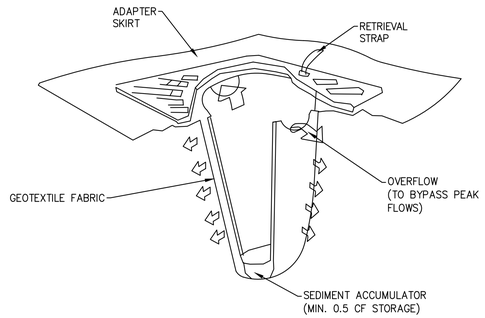


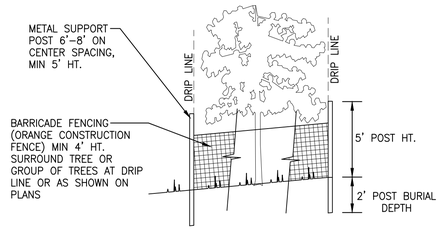
NTS
SILT FENCE 1



SCHEMATIC DETAIL

PROVIDE "STREAMGUARD SEDIMENT CATCH BASIN INSERT" OR APPROVED EQUAL
MANUFACTURER'S NAME: BOWHEAD ENVIRONMENTAL & SAFETY
ADDRESS: P.O. BOX 375 PRESTON, WA 98050
TELEPHONE: FOR INFORMATION: (800) 909-3677
WWW.SHOPBOWHEAD.COM

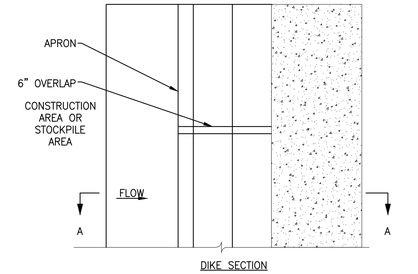
NTS
INLET PROTECTION 2



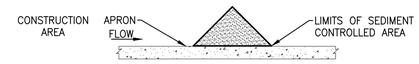
NOTES:

1. A 4 FOOT HIGH TEMPORARY FENCE MUST BE PLACED AT THE DRIP LINE OF TREES PRIOR TO THE COMMENCEMENT OF CLEARING OR EARTHWORK. NOTIFY THE CLEARING AND GRADING INSPECTOR TO GET BOTH THE INSPECTION AND WRITTEN APPROVAL OF FLAGGED TREES AND TEMPORARY PROTECTION FENCING AROUND TREES TO BE SAVED PER THE APPROVED CLEARING AND GRADING PLAN.
2. NO STOCKPILING OF MATERIAL AND NO VEHICULAR TRAFFIC ARE ALLOWED WITHIN THE LIMITS OF THE DRIPLINE, THE TEMPORARY FENCING, UNLESS APPROVED BY THE ARBORIST. FILLING, EXCAVATION, AND CLEARING MUST BE ACCOMPLISHED BY HAND METHODS ONLY UNLESS APPROVED BY ARBORIST.
3. ROOTS OF TREES TO BE SAVED WHICH ARE DAMAGED DURING CONSTRUCTION MUST BE TREATED IN THE FOLLOWING WAY: FOR DAMAGED ROOTS OVER 1" IN DIAMETER, MAKE A CLEAN, STRAIGHT CUT TO REMOVE THE DAMAGED PORTION OF THE ROOT ALL EXPOSED ROOTS WILL BE TEMPORARILY COVERED WITH DAMP BURLAP OR WOOD SHAVINGS TO PREVENT DRYING AND COVERED WITH EARTH AS SOON AS POSSIBLE.

NTS
TREE PROTECTION FENCING 3



DIKE SECTION



DETAIL A-A

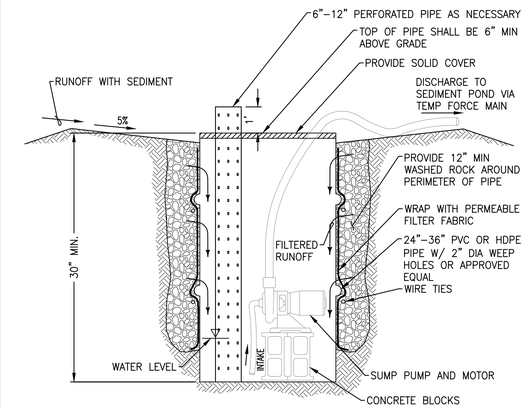
NOTE:
IF THE SURFACE AREA IS CONCRETE, ADHESIVES SUCH AS LIQUID NAIL OR SAND BAGS SHALL BE USED. IF IT IS AN ASPHALT SURFACE, A RUBBERIZED ASPHALT EMULSION CAN BE USED. THE TACKING AGENT MUST BE APPLIED UNDER THE FULL LENGTH OF THE BARRIER SECTION AND THE APRON.

NTS
TRIANGULAR SILT DIKE 4

NTS
NOT USED 5

NTS
NOT USED 6

NTS
NOT USED 7



NTS
TEMPORARY SUMP AND PUMP 8

NTS
NOT USED 9

NTS
NOT USED 10

NTS
NOT USED 11

NTS
NOT USED 12

CITY OF BELLEVUE APPROVAL STAMP

CITY OF BELLEVUE
UTILITY GRID D-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

LAURIE J. PEARL
STATE OF WASHINGTON
30766
REGISTERED
PROFESSIONAL ENGINEER
2-12-2021

LPD engineering pllc
1932 First Ave
Suite 201
Seattle, WA 98101
p. 206.725.1211
f. 206.973.5344
www.lpdengineering.com

DATE: 02/12/2021

PERMIT SET

TESC AND DEMOLITION DETAILS

C1.1

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GENERAL NOTES

1. EXISTING CONDITIONS:

   A. CONTACT ALL NECESSARY UTILITY PURVEYORS TO COORDINATE UTILITY CUTOFFS AND REMOVALS. VERIFY THAT ALL APPROPRIATE SERVICES HAVE BEEN DISCONNECTED.

   B. CONFORM TO LOCAL GOVERNING REQUIREMENTS REGARDING NOISE CONTROL.

   C. MAINTAIN SAFE VEHICULAR AND PEDESTRIAN TRAFFIC ROUTES:

2. ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, ALLEYS, SIDEWALKS, AND ADJACENT FACILITIES.

3. DO NOT CLOSE OR OBSTRUCT STREETS, FIRE LANES, SIDEWALKS, ALLEYS OR PASSAGEWAYS WITHOUT PERMISSION FROM AUTHORITIES HAVING JURISDICTION.

4. IF REQUIRED BY GOVERNING AUTHORITIES, PROVIDE ALTERNATE ROUTES AROUND CLOSED OR OBSTRUCTED TRAFFIC WAYS.

   A. VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES AT POINTS OF CONNECTION PRIOR TO COMMENCING WORK ON NEW UTILITY THAT IS TO BE CONNECTED TO THE EXISTING UTILITY. COORDINATE WITH OWNER'S REPRESENTATIVE IF ACTUAL CONDITIONS ARE AT VARIANCE WITH PLANS.

   B. VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES SUFFICIENTLY IN ADVANCE OF CONSTRUCTION TO ALLOW FOR COORDINATION AND MITIGATION OF CONFLICTS WITHOUT DOWN TIME.

5. DIMENSIONS AND LAYOUTS:

   A. THE CONTRACTOR IS RESPONSIBLE FOR PRESERVING ALL BENCHMARKS AND STAKES AND IS REQUIRED TO REPLACE ANY STAKES OR BENCHMARKS THAT ARE DISPLACED OR MISSING.

   B. THE CONTRACTOR IS RESPONSIBLE FOR REVIEW OF ALL UTILITY PURVEYOR AND CITY RECORDS RELATIVE TO THE EXISTING UNDERGROUND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR AVOIDING DAMAGE TO THESE FACILITIES AND SHALL RESTORE ALL UTILITIES AT CONTRACTOR'S OWN EXPENSE. THE CONTRACTOR IS TO NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY IF UNDERGROUND UTILITIES NOT SHOWN ON RECORD DOCUMENTS ARE ENCOUNTERED.

   C. THE CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING, SETTING AND MARKING ALL LINE LOCATION STAKES. A QUALIFIED LAYOUT ENGINEER, SURVEYOR, OR TECHNICAL SPECIALIST MUST BE ASSIGNED TO THE CONTRACTOR'S CREW FOR THIS WORK AND SHALL BE ON SITE AT ALL TIMES WHEN WORK REQUIRING CONTROL IS BEING PERFORMED, TOGETHER WITH ALL NECESSARY EQUIPMENT, SUPPLIES AND INSTRUMENTS RELATED THERETO. THIS EQUIPMENT AND PERSONNEL MUST BE AVAILABLE, AT NO ADDITIONAL COST TO THE OWNER OR OWNER'S REPRESENTATIVE, FOR THE PURPOSE OF VERIFYING LAYOUT AND CERTIFYING THE ACCURACY OF WORK ON THE SITE.

6. REGULATORY REQUIREMENTS:

   A. COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND SAFETY REGULATIONS. IF THERE ARE ANY CONFLICTS AMONG REFERENCED STANDARDS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.

   B. OBTAIN ALL NECESSARY PERMITS.

7. SAFETY SYSTEMS:

   A. PROTECT ALL EXCAVATION IN EXCESS OF FOUR-FEET IN DEPTH WITH A SAFETY SYSTEM CONFORMING TO THE REFERENCED REQUIREMENTS.

   B. THE CONTRACTOR'S EXCAVATION SAFETY SYSTEM SHALL BE DESIGNED BY A QUALIFIED PERSON AND MEET THE REFERENCED REQUIREMENTS.

   C. ALL EXCAVATION NOT REQUIRING TRENCH SAFETY SYSTEMS SHALL ALSO MEET THE WISHA SAFETY STANDARDS AND CITY OF BELLEVUE REQUIREMENTS.

8. EXCAVATION:

   A. MATERIALS NOT DESIGNATED FOR SALVAGE SHALL BE BROKEN UP, LOADED, AND LEGALLY DISPOSED OF BY THE CONTRACTOR. CARE SHALL BE TAKEN REMOVING ITEMS TO ENSURE THAT DAMAGE DOES NOT OCCUR TO THE EXISTING TREES AND IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE. ALL REMOVALS SHALL BE ACCOMPLISHED BY MAKING A NEAT VERTICAL SAWCUT AT THE LIMITS OF REMOVAL. ALL CONCRETE WALK REMOVALS SHALL BE SAWCUT AT THE NEXT ADJACENT JOINT. ADJACENT MATERIALS DESIGNATED TO REMAIN THAT ARE DAMAGED BY THE CONTRACTOR DURING THE WORK SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.

   B. SPRINKLE EXCAVATED MATERIAL AND ACCESS ROADS AS NECESSARY TO LIMIT DUST TO THE LOWEST PRACTICABLE LEVEL. DO NOT USE WATER TO SUCH AN EXTENT AS TO CAUSE FLOODING, CONTAMINATED RUNOFF, OR ICING.

   C. IN THE EVENT THE CONTRACTOR ENCOUNTERS UTILITY LINES NOT SHOWN ON THE SITE PLAN OR OTHERWISE INDICATED TO BE SAVED, REMOVED, OR ABANDONED, THE LOCATION OF SUCH LINES SHALL BE MARKED IN THE FIELD AND THE OWNER'S REPRESENTATIVE NOTIFIED.

9. FILL MATERIALS:

   A. ALL MATERIAL WHICH IS PROPOSED TO BE USED AS FILL, BEDDING OR BACKFILL SHALL BE GRADED AND TESTED FOR MOISTURE CONTENT AND COMPACTABILITY. GRADATION AND TEST RESULTS SHALL BE SUBMITTED FOR REVIEW AND ACCEPTANCE BY THE OWNER'S REPRESENTATIVE PRIOR TO PLACEMENT OF FILL. SEE SPECIFICATIONS FOR INFORMATION AND RESTRICTIONS ON THE USE OF RECYCLED MATERIAL AS FILL.

   B. MATERIAL USED IN FILLING SHALL BE APPROPRIATE TO THE SITE AND THE INTENDED USE OF THAT PORTION OF THE SITE.

   C. TOPSOIL SHALL NOT BE USED AS A FILL MATERIAL.

   D. NO FROZEN OR THAWING MATERIAL SHALL BE USED IN A FILL.

   E. COMMON FILL MATERIAL SHALL CONSIST OF ON-SITE EXCAVATED SOILS FREE OF ORGANIC AND DELETERIOUS MATERIAL AND OF SUCH SIZE AND GRADATION THAT THE SPECIFIED COMPACTION CAN BE READILY ATTAINED. THE MOISTURE OF COMMON FILL MATERIAL AT THE TIME OF PLACEMENT SHALL BE WITHIN A RANGE OF ONE PERCENT ABOVE TO TWO PERCENT BELOW THE OPTIMUM MOISTURE CONTENT FOR COMPACTION.

   F. GRAVEL BORROW: PER SECTION 9-03.14(1) OF WSDOT.

   G. STRUCTURAL FILL SHALL BE NON-ORGANIC SOIL, ACCEPTABLE TO THE OWNER'S REPRESENTATIVE, PLACED IN MAXIMUM 8-INCH LOOSE LIFTS, WITH EACH LIFT BEING COMPACTED TO AT LEAST 95% OF THE MODIFIED PROCTOR MAXIMUM DENSITY USING ASTM:D 1557. STRUCTURAL FILL SHALL BE PLACED AND COMPACTED WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT.

10. COMPACTION:

    REQUIRED COMPACTION: COMPACT FILLS AND BACKFILLS TO THE FOLLOWING MINIMUM RELATIVE COMPACTION (PERCENTAGE OF MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH ASTM D1557).

LOCATIONS	REQUIRED MINIMUM RELATIVE COMPACTION
UTILITY TRENCHES:	95%
UNDER WALKS AND PAVING:	95%
AGAINST WALLS:	90%
PLANTING AND LANDSCAPE AREAS:	85%
OTHER:	95%

11. FIELD QUALITY CONTROL:

    A. THE OWNER'S TESTING AGENCY SHALL PERFORM TESTING. THE OWNER'S TESTING IS ONLY TO VERIFY CONFORMANCE WITH THE PROJECT PLANS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THAT THE WORK MEETS THE REQUIREMENTS OF THE SPECIFICATIONS AND THE CITY OF BELLEVUE.

NTS
GENERAL NOTES 5

CONSTRUCTION SEQUENCE

1. BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY, A PRE-CONSTRUCTION MEETING MUST BE HELD BETWEEN THE CITY OF BELLEVUE, THE APPLICANT, AND THE APPLICANT'S CONSTRUCTION REPRESENTATIVE.
2. VERIFY VERTICAL AND HORIZONTAL LOCATIONS OF ALL EXISTING UNDERGROUND UTILITIES. CONTACT ALL UTILITY COMPANIES THAT MAY BE AFFECTED BY THE PROPOSED CONSTRUCTION. THE ONE CALL CALL NUMBER IS 1-800-424-5555.
3. MAINTAIN & PROTECT EXISTING UTILITY SERVICES TO REMAIN, AS INDICATED ON THE PLANS, DURING CONSTRUCTION.
4. VERIFY GRADES PRIOR TO CONSTRUCTION. FLAG CLEARING LIMITS.
5. UTILIZE EXISTING PAVEMENT WHERE POSSIBLE FOR CONSTRUCTION ACCESS AND STAGING. INSTALL STABILIZED CONSTRUCTION ENTRANCES, SITE ACCESS ROUTES, CONSTRUCTION PADS AND LAYDOWN AREA AS NECESSARY TO STABILIZE SITE.
6. INSTALL REINFORCED SILT FENCE, TREE PROTECTION FENCE, COMPOST FILTER SOCKS AND OTHER TESC MEASURES AS INDICATED ON PLAN AND AS NECESSARY TO PREVENT EROSION AND STABILIZE SITE.
7. INSTALL DISCHARGE PIPES. PLUG CATCH BASINS (CB) AS NECESSARY. INSTALL CATCH BASIN INSERTS ON ALL EXISTING CB THAT COULD BE IMPACTED BY THE PROJECT .
8. REMOVE ASPHALT, GRAVEL, ROCKERY AND UTILITIES AS NOTED ON THE PLANS.
9. CLEAR & GRUB AREAS OF THE SITE TO BE ROUGH GRADED OR FILLED.
10. REMOVE UNSUITABLE BEARING MATERIAL AS IN DICTATED ON THE PLAN AND AS REQUIRED.
11. GRADE AND PLACE ACCEPTABLE FILL. AS SITEWORK PROGRESSES, MAINTAIN AND ADJUST AS NECESSARY.
12. INSTALL NEW STORM DRAINAGE SYSTEM AND CATCH BASIN INSERTS.
13. INSTALL UNDERGROUND UTILITIES.
14. CONSTRUCT PROPOSED SITE IMPROVEMENTS.
15. INSTALL AMENDED SOILS ON ALL DISTURBED SOILS NOT COVERED BY HARD SURFACE IN ACCORDANCE WITH THE CITY OF BELLEVUE BMP T5.13.
16. COMPLETE FINE GRADING AND FINAL STABILIZATION MEASURES INCLUDING LANDSCAPE INSTALLATION.
17. REMOVE EXCESS EXCAVATED MATERIALS, TRASH DEBRIS, AND WASTE MATERIALS. DISPOSE OF IN AN AUTHORIZED LOCATION.
18. CLEAN STORM DRAINAGE SYSTEM OF ALL SEDIMENT AND DEBRIS.
19. MAINTAIN TEMPORARY EROSION CONTROL FACILITIES UNTIL SITE IS COMPLETELY STABILIZED.

NTS
CONSTRUCTION SEQUENCE NOTES 2

CONSTRUCTION NOISE NOTES

1. CONSTRUCTION NOISE OUTSIDE THE ALLOWABLE HOURS IS PROHIBITED PER BCC 9.18.040. TO BE CONSIDERED A VIOLATION UNLESS UNLESS EXPANDED HOURS OF OPERATION ARE AUTHORIZED BY THE APPLICABLE DEPARTMENT DIRECTOR. THE CONSTRUCTION-RELATED NOISE MUST BE AUDIBLE ACROSS A PROPERTY LINE OR AT LEAST 75 FEET FROM THE SOURCE. ANY VIOLATION IS A CIVIL INFRACTION AND THE CITY MAY ASSESS A MONETARY PENALTY TO THE INDIVIDUAL CREATING THE NOISE. THE PENALTIES ARE:

   A. A WARNING WILL BE ISSUED IF NO CONSTRUCTION NOISE VIOLATION HAS BEEN COMMITTED BY THE SAME PERSON WITHIN THE PREVIOUS TWO YEARS AT ANY LOCATION WITHIN THE CITY.

   B. A CITATION WILL BE ISSUED AND A $125 FINE IMPOSED IF ONE PREVIOUS VIOLATION HAS BEEN COMMITTED BY THE SAME PERSON WITHIN THE PREVIOUS TWO YEARS AT ANY LOCATION WITHIN THE CITY.

   C. A CITATION WILL BE ISSUED AND A $250 FINE IMPOSED IF TWO OR MORE PREVIOUS VIOLATION HAVE BEEN COMMITTED BY THE SAME PERSON WITHIN THE PREVIOUS TWO YEARS AT ANY LOCATION WITHIN THE CITY.

2. FOR ALL COMMERCIAL, MULTI-FAMILY, AND NEW SINGLE-FAMILY HOMES, CONSTRUCTION-RELATED NOISE IS ALLOWED 7 AM TO 6 PM ON WEEKDAYS AND 9 AM TO 6 PM ON SATURDAYS . NO DELIVERIES SHALL BE SCHEDULED PRIOR TO 7:00 AM OR AFTER 6:00 PM.
3. CONSTRUCTION-RELATED NOISE IS NOT ALLOWED OUTSIDE OF ALLOWABLE HOURS, LEGAL HOLIDAYS, OR SUNDAYS.
4. EXCEPTIONS FOR CONSTRUCTION RELATED NOISE LIMITATIONS CONTAINED IN THE NOISE CONTROL CODE MAY BE GRANTED PURSUANT TO BMC 9.18.020C.1 WHEN NECESSARY TO ACCOMMODATE CONSTRUCTION ON SCHOOLS WHICH CANNOT BE UNDERTAKEN DURING EXEMPT HOURS. NO BLANKET EXEMPTION EXISTS.
5. ALLOWANCES FOR SHORT TERM WORK OUTSIDE OF NORMAL HOURS FOR CONSTRUCTION RELATED NOISE SHALL BE LIMITED AND WILL BE REVIEWED ON A CASE BY CASE BASIS TO VERIFY NECESSITY AND ENSURE APPROPRIATE NOISE MITIGATION IS UTILIZED TO PROTECT SURROUNDING USES AND PROPERTIES.
6. IF EXPANDED HOURS ARE NECESSARY TO ACCOMMODATE A SPECIFIC COMPONENT OF THE SCHOOL CONSTRUCTION, THE DISTRICT MUST APPLY FOR A SEPARATE NOISE PERMIT FOR REVIEW AND APPROVAL BY STAFF. IN THIS TIME PERIOD, THE SITE SHALL BE POSTED ON ALL STREET FRONTAGES PRIOR TO THE START OF CONSTRUCTION ACTIVITY.

NTS
CONSTRUCTION NOISE NOTES 6

CITY OF BELLEVUE CLEARING AND GRADING STANDARD NOTES

1. ALL CLEARING & GRADING CONSTRUCTION MUST BE IN ACCORDANCE WITH CITY OF BELLEVUE (COB) CLEARING & GRADING CODE, CLEARING & GRADING DEVELOPMENT STANDARDS, LAND USE CODE, UNIFORM BUILDING CODE, PERMIT CONDITIONS, AND ALL OTHER APPLICABLE CODES, ORDINANCES, AND STANDARDS. THE DESIGN ELEMENTS WITHIN THESE PLANS HAVE BEEN REVIEWED ACCORDING TO THESE REQUIREMENTS. ANY VARIANCE FROM ADOPTED EROSION CONTROL STANDARDS IS NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY THE CITY OF BELLEVUE DEVELOPMENT SERVICES (DSD) PRIOR TO CONSTRUCTION. IT SHALL BE THE SOLE RESPONSIBILITY OF THE APPLICANT AND THE PROFESSIONAL CIVIL ENGINEER TO CORRECT ANY ERROR, OMISSION, OR VARIATION FROM THE ABOVE REQUIREMENTS FOUND IN THESE PLANS. ALL CORRECTIONS SHALL BE AT NO ADDITIONAL COST OR LIABILITY TO THE COB.
2. APPROVAL OF THIS EROSION/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.).
3. A COPY OF THE APPROVED PLANS AND DRAWINGS MUST BE ON-SITE DURING CONSTRUCTION. THE APPLICANT IS RESPONSIBLE FOR OBTAINING ANY OTHER REQUIRED OR RELATED PERMITS PRIOR TO BEGINNING OF CONSTRUCTION.
4. THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
5. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
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 TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
7. ALL LOCATIONS OF EXISTING UTILITIES HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD, THEREFORE, BE CONSIDERED ONLY APPROXIMATE AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS AND TO DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN.
8. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
9. CLEARING SHALL BE LIMITED TO THE AREAS WITHIN THE APPROVED DISTURBANCE LIMITS. EXPOSED SOILS MUST BE COVERED AT THE END OF EACH WORKING DAY WHEN WORKING FROM OCTOBER 1ST THROUGH APRIL 30TH. FROM MAY 1ST THROUGH SEPTEMBER 30TH, EXPOSED SOILS MUST BE COVERED AT THE END OF EACH CONSTRUCTION WEEK AND AT THE THREAT OF RAIN.
10. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED 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.
11. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT.
12. THE CONTRACTOR MUST MAINTAIN A SWEEPER ON SITE DURING EARTHWORK AND IMMEDIATELY REMOVE SOIL THAT HAS BEEN TRACKED ONTO PAVED AREAS AS RESULT OF CONSTRUCTION.
13. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
14. ANY EXCAVATED MATERIAL REMOVED FROM THE CONSTRUCTION SITE AND DEPOSITED ON PROPERTY WITHIN THE CITY LIMITS MUST BE DONE IN COMPLIANCE WITH A VALID CLEARING & GRADING PERMIT. LOCATIONS FOR THE MOBILIZATION AREA AND STOCKPILED MATERIAL MUST BE APPROVED BY THE CLEARING AND GRADING INSPECTOR AT LEAST 24 HOURS IN ADVANCE OF ANY STOCKPILING.
15. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 48 HOURS FOLLOWING A MAJOR STORM EVENT.
16. FINAL SITE GRADING MUST DIRECT DRAINAGE AWAY FROM ALL BUILDING STRUCTURES AT A MINIMUM 5% SLOPE, PER THE INTERNATIONAL RESIDENTIAL CODE (IRC) R401.3.
17. INSTALL AMENDED SOILS ON ALL DISTURBED SOILS NOT COVERED BY HARD SURFACE IN ACCORDANCE WITH THE CITY OF BELLEVUE BMP T5.13.

NTS
CITY OF BELLEVUE CLEARING AND GRADING STANDARD NOTES 7

GEOTECHNICAL NOTES

1. THE PROJECT GEOTECHNICAL ENGINEER OF RECORD OR HIS REPRESENTATIVE MUST BE ONSITE DURING CRITICAL EARTHWORK OPERATIONS. THE GEOTECHNICAL ENGINEER SHALL OBSERVE ALL EXCAVATIONS AND FILL AREAS. IN ADDITION, THE ENGINEER SHALL INSPECT THE SOIL CUTS PRIOR TO CONSTRUCTION OF WALLS AND INSPECT THE COMPACTION IN FILL AREAS. THE ENGINEER MUST SUBMIT FIELD REPORTS IN WRITING TO THE PCD INSPECTOR FOR SOILS VERIFICATION AND FOUNDATION CONSTRUCTION. ALL EARTHWORK SHOULD BE IN CONFORMANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT.
2. THE GEOTECHNICAL ENGINEER MUST BE PRESENT AT THE PRE-CONSTRUCTION MEETING(S). IN ADDITION, THE FOLLOWING CONSTRUCTION STAGES MUST BE INSPECTED, MONITORED, AND TESTED AS NECESSARY BY THE GEOTECHNICAL ENGINEER OF RECORD:

   A. SITE CLEARING AND STRIPPING OF ORGANIC TOPSOIL FOR ALL AREAS TO RECEIVE STRUCTURAL FILL, PAVEMENTS, OR FOUNDATIONS.

   B. CUT SLOPES OVER FOUR FEET HIGH.

   C. BENCHING FOR FILL TO BE PLACED ON SLOPES.

   D. INSPECTION OF PROPOSED IMPORT FILL MATERIAL, PRIOR TO PLACEMENT.

   E. PLACEMENT OF STRUCTURAL FILL, INCLUDING OBSERVATION OF PROPER MOISTURE CONTENT, LIFT THICKNESS, AND MINIMUM COMPACTION.

   F. SUBGRADES FOR RETAINING WALLS, FOUNDATIONS, AND FOR THE BASE OF ROCKERIES.

   G. INSTALLATION OF SUBSURFACE DRAINAGE FACILITIES.

   H. UTILITY TRENCH BEDDING AND BACKFILL, INCLUDING OBSERVATION OF PROPER MOISTURE CONTENT, LIFT THICKNESS, AND MINIMUM COMPACTION.

   I. UTILITIES ON STEEP SLOPES; SLOPE ANCHORS AND/OR BACKFILL SLOPE STABILIZATION.

   J. ANY UNUSUAL SEEPAGE, SLOPE, OR SUBGRADE CONDITION AS DELINEATED IN THE GEOTECHNICAL REPORT OR DISCOVERED IN THE FIELD.

3. AT THE END OF CONSTRUCTION, THE GEOTECHNICAL ENGINEER SHALL SUBMIT A FINAL SUMMARY LETTER VERIFYING THAT CRITICAL STAGES OF CONSTRUCTION HAVE BEEN INSPECTED AND ARE IN CONFORMANCE WITH GEOTECHNICAL REPORT.

NTS
GEOTECHNICAL NOTES 4

MOBILIZATION/STOCKPILE AREA NOTES

1. ANY EXCAVATED MATERIAL REMOVED FROM THE CONSTRUCTION SITE AND DEPOSITED ON PROPERTY WITHIN THE CITY LIMITS MUST BE DONE IN COMPLIANCE WITH A VALID CLEARING & GRADING PERMIT. LOCATIONS FOR THE MOBILIZATION AREA AND STOCKPILED MATERIAL MUST BE APPROVED BY THE CITY INSPECTOR AT LEAST 24 HOURS IN ADVANCE OF ANY DUMPING.

DESIGN CHANGES AFTER PERMIT ISSUANCE

1. IF UTILITIES DESIGN CHANGES RESULT IN CHANGES TO THE CLEARING LIMITS SHOWN ON THESE PLANS, THE APPLICANT MUST SUBMIT A REVISION TO THE CLEARING AND GRADING PERMIT THAT INDICATES THE LOCATION OF THE NEW CLEARING LIMITS.

CITY OF BELLEVUE APPROVAL STAMP

NTS
OTHER NOTES 8

CITY OF BELLEVUE
UTILITY GRID 0-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

LAURIE J. PIARK
STATE OF WASHINGTON
30766
REGISTERED
PROFESSIONAL ENGINEER
2-12-2021

LPD engineering pllc
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Seattle, WA 98101
p. 206.725.1211
f. 206.973.5344
www.lpdengineering.com

DATE: 02/12/2021

PERMIT SET

TESC AND DEMOLITION NOTES

C1.2

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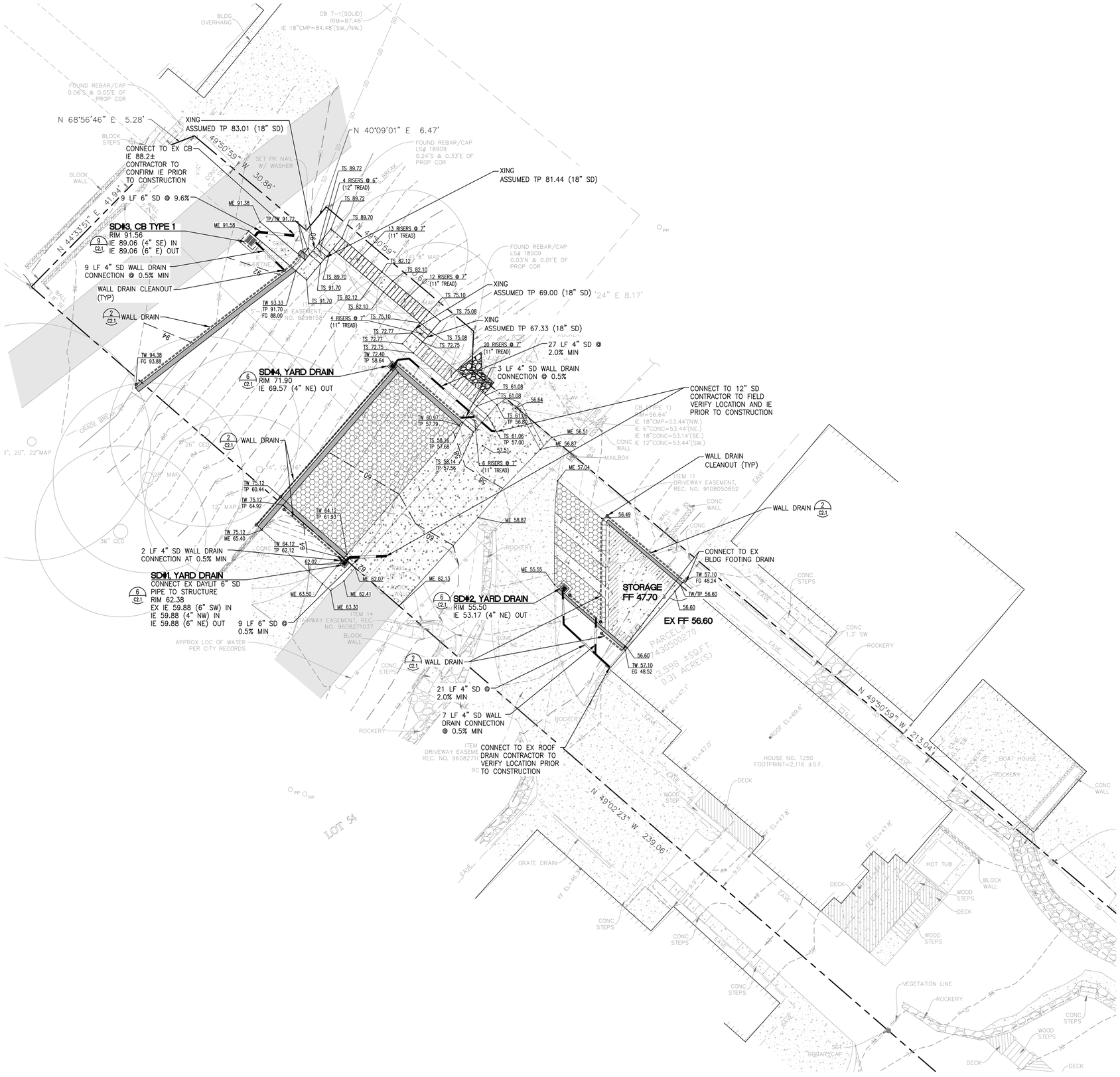

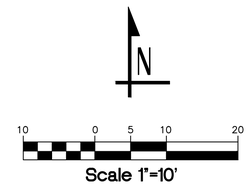

LEGEND

	PROPERTY LINE
230	EX CONTOUR (INDEX)
231	EX CONTOUR
230	PROPOSED CONTOUR (INDEX)
231	PROPOSED CONTOUR
XXX.X	SPOT ELEVATION
FF 78.0	FINISHED FLOOR ELEVATION
	EX BUILDING
	PROPOSED BUILDING
	HEAVY DUTY CONCRETE
	CONCRETE PAVEMENT
	ASPHALT (AC) PAVEMENT
	GRASSPAVE
	SITE WALL
	AREA/YARD DRAIN
	CATCH BASIN TYPE 1
	STORM DRAINAGE PIPE
	FOOTING/SUBSURFACE DRAIN
SDCO	STORM DRAIN CLEANOUT
FDCO	FOOTING DRAIN CLEANOUT
DS	DOWNSPOUTS
FG	FINISHED GRADE
ME	MATCH EXISTING
TP	TOP OF PAVEMENT
TS	TOP OF STEP
TW	TOP OF WALL

DROLLINGER RESIDENCE
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2-12-2021

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DATE: 02/12/2021

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GRADING
AND
DRAINAGE
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C2.0

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days before you dig.

CITY OF BELLEVUE APPROVAL STAMP

CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

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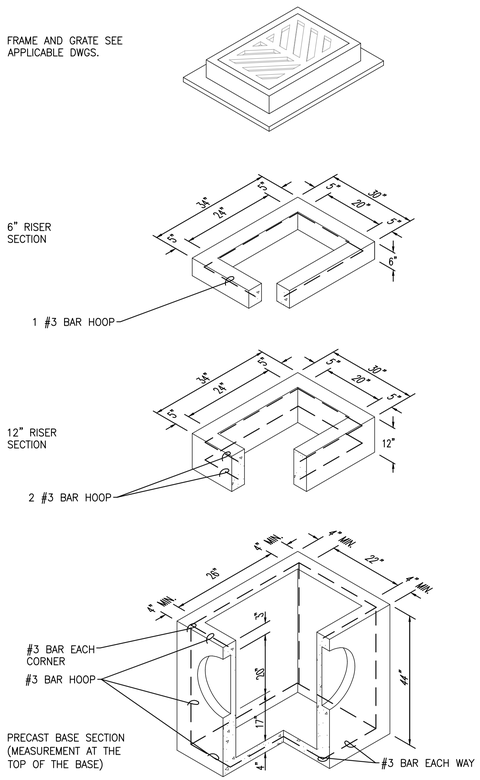
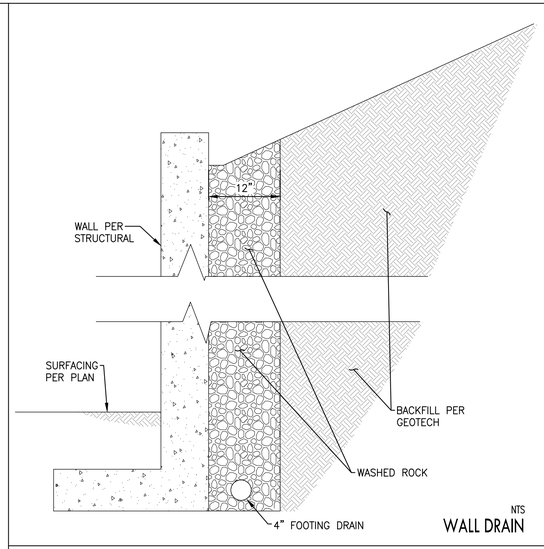


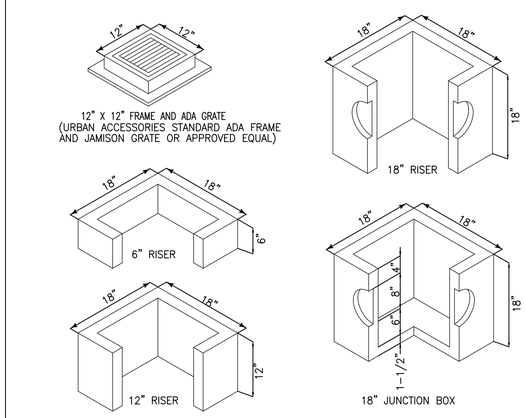
NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIA. OF 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
6. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIA. PLUS CATCH BASIN WALL THICKNESS.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. FOR CATCH BASINS IN PARKING LOTS REFER TO WSDOT STD PLAN B-5.60-01.
12. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
13. CATCH BASIN INSTALLATION SHALL BE PER CONTRACT DOCUMENTS AND DETAILS.

NTS
CATCH BASIN TYPE 1 **9**



NTS
WALL DRAIN **2**



18" X 18" TYPE 18 CONCRETE AREA DRAIN BY SHOPE CONCRETE PRODUCTS OR EQUAL

NTS
YARD DRAIN **6**

CITY OF BELLEVUE STORM DRAINAGE GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE 2021 EDITION OF THE CITY OF BELLEVUE UTILITIES DEPARTMENT ENGINEERING STANDARDS AND THE DEVELOPER EXTENSION AGREEMENT.
2. STORM PIPE SHALL BE PVC CONFORMING TO ASTM D-3034 SDR 35 (4"H - 15"H) OR ASTM F-679 (18"H-27"H). BEDDING AND BACKFILL SHALL BE AS SHOWN IN THE STANDARD DETAILS.
3. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD THEREFORE BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE EXCAVATOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN, AND TO FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN. IMMEDIATELY NOTIFY THE ENGINEER IF A CONFLICT EXISTS.
4. THE FOOTING DRAINAGE SYSTEM AND THE ROOF DOWNSPOUT SYSTEM SHALL NOT BE INTERCONNECTED AND SHALL SEPARATELY CONVEY COLLECTED FLOWS TO THE CONVEYANCE SYSTEM OR TO ON-SITE STORMWATER FACILITIES.
5. PROVIDE AND MAINTAIN TEMPORARY SEDIMENTATION COLLECTION FACILITIES TO ENSURE THAT SEDIMENT OR OTHER HAZARDOUS MATERIALS DO NOT ENTER THE STORM DRAINAGE SYSTEM IN ACCORDANCE WITH THE SITES APPROVED CSWPPP. FOR ALL CONSTRUCTION DURING THE RAINY SEASON, DOWNHILL BASINS AND INLETS MUST BE PROTECTED WITH CATCH BASIN INSERTS. SIMPLY PLACING FILTER FABRIC UNDER THE GRATE IS NOT ACCEPTABLE.
6. PRIOR TO FINAL INSPECTION AND ACCEPTANCE OF STORM DRAINAGE WORK, PIPES AND STORM DRAIN STRUCTURES SHALL BE CLEANED AND FLUSHED. ANY OBSTRUCTIONS TO FLOW WITHIN THE STORM DRAIN SYSTEM, (SUCH AS RUBBLE, MORTAR AND WEDGED DEBRIS), SHALL BE REMOVED AT THE NEAREST STRUCTURE. WASH WATER OF ANY SORT SHALL NOT BE DISCHARGED TO THE STORM DRAIN SYSTEM OR SURFACE WATERS.
7. ENDS OF EACH STORM DRAIN STUB AT THE PROPERTY LINE SHALL BE CAPPED AND LOCATED WITH AN 8' LONG 2" X 4" BOARD, EMBEDDED TO THE STUB CAP AND EXTENDING AT LEAST 3 FEET ABOVE GRADE, AND MARKED PERMANENTLY "STORM". A COPPER 12 GA. LOCATE WIRE FIRMLY ATTACHED. THE STUB DEPTH SHALL BE INDICATED ON THE MARKER.
8. ALL GRATES IN ROADWAYS SHALL BE DUCTILE IRON, BOLT-LOCKING, VANED GRATES PER THE STANDARD DETAILS. STRUCTURES IN TRAFFIC LANES OUTSIDE OF THE CURBLINE WHICH DO NOT COLLECT RUNOFF SHALL BE FITTED WITH ROUND, BOLT-LOCKING SOLID COVERS. OFF-STREET STRUCTURES WHICH DO NOT COLLECT RUNOFF SHALL BE FITTED WITH BOLT-LOCKING SOLID COVERS.
9. VEGETATION/LANDSCAPING IN THE DETENTION POND, BIORETENTION FACILITY, VEGETATED ROOF AND/OR DRAINAGE SWALE(S) ARE AN INTEGRAL PART OF THE RUNOFF TREATMENT SYSTEM FOR THE PROJECT. SUCH DRAINAGE FACILITIES WILL NOT BE ACCEPTED UNTIL PLANTINGS ARE ESTABLISHED.
10. ALL NEW MANHOLES SHALL HAVE A MINIMUM INSIDE DIAMETER OF 48"H AND SHALL CONFORM TO THE STANDARD DETAILS. ALL NEW CATCH BASINS SHALL CONFORM TO THE STANDARD DETAILS.
12. ALL TESTING AND CONNECTIONS TO EXISTING MAINS SHALL BE DONE IN THE PRESENCE OF A REPRESENTATIVE OF THE CITY OF BELLEVUE UTILITIES DEPARTMENT.
13. ALL TRENCHES SHALL BE COMPACTED, AND HOT MIX ASPHALT IN PLACE IN PAVED AREAS, PRIOR TO TESTING STORM LINES FOR ACCEPTANCE.
14. ALL PUBLIC STORM DRAINS SHALL BE AIR TESTED AND HAVE A VIDEO INSPECTION PERFORMED PRIOR TO ACCEPTANCE (SEE #23 BELOW). STORM MAIN CONSTRUCTED WITH FLEXIBLE PIPE SHALL BE DEFLECTION TESTED WITH A MANDREL PRIOR TO ACCEPTANCE.
15. STORM STUBS SHALL BE TESTED FOR ACCEPTANCE AT THE SAME TIME THE MAIN STORM IS TESTED.
16. ALL MANHOLES/ CATCH BASINS IN UNPAVED AREAS SHALL INCLUDE A CONCRETE SEAL AROUND ADJUSTMENT RINGS PER STANDARD DETAILS.
17. ALL STORM MAIN EXTENSIONS WITHIN THE PUBLIC RIGHT-OF-WAY OR IN EASEMENTS MUST BE "STAKED" BY A SURVEYOR LICENSED IN WASHINGTON STATE FOR "LINE AND GRADE" AND CUT SHEETS PROVIDED TO THE ENGINEER, PRIOR TO STARTING CONSTRUCTION.
18. THE CONTRACTOR SHALL USE A VACUUM STREET SWEEPER TO REMOVE DUST AND DEBRIS FROM PAVEMENT AREAS AS DIRECTED BY THE ENGINEER. FLUSHING OF STREETS SHALL NOT BE PERMITTED WITHOUT PRIOR CITY APPROVAL.
19. STORM DRAINAGE MAINLINES, STUBS AND FITTINGS SHALL BE CONSTRUCTED USING THE SAME PIPE MATERIAL AND MANUFACTURER. CONNECTIONS BETWEEN STUBS AND THE MAINLINE WILL BE MADE WITH A TEE FITTING. TEE FITTING SHALL BE FROM SAME MANUFACTURER AS PIPE. CUT-IN CONNECTIONS ARE ONLY ALLOWED WHEN CONNECTING A NEW STUB TO AN EXISTING MAINLINE.
20. MANHOLES, CATCH BASINS AND VAULTS ARE CONSIDERED TO BE PERMIT-REQUIRED CONFINED SPACES. ENTRY INTO THESE SPACES SHALL BE IN ACCORDANCE WITH CHAPTER 296-809 WAC.
21. PLACEMENT OF SURFACE APPURTENANCES (MH LIDS, VALVE LIDS, ETC) IN TIRE TRACKS OF TRAFFIC LANES SHALL BE AVOIDED WHENEVER POSSIBLE.
22. CALL 1-800-424-5555, OR 8-1-1, 72 HOURS BEFORE CONSTRUCTION FOR UTILITY LOCATES.
23. THE CONTRACTOR SHALL PERFORM A VIDEO INSPECTION AND PROVIDE A DVD OF THE STORM PIPE INTERIOR FOR THE CITY'FS REVIEW. THE VIDEO SHALL PROVIDE A MINIMUM OF 14 LINES PER MILLIMETER RESOLUTION AND COVER THE ENTIRE LENGTH OF THE APPLICABLE PIPE. THE CAMERA SHALL BE MOVED THROUGH THE PIPE AT A UNIFORM RATE (≤ 30 FT/MIN), STOPPING WHEN NECESSARY TO ENSURE PROPER DOCUMENTATION OF THE PIPE CONDITION. THE VIDEO SHALL BE TAKEN AFTER INSTALLATION AND CLEANING TO INSURE THAT NO DEFECTS EXIST. THE PROJECT WILL NOT BE ACCEPTED UNTIL ALL DEFECTS HAVE BEEN REPAIRED.
24. CLEARLY LABEL PUBLIC AND PRIVATE SYSTEMS ON THE PLANS. PRIVATE SYSTEMS SHALL BE MARKED "PRIVATE" AND SHALL BE MAINTAINED BY THE PROPERTY OWNER(S).
25. ALL CONCRETE STRUCTURES (VAULTS, CATCH BASINS, MANHOLES, OIL/WATER SEPARATORS, ETC.) SHALL BE VACUUM TESTED.
26. MANHOLES, CATCH BASINS AND INLETS IN EASEMENTS SHALL BE CONSTRUCTED TO PROVIDE A STABLE, LEVEL GRADE FOR A MINIMUM RADIUS OF 2.5 FEET AROUND THE CENTER OF THE ACCESS OPENING TO ACCOMMODATE CONFINED SPACE ENTRY EQUIPMENT.
27. TOPS OF MANHOLES/ CATCH BASINS WITHIN PUBLIC RIGHT-OF-WAY SHALL NOT BE ADJUSTED TO FINAL GRADE UNTIL AFTER PAVING.
28. CONTRACTOR SHALL ADJUST ALL MANHOLE/ CATCH BASIN RIMS TO FLUSH WITH FINAL FINISHED GRADES, UNLESS OTHERWISE SHOWN.
29. CONTRACTOR SHALL INSTALL, AT ALL CONNECTIONS TO EXISTING DOWNSTREAM MANHOLES/CATCH BASINS, SCREENS OR PLUGS TO PREVENT FOREIGN MATERIALS FROM ENTERING EXISTING STORM DRAINAGE SYSTEM. SCREENS OR PLUGS SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF THE CONSTRUCTION AND SHALL BE REMOVED ALONG WITH COLLECTED DEBRIS AT THE TIME OF FINAL INSPECTION AND IN THE PRESENCE OF A REPRESENTATIVE OF THE CITY OF BELLEVUE UTILITIES DEPARTMENT.
30. SURFACE RESTORATION OF EXISTING ASPHALT PAVEMENT SHALL BE AS REQUIRED BY THE RIGHT-OFWAY USE PERMIT.
31. THE CONTRACTOR SHALL MAINTAIN A MINIMUM OF FIVE FEET (5') HORIZONTAL SEPARATION BETWEEN ALL WATER AND STORM DRAINAGE LINES. ANY CONFLICT SHALL BE REPORTED TO THE UTILITY AND THE DEVELOPER'S ENGINEER PRIOR TO CONSTRUCTION.
32. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT NO CONFLICTS EXIST BETWEEN STORM DRAINAGE LINES AND PROPOSED OR EXISTING UTILITIES PRIOR TO CONSTRUCTION.
33. BEFORE COMMENCEMENT OF TRENCHING, THE CONTRACTOR SHALL PROVIDE FILTER FABRIC FOR ALL DOWNHILL STORM DRAIN INLETS AND CATCH BASINS, WHICH WILL RECEIVE RUNOFF FROM THE PROJECT SITE. THE CONTRACTOR SHALL PERIODICALLY INSPECT THE CONDITION OF ALL FILTER FABRIC AND REPLACE AS NECESSARY.
34. MINIMUM COVER OVER STORM DRAINAGE PIPE SHALL BE 2 FEET, UNLESS OTHERWISE SHOWN.
35. AVOID CROSSING WATER OR SEWER MAINS AT HIGHLY ACUTE ANGLES. THE SMALLEST ANGLE MEASURE BETWEEN UTILITIES SHOULD BE 45 DEGREES.
36. AT POINTS WHERE EXISTING THRUST BLOCKING IS FOUND, MINIMUM CLEARANCE BETWEEN CONCRETE BLOCKING AND OTHER BURIED UTILITIES OR STRUCTURES SHALL BE 5 FEET.
37. WHEN WORK IS TO OCCUR IN EASEMENTS, THE CONTRACTOR SHALL NOTIFY THE EASEMENT GRANTOR AND BELLEVUE UTILITIES IN WRITING A MINIMUM OF 48 HOURS IN ADVANCE OF BEGINNING WORK (NOT INCLUDING WEEKENDS OR HOLIDAYS). FAILURE TO NOTIFY GRANTOR AND BELLEVUE UTILITIES WILL RESULT IN A STOP WORK ORDER BEING POSTED UNTIL THE MATTER IS RESOLVED TO THE SATISFACTION OF BELLEVUE UTILITIES. A WRITTEN RELEASE FROM THE EASEMENT GRANTOR SHALL BE FURNISHED TO THE UTILITIES INSPECTOR PRIOR TO PERMIT SIGN-OFF.
38. THE CONTRACTOR SHALL RESTORE THE RIGHT-OF-WAY AND EXISTING PUBLIC STORM DRAINAGE EASEMENT(S) AFTER CONSTRUCTION TO A CONDITION EQUAL OR BETTER THAN CONDITION PRIOR TO ENTRY. THE CONTRACTOR SHALL FURNISH A SIGNED RELEASE FROM ALL AFFECTED PROPERTY OWNERS AFTER RESTORATION HAS BEEN COMPLETED.
39. WHERE A NEW UTILITY LINE CROSSES BELOW AN EXISTING AC MAIN, THE AC PIPE SHALL BE REPLACED WITH DI PIPE TO 3 FEET PAST EACH SIDE OF THE TRENCH AS SHOWN ON STANDARD DETAIL W-8. ALTERNATIVELY, WHERE DIRECTED BY THE UTILITY, THE TRENCH SHALL BE BACKFILLED WITH CONTROLLED DENSITY FILL (CDF, AKA FLOWABLE FILL) FROM BOTTOM OF TRENCH TO BOTTOM OF AC MAIN.

MAINTAIN 2021 EDITION OF COB UTILITY ENGINEERING STANDARDS AND DETAILS ON SITE AT ALL TIMES

NTS
COB STORM DRAINAGE GENERAL NOTES **8**

NTS
NOT USED **10**

NTS
NOT USED **11**

NTS
NOT USED **12**

CITY OF BELLEVUE APPROVAL STAMP

CITY OF BELLEVUE
UTILITY GRID D-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

LAURIE J. PIARK
STATE OF WASHINGTON
30766
REGISTERED
PROFESSIONAL ENGINEER
2-12-2021

LPD engineering pllc
1932 First Ave
Suite 201
Seattle, WA 98101
p. 206.725.1211
f. 206.973.5344
www.lpdengineering.com

DATE: 02/12/2021

PERMIT SET

DRAINAGE DETAILS AND NOTES

C2.1

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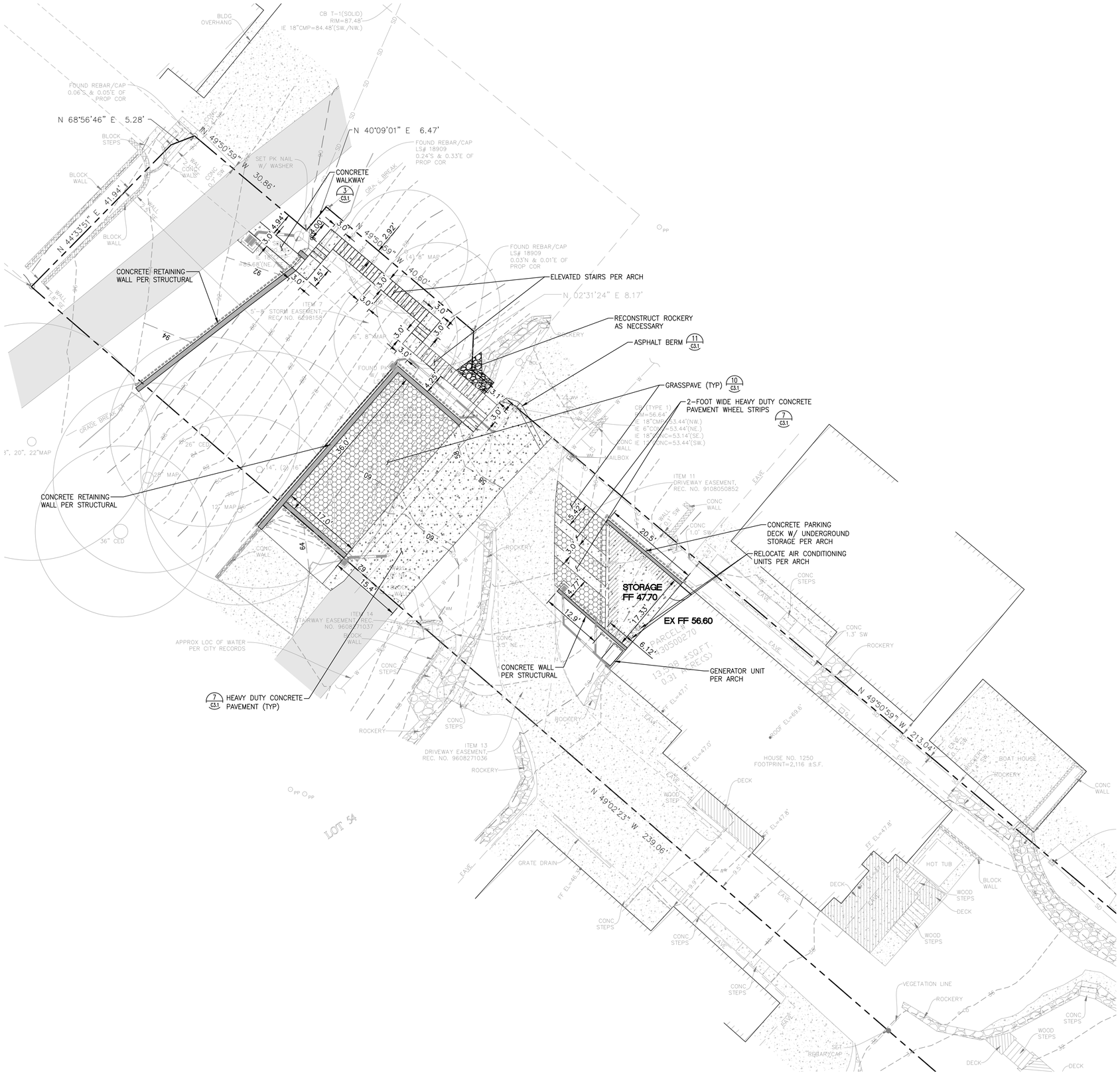

N

10 0 5 10 20

Scale 1"=10'

LEGEND

	PROPERTY LINE
230	EX CONTOUR (INDEX)
231	EX CONTOUR
230	PROPOSED CONTOUR (INDEX)
231	PROPOSED CONTOUR
FF 78.0	FINISHED FLOOR ELEVATION
	EX BUILDING
	PROPOSED BUILDING
	HEAVY DUTY CONCRETE
	CONCRETE PAVEMENT
	ASPHALT (AC) PAVEMENT
	GRASSPAVE
	SITE WALL
	AREA/YARD DRAIN
	CATCH BASIN TYPE 1
	STORM DRAINAGE PIPE
	FOOTING/SUBSURFACE DRAIN
SDCO	STORM DRAIN CLEANOUT
FDCO	FOOTING DRAIN CLEANOUT
DS	DOWNSPOUTS
FG	FINISHED GRADE
ME	MATCH EXISTING
TP	TOP OF PAVEMENT
TS	TOP OF STEP
TW	TOP OF WALL

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

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DATE: 02/12/2021

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PAVING AND UTILITIES PLAN

C3.0

811
Know what's below.
Call two business days before you dig.

CITY OF BELLEVUE APPROVAL STAMP

CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

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NTS
NOT USED 1

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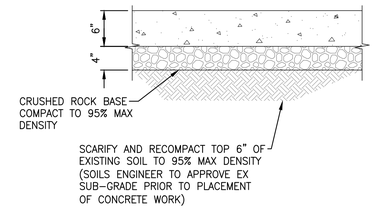
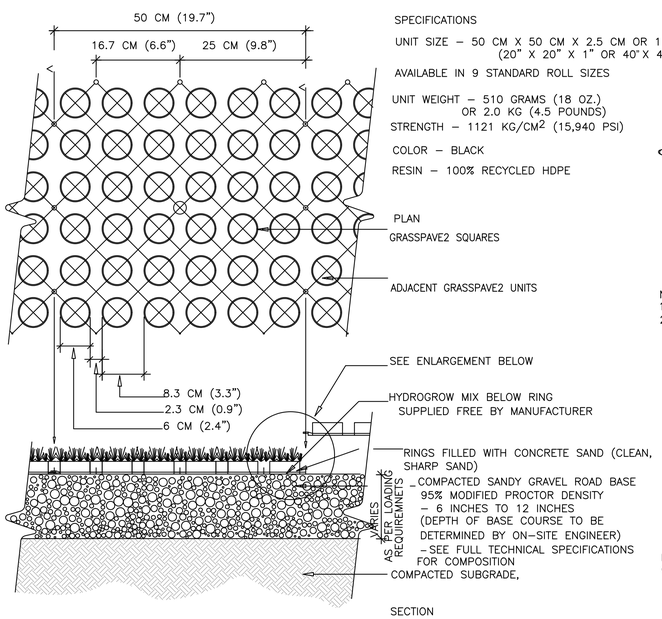
NOT USED 2



NOTE:

1. MINIMUM CONCRETE 3000 PSI (5 1/2 SACK)
2. PROVIDE CONSTRUCTION OR CONTRACTION JOINTS TO BREAK INTO AREAS OF 144 SF OR LESS. NO ACUTE ANGLES. JOINT LOCATIONS TO BE APPROVED BY THE ARCHITECT.
3. PROOF ROLL EXISTING SUBGRADE AND REMOVE ANY SOFT SPOTS

NTS
CONCRETE WALKWAY 3



SPECIFICATIONS

UNIT SIZE – 50 CM X 50 CM X 2.5 CM OR 1 M X 1 M X 2.5 CM (20" X 20" X 1" OR 40" X 40" X 1")

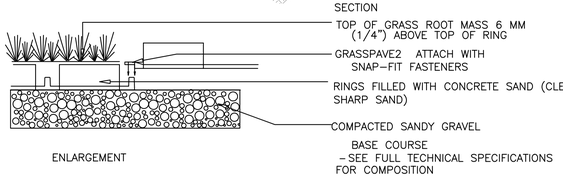
AVAILABLE IN 9 STANDARD ROLL SIZES

UNIT WEIGHT – 510 GRAMS (18 OZ.) OR 2.0 KG (4.5 POUNDS)

STRENGTH – 1121 KG/CM^2 (15,940 PSI)

COLOR – BLACK

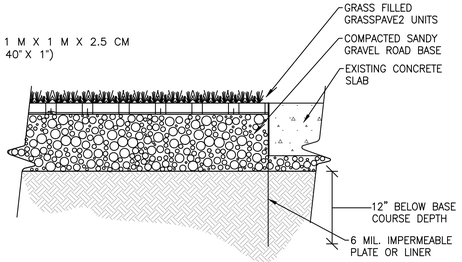
RESIN – 100% RECYCLED HDPE



ENLARGEMENT

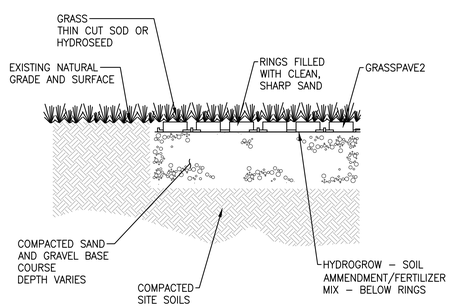
NOTE: GRASS/PLANT TYPES SHALL BE SPECIFIED BY A LANDSCAPE ARCHITECT OR LANDSCAPE DESIGNER.

TYPICAL GRASSPAVE2 DETAIL



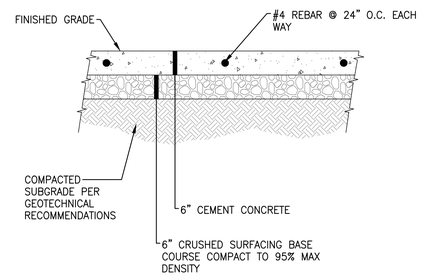
EXISTING CONCRETE DETAIL

NOTE:
1. COMPACTED SUBGRADE, 95% MODIFIED PROCTOR DENSITY
2. GRASS/PLANT TYPES SHALL BE SPECIFIED BY A LANDSCAPE ARCHITECT OR LANDSCAPE DESIGNER.

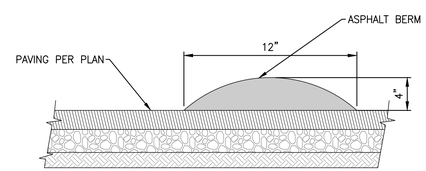


FLUSH, NATURAL (EXISTING) EDGING

NTS
GRASSPAVE 10



NTS
HEAVY DUTY CONCRETE PAVEMENT 7



NTS
ASPHALT BERM 11

CITY OF BELLEVUE GENERAL WATER NOTES

1. ALL WORK SHALL CONFORM TO THE 2021 CITY OF BELLEVUE UTILITY ENGINEERING STANDARDS AND THE DEVELOPER EXTENSION AGREEMENT.
2. ALL PIPE SHALL BE DUCTILE IRON CLASS 52 UNLESS OTHERWISE SHOWN.
3. ALL PIPE AND FITTINGS NOT TO BE DISINFECTED IN PLACE SHALL BE SWABBED WITH 1% AVAILABLE CHLORINE SOLUTION PRIOR TO INSTALLATION.
4. THE NEW WATERMAIN SHALL BE CONNECTED TO THE EXISTING SYSTEM ONLY AFTER NEW MAIN IS PRESSURE TESTED, FLUSHED, DISINFECTED AND SATISFACTORY BACTERIOLOGICAL SAMPLE RESULTS ARE OBTAINED AND RECEIVED BY THE CITY INSPECTOR. SEE STANDARD DETAIL W-9.
5. AFTER DISINFECTING THE WATERMAIN, DISPOSE OF CHLORINATED WATER BY DISCHARGING TO THE NEAREST OPERATING SANITARY SEWER.
6. WATER MAIN SHUT-DOWNS SHALL BE COORDINATED WITH THE WATER OPERATIONS DIVISION FOR PREFERRED TIMING DURING FLOW CONTROL CONDITIONS. WATER MAIN SHUTDOWNS SHALL NOT BE SCHEDULED TO TAKE PLACE ON FRIDAYS, OR ON THE FIVE DAYS BEFORE NOR ONE DAY AFTER A CITY HOLIDAY, UNLESS OTHERWISE APPROVED BY THE UTILITY.
7. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD THEREFORE BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN, AND TO FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN.
8. DEFLECT THE WATER MAIN ABOVE OR BELOW EXISTING UTILITIES AS REQUIRED TO MAINTAIN 3 FT. MINIMUM COVER AND 12-INCH MINIMUM VERTICAL CLEARANCE BETWEEN UTILITIES UNLESS OTHERWISE SPECIFIED.
9. WRAP ALL DUCTILE IRON PIPE AND ADJACENT VALVES AND FITTINGS WITH 8-MIL. POLYETHYLENE CONFORMING TO AWWA C105.
10. THE WATERMAIN SHALL BE INSTALLED ONLY AFTER THE ROADWAY SUBGRADE IS BACKFILLED, GRADED AND COMPACTED IN CUT AND FILL AREAS.
11. TRENCH BACKFILL AND SURFACE RESTORATION OF EXISTING ASPHALT PAVEMENT SHALL BE AS REQUIRED BY THE RIGHT-OF-WAY USE PERMIT.
12. ALL FITTINGS SHALL BE BLOCKED PER STANDARD DETAILS UNLESS OTHERWISE SPECIFIED.
14. WHEN WORKING WITH ASBESTOS CEMENT PIPE, THE CONTRACTOR IS REQUIRED TO MAINTAIN WORKERS' EXPOSURE TO ASBESTOS MATERIAL AT OR BELOW THE LIMIT PRESCRIBED IN WAC 296-62-07705.
15. CALL 1-800-424-5555, OR 811, 72 HOURS BEFORE CONSTRUCTION FOR UTILITY LOCATIONS.
16. UNIFORM PLUMBING CODE REQUIRES THE INSTALLATION OF PRIVATELY OWNED AND OPERATED PRESSURE REDUCING VALVES WHERE THE OPERATING PRESSURE EXCEEDS 80 PSI.
17. THE CONTRACTOR SHALL USE A VACUUM STREET SWEEPER TO REMOVE DUST AND DEBRIS FROM PAVEMENT AREAS AS DIRECTED BY THE ENGINEER. FLUSHING OF STREETS SHALL NOT BE PERMITTED WITHOUT PRIOR CITY APPROVAL.
18. BEFORE COMMENCEMENT OF TRENCHING, THE CONTRACTOR SHALL PROVIDE CATCH BASIN INSERTS FOR ALL CATCH BASINS THAT WILL RECEIVE RUNOFF FROM THE PROJECT SITE. THE CONTRACTOR SHALL PERIODICALLY INSPECT THE CONDITION OF ALL INSERTS AND REPLACE AS NECESSARY.
19. ABANDONMENT OF EXISTING WATER SERVICES SHALL BE ACCOMPLISHED AS FOLLOWS:
    A. REMOVE EXISTING SERVICE SADDLE FROM WATER MAIN AND REPLACE WITH NEW STAINLESS STEEL REPAIR BAND, ROMAC SS2 FORD SERVICE SADDLE FC101, OR APPROVED EQUAL (WILL NOT BE REQUIRED WHEN WATER MAIN IS TO BE ABANDONED).
    B. REMOVE AND DISPOSE OF EXISTING SETTER AND METER BOX.
    C. CAP OR CRIMP (IF COPPER) EXISTING SERVICE LINE TO BE ABANDONED IN PLACE, EACH END.
    D. RETURN EXISTING METER TO CITY OF BELLEVUE UTILITIES INSPECTOR.
20. WHERE NEW UTILITY LINE CROSSES BELOW AN EXISTING AC MAIN, THE AC PIPE SHALL BE REPLACED WITH DI PIPE TO 3 FEET PAST EACH SIDE OF THE TRENCH AS SHOWN ON STANDARD DETAIL W-8. WRAP DI PIPE AND COUPLINGS WITH 8-MIL POLYETHYLENE CONFORMING TO AWWA C105. ALTERNATIVELY, WHERE DIRECTED BY THE ENGINEER, THE TRENCH SHALL BE BACKFILLED WITH CONTROLLED DENSITY FILL (CDF, AKA FLOWABLE FILL) FROM BOTTOM OF TRENCH TO THE INVERT OF THE AC MAIN.
21. AVOID CROSSING WATER OR SEWER MAINS AT HIGHLY ACUTE ANGLES. THE SMALLEST ANGLE MEASURE BETWEEN UTILITIES SHOULD BE 45 TO 90 DEGREES.
22. WHERE WATER MAIN CROSSES ABOVE OR BELOW SANITARY SEWER, ONE FULL LENGTH OF WATER PIPE SHALL BE CENTERED FOR MAXIMUM JOINT SEPARATION.
23. AT POINTS WHERE EXISTING THRUST BLOCKING IS FOUND, MINIMUM CLEARANCE BETWEEN THE CONCRETE BLOCKING AND OTHER BURIED UTILITIES OR STRUCTURES SHALL BE 5 FEET.
24. WORKERS MUST FOLLOW CONFINED SPACE REGULATIONS AND PROCEDURES WHEN ENTERING OR DOING WORK IN COB OWNED CONFINED SPACES. COMPLETED PERMIT MUST BE GIVEN TO THE UTILITIES INSPECTOR PRIOR TO ENTRY.
25. MANHOLES, CATCH BASINS AND VAULTS ARE CONSIDERED TO BE PERMIT-REQUIRED CONFINED SPACES. ENTRY INTO THESE SPACES SHALL BE IN ACCORDANCE WITH CHAPTER 296-809 WAC.
26. WHEN WORK IS TO OCCUR IN EASEMENTS, THE CONTRACTOR SHALL NOTIFY THE EASEMENT GRANTOR AND BELLEVUE UTILITIES IN WRITING A MINIMUM OF 48 HOURS IN ADVANCE OF BEGINNING WORK (NOT INCLUDING WEEKENDS OR HOLIDAYS). FAILURE TO NOTIFY GRANTOR AND BELLEVUE UTILITIES WILL RESULT IN A STOP WORK ORDER BEING POSTED UNTIL THE MATTER IS RESOLVED TO THE SATISFACTION OF BELLEVUE UTILITIES. A WRITTEN RELEASE FROM THE EASEMENT GRANTOR SHALL BE FURNISHED TO THE UTILITIES INSPECTOR PRIOR TO PERMIT SIGNOFF.
27. THE CONTRACTOR SHALL RESTORE THE RIGHT-OF-WAY AND EXISTING PUBLIC UTILITY EASEMENT(S) AFTER CONSTRUCTION TO A CONDITION EQUAL OR BETTER THAN CONDITION PRIOR TO ENTRY. CONTRACTOR SHALL FURNISH A SIGNED RELEASE FROM ALL AFFECTED PROPERTY OWNERS AFTER RESTORATION HAS BEEN COMPLETED.
28. PRIVATE FIRE SERVICE MAINS MUST BE INSTALLED IN ACCORDANCE WITH NFPA-24 AS WELL AS COB REQUIREMENTS. THE PIPING MUST BE DOUBLY RESTRAINED AT ALL JOINTS. THIS MEANS THAT ANY CHANGE OF DIRECTION WILL REQUIRE BOTH CONCRETE THRUST BLOCKING AND A MECHANICAL RESTRAINT TYPE JOINT. STRAIGHT RUNS OF PIPE ARE CONSIDERED TO BE DOUBLY RESTRAINED WITH A MECHANICAL RESTRAINT JOINT AND THE WEIGHT OF THE BACKFILL. THIS PIPING MUST BE TESTED AT 200 PSI FOR TWO HOURS WITH NO LEAKS.

CITY OF BELLEVUE APPROVAL STAMP

NTS
COB WATER GENERAL NOTES 12

CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

LAURIE J. PIARR
STATE OF WASHINGTON
30766
REGISTERED
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2-12-2021

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Seattle, WA 98101
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DATE: 02/12/2021

PERMIT SET

PAVING AND UTILITIES DETAILS AND NOTES

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TOPOGRAPHIC & BOUNDARY SURVEY

LEGAL DESCRIPTION

(PER STATUTORY WARRANTY DEED RECORDING# 20140219000844)

TRACT 53, ROSEMONT BEACH, ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 34 OF PLATS, PAGE 28, IN KING COUNTY, WASHINGTON;

EXCEPT THAT PORTION DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST WESTERLY CORNER OF SAID TRACT 53;
THENCE SOUTH 49°02'23" EAST, ALONG THE SOUTHWESTERLY LINE OF SAID TRACT, A DISTANCE OF 71.82 FEET;
THENCE NORTH 44°33'51" EAST 41.94 FEET;
THENCE NORTH 68°56'46" EAST 5.28 FEET TO THE NORTHEASTERLY LINE OF SAID TRACT;
THENCE NORTH 49°50'59" WEST, ALONG SAID NORTHEASTERLY LINE, 77.26 FEET TO THE MOST NORTHERLY CORNER OF SAID TRACT 53, SAID POINT BEING ON A 3213.23 FOOT RADIUS CIRCULAR CURVE TO THE RIGHT, FROM WHICH POINT THE CENTER OF SAID CURVE BEARS NORTH 49°50'59" WEST;
THENCE SOUTHWESTERLY ALONG SAID CURVE AND THE NORTHWESTERLY LINE OF SAID TRACT, THROUGH A CENTRAL ANGLE OF 00°48'36" AN ARC DISTANCE OF 45.43 FEET TO THE POINT OF BEGINNING;

TOGETHER WITH THAT PORTION OF TRACT 52, ROSEMONT BEACH, ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 34 OF PLATS, PAGE 28, IN KING COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

COMMENCING AT THE MOST WESTERLY CORNER OF SAID TRACT 52;
THENCE SOUTH 49°50'59" EAST ALONG THE SOUTHWESTERLY LINE OF SAID TRACT, 108.12 FEET TO THE TRUE POINT PF BEGINNING;
THENCE CONTINUING ALONG SAID SOUTHWESTERLY LINE, SOUTH 49°50'59" EAST 45.59 FEET;
THENCE NORTH 02°31'24" EAST 8.17 FEET;
THENCE NORTH 49°50'59" WEST 40.60 FEET;
THENCE SOUTH 40°09'01" WEST 6.47 FEET TO THE TRUE POINT OF BEGINNING;
(ALSO KNOWN AS LOT B, CITY OF BELLEVUE BOUNDARY LINE ADJUSTMENT NUMBER 95-1207, RECORDED UNDER RECORDING NUMBER 9506019001).

SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

BASIS OF BEARINGS

BETWEEN CITY OF BELLEVUE HORIZONTAL STA. 492 AND 493
BEARING = NORTH 38°41'06" EAST PER R1.

REFERENCES

R1. BOUNDARY LINE ADJUSTMENT, REC. NO. 9506019001.

R2. RECORD OF SURVEY, REC. NO. 20151204900006.

VERTICAL DATUM

NAVD88, PER CITY OF BELLEVUE VERTICAL STA. NO.43

CONC MON W/COB BRASS CAP STAMPED "H514" & V493 IN CASE; TOP MON TO TOP RIM CASE 0.29 FEET, 10' EAST E/P W LK SAMMAMISH BLVD NE, 1200' NORTH OF 513 NEAR LARGE BOULDER. ELEVATION = 150.70'

SURVEYOR'S NOTES

1. THE TOPOGRAPHIC SURVEY SHOWN HEREON WAS PERFORMED IN AUGUST OF 2019. THE FIELD DATA WAS COLLECTED AND RECORDED ON MAGNETIC MEDIA THROUGH AN ELECTRONIC THEODOLITE. THE DATA FILE IS ARCHIVED ON DISC OR CD. WRITTEN FIELD NOTES MAY NOT EXIST. CONTOURS ARE SHOWN FOR CONVENIENCE ONLY. DESIGN SHOULD RELY ON SPOT ELEVATIONS.
2. ALL MONUMENTS SHOWN HEREON WERE LOCATED DURING THE COURSE OF THIS SURVEY UNLESS OTHERWISE NOTED.
3. THE TYPES AND LOCATIONS OF ANY UTILITIES SHOWN ON THIS DRAWING ARE BASED ON INFORMATION PROVIDED TO US, BY OTHERS OR GENERAL INFORMATION READILY AVAILABLE IN THE PUBLIC DOMAIN INCLUDING, AS APPLICABLE, IDENTIFYING MARKINGS PLACED BY UTILITY LOCATE SERVICES AND OBSERVED BY TERRANE IN THE FIELD. AS SUCH, THE UTILITY INFORMATION SHOWN ON THESE DRAWINGS ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE RELIED ON FOR DESIGN OR CONSTRUCTION PURPOSES; TERRANE IS NOT RESPONSIBLE OR LIABLE FOR THE ACCURACY OR COMPLETENESS OF THIS UTILITY INFORMATION. FOR THE ACCURATE LOCATION AND TYPE OF UTILITIES NECESSARY FOR DESIGN AND CONSTRUCTION, PLEASE CONTACT THE SITE OWNER AND THE LOCAL UTILITY LOCATE SERVICE (800-424-5555).
4. SUBJECT PROPERTY TAX PARCEL NO. 743050-0270.
5. SUBJECT PROPERTY AREA PER THIS SURVEY IS 13,598 ±S.F. (0.31 ACRES)
6. ALL TITLE INFORMATION SHOWN ON THIS MAP HAS BEEN EXTRACTED FROM FIRST NEXTITLE COMPANY'S "PRELIMINARY REPORT", COMMITMENT NO. NXWA-0130062, DATED JANUARY 8, 2014. IN PREPARING THIS MAP, TERRANE, INC. HAS CONDUCTED NO INDEPENDENT TITLE SEARCH NOR IS TERRANE, INC. AWARE OF ANY TITLE ISSUES AFFECTING THE SURVEYED PROPERTY OTHER THAN THOSE SHOWN ON THE MAP AND DISCLOSED BY THE REFERENCED "SUBDIVISION GUARANTEE". TERRANE, INC. HAS RELIED WHOLLY ON NEXTITLE COMPANY'S REPRESENTATIONS OF THE TITLE'S CONDITION TO PREPARE THIS SURVEY AND TERRANE, INC. QUALIFIES THE MAP'S ACCURACY AND COMPLETENESS TO THAT EXTENT.
7. FIELD DATA FOR THIS SURVEY WAS OBTAINED BY DIRECT FIELD MEASUREMENTS WITH A CALIBRATED ELECTRONIC 5-SECOND TOTAL STATION AND/OR SURVEY GRADE GPS OBSERVATIONS. ALL ANGULAR AND LINEAR RELATIONSHIPS ARE ACCURATE AND MEET THE STANDARDS SET BY WAC 332-130-090.

SCHEDULE B ITEMS

3. EASEMENT AND THE TERMS AND CONDITIONS THEREOF: GRANTEE: PUGET SOUND POWER & LIGHT COMPANY, A MASSACHUSETTS CORPORATION, PURPOSE: ELECTRIC TRANSMISSION AND/OR DISTRIBUTION SYSTEM, AREA AFFECTED: PORTION OF SAID PREMISES, RECORDED: APRIL 28, 1941, UNDER RECORDING NO.: 3161079. (LOCATION NOT SPECIFIC)

SCHEDULE B ITEMS CONT.

4. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: TWO 40 FOOT EASEMENTS FOR EXISTING PRIVATE ROADWAYS AND A UTILITY EASEMENT ALONG BOTH PRIVATE ROADWAYS; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 3308907. (LOCATION NOT SPECIFIC)
5. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: EXISTING PRIVATE ROADWAYS; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 3764710. (LOCATION NOT SPECIFIC)
6. EASEMENT AND THE TERMS AND CONDITIONS THEREOF: GRANTEE: LAKE HILLS SEWER DISTRICT, PURPOSE: SANITARY SEWER LINE OR LINES, AREA AFFECTED: PORTION OF SAID PREMISES, RECORDED: JUNE 7, 1965, UNDER RECORDING NO.: 5887693. (DOCUMENT NOT LEGIBLE ENOUGH TO PLOT)
7. SIDE SEWER EASEMENT AND THE TERMS AND CONDITIONS THEREOF: 10 FEET IN WIDTH, LOCATED ALONG THE LINE OF THE LAND AS CONSTRUCTED, RECORDED: JUNE 7, 1965; RECORDING NO.: 5887693. (DOCUMENT NOT LEGIBLE ENOUGH TO PLOT)
8. EASEMENT AND THE TERMS AND CONDITIONS THEREOF: GRANTEE: WATER DISTRICT NUMBER 97 A WATER LINE OR LINES AND APPURTENANCES, PURPOSE: PORTION OF SAID PREMISES, AREA AFFECTED: PORTION OF SAID PREMISES, RECORDED: JUNE 2, 1967, UNDER RECORDING NO.: 6184216. (PLOTTED)
9. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: DRAINAGE PIPE; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 6298158. (PLOTTED)
10. EASEMENT AND THE TERMS AND CONDITIONS THEREOF: GRANTEE: WATER DISTRICT NO. 97, KING COUNTY, WASHINGTON, A MUNICIPAL CORPORATION, PURPOSE: WATER LINE, AREA AFFECTED: PORTION OF SAID PREMISES, RECORDED: OCTOBER 3, 1972, UNDER RECORDING NO.: 7210030547. (LOCATION NOT SPECIFIC)
11. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: EXISTING PRIVATE ROADWAY OR ROADWAYS; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 7210030547. (LOCATION NOT SPECIFIC)

SCHEDULE B ITEMS CONT.

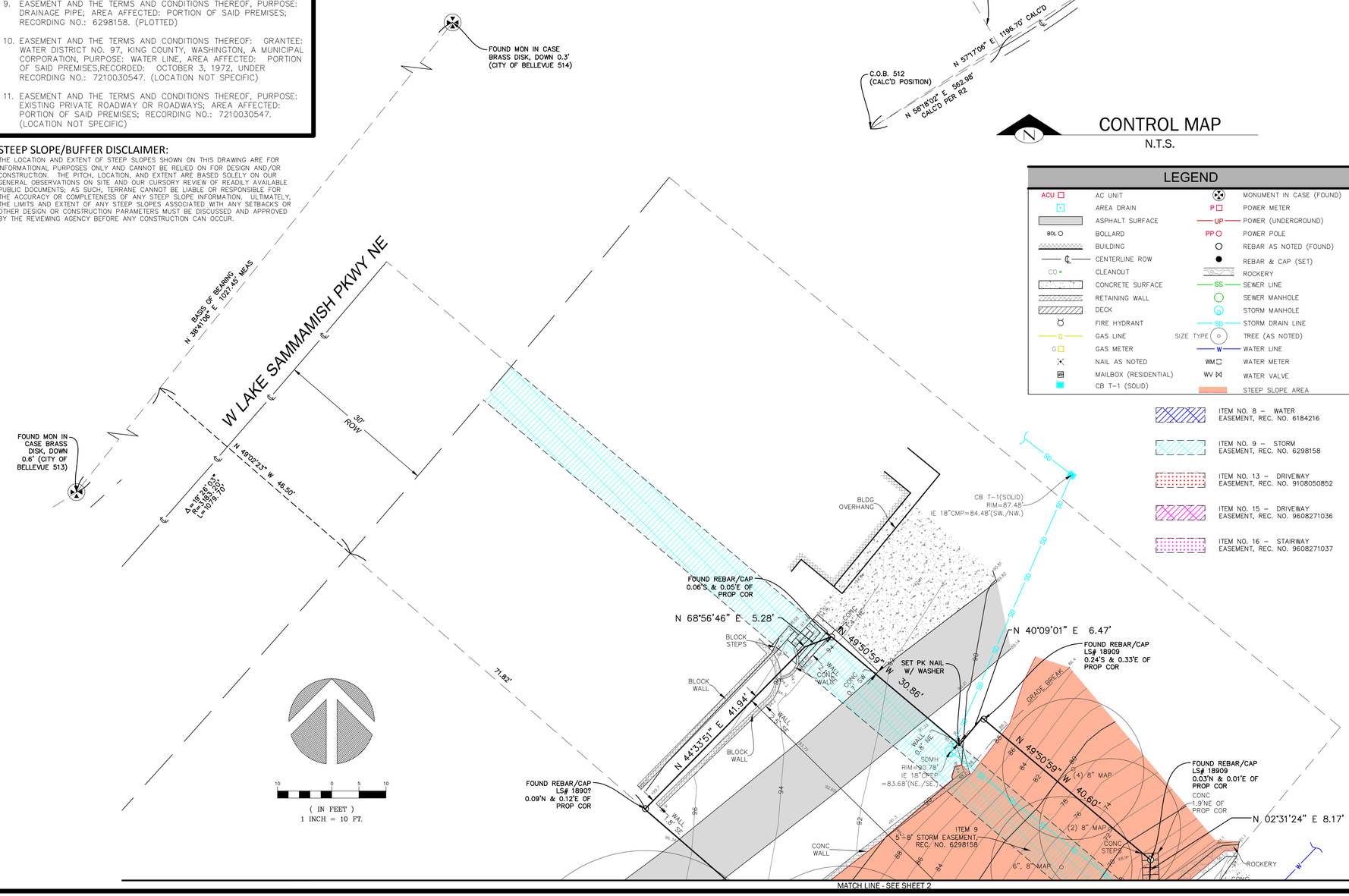
12. UNDERGROUND UTILITY EASEMENT AND THE TERMS AND CONDITIONS THEREOF: GRANTEE: WASHINGTON NATURAL GAS COMPANY, A WASHINGTON CORPORATION; PURPOSE: GAS PIPELINE OR PIPELINES; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDED: FEBRUARY 21, 1991; RECORDING NO.: 9102210569. (LOCATION NOT SPECIFIC)
13. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: DRIVEWAY; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 9106050852. (PLOTTED)
14. SIDE SEWER EASEMENT AND THE TERMS AND CONDITIONS THEREOF: 5 FEET IN WIDTH, LOCATED ALONG THE LINE OF THE LAND AS CONSTRUCTED, RECORDED: NOVEMBER 2, 1992; RECORDING NO.: 9211020856. (AS CONSTRUCTED)
15. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: DRIVEWAY; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 9608271036. (PLOTTED)
16. EASEMENT AND THE TERMS AND CONDITIONS THEREOF, PURPOSE: STAIRWAY; AREA AFFECTED: PORTION OF SAID PREMISES; RECORDING NO.: 9608271037. (PLOTTED)

VICINITY MAP

N.T.S.

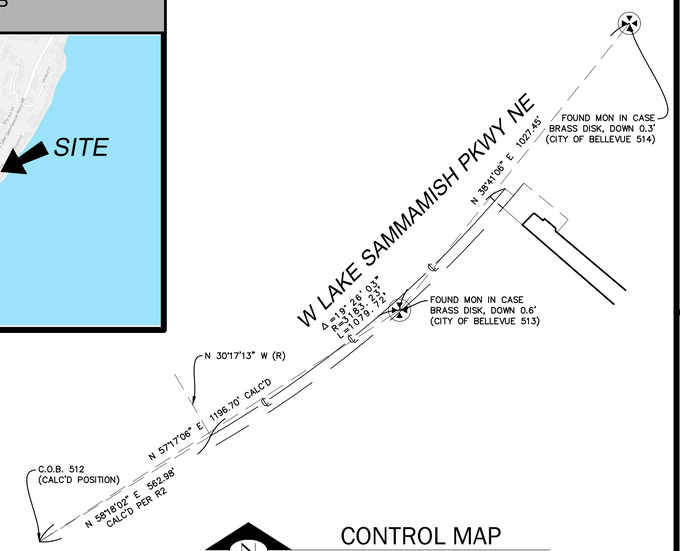
STEEP SLOPE/BUFFER DISCLAIMER:

THE LOCATION AND EXTENT OF STEEP SLOPES SHOWN ON THIS DRAWING ARE FOR INFORMATIONAL PURPOSES ONLY AND CANNOT BE RELIED ON FOR DESIGN AND/OR CONSTRUCTION. THE PITCH, LOCATION, AND EXTENT ARE BASED SOLELY ON OUR GENERAL OBSERVATIONS ON SITE AND OUR CURSORY REVIEW OF READILY AVAILABLE PUBLIC DOCUMENTS; AS SUCH, TERRANE CANNOT BE LIABLE OR RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY STEEP SLOPE INFORMATION. ULTIMATELY, THE LIMITS AND EXTENT OF ANY STEEP SLOPES ASSOCIATED WITH ANY SETBACKS OR OTHER DESIGN OR CONSTRUCTION PARAMETERS MUST BE DISCUSSED AND APPROVED BY THE REVIEWING AGENCY BEFORE ANY CONSTRUCTION CAN OCCUR.



CONTROL MAP

N.T.S.

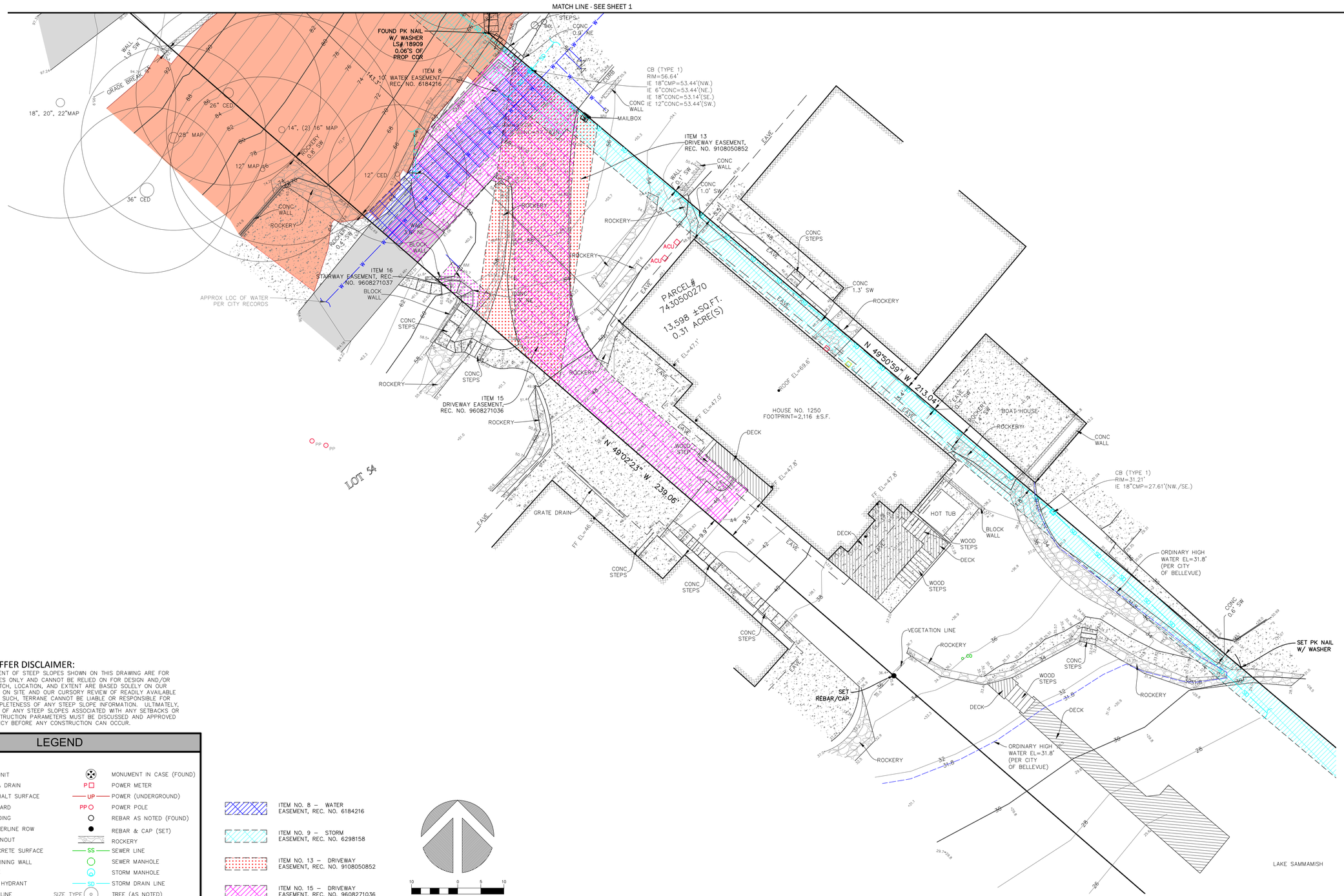


LEGEND

ACU	AC UNIT		MONUMENT IN CASE (FOUND)
	AREA DRAIN	P	POWER METER
	ASPHALT SURFACE	UP	POWER (UNDERGROUND)
BOL	BOLLARD	PP	POWER POLE
	BUILDING		REBAR AS NOTED (FOUND)
	CENTERLINE ROW		REBAR & CAP (SET)
CO	CLEANOUT		ROCKERY
	CONCRETE SURFACE	SS	SEWER LINE
	RETAINING WALL		SEWER MANHOLE
	DECK		STORM MANHOLE
	FIRE HYDRANT	SD	STORM DRAIN LINE
G	GAS LINE	SIZE TYPE	TREE (AS NOTED)
G	GAS METER	W	WATER LINE
	NAIL AS NOTED	WM	WATER METER
	MAILBOX (RESIDENTIAL)	WV	WATER VALVE
	CB T-1 (SOLID)		STEEP SLOPE AREA

	ITEM NO. 8 – WATER EASEMENT, REC. NO. 6184216
	ITEM NO. 9 – STORM EASEMENT, REC. NO. 6

TOPOGRAPHIC & BOUNDARY SURVEY



STEEP SLOPE/BUFFER DISCLAIMER:

THE LOCATION AND EXTENT OF STEEP SLOPES SHOWN ON THIS DRAWING ARE FOR INFORMATIONAL PURPOSES ONLY AND CANNOT BE RELIED ON FOR DESIGN AND/OR CONSTRUCTION. THE PITCH, LOCATION, AND EXTENT ARE BASED SOLELY ON OUR GENERAL OBSERVATIONS ON SITE AND OUR CURSORY REVIEW OF READILY AVAILABLE PUBLIC DOCUMENTS; AS SUCH, TERRANE CANNOT BE LIABLE OR RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY STEEP SLOPE INFORMATION. ULTIMATELY, THE LIMITS AND EXTENT OF ANY STEEP SLOPES ASSOCIATED WITH ANY SETBACKS OR OTHER DESIGN OR CONSTRUCTION PARAMETERS MUST BE DISCUSSED AND APPROVED BY THE REVIEWING AGENCY BEFORE ANY CONSTRUCTION CAN OCCUR.

LEGEND

ACU	AC UNIT		MONUMENT IN CASE (FOUND)
	AREA DRAIN	P	POWER METER
	ASPHALT SURFACE	UP	POWER (UNDERGROUND)
BOL	BOLLARD	PP	POWER POLE
	BUILDING		REBAR AS NOTED (FOUND)
	CENTERLINE ROW		REBAR & CAP (SET)
CO	CLEANOUT		ROCKERY
	CONCRETE SURFACE	SS	SEWER LINE
	RETAINING WALL		SEWER MANHOLE
	DECK		STORM MANHOLE
	FIRE HYDRANT	SD	STORM DRAIN LINE
G	GAS LINE	SIZE TYPE	TREE (AS NOTED)
G	GAS METER	W	WATER LINE
	NAIL AS NOTED	WM	WATER METER
	MAILBOX (RESIDENTIAL)	WV	WATER VALVE
	CB T-1 (SOLID)		STEEP SLOPE AREA

ITEM NO. 8 – WATER EASEMENT, REC. NO. 6184216

ITEM NO. 9 – STORM EASEMENT, REC. NO. 6298158

ITEM NO. 13 – DRIVEWAY EASEMENT, REC. NO. 9108050852

ITEM NO. 15 – DRIVEWAY EASEMENT, REC. NO. 9608271036

ITEM NO. 16 – STAIRWAY EASEMENT, REC. NO. 9608271037

10 0 5 10

(IN FEET)
1 INCH = 10 FT.

measure success

TOPOGRAPHIC & BOUNDARY SURVEY
NE 1/4 OF SW 1/4 SEC 30, TWP. 30N, RGE 25E., W.M.
TAX PARCEL NO. 7430500270

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE, WA 98008

Terrane
10801 Main Street, Suite 102, Bellevue, WA 98004
phone 425.458.4488 support@terrane.net
www.terrane.net

JOB NUMBER:	191168
DATE:	08/28/19
DRAFTED BY:	IDV-GKD
CHECKED BY:	JPS
SCALE:	1"=10'
REVISION HISTORY	
10/04/19	TITLE REVIEW
11/02/20	ADJUST MATCHLINE
SHEET NUMBER	
2 OF 2	

CRITICAL AREAS REPORT, MITIGATION PLAN, AND SHORELINE NARRATIVE

FOR

1250 W LAKE SAMMAMISH PKWY NE

Wetland Resources, Inc. Project #20256

Prepared By
Wetland Resources, Inc.
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Everett, WA 98208
(425) 337-3174

Prepared For
Rob Drollinger
1250 W Lake Sammamish Pkwy NE
Bellevue, WA 98008

March 2, 2021

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TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 SITE DESCRIPTION 1
1.2 PROJECT DESCRIPTION 2
2.0 CRITICAL AREA DETERMINATION 3
2.1 REVIEW OF EXISTING INFORMATION 3
2.2 HABITAT ASSESSMENT 4
2.2.1 Vegetation Description 4
2.2.2 Species of Local Importance 4
2.2.3 Potential Habitat Impact 5
2.3 GEOLOGIC HAZARD AREAS 5
2.4 FREQUENTLY FLOODED AREAS 6
2.5 OTHER CRITICAL AREAS 6
3.0 CRITICAL AREA REPORT – DECISION CRITERIA 6
4.0 SHORELINE MASTER PROGRAM COMPLIANCE 7
5.0 PROPOSED IMPACTS AND MITIGATION 11
5.1 PROPOSED IMPACTS 11
5.2 MITIGATION PLAN 11
5.3 MITIGATION SEQUENCING 12
5.4 ENHANCEMENT PLAN 13
5.4.1 Enhancement Area A 13
5.4.2 Enhancement Area B 14
5.4.3 Buffer Enhancement 14
5.5 PLANTING NOTES 15
6.0 PROJECT MONITORING PROGRAM 17
6.1 MITIGATION GOALS AND OBJECTIVES 17
6.2 MONITORING REQUIREMENTS 18
6.2.2 Photo points 18
6.2.3 Monitoring Reports 18
6.2.4 Project Success and Compliance 19
7.0 MAINTENANCE PROGRAM 19
8.0 CONTINGENCY PLAN 21
9.0 PERFORMANCE BOND 21
10.0 USE OF THIS REPORT 22
11.0 REFERENCES 23

LISIT OF FIGURES

FIGURE 1 - AERIAL PHOTO OF THE SUBJECT PROPERTY (NOT TO SCALE) 2

LIST OF TABLES

TABLE 1 - STEEP SLOPE IMPACTS AND MITIGATION SUMMARY 11
TABLE 2 - TOP OF SLOPE BUFFER IMPACTS AND MITIGATION SUMMARY 12

List of Appendices

Appendix A: Storm Drainage Report (LPD Engineering; February 12, 2021)

Appendix B: Geotechnical and Critical Area Report (PanGEO; October 26, 2020)

Appendix C: Existing Conditions Map (Sheet 1/2)

Appendix D: Critical Areas Report & Mitigation Plan Map (Sheet 2/2)

Appendix E: Site Photos

1.0 INTRODUCTION

Wetland Resources, Inc. (WRI) performed a site investigation on November 16, 2020 to identify and evaluate wetlands, streams, and wildlife habitat on and in the vicinity of King County parcel number 7430500270. The 0.31-acre parcel is located at 1250 West Lake Sammamish Parkway Northeast in the city of Bellevue, WA. The Public Land Survey System (PLSS) locator for the site is Section 30, Township 25N, Range 06E, W.M. It is located in the West Lake Sammamish drainage basin within the Cedar-Sammamish watershed, Water Resources Inventory Area (WRIA) 8. A geotechnical study was conducted by PanGEO to identify and evaluate geological hazard areas on the site. The *Geotechnical and Critical Area Report* (PanGEO, dated October 26, 2020), henceforth referred to as the geotechnical report, contains a detailed analysis of geological hazard areas, impacts, and construction recommendations as well as compliance with Bellevue Land Use Code (LUC) as it applies. The geotechnical report is included in Appendix A.

The purpose of this report is to provide information on existing conditions of the site as required when a project is requesting a modification of critical areas, buffers, or setbacks. This report documents presence of critical areas on and in the vicinity of the subject site and includes a mitigation plan to compensate for unavoidable impacts to a steep slope on the site associated with the proposed development.

1.1 SITE DESCRIPTION

The subject site is located on the western shore of Lake Sammamish. Lake Sammamish is regulated as a Type S waterbody (Shoreline of the State). Surrounding land use is single-family residential. The property is bounded to the northwest by N Rosemont Road and to the southeast by Lake Sammamish. The site is developed with a single-family residence (SFR) and contains maintained lawn and landscaping adjacent to the house, natural vegetation on a steep slope in the northwestern portion of the property, and a maintained gravel beach along the shoreline. Topography of the site slopes to the east toward the lake. The eastern portion of the site is gently sloping, while the western portion contains slopes greater than 40 percent. Per Bellevue LUC 20.25E.065(E)(1)(b) the ordinary high water mark of the lake is identified as 31.8 feet elevation (NAVD 88). A 50-foot shoreline structure setback from the ordinary high water mark of the lake is required. The extent of the 100-year floodplain as determined by the City of Bellevue, as well as the FEMA 100-year flood plain (Flood Insurance Rate Map, August 19, 2020) are depicted on the Existing Conditions Map (Appendix B). Areas within either defined 100-year floodplain are regulated as frequently flooded areas. No wetlands or streams were identified on or in the vicinity of the site. Appendix E includes photographs of the site.

Figure 1 - Aerial photo of the subject property (not to scale)

1.2 PROJECT DESCRIPTION

The applicant proposes the following:

- Construct an addition over a portion of the existing single-family residence
- Construct a paved/pervious pave parking area and below grade storage to the northwest of the house
- Replace a wood retaining structure at the top of the steep slope with a soldier pile wall in the same location to improve stability
- Replace a rockery wall at the base of the steep slope with a soldier pile wall to improve stability
- Construct a pervious (grasspave) parking pad on the north side of NE Rosemont Place
- Replace existing degraded concrete steps near the base of the existing slope and extend to N Rosemont Road
- Install new stormwater drainage infrastructure

Impacts to the steep slope are unavoidable for the construction of the new soldier pile walls, pervious parking pad, the proposed steps between Northeast Rosemont Place and North Rosemont Road, and new necessary stormwater infrastructure. Impacts to the slope total 774 square feet. Pervious pavement (grasspave) will be utilized where possible for the proposed parking areas to minimize impacts. To mitigate for the unavoidable impacts to the steep slope, the applicant proposes to enhance the remaining steep slope area (a total of 1,750 SF) by removing invasive plant species and planting native trees and shrubs.

A small amount of impact to the top of slope buffer (56 square feet) is unavoidable to connect the proposed stairs to N Rosemont Road and for a stormwater catch basin. To compensate for this impact, the applicant proposes to provide 112 square feet of buffer enhancement.

The applicant also proposes to modify the toe of slope setback to accommodate the proposed development adjacent to the existing house, as described in the geotechnical report (Appendix A).

No development is proposed within the shoreline setback associated with Lake Sammamish nor within the City of Bellevue or FEMA 100-year floodplains.

2.0 CRITICAL AREA DETERMINATION

2.1 REVIEW OF EXISTING INFORMATION

Prior to conducting an on-site investigation of the project area, public resource information was reviewed to identify the presence of wetlands, streams, and other critical areas within and near the project area. The following information was examined:

- *USDA/NRCS Web Soil Survey*: The Web Soil Survey shows the soils on-site are Alderwood (50 percent) and Kitsap (25 percent) soils, very steep. These soils are described as moderately well drained. Alderwood soils are typically found on moraines and till plains and Kitsap soils are typically found on terraces. Neither of these is a hydric soil type.
- *USFWS National Wetlands Inventory (NWI)*: NWI maps Lake Sammamish adjacent to the southeast of the subject property as a Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded feature. No other features are depicted on or in the vicinity of the site.
- *Washington State DNR Forest Practices Application Mapping Tool (FPAMT)*: This resource depicts Lake Sammamish to the southeast of the property as a Type S waterbody. No other features are mapped on or in the vicinity of the site.
- *WDFW SalmonScape Interactive Map*: The SalmonScape map does not identify any streams on or near the project site.
- *WDFW Priority Habitat and Species (PHS) Interactive Map*: PHS maps occurrence of several salmonid species in Lake Sammamish. No other features are depicted on or in the vicinity of the site.

- *King County iMap*: The King County iMap online mapping tool depicts the limit of the FEMA 100-year floodplain along the shoreline of Lake Sammamish on the subject property.
- *Bellevue Geologic Hazards Map:* Steep slopes greater than 40 percent are depicted in the northwestern portion of the property. The site is mapped within a very severe soil erosion hazard area and a moderate to high liquefaction hazard area.
- *Bellevue Map Viewer*: The Bellevue Map Viewer online mapping tool depicts steep slopes in the northwestern portion of the property and maps the property within a liquefaction prone area. The 100-year floodplain is also shown in the southeastern portion of the property.

2.2 HABITAT ASSESSMENT

Habitat associated with species of local importance listed in LUC 20.25H.165.A is designated as critical area under LUC 20.25H.150.B. Therefore, WRI performed an assessment of the property to determine the likelihood of use by these species.

2.2.1 Vegetation Description

The portion of the property southeast of Northeast Rosemont Place is developed with a single-family residence, driveway, lawn, maintained gravel beach, and a small amount of ornamental landscaping. Vegetation in this area consists of maintained lawn grasses and ornamental trees and shrubs. The portion of the property northwest of Northeast Rosemont Place consists of a naturally vegetated steep slope. This area contains trees including Western red cedar (*Thuja plicata*) and big-leaf maple (*Acer macrophyllum*) with a sparse understory that includes beaked hazelnut (*Corylus cornuta*), salmonberry (*Rubus spectabilis*), swordfern (*Polystichum munitum*) and a small amount of Himalayan blackberry (*Rubus armeniacus*) and English ivy (*Hedera helix*).

2.2.2 Species of Local Importance

Lake Sammamish supports Chinook salmon (*Oncorhynchus tshawytscha*), Bull trout (*Salvelinus confluentus*), and Coho salmon (*Oncorhynchus kisutch*), which are species of local importance in the City of Bellevue per LUC 20.25H.150. No other priority species or habitats are identified by the WDFW PHS online mapping application as being present on the subject property. During the site investigation, songbird activity was noted in the forested steep slope portion of the site. No other wildlife was observed.

Based on the available habitat, avian species that are likely to utilize the site include American Crow (*Corvus brachyrhyncos*), American Robin (*Turdis migratorius*), Common Starling (*Sturnus vulgaris*), Stellar's Jay (*Cyanocitta stelleri)*, Black-capped Chickadee (*Poecile atricapillus*), and Dark-eyed Junco *(Junco hyemalis)*. Osprey (*Pandion halieaetus*) and Great Blue Heron (*Ardea herodias*) are likely to be present in the area as the lake provides foraging opportunity for these species. No snags were observed on the site.

Mammalian species that may utilize this site include squirrels (*Sciurus spp.*), shrews (*Sorex* spp.), raccoons (*Procyon lotor*), skunks (*Mephitis* spp.), deer mice (*Peromyscus maniculatus*), and Virginia opossums (*Didelphis virginiana*).

These lists are not intended to be all-inclusive, and may omit species that currently utilize or could utilize the site. The subject property is located within a dense suburban residential development area which limits it's use as a wildlife corridor.

No species of local importance were observed on or in the vicinity of the site during the site investigation. Aside from salmonid fish species, Osprey, and Great Blue Heron, which are known to occur or likely to occur in or forage in Lake Sammamish, no other species of local importance are predicted to utilize the site.

2.2.3 Potential Habitat Impact

No in-water work is proposed nor is any work proposed within the shoreline setback adjacent to Lake Sammamish. Therefore, no direct or indirect impacts are proposed to any habitats associated with species of local importance. The proposed development plan includes unavoidable permanent impact to 774 square feet of the naturally vegetated steep slope in the northwestern portion of the property for replacement of an existing rockery wall with a soldier pile wall and new pervious parking pad. Mitigation for this impact will be in the form of enhancement of the remaining portion of the steep slope, which will result in an overall improvement in wildlife habitat function. Vegetation is sparse on portions of the slope and includes a small amount of cover of invasive species. All invasive vegetation will be removed, and a diverse mix of native trees and shrubs will be planted. This will provide increased perching and nesting opportunities, increased thermal and hiding cover, and more forage opportunities. The remainder of the proposed development will occur over the existing single-family residence and a portion of the landscaped area northwest of the house and will not impact wildlife habitat.

2.3 Geologic Hazard Areas

Geologic hazard areas on the site were evaluated by PanGEO and are described in detail in the geotechnical report (Appendix A). One steep slope area occurs on the subject site. Liquefaction analysis indicated that the soils below the groundwater table (7.0 feet) to a depth of about 18 feet in the proposed addition area are potentially liquefiable and ground settlement due to soil liquefaction is estimated to be about 3.0 inches. The geotechnical evaluation determined that the soils on the site are anticipated to exhibit moderate to high erosion potential when disturbed and left unprotected, but that the erosion hazards can be effectively mitigated with best management practice during construction and appropriate design. All design recommendations provided in the geotechnical report have been applied in the proposed site design, and all construction recommendations shall be followed.

Geotechnical analysis determined that the existing condition of the steep slope does not meet the required minimum factors of safety (static and seismic analyses). The proposed replacement of the wood and rockery retaining walls at the top and base of the steep slope will result in a post-construction factor of safety that exceeds code requirements.

The geotechnical report provides detailed recommendations for design and implementation of the proposed development to mitigate any risks associated with the geologic hazards identified on the site. Additionally, the geotechnical report addresses criteria under the City of Bellevue Land Use Code (LUC), section 20.25H, that pertain to geologic hazard areas as they apply to this project.

2.4 FREQUENTLY FLOODED AREAS

Per LUC 20.25H.175(A), areas regulated as frequently flooded areas include land subject one-hundred-year flood as determined by the City of Bellevue and areas identified on the Flood Insurance Rate Maps (FIRMs, dated August 19, 2020). Frequently flooded areas meeting these definitions occur in the eastern portion of the subject property along the shore of Lake Sammamish. No work is proposed within frequently flooded areas.

2.5 OTHER CRITICAL AREAS

No other critical areas as defined under LUC 20.25H were identified on or in the vicinity of the subject site. Soils in the upper 18 inches of the profile on the site were found to be dark brown (10YR 3/3) to very dark brown (10YR 2/2) with a sandy loam texture and were dry to moist at the time of the site investigation. No evidence of ponding or prolonged saturation were observed landward of the ordinary high water mark of Lake Sammamish.

3.0 CRITICAL AREA REPORT – DECISION CRITERIA

Text in italics below is from LUC 20.45H.255, with WRI responses in plain text.

A. General

Except for the proposal described in subsection B of this section, the Director may approve, or approve with modifications, the proposed modification where the applicant demonstrates:

1. *The modifications and performance standards included in the proposal lead to levels of protection of critical area functions and values at least as protective as application of the regulations and standards of this code;*

Per the geotechnical report, the existing condition of the slope does not meet the required factor of safety. The geotechnical analysis indicates that the proposed replacement of existing rockery and wood retaining structures with soldier pile walls will result in minimum factors of safety (static analysis and seismic analysis) that bring the condition into compliance with code requirements. Overall, this portion of the project will improve the stability of the steep slope critical area.

To compensate for 774 square feet of unavoidable impact to the steep slope for the replacement of the rockery wall at the base of the slope, the proposed pervious parking pad, and the proposed steps to extend between Northeast Rosemont Place and North Rosemont Road, the applicant proposes to enhance the vegetation on the remainder of the on-site steep slope. Portions of the steep slope currently contain sparse vegetative cover and include invasive species. The proposed enhancement will increase slope stability as well as improve wildlife habitat.

Overall, the proposed project will result in a net improvement in critical area functions on the site.

2. *Adequate resources to ensure completion of any required mitigation and monitoring efforts;*

The applicant will provide a surety at the time of the building permit application submittal.

3. *The modifications and performance standards included in the proposal are not detrimental to the functions and values of critical areas and critical area buffers off-site; and*

The proposed project will result in a net improvement in critical area functions and values on site as well as on the adjacent property to the west. There will be no adverse impacts to critical area or buffer functions off site.

4. *The resulting development is compatible with other uses and development in the same land use district.*

The subject site is in single-family residential neighborhood. The proposed development is an expansion to a single-family home, which is compatible with the land use district.

4.0 SHORELINE MASTER PROGRAM COMPLIANCE

The subject site is bounded to the east by Lake Sammamish, a Type S waterbody. Lake Sammamish is regulated under LUC 20.25E, Shoreline Overlay District. Per LUC 20.25E.010(F), Lake Sammamish is designated as a Shoreline of Statewide Significance. The subject property is mapped within the Shoreline Residential (SR) shoreline environment.

The current land use of the property is single-family residential, which is compliant with allowed uses in the Shoreline Residential shoreline environment. The proposed project does not result in any changes to the existing land use.

The following sections demonstrate project compliance with applicable shoreline code requirements under LUC 20.25E (code sections cited in italics with responses below in normal text):

LUC 20.25E.065(B)(2)

a. Shoreline Stabilization. New residential development should be located and designed to avoid the need for future shoreline stabilization to the extent feasible.
The proposed development will not result in the need for additional future shoreline stabilization.

b. Parking and Driveways. New driveways and garages associated with residential development shall comply with the following applicable standards:

> *i. New residential parking shall not be permitted over water or within the shoreline structure setback.*
> No parking or any other development is proposed over water or within the shoreline structure setback.
>
> *ii. New parking surfaces and driveway areas should be designed to incorporate natural drainage practices and low-impact development practices where feasible. (For further information regarding Citywide requirements, refer to the Storm and Surface Water Utility Code, Chapter 24.06 BCC, and the Storm and Surface Water Engineering Standards (2011), now or as hereafter amended.)*

The proposed new parking surfaces will consist primarily of pervious pavement (grasspave). A portion of the parking pad adjacent to the house will be concrete to ensure stability. Please refer to the Storm Drainage Report (LPD Engineering, PLLC; dated February 12, 2021) for details regarding the proposed stormwater drainage plan.

iii. Construction, maintenance, and repair of parking surfaces and driveways shall prevent surface water runoff from contaminating water bodies by using best management practices. (For further information regarding Citywide requirements, refer to the Bellevue Storm and Surface Water Utility Code, Chapter 24.06 BCC, and the Storm and Surface Water Engineering Design Standards (2011); now or as hereafter amended.)

Please refer to the Storm Drainage Report (LPD Engineering, PLLC; dated February 12, 2021) for details of the project stormwater drainage plan and construction stormwater pollution prevention plan (SWPPP) plan.

c. Accessory Utilities. To minimize disturbance in the Shoreline Overlay District, and to reduce the impact on shoreline ecological functions, utilities serving residential development shall be consolidated when reasonable within existing or proposed roadway and driveway corridors that provide access to the development. Consolidation of utilities within the roadway and driveway corridor is not reasonable when consolidation will not achieve the intended function of the utility, or the cost of avoiding disturbance is substantially disproportionate when compared to the environmental impact of proposed disturbance. Septic systems may be removed upon connection to sanitary sewer; provided, that all areas of temporary disturbance are restored to a condition equivalent to that which existed prior to undertaking the removal activity. Mitigation credits can be earned pursuant to the provisions of subsection F.8 of this section for vegetation enhancements that will improve the pre-existing condition after the removal activity is completed.

New utility infrastructure proposed as part of this project is limited to stormwater management features to manage runoff from proposed surfaces and retaining walls. These features are partially located within the existing roadway of NE Rosemont Place and will not result in any adverse impacts to shoreline functions.

d. Clearing and Grading.

i. All clearing, grading, excavating, and filling in the Shoreline Overlay District shall comply with the provisions of this subsection B.2.d. (For further information regarding Citywide requirements, refer to Chapter 24.06 BCC (Storm and Surface Water Utility Code), Chapter 23.76 BCC (Clearing and Grading Code), and the City's engineering and clearing and grading development standards, now or as hereafter amended.)

All proposed clearing, grading, excavating, and filling will be conducted in compliance with Chapter 24.06 BCC, Chapter 23.76 BCC, and the City's engineering and clearing and grading development standards. Please refer to the grading and drainage plan provided in the Storm Drainage Plan (LDP Engineering, PLLC; dated February 12, 2021) for details.

ii. Minimum Necessary. Clearing, grading, excavation, and filling is permitted only in association with an approved residential use or development and shall be the minimum necessary to support the approved residential use or development. Filling to create dry land is prohibited.

Clearing, grading, excavation, and filling activities proposed are the minimum necessary to support the proposed development. No fill to create dry land will occur.

e. Critical Areas. Critical areas in the Shoreline Overlay District shall be regulated pursuant to Part 20.25H LUC, Critical Areas Overlay District (as set forth in Ordinance No. 6417, passed on May 21, 2018, which is incorporated by this reference into the SMP). In the event of a conflict between Part 20.25H LUC and the SMP, the provision providing the greatest protection to critical areas shall apply, consistent with LUC 20.25E.010.C.1.b.ii, unless otherwise described in the applicable provision. If critical areas are located on the site, the requirements for the associated critical area buffer and buffer setback may impose a larger setback requirement than required under this section.

Geological hazard areas occur on the subject property within the shoreline environment. Compliance with applicable critical area requirements is demonstrated within the geotechnical report (Appendix A). A mitigation plan for unavoidable impacts to the steep slopes is provided in Section 5.0 of this report.

f. Water Quality, Stormwater, Non-Point Source Pollution.

i. Purpose. Single-family residences are identified as a priority use when developed in a manner consistent with control of pollution and prevention of damage to the natural environment. The purpose of this subsection is to prevent impacts to water quality and quantity that would result in a net loss of shoreline ecological functions, or a significant impact to aesthetic qualities or recreational opportunities. The responsibility for water quality and control of stormwater and non-point source pollution beyond individual properties is a Citywide obligation that is not borne entirely by property owners of land located within the Shoreline Overlay District.

ii. Applicability. All shoreline residential development and uses shall comply with applicable provisions of this subsection. (For further information regarding Citywide requirements, refer to Chapter 24.06 BCC (Storm and Surface Water Utility Code), the Storm and Surface Water Engineering Design Standards (2011), Chapter 23.76 BCC (Clearing and Grading Code), and the Clearing and Grading Development Standards; now or as hereafter amended.)

Please refer to the Storm Drainage Report (LPD Engineering, PLLC; dated February 12, 2021 for the grading and drainage plan, which has been designed in compliance with these requirements.

iii. Construction Materials. All structures that may come in contact with water shall be constructed of materials, such as untreated wood, concrete, approved plastic composites or steel, that will not adversely affect water quality, aquatic plants, or animals. Materials used for decking or other structural components shall be approved by the Environmental Protection Agency for contact with water to avoid discharge of pollutants from wave splash, rain, or runoff. Wood treated with creosote, copper, chromium, arsenic, or pentachlorophenol is prohibited in or above shoreline water bodies. Preservative and surface treatments are limited to products approved for use in aquatic environments, and must be applied according to label directions. Construction hardware that comes into contact with water either directly or through precipitation that causes discharges either directly or indirectly into surface waters shall not be susceptible to dissolution by corrosion. Materials used for construction of moorage facilities shall conform to the provisions of subsection H.3.a of this section. The use of cold tar sealants that contain polycyclic aromatic hydrocarbons is prohibited.

No structures are proposed that would come in contact with water. There is no development proposed in or adjacent to Lake Sammamish or within the shoreline setback.

The following dimensional requirements apply under LUC 20.25E.065(C):

Shoreline Structure Setback

A 50-foot shoreline structure setback is required. Per LUC 20.25E.065(E)(1)(c), when a legally established structure existing on or before May 21, 2018, encroaches into the structure setback, the structure setback shall be modified to exclude the footprint of that portion of the structure located within the setback. The 50-foot shoreline structure setback has been modified to exclude the existing single-family residence, which is a legally established structure that was constructed in 1993. No development is proposed within the shoreline structure setback.

Maximum Shoreline Lot Coverage by Structures

For residential uses within the Shoreline Residential shoreline environment, maximum lot coverage by structures pursuant to LUC Chart 20.20.010 applies. The property is zoned R-2.5. In this zone, maximum lot coverage by structures is 35 percent. The lot is 10,495.2 square feet in size. Proposed lot coverage is 1,720 square feet, which is 16.4 percent. Therefore, the proposed development is compliant with this requirement.

Maximum Shoreline Building Height

Maximum shoreline building height is 35 feet. The proposed project is compliant with this requirement.

Maximum Shoreline Impervious Surface

Pursuant to LUC Chart 20.25E.065.C.2, the maximum amount of impervious surfaces within 200 feet of the ordinary high water mark of Lake Sammamish shall be 50 percent in the R-2.5 zone. The portion of the property within 200 feet of the lake is 10,479.2 square feet in size. Existing impervious surfaces within this zone total 4,872 square feet (46.4 percent). Following construction of the proposed elements, total impervious surfaces within 200 feet of the lake will total 5,217 square feet (49.7 percent).

Per LUC 20.25E.065(E), a 50-foot shoreline structure setback is required for residential development in the Shoreline Residential environment. The setback may be measured landward for elevation 31.8 NAVD88. When a legally established structure existing on or before May 21, 2018, encroaches into the structure setback, the setback shall be modified to exclude the footprint of that portion of the structure located within the setback. A 50-foot structure setback has been applied on the subject property and has been modified to exclude the footprint of the existing single-family residence, which was legally established in 1993.

Pursuant to LUC 20.25E.065(F), conservation of significant trees and existing shoreline vegetation is required. No impacts are proposed within the shoreline vegetation conservation area. Per LUC 20.25E.065(F)(9), development outside of the shoreline vegetation conservation area shall be regulated pursuant to the Citywide Tree Retention and Replacement standards in LUC 20.20.900. Per LUC 20.20.900(F), retention of significant trees is required for expanding single-family structures when additions to impervious surface areas exceed 20 percent. The proposed development results in less than 10 percent increase in impervious surface. Additional standards required for critical areas also apply per LUC 20.25H.

5.0 PROPOSED IMPACTS AND MITIGATION

5.1 PROPOSED IMPACTS

As part of the development, the applicant proposes to replace the existing rockery wall at the base of the steep slope with a soldier pile wall to improve stability of the slope. To stabilize the slope, the new soldier pile wall needs to tie into the existing wall on the adjacent property to the west. As part of the wall replacement, the applicant proposes to construct a pervious parking pad. Additionally, impacts to the steep slope are required to accommodate the proposed steps to extend from N Rosemont Place to N Rosemont Road, replacing the existing degraded concrete steps. In total, 774 square feet of impacts to the steep slope are proposed. Impacts have been minimized by reducing the footprint of the impact area and using pervious pavement to avoid increasing impervious surface area. Replacement of the steps will result in improved slope stability, as the existing steps are unstable and a portion of the path connecting NE Rosemont Place and N Rosemont Road currently consists of a dirt footpath. To compensate for the unavoidable impacts to the steep slope associated with the development, the applicant proposes to enhance the remaining on-site steep slope area by removing invasive species and planting native trees and shrubs.

Additionally, a small amount of impact to the top of slope buffer (totaling 56 square feet) is unavoidable to complete the pedestrian connection to N Rosemont Place and for a catch basin that is required as part of the stormwater management plan.

5.2 MITIGATION PLAN

In order to compensate for the proposed impacts to the steep slope, the applicant proposes to enhance the remaining on-site steep slope area (1,750 square feet). The on-site steep slope currently contains four trees that provide partial canopy cover on the slope. These include two 8-inch diameter big-leaf maple (*Acer macrophyllum*), a 16-inch diameter big-leaf maple, and a 26-inch Western red cedar, and a 12-inch Western red cedar. The 12-inch Western red cedar is located directly adjacent to the existing rockery wall at the base of the slope and will need to be removed in order to replace the wall. The understory is relatively sparse, especially in the upper half of the slope, and is composed of beaked hazelnut (*Corylus cornuta*), salmonberry (*Rubus spectabilis*), swordfern (*Polystichum munitum*), Himalayan blackberry (*Rubus armeniacus*), and English ivy (*Hedera helix*). Himalayan blackberry and English ivy are invasive species, which will be removed prior to installation of enhancement plantings. Native trees, shrubs, and herbaceous species will be inter-planted among existing native plants to improve slope stability and wildlife habitat function.

Table 1 - Steep Slope Impacts and Mitigation Summary

Impact Area (square feet)	Mitigation Type	Mitigation Area (square feet)	Mitigation Ratio
774	Enhancement	1,750	>2:1

To compensate for the proposed impacts to the top of slope buffer, the applicant proposes to enhance 84 square feet of the buffer adjacent to the new stairs. The area where the buffer impacts

and enhancement are proposed currently consists primarily of maintained lawn. The proposed project design results in improved slope stability. The proposed enhancement plantings will also improve slope stability and improve wildlife habitat functions.

Table 2 - Top of Slope Buffer Impacts and Mitigation Summary

Impact Area (square feet)	Mitigation Type	Mitigation Area (square feet)	Mitigation Ratio
56	Enhancement	84	1.5:1

Temporary impacts to the top of slope buffer are unavoidable to install stormwater drainage pipes. These areas currently consist of maintained lawn. A portion of the buffer to be temporarily impacted to the east of the proposed stairs will be restored with native plants as part of the buffer enhancement plan. A buffer area to the west of the proposed stairs totaling approximately 15 square feet will be restored with grass seed.

5.3 MITIGATION SEQUENCING

The City of Bellevue requires that all reasonable efforts be taken to avoid and minimize impacts to critical areas and buffers. If impacts do occur, they must be compensated in the following order of preference (LUC 20.25H.215):

A) Avoiding the impact altogether by not taking a certain action or parts of an action;
B) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps, such as project redesign, relocation, or timing, to avoid or reduce impacts;
C) Performing the following types of mitigation (listed in order of preference):
  1) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
  2) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
  3) Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;
D) Monitoring the hazard or other required mitigation and taking remedial action when necessary.

In order to replace the existing rockery wall at the base of the steep slope with a soldier pile wall to stabilize the slope, it is necessary to tie into the existing wall on the adjacent property. This results in unavoidable impacts to the slope. Additionally, impacts to the slope are unavoidable for the pervious parking pad and replacement of the existing degraded concrete steps. Therefore, a total of 774 square feet of impact to the steep slope is unavoidable. A small amount of impact to the top of slope buffer (56 square feet) is also unavoidable to complete the pedestrian connection between NE Rosemont Place and N Rosemont Road and for installation of a catch basin. The proposed plan will result in an overall improvement in slope stability.

Impacts have been limited to the minimum amount required to achieve the project goals. The extent of excavation proposed at the base of the steep slope has been reduced from the original plans. The parking pad will be constructed using solely pervious pavement to further minimize

impacts. The proposed concrete steps will replace the existing concrete steps, which are failing, and the design is the minimum necessary to achieve a safe and stable pedestrian connection between NE Rosemont Place and N Rosemont Road.

The proposed new soldier pile walls and concrete steps will improve the stability of the steep slope, thus resulting in improved function of this critical area. Compensation for the impacts to the vegetated slope and top of slope buffer will be provided by enhancing the remaining portion of the steep slope (1,750 square feet) and 84 square feet of buffer with native plants.

A five-year monitoring plan will be implemented to ensure that the mitigation is successful, and functions as designed. Contingency plans will be developed and implemented if any portion of the proposed mitigation is unsuccessful. The complete monitoring program is included in Section 6.0 of this report.

5.4 ENHANCEMENT PLAN

All invasive species including, but not limited to, Himalayan blackberry (*Rubus armeniacus*) and English ivy (*Hedera helix*) will be removed from the on-site slope. These shall be removed by hand taking care to minimize soil disturbance, and all roots shall be grubbed out to the extent possible in order to prevent re-growth. All invasive plant material shall be immediately removed from the enhancement areas and shall be disposed of appropriately at an off-site location.

Following invasive species removal, the following native species shall be interplanted among existing native species, which are to remain. The proposed planting plan includes species recommended in the City of Bellevue's Critical Areas Handbook for steep slopes.

5.4.1 Enhancement Area A

Enhancement Area A encompasses the majority of the existing slope on the property and is located between the western property boundary and the proposed steps. Existing vegetation in this area is described in Section 5.2. After removal of invasive species, the following plants are proposed to be installed among existing native vegetation in this enhancement area. *Actual plant quantities may be adjusted at the time of installation based on existing native plant density.* Final density of native trees and shrubs shall be as specified in the planting plan.

Enhancement Area A (1,531 SF)

Common Name	Latin Name	Size	Spacing	Quantity
Big leaf maple	*Acer macrophyllum*	1 gallon	9'	2
Douglas fir	*Pseudotsuga menziesii*	1 gallon	9'	4
Western red cedar	*Thuja plicata*	1 gallon	9'	4
Vine maple	*Acer circinatum*	1 gallon	4.5'	5
Beaked hazelnut	*Corylus cornuta*	1 gallon	4.5'	5
Snowberry	*Symphoricarpos albus*	1 gallon	4.5'	5
Salal	*Gaultheria shallon*	1 gallon	4.5'	8
Dull oregon grape	*Mahonia nervosa*	1 gallon	4.5'	8
Swordfern	*Polystichum munitum*	1 gallon	2'	15

5.4.2 Enhancement Area B

Enhancement Area B includes the narrow portions of the slope located adjacent to the east and west of the proposed stairs. Because these areas are narrow and installation of trees or shrubs would result in future maintenance to keep the stairway clear of vegetation, only groundcover plants are proposed. *Plants will be installed among existing native plants and quantities may be adjusted at the time of installation based on existing native plant density.*

Enhancement Area B (219 SF)

Common Name	Latin Name	Size	Spacing	Quantity
Swordfern	*Polystichum munitum*	1 gallon	2'	10
Fringecup	*Tellima grandiflora*	1 gallon	2'	10

5.4.3 Buffer Enhancement

The proposed buffer enhancement area is located adjacent to the stairs at the top of the slope. As this area is also narrow, native groundcover plants are proposed.

Buffer Enhancement (84 SF)

Common Name	Latin Name	Size	Spacing	Quantity
Swordfern	*Polystichum munitum*	1 gallon	2'	10
Fringecup	*Tellima grandiflora*	1 gallon	2'	10

Because the proposed enhancement plants will be installed among existing native plants, the specific plant layout will be determined on site at the time of installation. Mulch (woodchip/arborist) shall be applied within in a minimum two-foot diameter ring around each installed plant. Mulch shall be no less than 3 inches deep and shall be kept 2 inches away from the trunks/stems of installed plants to prevent damage.

5.5 PLANTING NOTES

Plant between late fall and early spring and obtain all plants from a reputable nursery. Care and handling of all plant materials is extremely important to the overall success of the project. The origin of all plant materials specified in this plan shall be native plants, nursery grown in the Puget Sound region of Washington. Some species substitution may be allowed with agreement of the contracted ecologist.

Pre-Planting Meeting
Prior to control of invasive species or installation of mitigation plantings, a site meeting between the contracted landscaper and the consulting ecologist may occur to resolve any questions that may arise. During this meeting a discussion regarding plant spacing and proper locations of plant species will occur, as well as an inspection of the plants prior to planting. Minor adjustments to the original design may be required prior to and during construction.

Handling
Plants shall be handled so as to avoid all damage, including: breaking, bruising, root damage, sunburn, drying, freezing or other injury. Plants must be covered during transport. Plants shall not be bound with wire or rope in a manner that could damage branches. Protect plant roots with shade and wet soil in the time period between delivery and installation. Do not lift container stock by trunks, stems, or tops. Do not remove from containers until ready to plant. Water all plants as necessary to keep moisture levels appropriate to the species horticultural requirements. Plants shall not be allowed to dry out. All plants shall be watered thoroughly immediately upon installation. Soak all containerized plants thoroughly prior to installation.

Storage
Plants stored by the Permittee for longer than one month prior to planting shall be planted in nursery rows and treated in a manner suitable to those species' horticultural requirements. Plants must be re-inspected by the landscape architect prior to installation.

Damaged plants
Damaged, dried out, or otherwise mishandled plants will be rejected at installation inspection. All rejected plants shall be immediately removed from the site, and properly replaced.

Plant Names
Plant names shall comply with those generally accepted in the native plant nursery trade. Any question regarding plant species or variety shall be referred to the landscape architect or consulting ecologist. All plant materials shall be true to species and variety and legibly tagged.

Quality and condition
Plants shall be normal in pattern of growth, healthy, well-branched, vigorous, with well-developed root systems, and free of pests and diseases. Damaged, diseased, pest-infested, scraped, bruised, dried out, burned, broken, or defective plants will be rejected. Plants with pruning wounds over 1" in diameter will be rejected.

Roots
All plants shall be balled and burlapped (B&B) or containerized, unless explicitly authorized by the landscape architect and/or consulting ecologist. Rootbound plants or B&B plants with damaged, cracked, or loose rootballs (major damage) will be rejected. Immediately before installation, plants with minor root damage must be root-pruned. Matted or circling roots of containerized plantings must be pruned or straightened and the sides of the root ball must be roughened from top to bottom to a depth of at least an inch.

Sizes
Plant sizes shall be the size indicated in the plant schedule in approved plans, unless approved by the landscape architect or consulting ecologist. Larger stock may be acceptable provided that it has not been cut back to the size specified, and that the root ball is proportionate to the size of the plant. Smaller stock may be acceptable, and preferable under some circumstances, based on site-specific conditions. Measurements, caliper, branching, and balling and burlapping shall conform to the American Standard of Nursery Stock by the American Association of Nurserymen (latest edition).

Form
Evergreen trees shall have single trunks and symmetrical, well-developed form. Deciduous trees shall be single trunked unless specified as multi-stem in the plant schedule. Shrubs shall have multiple stems and be well-branched.

Timing of Planting
Unless otherwise approved by the landscape designer/consulting ecologist, all planting shall occur between October 1 and March 1. Overall, the earlier the plants go into the ground during the dormant period, the more time they have to adapt to the site and extend their root systems before the water demands of summer.

Weeding
Non-native, invasive vegetation in the mitigation area will be hand-weeded from around all installed plants at the time of installation and on a routine basis throughout the monitoring period. No chemical control of vegetation on any portion of the site is recommended without prior approval from the City and consulting ecologist.

Site conditions
The landscaping contractor shall immediately notify the landscape designer and/or consulting ecologist of drainage or soil conditions likely to be detrimental to the growth or survival of plants. Planting operations shall not be conducted under the following conditions: freezing weather, when the ground is frozen, excessively wet weather, excessively windy weather, or in excessive heat.

Planting Pits
Planting pits shall be circular or square with vertical sides, and shall be at least 12" wider in diameter than the root ball of the plant. Break up the sides of the pit in compacted soils. Set plants upright in pits. All burlap shall be removed from the planting pit/rootball. Backfill of native soils shall be worked back into holes such that air pockets are removed without adversely compacting soils.

Fertilizer
Slow release fertilizer may be used if pre-approved by the consulting ecologist. Fertilizers shall be applied only at the base of plantings underneath the required covering of mulch (that does not make contact with stems of the plants). No fertilizers shall be placed within planting holes.

Support Staking
Most shrubs and many trees DO NOT require any staking. If the plant can stand alone without staking in a moderate wind, do not use a stake. If the plant needs support, then strapping or webbing should be used as low as possible on the trunk to loosely brace the tree with two stakes. Do not brace the tree tightly or too high on the trunk. If the tree is unable to sway, it will further lose the ability to support itself. Do not use wire in a rubber hose for strapping as it exerts too much pressure on the bark. As soon as supporting the plant becomes unnecessary, remove the stakes. All stakes must be removed within two (2) years of installation.

Plant Location
Colored surveyors ribbon or other appropriate marking shall be attached to the installed plants to assist in locating the plants while removing the competing non-native vegetation and during the monitoring period. Flagging or ribbon shall be attached to lateral branches rather than the main leader whenever possible.

Arrangement and Spacing
The plants shall be arranged in a pattern with the appropriate numbers, sizes, species, and distribution that are required in accordance with the approved plans. The actual placement of individual plants shall mimic natural, asymmetric vegetation patterns found on similar undisturbed sites in the area. Spacing of the plantings may be adjusted to maintain existing vegetation with the agreement of the landscape designer and/or consulting ecologist.

Mulch
Mulch (woodchip/arborist) shall be applied in a minimum three-foot diameter ring around each installed plant. Mulch shall be no less than 3 inches deep, and shall be kept 2 inches away from the trunks/stems of installed plants to prevent damage.

6.0 PROJECT MONITORING PROGRAM

6.1 MITIGATION GOALS AND OBJECTIVES

The goal of this mitigation plan is to maintain or improve the functions of the steep slope. The objectives of the plan are to eliminate invasive plant species, increase vegetative species diversity and cover, increase browsing, perching, nesting, and cover opportunities for wildlife, increase soil stabilization capacity, and limit erosion.

To achieve the goals previously stated, invasive plants will be carefully removed from the steep slope by hand, and diverse native vegetation will be installed. Installed vegetation will be of high

value to wildlife, form wide-spreading and complex root structure, will densely cover the ground surface and provide habitat with multiple vegetation strata.

Overall, this mitigation project is expected to achieve a net-gain in functions to wildlife, water quality, hydrology, erosion capacity, and soil stability of the steep slope.

6.2 MONITORING REQUIREMENTS

Requirements for monitoring project:

1. Initial compliance report/as-built map
2. Annual site inspections (in the fall) for five years
3. Annual reports including final report (one report submitted in the fall of each monitored year)

Purpose for Monitoring
The purpose for monitoring shall be to evaluate the project's success. Success will be determined if monitoring shows at the end of five years that the performance standards stated below are met. Access shall be granted to the planting area for inspection and maintenance to the contracted landscaper and/or ecologist and the City during the monitoring period or until the project is evaluated as successful.

Vegetation Monitoring Methodology
At least 2 permanent vegetation sampling points shall be established to monitor the condition of installed enhancement plantings. Monitoring of vegetation should occur annually between May 15 and September 30 (prior to leaf drop), unless otherwise specified.

The following data will be recorded for the enhancement areas:

- Species present
- Aerial cover by native and non-native species
- Quantity of dead installed plants
- General observations

6.2.2 Photo points

At least two permanent photo points will be established within the enhancement areas. Photographs will be taken from photo points to visually record condition of the enhancement areas. Photos shall be taken annually between May 15 and September 30 (prior to leaf drop), unless otherwise specified.

6.2.3 Monitoring Reports

Monitoring reports shall be submitted by December 31 of each year during the monitoring period. As applicable, monitoring reports must include descriptions/data for:

(1) Site plan and vicinity map;
(2) Historic description of project, including date of installation, current year of monitoring, restatement of planting/restoration goals, and performance standards;

(3) Plant survival, vigor, and areal coverage for every plant stratum (sampling point data), and explanation of monitoring methodology in the context of assessing performance standards;
(4) Slope condition and site stability;
(5) Overall conditions, e.g., surrounding land use, use by humans and/or wildlife;
(6) Observed wildlife, including amphibian, avian, and others;
(7) Assessment of invasive biota and recommendations for management;
(8) Color photographs taken from permanent photo points that shall be depicted on the monitoring report map.

6.2.4 Project Success and Compliance

Upon installation and completion of the approved mitigation plan, an inspection by a qualified ecologist and/or City will be made to determine plan compliance. A compliance report will be supplied to the City of Bellevue within 30 days of the completion of planting. The Applicant or consulting ecologist/landscape designer will perform condition monitoring of the plantings in the early fall of each year for five years. A written report describing the monitoring results will be submitted to the City in the fall after each site inspection of each monitored year. Final inspection will occur five years after completion of this project, and a report on overall project success will be prepared.

Performance Standards

Project success will be measured by native species survival and richness, and areal cover of native and invasive plants. The mitigation areas must achieve the following Performance Standards to be considered successful:

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year5**
Installed Plant Survival	100%	≥90%	≥80%	≥80%	≥80%
Areal cover of Native Trees & Shrubs	≥20%	≥30%	≥40%	≥50%	≥60%
Invasive/Non-native species cover	<5%	<5%	<5%	<5%	<5%

Notes:
-Survival applies only to installed plants
-Existing, volunteer, and installed native plants may be counted toward areal cover

7.0 MAINTENANCE PROGRAM

This mitigation project will require periodic maintenance to replace mortality of planted species and control invasive, non-native plant species. The mitigation planting areas will be maintained (at a minimum) in spring and late summer of each year for the five-year monitoring period. Maintenance may include, but will not be limited to, removal of competing species and non-native vegetation (by hand), irrigation, replacement of dead plants, and/or the replacement of mulch during each maintenance period. The Permittee is responsible for ensuring maintenance occurs as needed in all monitoring years.

Duration and Extent
In order to achieve performance standards, the Permittee shall have the planting area maintained for the duration of the five-year monitoring period. Maintenance will include: watering, weeding around the base of installed plants, pruning, replacement, re-staking, removal of all classes of noxious weeds (see Washington State Noxious Weeds List), and any other measures needed to insure plant survival.

Survival
The Permittee shall be responsible for the health of 100 percent of all newly installed plants for *one growing season* after installation has been accepted by the City. A growing season for these purposes is defined as occurring from spring to spring (March 15 to March 15 of the following year). For fall installation (often required), the growing season will begin the following spring. The Permittee shall replace any plants that are failing, weak, defective in manner of growth, or dead during this growing season.

Installation Timing for Replacement Plants
Replacement plants shall be installed between October 1 and March 1, unless otherwise determined by the consulting ecologist and/or City staff.

Standards for Replacement Plants
Replacement plants shall meet the same standards for size and type as those specified for the original installation unless otherwise directed by the landscape designer, consulting ecologist, and/or City staff.

Mulch
All plantings will have wood chip mulch reapplied at their bases for at least the first two growing years of the monitoring period. Plants shall receive no less than 3 inches of wood chips (a.k.a. arborist mulch). Mulch shall be kept well away (at least 2 inches) from the trunks and stems of woody plants.

Herbicides/Pesticides and Fertilizer
Chemical control of invasive, non-native species, if necessary, shall be applied only after approval by the City of Bellevue or consulting ecologist. Herbicide shall be applied by a licensed applicator following all label instructions. Chemical control and fertilization within the mitigation areas will only be performed if deemed necessary.

Watering/Irrigation
Water should be provided during the dry season (~July 1 through September 15) to insure plant survival and establishment. Water should be applied at a rate of one inch of water twice per week during the dry season for the first year and one inch of water per week during the dry season for the second year. The landscaping contractor and/or property owners will determine if additional watering is necessary. Due to the steep slopes on the site, hand watering or a drip system, that waters for short periods at a time, shall be used to prevent any erosion or slope stability issues.

Pruning of Existing Trees
In the future, if it is necessary to prune the existing trees away from Northeast Rosemont Place, individual branches will be removed, leaving the tree(s) intact. Should the need to remove a tree arise, the property owners will comply with the current City of Bellevue regulations for vegetation removal in critical areas and/or buffers at that time.

8.0 CONTINGENCY PLAN

If, during any of the annual inspections, performance standards are not being met for species survival, additional plants of the same species will be added to the mitigation area. If invasive, non-native species exceed 5 percent cover (as measured by areal cover), manual control shall occur. If any of these situations persist to the next inspection, a meeting with the landscape designer/consulting ecologist and the Permittee will be held to decide upon contingency plans. Elements of a contingency plan may include but will not be limited to more aggressive weed control, mulching, replanting with larger plant material, species substitution, fertilization, soil amendments, and/or irrigation.

9.0 PERFORMANCE BOND

The City of Bellevue may require a performance bond or maintenance assurance device if it is determined to be necessary. The City will determine the type and amount of assurance device required. The performance or maintenance assurance device amount is typically determined from the estimated cost of work. An estimate of the cost of project installation is provided below.

Cost of Plants and Labor 1-gal pots ($11.50 per plant) = 96 plants	$1,104.00
Cost of Mulch ($3.25/sq.yd.) = 26.5 SY	$86.13
TOTAL ESTIMATED COST	$1,190.13

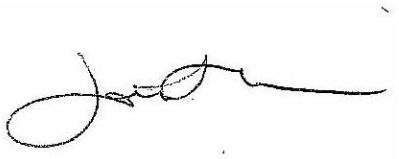
10.0 USE OF THIS REPORT

This Critical Areas Report, Mitigation Plan, and Shoreline Narrative is supplied to Rob Drollinger as a means of determining on-site critical area conditions, as required by the City of Bellevue during the permitting process. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to wetlands are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.



Joie Goodman
Senior Ecologist
Professional Wetland Scientist

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APPENDIX A:
GEOTECHNICAL AND CRITICAL AREA REPORT
PANGEO, OCTOBER 26 2020

PanGEO
INCORPORATED
Geotechnical & Earthquake
Engineering Consultants

October 26, 2020
PanGEO Project No. 20-117

Mr. Rob Drollinger
1250 West Lake Sammamish Parkway NE
Bellevue, WA 98008

Subject: **Geotechnical and Critical Area Report**
Proposed House Addition and Site Improvements
1250 West Lake Sammamish Parkway NE, Bellevue, Washington

Dear Mr. Drollinger,

Attached please find our geotechnical and critical report for the proposed project at the above site in Bellevue, Washington. This report documents the subsurface conditions at the site and presents our geotechnical engineering design recommendations for the proposed house addition and site improvements.

In summary, based on the test borings drilled, the site is underlain by up to about 13 feet of loose to medium dense fill and colluvium overlying medium dense to very dense alluvium sand and pre-Fraser deposits. Based on soil conditions and anticipated addition finish floor elevation, in our opinion, the proposed house addition should be supported on the small diameter steel pipe piles (pin piles) to mitigate potential liquefaction settlements. To improve the stability of the existing steep slope to the west of the house, permanent soldier pile shoring walls may be used to replace existing rockery and retaining wall.

The site contains steep slope critical area, the City of Bellevue requires a Critical Area Report for permitting. Additional discussions regarding relevant land use codes for critical area report are included in this report.

We appreciate the opportunity to be of service. Should you have any questions, please do not hesitate to call.

3213 Eastlake Avenue East, Suite B
Seattle, WA 98102
T. (206) 262-0370
F. (206) 262-0374

Sincerely,

Johnny Chen

Johnny C. Chen, P.E.
Project Geotechnical Engineer

TABLE OF CONTENTS

Section Page

1.0 GENERAL 1
2.0 SITE AND PROJECT DESCRIPTION 1
3.0 SUBSURFACE EXPLORATIONS 2
3.1 CURRENT EXPLORATION 2
3.2 PREVIOUS EXPLORATION 3
4.0 SITE GEOLOGY AND SUBSURFACE CONDITIONS 3
4.1 SITE GEOLOGY 3
4.2 SOIL CONDITIONS 4
4.3 GROUNDWATER 5
5.0 GEOLOGIC HAZARDS ASSESSMENT 6
5.1 LANDSLIDE HAZARDS AND STEEP SLOPES EVALUATION 6
5.1.1 Site Reconnaissance 7
5.1.2 Quantitative Slope Stability Analysis 7
5.2 EROSION HAZARDS EVALUATION 9
5.3 LIQUEFACTION HAZARDS EVALUATION 10
6.0 GEOTECHNICAL RECOMMENDATIONS 11
6.1 SEISMIC DESIGN CONSIDERATIONS 11
6.2 BUILDING FOUNDATIONS 12
6.3 FLOOR SLABS 15
6.4 RETAINING WALL DESIGN PARAMETERS 16
6.4.1 Lateral Earth Parameters 16
6.4.2 Surcharge 16
6.4.3 Lateral Resistance 16
6.4.4 Wall Drainage 17
6.4.5 Wall Backfill 17
6.5 PERMANENT CUT AND FILL SLOPES 17
7.0 TEMPORARY EXCAVATIONS AND SHORING 18
7.1 TEMPORARY EXCAVATION SLOPES 18
7.2 PERMANENT SOLDIER PILE WALLS SHORING 18
7.2.1 Wall Design Parameters 19
7.2.2 Lagging 19
7.2.3 Construction Considerations 19
7.2.4 Performance Monitoring 20
8.0 EARTHWORK CONSIDERATIONS 21

8.1 STRUCTURAL FILL AND COMPACTION.....21
8.2 MATERIAL REUSE 22
8.3 CONSTRUCTION DEWATERING 22
8.3 WET WEATHER CONSTRUCTION 22
8.4 EROSION CONSIDERATIONS.....23
9.0 ADDITIONAL SERVICES 23
10.0 CLOSURE 24
11.0 REFERENCES.....26

ATTACHMENTS:

Figure 1 Vicinity Map
Figure 2 Site and Exploration Location Plan
Figure 3 Generalized Subsurface Profile A-A'
Figure 4 Design Lateral Earth Pressures: Cantilevered Soldier Pile Shoring (Upper Slope)
Figure 5 Design Lateral Earth Pressures: Cantilevered Soldier Pile Shoring (Lower Slope)
Figure 6 Static Global Stability Analysis – Existing Condition
Figure 7 Static Global Stability Analysis – Proposed Condition
Figure 8 Pseudo-Static (Seismic) Global Stability Analysis – Proposed Condition

Appendix A Summary Boring Logs
Figure A-1 Terms and Symbols for Boring and Test Pit Logs
Figures A-2 through A-4 Logs of Test Borings PG-1 through PG-3

Appendix B Summary Previous Test Pit Logs (GEO Consultants, 1991)

Appendix C Relevant Codes for Critical Area Report

GEOTECHNICAL AND CRITICAL REPORT
PROPOSED HOUSE ADDITION AND SITE IMPROVEMENTS
1250 WEST LAKE SAMMAMISH PARKWAY NE
BELLEVUE, WASHINGTON

1.0 GENERAL

This report presents the results of a geotechnical engineering study that was undertaken to support the design and construction of the proposed project in Bellevue, Washington. This study was performed in general accordance with our mutually agreed scope of services outlined in our proposal dated March 17, 2020, which was subsequently approved by you on March 19, 2020. Our scope of services included reviewing readily available geologic and geotechnical data, drilling three test borings, conducting a site reconnaissance, performing engineering analyses, and developing the conclusions and recommendations presented in this report.

2.0 SITE AND PROJECT DESCRIPTION

The subject property is an approximately 13,598 square-foot waterfront lot located at 1250 West Lake Sammamish Parkway NE in Bellevue, Washington (see Vicinity Map, Figure 1). The site is roughly rectangular in shape and is bordered to the north and south by single-family dwellings, to the west by North Rosemont Road, and to the east by Lake Sammamish, which is designated as the project east. The layout of the site is shown on Figure 2, Site and Exploration Plan.

The site topography generally descends from west to east, and eventually terminates at the shore of Lake Sammamish. The total topographic relief within the property is about 60 feet, between roughly Elevation 90 feet along North Rosemont Road and Elevation 30 feet along the lake shore.

The approximately western one-quarter of the site, between North Rosemont Road and NE Rosemont Place, is an over 40% steep slope. The slope is approximately 30-foot high, ranging from approximately Elevation 90 feet along the top of the slope to Elevation 60 feet along the toe of the slope. Bason on review of the topographic survey, the slope gradient is about 50% to 60%. A rockery with a concrete stairway is currently located along the toe of the slope, and a wood retaining wall is located along the top of the slope. The slope is currently covered with shed vegetative parts (such as leaves, branches, bark, and stems) and some trees.

The ground surface in the approximately eastern three-quarter of the site (i.e., between the toe of the slope and lake shore) ranges from approximately Elevation 60 feet along NE Rosemont Place to Elevation 30 feet along the lake shore. The slope gradient in this area is about 15% to 20%. A two-story house with a daylight basement currently occupies the middle portion of this area with a concrete shared driveway coming from NE Rosemont Place and along the south property line. The rest of areas surrounding the house consist of rockery, lawn, landscaping plants, and trees.

We understand that you plan to remodel the existing house and add an addition with a below grade garage in the west portion of the house. As a result, a new basement walls will be required to replace the existing west building wall. We also understand that you plan to stabilize the existing steep slope and create a parking space by replacing the existing rockery and wood retaining wall with permanent soldier pile walls. Because of the site contains steep slope critical area, the City of Bellevue requires a Critical Area Report for permitting. Additional discussions regarding relevant land use codes for critical area report are included in this report.

The conclusions and recommendations in this report are based on our understanding of the proposed development, which is in turn based on the project information provided. If the above project description is incorrect, or the project information changes, we should be consulted to review the recommendations contained in this study and make modifications, if needed. In any case PanGEO should be retained to provide a review of the final design to confirm that our geotechnical recommendations have been correctly interpreted and adequately implemented in the construction documents.

3.0 SUBSURFACE EXPLORATIONS

3.1 CURRENT EXPLORATION

Our subsurface exploration program consisted of drilling three test borings, designated as PG-1 through PG-3, at the approximate locations shown on Figure 2. The borings were drilled at the site on May 12, 2020 using a CAT track drill rig operated by Geologic Drill Partners, Inc. under a subcontract to PanGEO. The drill rig was equipped with a 6-inch outside diameter hollow stem auger.

Soil samples were obtained from the borings at 2½- and 5-foot depth intervals in general accordance with Standard Penetration Test (SPT) sampling methods (ASTM test method

D-1586), in which the samples are obtained using a 2-inch outside diameter split-spoon sampler. The sampler was driven into the soil using a 140-pound weight falling a distance of 30 inches per stroke until reaching a total penetration of 18 inches. The number of blows required for each 6-inch increment of sampler penetration was recorded. The number of blows required to achieve the last 12 inches of sample penetration is defined as the SPT N-value. The N-value provides an empirical measure of the relative density of cohesionless soil, or the relative consistency of fine-grained soils. The completed borings were backfilled with bentonite chips.

A geologist from PanGEO was present during the field exploration to observe the drilling, to assist in sampling, and to describe and document the soil samples obtained from the borings. The soils were logged in general accordance with ASTM D-2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) and the system summarized on Figure A-1, Terms and Symbols for Boring and Test Pit Logs. Summary test boring logs are included as Figures A-2 through A-4 in Appendix A.

3.2 Previous Exploration

In addition to our test borings completed for the current study, we also reviewed the previous test pits that was completed at the site for the site development. The approximate location of the previous test pits TP-3 and TP-4, which were completed by GEO Consultants Inc. in 1991, are indicated on the attached Figure 2.

In summary, previous test pits generally encountered approximately one feet of fill overlying very dense native soils that extended to the bottom of test pits at about three feet below ground surface. Groundwater was not encountered in the test pits. The summary logs of the previous exploration are included in Appendix B of this report.

4.0 SITE GEOLOGY AND SUBSURFACE CONDITIONS

4.1 Site Geology

According to the *Geologic Map of King County, Washington* (Booth, D. B., Troost, K. A., and Wisher, A. P., 2007), the project area is underlain by pre-Fraser deposits (Qpf) in the west (upper) portion of the site and Alluvium (Qal) in the east (lower) portion of the site near Lake Sammamish.

- Alluvium (Qal) generally consists of sand, silt, gravel, and cobbles deposited by streams and running water, and may locally contain soft peat lenses. Alluvium typically has a loose to dense condition or soft to stiff consistency.

- Pre-Fraser (Qpf) deposits typically consist of very dense and hard, interbedded silt, sand, gravel, and diamicts of indeterminate age and origin.

4.2 SOIL CONDITIONS

Based on the results of the test borings advanced for this project, the site is generally underlain by surficial layer of fill, colluvium, and alluvium overlaying pre-Fraser deposits. Figure 3 depicts the general subsurface profile along cross section A-A'. For a detailed description of the subsurface conditions encountered at each exploration location, please refer to the boring logs provided in Appendix A. The stratigraphic contacts indicated on the boring logs represent the approximate depth to boundaries between soil units. Actual transitions between soil units may be more gradual or occur at different elevations. The descriptions of groundwater conditions and depths are likewise approximate.

The following is a generalized description of the soils encountered in the borings.

Fill – Boring PG-1, which was drilled at the top of steep slope, encountered approximately 4½ feet of very loose, slightly silty, gravelly sand with trace organics. Boring PG-2, which was drilled at the toe of the steep slope, encountered approximately one foot of silty sandy gravel below the existing concrete pavement base. This soil unit was not encountered in boring PG-3. We interpret this soil unit as fill based on its loose condition, presence of organics, and disturbed appearance.

Colluvium – Underlying the fill in PG-1, the boring encountered approximately 7 feet of very loose silty sand with organic silt to medium dense gravelly silt/sandy gravel. Below the ground surface in PG-3, the boring encountered approximately 13 feet of loose to very loose silty sand with trace organics. This soil unit was not encountered in boring PG-2. We interpret this soil unit as colluvium.

Alluvium – Underlying the colluvium in PG-3, the boring encountered approximately 10 feet of medium dense to dense gravelly sand. This soil unit was not encountered in borings PG-1 or PG-2. We interpret this soil unit as the mapped alluvium.

Pre-Fraser Deposits – Underlying the colluvium in PG-1, underlying the fill in PG-2, and underlying the alluvium in PG-3, the borings encountered medium dense to very dense interlayered sand and silt that extended to the bottom of borings at about 16½ to 41½ feet below the existing grade. We interpret this soil unit as the mapped pre-Fraser deposits.

Based on our review of the subsurface data from the previous exploration completed at the site, the test pits encountered approximately one feet of silty sand to loamy gravelly sand with organics (fill) overlying very dense native sandy gravel to gravelly sand that extended to the bottom of test pits at about three feet below ground surface. The soil conditions are not quite consistent with the soil conditions encountered in current exploration due to the limited exploration depth.

Our subsurface descriptions are based on the conditions encountered at the time of our exploration. Soil conditions between our exploration locations may vary from those encountered. The nature and extent of variations between our exploratory locations may not become evident until construction. If variations do appear, PanGEO should be requested to reevaluate the recommendations in this report and to modify or verify them in writing prior to proceeding with earthwork and construction.

4.3 GROUNDWATER

Perched groundwater seepage was observed in boring PG-1 at depths of about 6 to 11½ feet below the existing grade, and in boring PG-2 at about 1½ to 5½ feet below the existing grade during drilling. This groundwater appeared to be perched above the fine-grained pre-Fraser deposits, and appears to be the seepage visible at the toe of the steep slope.

Groundwater seepage was also observed at a depth of about 7 feet below the existing grade in boring PG-3. However, groundwater was not encountered in test pits TP-3 and TP-4 within the three-foot excavation.

Because the subject site is located along the shores of Lake Sammamish, we anticipate that groundwater levels at the east end of the site may be close to the lake level. It should be noted that groundwater conditions at the site are likely to fluctuate depending on seasonal rainfall and the lake level. Generally, the water level is higher and seepage rates are greater in the wetter, winter months (typically October through May).

5.0 GEOLOGIC HAZARDS ASSESSMENT

We conducted a geologic hazards assessment for the proposed development as part of our study. The assessment includes an evaluation of Landslide Hazards, Erosion Hazards, and Liquefaction Hazards. Based on the site topographic survey provided to us (Figures 2), the slopes in the west portion of the property are 40% or greater, and designated "Steep Slope Area per City of Bellevue Standards". Based on the City of Bellevue's Geologic Hazards Map, the entire site is mapped as an erosion hazard area and a liquefaction hazard area (see Plate 1, below). The following sections contain our assessment of potential Geologic Hazards and their possible effects on the proposed development.

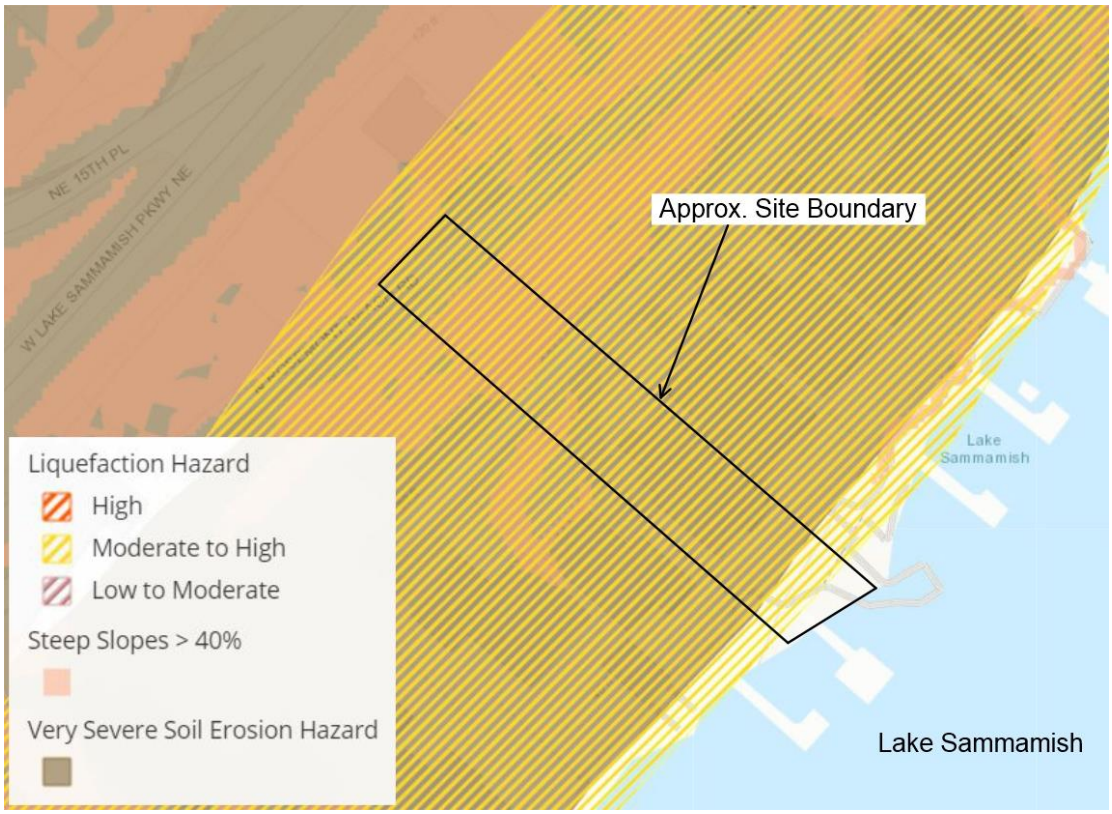


Plate 1. City of Bellevue Geologic Hazards Map

5.1 LANDSLIDE HAZARDS AND STEEP SLOPES EVALUATION

The site is not mapped as a landslide hazard area in accordance with the King County Landslide Hazard Map, but the west (upper) portion of the site above NE Rosemont Place contains over 40% steep slopes. The east (lower) portion of the site, where the house addition is proposed, does not contain steep slopes.

5.1.1 Site Reconnaissance

As part of our study, we conducted a site reconnaissance on May 12, 2020 to observe signs of slope instability or ground movement at the site. The steep slope in the west portion of the site is currently covered with shed vegetative parts (such as leaves, branches, bark, and stems) and some trees. During our site reconnaissance, we observed some exposed ground surface, surficial soil erosion, and a couple curved trees on the slope. The existing rockery at the toe of the slope was in a stable condition, but groundwater seepage was observed coming out blow the rockery and concrete curbs along the toe of the slope. In addition, we observed the existing wood retaining wall along top of slope was slightly leaning toward the downhill side. Sealed cracks were observed on the asphalt pavement along North Rosemont Road. However, we did not observe any obvious evidence of past or ongoing instability in the east (lower) portion of the site. The existing house, foundation walls, rockery, and concrete driveway were observed to be in a fair condition.

5.1.2 Quantitative Slope Stability Analysis

We further evaluated the stability of the site slopes using computer program *Slide2 Modeler* (Rocscience, 2020). Our evaluation considers both the existing and post-construction conditions. Search routines were used to identify the surface that has the lowest factor of safety. The seismic stability was analyzed using pseudo-static procedures, where the effect of earthquake ground shaking is represented by the use of a "seismic coefficient" in the stability calculations.

For seismic analysis, an acceleration factor was determined based on a Peak Ground Acceleration (PGA) with a 10 percent of probability of exceedance in 50 years (i.e. a 475-year return period) stipulated by the City of Bellevue. Accordingly, the PGA value of the site, 0.30g was calculated from the USGS seismic hazard deaggregation program (2008). One-half of the PGA (0.5x0.30g = 0.15g) was used in our pseudo-static stability analysis per typical practice for projects in Bellevue. The soil parameters for soil units were assigned based on test borings PG-1 and PG-2 (soil classifications and SPT blowcount values), our experience with similar soils, and published literatures. The following soil parameters in Table 1 were used in our analyses.

Table 1 - Soil Strength Parameters for Slope Stability Analysis

Soil Type	Unit Weight (pcf)	Cohesion (psf)	Friction Angles (degrees)
Engineering Soil Unit (ESU) 1 – Loose Fill	115	0	28
ESU 2 – Loose to medium dense Colluvium & Alluvium	120	0	32
ESU 3 – Medium dense to very dense pre-Fraser deposits	125	0	40

The slope analysis was performed along the section A-A' as shown in Figure 2. Groundwater level was based on the depths observed in borings PG-1 and PG-2. The profiles and soil parameters used in our slope stability analysis are also shown in Figures 6 through 8.

Existing Condition – The geometry of the existing slopes, material properties, and the results of the slope stability analysis for the static condition are shown in Figures 6. The computed factor of safety against the slope instability is 0.87, less than the code required factor of safety of 1.50.

Post-Construction Condition – In post-construction condition, based on current design drawings, a soldier pile shoring system with a parking space will be constructed at the toe of slope to replace the existing rockery and to improve the stability of the existing steep slope. To stabilize the upper portion of the steep slope, a soldier pile shoring wall is also planned to replace the existing wood retaining wall along North Rosemont Road (see Figure 2, Site Plan).

The results of slope stability analyses for post-construction conditions are summarized on Figures 7 and 8, for static and pseudo-static (seismic) conditions. Based on the results of the analysis, the improved slopes have adequate factors of safety against failures under static and seismic conditions. The factors of safety after the improvement are greater than the existing site condition and code required factor of safety.

Table 2 below summaries the factors of safety from the results our slope stability analysis.

Table 2 – Minimum Factors of Safety (FS) from Slope Stability Analysis

Site Condition	Static Analysis	Seismic Analysis
Existing Condition	0.87	< 0.87
Post-Construction	1.70*	1.26*
Code Required FS	**1.50**	**1.15**

* Lowest factor of safety amount different failure surfaces

Summary and Qualifications – Based on the results of our study, it is our opinion that the proposed addition and slope improvements as planned will have adequate factors of safety against slope instability and will not have adversely impacts the subject and surrounding properties, provided that the recommendations presented in this report are properly incorporated into the design and construction of the project. In our opinion, the building setback for the proposed addition may be reduced to 30 feet from the toe of steep slope after the stabilization of the exiting slope is completed.

It should be noted that any development on or near a steep slope area always involves some level of risk. In addition, future activities on and off the site could also affect the stability of the site.

5.2 Erosion Hazards Evaluation

The site is mapped as a potential erosion hazard area in accordance with the City of Bellevue's Geologic Hazards Map. Based on the USDA Soil Survey data and our test borings, the site soils (Alderwood and Kitsap Soils, AkF) are anticipated to exhibit moderate to high erosion potential when disturbed and left unprotected. However, in our opinion, the erosion hazards at the site can be effectively mitigated with the best management practice during construction and with properly designed and implemented landscaping for permanent erosion control. During construction, the temporary erosion hazard can also be effectively managed with an appropriate erosion and sediment control plan, including but not limited to installing a silt fence at the construction perimeter, placing quarry spalls or hay bales at the disturbed and traffic areas, covering stockpiled soil

or cut slopes with plastic sheets, constructing a temporary drainage pond to control surface runoff and sediment trap, placing rocks at the construction entrance, etc.

Permanent erosion control measures should be applied to the disturbed areas as soon as feasible. These measures may include but not limited to planting and hydroseeding. The use of permanent erosion control mat may also be considered in conjunction with planting/hydroseeding to protect the soils from erosion.

5.3 LIQUEFACTION HAZARDS EVALUATION

The City of Bellevue defines liquefaction hazard areas as those areas subject to severe risk of earthquake damage as a result of seismically induced settlement or soil liquefaction. According to the City of Bellevue's Geologic Hazards Map, the project area is mapped with moderate to high liquefaction hazard.

Liquefaction is a process that can occur when soils lose shear strength for short periods of time during a seismic event. Ground shaking of sufficient strength and duration results in the loss of grain-to-grain contact and an increase in pore water pressure, causing the soil to behave as a fluid. Soils with a potential for liquefaction are typically cohesionless, predominately silt and sand sized, must be loose, and be below the groundwater table.

We performed liquefaction analysis based on the soil conditions in the test boring PG-3, using the GeoLogismiki LiqSvs software suites. The input ground motion parameters in our analysis included a Magnitude 7.5 earthquake with a Peak Ground Acceleration (PGA) of 0.515g to model an IBC code event. The liquefaction analysis, using the procedure proposed by the 1996 and 1998 NCEER/NSF workshops (Youd et al., 2001) or the methodologies developed by Boulanger and Idriss (2014), indicate that the loose to medium dense sandy soils below the groundwater table (i.e. 7.0 feet) to a depth of about 18 feet in the proposed addition area are potentially liquefiable. Based on the results of our analysis, ground settlement due to soil liquefaction for this event is estimated to be about 3.0 inches.

Due to the anticipated excessive ground settlement during the static and seismic loading conditions, we recommend that the proposed addition be supported by a deep foundation system consisting of driven small diameter steel pipes (pin piles). Our recommendations for the pin piles are presented in the Section 6.2 Building Foundations.

6.0 GEOTECHNICAL RECOMMENDATIONS

6.1 SEISMIC DESIGN CONSIDERATIONS

The 2015 International Building Code (IBC) seismic design section provides a basis for seismic design of structures, and the IBC seismic design parameters are in part based on the site soil conditions and site classifications defined in Chapter 20 of ASCE 7. According to Chapter 20 of ASCE 7, the site soil at the addition location should be classified as Site Class F because of its liquefaction potential during a strong seismic event. According to the Section 20.3.1 of ASCE 7 for Site Class F, a site response analysis in accordance with Section 21.1 shall be performed unless the exception to Section 20.3.1 is applicable.

Section 20.3.1 of ASCE-7 states that "*For structures having fundamental periods of vibration equal to or less than 0.5s, site response analysis is not required to determine spectral accelerations for liquefiable soils. Rather, a site class is permitted to be determined in accordance with Section 20.3 and the corresponding values of F_a and F_v determined from Tables 11.4-1 and 11.4-2*." In other words, for structures with a period of vibration equal to or less than 0.5 second and situated on liquefiable soils, the ASCE-7 exception allows the values of F_a and F_v for liquefiable soils be taken equal to the values of site class determined without regard to soil liquefaction.

Based on our understanding of the proposed lightly loaded, two- to three-story wood-frame structure, the vibration period for the buildings should be less than 0.5 second. For design purposes, we recommend assuming Site Class D for determining site coefficients. If the fundamental period of the proposed structure is greater than 0.5 second, a site-specific site response analysis will be required.

Table 3, below, provides seismic design parameters for the site that are in conformance with the 2015 editions of IBC, which specifies a design earthquake having a 2% probability of occurrence in 50 years (return interval of 2,475 years), and the 2008 USGS seismic hazard maps. The spectral response accelerations were obtained from the USGS Earthquake Hazards Program Interpolated Probabilistic Ground Motion website (2008 data) for the project latitude and longitude.

Table 3 – Seismic Design Parameters

Site Class	Spectral Acceleration at 0.2 sec. [g] S_S	Spectral Acceleration at 1.0 sec. [g] S_1	Site Coefficients		Design Spectral Response Parameters	
			F_a	F_v	S_{DS}	S_{D1}
D	1.271	0.486	1.0	1.514	0.848	0.491

6.2 BUILDING FOUNDATIONS

Based on our test boring PG-3 near the addition location, the addition foundation soils consist of approximately 13 feet of very loose to loose colluvium, and the loose sandy soil below groundwater table may liquefy during a design earthquake. As such, based on the subsurface conditions encountered, it is our opinion the proposed addition should be supported on small diameter steel pipe piles (pin pile) to mitigate the potential for excessive post-construction foundation settlement during both static and seismic loading conditions. The following sections present our recommendation for pin pile foundations.

Pin Pile Sizes - In our opinion, 3- or 4-inch diameter, Schedule 40, galvanized pin piles may be used to support the new addition. Three or four-inch diameter pin piles are typically installed using small hammers mounted on a small excavator.

Pin Pile Capacity - The number of piles required depends on the magnitude of the design load. Allowable axial compression capacities of 6 and 10 tons may be used for the 3- and 4-inch diameter pin piles, respectively, with an approximate factor of safety of 2. Penetration resistance required to achieve the capacities will be determined based on the hammer used to install the pile. Tensile capacity of pin piles should be ignored in design calculations.

It is our experience that the driven pipe pile foundations should provide adequate support with total settlements on the order of ½-inch or less.

Lateral Forces - The capacity of pin pipes to resist lateral loads is very limited and should not be used in design. Therefore, lateral forces from wind or seismic loading should be

resisted by the passive earth pressures acting against the pile caps and below-grade walls or from battered piles (batter no steeper than 3(H):12(V)). ***Friction at the base of pile-supported concrete grade beam should be ignored in the design calculations.*** Passive resistance values may be determined using an equivalent fluid weight of 200 pounds per cubic foot (pcf). This value includes a safety factor of about 1.5 assuming that properly compacted granular fill will be placed adjacent to and surrounding the pile caps and grade beams.

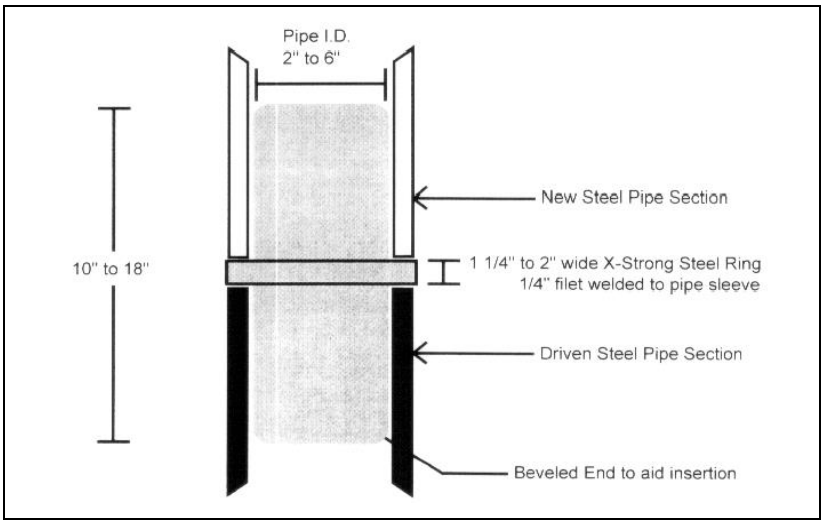
Pin Pile Driving Criteria - Three- or four-inch diameter piles are typically installed using small (approximately 650 to 2,000 pound) hammers mounted to a small excavator. The criterion for driving refusal is defined as the minimum amount of time (in seconds) required to achieve one inch of penetration, and it varies with the size of hammer used for pile driving. For 3- or 4-inch pin piles, the Table 4 below provides a summary of driving refusal criteria for different hammer sizes that are commonly used in the Seattle area. Please note that these refusal criteria were established empirically based on previous load tests on 3- and 4-inch pin piles in the region. Contractors may select a different hammer for driving these piles, and propose a different driving criterion. In this case, it is the contractor's responsibility to demonstrate to the Engineer's satisfaction that the design load can be achieved based on their selected equipment and driving criteria.

Table 4 - Summary of Commonly-Accepted Driving Criteria for a 3- or 4-inch Pipe with a 6- or 10-ton Allowable Axial Compression Load

Hammer Model	Hammer Weight (lb) / Blows per minute	3" Pile Refusal Criteria (seconds per inch of penetration)	4" Pile Refusal Criteria (seconds per inch of penetration)
Hydraulic TB 225	650 / 550 - 1100	12	20
Hydraulic TB 325	850 / 550 - 1100	10	16
Hydraulic TB 425	1,100 / 550 - 1100	6	10
Hydraulic TB 725X	2,000 / 600	3	4

Pin Pile Specifications - We recommend that the following specifications be included on the foundation plan:

1. Three-inch or four-inch diameter piles should consist of Schedule-40, ASTM A-53 Grade "A" pipe.
2. Three- and four-inch piles shall be driven to refusal with a minimum 650-lb hydraulic hammer. The driving criteria will be determined based on the actual hammer size selected by the contractor, and a static load test program (see Table 4 above and Item 3 below).
3. At least 3% (but no more than 5) of the 3- and 4-inch diameter pin piles should be load tested. All load tests shall be performed in accordance with the procedure outlined in ASTM D1143. The maximum test load shall be 2 times the design load. The objective of the testing program is to verify the adequacy of the driving criteria, and the efficiency of the hammer used for the project.
4. Piles shall be driven in nominal sections and connected with compression fitted sleeve couplers (see typical detail below). We discourage welding of pipe joints, particularly when galvanized pipe is used, as we have frequently observed welds broken during driving.
5. The geotechnical engineer of record or his/her representative shall provide full time observation of pile installation and testing.



The quality of a pin pile foundation is dependent, in part, on the experience and professionalism of the installation company. We recommend that a company with experienced personnel be selected to install the piles.

Grade Beam/Pile Cap Embedment - We recommend that the grade beams and pile caps located around the perimeter of the structure be embedded such that the bottom of the grade beam is at least 16 inches below the adjacent ground surface.

Estimated Pile Length – The subsurface conditions at the site will likely vary substantially across the site. Based on the soil conditions at the site and our experience in the project area, for planning and cost estimating purposes, we estimate that pile length may range from about 23 to 25 feet.

6.3 FLOOR SLABS

The floor slabs for the proposed addition may be constructed using conventional concrete slab-on-grade floor construction. The floor slabs should be supported on competent undisturbed native soil or structural fill paced on undisturbed native soils. Any over-excavations, if needed, should be backfilled with structural fill.

Interior concrete slab-on-grade floors should be underlain by a capillary break consisting of at least of 4 inches of pea gravel or compacted ¾-inch, clean crushed rock (less than 3 percent fines). The capillary break material should meet the gradational requirements provided in Table 5, below.

Table 5 – Capillary Break Gradation

Sieve Size	Percent Passing
¾-inch	100
No. 4	0 – 10
No. 100	0 – 5
No. 200	0 – 3

The capillary break should be placed on subgrade soils that have been compacted to a dense and unyielding condition.

A minimum 10-mil polyethylene vapor barrier should also be placed directly below the slab. Construction joints should be incorporated into the floor slab to control cracking.

6.4 Retaining Wall Design Parameters

Cast-in-place concrete retaining and basement walls should be designed to resist the lateral earth pressures exerted by the soils behind the wall. Proper drainage provisions should also be provided to intercept and remove groundwater that may be present behind the walls. Our recommendations for the design and construction of the retaining wall are presented below.

6.4.1 Lateral Earth Parameters

Cantilever walls should be designed for an equivalent fluid pressure of 35 pcf for a level backfill condition behind the walls and assuming the walls are free to rotate. If the walls are restrained at the top from free movement, such as basement walls with a floor diaphragm, an equivalent fluid pressure of 45 pcf should be used for a level backfill condition behind the walls. Permanent walls should be designed for an additional uniform lateral pressure of 8H psf for seismic loading, where H corresponds to the height of the buried depth of the wall.

The recommended lateral pressures assume the backfill behind the walls consists of a free draining and properly compacted fill with adequate drainage provisions.

6.4.2 Surcharge

Surcharge loads, where present, should also be included in the design of retaining walls. We recommend that a lateral load coefficient of 0.3 be used to compute the lateral pressure on the wall face resulting from surcharge loads located within a horizontal distance of one-half the wall height.

6.4.3 Lateral Resistance

Lateral forces from seismic loading and unbalanced lateral earth pressures may be resisted by a combination of passive earth pressures acting against the embedded portions of the foundations and by friction acting on the base of the wall foundation. Passive resistance values may be determined using an equivalent fluid weight of 250 pcf. This value includes a factor of safety of 1.5, assuming the footing is backfilled with structural fill. A friction coefficient of 0.35 may be used to determine the frictional resistance at the base of the footings. The coefficient includes a factor of safety of 1.5.

6.4.4 Wall Drainage

Provisions for wall drainage should consist of a 4-inch diameter perforated drainpipe placed behind and at the base of the wall footings, embedded in 12 to 18 inches of clean crushed rock or pea gravel wrapped with a layer of filter fabric. A minimum 18-inch wide zone of free draining granular soils (i.e. pea gravel or washed rock) is recommended to be placed adjacent to the wall for the full height of the wall. Alternatively, a composite drainage material, such as Miradrain 6000, may be used in lieu of the clean crushed rock or pea gravel. The drainpipe at the base of the wall should be graded to direct water to a suitable outlet.

6.4.5 Wall Backfill

Retaining wall backfill should consist of free draining granular material. The site soils are relatively silty and would not meet the requirements for wall backfill. We recommend importing a free draining granular material, such as Seattle Type 17 or a soil meeting the requirements of Gravel Borrow as defined in Section 9-03.14(1) of the WSDOT *Standard Specifications for Road, Bridge, and Municipal Construction* (WSDOT, 2020). In areas where space is limited between the wall and the face of excavation, pea gravel may be used as backfill without compaction.

Wall backfill should be properly moisture conditioned, placed in loose, horizontal lifts less than 12 inches in thickness, and compacted to a dense and unyielding condition. If density tests will be performed, the test results should show at least 95 percent of the maximum dry density, as determined using test method ASTM D-1557 (Modified Proctor). Within 5 feet of the wall, the backfill should be compacted with hand-operated equipment to at least 90 percent of the maximum dry density.

6.5 Permanent Cut and Fill Slopes

Based on the anticipated soil that will be exposed in the planned excavation, we recommend permanent cut and fill slopes be constructed no steeper than 2H:1V (Horizontal:Vertical)

7.0 TEMPORARY EXCAVATIONS AND SHORING

As currently planned, the excavation for the proposed basement (below grade storage) and foundation may be as deep as nine feet. Within the depth of the basement excavation, we anticipate the excavation to encounter loose colluvium overlying medium dense alluvium. All temporary excavations should be performed in accordance with Part N of WAC (Washington Administrative Code) 296-155. The contractor is responsible for maintaining safe excavation slopes and/or shoring.

7.1 TEMPORARY EXCAVATION SLOPES

All temporary excavations deeper than a total height of 4 feet should be sloped or shored. Where space is available, it is our opinion that unsupported open cut excavation is feasible at the site. Based on the soil conditions at the site, for planning purposes, it is our opinion that temporary excavations for the proposed basement may be sloped as steep as 1H:1V (Horizontal:Vertical). Where space is limited, the use of L-shaped footings may be considered to reduce the lateral extent of the proposed excavation.

If sufficient space is not available for an unsupported open cut, excavation shoring will be required for the basement wall construction.

The temporary excavations and cut slopes should be re-evaluated in the field during construction based on actual observed soil conditions, and may need to be flattened in the wet reasons and should be covered with plastic sheets. The cut slopes should be covered with plastic sheets in the raining season. We also recommend that heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed within a distance equal to 1/3 the slope height from the top of any excavation.

7.2 PERMANENT SOLDIER PILE WALLS SHORING

We understand that you plan to stabilize the existing steep slopes and replace the existing rockery and wood retaining wall with new retaining walls. Based on the subsurface conditions and our slope stability analysis, we recommend that permanent soldier pile walls be installed for the proposed slope improvements to serve as retaining structures and as long-term stabilization measures. The approximate locations of the proposed soldier pile walls are shown in Figure 2.

Soldier pile wall consists of vertical steel beams, typically spaced from 6 to 8 feet apart along the proposed excavation alignment, spanned by timber lagging. Prior to the start of excavation, the steel beams are installed in holes drilled to a design depth and then backfilled with lean mix or structural concrete. As the excavation proceeds downward and the steel piles are subsequently exposed, timber lagging is installed between the piles to further stabilize the walls of the excavation.

For permanent soldier piles, the piles should be protected against corrosion. This may include proper coatings or upsizing of piles. In addition, it should also be noted that timber lagging has limited design life, and the use of concrete facing may also be considered for permanent soldier pile walls. Tiebacks are typically used for wall heights greater than about 12 to 15 feet to achieve a more economical design. We anticipate that the maximum wall height for this project will likely be less than 12 feet, and hence we do not anticipate the use of tiebacks.

7.2.1 Wall Design Parameters

We recommend that the earth pressures depicted on Figure 4 may be used for the shoring design along the lower portion of the slope. For the shoring design along the top of slope, the earth pressures depicted on Figure 5 may be used.

The vertical capacity of the soldier piles should be determined using an allowable skin friction value of 0.5 ksf for the portion of the pile below the bottom of excavation, and an allowable end soil bearing capacity value of 10 ksf. Permanent wall should be designed for an additional uniform lateral pressure of 8H psf for seismic loading.

7.2.2 Lagging

Lagging design recommendations are presented on Figures 4 and 5. We recommend that the lagging for the upper shoring wall be extended five feet below final grade to prevent the soil sloughing in front of the shoring wall. We also recommend voids behind the lagging be backfilled with either Control Density Fill (CDF), sand, or approved alternative materials.

7.2.3 Construction Considerations

The drilling of soldier piles is anticipated to encounter loose fill, sand, silty sand, and silt. Caving in fill and very moist to wet sand/silty sand layers could occur during drilling. As

a result, the drilling contractor should be prepared to stabilize the holes by using temporary casings, hydrostatic pressures (i.e., flooding the hole), or drilling fluids, to prevent potential bottom heaving.

We anticipate that groundwater to be present in the drilled holes during soldier pile installation. If groundwater is present in the drilled holes, lean concrete or structural concrete backfill should be placed with tremie pipes from bottom up.

We recommend that the following should be incorporated into the project plans and specifications:

- The geotechnical engineer shall verify the suitability of all soldier pile holes before concrete placement;
- Tremie methods shall be used for concrete placement in all holes having 6 or more inches of accumulated water if perched ground water or heavy precipitation is encountered during construction.
- All soldier pile holes drilled shall be filled with lean concrete mix or structural concrete on the same day.
- If soldier piles are designed as a permanent foundation system, any soft/disturbed soils encountered at the bottom of the hole during drilling will need to be removed using a cleanout bucket prior to placing the steel beam and concrete.
- The contractor shall evaluate the site access prior to the shoring installation.

When placing timber lagging, the height of each lift may need to be limited to prevent the un-shored soil from escaping through the base of the timber boards. We recommend that the soil exposed for timber lagging be no more than 4 to 5 feet deep. The actual allowable vertical cut for timber lagging placement should be determined in the field, based on the actual conditions observed.

7.2.4 Performance Monitoring

Because ground deformations will occur due to the excavation (open cut or shored), we recommend that existing conditions on the adjacent private properties be photo-documented prior to the start of the project. We also recommend that survey points be installed on every other soldier pile and on adjacent structures.

The survey points on the piles should be monitored by the project surveyor until one week after the excavation has been backfilled or permanent walls are completed. The monitoring program should include changes in both the horizontal (x and y directions) and vertical deformations to the nearest 0.01-foot, and the results be promptly submitted to PanGEO for review. After the initial baseline readings, which should be taken prior to the start of pile installations, the monitoring points on the adjacent structures only need to be shot if excessive soldier pile deflections are noted. The results of the monitoring will allow the design team to confirm design parameters, and for the contractor to make adjustments if necessary.

8.0 EARTHWORK CONSIDERATIONS

8.1 STRUCTURAL FILL AND COMPACTION

Structural fill, if needed, should consist of City of Seattle Type 17, WSDOT Section 9-03.9(3) Crushed Surfacing Base Course (WSDOT 2020), or an approved equivalent.

Structural fill should be properly moisture conditioned, placed in loose, horizontal lifts less than 12 inches in thickness, and compacted to a dense and unyielding condition. The adequacy of compaction should be verified by a PanGEO representative. Alternatively, a minimum 95 percent maximum density as determined using ASTM D-1557 (Modified Proctor) maybe used to determine the adequacy of the compacted fill.

The procedure to achieve proper density of a compacted fill depends on the size and type of compaction equipment, the number of passes, thickness of the lifts being compacted, and certain soil properties. If the excavation to be backfilled is constricted and limits the use of heavy equipment, smaller equipment can be used, but the lift thickness will need to be reduced to achieve the required relative compaction.

Generally, loosely compacted soils are a result of poor construction technique or improper moisture content. Soils with high fines contents are particularly susceptible to becoming too wet and coarse-grained materials easily become too dry, for proper compaction. Soils with a moisture content too high for adequate compaction should be dried as necessary, or moisture conditioned by mixing with drier materials, or other methods.

8.2 MATERIAL REUSE

In the context of this report, structural fill is defined as compacted fill placed under footings, concrete stairs and landings, and slabs, or other load-bearing areas. In our opinion, the on-site soils are not suitable to be reused as structural fill. The on-site soils may be used as general fill in the non-structural and landscaping areas. If use of the on-site soil is planned, the excavated soil should be stockpiled and protected with plastic sheeting to prevent softening from rainfall in the wet season.

8.3 CONSTRUCTION DEWATERING

Based on our test borings, groundwater may be also encountered during the exaction for the proposed addition and shoring installation. Therefore, dewatering is likely needed to use for the excavation, especially if the excavation will occur during the wet season. Based on the subsurface and groundwater conditions encountered in the borings, it is our opinion that the dewatering may be accomplished with conventional sumps and pumps.

The number of the sumps and pumps should be determined by the contractor, and may be modified during construction based on field observations at the time of construction. If groundwater is encountered during construction, the bottom of the excavation should be sloped to the sump pits. The collected water can then be pumped from these pits to a positive and permanent discharge.

It should be noted that the level and flow of the groundwater seepage will fluctuate depending on the season, amount of rainfall, lake level, construction schedule and sequencing, surface water runoff, the selection of excavation, and other factors. Dewatering for construction is the responsibility of the contractor. The selection of equipment and methods of dewatering should be left up to the contractor provided they are in accordance with the recommendations in this report and the project specifications.

8.3 WET WEATHER CONSTRUCTION

General recommendations relative to earthwork performed in wet weather or in wet conditions are presented below. The following procedures are best management practices recommended for use in wet weather construction:

- Earthwork should be performed in small areas to minimize subgrade exposure to wet weather. Excavation or the removal of unsuitable soil should be followed

promptly by the placement and compaction of clean structural fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance.

- During wet weather, the allowable fines content of the structural fill should be reduced to no more than 5 percent by weight based on the portion passing the 0.75-inch sieve. The fines should be non-plastic.
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water.
- Geotextile silt fences should be installed at strategic locations around the site to control erosion and the movement of soil.
- Excavation slopes and soils stockpiled on site should be covered with plastic sheeting.

8.4 EROSION CONSIDERATIONS

Surface runoff can be controlled during construction by careful grading practices. Typically, this includes the construction of shallow, upgrade perimeter ditches or low earthen berms in conjunction with silt fences to collect runoff and prevent water from entering excavations or to prevent runoff from the construction area leaving the immediate work site. Temporary erosion control may require the use of hay bales on the downhill side of the project to prevent water from leaving the site and potential storm water detention to trap sand and silt before the water is discharged to a suitable outlet. All collected water should be directed under control to a positive and permanent discharge system.

Permanent control of surface water should be incorporated in the final grading design. Adequate surface gradients and drainage systems should be incorporated into the design such that surface runoff is collected and directed away from the structure to a suitable outlet. Potential issues associated with erosion may also be reduced by establishing vegetation within disturbed areas immediately following grading operations.

9.0 ADDITIONAL SERVICES

To confirm that our recommendations are properly incorporated into the design and construction of the proposed development, PanGEO should be retained to conduct a review of the final project plans and specifications, and to monitor the construction of geotechnical

elements. Modifications to our recommendations presented in this report may be necessary, based on the actual conditions encountered during construction.

10.0 CLOSURE

We have prepared this report for Mr. Rob Drollinger and the project design team. Recommendations contained in this report are based on a site reconnaissance, a subsurface exploration program, review of pertinent subsurface information, and our understanding of the project. The study was performed using a mutually agreed-upon scope of services.

Variations in soil conditions may exist between the locations of the explorations and the actual conditions underlying the site. The nature and extent of soil variations may not be evident until construction occurs. If any soil conditions are encountered at the site that are different from those described in this report, we should be notified immediately to review the applicability of our recommendations. Additionally, we should also be notified to review the applicability of our recommendations if there are any changes in the project scope.

The scope of our work does not include services related to construction safety precautions. Our recommendations are not intended to direct the contractors' methods, techniques, sequences or procedures, except as specifically described in our report for consideration in design. Additionally, the scope of our services specifically excludes the assessment of environmental characteristics, particularly those involving hazardous substances. We are not mold consultants nor are our recommendations to be interpreted as being preventative of mold development. A mold specialist should be consulted for all mold-related issues.

This report has been prepared for planning and design purposes for specific application to the proposed project in accordance with the generally accepted standards of local practice at the time this report was written. No warranty, express or implied, is made.

This report may be used only by the client and for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both off and on-site), or other factors including advances in our understanding of applied science, may change over time and could materially affect our findings. Therefore, this report should not be relied upon after 24 months from its issuance. PanGEO should be notified if the project is delayed by more than 24 months from the date of this report so that we may review the applicability of our conclusions considering the time lapse.

It is the client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk. Any party other than the client who wishes to use this report shall notify PanGEO of such intended use and for permission to copy this report. Based on the intended use of the report, PanGEO may require that additional work be performed and that an updated report be reissued. Noncompliance with any of these requirements will release PanGEO from any liability resulting from the use this report.

Sincerely,

PanGEO, Inc.

Chien-Lin (Johnny) Chen, P.E.
Project Geotechnical Engineer

11.0 REFERENCES

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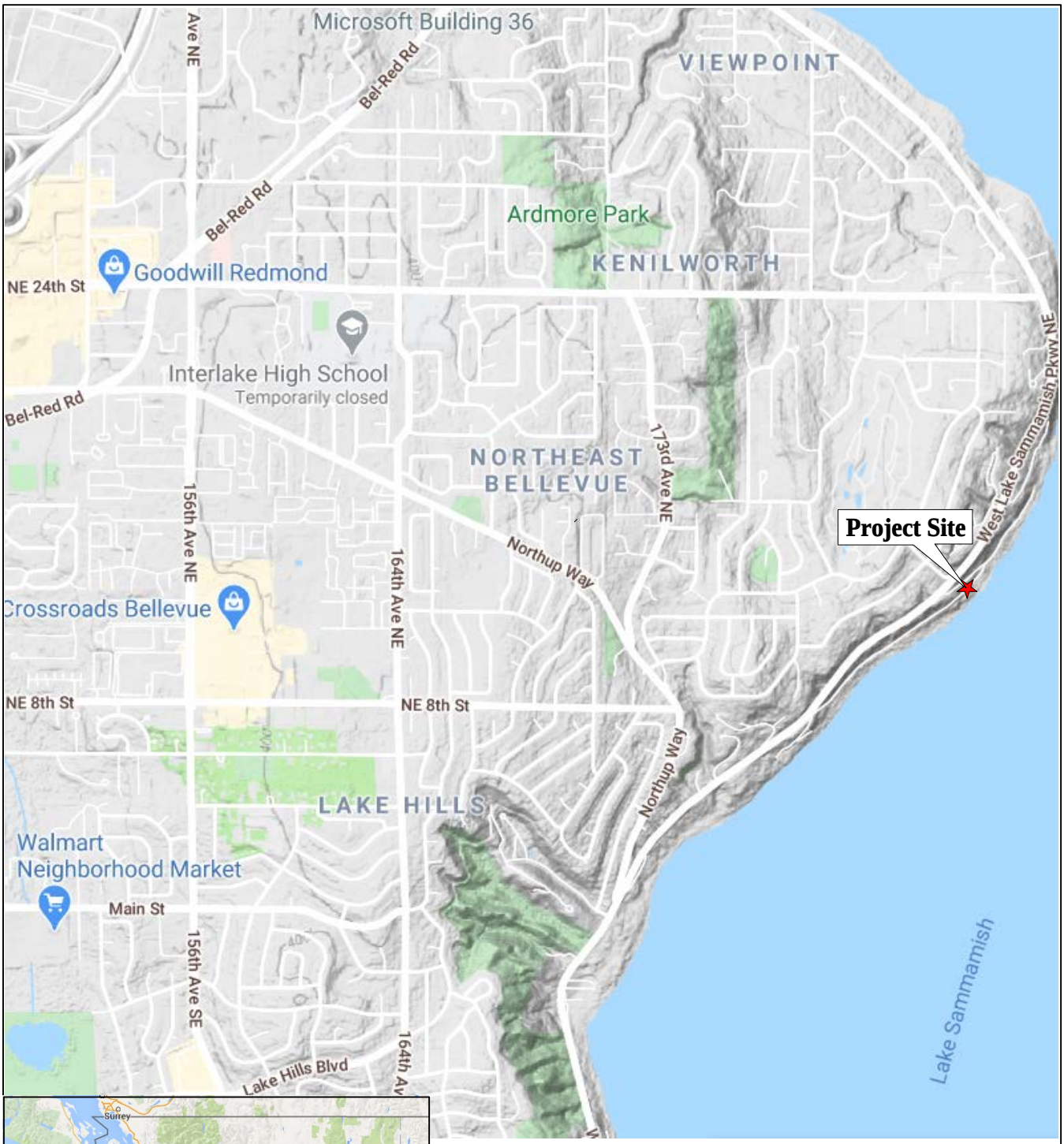

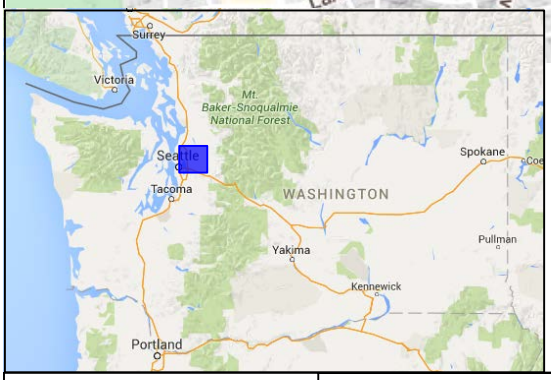

Base Map: Google Maps

NORTH

Not to Scale

PanGEO INCORPORATED

Proposed House Remodel and Addition
1250 W Lake Sammamish Pkwy NE
Bellevue, Washington

VICINITY MAP

Project No. **20-117**

Figure No. **1**

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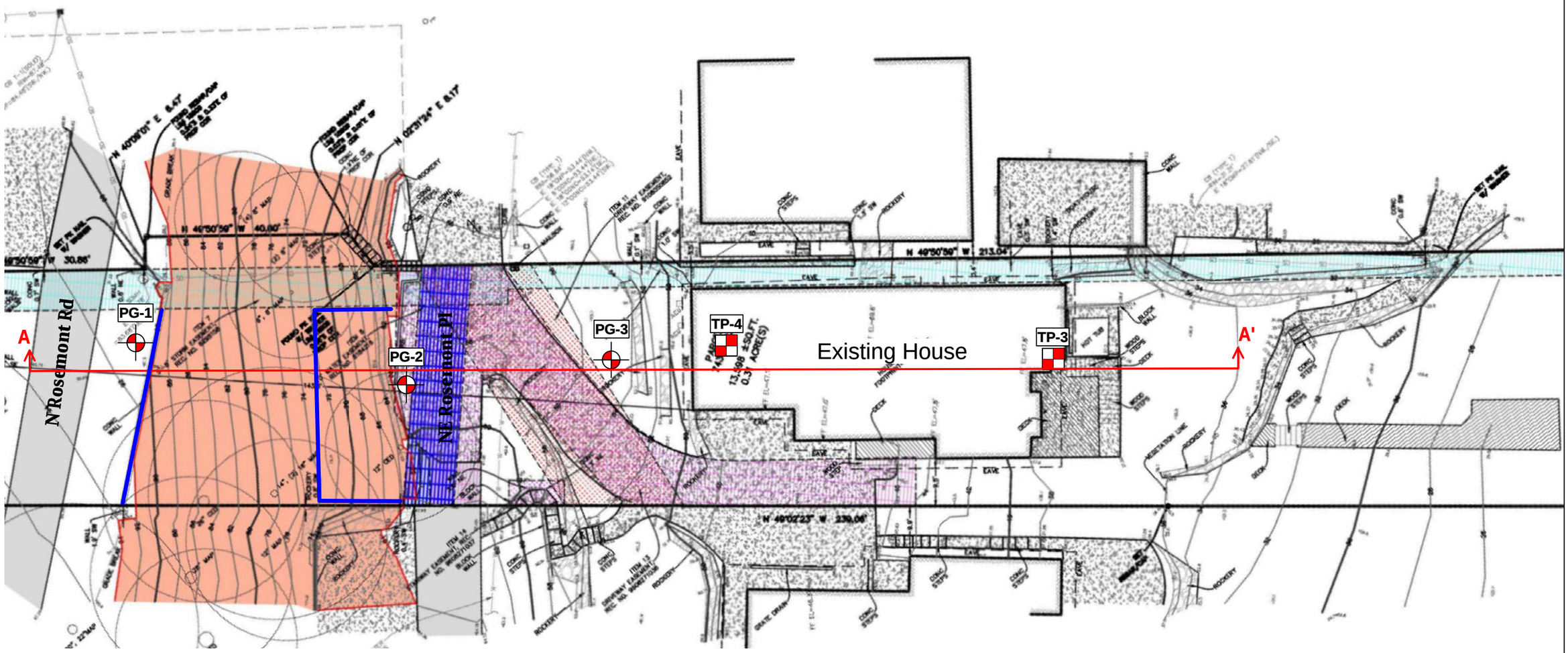


PROJECT NORTH

Scale:
1 inch = 20 feet

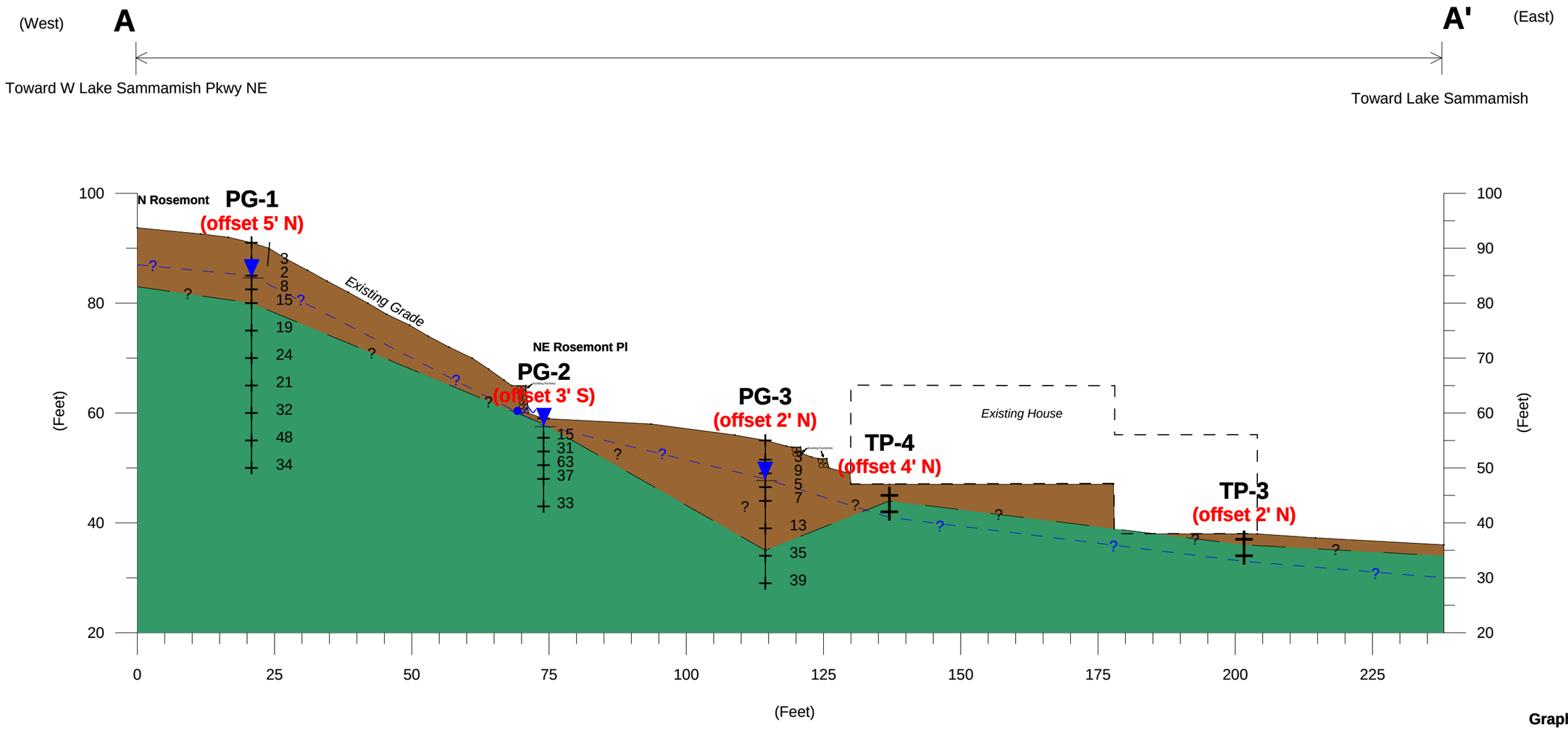
Legend:

- Approx. Test Boring Location
- Approx. Previous Test Pit Location (*GEO Consultants, 1991*)
- Approx. Subsurface Profile Location (See Figure 3)
- Proposed Soldier Pile Shoring Wall

Base map modified from Topographic & Boundary Survey by Terrane dated August 28, 2019

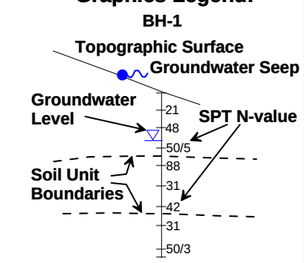
PanGEO INCORPORATED	Proposed House Remodel and Addition 1250 W Lake Sammamish Pkwy NE Bellevue, Washington	SITE AND EXPLORATION PLAN	
		Project No. 20-117	Figure No. 2

20-117 Fig 2 Site and Exploration Plan.grf 10/28/20 (5:02:46)



Horizontal Scale
1" = 20'
Vertical Scale
1" = 20'

Graphics Legend:



Engineering Soil Unit 1 & 2 - Very loose to medium dense silty SAND with organics (Fill/Colluvium/Alluvium)

Engineering Soil Unit 3 - Medium dense to very dense interlayered SAND and SILT (Pre-Fraser Deposits)

Notes:
1. Topography obtained from Topographic & Boundary Survey by Terrane, August 28, 2019.
2. See Figure 2 for location of Section A-A'.
3. See report text for additional discussions on subsurface conditions.
4. The generalized soil profile is based on widely-spaced borings. Soil conditions may vary over a small distance, and the actual subsurface conditions may be different from the generalized soil profile depicted in this figure.

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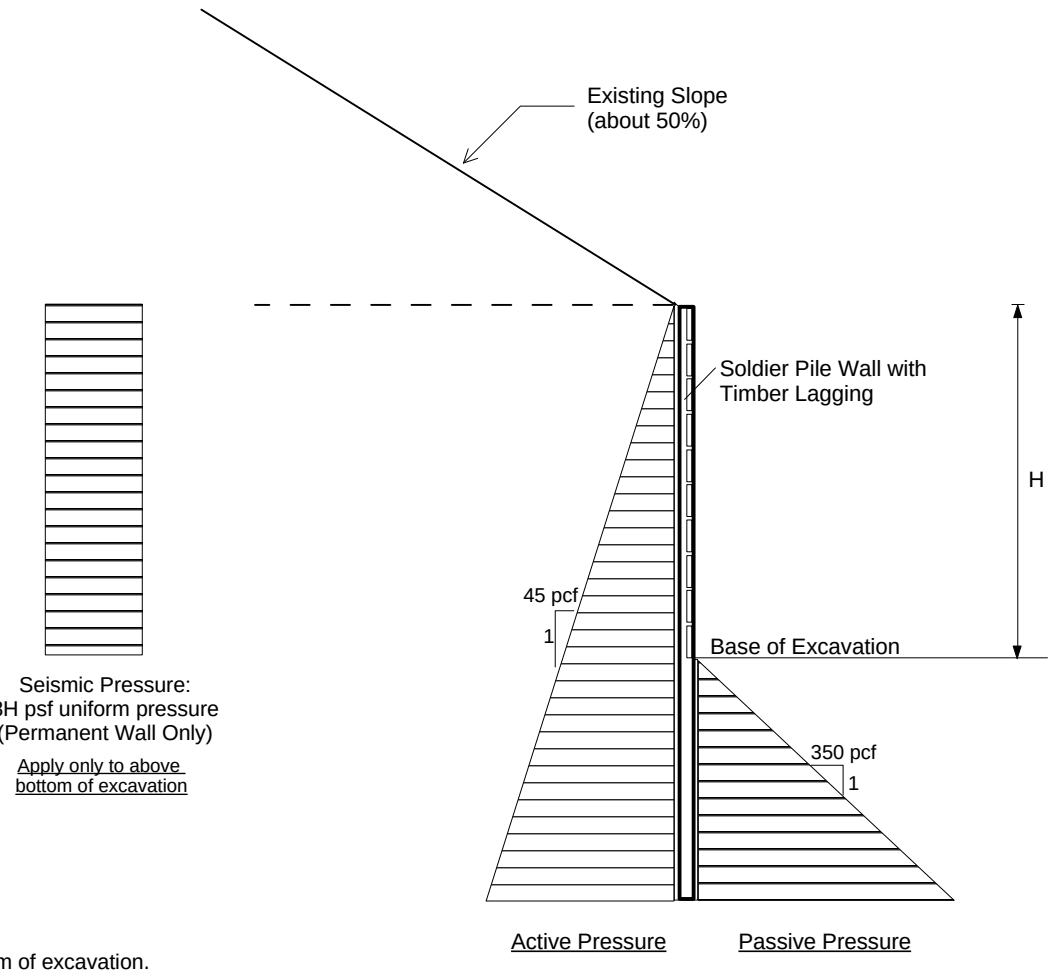
Proposed House Remodel and Addition
1250 W Lake Sammamish Pkwy NE
Bellevue, Washington

GENERALIZED SUBSURFACE PROFILE A-A'

Project No. **20-117**

Figure No. **3**

20-117_Fig3_Sub_Profile.grf 10/28/20 (5:13:16) BW



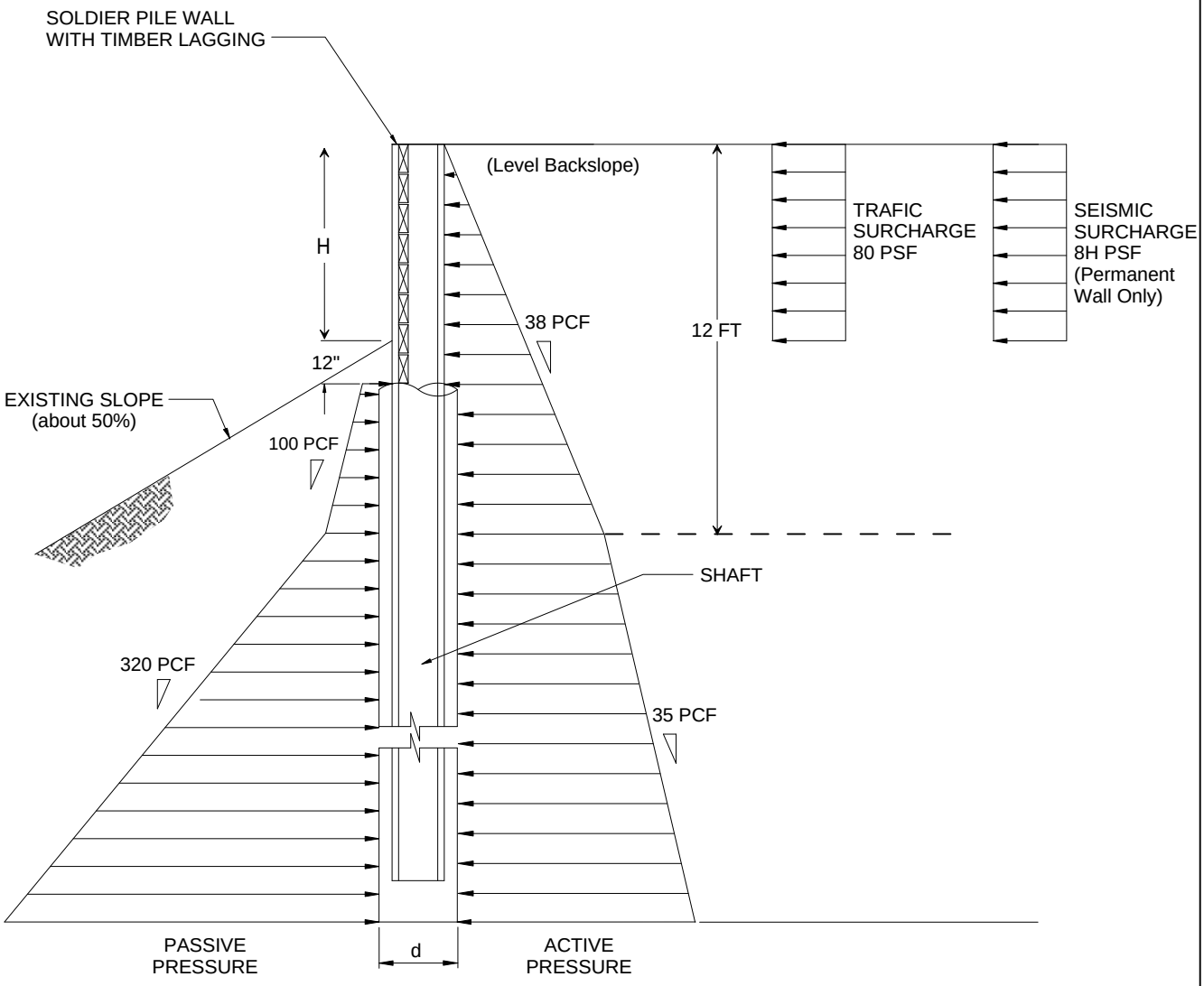
Notes:
1. Minumum embedment should be at least 10 feet below bottom of excavation.
2. A factor of safety of 1.5 has been applied to the recommended passive pressure values. No factor of safety has been applied to the recommended active earth pressure values.
3. Active pressures should be applied over the full width of the pile spacing above the base of the excavation, and over one pile diameter below the base of the excavation.
4. Surcharge pressures should be applied over the entire length of the loaded area.
5. Passive pressure should be applied to two times the diameter of the soldier piles.
6. Use 50% of the active and surcharge pressures for lagging design with soldier piles spaced at 8' or less.
7. Refer to report text for additional discussions.

PanGEO INCORPORATED

Proposed House Remodel and Addition
1250 W Lake Sammamish Pkwy NE
Bellevue, Washington

DESIGN LATERAL EARTH PRESSURES: CANTILEVERED SOLDIER PILE WALL (Lower Slope)

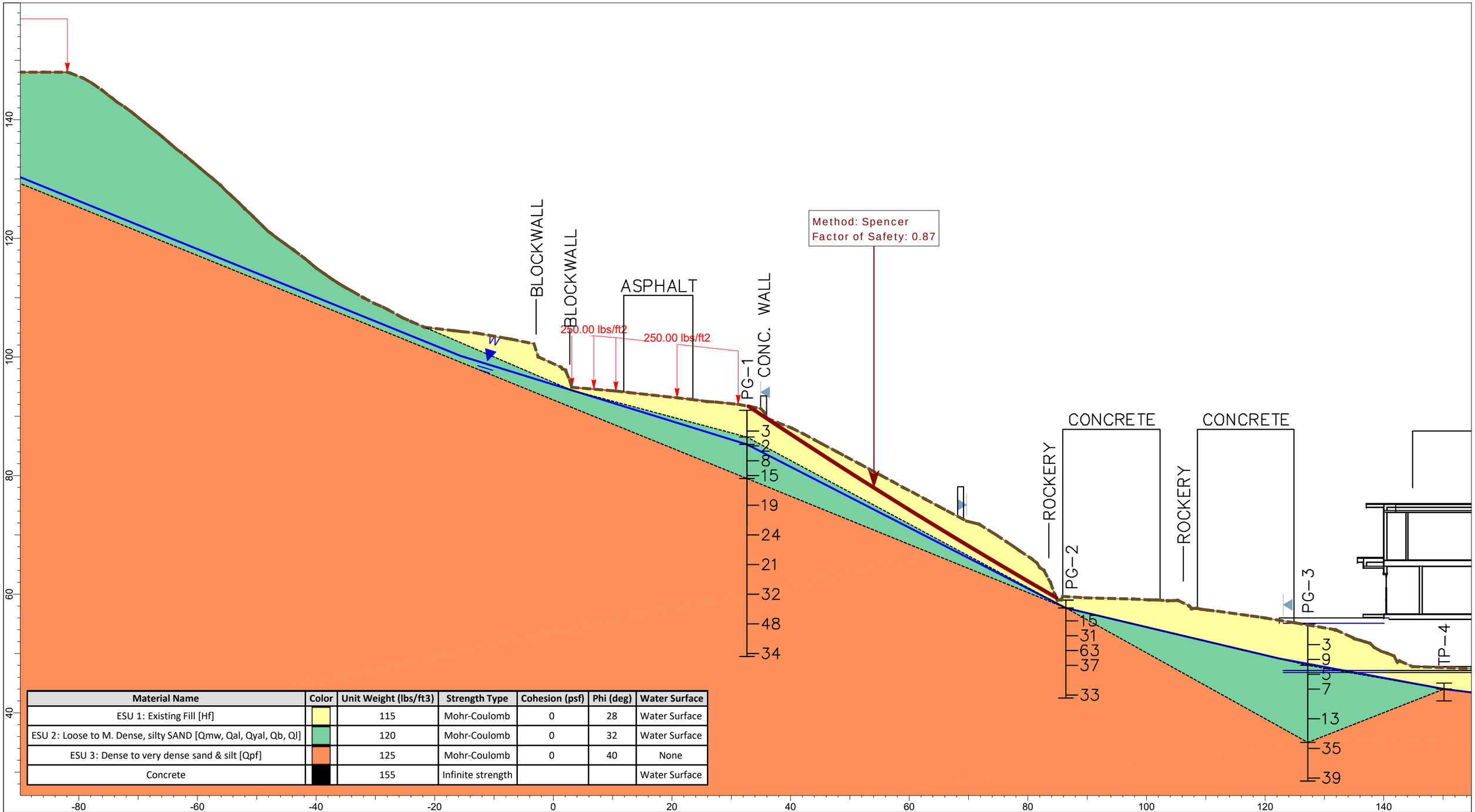
Project No.	Figure No.
20-117	**4**



Notes:
1. Minumum embedment should be at least 10 feet below bottom of excavation.
2. A factor of safety of 1.5 has been applied to the recommended passive pressure values. No factor of safety has been applied to the recommended active earth pressure values.
3. Active pressures should be applied over the full width of the pile spacing above the base of the excavation, and over one pile diameter below the base of the excavation.
4. Surcharge pressures should be applied over the entire length of the loaded area.
5. Passive pressure should be applied to two times the diameter of the soldier piles.
6. Use 50% of the active and surcharge pressures for lagging design with soldier piles spaced at 8' or less.
7. Refer to report text for additional discussions.

EP diagram.grf 10/28/20 (5:44:15) SDD

PanGEO INCORPORATED	**Proposed House Remodel and Addition** **1250 W Lake Sammamish Pkwy NE** **Bellevue, Washington**	**DESIGN LATERAL EARTH PRESSURES: CANTILEVERED SOLDIER PILE WALL (Upper Slope)** Project No. **20-117** Figure No. **5**



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface
ESU 1: Existing Fill [Hf]		115	Mohr-Coulomb	0	28	Water Surface
ESU 2: Loose to M. Dense, silty SAND [Qmw, Qal, Qyal, Qb, Ql]		120	Mohr-Coulomb	0	32	Water Surface
ESU 3: Dense to very dense sand & silt [Qpf]		125	Mohr-Coulomb	0	40	None
Concrete		155	Infinite strength			Water Surface

PanGEO INCORPORATED

SLIDEINTERPRET 9.010

Proposed House Addition & Site Improvements

1250 W. LK. Sammamish Pkwy NE

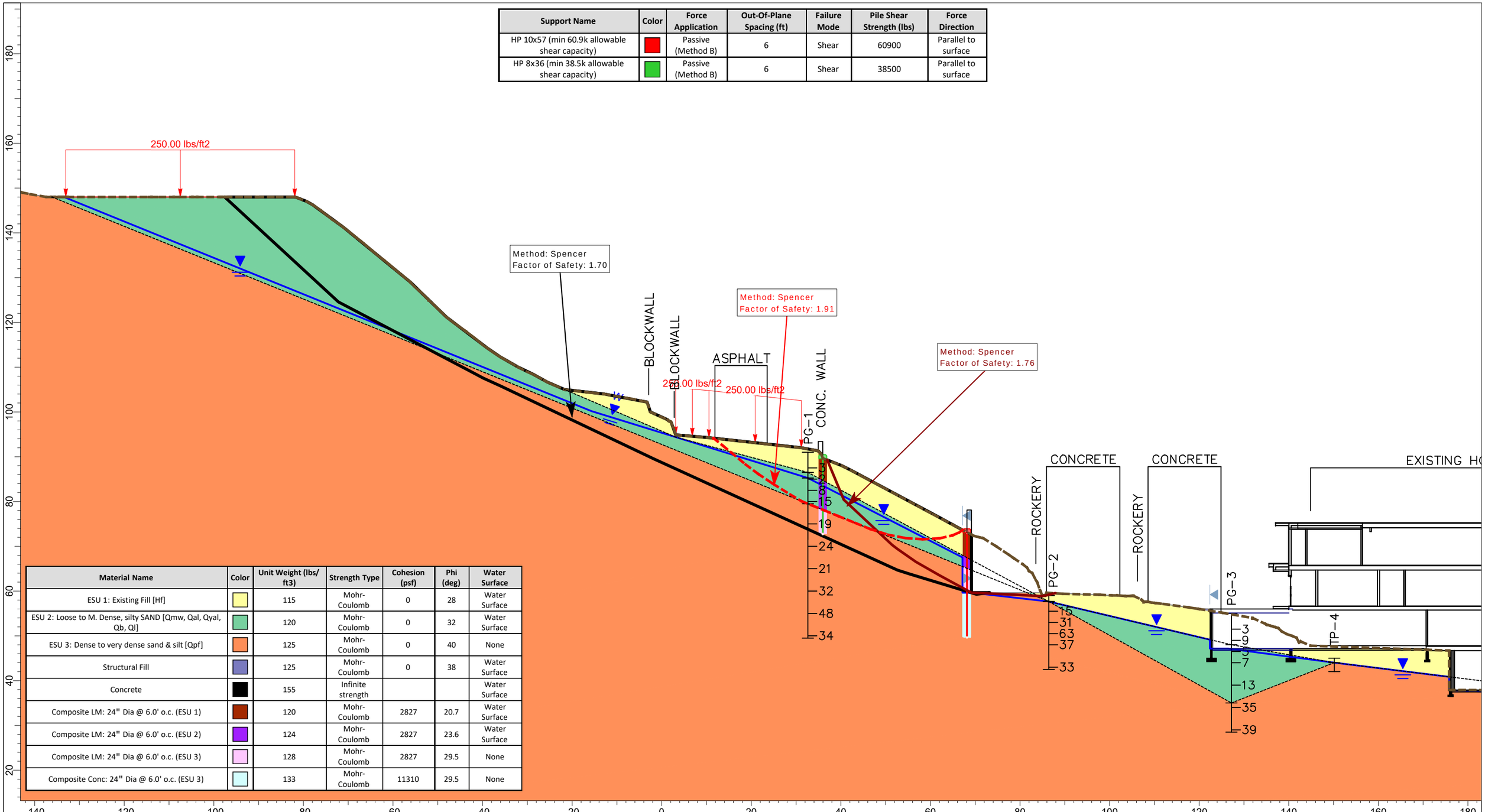
Bellevue, Washington

Static Global Stability Analysis

Section A - Existing Condition

Scale:	Project No.	Figure No.
1:180	20-117	6

Support Name	Color	Force Application	Out-Of-Plane Spacing (ft)	Failure Mode	Pile Shear Strength (lbs)	Force Direction
HP 10x57 (min 60.9k allowable shear capacity)		Passive (Method B)	6	Shear	60900	Parallel to surface
HP 8x36 (min 38.5k allowable shear capacity)		Passive (Method B)	6	Shear	38500	Parallel to surface



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface
ESU 1: Existing Fill [Hf]		115	Mohr-Coulomb	0	28	Water Surface
ESU 2: Loose to M. Dense, silty SAND [Qmw, Qal, Qyal, Qb, Ql]		120	Mohr-Coulomb	0	32	Water Surface
ESU 3: Dense to very dense sand & silt [Qpf]		125	Mohr-Coulomb	0	40	None
Structural Fill		125	Mohr-Coulomb	0	38	Water Surface
Concrete		155	Infinite strength			Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 1)		120	Mohr-Coulomb	2827	20.7	Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 2)		124	Mohr-Coulomb	2827	23.6	Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 3)		128	Mohr-Coulomb	2827	29.5	None
Composite Conc: 24" Dia @ 6.0' o.c. (ESU 3)		133	Mohr-Coulomb	11310	29.5	None

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SLIDEINTERPRET 9.010

Proposed House Addition & Site Improvements

1250 W. LK. Sammamish Pkwy NE

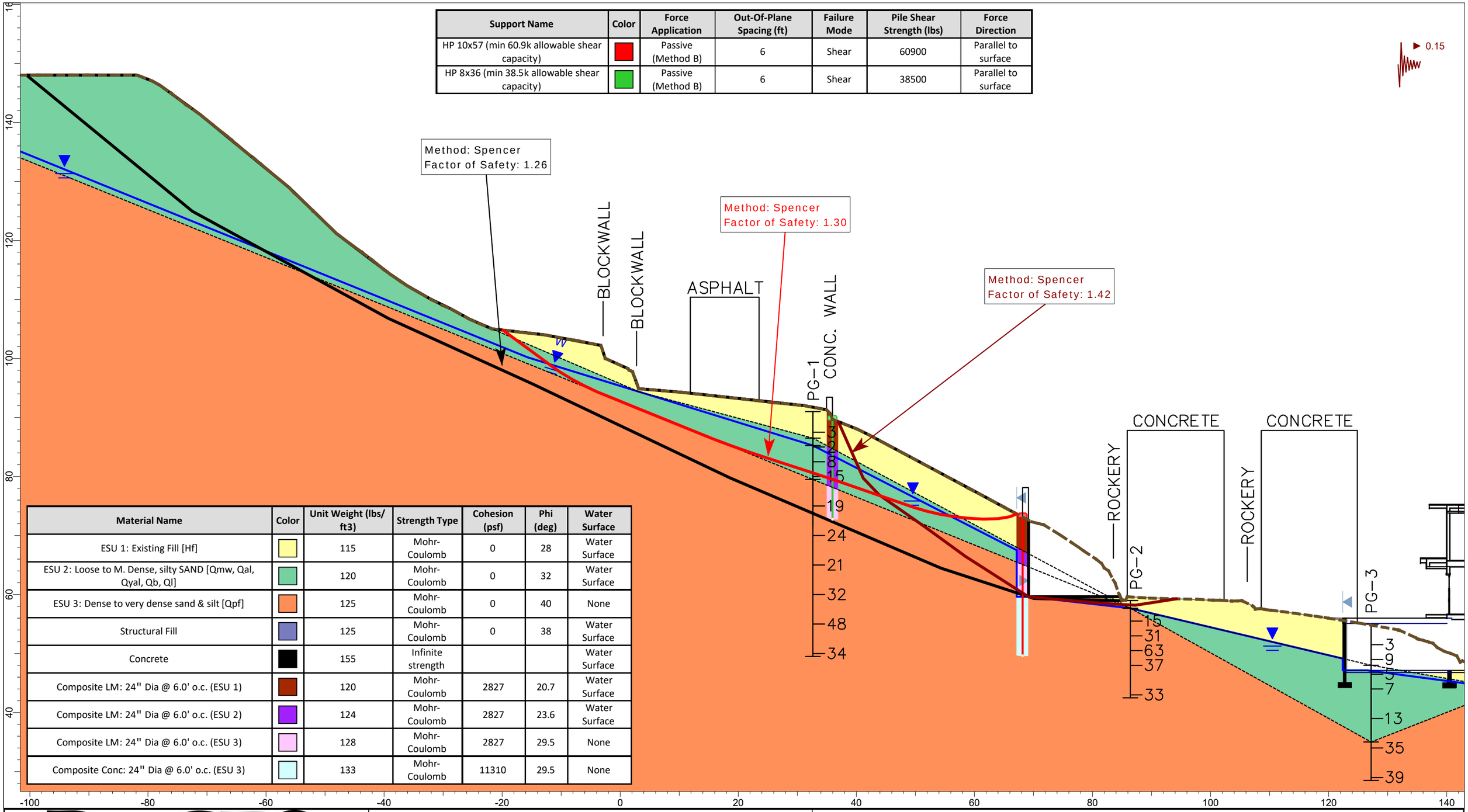
Bellevue, Washington

Static Global Stability Analysis

Section A - Proposed Condition

Scale:	Project No.	Figure No.
1:240	20-117	7

Support Name	Color	Force Application	Out-Of-Plane Spacing (ft)	Failure Mode	Pile Shear Strength (lbs)	Force Direction
HP 10x57 (min 60.9k allowable shear capacity)		Passive (Method B)	6	Shear	60900	Parallel to surface
HP 8x36 (min 38.5k allowable shear capacity)		Passive (Method B)	6	Shear	38500	Parallel to surface



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface
ESU 1: Existing Fill [Hf]		115	Mohr-Coulomb	0	28	Water Surface
ESU 2: Loose to M. Dense, silty SAND [Qmw, Qal, Qyal, Qb, Ql]		120	Mohr-Coulomb	0	32	Water Surface
ESU 3: Dense to very dense sand & silt [Qpf]		125	Mohr-Coulomb	0	40	None
Structural Fill		125	Mohr-Coulomb	0	38	Water Surface
Concrete		155	Infinite strength			Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 1)		120	Mohr-Coulomb	2827	20.7	Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 2)		124	Mohr-Coulomb	2827	23.6	Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 3)		128	Mohr-Coulomb	2827	29.5	None
Composite Conc: 24" Dia @ 6.0' o.c. (ESU 3)		133	Mohr-Coulomb	11310	29.5	None

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SLIDEINTERPRET 9.010

Proposed House Addition & Site Improvements

1250 W. LK. Sammamish Pkwy NE

Bellevue, Washington

Pseudo-Static (Seismic) Global Stability Analysis

Section A - Proposed Condition

Scale:	Project No.	Figure No.
1:180	20-117	8

APPENDIX A

SUMMARY BORING LOGS

RELATIVE DENSITY / CONSISTENCY

SAND / GRAVEL			SILT / CLAY		
Density	SPT N-values	Approx. Relative Density (%)	Consistency	SPT N-values	Approx. Undrained Shear Strength (psf)
Very Loose	<4	<15	Very Soft	<2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Med. Dense	10 to 30	35 - 65	Med. Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	>50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	>30	>4000

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		GROUP DESCRIPTIONS	
Gravel 50% or more of the coarse fraction retained on the #4 sieve. Use dual symbols (eg. GP-GM) for 5% to 12% fines.	GRAVEL (<5% fines)	GW	Well-graded GRAVEL
		GP	Poorly-graded GRAVEL
	GRAVEL (>12% fines)	GM	Silty GRAVEL
		GC	Clayey GRAVEL
Sand 50% or more of the coarse fraction passing the #4 sieve. Use dual symbols (eg. SP-SM) for 5% to 12% fines.	SAND (<5% fines)	SW	Well-graded SAND
		SP	Poorly-graded SAND
	SAND (>12% fines)	SM	Silty SAND
		SC	Clayey SAND
Silt and Clay 50%or more passing #200 sieve	Liquid Limit < 50	ML	SILT
		CL	Lean CLAY
		OL	Organic SILT or CLAY
	Liquid Limit > 50	MH	Elastic SILT
		CH	Fat CLAY
		OH	Organic SILT or CLAY
Highly Organic Soils		PT	PEAT

Notes: 1. Soil exploration logs contain material descriptions based on visual observation and field tests using a system modified from the Uniform Soil Classification System (USCS). Where necessary laboratory tests have been conducted (as noted in the "Other Tests" column), unit descriptions may include a classification. Please refer to the discussions in the report text for a more complete description of the subsurface conditions.

2. The graphic symbols given above are not inclusive of all symbols that may appear on the borehole logs. Other symbols may be used where field observations indicated mixed soil constituents or dual constituent materials.

DESCRIPTIONS OF SOIL STRUCTURES

Layered: Units of material distinguished by color and/or composition from material units above and below

Laminated: Layers of soil typically 0.05 to 1mm thick, max. 1 cm

Lens: Layer of soil that pinches out laterally

Interlayered: Alternating layers of differing soil material

Pocket: Erratic, discontinuous deposit of limited extent

Homogeneous: Soil with uniform color and composition throughout

Fissured: Breaks along defined planes

Slickensided: Fracture planes that are polished or glossy

Blocky: Angular soil lumps that resist breakdown

Disrupted: Soil that is broken and mixed

Scattered: Less than one per foot

Numerous: More than one per foot

BCN: Angle between bedding plane and a plane normal to core axis

COMPONENT DEFINITIONS

COMPONENT	SIZE / SIEVE RANGE	COMPONENT	SIZE / SIEVE RANGE
Boulder:	> 12 inches	Sand	
Cobbles:	3 to 12 inches	Coarse Sand:	#4 to #10 sieve (4.5 to 2.0 mm)
Gravel		Medium Sand:	#10 to #40 sieve (2.0 to 0.42 mm)
Coarse Gravel:	3 to 3/4 inches	Fine Sand:	#40 to #200 sieve (0.42 to 0.074 mm)
Fine Gravel:	3/4 inches to #4 sieve	Silt	0.074 to 0.002 mm
		Clay	<0.002 mm

TEST SYMBOLS

for In Situ and Laboratory Tests listed in "Other Tests" column.

ATT	Atterberg Limit Test
Comp	Compaction Tests
Con	Consolidation
DD	Dry Density
DS	Direct Shear
%F	Fines Content
GS	Grain Size
Perm	Permeability
PP	Pocket Penetrometer
R	R-value
SG	Specific Gravity
TV	Torvane
TXC	Triaxial Compression
UCC	Unconfined Compression

SYMBOLS

Sample/In Situ test types and intervals

- 2-inch OD Split Spoon, SPT (140-lb. hammer, 30" drop)
- 3.25-inch OD Spilt Spoon (300-lb hammer, 30" drop)
- Non-standard penetration test (see boring log for details)
- Thin wall (Shelby) tube
- Grab
- Rock core
- Vane Shear

MONITORING WELL

- Groundwater Level at time of drilling (ATD)
- Static Groundwater Level
- Cement / Concrete Seal
- Bentonite grout / seal
- Silica sand backfill
- Slotted tip
- Slough
- Bottom of Boring

MOISTURE CONTENT

Dry	Dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water

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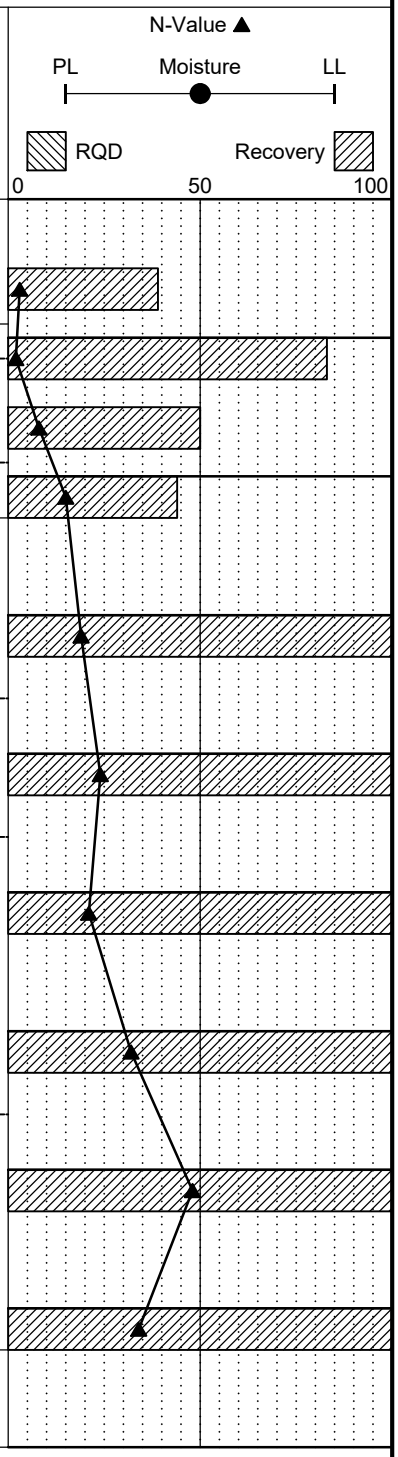
Phone: 206.262.0370

Terms and Symbols for Boring and Test Pit Logs

Figure A-1

Project:	Proposed House Remodel and Addition	Surface Elevation:	91.0ft
Job Number:	20-117	Top of Casing Elev.:	N/A
Location:	1250 W Lake Sammamish Pkwy NE, Bellevue, WA	Drilling Method:	HSA
Coordinates:	Northing: 47.6213, Easting: -122.09225	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0						Gravel surface over very loose, gray-brown, slightly silty and gravelly, fine and coarse SAND; moist; poorly graded, organics, disturbed appearance [Fill].
	S-1	X	1 2 1			
5						Very soft, dark brown, organic SILT; moist; non-plastic [Colluvium].
	S-2	X	1 1 1			Very loose to loose, gray, silty SAND trace fine gravel; wet; poorly graded [Colluvium].
	S-3	X	3 4 4			--becomes loose.
10	S-4	X	2 6 9			Medium dense, brown and gray, sandy, gravelly SILT to sandy GRAVEL; wet; poorly graded, non-plastic fines, dry gray silt in tip [Colluvium].
						Medium dense, gray, sandy SILT interlayered with some silty fine SAND; moist to very moist in sandy layers; poorly graded, non-plastic fines [Qpf - Pre-Fraser Deposits].
15	S-5	X	7 9 10			
						Medium dense, gray, silty fine SAND; very moist; poorly graded, iron oxide banding [Qpf - Pre-Fraser Deposits].
20	S-6	X	9 12 12			
						Medium dense to dense, interlayered gray and gray-brown, silty fine SAND and sandy SILT; moist to very moist in sandy layers; poorly graded, non-plastic fines [Qpf - Pre-Fraser Deposits].
25	S-7	X	7 9 12			--drillers note increased drilling difficulty at about 27'.
30	S-8	X	9 14 18			--becomes dense with trace coarse sand to fine gravel.
						Dense, gray, fine SAND trace silt; moist; poorly graded, massive [Qpf - Pre-Fraser Deposits].
35	S-9	X	5 18 30			
40	S-10	X	6 16 18			
						Boring terminated at about 41.5 feet below grade. Perched groundwater was observed from about 6 to 11.5 feet and very moist soils observed in sandy interlayers between about 11.5 and 33 feet during drilling.
45						



Completion Depth:	41.5ft
Date Borehole Started:	5/12/20
Date Borehole Completed:	5/12/20
Logged By:	B Weitering
Drilling Company:	Geologic Drill Partners

Remarks: Borings drilled using a CAT tracked drill rig. Standard penetration test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. Surface elevation estimated from Topographic & Boundary Survey by Terrane dated 8/28/2019.

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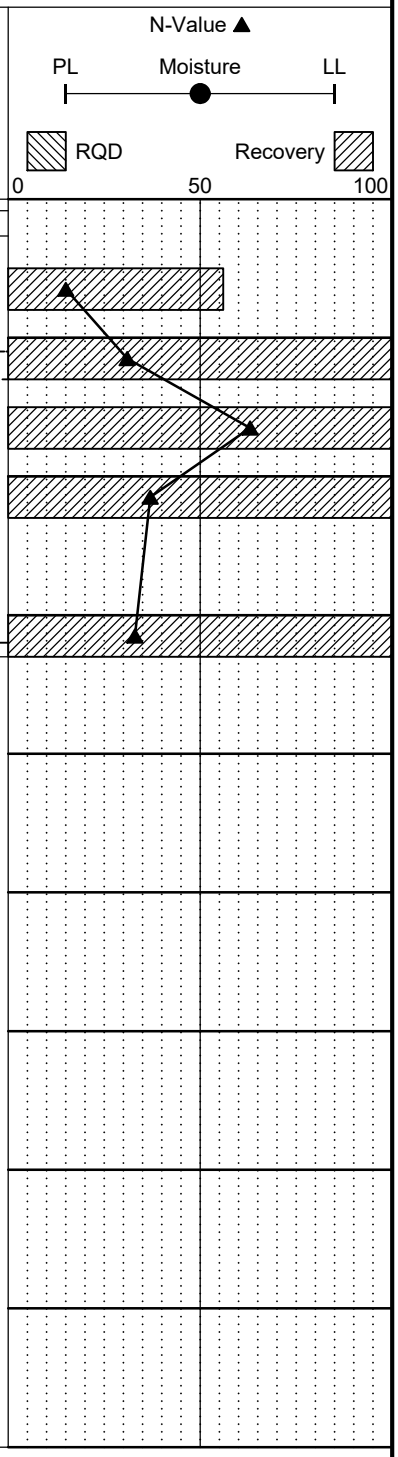
LOG OF TEST BORING PG-1

Figure A-2

The stratification lines represent approximate boundaries. The transition may be gradual.

Project:	Proposed House Remodel and Addition	Surface Elevation:	59.0ft
Job Number:	20-117	Top of Casing Elev.:	N/A
Location:	1250 W Lake Sammamish Pkwy NE, Bellevue, WA	Drilling Method:	HSA
Coordinates:	Northing: 47.6212, Easting: -122.0921	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0						~5" concrete.
						Medium dense, gray-brown, silty, sandy GRAVEL; moist; well-graded, brick [Fill].
	S-1	X	6 8 7			Medium dense, gray-brown, gravelly SAND; wet; poorly graded [Qpf - Pre-Fraser Deposits].
5	S-2	X	11 10 21			Hard, dark brown to gray-brown, SILT; moist; non-plastic, slightly organic in upper half [Qpf - Pre-Fraser Deposits].
	S-3	X	15 25 38			Very dense, gray, slightly silty fine SAND trace gravel; very moist; poorly graded [Qpf - Pre-Fraser Deposits].
10	S-4	X	10 15 22			--becomes dense. --trace wood.
15	S-5	X	12 11 22			--sand becomes fine to coarse.
						Hard, gray-brown, SILT; moist; non-plastic [Qpf - Pre-Fraser Deposits].
						Boring terminated at about 16.5 feet below grade. Perched groundwater was observed from about 1.3 to 5.5 feet and very moist soils observed between about 6.5 and 16 feet during drilling.
20						
25						
30						
35						
40						
45						



Completion Depth:	16.5ft
Date Borehole Started:	5/12/20
Date Borehole Completed:	5/12/20
Logged By:	B Weitering
Drilling Company:	Geologic Drill Partners

Remarks: Borings drilled using a CAT tracked drill rig. Standard penetration test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. Surface elevation estimated from Topographic & Boundary Survey by Terrane dated 8/28/2019.

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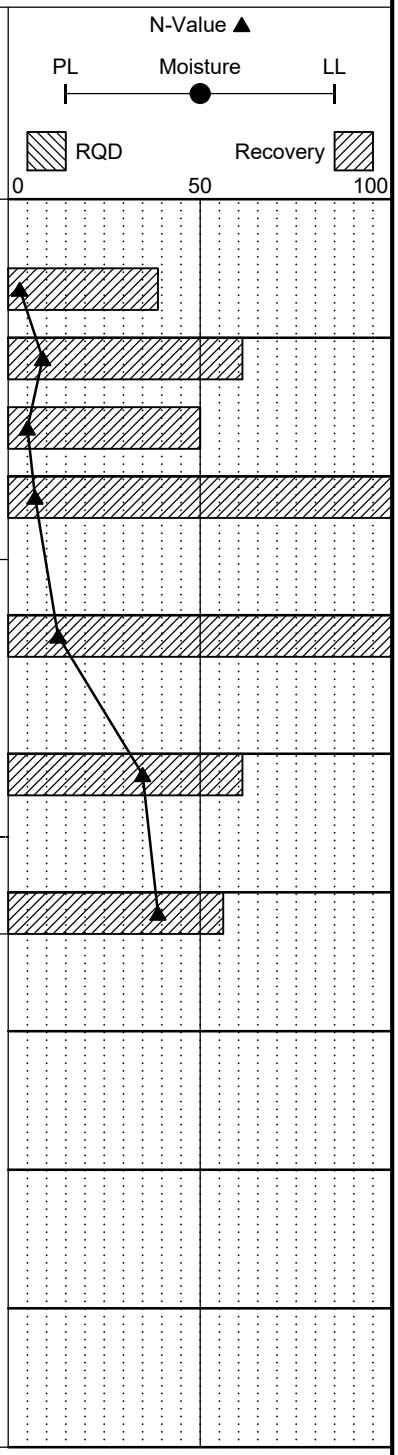
LOG OF TEST BORING PG-2

Figure A-3

The stratification lines represent approximate boundaries. The transition may be gradual.

Project:	Proposed House Remodel and Addition	Surface Elevation:	55.0ft
Job Number:	20-117	Top of Casing Elev.:	N/A
Location:	1250 W Lake Sammamish Pkwy NE, Bellevue, WA	Drilling Method:	HSA
Coordinates:	Northing: 47.62115, Easting: -122.0919	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0						Mulch landscaped surface over very loose, mixed dark brown, brown, and gray, slightly gravelly, silty SAND; moist; poorly graded, fine organics [Colluvium].
	S-1		2 1 2			
5	S-2		3 4 5			--becomes loose.
	S-3		2 3 2			--becomes wet.
10	S-4		4 3 4			--becomes gray.
						Medium dense to dense, gray, gravelly fine to coarse SAND; wet; poorly graded [Qal - Alluvium].
15	S-5		5 8 5			
20	S-6		4 18 17			--becomes dense.
						Dense, gray, silty fine SAND; wet; poorly graded, trace wood [Qpf - Pre-Fraser Deposits].
25	S-7		12 18 21			
						Boring terminated at about 26.5 feet below grade. Groundwater was observed at about 7 feet below grade during drilling.
30						
35						
40						
45						



Completion Depth:	26.5ft
Date Borehole Started:	5/12/20
Date Borehole Completed:	5/12/20
Logged By:	B Weitering
Drilling Company:	Geologic Drill Partners

Remarks: Borings drilled using a CAT tracked drill rig. Standard penetration test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. Surface elevation estimated from Topographic & Boundary Survey by Terrane dated 8/28/2019.

PanGEO INCORPORATED

LOG OF TEST BORING PG-3

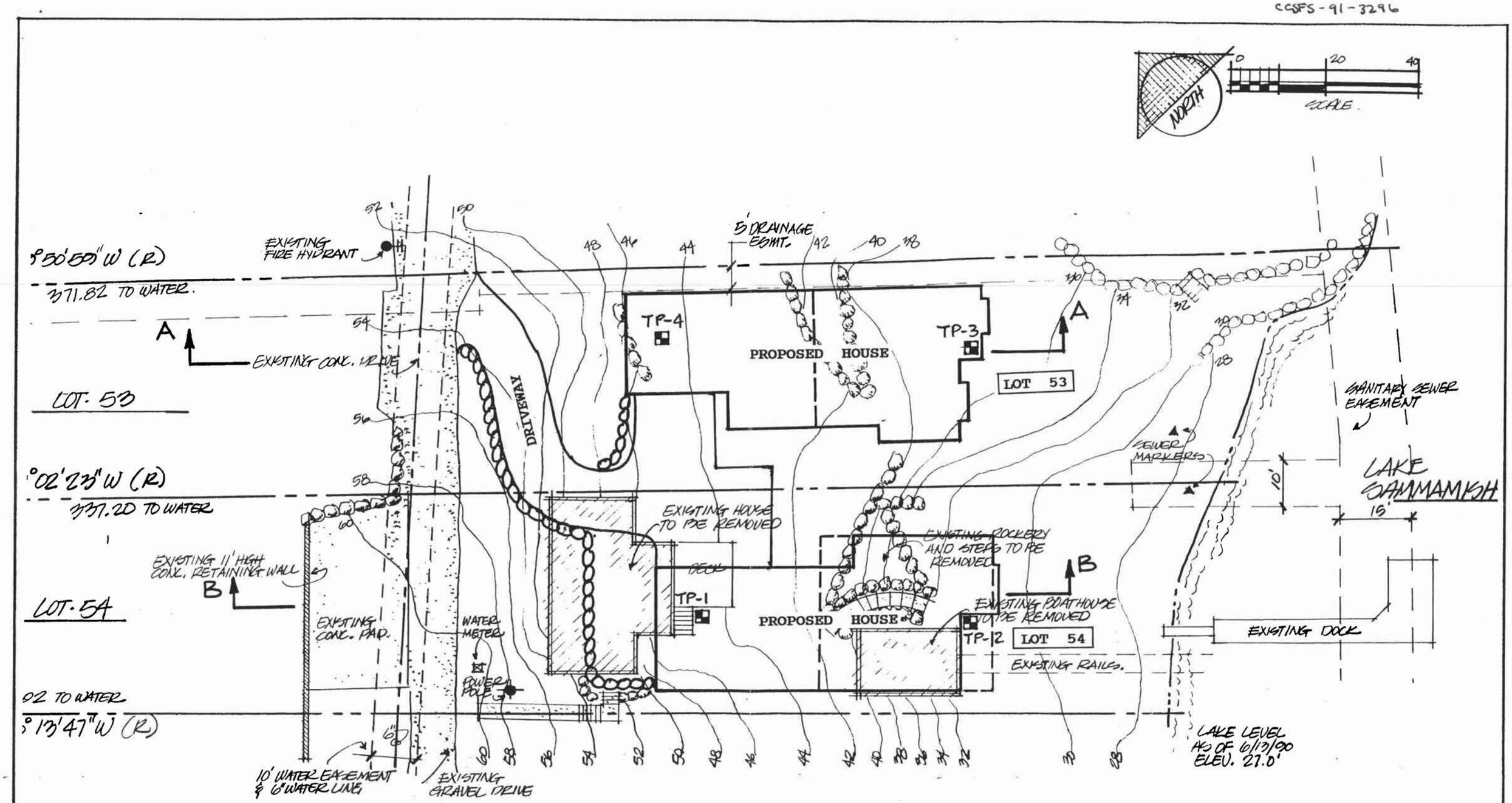
Figure A-4

The stratification lines represent approximate boundaries. The transition may be gradual.

APPENDIX B

SUMMARY PREVIOUS TEST PIT LOGS
(GEO CONSULTANTS, 1991)

CGSFS-91-3296



GEO Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

SITE PLAN

SCALE	DATE	MADE	CHKD.	JOB No.	PLATE
As Shown	3/31/91	JSL	WC	G-0055	2

Logged By JSL
Date 3/28/91

TEST PIT NO. 3

Elev. 37'±

Depth (ft.)		USCS	Soil Description	W (%)	
0		OL	FILL, moist, organic, dark brown, silty SAND w/ thin roots		
1		GP - SP	Very dense, moist, dark brown, sandy GRAVEL to gravelly SAND		
2					
3			GROUNDWATER NOT ENCOUNTERED.		

Logged By JSL
Date 3/28/91

TEST PIT NO. 4

Elev. 45'±

0		OL	TOP SOIL, moist, dark brown, loamy, gravelly SAND, w/ thin roots		
1		SP - GP	Very dense, moist, tannish brown, grvally SAND to sandy GRAVEL		
2					
3			GROUNDWATER NOT ENCOUNTERED.		

GEO Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

TEST PIT LOGS

Proj. No. G0055 | Date 4/5/91 | PLATE 5

APPENDIX C

RELEVANT CODES FOR CRTICAL AREA REPORT

As a part of our study, PanGEO reviewed the City of Bellevue's review letter dated September 14, 2020 for the proposed building and site work (File #20-112339-DC). The review letter requires geotechnical input to respond the applicable performance stands in Land Use Code (LUC) 20.25H for the Critical Areas Land Use Permit (LO) submittal. Our responses (in red) with relevant code sections are listed below:

LUC 20.25H.125 Performance standards – Landslide hazards and steep slopes.

In addition to generally applicable performance standards set forth in LUC 20.25H.055 and 20.25H.065, development within a landslide hazard or steep slope critical area or the critical area buffers of such hazards shall incorporate the following additional performance standards in design of the development, as applicable. The requirement for long-term slope stability shall exclude designs that require regular and periodic maintenance to maintain their level of function.

A. Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography; - The proposed addition will be constructed at the location of the existing house, and will not change the existing steep slopes. The proposed slope stabilization will utilize the soldier pile shoring to minimize alterations to the natural contour.

B. Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation; - The proposed addition will be constructed at the location of the existing house, and will not change the existing critical slopes. The proposed slope stabilization with soldier pile shoring is intended to minimize the ground disturbance on the slopes. The existing landforms and vegetation between the shoring walls will remain.

C. The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties; - Based on our study, the proposed addition will not result in greater risk to the neighboring properties, and it will not result in the need for increased buffers on neighboring properties.

D. The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes where graded slopes would result in increased disturbance as compared to use of retaining wall; - The retaining walls for the slope stabilization will constructed with soldier piles to minimize ground disturbance. The

existing natural slopes between the retaining walls will be maintained and no artificial slopes are planned for the proposal.

E. Development shall be designed to minimize impervious surfaces within the critical area and critical area buffer; - The proposed addition and slope improvements are intended to minimize the impervious surfaces within the critical area and critical area buffer.

F. Where change in grade outside the building footprint is necessary, the site retention system should be stepped and regrading should be designed to minimize topographic modification. On slopes in excess of 40 percent, grading for yard area may be disallowed where inconsistent with this criteria; - The recommended retaining system (soldier pile shoring) is intended to minimize the ground disturbance and topographic modifications.

G. Building foundation walls shall be utilized as retaining walls rather than rockeries or retaining structures built separately and away from the building wherever feasible. Freestanding retaining devices are only permitted when they cannot be designed as structural elements of the building foundation; - Building foundation walls will be utilized as retaining walls.

H. On slopes in excess of 40 percent, use of pole-type construction which conforms to the existing topography is required where feasible. If pole-type construction is not technically feasible, the structure must be tiered to conform to the existing topography and to minimize topographic modification; - The soldier pile shoring (pole-type construction) will be used to stabilize the existing steep slope.

I. On slopes in excess of 40 percent, piled deck support structures are required where technically feasible for parking or garages over fill-based construction types; and - Not applicable in this case.

J. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210. - Disturbed areas will be restored per Land Use Code. Mitigation and restoration plan may be needed and will be addressed by others.

20.25H.135 Mitigation and monitoring – Additional provisions for landslide hazards and steep slopes.

In addition to the general mitigation and restoration plan requirements of LUC 20.25H.210, each mitigation or restoration plan for geologic hazard critical areas shall include:

A. **Erosion and Sediment Control Plan.**

The erosion and sediment control plan shall be prepared in compliance with requirements set forth in Chapter 23.76 BCC, now or as hereafter amended. Such plans shall also include, if not otherwise addressed in Chapter 23.76 BCC, the location and methods of drainage, surface water management, locations and methods of erosion control, a vegetation management and/or replanting plan, and/or other means for maintaining long-term soil stability; - To be addressed by the project civil engineer.

B. **Drainage Plan.**

The technical information shall include a drainage plan for the collection, transport, treatment, discharge, and/or recycle of water prepared in accordance with applicable City codes and standards. The drainage plan should consider on-site septic system disposal volumes where the additional volume will affect the erosion or landslide hazard area; - To be addressed by the project civil engineer.

C. **Monitoring Surface Waters.**

If the Director determines that there is a significant risk of damage to downstream receiving waters due to potential erosion from the site, based on the size of the project, the proximity to the receiving waters, or the sensitivity of the receiving waters, the technical information shall include a plan to monitor the surface water discharge from the site. - To be addressed by the project civil engineer.

LUC 20.25H.140 Critical areas report – Additional provisions for landslide hazards and steep slopes.

In addition to the provisions of LUC 20.25H.230, any proposal to modify a landslide hazard or steep slope or associated critical area buffer through a critical areas report shall comply with the requirements of this section.

A. **Limitation on Modification.**

The provisions for coal mine hazard areas in LUC 20.25H.130 may not be modified through a critical areas report. - Not applicable in this case.

B. **Area Addressed in Critical Area Report.**

In addition to the general requirements of LUC 20.25H.230, the following areas shall be addressed in a critical areas report for geologically hazardous areas:

1. Site and Construction Plans. The report shall include a copy of the site plans for the proposal and a topographic survey; - Please see Figures 2, Site and Exploration Plan, in this report.

2. Assessment of Geological Characteristics. The report shall include an assessment of the geologic characteristics of the soils, sediments, and/or rock of the project area and potentially affected adjacent properties, and a review of the site history regarding landslides, erosion, and prior grading. Soils analysis shall be accomplished in accordance with accepted classification systems in use in the region; - Please see Section 4.0, Site Geology and Subsurface Conditions, in this report.

3. Analysis of Proposal. The report shall contain a hazards analysis including a detailed description of the project, its relationship to the geologic hazard(s), and its potential impact upon the hazard area, the subject property, and affected adjacent properties; and - Please see Section 5.0, Geologic Hazards Assessment, in this report.

4. Minimum Critical Area Buffer and Building Setback. The report shall make a recommendation for a minimum geologic hazard critical area buffer, if any, and minimum building setback, if any, from any geologic hazard based upon the geotechnical analysis. - This proposal intends to request a modification to the standard building setback. In our opinion, the proposed addition may be constructed within the steep slope setback with proper engineering support after the slope improvements. Please see Summary and Qualifications (page 9) in Section 5.1.2 in this report.

LUC 20.25H.145 Critical areas report – Approval of modification.

Modifications to geologic hazard critical areas and critical area buffers shall only be approved if the Director determines that the modification:

A. Will not increase the threat of the geological hazard to adjacent properties over conditions that would exist if the provisions of this part were not modified; - The proposed improvements will not increase the threat of the site geological hazards to adjacent properties.

B. Will not adversely impact other critical areas; - The proposed improvements will not have adversely impacts on the other critical areas.

C. Is designed so that the hazard to the project is eliminated or mitigated to a level equal to or less than would exist if the provisions of this part were not modified; - Based on our study, the proposed improvements will mitigate the site geologic hazards to a level equal to or less than the existing conditions.

D. Is certified as safe as designed and under anticipated conditions by a qualified engineer or geologist, licensed in the state of Washington; - The geologic hazards and geotechnical elements of the project were evaluated by a qualified civil engineer licensed in the State of Washington.

E. The applicant provides a geotechnical report prepared by a qualified professional demonstrating that modification of the critical area or critical area buffer will have no adverse impacts on stability of any adjacent slopes, and will not impact stability of any existing structures. Geotechnical reporting standards shall comply with requirements developed by the Director in City of Bellevue Submittal Requirements Sheet 25, Geotechnical Report and Stability Analysis Requirements, now or as hereafter amended; - The geotechnical report was prepared by a qualified engineer in general accordance with the City of Bellevue's submittal requirements.

F. Any modification complies with recommendations of the geotechnical support with respect to best management practices, construction techniques or other recommendations; and - The geotechnical elements of the proposed project should be constructed in general accordance with the recommendations contained in this geotechnical report.

G. The proposed modification to the critical area or critical area buffer with any associated mitigation does not significantly impact habitat associated with species of local importance, or such habitat that could reasonably be expected to exist during the

anticipated life of the development proposal if the area were regulated under this part.
- To be addressed by the others.

Review Comment #6: Soft stabilization measures must be explored as part of the proposal prior to hard stabilization.

According to the City of Bellevue LUC 20.25E.080.F, Soft Shoreline Stabilization combines a range of bioengineered actions, beach enhancement, anchor trees, large rocks, gravel placement, shoreline plantings, and similar measures that use natural materials engineered to provide shoreline stabilization while preserving or mimicking important shoreline ecological functions.

In our opinion, the soft stabilization measures described above are not applicable to this steep slope improvements. The soft stabilization measures are relatively shallow and unbale to prevent the potential deep-seated landslide. As a result, we recommend that hard stabilization measures (i.e. soldier pile shoring walls) should be used to stabilize the existing steep slope.

APPENDIX B:
STORM DRAINAGE REPORT
LPD ENGINEERING, FEBRUARY 12, 2021

Drollinger Residence

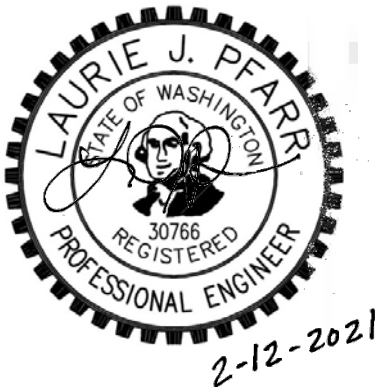
1250 West Lake Sammamish Parkway NE

Bellevue, WA 98008

Storm Drainage Report

February 12, 2021

The information contained in this report was prepared by and under the direct supervision of the undersigned:



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DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PARKWAY NE
STORM DRAINAGE REPORT

TABLE OF CONTENTS

PROJECT OVERVIEW 1
MINIMUM REQUIREMENTS 2
OFFSITE ANALYSIS 5
PERMANENT STORMWATER CONTROL PLAN 6
CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (SWPPP) 9

FIGURES

Figure 1: Vicinity Map

Figure 2: Soils Map

Figure 3: Existing Impervious Coverage & Conditions

Figure 4: Downstream Drainage Map

Figure 5: Proposed Conditions

APPENDICES

Appendix A – Design Drawings

Appendix B – Design Calculations and Supporting Information

Appendix C – Stormwater Pollution Prevention Plan (SWPPP) Narrative

Appendix D – Geotechnical Report

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PARKWAY NE
STORM DRAINAGE REPORT
FEBRUARY 12, 2021

PROJECT OVERVIEW

General Project Description

The following Stormwater Drainage Report is for proposed improvements Drollinger Residence. The project is located at 1250 W Lake Sammamish Parkway NE in Bellevue, Washington. The project site is located in Section 30, Township 25 North, Range 6 East, Willamette Meridian. Refer to Figure 1 - Vicinity Map for site location. The proposed project includes a partial renovation of the existing residence, as well as added above-ground parking spaces, underground storage area, shoring wall, and a stair connection between access streets.

This storm drainage report addresses the requirements of the Department of Ecology's *2012 Stormwater Management Manual for Western Washington as amended in December 2014 (2014 SWMMWW)* as adopted by the City of Bellevue, as well as the City of Bellevue's *2021 Surface Water Engineering Standards (SWES)*. Refer to the Minimum Requirements section of this report for the project classification and the minimum requirements that are applicable to the project area.

Existing Conditions

The property is located on parcel #7430500270 which totals approximately 0.31 acres. The site currently contains a single-family residence, with a shared driveway at the northwest corner of the site. According to the City of Bellevue Zoning Map and the King County Assessor's report, the site is zoned R-2.5, Single-Family Residential. Existing development on the property consists of a 2-story single-family residence and a concrete driveway. Additionally, there is an existing rockery with a concrete stairway located to the northeast of the residence. The property is bounded by single-family residences to the southwest and northeast, NE Rosemont Place to the west, and Lake Sammamish to the east.

Topographically, the northwest region of the property encompasses a portion of N Rosemont, which is topographically 30-40 feet higher than the access drive at NE Rosemont Place. A vegetated steep slope is in-between with a grade of approximately 54%. NE Rosemont Place slopes from west to east at around 10-14%. The access driveway to the existing residence falls at an approximate 20% grade down to the garage entrance. Beyond the house structure, the topography continues to slope down from north to south toward Lake Sammamish at grade of 7-11%.

Per the USDA geological map data, the site is underlain with Alderwood and Kitsap soils, very steep (AkF). A geotechnical report was performed by PanGEO, Inc., dated October 26, 2020, attached in Appendix D of this report for reference. It asserts that underlying soils consist of medium dense fill and colluvium overlying medium dense to very dense alluvium sand and pre-Fraser deposits. According to the City of Bellevue infiltration mapping, the site resides in an area infeasible for infiltration.

The City of Bellevue designates the site within the Rosemont Drainage Basin. There is an existing 18-inch storm line (within an easement) running along the northeast property line. Drainage from the project in the existing and proposed conditions connect to this storm line. The 18-inch storm pipe conveys water to the southeast, directly discharging to Lake Sammamish.

Based upon City of Bellevue GIS Maps, the project is located within several critical areas including Steep Slope and Liquefaction ECAs. The entire site is mapped as a Liquefaction Hazard Area, and according to the survey, a relatively expansive Steep Slope Area is located in the western region of the property just beyond the existing residence. Other designated critical areas include an Erosion Hazard Area across the full span of the parcel. According to the Washington State Department of Ecology flood hazard maps, the southeast portion of the parcel is located within a Floodway or 100-year Floodplain. The project will take place entirely outside of the flood hazard area.

Proposed Conditions

The proposed project will include the renovation of the existing single-family residence at the north end of the building, which will include new roof surfacing. A new above ground parking area is proposed north of the building adjacent to the existing three-car garage with underground storage space. A parking area will be created north of N Rosemont, which is within the owner's property and will include various retaining walls to mitigate the slopes. Other improvements include the installation of a shoring wall to replace an existing concrete wall at the upper slope adjacent to NE Rosemont Place. A stairway will be constructed to provide pedestrian access from NE Rosemont Place to N Rosemont.

On-site stormwater management will be provided via Post Construction Soil Quality and Depth for proposed landscaped areas, as well as permeable pavement in the form of GrassPave for the parking areas. Flow control and water quality do not apply to this project, as the project is only subject to Minimum Requirements #1-5.

MINIMUM REQUIREMENTS

Per the previous discussion, the site is considered "Redevelopment" if there is more than 35% of existing impervious coverage. The existing impervious surface coverage for the entire property was determined to be approximately 42.0%; refer to Figure 3 – Existing Conditions & Impervious Coverage. Therefore, the project is considered "Redevelopment" and minimum requirements will be dictated by Figure 1.5 of the 2021 City of Bellevue Surface Water Engineering Standards, which is shown below. The project will involve greater than 2,000 square feet of new plus replaced hard surface, but less than 5,000 square feet of new hard surfaces (no converted vegetation areas). The project is not road-related and involves less than 5,000 square feet of new plus replaced hard surfaces. Therefore, based upon Figure 1.5 of the 2021 City of Bellevue SWES, minimum requirements (MR1-MR5) will apply to **new plus replaced hard surfaces** and **converted vegetation areas** for the project area.

Figure 1.5 of the City of Bellevue's 2021 Storm and Surface Water Engineering Standards

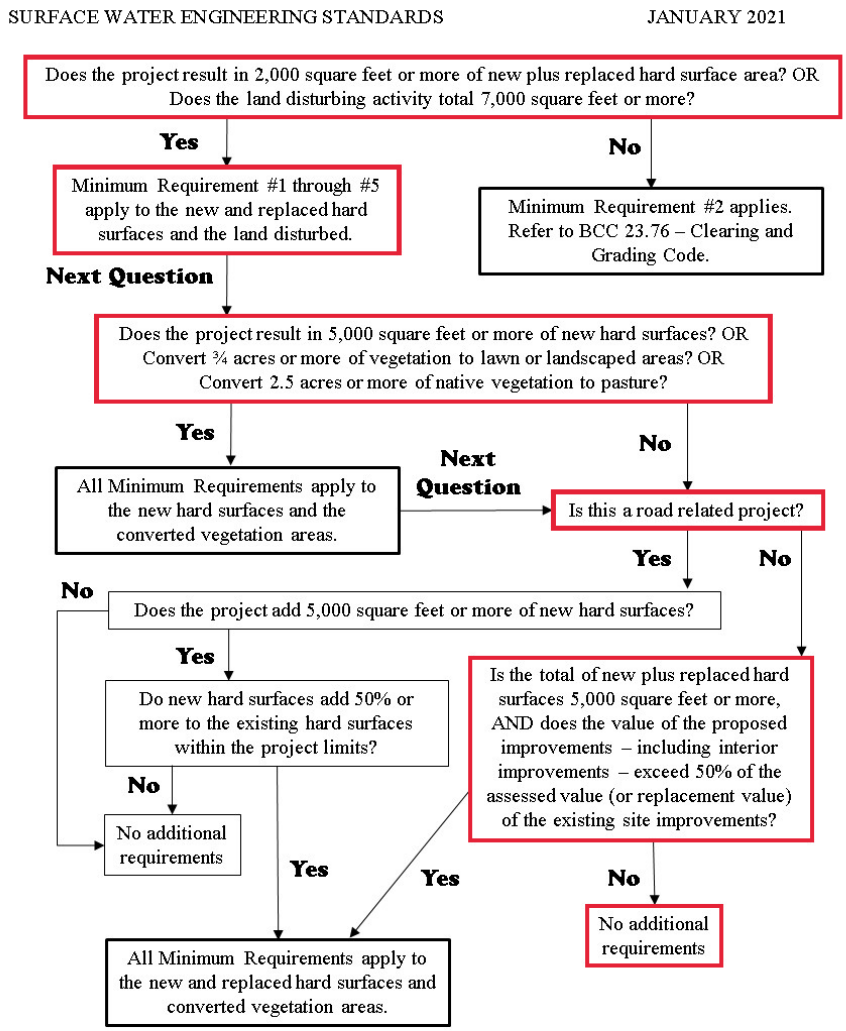


Figure 1.5 – Flow Chart for Determining Minimum Requirements for Redevelopment Projects

Source: Adapted from Figure 2.4.2 of Volume I of the DOE Manual.

Below is a description of each of the minimum requirements for the project and how this project addresses them:

Minimum Requirement #1 – Preparation of Stormwater Site Plans (MR1): This document is the Stormwater Site Plan. It outlines the existing and proposed site and drainage conditions, describes the flow control systems, and presents the stormwater analysis.

Minimum Requirement #2 – Construction Stormwater Pollution Prevention Plan (SWPPP) (MR2): The construction SWPPP narrative is included as Appendix C of this report.

Minimum Requirement #3 – Source Control of Pollution (MR3): In the proposed conditions, applicable activities matching those listed within Volume IV of the 2014 DOE Manual that will require the use of source control measures.

- S417 BMPs for Maintenance of Stormwater Drainage and Treatment Systems.

Minimum Requirement #4 – Preservation of Natural Drainage Systems and Outfalls (MR4): The proposed conditions will not alter the general drainage path. Currently, stormwater runoff is conveyed via the 18-inch system along the northeast boundary line. The proposed drainage system will continue to route stormwater to this system, discharging to Lake Sammamish. Refer to the Offsite Analysis section of this report for a description of the existing discharge point and the Permanent Stormwater Control Plan section of this report for the proposed drainage system description.

Minimum Requirement #5 – On-Site Stormwater Management (MR5): BMPs from List #1 were evaluated for each surface to determine the feasibility. This project will utilize compost amended soils for the disturbed pervious areas, as well as permeable pavement (GrassPave) for the various parking areas. Refer to the Permanent Stormwater Control Plan section of this report for the detailed feasibility evaluation of the on-site stormwater management BMPs.

OFFSITE ANALYSIS

Task 1 – Define and Map Study Area

The topographical field survey was supplemented by City of Bellevue GIS drainage information, aerial mapping, and the King County iMap to further define and map the study area in order to prepare the offsite analysis.

Task 2 – Information Review

Surveyed information on stormwater indicates that there is a catch basin along N Rosemont in the upper portion of the site that connects to a catch basin in lower portion of the site with another catch basin along the direct route to Lake Sammamish southeast of the site. As previously indicated, the site is within the Rosemont drainage basin. Based upon King County iMap and City of Bellevue GIS, there are several environmentally sensitive areas in or near the project site. These include an Infiltration Infeasible Area, a Steep Slope Area, and a Liquefaction Prone Area. According to the Washington State Department of Ecology flood hazard maps, the southeast portion of the project parcel is located within a Floodway or 100-year Floodplain.

Task 3 – Field Inspection

The project area consists of an existing home, shared concrete driveway, landscaping, a concrete wall, rockeries, and a concrete stairway in poor condition. The vegetated steep slope between N Rosemont and NE Rosemont Place is also within the project area.

Upstream Basin

There are various areas upstream of the project area, such as driveways to the southwest, the vegetated steep slope, and some road area on N Rosemont. Drainage modifications will be made to collect stormwater and route it to the appropriate existing systems. Flow control and water quality

are not required on this project, so upstream areas will not affect any stormwater modeling calculations.

Task 4 – Drainage System Description and Problem Descriptions

The downstream drainage path was determined based on City of Bellevue GIS storm drainage maps and the site survey. The northwest area (upper end) of the parcel sheet flows to a catch basin along N Rosemont. From this catch basin, the downstream path is as follows:

1. Stormwater is conveyed with an 18-inch storm pipe down the steep slope. This pipe is located within the site property, but it located within an easement.
2. After approximately 110 feet, the piped system comes to a catch basin within the existing access driveway to the residence. Coming into this catch basin is a 12-inch storm pipe from the southwest, to which proposed drainage will connect to.
3. The 18-inch system continues to the southeast, along the northeast property line and discharges into Lake Sammamish.

Refer to Figure 4 – Downstream Drainage Map for a visual representation of the downstream drainage path. There are no known issues with the downstream path at this time.

PERMANENT STORMWATER CONTROL PLAN

The project proposes approximately 3,507 SF (0.081 acres) of new plus replaced hard surface. The following table shows a breakdown of the proposed hard surfaces. Refer to **Figure 5 - Proposed Conditions**, for a layout of the proposed project areas.

Table 1 – New Plus Replaced Hard Surfaces

	Square Feet	Acres
Roof	1,293	0.030
Concrete Parking/Driveway (PGHS)	1,024	0.024
GrassPave (PGHS)	795	0.018
Stairs/Walls	395	0.009
Total New Plus Replaced Hard Surface	**3,507**	**0.081**

Pre-developed Site Hydrology

Refer to the offsite analysis section of this report for a detailed description of the existing drainage conditions. In general, stormwater from the site is generally collected via piped systems and is routed to an 18-inch piped system along the northeast property line of the project site. The 18-inch system discharges into Lake Sammamish to the southeast of the home.

Proposed Site Hydrology

In the proposed conditions, stormwater runoff from the parking area adjacent to the house will be collected with a yard drain and connect to the existing 18-inch system along the property line. The new parking area adjacent to the slope will be collected via catch basins and also routed to the 18-

inch system. The 18-inch system to Lake Sammamish will continue to be utilized, and therefore there is no altering of the downstream drainage course from the proposed conditions.

On-Site Stormwater Management (MR #5)

On-site stormwater management will be required in compliance with section D1-04.2(e) of the 2020 COB SWES. This project will use the On-Site List Approach for selecting the appropriate Best Management Practices (BMPs) per section D5-03.3.1 of the SWES. The following lists two multi-step processes, one for evaluating infiltration feasibility and the other for determining applicable on-site stormwater management BMPs.

<u>Infiltration Feasibility (per Appendix D-11 of SSWES)</u>

- *Step 1:* Review the City of Bellevue Infiltration Potential Map

  In regards to infiltration, the City of Bellevue Infiltration Potential Map was reviewed. Based on this map, the site is within an area designated as "Infeasible for Infiltration without additional study".

<u>On-site Stormwater Management BMPs (per section D5-03.3.1 of SSWES)</u>

- *Step 1 – Determine if Dispersion and Infiltration are Feasible*

  As mentioned, infiltration is infeasible for this site based on the City of Belleuve's Infiltration Potential map.

- *Step 2 – Calculate Areas by Surface Type*

  The various areas have been delineated and are shown on the attached Figure 5 – Proposed Conditions.

- *Step 3 – Identify the Applicable On-site List*

  This project is required to comply with minimum requirements #1-5, and therefore List #1 shall be used for the selection of on-site stormwater management BMPs.

- *Step 4 – Evaluate BMPs for Each Surface Type in Order*

  All new lawn/grass areas shall be subject to BMP T5.13, Post-Construction Soil Quality and Depth. Establishing the amended soil section will help these areas maintain stormwater functions and minimize the need for landscaping chemicals, thus reducing pollution.

  The various environmental critical areas do not allow for infiltration or dispersion BMPs. Bioretention is infeasible, due to the lack of siting area and inability to meet horizontal setbacks. Permeable pavement, in the form of GrassPave, will be utilized for both parking areas. GrassPave is a porous paver that appears as grass, but has a ring-on-grid structure beneath that is able to withstand heavy-weight vehicular traffic.

The following table steps through each on-site stormwater management BMP in List #1 and whether it will feasible for this project.

Table 2 – On-Site Stormwater Management List Method BMP Evaluation

BMP	Feasibility	Explanation
Lawn/Landscaped Areas		
Post-Construction Soil Quality and Depth	Yes	Post-Construction Soil Quality and Depth per BMP T5.13 will be utilized for all disturbed pervious areas.
Roofs		
Full Dispersion	No	A 65 to 10 ratio of forested or native vegetation area to impervious area cannot be achieved.
Bioretention	No	Infiltration in feasible. Additionally, the project is within a variety of environmental critical areas and steep slope area.
Downspout Dispersion Systems	No	There is not available vegetated flow path area for the north region of the building renovation. The only vegetated open space would be northwest of the building, but this area does not provide positive drainage and is the space for the new parking space, which is a component of this project.
Perforated Stub-Out Connections	No	The proposed renovation of the building is surrounded by impervious surface, and thus perforated-stub out connections would not be feasible. Additionally, the project is within a variety of environmental critical areas and steep slope area.
Other Hard Surfaces		
Full Dispersion	No	A 65 to 10 ratio of forested or native vegetation area to impervious area cannot be achieved.
Permeable Pavement	Yes	The proposed parking area north of NE Rosemont Place will consist of GrassPave pavers, which does classify as permeable pavement. The stairs cannot be permeable pavement because the slopes of the pavement will exceed 5%. The additional parking area is adjacent to the existing structure.
Bioretention	No	Infiltration in feasible. Additionally, the project is within a variety of environmental critical areas and steep slope area.
Sheet Flow Dispersion	No	The new parking area does not have sufficient adjacent vegetated flow path available. The proposed stairway does not have a positive drainage path and it is on a steep slope. The proposed GrassPave does not have adjacent vegetated areas and the area to the north is separated by the proposed wall.

Conveyance System Analysis and Design

An analysis of the onsite conveyance system was performed for the 4-inch discharge pipe located to the northwest of the residential building (pipe run #1) and the 6-inch discharge pipe located on N Rosemont (pipe run #2). Refer to the Conveyance Analysis Spreadsheet in Appendix B. The proposed systems were analyzed to convey the 25-year peak flow and the 100-year peak flow as a conservative measure. The peak flows were determined using MGS Flood with 15-minute time steps. This was compared to the full flow capacity of the conveyance pipe, which was determined using Manning's Equation.

For pipe run #1, the tributary area will be limited to the GrassPave and concrete parking area adjacent to the residence. The full-flow capacity per Manning's Equation for the 4-inch pipe (n=0.011) at a minimum 2.0% slope (actual slope will be much steeper) is 0.32 cubic feet per second (cfs). The 25-year and 100-year peak flows from MGS Flood were determined to be 0.007 cfs and 0.010 cfs, respectively. Based on comparing these peak flows to the full-flow capacity, this pipe will have adequate conveyance capacity.

For pipe run #2, the 6-inch pipe connection at the upper portion near North Rosemont is being evaluated. The proposed catch basin will capture flow from the street and various landscape areas and route to the 18-inch system down the steep slope. The full-flow capacity per Manning's Equation for the 6-inch pipe (n=0.011) at a 9.6% slope is 2.06 cubic feet per second (cfs). The 25-year and 100-year peak flows from MGS Flood were determined to be 0.015 cfs and 0.026 cfs, respectively. Therefore, the conveyance capacity for this pipe is sufficient.

CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A construction SWPPP narrative for the project has been included in Appendix C, based on requirements from Volume II of the 2014 DOE Stormwater Management Manual requirements. The TESC plan can be found in Appendix A. TESC elements in the project include the following:

- Triangular Silt Dike, per BMP C208
- Catch Basin Insert, per BMP C220
- Silt Fence, per BMP C233
- Tree Protection Fencing
- Temporary Sediment Settling Tank

The TESC elements shown are intended to be the minimum allowable. The NPDES permit will require periodic inspection of the TESC elements to confirm they are holding up and continuing to function as intended. During construction, the contractor is responsible for upgrading these facilities as necessary. The implementation of the TESC plan and construction maintenance, replacement, and upgrading of the TESC facilities are the responsibility of the contractor, per the contract documents. The TESC facilities will be constructed prior to and in conjunction with all clearing and grading activity and in a manner in which sediment or sediment laden water does not leave the project site, enter the drainage system, or violate applicable water quality standards.

FIGURES

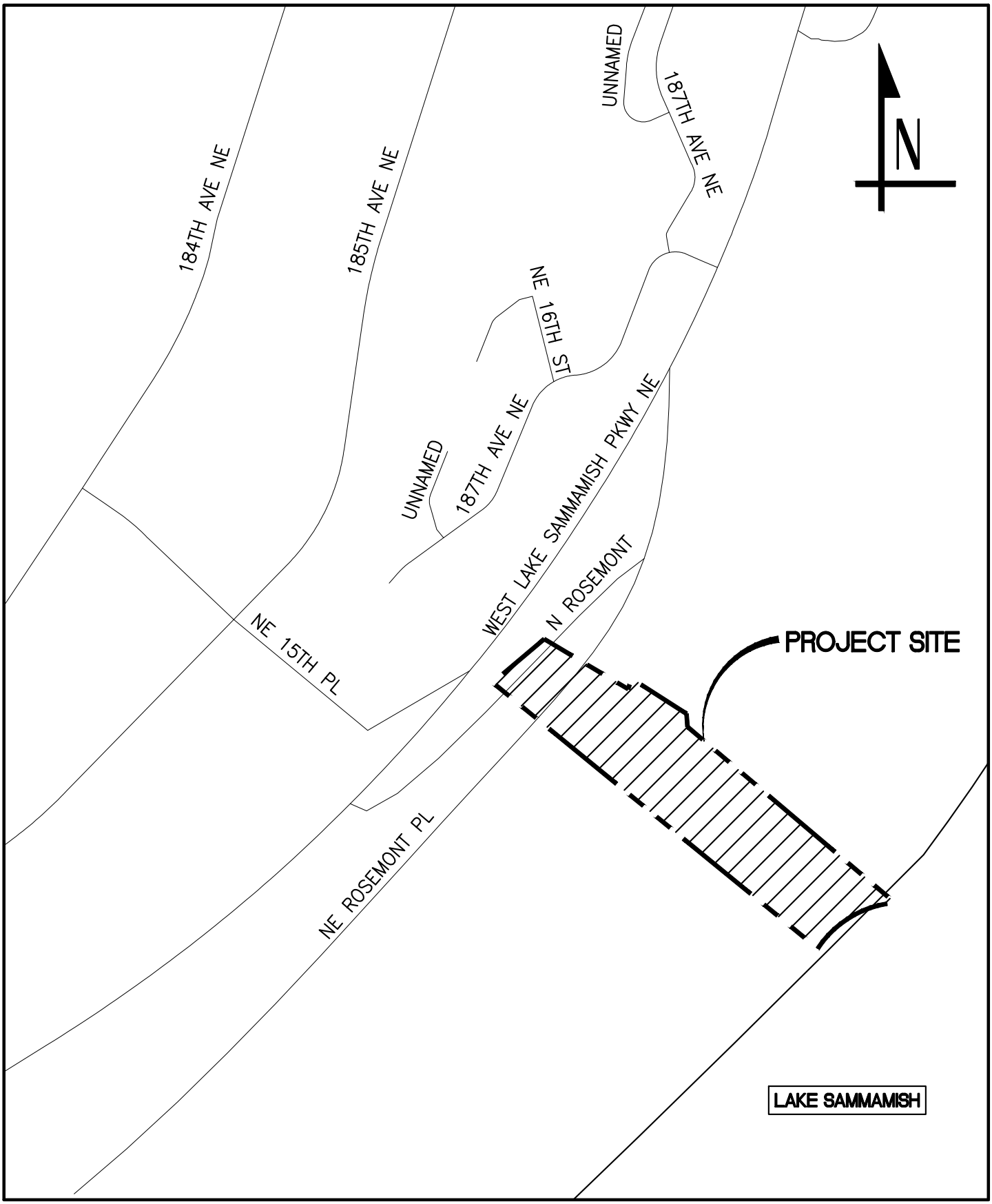
Figure 1: Vicinity Map

Figure 2: Soils Map

Figure 3: Existing Conditions & Impervious Coverage

Figure 4: Downstream Drainage Map

Figure 5: Proposed Conditions



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DESCRIPTION

FEBRUARY 12, 2021

VICINITY MAP

FIGURE

1

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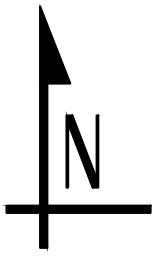

KING COUNTY AREA, WASHINGTON (WA633)

MAP UNIT SYMBOL	MAP UNIT NAME
AkF	Alderwood and Kitsap soils, very steep
W	Water

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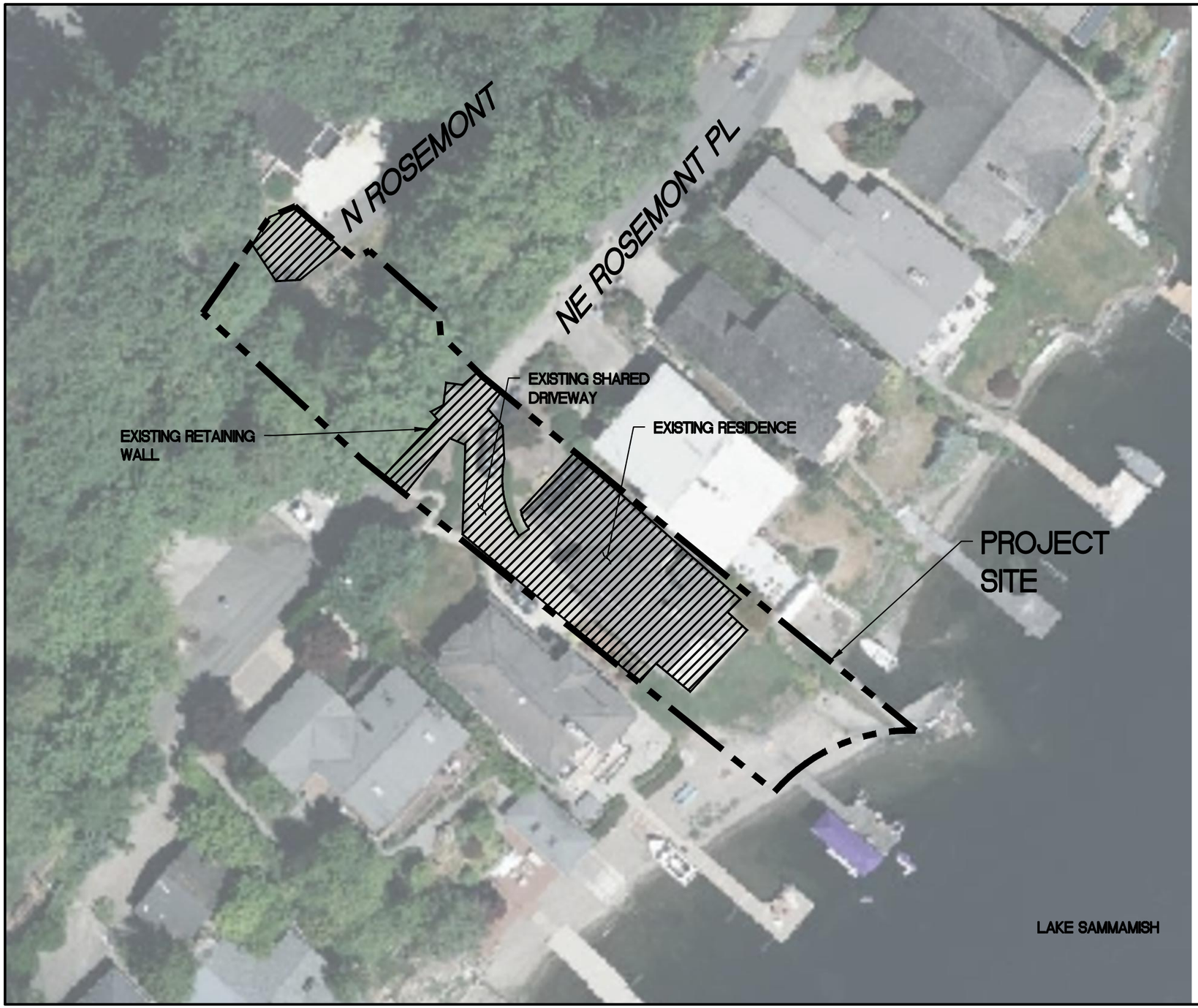
FEBRUARY 12, 2021

SOILS MAP

FIGURE

2



N

0 20 40

Scale 1"=40'

EXISTING IMPERVIOUS AREA	
Existing Impervious	0.131 AC
Total Property Area	0.312 AC
Percentage of Site Impervious	42.0%

DROLLINGER RESIDENCE

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DESCRIPTION

FEBRUARY 12, 2021

EXISTING IMPERVIOUS COVERAGE & CONDITIONS

FIGURE

3

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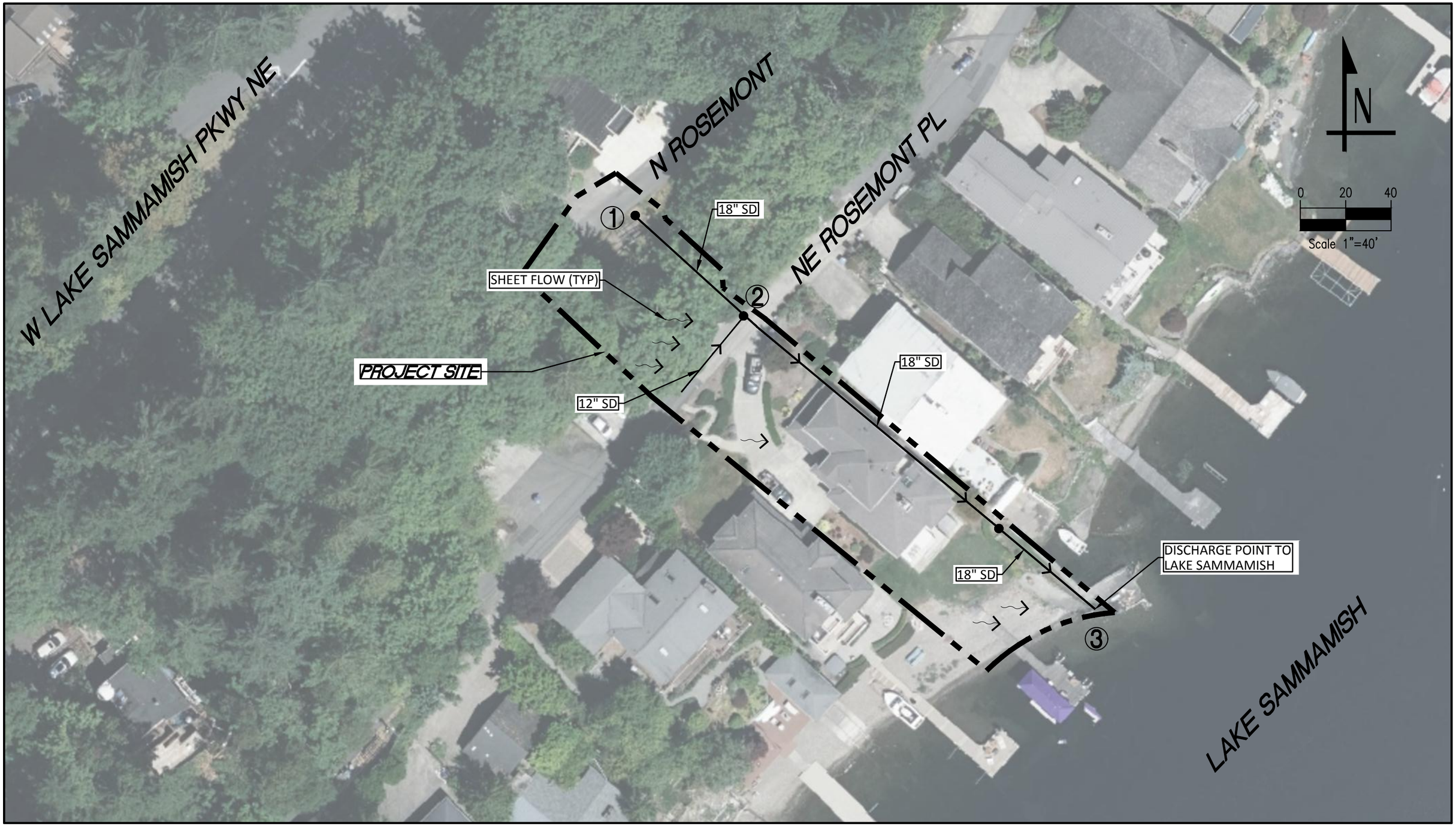

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DESCRIPTION

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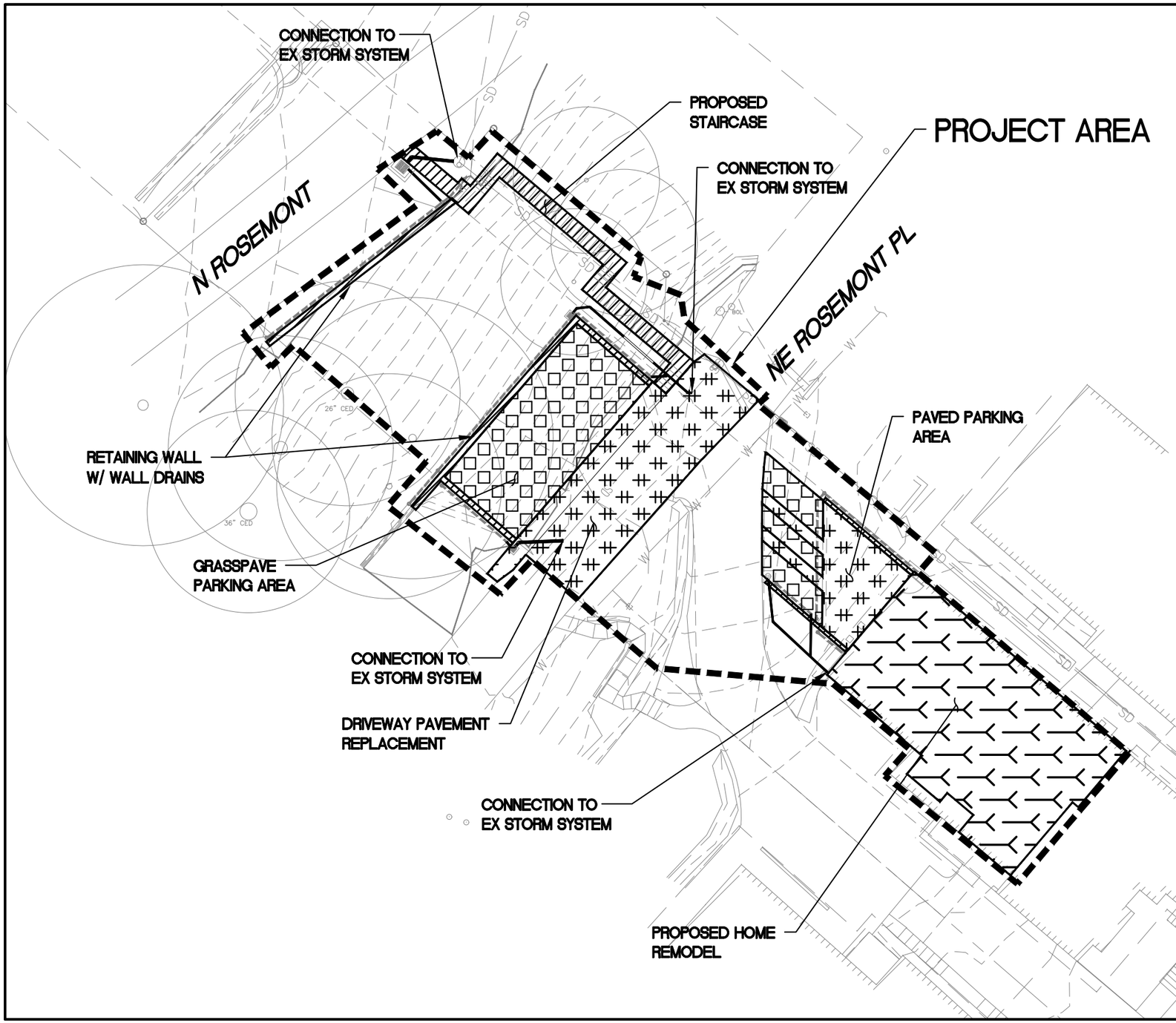
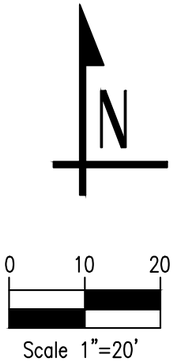
DOWNSTREAM DRAINAGE MAP

FIGURE

4





Hard Surface Summary

BUILDING ROOF	1,293 SF (0.030 AC)
CONCRETE PARKING/DRIVEWAY (PGHS)	1,024 SF (0.024 AC)
GRASSPAVE (PGHS)	795 SF (0.018 AC)
STAIRS/WALLS	395 SF (0.009 AC)
TOTAL NEW PLUS REPLACED HARD SURFACE	3,507 SF (0.081 AC)

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DROLLINGER RESIDENCE

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LPD engineering pllc
1932 1st Ave,
Suite 201,
Seattle, WA 98101
p. 206.725.1211
f. 206.973.5344
www.lpdengineering.com

DESCRIPTION

PROPOSED CONDITIONS

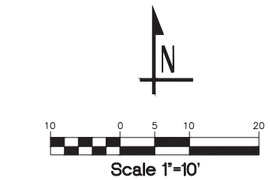
FEBRUARY 12, 2021

FIGURE

5

APPENDIX A

Design Drawings



LEGEND

- PROPERTY LINE
- EX CONTOUR (INDEX)
- EX CONTOUR
- EX BUILDING
- PROPOSED BUILDING OUTLINE
- BUILDING/STRUCTURE REMOVAL
- SAWCUT LINE
- ASPHALT REMOVAL
- CONCRETE REMOVAL
- STABILIZED CONSTRUCTION ENTRANCE
- CONSTRUCTION FENCING
- SILT FENCE
- TRIANGULAR SILT DIKE
- TEMP FORCE MAIN
- EX TREE TO REMAIN
- EX TREE TO BE REMOVED
- TREE PROTECTION
- EX CURB TO BE REMOVED
- EX UTILITY TO BE REMOVED
- INLET PROTECTION
- LIMITS OF WORK

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

LAURIE J. PEARK
STATE OF WASHINGTON
30766
REGISTERED
PROFESSIONAL ENGINEER
2-12-2021

IPD engineering pllc
1932 First Ave
Suite 201
Seattle, WA 98101
p. 206.725.1211
f. 206.973.5344
www.ipdengineering.com

DATE: 02/12/2021

PERMIT SET

TESC AND DEMOLITION PLAN

C1.0

811
Know what's below.
Call two business days before you dig.

CITY OF BELLEVUE APPROVAL STAMP

CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

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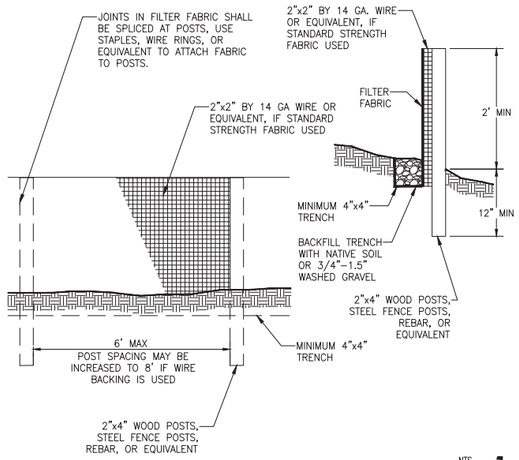

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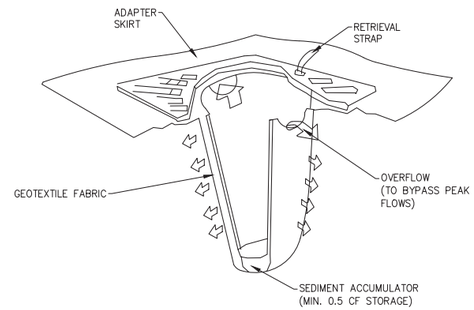
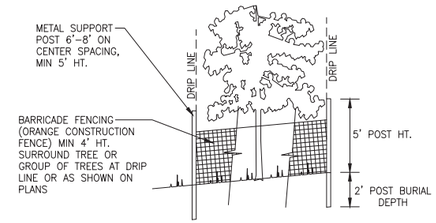


SCHEMATIC DETAIL

PROVIDE "STREAMGUARD SEDIMENT CATCH BASIN INSERT" OR APPROVED EQUAL
MANUFACTURER'S NAME: BOWHEAD ENVIRONMENTAL & SAFETY
ADDRESS: P.O. BOX 375 PRESTON, WA 98050
TELEPHONE: FOR INFORMATION: (800) 909-3677
WWW.SHOPBOWHEAD.COM

NTS
INLET PROTECTION 2



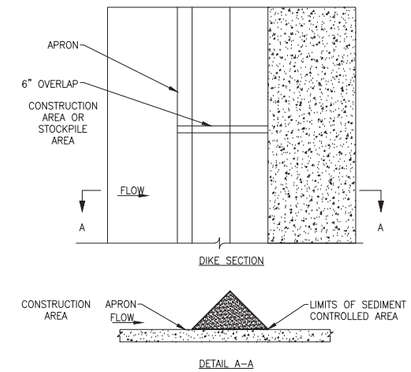
NOTES:

1. A 4 FOOT HIGH TEMPORARY FENCE MUST BE PLACED AT THE DRIP LINE OF TREES PRIOR TO THE COMMENCEMENT OF CLEARING OR EARTHWORK. NOTIFY THE CLEARING AND GRADING INSPECTOR TO GET BOTH THE INSPECTION AND WRITTEN APPROVAL OF FLAGGED TREES AND TEMPORARY PROTECTION FENCING AROUND TREES TO BE SAVED PER THE APPROVED CLEARING AND GRADING PLAN.

2. NO STOCKPILING OF MATERIAL AND NO VEHICULAR TRAFFIC ARE ALLOWED WITHIN THE LIMITS OF THE DRIPLINE, THE TEMPORARY FENCING, UNLESS APPROVED BY THE ARBORIST. FILLING, EXCAVATION, AND CLEARING MUST BE ACCOMPLISHED BY HAND METHODS ONLY UNLESS APPROVED BY ARBORIST.

3. ROOTS OF TREES TO BE SAVED WHICH ARE DAMAGED DURING CONSTRUCTION MUST BE TREATED IN THE FOLLOWING WAY: FOR DAMAGED ROOTS OVER 1" IN DIAMETER, MAKE A CLEAN, STRAIGHT CUT TO REMOVE THE DAMAGED PORTION OF THE ROOT ALL EXPOSED ROOTS WILL BE TEMPORARILY COVERED WITH DAMP BURLAP OR WOOD SHAVINGS TO PREVENT DRYING AND COVERED WITH EARTH AS SOON AS POSSIBLE.

NTS
TREE PROTECTION FENCING 3



NOTE:
IF THE SURFACE AREA IS CONCRETE, ADHESIVES SUCH AS LIQUID NAIL OR SAND BAGS SHALL BE USED. IF IT IS AN ASPHALT SURFACE, A RUBBERIZED ASPHALT EMULSION CAN BE USED. THE TACKING AGENT MUST BE APPLIED UNDER THE FULL LENGTH OF THE BARRIER SECTION AND THE APRON.

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TRIANGULAR SILT DIKE 4

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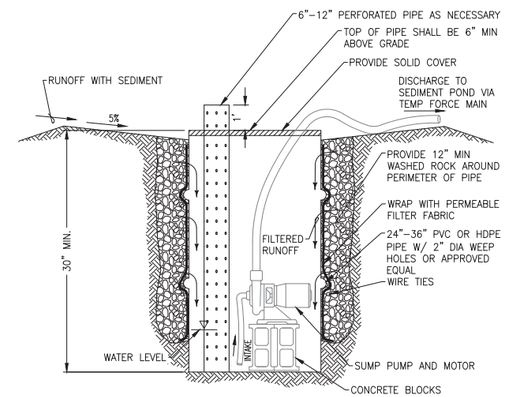

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TEMPORARY SUMP AND PUMP 8

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CITY OF BELLEVUE APPROVAL STAMP

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CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

DROLLINGER RESIDENCE
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DATE: 02/12/2021

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TESC AND DEMOLITION DETAILS

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GENERAL NOTES

1. EXISTING CONDITIONS:

   A. CONTACT ALL NECESSARY UTILITY PURVEYORS TO COORDINATE UTILITY CUTOFFS AND REMOVALS. VERIFY THAT ALL APPROPRIATE SERVICES HAVE BEEN DISCONNECTED.

   B. CONFORM TO LOCAL GOVERNING REQUIREMENTS REGARDING NOISE CONTROL.

   C. MAINTAIN SAFE VEHICULAR AND PEDESTRIAN TRAFFIC ROUTES:

2. ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, ALLEYS, SIDEWALKS, AND ADJACENT FACILITIES.

3. DO NOT CLOSE OR OBSTRUCT STREETS, FIRE LANES, SIDEWALKS, ALLEYS OR PASSAGEWAYS WITHOUT PERMISSION FROM AUTHORITIES HAVING JURISDICTION.

4. IF REQUIRED BY GOVERNING AUTHORITIES, PROVIDE ALTERNATE ROUTES AROUND CLOSED OR OBSTRUCTED TRAFFIC WAYS.

   A. VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES AT POINTS OF CONNECTION PRIOR TO COMMENCING WORK ON NEW UTILITY THAT IS TO BE CONNECTED TO THE EXISTING UTILITY. COORDINATE WITH OWNER'S REPRESENTATIVE IF ACTUAL CONDITIONS ARE AT VARIANCE WITH PLANS.

   B. VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES SUFFICIENTLY IN ADVANCE OF CONSTRUCTION TO ALLOW FOR COORDINATION AND MITIGATION OF CONFLICTS WITHOUT DOWN TIME.

5. DIMENSIONS AND LAYOUTS:

   A. THE CONTRACTOR IS RESPONSIBLE FOR PRESERVING ALL BENCHMARKS AND STAKES AND IS REQUIRED TO REPLACE ANY STAKES OR BENCHMARKS THAT ARE DISPLACED OR MISSING.

   B. THE CONTRACTOR IS RESPONSIBLE FOR REVIEW OF ALL UTILITY PURVEYOR AND CITY RECORDS RELATIVE TO THE EXISTING UNDERGROUND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR AVOIDING DAMAGE TO THESE FACILITIES AND SHALL RESTORE ALL UTILITIES AT CONTRACTOR'S OWN EXPENSE. THE CONTRACTOR IS TO NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY IF UNDERGROUND UTILITIES NOT SHOWN ON RECORD DOCUMENTS ARE ENCOUNTERED.

   C. THE CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING, SETTING AND MARKING ALL LINE LOCATION STAKES. A QUALIFIED LAYOUT ENGINEER, SURVEYOR, OR TECHNICAL SPECIALIST MUST BE ASSIGNED TO THE CONTRACTOR'S CREW FOR THIS WORK AND SHALL BE ON SITE AT ALL TIMES WHEN WORK REQUIRING CONTROL IS BEING PERFORMED, TOGETHER WITH ALL NECESSARY EQUIPMENT, SUPPLIES AND INSTRUMENTS RELATED THERETO. THIS EQUIPMENT AND PERSONNEL MUST BE AVAILABLE, AT NO ADDITIONAL COST TO THE OWNER OR OWNER'S REPRESENTATIVE, FOR THE PURPOSE OF VERIFYING LAYOUT AND CERTIFYING THE ACCURACY OF WORK ON THE SITE.

6. REGULATORY REQUIREMENTS:

   A. COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND SAFETY REGULATIONS. IF THERE ARE ANY CONFLICTS AMONG REFERENCED STANDARDS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.

   B. OBTAIN ALL NECESSARY PERMITS.

7. SAFETY SYSTEMS:

   A. PROTECT ALL EXCAVATION IN EXCESS OF FOUR-FEET IN DEPTH WITH A SAFETY SYSTEM CONFORMING TO THE REFERENCED REQUIREMENTS.

   B. THE CONTRACTOR'S EXCAVATION SAFETY SYSTEM SHALL BE DESIGNED BY A QUALIFIED PERSON AND MEET THE REFERENCED REQUIREMENTS.

   C. ALL EXCAVATION NOT REQUIRING TRENCH SAFETY SYSTEMS SHALL ALSO MEET THE WISHA SAFETY STANDARDS AND CITY OF BELLEVUE REQUIREMENTS.

8. EXCAVATION:

   A. MATERIALS NOT DESIGNATED FOR SALVAGE SHALL BE BROKEN UP, LOADED, AND LEGALLY DISPOSED OF BY THE CONTRACTOR. CARE SHALL BE TAKEN REMOVING ITEMS TO ENSURE THAT DAMAGE DOES NOT OCCUR TO THE EXISTING TREES AND IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE. ALL REMOVALS SHALL BE ACCOMPLISHED BY MAKING A NEAT VERTICAL SAWCUT AT THE LIMITS OF REMOVAL. ALL CONCRETE WALK REMOVALS SHALL BE SAWCUT AT THE NEXT ADJACENT JOINT. ADJACENT MATERIALS DESIGNATED TO REMAIN THAT ARE DAMAGED BY THE CONTRACTOR DURING THE WORK SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.

   B. SPRINKLE EXCAVATED MATERIAL AND ACCESS ROADS AS NECESSARY TO LIMIT DUST TO THE LOWEST PRACTICABLE LEVEL. DO NOT USE WATER TO SUCH AN EXTENT AS TO CAUSE FLOODING, CONTAMINATED RUNOFF, OR ICING.

   C. IN THE EVENT THE CONTRACTOR ENCOUNTERS UTILITY LINES NOT SHOWN ON THE SITE PLAN OR OTHERWISE INDICATED TO BE SAVED, REMOVED, OR ABANDONED, THE LOCATION OF SUCH LINES SHALL BE MARKED IN THE FIELD AND THE OWNER'S REPRESENTATIVE NOTIFIED.

9. FILL MATERIALS:

   A. ALL MATERIAL WHICH IS PROPOSED TO BE USED AS FILL, BEDDING OR BACKFILL SHALL BE GRADED AND TESTED FOR MOISTURE CONTENT AND COMPACTABILITY. GRADATION AND TEST RESULTS SHALL BE SUBMITTED FOR REVIEW AND ACCEPTANCE BY THE OWNER'S REPRESENTATIVE PRIOR TO PLACEMENT OF FILL. SEE SPECIFICATIONS FOR INFORMATION AND RESTRICTIONS ON THE USE OF RECYCLED MATERIAL AS FILL.

   B. MATERIAL USED IN FILLING SHALL BE APPROPRIATE TO THE SITE AND THE INTENDED USE OF THAT PORTION OF THE SITE.

   C. TOPSOIL SHALL NOT BE USED AS A FILL MATERIAL.

   D. NO FROZEN OR THAWING MATERIAL SHALL BE USED IN A FILL.

   E. COMMON FILL MATERIAL SHALL CONSIST OF ON-SITE EXCAVATED SOILS FREE OF ORGANIC AND DELETERIOUS MATERIAL AND OF SUCH SIZE AND GRADATION THAT THE SPECIFIED COMPACTION CAN BE READILY ATTAINED. THE MOISTURE OF COMMON FILL MATERIAL AT THE TIME OF PLACEMENT SHALL BE WITHIN A RANGE OF ONE PERCENT ABOVE TO TWO PERCENT BELOW THE OPTIMUM MOISTURE CONTENT FOR COMPACTION.

   F. GRAVEL BORROW: PER SECTION 9-03.14(1) OF WSDOT.

   G. STRUCTURAL FILL SHALL BE NON-ORGANIC SOIL, ACCEPTABLE TO THE OWNER'S REPRESENTATIVE, PLACED IN MAXIMUM 8-INCH LOOSE LIFTS, WITH EACH LIFT BEING COMPACTED TO AT LEAST 95% OF THE MODIFIED PROCTOR MAXIMUM DENSITY USING ASTM:D 1557. STRUCTURAL FILL SHALL BE PLACED AND COMPACTED WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT.

10. COMPACTION:

    REQUIRED COMPACTION: COMPACT FILLS AND BACKFILLS TO THE FOLLOWING MINIMUM RELATIVE COMPACTION (PERCENTAGE OF MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH ASTM D1557).

LOCATIONS	REQUIRED MINIMUM RELATIVE COMPACTION
UTILITY TRENCHES:	95%
UNDER WALKS AND PAVING:	95%
AGAINST WALLS:	90%
PLANTING AND LANDSCAPE AREAS:	85%
OTHER:	95%

11. FIELD QUALITY CONTROL:

    A. THE OWNER'S TESTING AGENCY SHALL PERFORM TESTING. THE OWNER'S TESTING IS ONLY TO VERIFY CONFORMANCE WITH THE PROJECT PLANS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THAT THE WORK MEETS THE REQUIREMENTS OF THE SPECIFICATIONS AND THE CITY OF BELLEVUE.

NTS
GENERAL NOTES 5

CONSTRUCTION SEQUENCE

1. BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY, A PRE-CONSTRUCTION MEETING MUST BE HELD BETWEEN THE CITY OF BELLEVUE, THE APPLICANT, AND THE APPLICANT'S CONSTRUCTION REPRESENTATIVE.
2. VERIFY VERTICAL AND HORIZONTAL LOCATIONS OF ALL EXISTING UNDERGROUND UTILITIES. CONTACT ALL UTILITY COMPANIES THAT MAY BE AFFECTED BY THE PROPOSED CONSTRUCTION. THE ONE CALL CALL NUMBER IS 1-800-424-5555.
3. MAINTAIN & PROTECT EXISTING UTILITY SERVICES TO REMAIN, AS INDICATED ON THE PLANS, DURING CONSTRUCTION.
4. VERIFY GRADES PRIOR TO CONSTRUCTION. FLAG CLEARING LIMITS.
5. UTILIZE EXISTING PAVEMENT WHERE POSSIBLE FOR CONSTRUCTION ACCESS AND STAGING. INSTALL STABILIZED CONSTRUCTION ENTRANCES, SITE ACCESS ROUTES, CONSTRUCTION PADS AND LAYDOWN AREA AS NECESSARY TO STABILIZE SITE.
6. INSTALL REINFORCED SILT FENCE, TREE PROTECTION FENCE, COMPOST FILTER SOCKS AND OTHER TESC MEASURES AS INDICATED ON PLAN AND AS NECESSARY TO PREVENT EROSION AND STABILIZE SITE.
7. INSTALL DISCHARGE PIPES. PLUG CATCH BASINS (CB) AS NECESSARY. INSTALL CATCH BASIN INSERTS ON ALL EXISTING CB THAT COULD BE IMPACTED BY THE PROJECT .
8. REMOVE ASPHALT, GRAVEL, ROCKERY AND UTILITIES AS NOTED ON THE PLANS.
9. CLEAR & GRUB AREAS OF THE SITE TO BE ROUGH GRADED OR FILLED.
10. REMOVE UNSUITABLE BEARING MATERIAL AS IN DICTATED ON THE PLAN AND AS REQUIRED.
11. GRADE AND PLACE ACCEPTABLE FILL. AS SITEWORK PROGRESSES, MAINTAIN AND ADJUST AS NECESSARY.
12. INSTALL NEW STORM DRAINAGE SYSTEM AND CATCH BASIN INSERTS.
13. INSTALL UNDERGROUND UTILITIES.
14. CONSTRUCT PROPOSED SITE IMPROVEMENTS.
15. INSTALL AMENDED SOILS ON ALL DISTURBED SOILS NOT COVERED BY HARD SURFACE IN ACCORDANCE WITH THE CITY OF BELLEVUE BMP T5.13.
16. COMPLETE FINE GRADING AND FINAL STABILIZATION MEASURES INCLUDING LANDSCAPE INSTALLATION.
17. REMOVE EXCESS EXCAVATED MATERIALS, TRASH DEBRIS, AND WASTE MATERIALS. DISPOSE OF IN AN AUTHORIZED LOCATION.
18. CLEAN STORM DRAINAGE SYSTEM OF ALL SEDIMENT AND DEBRIS.
19. MAINTAIN TEMPORARY EROSION CONTROL FACILITIES UNTIL SITE IS COMPLETELY STABILIZED.

NTS
CONSTRUCTION SEQUENCE NOTES 2

CONSTRUCTION NOISE NOTES

1. CONSTRUCTION NOISE OUTSIDE THE ALLOWABLE HOURS IS PROHIBITED PER BCC 9.18.040. TO BE CONSIDERED A VIOLATION UNLESS UNLESS EXPANDED HOURS OF OPERATION ARE AUTHORIZED BY THE APPLICABLE DEPARTMENT DIRECTOR. THE CONSTRUCTION-RELATED NOISE MUST BE AUDIBLE ACROSS A PROPERTY LINE OR AT LEAST 75 FEET FROM THE SOURCE. ANY VIOLATION IS A CIVIL INFRACTION AND THE CITY MAY ASSESS A MONETARY PENALTY TO THE INDIVIDUAL CREATING THE NOISE. THE PENALTIES ARE:

   A. A WARNING WILL BE ISSUED IF NO CONSTRUCTION NOISE VIOLATION HAS BEEN COMMITTED BY THE SAME PERSON WITHIN THE PREVIOUS TWO YEARS AT ANY LOCATION WITHIN THE CITY.

   B. A CITATION WILL BE ISSUED AND A $125 FINE IMPOSED IF ONE PREVIOUS VIOLATION HAS BEEN COMMITTED BY THE SAME PERSON WITHIN THE PREVIOUS TWO YEARS AT ANY LOCATION WITHIN THE CITY.

   C. A CITATION WILL BE ISSUED AND A $250 FINE IMPOSED IF TWO OR MORE PREVIOUS VIOLATION HAVE BEEN COMMITTED BY THE SAME PERSON WITHIN THE PREVIOUS TWO YEARS AT ANY LOCATION WITHIN THE CITY.

2. FOR ALL COMMERCIAL, MULTI-FAMILY, AND NEW SINGLE-FAMILY HOMES, CONSTRUCTION-RELATED NOISE IS ALLOWED 7 AM TO 6 PM ON WEEKDAYS AND 9 AM TO 6 PM ON SATURDAYS . NO DELIVERIES SHALL BE SCHEDULED PRIOR TO 7:00 AM OR AFTER 6:00 PM.
3. CONSTRUCTION-RELATED NOISE IS NOT ALLOWED OUTSIDE OF ALLOWABLE HOURS, LEGAL HOLIDAYS, OR SUNDAYS.
4. EXCEPTIONS FOR CONSTRUCTION RELATED NOISE LIMITATIONS CONTAINED IN THE NOISE CONTROL CODE MAY BE GRANTED PURSUANT TO BMC 9.18.020C.1 WHEN NECESSARY TO ACCOMMODATE CONSTRUCTION ON SCHOOLS WHICH CANNOT BE UNDERTAKEN DURING EXEMPT HOURS. NO BLANKET EXEMPTION EXISTS.
5. ALLOWANCES FOR SHORT TERM WORK OUTSIDE OF NORMAL HOURS FOR CONSTRUCTION RELATED NOISE SHALL BE LIMITED AND WILL BE REVIEWED ON A CASE BY CASE BASIS TO VERIFY NECESSITY AND ENSURE APPROPRIATE NOISE MITIGATION IS UTILIZED TO PROTECT SURROUNDING USES AND PROPERTIES.
6. IF EXPANDED HOURS ARE NECESSARY TO ACCOMMODATE A SPECIFIC COMPONENT OF THE SCHOOL CONSTRUCTION, THE DISTRICT MUST APPLY FOR A SEPARATE NOISE PERMIT FOR REVIEW AND APPROVAL BY STAFF. IN THIS TIME PERIOD, THE SITE SHALL BE POSTED ON ALL STREET FRONTAGES PRIOR TO THE START OF CONSTRUCTION ACTIVITY.

NTS
CONSTRUCTION NOISE NOTES 6

CITY OF BELLEVUE CLEARING AND GRADING STANDARD NOTES

1. ALL CLEARING & GRADING CONSTRUCTION MUST BE IN ACCORDANCE WITH CITY OF BELLEVUE (COB) CLEARING & GRADING CODE, CLEARING & GRADING DEVELOPMENT STANDARDS, LAND USE CODE, UNIFORM BUILDING CODE, PERMIT CONDITIONS, AND ALL OTHER APPLICABLE CODES, ORDINANCES, AND STANDARDS. THE DESIGN ELEMENTS WITHIN THESE PLANS HAVE BEEN REVIEWED ACCORDING TO THESE REQUIREMENTS. ANY VARIANCE FROM ADOPTED EROSION CONTROL STANDARDS IS NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY THE CITY OF BELLEVUE DEVELOPMENT SERVICES (DSD) PRIOR TO CONSTRUCTION. IT SHALL BE THE SOLE RESPONSIBILITY OF THE APPLICANT AND THE PROFESSIONAL CIVIL ENGINEER TO CORRECT ANY ERROR, OMISSION, OR VARIATION FROM THE ABOVE REQUIREMENTS FOUND IN THESE PLANS. ALL CORRECTIONS SHALL BE AT NO ADDITIONAL COST OR LIABILITY TO THE COB.
2. APPROVAL OF THIS EROSION/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.).
3. A COPY OF THE APPROVED PLANS AND DRAWINGS MUST BE ON-SITE DURING CONSTRUCTION. THE APPLICANT IS RESPONSIBLE FOR OBTAINING ANY OTHER REQUIRED OR RELATED PERMITS PRIOR TO BEGINNING OF CONSTRUCTION.
4. THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
5. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
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 TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
7. ALL LOCATIONS OF EXISTING UTILITIES HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD, THEREFORE, BE CONSIDERED ONLY APPROXIMATE AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS AND TO DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN.
8. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
9. CLEARING SHALL BE LIMITED TO THE AREAS WITHIN THE APPROVED DISTURBANCE LIMITS. EXPOSED SOILS MUST BE COVERED AT THE END OF EACH WORKING DAY WHEN WORKING FROM OCTOBER 1ST THROUGH APRIL 30TH. FROM MAY 1ST THROUGH SEPTEMBER 30TH, EXPOSED SOILS MUST BE COVERED AT THE END OF EACH CONSTRUCTION WEEK AND AT THE THREAT OF RAIN.
10. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED 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.
11. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT.
12. THE CONTRACTOR MUST MAINTAIN A SWEEPER ON SITE DURING EARTHWORK AND IMMEDIATELY REMOVE SOIL THAT HAS BEEN TRACKED ONTO PAVED AREAS AS RESULT OF CONSTRUCTION.
13. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
14. ANY EXCAVATED MATERIAL REMOVED FROM THE CONSTRUCTION SITE AND DEPOSITED ON PROPERTY WITHIN THE CITY LIMITS MUST BE DONE IN COMPLIANCE WITH A VALID CLEARING & GRADING PERMIT. LOCATIONS FOR THE MOBILIZATION AREA AND STOCKPILED MATERIAL MUST BE APPROVED BY THE CLEARING AND GRADING INSPECTOR AT LEAST 24 HOURS IN ADVANCE OF ANY STOCKPILING.
15. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 48 HOURS FOLLOWING A MAJOR STORM EVENT.
16. FINAL SITE GRADING MUST DIRECT DRAINAGE AWAY FROM ALL BUILDING STRUCTURES AT A MINIMUM 5% SLOPE, PER THE INTERNATIONAL RESIDENTIAL CODE (IRC) R401.3.
17. INSTALL AMENDED SOILS ON ALL DISTURBED SOILS NOT COVERED BY HARD SURFACE IN ACCORDANCE WITH THE CITY OF BELLEVUE BMP T5.13.

NTS
CITY OF BELLEVUE CLEARING AND GRADING STANDARD NOTES 7

GEOTECHNICAL NOTES

1. THE PROJECT GEOTECHNICAL ENGINEER OF RECORD OR HIS REPRESENTATIVE MUST BE ONSITE DURING CRITICAL EARTHWORK OPERATIONS. THE GEOTECHNICAL ENGINEER SHALL OBSERVE ALL EXCAVATIONS AND FILL AREAS. IN ADDITION, THE ENGINEER SHALL INSPECT THE SOIL CUTS PRIOR TO CONSTRUCTION OF WALLS AND INSPECT THE COMPACTION IN FILL AREAS. THE ENGINEER MUST SUBMIT FIELD REPORTS IN WRITING TO THE PCD INSPECTOR FOR SOILS VERIFICATION AND FOUNDATION CONSTRUCTION. ALL EARTHWORK SHOULD BE IN CONFORMANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT.
2. THE GEOTECHNICAL ENGINEER MUST BE PRESENT AT THE PRE-CONSTRUCTION MEETING(S). IN ADDITION, THE FOLLOWING CONSTRUCTION STAGES MUST BE INSPECTED, MONITORED, AND TESTED AS NECESSARY BY THE GEOTECHNICAL ENGINEER OF RECORD:

   A. SITE CLEARING AND STRIPPING OF ORGANIC TOPSOIL FOR ALL AREAS TO RECEIVE STRUCTURAL FILL, PAVEMENTS, OR FOUNDATIONS.

   B. CUT SLOPES OVER FOUR FEET HIGH.

   C. BENCHING FOR FILL TO BE PLACED ON SLOPES.

   D. INSPECTION OF PROPOSED IMPORT FILL MATERIAL, PRIOR TO PLACEMENT.

   E. PLACEMENT OF STRUCTURAL FILL, INCLUDING OBSERVATION OF PROPER MOISTURE CONTENT, LIFT THICKNESS, AND MINIMUM COMPACTION.

   F. SUBGRADES FOR RETAINING WALLS, FOUNDATIONS, AND FOR THE BASE OF ROCKERIES.

   G. INSTALLATION OF SUBSURFACE DRAINAGE FACILITIES.

   H. UTILITY TRENCH BEDDING AND BACKFILL, INCLUDING OBSERVATION OF PROPER MOISTURE CONTENT, LIFT THICKNESS, AND MINIMUM COMPACTION.

   I. UTILITIES ON STEEP SLOPES; SLOPE ANCHORS AND/OR BACKFILL SLOPE STABILIZATION.

   J. ANY UNUSUAL SEEPAGE, SLOPE, OR SUBGRADE CONDITION AS DELINEATED IN THE GEOTECHNICAL REPORT OR DISCOVERED IN THE FIELD.

3. AT THE END OF CONSTRUCTION, THE GEOTECHNICAL ENGINEER SHALL SUBMIT A FINAL SUMMARY LETTER VERIFYING THAT CRITICAL STAGES OF CONSTRUCTION HAVE BEEN INSPECTED AND ARE IN CONFORMANCE WITH GEOTECHNICAL REPORT.

NTS
GEOTECHNICAL NOTES 4

MOBILIZATION/STOCKPILE AREA NOTES

1. ANY EXCAVATED MATERIAL REMOVED FROM THE CONSTRUCTION SITE AND DEPOSITED ON PROPERTY WITHIN THE CITY LIMITS MUST BE DONE IN COMPLIANCE WITH A VALID CLEARING & GRADING PERMIT. LOCATIONS FOR THE MOBILIZATION AREA AND STOCKPILED MATERIAL MUST BE APPROVED BY THE CITY INSPECTOR AT LEAST 24 HOURS IN ADVANCE OF ANY DUMPING.

DESIGN CHANGES AFTER PERMIT ISSUANCE

1. IF UTILITIES DESIGN CHANGES RESULT IN CHANGES TO THE CLEARING LIMITS SHOWN ON THESE PLANS, THE APPLICANT MUST SUBMIT A REVISION TO THE CLEARING AND GRADING PERMIT THAT INDICATES THE LOCATION OF THE NEW CLEARING LIMITS.

CITY OF BELLEVUE APPROVAL STAMP

CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

NTS
OTHER NOTES 8

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

LAURIE J. PEARK
STATE OF WASHINGTON
30706
REGISTERED
PROFESSIONAL ENGINEER
2-12-2021

LPD engineering pllc
1932 First Ave
Suite 201
Seattle, WA 98101
p. 206.725.1211
f. 206.973.5344
www.lpdengineering.com

DATE: 02/12/2021

PERMIT SET

TESC AND DEMOLITION NOTES

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Scale 1"=10'

LEGEND

	PROPERTY LINE
230	EX CONTOUR (INDEX)
231	EX CONTOUR
230	PROPOSED CONTOUR (INDEX)
231	PROPOSED CONTOUR
XXX.X	SPOT ELEVATION
FF 78.0	FINISHED FLOOR ELEVATION
	EX BUILDING
	PROPOSED BUILDING
	HEAVY DUTY CONCRETE
	CONCRETE PAVEMENT
	ASPHALT (AC) PAVEMENT
	GRASSPAVE
	SITE WALL
	AREA/YARD DRAIN
	CATCH BASIN TYPE 1
	STORM DRAINAGE PIPE
	FOOTING/SUBSURFACE DRAIN
SDCO ●	STORM DRAIN CLEANOUT
FDCO ●	FOOTING DRAIN CLEANOUT
DS●	DOWNSPOUTS
FG	FINISHED GRADE
ME	MATCH EXISTING
TP	TOP OF PAVEMENT
TS	TOP OF STEP
TW	TOP OF WALL

811

Know what's below.
Call two business days before you dig.

CITY OF BELLEVUE APPROVAL STAMP

CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

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GRADING AND DRAINAGE PLAN

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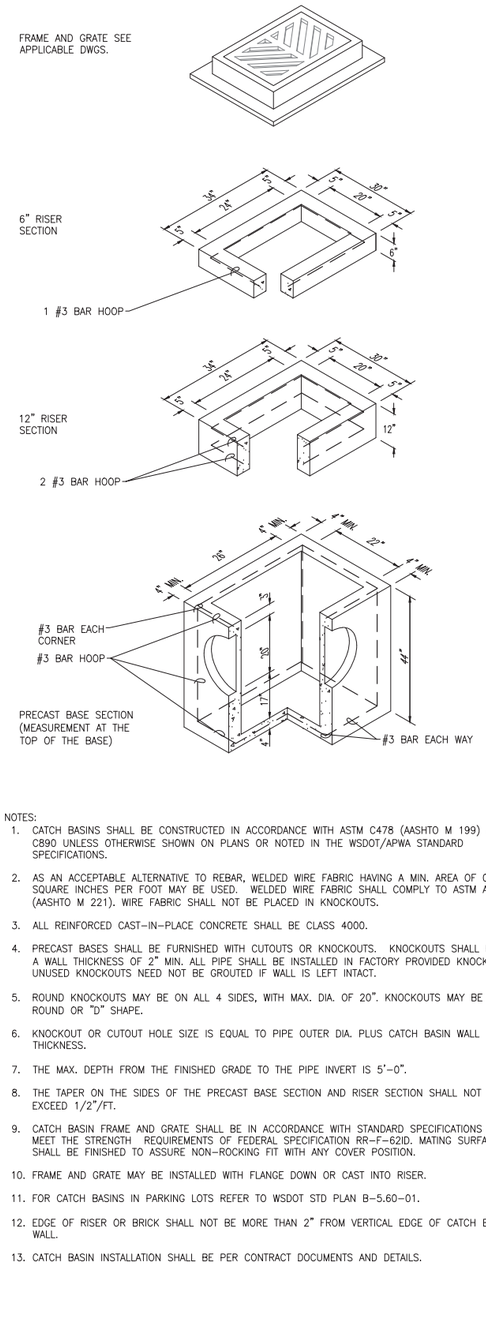
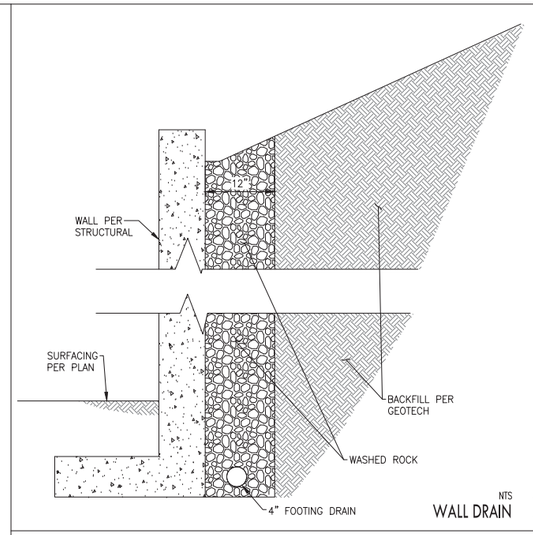


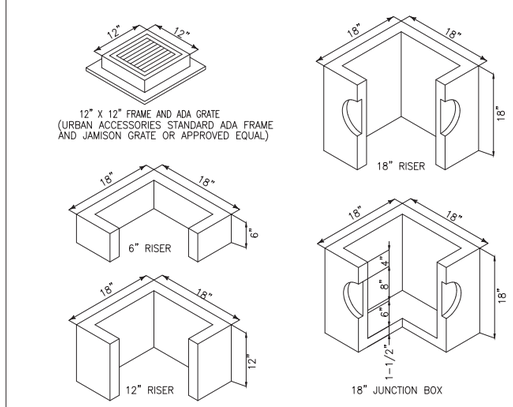
NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIA. OF 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
6. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIA. PLUS CATCH BASIN WALL THICKNESS.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-62ID. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. FOR CATCH BASINS IN PARKING LOTS REFER TO WSDOT STD PLAN B-5.60-01.
12. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
13. CATCH BASIN INSTALLATION SHALL BE PER CONTRACT DOCUMENTS AND DETAILS.

NTS
CATCH BASIN TYPE 1 **9**



NTS
WALL DRAIN **2**



18" X 18" TYPE 18 CONCRETE AREA DRAIN BY SHOPE CONCRETE PRODUCTS OR EQUAL

NTS
YARD DRAIN **6**

CITY OF BELLEVUE STORM DRAINAGE GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE 2021 EDITION OF THE CITY OF BELLEVUE UTILITIES DEPARTMENT ENGINEERING STANDARDS AND THE DEVELOPER EXTENSION AGREEMENT.
2. STORM PIPE SHALL BE PVC CONFORMING TO ASTM D-3034 SDR 35 (4"H – 15"H) OR ASTM F-679 (18"H-27"H). BEDDING AND BACKFILL SHALL BE AS SHOWN IN THE STANDARD DETAILS.
3. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD THEREFORE BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE EXCAVATOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN, AND TO FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN. IMMEDIATELY NOTIFY THE ENGINEER IF A CONFLICT EXISTS.
4. THE FOOTING DRAINAGE SYSTEM AND THE ROOF DOWNSPOUT SYSTEM SHALL NOT BE INTERCONNECTED AND SHALL SEPARATELY CONVEY COLLECTED FLOWS TO THE CONVEYANCE SYSTEM OR TO ON-SITE STORMWATER FACILITIES.
5. PROVIDE AND MAINTAIN TEMPORARY SEDIMENTATION COLLECTION FACILITIES TO ENSURE THAT SEDIMENT OR OTHER HAZARDOUS MATERIALS DO NOT ENTER THE STORM DRAINAGE SYSTEM IN ACCORDANCE WITH THE SITES APPROVED CSWPPP. FOR ALL CONSTRUCTION DURING THE RAINY SEASON, DOWNHILL BASINS AND INLETS MUST BE PROTECTED WITH CATCH BASIN INSERTS. SIMPLY PLACING FILTER FABRIC UNDER THE GRATE IS NOT ACCEPTABLE.
6. PRIOR TO FINAL INSPECTION AND ACCEPTANCE OF STORM DRAINAGE WORK, PIPES AND STORM DRAIN STRUCTURES SHALL BE CLEANED AND FLUSHED. ANY OBSTRUCTIONS TO FLOW WITHIN THE STORM DRAIN SYSTEM, (SUCH AS RUBBLE, MORTAR AND WEDGED DEBRIS), SHALL BE REMOVED AT THE NEAREST STRUCTURE. WASH WATER OF ANY SORT SHALL NOT BE DISCHARGED TO THE STORM DRAIN SYSTEM OR SURFACE WATERS.
7. ENDS OF EACH STORM DRAIN STUB AT THE PROPERTY LINE SHALL BE CAPPED AND LOCATED WITH AN 8' LONG 2" X 4" BOARD, EMBEDDED TO THE STUB CAP AND EXTENDING AT LEAST 3 FEET ABOVE GRADE, AND MARKED PERMANENTLY "STORM". A COPPER 12 GA. LOCATE WIRE FIRMLY ATTACHED. THE STUB DEPTH SHALL BE INDICATED ON THE MARKER.
8. ALL GRATES IN ROADWAYS SHALL BE DUCTILE IRON, BOLT-LOCKING, VANED GRATES PER THE STANDARD DETAILS. STRUCTURES IN TRAFFIC LANES OUTSIDE OF THE CURBLINE WHICH DO NOT COLLECT RUNOFF SHALL BE FITTED WITH ROUND, BOLT-LOCKING SOLID COVERS. OFF-STREET STRUCTURES WHICH DO NOT COLLECT RUNOFF SHALL BE FITTED WITH BOLT-LOCKING SOLID COVERS.
9. VEGETATION/LANDSCAPING IN THE DETENTION POND, BIORETENTION FACILITY, VEGETATED ROOF AND/OR DRAINAGE SWALE(S) ARE AN INTEGRAL PART OF THE RUNOFF TREATMENT SYSTEM FOR THE PROJECT. SUCH DRAINAGE FACILITIES WILL NOT BE ACCEPTED UNTIL PLANTINGS ARE ESTABLISHED.
10. ALL NEW MANHOLES SHALL HAVE A MINIMUM INSIDE DIAMETER OF 48"H AND SHALL CONFORM TO THE STANDARD DETAILS. ALL NEW CATCH BASINS SHALL CONFORM TO THE STANDARD DETAILS.
12. ALL TESTING AND CONNECTIONS TO EXISTING MAINS SHALL BE DONE IN THE PRESENCE OF A REPRESENTATIVE OF THE CITY OF BELLEVUE UTILITIES DEPARTMENT.
13. ALL TRENCHES SHALL BE COMPACTED, AND HOT MIX ASPHALT IN PLACE IN PAVED AREAS, PRIOR TO TESTING STORM LINES FOR ACCEPTANCE.
14. ALL PUBLIC STORM DRAINS SHALL BE AIR TESTED AND HAVE A VIDEO INSPECTION PERFORMED PRIOR TO ACCEPTANCE (SEE #23 BELOW). STORM MAIN CONSTRUCTED WITH FLEXIBLE PIPE SHALL BE DEFLECTION TESTED WITH A MANDREL PRIOR TO ACCEPTANCE.
15. STORM STUBS SHALL BE TESTED FOR ACCEPTANCE AT THE SAME TIME THE MAIN STORM IS TESTED.
16. ALL MANHOLES/ CATCH BASINS IN UNPAVED AREAS SHALL INCLUDE A CONCRETE SEAL AROUND ADJUSTMENT RINGS PER STANDARD DETAILS.
17. ALL STORM MAIN EXTENSIONS WITHIN THE PUBLIC RIGHT-OF-WAY OR IN EASEMENTS MUST BE "STAKED" BY A SURVEYOR LICENSED IN WASHINGTON STATE FOR "LINE AND GRADE" AND CUT SHEETS PROVIDED TO THE ENGINEER, PRIOR TO STARTING CONSTRUCTION.
18. THE CONTRACTOR SHALL USE A VACUUM STREET SWEEPER TO REMOVE DUST AND DEBRIS FROM PAVEMENT AREAS AS DIRECTED BY THE ENGINEER. FLUSHING OF STREETS SHALL NOT BE PERMITTED WITHOUT PRIOR CITY APPROVAL.
19. STORM DRAINAGE MAINLINES, STUBS AND FITTINGS SHALL BE CONSTRUCTED USING THE SAME PIPE MATERIAL AND MANUFACTURER. CONNECTIONS BETWEEN STUBS AND THE MAINLINE WILL BE MADE WITH A TEE FITTING. TEE FITTING SHALL BE FROM SAME MANUFACTURER AS PIPE. CUT-IN CONNECTIONS ARE ONLY ALLOWED WHEN CONNECTING A NEW STUB TO AN EXISTING MAINLINE.
20. MANHOLES, CATCH BASINS AND VAULTS ARE CONSIDERED TO BE PERMIT-REQUIRED CONFINED SPACES. ENTRY INTO THESE SPACES SHALL BE IN ACCORDANCE WITH CHAPTER 296-809 WAC.
21. PLACEMENT OF SURFACE APPURTENANCES (MH LIDS, VALVE LIDS, ETC) IN TIRE TRACKS OF TRAFFIC LANES SHALL BE AVOIDED WHENEVER POSSIBLE.
22. CALL 1-800-424-5555, OR 8-1-1, 72 HOURS BEFORE CONSTRUCTION FOR UTILITY LOCATES.
23. THE CONTRACTOR SHALL PERFORM A VIDEO INSPECTION AND PROVIDE A DVD OF THE STORM PIPE INTERIOR FOR THE CITY'FS REVIEW. THE VIDEO SHALL PROVIDE A MINIMUM OF 14 LINES PER MILLIMETER RESOLUTION AND COVER THE ENTIRE LENGTH OF THE APPLICABLE PIPE. THE CAMERA SHALL BE MOVED THROUGH THE PIPE AT A UNIFORM RATE (≤ 30 FT/MIN), STOPPING WHEN NECESSARY TO ENSURE PROPER DOCUMENTATION OF THE PIPE CONDITION. THE VIDEO SHALL BE TAKEN AFTER INSTALLATION AND CLEANING TO INSURE THAT NO DEFECTS EXIST. THE PROJECT WILL NOT BE ACCEPTED UNTIL ALL DEFECTS HAVE BEEN REPAIRED.
24. CLEARLY LABEL PUBLIC AND PRIVATE SYSTEMS ON THE PLANS. PRIVATE SYSTEMS SHALL BE MARKED "PRIVATE" AND SHALL BE MAINTAINED BY THE PROPERTY OWNER(S).
25. ALL CONCRETE STRUCTURES (VAULTS, CATCH BASINS, MANHOLES, OIL/WATER SEPARATORS, ETC.) SHALL BE VACUUM TESTED.
26. MANHOLES, CATCH BASINS AND INLETS IN EASEMENTS SHALL BE CONSTRUCTED TO PROVIDE A STABLE, LEVEL GRADE FOR A MINIMUM RADIUS OF 2.5 FEET AROUND THE CENTER OF THE ACCESS OPENING TO ACCOMMODATE CONFINED SPACE ENTRY EQUIPMENT.
27. TOPS OF MANHOLES/ CATCH BASINS WITHIN PUBLIC RIGHT-OF-WAY SHALL NOT BE ADJUSTED TO FINAL GRADE UNTIL AFTER PAVING.
28. CONTRACTOR SHALL ADJUST ALL MANHOLE/ CATCH BASIN RIMS TO FLUSH WITH FINAL FINISHED GRADES, UNLESS OTHERWISE SHOWN.
29. CONTRACTOR SHALL INSTALL, AT ALL CONNECTIONS TO EXISTING DOWNSTREAM MANHOLES/CATCH BASINS, SCREENS OR PLUGS TO PREVENT FOREIGN MATERIALS FROM ENTERING EXISTING STORM DRAINAGE SYSTEM. SCREENS OR PLUGS SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF THE CONSTRUCTION AND SHALL BE REMOVED ALONG WITH COLLECTED DEBRIS AT THE TIME OF FINAL INSPECTION AND IN THE PRESENCE OF A REPRESENTATIVE OF THE CITY OF BELLEVUE UTILITIES DEPARTMENT.
30. SURFACE RESTORATION OF EXISTING ASPHALT PAVEMENT SHALL BE AS REQUIRED BY THE RIGHT-OFWAY USE PERMIT.
31. THE CONTRACTOR SHALL MAINTAIN A MINIMUM OF FIVE FEET (5') HORIZONTAL SEPARATION BETWEEN ALL WATER AND STORM DRAINAGE LINES. ANY CONFLICT SHALL BE REPORTED TO THE UTILITY AND THE DEVELOPER'S ENGINEER PRIOR TO CONSTRUCTION.
32. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT NO CONFLICTS EXIST BETWEEN STORM DRAINAGE LINES AND PROPOSED OR EXISTING UTILITIES PRIOR TO CONSTRUCTION.
33. BEFORE COMMENCEMENT OF TRENCHING, THE CONTRACTOR SHALL PROVIDE FILTER FABRIC FOR ALL DOWNHILL STORM DRAIN INLETS AND CATCH BASINS, WHICH WILL RECEIVE RUNOFF FROM THE PROJECT SITE. THE CONTRACTOR SHALL PERIODICALLY INSPECT THE CONDITION OF ALL FILTER FABRIC AND REPLACE AS NECESSARY.
34. MINIMUM COVER OVER STORM DRAINAGE PIPE SHALL BE 2 FEET, UNLESS OTHERWISE SHOWN.
35. AVOID CROSSING WATER OR SEWER MAINS AT HIGHLY ACUTE ANGLES. THE SMALLEST ANGLE MEASURE BETWEEN UTILITIES SHOULD BE 45 DEGREES.
36. AT POINTS WHERE EXISTING THRUST BLOCKING IS FOUND, MINIMUM CLEARANCE BETWEEN CONCRETE BLOCKING AND OTHER BURIED UTILITIES OR STRUCTURES SHALL BE 5 FEET.
37. WHEN WORK IS TO OCCUR IN EASEMENTS, THE CONTRACTOR SHALL NOTIFY THE EASEMENT GRANTOR AND BELLEVUE UTILITIES IN WRITING A MINIMUM OF 48 HOURS IN ADVANCE OF BEGINNING WORK (NOT INCLUDING WEEKENDS OR HOLIDAYS). FAILURE TO NOTIFY GRANTOR AND BELLEVUE UTILITIES WILL RESULT IN A STOP WORK ORDER BEING POSTED UNTIL THE MATTER IS RESOLVED TO THE SATISFACTION OF BELLEVUE UTILITIES. A WRITTEN RELEASE FROM THE EASEMENT GRANTOR SHALL BE FURNISHED TO THE UTILITIES INSPECTOR PRIOR TO PERMIT SIGN-OFF.
38. THE CONTRACTOR SHALL RESTORE THE RIGHT-OF-WAY AND EXISTING PUBLIC STORM DRAINAGE EASEMENT(S) AFTER CONSTRUCTION TO A CONDITION EQUAL OR BETTER THAN CONDITION PRIOR TO ENTRY. THE CONTRACTOR SHALL FURNISH A SIGNED RELEASE FROM ALL AFFECTED PROPERTY OWNERS AFTER RESTORATION HAS BEEN COMPLETED.
39. WHERE A NEW UTILITY LINE CROSSES BELOW AN EXISTING AC MAIN, THE AC PIPE SHALL BE REPLACED WITH DI PIPE TO 3 FEET PAST EACH SIDE OF THE TRENCH AS SHOWN ON STANDARD DETAIL W-8. ALTERNATIVELY, WHERE DIRECTED BY THE UTILITY, THE TRENCH SHALL BE BACKFILLED WITH CONTROLLED DENSITY FILL (CDF, AKA FLOWABLE FILL) FROM BOTTOM OF TRENCH TO BOTTOM OF AC MAIN.

MAINTAIN 2021 EDITION OF COB UTILITY ENGINEERING STANDARDS AND DETAILS ON SITE AT ALL TIMES

NTS
COB STORM DRAINAGE GENERAL NOTES **8**

NTS
NOT USED **10**

NTS
NOT USED **11**

NTS
NOT USED **12**

CITY OF BELLEVUE APPROVAL STAMP

CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

DROLLINGER RESIDENCE
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DRAINAGE DETAILS AND NOTES

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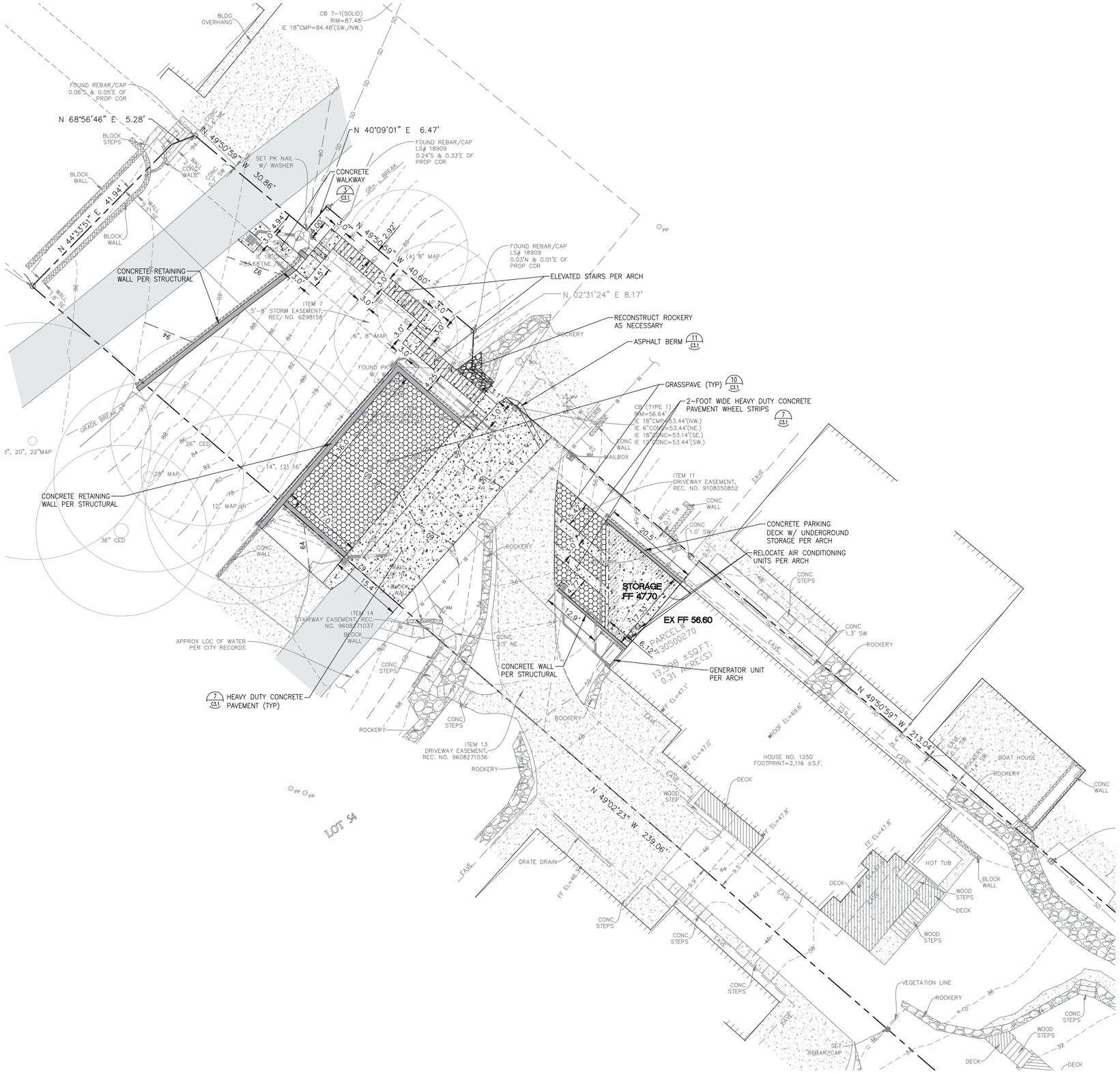

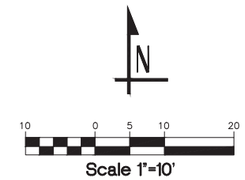

LEGEND

	PROPERTY LINE
230	EX CONTOUR (INDEX)
231	EX CONTOUR
230	PROPOSED CONTOUR (INDEX)
231	PROPOSED CONTOUR
FF 78.0	FINISHED FLOOR ELEVATION
	EX BUILDING
	PROPOSED BUILDING
	HEAVY DUTY CONCRETE
	CONCRETE PAVEMENT
	ASPHALT (AC) PAVEMENT
	GRASSPAVE
	SITE WALL
	AREA/YARD DRAIN
	CATCH BASIN TYPE 1
	STORM DRAINAGE PIPE
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SDCO	STORM DRAIN CLEANOUT
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PAVING AND UTILITIES PLAN

C3.0

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Know what's below.
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CITY OF BELLEVUE APPROVAL STAMP

CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

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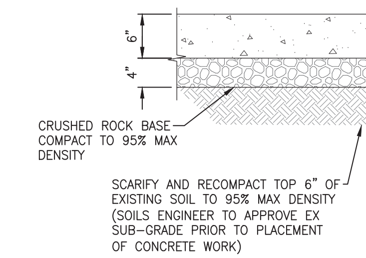
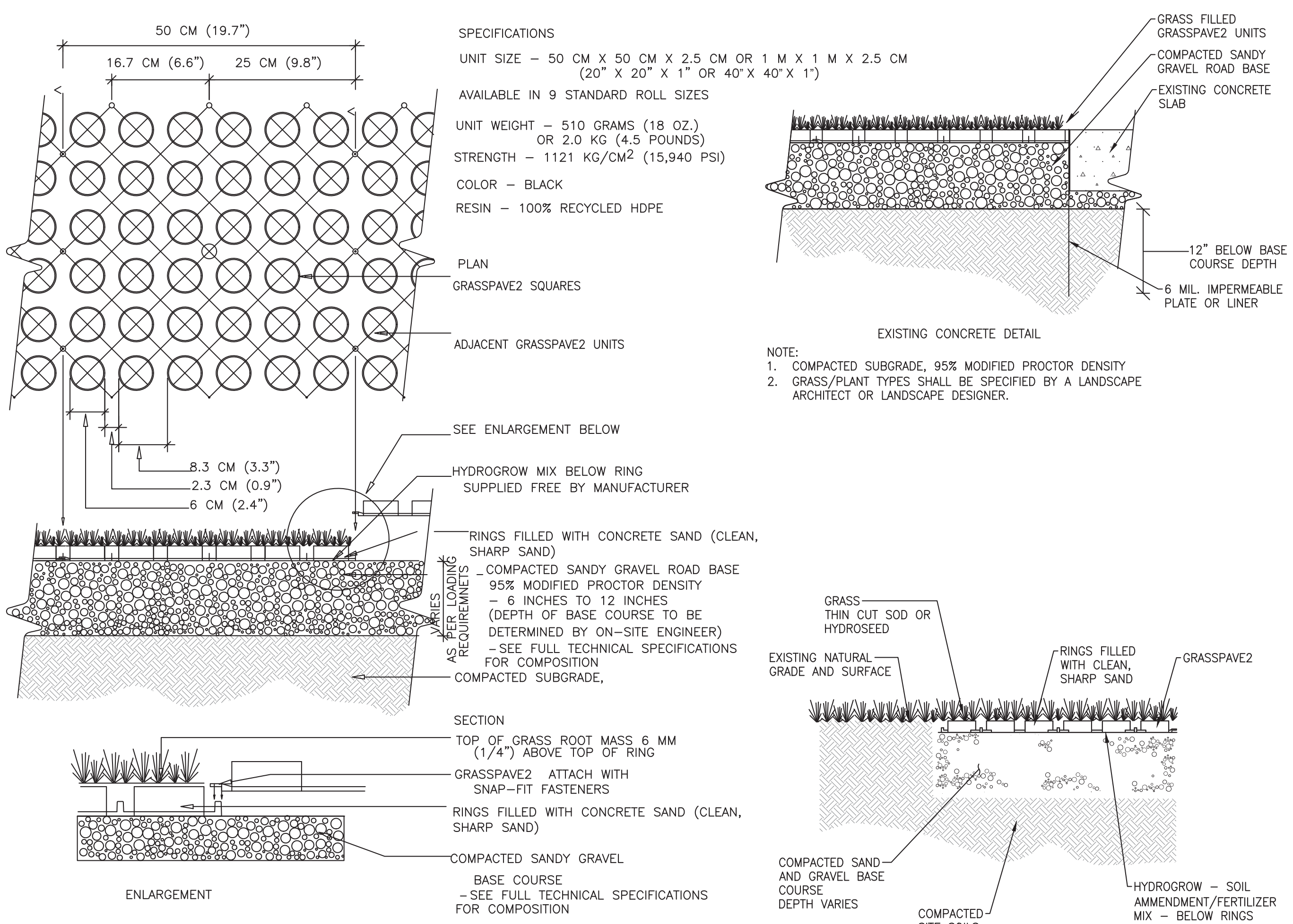


NOTE:

1. MINIMUM CONCRETE 3000 PSI (5 1/2 SACK)
2. PROVIDE CONSTRUCTION OR CONTRACTION JOINTS TO BREAK INTO AREAS OF 144 SF OR LESS. NO ACUTE ANGLES. JOINT LOCATIONS TO BE APPROVED BY THE ARCHITECT.
3. PROOF ROLL EXISTING SUBGRADE AND REMOVE ANY SOFT SPOTS

NTS
CONCRETE WALKWAY 3



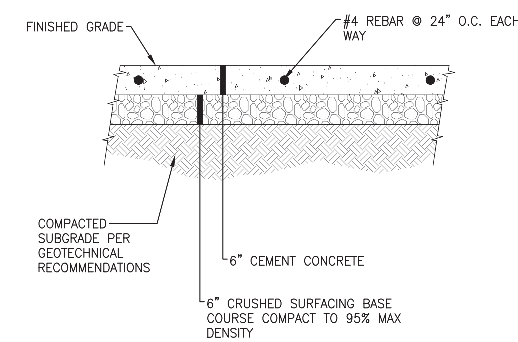
NOTE:
1. COMPACTED SUBGRADE, 95% MODIFIED PROCTOR DENSITY
2. GRASS/PLANT TYPES SHALL BE SPECIFIED BY A LANDSCAPE ARCHITECT OR LANDSCAPE DESIGNER.

NOTE: GRASS/PLANT TYPES SHALL BE SPECIFIED BY A LANDSCAPE ARCHITECT OR LANDSCAPE DESIGNER.

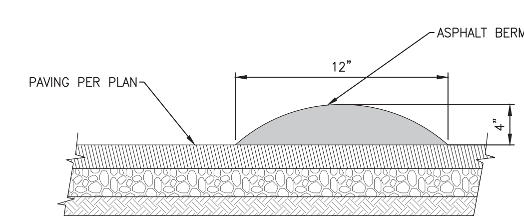
TYPICAL GRASSPAVE2 DETAIL

FLUSH, NATURAL (EXISTING) EDGING

NTS
GRASSPAVE 10



NTS
HEAVY DUTY CONCRETE PAVEMENT 7



NTS
ASPHALT BERM 11

CITY OF BELLEVUE GENERAL WATER NOTES

1. ALL WORK SHALL CONFORM TO THE 2021 CITY OF BELLEVUE UTILITY ENGINEERING STANDARDS AND THE DEVELOPER EXTENSION AGREEMENT.
2. ALL PIPE SHALL BE DUCTILE IRON CLASS 52 UNLESS OTHERWISE SHOWN.
3. ALL PIPE AND FITTINGS NOT TO BE DISINFECTED IN PLACE SHALL BE SWABBED WITH 1% AVAILABLE CHLORINE SOLUTION PRIOR TO INSTALLATION.
4. THE NEW WATERMAIN SHALL BE CONNECTED TO THE EXISTING SYSTEM ONLY AFTER NEW MAIN IS PRESSURE TESTED, FLUSHED, DISINFECTED AND SATISFACTORY BACTERIOLOGICAL SAMPLE RESULTS ARE OBTAINED AND RECEIVED BY THE CITY INSPECTOR. SEE STANDARD DETAIL W-9.
5. AFTER DISINFECTING THE WATERMAIN, DISPOSE OF CHLORINATED WATER BY DISCHARGING TO THE NEAREST OPERATING SANITARY SEWER.
6. WATER MAIN SHUT-DOWNS SHALL BE COORDINATED WITH THE WATER OPERATIONS DIVISION FOR PREFERRED TIMING DURING FLOW CONTROL CONDITIONS. WATER MAIN SHUTDOWNS SHALL NOT BE SCHEDULED TO TAKE PLACE ON FRIDAYS, OR ON THE FIVE DAYS BEFORE NOR ONE DAY AFTER A CITY HOLIDAY, UNLESS OTHERWISE APPROVED BY THE UTILITY.
7. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD THEREFORE BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN, AND TO FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN.
8. DEFLECT THE WATER MAIN ABOVE OR BELOW EXISTING UTILITIES AS REQUIRED TO MAINTAIN 3 FT. MINIMUM COVER AND 12-INCH MINIMUM VERTICAL CLEARANCE BETWEEN UTILITIES UNLESS OTHERWISE SPECIFIED.
9. WRAP ALL DUCTILE IRON PIPE AND ADJACENT VALVES AND FITTINGS WITH 8-MIL. POLYETHYLENE CONFORMING TO AWWA C105.
10. THE WATERMAIN SHALL BE INSTALLED ONLY AFTER THE ROADWAY SUBGRADE IS BACKFILLED, GRADED AND COMPACTED IN CUT AND FILL AREAS.
11. TRENCH BACKFILL AND SURFACE RESTORATION OF EXISTING ASPHALT PAVEMENT SHALL BE AS REQUIRED BY THE RIGHT-OF-WAY USE PERMIT.
12. ALL FITTINGS SHALL BE BLOCKED PER STANDARD DETAILS UNLESS OTHERWISE SPECIFIED.
14. WHEN WORKING WITH ASBESTOS CEMENT PIPE, THE CONTRACTOR IS REQUIRED TO MAINTAIN WORKERS' EXPOSURE TO ASBESTOS MATERIAL AT OR BELOW THE LIMIT PRESCRIBED IN WAC 296-62-07705.
15. CALL 1-800-424-5555, OR 811, 72 HOURS BEFORE CONSTRUCTION FOR UTILITY LOCATIONS.
16. UNIFORM PLUMBING CODE REQUIRES THE INSTALLATION OF PRIVATELY OWNED AND OPERATED PRESSURE REDUCING VALVES WHERE THE OPERATING PRESSURE EXCEEDS 80 PSI.
17. THE CONTRACTOR SHALL USE A VACUUM STREET SWEEPER TO REMOVE DUST AND DEBRIS FROM PAVEMENT AREAS AS DIRECTED BY THE ENGINEER. FLUSHING OF STREETS SHALL NOT BE PERMITTED WITHOUT PRIOR CITY APPROVAL.
18. BEFORE COMMENCEMENT OF TRENCHING, THE CONTRACTOR SHALL PROVIDE CATCH BASIN INSERTS FOR ALL CATCH BASINS THAT WILL RECEIVE RUNOFF FROM THE PROJECT SITE. THE CONTRACTOR SHALL PERIODICALLY INSPECT THE CONDITION OF ALL INSERTS AND REPLACE AS NECESSARY.
19. ABANDONMENT OF EXISTING WATER SERVICES SHALL BE ACCOMPLISHED AS FOLLOWS:
    A. REMOVE EXISTING SERVICE SADDLE FROM WATER MAIN AND REPLACE WITH NEW STAINLESS STEEL REPAIR BAND, ROMAC SS2 FORD SERVICE SADDLE FC101, OR APPROVED EQUAL (WILL NOT BE REQUIRED WHEN WATER MAIN IS TO BE ABANDONED).
    B. REMOVE AND DISPOSE OF EXISTING SETTER AND METER BOX.
    C. CAP OR CRIMP (IF COPPER) EXISTING SERVICE LINE TO BE ABANDONED IN PLACE, EACH END.
    D. RETURN EXISTING METER TO CITY OF BELLEVUE UTILITIES INSPECTOR.
20. WHERE NEW UTILITY LINE CROSSES BELOW AN EXISTING AC MAIN, THE AC PIPE SHALL BE REPLACED WITH DI PIPE TO 3 FEET PAST EACH SIDE OF THE TRENCH AS SHOWN ON STANDARD DETAIL W-8. WRAP DI PIPE AND COUPLINGS WITH 8-MIL POLYETHYLENE CONFORMING TO AWWA C105. ALTERNATIVELY, WHERE DIRECTED BY THE ENGINEER, THE TRENCH SHALL BE BACKFILLED WITH CONTROLLED DENSITY FILL (CDF, AKA FLOWABLE FILL) FROM BOTTOM OF TRENCH TO THE INVERT OF THE AC MAIN.
21. AVOID CROSSING WATER OR SEWER MAINS AT HIGHLY ACUTE ANGLES. THE SMALLEST ANGLE MEASURE BETWEEN UTILITIES SHOULD BE 45 TO 90 DEGREES.
22. WHERE WATER MAIN CROSSES ABOVE OR BELOW SANITARY SEWER, ONE FULL LENGTH OF WATER PIPE SHALL BE CENTERED FOR MAXIMUM JOINT SEPARATION.
23. AT POINTS WHERE EXISTING THRUST BLOCKING IS FOUND, MINIMUM CLEARANCE BETWEEN THE CONCRETE BLOCKING AND OTHER BURIED UTILITIES OR STRUCTURES SHALL BE 5 FEET.
24. WORKERS MUST FOLLOW CONFINED SPACE REGULATIONS AND PROCEDURES WHEN ENTERING OR DOING WORK IN COB OWNED CONFINED SPACES. COMPLETED PERMIT MUST BE GIVEN TO THE UTILITIES INSPECTOR PRIOR TO ENTRY.
25. MANHOLES, CATCH BASINS AND VAULTS ARE CONSIDERED TO BE PERMIT-REQUIRED CONFINED SPACES. ENTRY INTO THESE SPACES SHALL BE IN ACCORDANCE WITH CHAPTER 296-809 WAC.
26. WHEN WORK IS TO OCCUR IN EASEMENTS, THE CONTRACTOR SHALL NOTIFY THE EASEMENT GRANTOR AND BELLEVUE UTILITIES IN WRITING A MINIMUM OF 48 HOURS IN ADVANCE OF BEGINNING WORK (NOT INCLUDING WEEKENDS OR HOLIDAYS). FAILURE TO NOTIFY GRANTOR AND BELLEVUE UTILITIES WILL RESULT IN A STOP WORK ORDER BEING POSTED UNTIL THE MATTER IS RESOLVED TO THE SATISFACTION OF BELLEVUE UTILITIES. A WRITTEN RELEASE FROM THE EASEMENT GRANTOR SHALL BE FURNISHED TO THE UTILITIES INSPECTOR PRIOR TO PERMIT SIGNOFF.
27. THE CONTRACTOR SHALL RESTORE THE RIGHT-OF-WAY AND EXISTING PUBLIC UTILITY EASEMENT(S) AFTER CONSTRUCTION TO A CONDITION EQUAL OR BETTER THAN CONDITION PRIOR TO ENTRY. CONTRACTOR SHALL FURNISH A SIGNED RELEASE FROM ALL AFFECTED PROPERTY OWNERS AFTER RESTORATION HAS BEEN COMPLETED.
28. PRIVATE FIRE SERVICE MAINS MUST BE INSTALLED IN ACCORDANCE WITH NFPA-24 AS WELL AS COB REQUIREMENTS. THE PIPING MUST BE DOUBLY RESTRAINED AT ALL JOINTS. THIS MEANS THAT ANY CHANGE OF DIRECTION WILL REQUIRE BOTH CONCRETE THRUST BLOCKING AND A MECHANICAL RESTRAINT TYPE JOINT. STRAIGHT RUNS OF PIPE ARE CONSIDERED TO BE DOUBLY RESTRAINED WITH A MECHANICAL RESTRAINT WITHIN THE WEIGHT OF THE BACKFILL. THIS PIPING MUST BE TESTED AT 200 PSI FOR TWO HOURS WITH NO LEAKS.

CITY OF BELLEVUE APPROVAL STAMP

NTS
COB WATER GENERAL NOTES 12

CITY OF BELLEVUE
UTILITY GRID O-7
COB UE#XX-XXXXXX, GD#XX-XXXXXX
NE 1/4 , SECTION 30, TOWNSHIP 25 N, RANGE 6 E WM

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PKWY NE
BELLEVUE WA 98008

LAURIE J. PEARL
30766
REGISTERED
PROFESSIONAL ENGINEER
2-12-2021

LPD engineering pllc
1932 First Ave
Suite 201
Seattle, WA 98101
p. 206.725.1211
f. 206.973.5344
www.lpdengineering.com

DATE: 02/12/2021

PERMIT SET

PAVING AND UTILITIES DETAILS AND NOTES

C3.1

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APPENDIX B

Design Calculations and Supporting Information

Drollinger Residence
Conveyance Analysis Spreadsheet

2/12/2021

Pipe Run No.	Pipe Run	Size *(inches)*	Mannings N	Plan Slope *(ft/ft)*	Qfull *(cfs)*	Tributary Basins	Total Tributary Area	Tributary Impervious Area	Tributary Pervious Area *(acres)*	Qtrib, 25-year (WWHM, 15 min) *(cfs)*	% Full (25-year)	Qtrib, 100-year (WWHM, 15 min) *(cfs)*	% Full (100-year)
1	4" SD connection - parking NW of residence	4	0.011	0.02	**0.32**	Grasspave and pavement parking area adjacent to house	0.011	0.009	0.002	**0.007**	**2%**	**0.010**	**3%**
2	Upper 6-inch SD to ex CB	6	0.011	0.096	**2.06**	N Rosemont existing pavement & pervious area upstream of proposed catch basin	0.032	0.013	0.019	**0.015**	**1%**	**0.026**	**1%**

MGS FLOOD
PROJECT REPORT – CONVEYANCE (PIPE RUN #1)

Program Version: MGSFlood 4.50
Program License Number: 201410003
Project Simulation Performed on: 01/29/2021 3:02 PM
Report Generation Date: 01/29/2021 3:02 PM

Input File Name: 2021-01-19 Pipe Run 1 Conveyance.fld
Project Name: Drollinger Residence
Analysis Title: Conveyance
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 15

Extended Precipitation Time Series Selected
Climatic Region Number: 16

Full Period of Record Available used for Routing
Precipitation Station : 96004405 Puget East 44 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961044 Puget East 44 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post Developed
Total Subbasin Area (acres)	0.011	0.011
Area of Links that Include Precip/Evap (acres)	0.000	0.000
Total (acres)	0.011	0.011

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Grass	0.002
Impervious	0.009
Subbasin Total	0.011

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Grass	0.002
Impervious	0.009
Subbasin Total	0.011

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 0

**********Compliance Point Results **********

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Subbasin: Subbasin 1

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	3.820E-03	2-Year	3.820E-03
5-Year	4.943E-03	5-Year	4.943E-03
10-Year	5.975E-03	10-Year	5.975E-03
25-Year	7.470E-03	25-Year	7.470E-03
50-Year	8.961E-03	50-Year	8.961E-03
100-Year	1.104E-02	100-Year	1.104E-02
200-Year	1.143E-02	200-Year	1.143E-02
500-Year	1.192E-02	500-Year	1.192E-02

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

MGS FLOOD
PROJECT REPORT – CONVEYANCE (PIPE RUN #2)

Program Version: MGSFlood 4.50
Program License Number: 201410003
Project Simulation Performed on: 02/10/2021 10:33 AM
Report Generation Date: 02/10/2021 10:33 AM

Input File Name: 2021-01-19 Pipe Run 2 Conveyance.fld
Project Name: Drollinger Residence
Analysis Title: Conveyance
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 15

Extended Precipitation Time Series Selected
Climatic Region Number: 16

Full Period of Record Available used for Routing
Precipitation Station : 96004405 Puget East 44 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961044 Puget East 44 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post Developed
Total Subbasin Area (acres)	0.032	0.032
Area of Links that Include Precip/Evap (acres)	0.000	0.000
Total (acres)	0.032	0.032

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Grass	0.019
Impervious	0.013
Subbasin Total	0.032

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Grass	0.019
Impervious	0.013
Subbasin Total	0.032

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 0

**********Compliance Point Results **********

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	7.187E-03	2-Year	7.187E-03
5-Year	9.783E-03	5-Year	9.783E-03
10-Year	1.201E-02	10-Year	1.201E-02
25-Year	1.536E-02	25-Year	1.536E-02
50-Year	2.049E-02	50-Year	2.049E-02
100-Year	2.564E-02	100-Year	2.564E-02
200-Year	2.581E-02	200-Year	2.581E-02
500-Year	2.585E-02	500-Year	2.585E-02

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

Sediment Tank Sizing Calculations

Per the 2014 DOE Manual

Project Name: Drollinger Residence

Required Sediment Trap Surface Area (SA):

SA =2*Q/Vsed

Where:

Q = 2-year developed flow rate from MGS Flo

Vsed = Settling Velocity (0.00096 ft/sec)

Calculation:

multiplier =	2	
Q =	0.049	cfs
Vsed =	0.00096	fps
Required SA =	**102.6**	**square feet**

Equivalent Sediment Trap Volume:

To determine the minimum sediment tank volume, an equivalent sediment trap was sized based upon the required surface area.

Length of Top Surface Area =	11	feet
Width of Top Surface Area =	10	feet
Surface Area Provided =	110	square feet
Side Slope =	0	(H:1V)
Total Depth of Sediment Trap =	3.5	feet
Bottom Length of Sediment Trap =	11	feet
Bottom Width of Sediment Trap =	10	feet
Total Facility Volume =	**385**	cubic feet
	2879.8	gallons

MGS FLOOD
PROJECT REPORT – TESC SEDIMENT SIZING

Program Version: MGSFlood 4.50
Program License Number: 201410003
Project Simulation Performed on: 01/22/2021 12:47 PM
Report Generation Date: 01/22/2021 12:47 PM

Input File Name: TESC Sizing.fld
Project Name: Drollinger Residence
Analysis Title: TESC Sizing
Comments:

——————————————— PRECIPITATION INPUT ———————————————

Computational Time Step (Minutes): 15

Extended Precipitation Time Series Selected
Climatic Region Number: 16

Full Period of Record Available used for Routing
Precipitation Station : 96004405 Puget East 44 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961044 Puget East 44 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post Developed
Total Subbasin Area (acres)	0.172	0.172
Area of Links that Include Precip/Evap (acres)	0.000	0.000
Total (acres)	0.172	0.172

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Grass	0.063
Impervious	0.109
Subbasin Total	0.172

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Grass	0.063
Impervious	0.109
Subbasin Total	0.172

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 0

**********Compliance Point Results **********

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Subbasin: Subbasin 1

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	4.925E-02	2-Year	4.925E-02
5-Year	6.545E-02	5-Year	6.545E-02
10-Year	7.812E-02	10-Year	7.812E-02
25-Year	9.943E-02	25-Year	9.943E-02
50-Year	0.125	50-Year	0.125
100-Year	0.155	100-Year	0.155
200-Year	0.158	200-Year	0.158
500-Year	0.163	500-Year	0.163

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

APPENDIX C

Stormwater Pollution Prevention Plan (SWPPP) Narrative

1932 1st Ave, Suite 201
Seattle, WA 98101
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lpdengineering.com

DROLLINGER RESIDENCE
1250 W LAKE SAMMAMISH PARKWAY NE
CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN
FEBRUARY 12, 2021

BACKGROUND INFORMATION

The following Construction Storm Water Pollution Prevention Plan (CSWPPP) Narrative for the Drollinger Residence supplements the Temporary Erosion and Sediment Control drawings. This document was prepared to substitute the City of Bellevue CSWPPP Long Form Worksheet. This narrative and the drawings address the requirements of Section 3.2 of Volume II of the 2014 Washington State Department of Ecology (DOE) Stormwater Management Manual for Western Washington.

Applicant:	Rob Drollinger
Address:	1250 West Lake Sammamish Pkwy NE, Bellevue, WA 98008
Phone:	(206) 234-1255
Project Title:	Drollinger Residence
Site Address:	1250 West Lake Sammamish Parkway NE, Bellevue, WA 98008
Parcel Number:	9253900142

Project Scope

1. General Description

The proposed project will include the renovation of the existing single-family residence at the north end of the building, which will include new roof surfacing. A new above ground parking area is proposed north of the building adjacent to the existing three-car garage with underground storage space. Other improvements include the installation of a shoring wall to replace an existing concrete wall at the upper slope adjacent to NE Rosemont Place. A stairway will be constructed to provide pedestrian access from NE Rosemont Place to N Rosemont.

Storm drainage improvements for the project will include catch basins, conveyance pipes, and wall drain connections to the existing storm system. Flow control and water quality are not proposed because the project is only required to comply with Minimum Requirements #1-5 per the City of Bellevue Surface Water Engineering Standards.

2. Area of site (square feet):

13,598 SF (0.31 acres)

3. Proposed area of land disturbance (square feet):

7,192 SF (0.17 acres)

4. Proposed quantity of excavation (cubic yards):

TBD – earthwork estimate to be done

5. Proposed quantity of fill (cubic yards):

TBD – earthwork estimate to be done

6. **Total proposed impervious area to be constructed (square feet):**

   3,507 SF (0.081 acres)

7. **Existing site conditions including descriptions of existing topography, existing vegetation, and existing drainage:**

   The property is located on parcel #9253900142 which totals approximately 0.46 acres. The site currently contains a single-family residence, with a shared driveway at the northwest corner of the site. According to the City of Bellevue Zoning Map and the King County Assessor's report, the site is zoned R-2.5, Single-Family Residential. Existing development on the property consists of a 2-story single-family residence and a poured concrete driveway. Additionally, there is an existing rockery with a concrete stairway located along the entire east boundary of the property.

   Topographically, the northwest region of the property encompasses a portion of N Rosemont, which is topographically 30-40 feet higher than the access drive at NE Rosemont Place. A vegetated steep slope is in-between with a grade of approximately 54%. NE Rosemont Place slopes from west to east at around 10-14%. The access driveway to the existing residence falls at an approximate 20% grade down to the garage entrance. Beyond the house structure, the topography continues to slope down from north to south toward Lake Sammamish at grade of 7-11%.

   The site is located in the Rosemont drainage basin, as determined by the City of Bellevue. Based on the site survey, the existing drainage infrastructure on the site consists of piped drainage and catch basins. Based on site topography, it is assumed that stormwater is conveyed toward the southeast to an on-site easement within the easter region of the parcel, that directly discharges into Lake Sammamish.

8. **Description of site soils including soil unit, erodibility, settleability, permeability, depth, texture, and soil structure:**

   Per the USDA geological map data, the site is underlain with Alderwood and Kitsap soils, very steep (AkF). A geotechnical report was performed by PanGEO, Inc., dated October 26, 2020, attached in Appendix D of this report for reference. It asserts that underlying soils consist of medium dense fill and colluvium overlying medium dense to very dense alluvium sand and pre-Fraser deposits. According to the City of Bellevue infiltration mapping, the site resides in an area infeasible for infiltration.

9. **Description of adjacent areas which may be affected by site disturbance (i.e. streams, lakes, wetlands, residential areas, roads):**

   The property is bounded by single-family residences to the southwest and northeast, NE Rosemont Place to the west, and Lake Sammamish to the east.

10. **Description of critical areas that are on or adjacent to the site:**

    Based upon City of Bellevue GIS Maps, the project is located within several critical areas including Steep Slope and Liquefaction ECAs. The entire site is mapped as a Liquefaction Hazard Area, and according to the survey, a relatively expansive Steep Slope Area is located in the western region of the property just beyond the existing residence. Other designated critical areas include an Erosion Hazard Area across the full span of the parcel. According to the Washington State Department of Ecology flood hazard maps, the southeast portion of the project area is located within a Floodway or 100-year Floodplain.

11. **Describe potential erosion problems on site:**

    The site is within an erosion hazard area. Per the proposed contract documents, the Contractor is to provide protection for soils to limit the exposure to erosion. The limitation of disturbance, adequate cover practices, and runoff control are the most effective methods for reduction of turbidity in stormwater runoff.

12. **Describe the intended sequence and timing of construction activities and any proposed construction phasing:**

    At this time, it is not expected that the project will be formally phased. The Contractor is responsible for coordinating work of all subcontractors to keep the duration of site disturbance limited to the maximum extent possible.

13. **Describe the construction schedule:**

    Construction is expected to begin in Spring 2022 and be completed by Fall 2022.

14. **Describe ownership and financial obligations for the project. Include bond forms and other evidence of financial responsibility for environmental liabilities associated with construction:**

    The property is owned and operated by Robert and Margaret Drollinger. The Contractor on the project will be responsible for posting a performance and payment bond with Mr. Drollinger, and thus will be the responsible party for any liability associated with erosion and sedimentation impact.

15. **Engineering calculations for design of sediment ponds, diversion, waterways, etc. Also include calculations for runoff and stormwater detention design, if applicable:**

    A copy of calculations performed during design of the project and relevant storm drainage modeling discussions is included in the project's drainage report.

The Contractor shall meet the requirements and objectives of the following extended list of best management practices (BMPs):

EROSION CONTROL ELEMENT # 1 - MARK CLEARING LIMITS

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue's and State of Washington erosion control requirements as described below:

Preserve existing vegetation – BMP C101
Silt Fence – BMP C233

The limits of clearing and grading for the project are shown on the plans. In addition, Silt Fence (per DOE BMP C233) will be used along portions of the limits of work boundary.

Requirements (per COB CSWPPP Worksheet)

The contractor shall meet the following requirements:

1. Before beginning land disturbing activities, including clearing and grading, the Contractor shall clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.
2. Retain the duff layer, native top soil, and natural vegetation in an undisturbed state to the maximum degree practical.

EROSION CONTROL ELEMENT # 2 - ESTABLISH CONSTRUCTION ACCESS

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue's and State of Washington erosion control requirements as described below:

Stabilized Construction Entrance – BMP C105

It is anticipated that the existing concrete driveway will be used as a construction entrance as long as possible during construction. A stabilized construction entrance (per DOE BMP C105) shall be used as necessary in places where no pavement exists.

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements:

1. Limit construction vehicle access and exit to one route, if possible.
2. Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize tracking sediment onto roads.
3. Locate wheel wash or tire baths on site, if the stabilized construction entrance is not effective in preventing tracking sediment onto roads.
4. If sediment is tracked off site, clean the affected roadway thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or pick up and transport the sediment to a controlled sediment disposal area.
5. Conduct street washing only after sediment is removed in accordance with the above bullet.
6. Control street wash wastewater by pumping back on site or otherwise preventing it from discharging into systems tributary to water of the State.

EROSION CONTROL ELEMENT # 3 - CONTROL FLOW RATES

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue's and State of Washington erosion control requirements as described below:

Sediment Settling Trap – BMP C240

During construction, the project will utilize a sediment settling tank. Capacity required was determined using methodology from Volume 2 of the 2014 DOE Manual. Stormwater runoff from the project work area will be collected and routed to this sediment tank, which will provide sediment settling before being discharged into the existing storm drainage systems onsite, in accordance with the turbidity monitoring requirements of the Construction Stormwater General Permit. Any stormwater discharged from the site will be in accordance with the turbidity monitoring requirements of the Construction Stormwater General Permit. There are no permanent flow control facilities associated with this project.

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirement:

1. Protect properties and waterways downstream of development sites from erosion and the associated discharge of turbid waters due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site, as required by local plan approval authority.

2. Where necessary to comply the bullet above, construct stormwater retention or detention facilities as one of the first steps in grading. Assure that detention facilities function properly before constructing site improvements (e.g. impervious surfaces).
3. If permanent infiltration ponds are used for flow control during construction, protect these facilities from siltation during the construction phase.

EROSION CONTROL ELEMENT # 4 - INSTALL SEDIMENT CONTROLS

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue and State of Washington erosion control requirements as described below:

Triangular Silt Dike – BMP C208
Silt Fence – BMP C233
Catch Basin Insert – BMP C220
Other Sediment Controls as Described Below

The following BMPs are proposed for sediment control as shown on the TESC plans; triangular silt dike (per DOE BMP C208), silt fencing (per DOE BMP C233), and catch basin filter inserts (per DOE BMP C220). Sediment control during construction will be achieved by keeping exposed soils covered, in accordance with the notes and details in the plans. In the event that unexpected conditions arise during construction, the Contractor is expected to contract with a third-party erosion control monitor to help manage the site and prevent any discharges of turbid water to the downstream system.

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements if applicable:

1. Construct sediment control BMPs (sediment ponds, traps, filters, etc.) as one of the first steps in grading. These BMPs shall be functional before other land disturbing activities take place.
2. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.
3. Direct stormwater runoff from disturbed areas through a sediment pond or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must meet the flow control performance standard in Element #3, bullet #1.
4. Locate BMPs intended to trap sediment on site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.
5. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal, and maximize stormwater infiltration, unless infeasible.
6. Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

EROSION CONTROL ELEMENT # 5 - STABILIZE SOILS

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue's and State of Washington erosion control requirements as described below:

Temporary & Permanent Seeding – BMP C120
Mulching – BMP C121
Nets & blankets – BMP C122
Plastic Covering – BMP C123

As described in the TESC Notes on the plans, the following BMPs are required to stabilize exposed soils: preserve natural vegetation (per DOE BMP C101), plastic covering (per DOE BMP C123), erosion control blankets (per DOE BMP C122), or mulching (per DOE BMP C121).

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements:

1. Stabilize exposed and unworked soils by application of effective BMPs that prevent erosion. Applicable BMPs include, but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion control fabrics and matting, soil application of polyacrylamide (PAM), the early application of gravel base early on areas to be paved, and dust control.
2. Control stormwater volume and velocity within the site to minimize soil erosion.
3. Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion.
4. Exposed/unworked soils must be covered daily to prevent erosion.
5. Stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.
6. Minimize the amount of soil exposed during construction activity.
7. Minimize the disturbance of steep slopes.
8. Minimize soil compaction and, unless infeasible, preserve topsoil.

EROSION CONTROL ELEMENT # 6 – PROTECT SLOPES

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue's and State of Washington erosion control requirements as described below:

Temporary & Permanent Seeding – BMP C120
Nets & blankets – BMP C122
Plastic Covering – BMP C123
Silt Fence – BMP C233

BMPs for slope protection will be utilized during construction, as defined on the TESC plan and TESC notes sheets. These BMPs include: preserve natural vegetation (per DOE BMP C101), silt fencing (per DOE BMP C233), plastic covering (per DOE BMP C123) and erosion control blankets (per DOE BMP C122).

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements where applicable or as directed by project documents:

1. Design and construct cut-and-fill slopes in a manner to minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (for example, track walking).

2. Divert off-site stormwater (run-on) or ground water away from slopes and disturbed areas with interceptor dikes, pipes, and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.
3. At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.
    - Temporary pipe slope drains must handle the peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas should be modeled as "landscaped" areas.
4. Place excavated material on the uphill side of trenches, consistent with safety and space considerations.
5. Place check dams, at regular intervals within constructed channels that are cut down a slope.

EROSION CONTROL ELEMENT # 7 – PROTECT DRAIN INLETS

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue's and State of Washington erosion control requirements as described below:

Storm Drain Inlet Protection – BMP C220

Catch basin inserts (per DOE BMP C220) will be installed on all catch basins located within or adjacent to the project area. Drainage structures in areas where no work occurs will remain and will be protected; discharge points to the public storm drain main line will also remain. Proposed inlets will also be protected with catch basin inserts, and where feasible, their outlets will be temporarily plugged until the site is stabilized.

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements:

1. Protect all storm drain inlets made operable during construction so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.
2. Clean or remove and replace inlet protection devices when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

EROSION CONTROL ELEMENT # 8 – STABILIZE CHANNEL AND OUTLETS

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue's and State of Washington erosion control requirements as described below:

Outlet Protection – BMP C209

There are no existing or proposed channels involved with this project. Quarry spall discharge pads (per DOE BMP C209) will be placed at the outlets of the existing and proposed pipe discharges for the project.

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements:

1. Design, construct, and stabilize all on-site conveyance channels to prevent erosion from the following expected peak flows:
    - Channels must handle the peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas should be modeled as "landscaped" areas.
2. Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent streambanks, slopes, and downstream reaches at the outlets of all conveyance systems.

EROSION CONTROL ELEMENT # 9 – CONTROL POLLUTANTS

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue's and State of Washington erosion control requirements as described below:

Concrete Handling – BMP C151
Sawcutting and Surfacing Pollution Prevention – BMP C152

The Contractor will be responsible for managing their construction equipment per DOE and COB-approved BMPs. Concrete truck wash water shall be collected and discharged to the public sanitary sewer (SS) system or off-site in an approved location. Contractor will be responsible for applying for a SS release permit if necessary and shall contact appropriate King County METRO and Bellevue Utilities personnel for authorization. Stabilized construction entrances are assumed to be sufficient for the construction period; if something more substantial is required, the Contractor is to coordinate with the Owner's Representative and the City of Bellevue inspector.

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements:

1. Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants.
2. Handle and dispose of all pollutants, including waste materials and demolition debris that occur on-site in a manner that does not cause contamination of stormwater.
3. Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. On-site fueling tanks must include secondary containment. Secondary containment means placing tanks or containers within an impervious structure capable of containing 100% of the volume contained in the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment.
4. Conduct maintenance, fueling, and repair of heavy equipment and vehicles using spill prevention and control measures. Clean contaminated surfaces immediately following any spill incident.
5. Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland land application, or to the sanitary sewer, with local sewer district approval.
6. Apply fertilizers and pesticides in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers' label requirements for application rates and procedures.

7. Use BMPs to prevent contamination of stormwater runoff by pH modifying sources. The sources for this contamination include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout waters.
8. Adjust the pH of stormwater if necessary to prevent violations of the water quality standards.
9. Assure that washout of concrete trucks is performed off-site or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Do not dump excess concrete on site, except in designated concrete washout areas. Concrete spillage or concrete discharge to surface waters of the State is prohibited.
10. Obtain written approval from Ecology before using chemical treatment other than CO2 or dry ice to adjust pH.

EROSION CONTROL ELEMENT # 10 – CONTROL DE-WATERING

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue's and State of Washington erosion control requirements as described below:

Sediment Settling Tank

If groundwater is encountered during construction, it should be pumped to a temporary sediment facility for sediment settling. Alternatively, dewatering may occur via off-site transport in a vehicle such as a vacuum flush truck. Water shall be legally disposed in a manner that does not pollute state waters.

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements:

1. Discharge foundation, vault, and trench dewatering water, which have characteristics similar to stormwater runoff at the site, into a controlled conveyance system before discharge to a sediment trap or sediment pond.
2. Discharge clean, non-turbid de-watering water, such as well-point ground water to systems tributary to, or directly into surface waters of the State, as specified in Element #8, provided the de-watering flow does not cause erosion or flooding of receiving waters or interfere with the operation of the system. Do not route clean dewatering water through stormwater sediment ponds. Note that "surface waters of the State" may exist on a construction site as well as off site; for example, a creek running through a site.
3. Handle highly turbid or contaminated dewatering water separately from stormwater.
4. Other treatment or disposal options may include:
    - Infiltration.
    - Transport off-site in a vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters.
    - Ecology-approved on-site chemical treatment or other suitable treatment technologies.
    - Sanitary sewer discharge with Metro and City of Bellevue approval, if there is no other option.
    - Use of a sedimentation bag with outfall to a ditch or swale for small volumes of localized dewatering.

EROSION CONTROL ELEMENT # 11 – MAINTAIN BMPS

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue's and State of Washington erosion control requirements as described below:

Maintain and repair in accordance with BMP specifications

Per the Clearing and Grading Notes and the Construction Sequence notes, the Contractor shall maintain erosion control measures in accordance with City of Bellevue and DOE Standards and manufacturer's recommendations.

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements:

1. Maintain and repair all temporary and permanent erosion and sediment control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.
2. Remove all temporary erosion and sediment control BMPs within 30 days after achieving final site stabilization or after the temporary BMPs are no longer needed.

EROSION CONTROL ELEMENT # 12 – MANAGE THE PROJECT

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue and State of Washington erosion control requirements as described below:

Manage the project in accordance with BMP requirements and specifications

Per the Clearing and Grading Notes and the Construction Sequence notes, the Contractor shall inspect, monitor and maintain erosion control measures in accordance with City of Bellevue and DOE Standards and manufacturer's recommendations. A contact list will be provided and posted at the job site. The Contractor shall be responsible for completing inspections and forms in accordance with City of Bellevue Standards.

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements:

1. Phase development projects to the maximum degree practicable and take into account seasonal work limits.
2. Inspection and monitoring – Inspect, maintain, and repair all BMPs as needed to assure continued performance of their intended function. Conduct site inspections and monitoring in accordance with the Construction Stormwater General Permit or local plan approval authority.
3. Maintaining an updated construction SWPPP – Maintain, update, and implement the SWPPP in accordance with the Construction Stormwater General Permit.
4. Projects that disturb one or more acres must have, site inspections conducted by a Certified Erosion and Sediment Control Lead (CSECL). Project sites less than one acre (not part of a larger common plan of development or sale) may have a person without CESCL certification conduct inspections. By the initiation of construction, the SWPPP must identify the CESCL or inspector, who shall be present on-site or on-call at all times.

EROSION CONTROL ELEMENT # 13 – PROTECT LOW IMPACT DEVELOPMENT BMPS

The following Best Management Practices will be implemented by the Contractor on the project site to meet the City of Bellevue and State of Washington erosion control requirements as described below:

High Visibility Fence – BMP C103
Silt Fence – BMP C233

The project does not have any Low Impact Development (LID) BMPs requiring protection. If necessary, sedimentation shall be controlled silt fencing (per DOE BMP C233) to protect excavation areas. High visibility construction fencing (per DOE BMP C103) can be used to protect BMPs in-progress during construction. Chapter 5 of the 2012 Low Impact Development Technical Guidance Manual for Puget Sound shall be consulted for the site preparation, inspection, and construction sequencing of LID facilities.

Requirements (per COB CSWPPP Worksheet)

The Contractor shall meet the following requirements:

1. Protect all Bioretention and Rain Garden BMPs from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the Bioretention and/or Rain Garden BMPs. Restore the BMPs to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden Bioretention/rain garden soils, and replacing the removed soils with soils meeting the design specification.
2. Prevent compacting Bioretention and rain garden BMPs by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.
3. Control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff onto permeable pavements.
4. Pavements fouled with sediments or no longer passing an initial infiltration test must be cleaned using procedures from the local stormwater manual or the manufacturer's procedures.
5. Keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils.

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APPENDIX A

CSWPPP BMPs and Attachments

4.1 Source Control BMPs

BMP C101: Preserving Natural Vegetation

Purpose

The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion. For example, conifers can hold up to about 50 percent of all rain that falls during a storm. Up to 20-30 percent of this rain may never reach the ground but is taken up by the tree or evaporates. Another benefit is that the rain held in the tree can be released slowly to the ground after the storm.

Conditions of Use

- Natural vegetation should be preserved on steep slopes, near perennial and intermittent watercourses or swales, and on building sites in wooded areas.
- As required by plat conditions, land use code, or land use approvals.

Design and Installation Specifications

Natural vegetation can be preserved in natural clumps or as individual trees, shrubs and vines.

The preservation of individual plants is more difficult because heavy equipment is generally used to remove unwanted vegetation. The points to remember when attempting to save individual plants are:

- Is the plant worth saving? Consider the location, species, size, age, vigor, and the work involved. Plat conditions or land use regulations may also require that natural vegetation and trees be saved.
- Fence or clearly mark areas around trees that are to be saved. It is preferable to keep ground disturbance away from the trees at least as far out as the dripline.

Plants need protection from three kinds of injuries:

- *Construction Equipment* - This injury can be above or below the ground level. Damage results from scarring, cutting of roots, and compaction of the soil. Placing a fenced buffer zone around plants to be saved prior to construction can prevent construction equipment injuries.
- *Grade Changes* - Changing the natural ground level will alter grades, which affects the plant's ability to obtain the necessary air, water, and minerals. Minor fills usually do not cause problems although sensitivity between species does vary and should be checked. Trees can tolerate fill of 6 inches or less. For shrubs and other plants, the fill should be less.

  When there are major changes in grade, it may become necessary to supply air to the roots of plants. This can be done by placing a layer of gravel and a tile system over the roots before the fill is made. A tile

system protects a tree from a raised grade. The tile system should be laid out on the original grade leading from a dry well around the tree trunk. The system should then be covered with small stones to allow air to circulate over the root area.

Lowering the natural ground level can seriously damage trees and shrubs. The highest percentage of the plant roots are in the upper 12 inches of the soil and cuts of only 2-3 inches can cause serious injury. To protect the roots it may be necessary to terrace the immediate area around the plants to be saved. If roots are exposed, construction of retaining walls may be needed to keep the soil in place. Plants can also be preserved by leaving them on an undisturbed, gently sloping mound. To increase the chances for survival, it is best to limit grade changes and other soil disturbances to areas outside the dripline of the plant.

- *Excavations* - Protect trees and other plants when excavating for drainfields, power, water, and sewer lines. Where possible, the trenches should be routed around trees and large shrubs. When this is not possible, it is best to tunnel under them. This can be done with hand tools or with power augers. If it is not possible to route the trench around plants to be saved, then the following should be observed:

  Cut as few roots as possible. When you have to cut, cut clean. Paint cut root ends with a wood dressing like asphalt base paint.

  Backfill the trench as soon as possible.

  Tunnel beneath root systems as close to the center of the main trunk to preserve most of the important feeder roots.

Some problems that can be encountered with a few specific trees are:

- Maple, Dogwood, Red alder, Western hemlock, Western red cedar, and Douglas fir do not readily adjust to changes in environment and special care should be taken to protect these trees.
- The windthrow hazard of Pacific silver fir and madronna is high, while that of Western hemlock is moderate. The danger of windthrow increases where dense stands have been thinned. Other species (unless they are on shallow, wet soils less than 20 inches deep) have a low windthrow hazard.
- Cottonwoods, maples, and willows have water-seeking roots. These can cause trouble in sewer lines and infiltration fields. On the other hand, they thrive in high moisture conditions that other trees would not.
- Thinning operations in pure or mixed stands of Grand fir, Pacific silver fir, Noble fir, Sitka spruce, Western red cedar, Western hemlock,

Pacific dogwood, and Red alder can cause serious disease problems. Disease can become established through damaged limbs, trunks, roots, and freshly cut stumps. Diseased and weakened trees are also susceptible to insect attack.

Maintenance Standards

- Inspect flagged and/or fenced areas regularly to make sure flagging or fencing has not been removed or damaged. If the flagging or fencing has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.
- If tree roots have been exposed or injured, "prune" cleanly with an appropriate pruning saw or lopers directly above the damaged roots and recover with native soils. Treatment of sap flowing trees (fir, hemlock, pine, soft maples) is not advised as sap forms a natural healing barrier.

BMP C120: Temporary and Permanent Seeding

Purpose

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Conditions of Use

- Seeding may be used throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.
- Channels that will be vegetated should be installed before major earthwork and hydroseeded with a Bonded Fiber Matrix. The vegetation should be well established (i.e., 75 percent cover) before water is allowed to flow in the ditch. With channels that will have high flows, erosion control blankets should be installed over the hydroseed. If vegetation cannot be established from seed before water is allowed in the ditch, sod should be installed in the bottom of the ditch over hydromulch and blankets.
- Retention/detention ponds should be seeded as required.
- Mulch is required at all times because it protects seeds from heat, moisture loss, and transport due to runoff.
- All disturbed areas shall be reviewed in late August to early September and all seeding should be completed by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.
- At final site stabilization, all disturbed areas not otherwise vegetated or stabilized shall be seeded and mulched. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions or geotextiles) which will prevent erosion.

Design and Installation Specifications

- Seeding should be done during those seasons most conducive to growth and will vary with the climate conditions of the region. Local experience should be used to determine the appropriate seeding periods.
- The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1. Seeding that occurs between July 1 and August 30 will require irrigation until 75 percent grass cover is established. Seeding that occurs between October 1 and March 30 will require a mulch or plastic cover until 75 percent grass cover is established.
- To prevent seed from being washed away, confirm that all required surface water control measures have been installed.

- The seedbed should be firm and rough. All soil should be roughened no matter what the slope. If compaction is required for engineering purposes, slopes must be track walked before seeding. Backblading or smoothing of slopes greater than 4:1 is not allowed if they are to be seeded.
- New and more effective restoration-based landscape practices rely on deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical the subgrade should be initially ripped to improve long-term permeability, infiltration, and water inflow qualities. At a minimum, permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches the rototilling process should be done in multiple lifts, or the prepared soil system shall be prepared properly and then placed to achieve the specified depth.
- Organic matter is the most appropriate form of "fertilizer" because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form. A natural system typically releases 2-10 percent of its nutrients annually. Chemical fertilizers have since been formulated to simulate what organic matter does naturally.
- In general, 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer can be used at a rate of 90 pounds per acre. Slow-release fertilizers should always be used because they are more efficient and have fewer environmental impacts. It is recommended that areas being seeded for final landscaping conduct soil tests to determine the exact type and quantity of fertilizer needed. This will prevent the over-application of fertilizer. Fertilizer should not be added to the hydromulch machine and agitated more than 20 minutes before it is to be used. If agitated too much, the slow-release coating is destroyed.
- There are numerous products available on the market that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal is a good source of long-term, slow-release, available nitrogen.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 percent tackifier. Mulch may be made up of 100 percent: cottonseed meal; fibers made of wood, recycled cellulose, hemp, and kenaf; compost; or blends of these. Tackifier shall be plant-based, such as guar or alpha plantago, or chemical-based such as polyacrylamide or polymers. Any mulch or tackifier product used shall be installed per manufacturer's instructions. Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at time of application.

- Mulch is always required for seeding. Mulch can be applied on top of the seed or simultaneously by hydroseeding.
- On steep slopes, Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products should be used. BFM/MBFM products are applied at a minimum rate of 3,000 pounds per acre of mulch with approximately 10 percent tackifier. Application is made so that a minimum of 95 percent soil coverage is achieved. Numerous products are available commercially and should be installed per manufacturer's instructions. Most products require 24-36 hours to cure before a rainfall and cannot be installed on wet or saturated soils. Generally, these products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.

BFMs and MBFMs have some advantages over blankets:

- No surface preparation required;
- Can be installed via helicopter in remote areas;
- On slopes steeper than 2.5:1, blanket installers may need to be roped and harnessed for safety;
- They are at least $1,000 per acre cheaper installed.

In most cases, the shear strength of blankets is not a factor when used on slopes, only when used in channels. BFMs and MBFMs are good alternatives to blankets in most situations where vegetation establishment is the goal.

- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. One way to overcome this is to increase seed quantities by up to 50 percent.
- Vegetation establishment can also be enhanced by dividing the hydromulch operation into two phases:
    1. Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift;
    2. Phase 2- Install the rest of the mulch and tackifier over the first lift.

An alternative is to install the mulch, seed, fertilizer, and tackifier in one lift. Then, spread or blow straw over the top of the hydromulch at a rate of about 800-1000 pounds per acre. Hold straw in place with a standard tackifier. Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:

1. Irrigation
2. Reapplication of mulch
3. Repair of failed slope surfaces

This technique works with standard hydromulch (1,500 pounds per acre minimum) and BFM/MBFMs (3,000 pounds per acre minimum).

- Areas to be permanently landscaped shall provide a healthy topsoil that reduces the need for fertilizers, improves overall topsoil quality, provides for better vegetal health and vitality, improves hydrologic characteristics, and reduces the need for irrigation. This can be accomplished in a number of ways:

  Recent research has shown that the best method to improve till soils is to amend these soils with compost. The optimum mixture is approximately two parts soil to one part compost. This equates to 4 inches of compost mixed to a depth of 12 inches in till soils. Increasing the concentration of compost beyond this level can have negative effects on vegetal health, while decreasing the concentrations can reduce the benefits of amended soils. Please note: The compost should meet specifications for Grade A quality compost in Ecology Publication 94-038.

  Other soils, such as gravel or cobble outwash soils, may require different approaches. Organics and fines easily migrate through the loose structure of these soils. Therefore, the importation of at least 6 inches of quality topsoil, underlain by some type of filter fabric to prevent the migration of fines, may be more appropriate for these soils.

  Areas that already have good topsoil, such as undisturbed areas, do not require soil amendments.

- Areas that will be seeded only and not landscaped may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Native topsoil should be re-installed on the disturbed soil surface before application.
- Seed that is installed as a temporary measure may be installed by hand if it will be covered by straw, mulch, or topsoil. Seed that is installed as a permanent measure may be installed by hand on small areas (usually less than 1 acre) that will be covered with mulch, topsoil, or erosion blankets. The seed mixes listed below include recommended mixes for both temporary and permanent seeding. These mixes, with the exception of the wetland mix, shall be applied at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used. Local suppliers or the local conservation district should be consulted for their recommendations because the appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used.

Table 4.1 represents the standard mix for those areas where just a temporary vegetative cover is required.

Table 4.1
Temporary Erosion Control Seed Mix

	% Weight	% Purity	% Germination
Chewings or annual blue grass *Festuca rubra var. commutata* or *Poa anna*	40	98	90
Perennial rye - *Lolium perenne*	50	98	90
Redtop or colonial bentgrass *Agrostis alba* or *Agrostis tenuis*	5	92	85
White dutch clover *Trifolium repens*	5	98	90

Table 4.2 provides just one recommended possibility for landscaping seed.

Table 4.2
Landscaping Seed Mix

	% Weight	% Purity	% Germination
Perennial rye blend *Lolium perenne*	70	98	90
Chewings and red fescue blend *Festuca rubra var. commutata* or *Festuca rubra*	30	98	90

This turf seed mix in Table 4.3 is for dry situations where there is no need for much water. The advantage is that this mix requires very little maintenance.

Table 4.3
Low-Growing Turf Seed Mix

	% Weight	% Purity	% Germination
Dwarf tall fescue (several varieties) *Festuca arundinacea var.*	45	98	90
Dwarf perennial rye (Barclay) *Lolium perenne var. barclay*	30	98	90
Red fescue *Festuca rubra*	20	98	90
Colonial bentgrass *Agrostis tenuis*	5	98	90

Table 4.4 presents a mix recommended for bioswales and other intermittently wet areas.

Table 4.4
Bioswale Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	75-80	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	92	85
Redtop bentgrass *Agrostis alba* or *Agrostis gigantea*	5-10	90	80

** Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix*

The seed mix shown in Table 4.5 is a recommended low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Other mixes may be appropriate, depending on the soil type and hydrology of the area. Recent research suggests that bentgrass (agrostis sp.) should be emphasized in wet-area seed mixes. Apply this mixture at a rate of 60 pounds per acre.

Table 4.5
Wet Area Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	60-70	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	98	85
Meadow foxtail *Alepocurus pratensis*	10-15	90	80
Alsike clover *Trifolium hybridum*	1-6	98	90
Redtop bentgrass *Agrostis alba*	1-6	92	85

** Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix*

The meadow seed mix in Table 4.6 is recommended for areas that will be maintained infrequently or not at all and where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seeding should take place in September or very early October in order to obtain adequate establishment prior to the winter months. The appropriateness of clover in the mix may need to be considered, as this can be a fairly invasive species. If the soil is amended, the addition of clover may not be necessary.

Table 4.6
Meadow Seed Mix

	% Weight	% Purity	% Germination
Redtop or Oregon bentgrass *Agrostis alba* or *Agrostis oregonensis*	20	92	85
Red fescue *Festuca rubra*	70	98	90
White dutch clover *Trifolium repens*	10	98	90

Maintenance Standards

- Any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows) shall be reseeded. If reseeding is ineffective, an alternate method, such as sodding, mulching, or nets/blankets, shall be used. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.

- After adequate cover is achieved, any areas that experience erosion shall be reseeded and protected by mulch. If the erosion problem is drainage related, the problem shall be fixed and the eroded area reseeded and protected by mulch.
- Seeded areas shall be supplied with adequate moisture, but not watered to the extent that it causes runoff.

BMP C121: Mulching

Purpose

The purpose of mulching soils is to provide immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There is an enormous variety of mulches that can be used. Only the most common types are discussed in this section.

Conditions of Use

As a temporary cover measure, mulch should be used:

- On disturbed areas that require cover measures for less than 30 days.
- As a cover for seed during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.
- Mulch may be applied at any time of the year and must be refreshed periodically.

Design and Installation Specifications

For mulch materials, application rates, and specifications, see Table 4.7. Note: Thicknesses may be increased for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter. Composted organic materials have higher specific gravities (densities) than straw, wood, or chipped material.

Maintenance Standards

- The thickness of the cover must be maintained.
- Any areas that experience erosion shall be remulched and/or protected with a net or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

Table 4.7 Mulch Standards and Guidelines			
Mulch Material	**Quality Standards**	**Application Rates**	**Remarks**
Straw	Air-dried; free from undesirable seed and coarse material.	2"-3" thick; 5 bales per 1000 sf or 2-3 tons per acre	Cost-effective protection when applied with adequate thickness. Hand-application generally requires greater thickness than blown straw. The thickness of straw may be reduced by half when used in conjunction with seeding. In windy areas straw must be held in place by crimping, using a tackifier, or covering with netting. Blown straw always has to be held in place with a tackifier as even light winds will blow it away. Straw, however, has several deficiencies that should be considered when selecting mulch materials. It often introduces and/or encourages the propagation of weed species and it has no significant long-term benefits. Straw should be used only if mulches with long-term benefits are unavailable locally. It should also not be used within the ordinary high-water elevation of surface waters (due to flotation).
Hydromulch	No growth inhibiting factors.	Approx. 25-30 lbs per 1000 sf or 1500 - 2000 lbs per acre	Shall be applied with hydromulcher. Shall not be used without seed and tackifier unless the application rate is at least doubled. Fibers longer than about ¾-1 inch clog hydromulch equipment. Fibers should be kept to less than ¾ inch.
Composted Mulch and Compost	No visible water or dust during handling. Must be purchased from supplier with Solid Waste Handling Permit (unless exempt).	2" thick min.; approx. 100 tons per acre (approx. 800 lbs per yard)	More effective control can be obtained by increasing thickness to 3". Excellent mulch for protecting final grades until landscaping because it can be directly seeded or tilled into soil as an amendment. Composted mulch has a coarser size gradation than compost. It is more stable and practical to use in wet areas and during rainy weather conditions.
Chipped Site Vegetation	Average size shall be several inches. Gradations from fines to 6 inches in length for texture, variation, and interlocking properties.	2" minimum thickness	This is a cost-effective way to dispose of debris from clearing and grubbing, and it eliminates the problems associated with burning. Generally, it should not be used on slopes above approx. 10% because of its tendency to be transported by runoff. It is not recommended within 200 feet of surface waters. If seeding is expected shortly after mulch, the decomposition of the chipped vegetation may tie up nutrients important to grass establishment.
Wood-based Mulch	No visible water or dust during handling. Must be purchased from a supplier with a Solid Waste Handling Permit or one exempt from solid waste regulations.	2" thick; approx. 100 tons per acre (approx. 800 lbs. per cubic yard)	This material is often called "hog or hogged fuel." It is usable as a material for Stabilized Construction Entrances (BMP C105) and as a mulch. The use of mulch ultimately improves the organic matter in the soil. Special caution is advised regarding the source and composition of wood-based mulches. Its preparation typically does not provide any weed seed control, so evidence of residual vegetation in its composition or known inclusion of weed plants or seeds should be monitored and prevented (or minimized).

BMP C151: Concrete Handling

Purpose

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. This BMP is intended to minimize and eliminate concrete process water and slurry from entering waters of the state.

Conditions of Use

Any time concrete is used, these management practices shall be utilized. Concrete construction projects include, but are not limited to, the following:

- Curbs
- Sidewalks
- Roads
- Bridges
- Foundations
- Floors
- Runways

Design and Installation Specifications

- Concrete truck chutes, pumps, and internals shall be washed out only into formed areas awaiting installation of concrete or asphalt.
- Unused concrete remaining in the truck and pump shall be returned to the originating batch plant for recycling.
- Hand tools including, but not limited to, screeds, shovels, rakes, floats, and trowels shall be washed off only into formed areas awaiting installation of concrete or asphalt.
- Equipment that cannot be easily moved, such as concrete pavers, shall only be washed in areas that do not directly drain to natural or constructed stormwater conveyances.
- Washdown from areas such as concrete aggregate driveways shall not drain directly to natural or constructed stormwater conveyances.
- When no formed areas are available, washwater and leftover product shall be contained in a lined container. Contained concrete shall be disposed of in a manner that does not violate groundwater or surface water quality standards.

Maintenance Standards

Containers shall be checked for holes in the liner daily during concrete pours and repaired the same day.

BMP C152: Sawcutting and Surfacing Pollution Prevention

Purpose

Sawcutting and surfacing operations generate slurry and process water that contains fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. This BMP is intended to minimize and eliminate process water and slurry from entering waters of the State.

Conditions of Use

Anytime sawcutting or surfacing operations take place, these management practices shall be utilized. Sawcutting and surfacing operations include, but are not limited to, the following:

- Sawing
- Coring
- Grinding
- Roughening
- Hydro-demolition
- Bridge and road surfacing

Design and Installation Specifications

- Slurry and cuttings shall be vacuumed during cutting and surfacing operations.
- Slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight.
- Slurry and cuttings shall not drain to any natural or constructed drainage conveyance.
- Collected slurry and cuttings shall be disposed of in a manner that does not violate groundwater or surface water quality standards.
- Process water that is generated during hydro-demolition, surface roughening or similar operations shall not drain to any natural or constructed drainage conveyance and shall be disposed of in a manner that does not violate groundwater or surface water quality standards.
- Cleaning waste material and demolition debris shall be handled and disposed of in a manner that does not cause contamination of water. If the area is swept with a pick-up sweeper, the material must be hauled out of the area to an appropriate disposal site.

Maintenance Standards

Continually monitor operations to determine whether slurry, cuttings, or process water could enter waters of the state. If inspections show that a violation of water quality standards could occur, stop operations and immediately implement preventive measures such as berms, barriers, secondary containment, and vacuum trucks.

BMP C208: Triangular Silt Dike (TSD) (Geotextile-Encased Check Dam)

Purpose

Triangular silt dikes may be used as check dams, for perimeter protection, for temporary soil stockpile protection, for drop inlet protection, or as a temporary interceptor dike.

Conditions of use

- May be used on soil or pavement with adhesive or staples.
- TSDs have been used to build temporary:
  1. sediment ponds;
  2. diversion ditches;
  3. concrete wash out facilities;
  4. curbing;
  5. water bars;
  6. level spreaders; and,
  7. berms.

Design and Installation Specifications

Made of urethane foam sewn into a woven geosynthetic fabric.

It is triangular, 10 inches to 14 inches high in the center, with a 20-inch to 28-inch base. A 2–foot apron extends beyond both sides of the triangle along its standard section of 7 feet. A sleeve at one end allows attachment of additional sections as needed.

- Install with ends curved up to prevent water from flowing around the ends.
- The fabric flaps and check dam units are attached to the ground with wire staples. Wire staples should be No. 11 gauge wire and should be 200 mm to 300 mm in length.
- When multiple units are installed, the sleeve of fabric at the end of the unit shall overlap the abutting unit and be stapled.
- Check dams should be located and installed as soon as construction will allow.
- Check dams should be placed perpendicular to the flow of water.
- When used as check dams, the leading edge must be secured with rocks, sandbags, or a small key slot and staples.
- In the case of grass-lined ditches and swales, check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.

Maintenance

- Triangular silt dams shall be inspected for performance and sediment

Standards

accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches one half the height of the dam.

- Anticipate submergence and deposition above the triangular silt dam and erosion from high flows around the edges of the dam. Immediately repair any damage or any undercutting of the dam.

BMP C209: Outlet Protection

Purpose

Outlet protection prevents scour at conveyance outlets and minimizes the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.

Conditions of use

Outlet protection is required at the outlets of all ponds, pipes, ditches, or other conveyances, and where runoff is conveyed to a natural or manmade drainage feature such as a stream, wetland, lake, or ditch.

Design and Installation Specifications

The receiving channel at the outlet of a culvert shall be protected from erosion by rock lining a minimum of 6 feet downstream and extending up the channel sides a minimum of 1–foot above the maximum tailwater elevation or 1-foot above the crown, whichever is higher. For large pipes (more than 18 inches in diameter), the outlet protection lining of the channel is lengthened to four times the diameter of the culvert.

- Standard wingwalls, and tapered outlets and paved channels should also be considered when appropriate for permanent culvert outlet protection. (See WSDOT Hydraulic Manual, available through WSDOT Engineering Publications).
- Organic or synthetic erosion blankets, with or without vegetation, are usually more effective than rock, cheaper, and easier to install. Materials can be chosen using manufacturer product specifications. ASTM test results are available for most products and the designer can choose the correct material for the expected flow.
- With low flows, vegetation (including sod) can be effective.
- The following guidelines shall be used for riprap outlet protection:
  1. If the discharge velocity at the outlet is less than 5 fps (pipe slope less than 1 percent), use 2-inch to 8-inch riprap. Minimum thickness is 1-foot.
  2. For 5 to 10 fps discharge velocity at the outlet (pipe slope less than 3 percent), use 24-inch to 48-inch riprap. Minimum thickness is 2 feet.
  3. For outlets at the base of steep slope pipes (pipe slope greater than 10 percent), an engineered energy dissipater shall be used.
- Filter fabric or erosion control blankets should always be used under riprap to prevent scour and channel erosion.

- New pipe outfalls can provide an opportunity for low-cost fish habitat improvements. For example, an alcove of low-velocity water can be created by constructing the pipe outfall and associated energy dissipater back from the stream edge and digging a channel, over-widened to the upstream side, from the outfall. Overwintering juvenile and migrating adult salmonids may use the alcove as shelter during high flows. Bank stabilization, bioengineering, and habitat features may be required for disturbed areas. This work may require a HPA. See Volume V for more information on outfall system design.

Maintenance Standards

- Inspect and repair as needed.
- Add rock as needed to maintain the intended function.
- Clean energy dissipater if sediment builds up.

BMP C220: Storm Drain Inlet Protection

Purpose

Storm drain inlet protection prevents coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

Conditions of Use

Use storm drain inlet protection at inlets that are operational before permanent stabilization of the disturbed drainage area. Provide protection for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless conveying runoff entering catch basins to a sediment pond or trap.

Also consider inlet protection for lawn and yard drains on new home construction. These small and numerous drains coupled with lack of gutters in new home construction can add significant amounts of sediment into the roof drain system. If possible delay installing lawn and yard drains until just before landscaping or cap these drains to prevent sediment from entering the system until completion of landscaping. Provide 18-inches of sod around each finished lawn and yard drain.

Table 4.2.2 lists several options for inlet protection. All of the methods for storm drain inlet protection tend to plug and require a high frequency of maintenance. Limit drainage areas to one acre or less. Possibly provide emergency overflows with additional end-of-pipe treatment where stormwater ponding would cause a hazard.

Table 4.2.2 Storm Drain Inlet Protection			
Type of Inlet Protection	**Emergency Overflow**	**Applicable for Paved/ Earthen Surfaces**	**Conditions of Use**
Drop Inlet Protection			
Excavated drop inlet protection	Yes, temporary flooding will occur	Earthen	Applicable for heavy flows. Easy to maintain. Large area Requirement: 30' X 30'/acre
Block and gravel drop inlet protection	Yes	Paved or Earthen	Applicable for heavy concentrated flows. Will not pond.
Gravel and wire drop inlet protection	No		Applicable for heavy concentrated flows. Will pond. Can withstand traffic.
Catch basin filters	Yes	Paved or Earthen	Frequent maintenance required.
Curb Inlet Protection			
Curb inlet protection with a wooden weir	Small capacity overflow	Paved	Used for sturdy, more compact installation.
Block and gravel curb inlet protection	Yes	Paved	Sturdy, but limited filtration.
Culvert Inlet Protection			
Culvert inlet sediment trap			18 month expected life.

Design and Installation Specifications

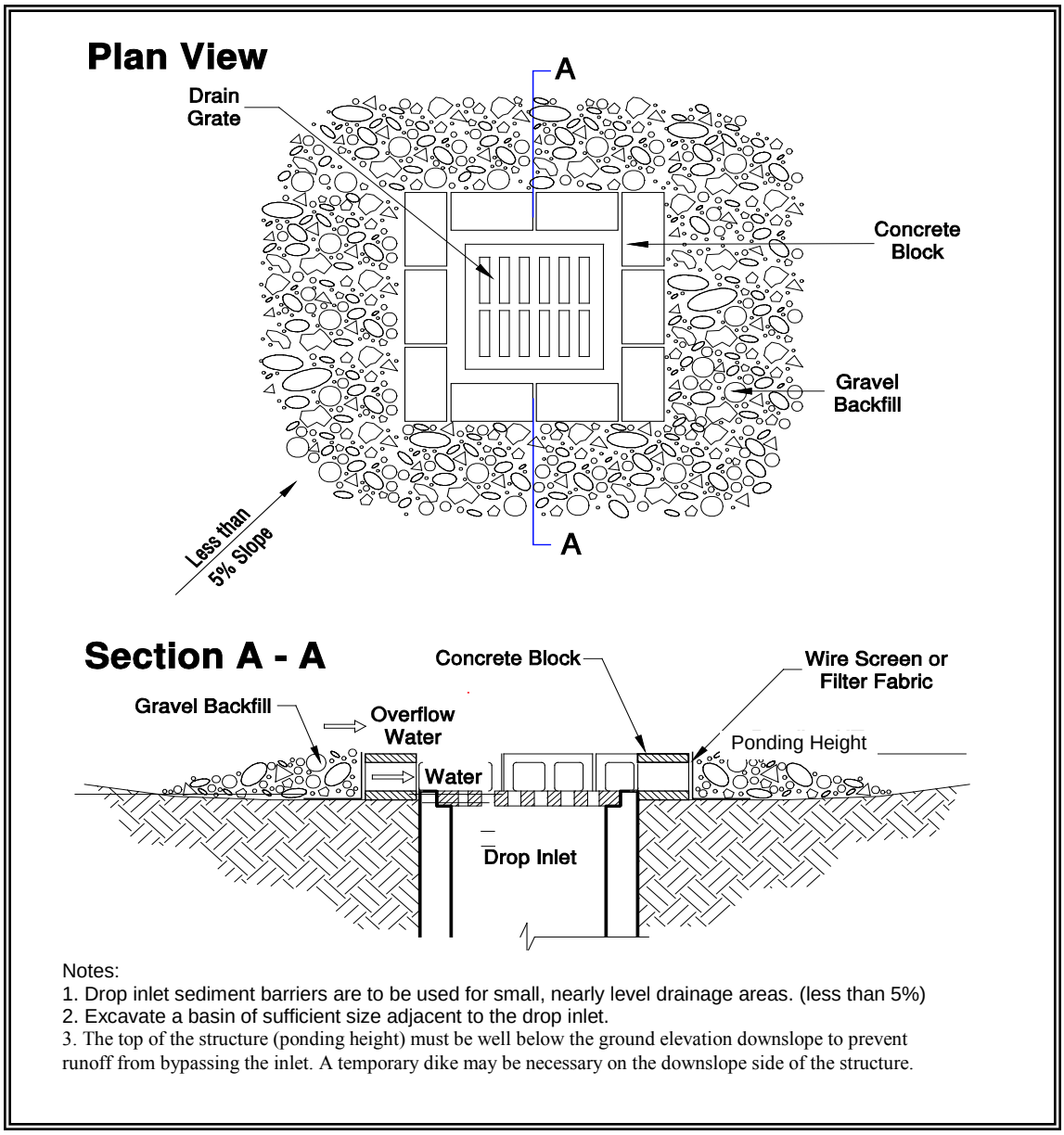
Excavated Drop Inlet Protection - An excavated impoundment around the storm drain. Sediment settles out of the stormwater prior to entering the storm drain.

- Provide a depth of 1-2 ft as measured from the crest of the inlet structure.
- Slope sides of excavation no steeper than 2H:1V.
- Minimum volume of excavation 35 cubic yards.
- Shape basin to fit site with longest dimension oriented toward the longest inflow area.
- Install provisions for draining to prevent standing water problems.
- Clear the area of all debris.
- Grade the approach to the inlet uniformly.
- Drill weep holes into the side of the inlet.
- Protect weep holes with screen wire and washed aggregate.
- Seal weep holes when removing structure and stabilizing area.

- Build a temporary dike, if necessary, to the down slope side of the structure to prevent bypass flow.

Block and Gravel Filter - A barrier formed around the storm drain inlet with standard concrete blocks and gravel. See Figure 4.2.8.

- Provide a height of 1 to 2 feet above inlet.
- Recess the first row 2-inches into the ground for stability.
- Support subsequent courses by placing a 2x4 through the block opening.
- Do not use mortar.
- Lay some blocks in the bottom row on their side for dewatering the pool.
- Place hardware cloth or comparable wire mesh with ½-inch openings over all block openings.
- Place gravel just below the top of blocks on slopes of 2H:1V or flatter.
- An alternative design is a gravel donut.
- Provide an inlet slope of 3H:1V.
- Provide an outlet slope of 2H:1V.
- Provide a1-foot wide level stone area between the structure and the inlet.
- Use inlet slope stones 3 inches in diameter or larger.
- Use gravel ½- to ¾-inch at a minimum thickness of 1-foot for the outlet slope.



Notes:
1. Drop inlet sediment barriers are to be used for small, nearly level drainage areas. (less than 5%)
2. Excavate a basin of sufficient size adjacent to the drop inlet.
3. The top of the structure (ponding height) must be well below the ground elevation downslope to prevent runoff from bypassing the inlet. A temporary dike may be necessary on the downslope side of the structure.

Figure 4.2.8 – Block and Gravel Filter

Gravel and Wire Mesh Filter - A gravel barrier placed over the top of the inlet. This structure does not provide an overflow.

- Use a hardware cloth or comparable wire mesh with ½-inch openings.
- Use coarse aggregate.
- Provide a height 1-foot or more, 18-inches wider than inlet on all sides.
- Place wire mesh over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure.
- Overlap the strips if more than one strip of mesh is necessary.

- Place coarse aggregate over the wire mesh.
- Provide at least a 12-inch depth of gravel over the entire inlet opening and extend at least 18-inches on all sides.

Catchbasin Filters – Use inserts designed by manufacturers for construction sites. The limited sediment storage capacity increases the amount of inspection and maintenance required, which may be daily for heavy sediment loads. To reduce maintenance requirements combine a catchbasin filter with another type of inlet protection. This type of inlet protection provides flow bypass without overflow and therefore may be a better method for inlets located along active rights-of-way.

- Provides 5 cubic feet of storage.
- Requires dewatering provisions.
- Provides a high-flow bypass that will not clog under normal use at a construction site.
- Insert the catchbasin filter in the catchbasin just below the grating.

Curb Inlet Protection with Wooden Weir – Barrier formed around a curb inlet with a wooden frame and gravel.

- Use wire mesh with ½-inch openings.
- Use extra strength filter cloth.
- Construct a frame.
- Attach the wire and filter fabric to the frame.
- Pile coarse washed aggregate against wire/fabric.
- Place weight on frame anchors.

Block and Gravel Curb Inlet Protection – Barrier formed around a curb inlet with concrete blocks and gravel. See Figure 4.2.9.

- Use wire mesh with ½-inch openings.
- Place two concrete blocks on their sides abutting the curb at either side of the inlet opening. These are spacer blocks.
- Place a 2x4 stud through the outer holes of each spacer block to align the front blocks.
- Place blocks on their sides across the front of the inlet and abutting the spacer blocks.
- Place wire mesh over the outside vertical face.
- Pile coarse aggregate against the wire to the top of the barrier.

Curb and Gutter Sediment Barrier – Sandbag or rock berm (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape. See Figure 4.2.10.

- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 feet high and 3 feet wide, at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the outside of the berm sized to sediment trap standards for protecting a culvert inlet.

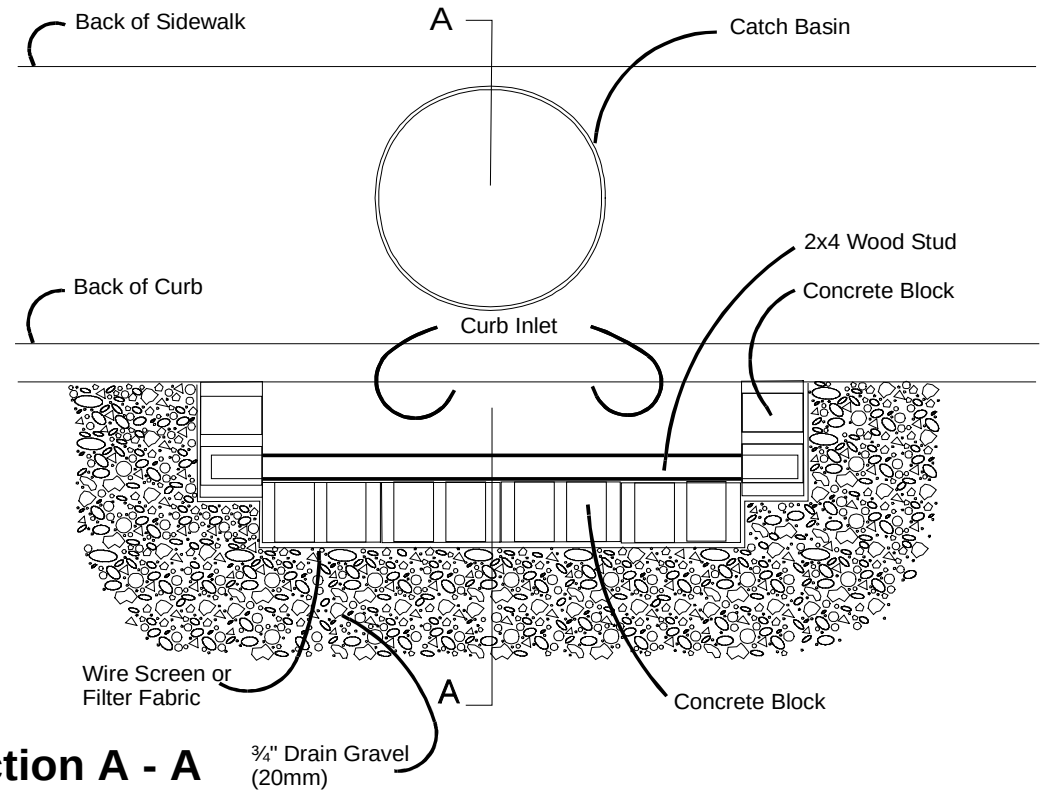
Maintenance Standards

- Inspect catch basin filters frequently, especially after storm events. Clean and replace clogged inserts. For systems with clogged stone filters: pull away the stones from the inlet and clean or replace. An alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.

Approved as Equivalent

Ecology has approved products as able to meet the requirements of BMP C220. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology's website at http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html

Plan View



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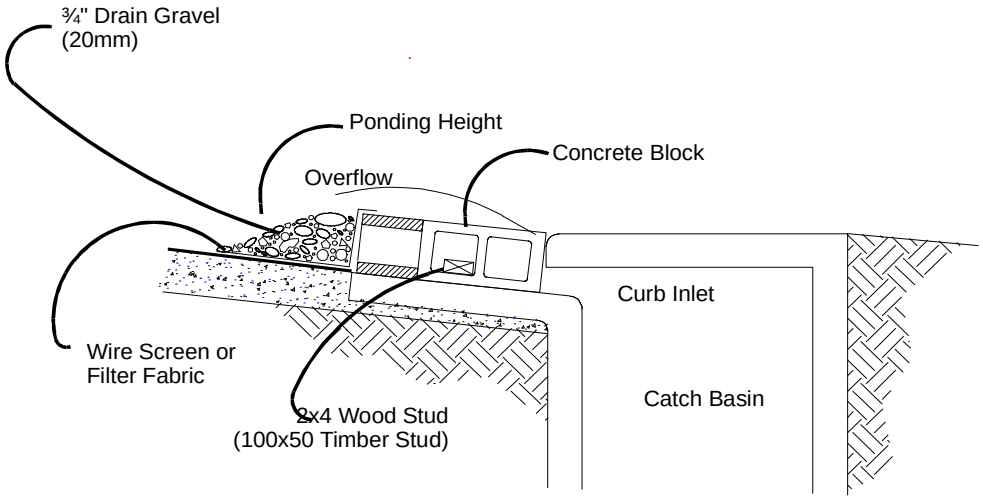
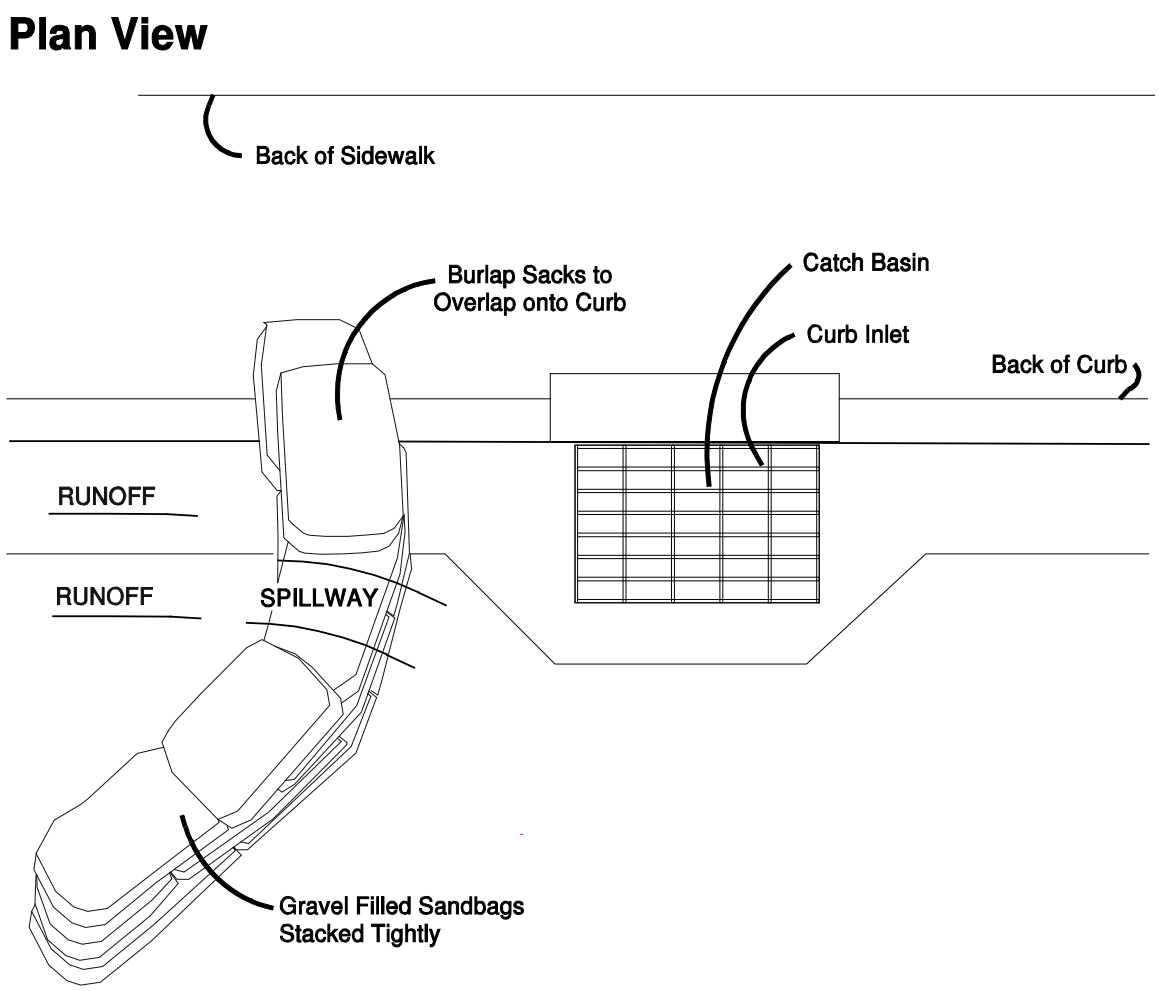


NOTES:
1. Use block and gravel type sediment barrier when curb inlet is located in gently sloping street segment, where water can pond and allow sediment to separate from runoff.
2. Barrier shall allow for overflow from severe storm event.
3. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

Figure 4.2.9 – Block and Gravel Curb Inlet Protection



NOTES:
1. Place curb type sediment barriers on gently sloping street segments, where water can pond and allow sediment to separate from runoff.
2. Sandbags of either burlap or woven `geotextile' fabric, are filled with gravel, layered and packed tightly.
3. Leave a one sandbag gap in the top row to provide a spillway for overflow.
4. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

Figure 4.2.10 – Curb and Gutter Barrier

BMP C232: Gravel Filter Berm

Purpose

A gravel filter berm is constructed on rights-of-way or traffic areas within a construction site to retain sediment by using a filter berm of gravel or crushed rock.

Conditions of Use

Where a temporary measure is needed to retain sediment from rights-of-way or in traffic areas on construction sites.

Design and Installation Specifications

- Berm material shall be ¾ to 3 inches in size, washed well-grade gravel or crushed rock with less than 5 percent fines.
- Spacing of berms:
  - Every 300 feet on slopes less than 5 percent
  - Every 200 feet on slopes between 5 percent and 10 percent
  - Every 100 feet on slopes greater than 10 percent
- Berm dimensions:
  - 1 foot high with 3H:1V side slopes
  - 8 linear feet per 1 cfs runoff based on the 10-year, 24-hour design storm

Maintenance Standards

- Regular inspection is required. Sediment shall be removed and filter material replaced as needed.

BMP C233: Silt Fence

Purpose

Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. See Figure 4.2.12 for details on silt fence construction.

Conditions of Use

Silt fence may be used downslope of all disturbed areas.

- Silt fence shall prevent soil carried by runoff water from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.
- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Convey any concentrated flows through the drainage system to a sediment pond.
- Do not construct silt fences in streams or use in V-shaped ditches. Silt fences do not provide an adequate method of silt control for anything deeper than sheet or overland flow.

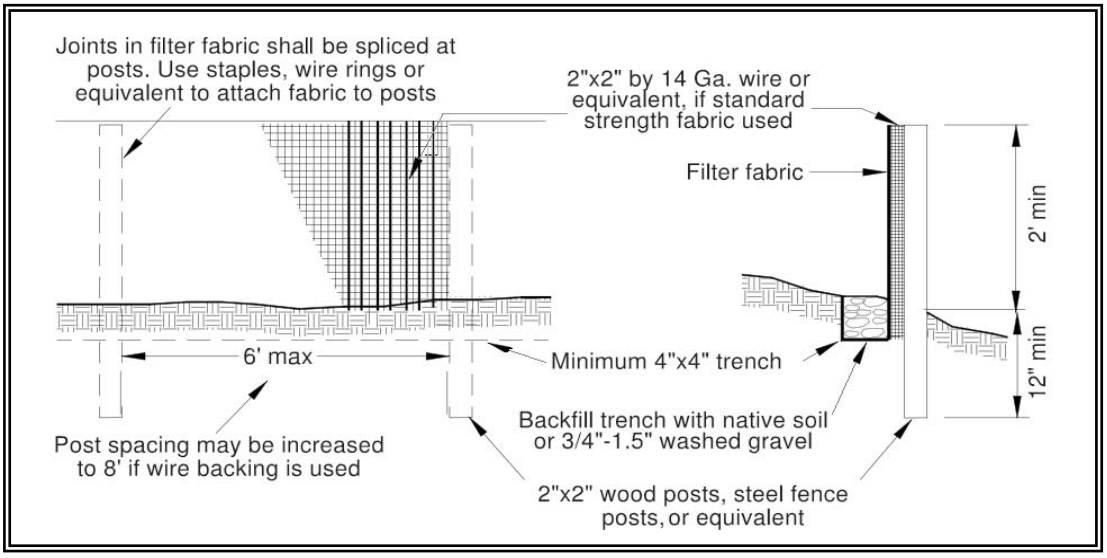


Figure 4.2.12 – Silt Fence

Design and Installation Specifications

- Use in combination with sediment basins or other BMPs.
- Maximum slope steepness (normal (perpendicular) to fence line) 1H:1V.
- Maximum sheet or overland flow path length to the fence of 100 feet.
- Do not allow flows greater than 0.5 cfs.
- The geotextile used shall meet the following standards. All geotextile properties listed below are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in Table 4.2.3):

Table 4.2.3
Geotextile Standards

Polymeric Mesh AOS (ASTM D4751)	0.60 mm maximum for slit film woven (#30 sieve). 0.30 mm maximum for all other geotextile types (#50 sieve). 0.15 mm minimum for all fabric types (#100 sieve).
Water Permittivity (ASTM D4491)	0.02 sec^{-1} minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. Minimum for extra strength fabric. 100 lbs minimum for standard strength fabric.
Grab Tensile Strength (ASTM D4632)	30% maximum
Ultraviolet Resistance (ASTM D4355)	70% minimum

- Support standard strength fabrics with wire mesh, chicken wire, 2-inch x 2-inch wire, safety fence, or jute mesh to increase the strength of the fabric. Silt fence materials are available that have synthetic mesh backing attached.

- Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F. to 120°F.
- One-hundred percent biodegradable silt fence is available that is strong, long lasting, and can be left in place after the project is completed, if permitted by local regulations.
- Refer to Figure 4.2.12 for standard silt fence details. Include the following standard Notes for silt fence on construction plans and specifications:

    1. The contractor shall install and maintain temporary silt fences at the locations shown in the Plans.
    2. Construct silt fences in areas of clearing, grading, or drainage prior to starting those activities.
    3. The silt fence shall have a 2-feet min. and a 2½-feet max. height above the original ground surface.
    4. The filter fabric shall be sewn together at the point of manufacture to form filter fabric lengths as required. Locate all sewn seams at support posts. Alternatively, two sections of silt fence can be overlapped, provided the Contractor can demonstrate, to the satisfaction of the Engineer, that the overlap is long enough and that the adjacent fence sections are close enough together to prevent silt laden water from escaping through the fence at the overlap.
    5. Attach the filter fabric on the up-slope side of the posts and secure with staples, wire, or in accordance with the manufacturer's recommendations. Attach the filter fabric to the posts in a manner that reduces the potential for tearing.
    6. Support the filter fabric with wire or plastic mesh, dependent on the properties of the geotextile selected for use. If wire or plastic mesh is used, fasten the mesh securely to the up-slope side of the posts with the filter fabric up-slope of the mesh.
    7. Mesh support, if used, shall consist of steel wire with a maximum mesh spacing of 2-inches, or a prefabricated polymeric mesh. The strength of the wire or polymeric mesh shall be equivalent to or greater than 180 lbs. grab tensile strength. The polymeric mesh must be as resistant to the same level of ultraviolet radiation as the filter fabric it supports.
    8. Bury the bottom of the filter fabric 4-inches min. below the ground surface. Backfill and tamp soil in place over the buried portion of the filter fabric, so that no flow can pass beneath the fence and scouring cannot occur. When wire or polymeric back-up support

mesh is used, the wire or polymeric mesh shall extend into the ground 3-inches min.

9. Drive or place the fence posts into the ground 18-inches min. A 12–inch min. depth is allowed if topsoil or other soft subgrade soil is not present and 18-inches cannot be reached. Increase fence post min. depths by 6 inches if the fence is located on slopes of 3H:1V or steeper and the slope is perpendicular to the fence. If required post depths cannot be obtained, the posts shall be adequately secured by bracing or guying to prevent overturning of the fence due to sediment loading.
10. Use wood, steel or equivalent posts. The spacing of the support posts shall be a maximum of 6-feet. Posts shall consist of either:
    - Wood with dimensions of 2-inches by 2-inches wide min. and a 3-feet min. length. Wood posts shall be free of defects such as knots, splits, or gouges.
    - No. 6 steel rebar or larger.
    - ASTM A 120 steel pipe with a minimum diameter of 1-inch.
    - U, T, L, or C shape steel posts with a minimum weight of 1.35 lbs./ft.
    - Other steel posts having equivalent strength and bending resistance to the post sizes listed above.
11. Locate silt fences on contour as much as possible, except at the ends of the fence, where the fence shall be turned uphill such that the silt fence captures the runoff water and prevents water from flowing around the end of the fence.
12. If the fence must cross contours, with the exception of the ends of the fence, place gravel check dams perpendicular to the back of the fence to minimize concentrated flow and erosion. The slope of the fence line where contours must be crossed shall not be steeper than 3H:1V.
    - Gravel check dams shall be approximately 1-foot deep at the back of the fence. Gravel check dams shall be continued perpendicular to the fence at the same elevation until the top of the check dam intercepts the ground surface behind the fence.
    - Gravel check dams shall consist of crushed surfacing base course, gravel backfill for walls, or shoulder ballast. Gravel check dams shall be located every 10 feet along the fence where the fence must cross contours.

- Refer to Figure 4.2.13 for slicing method details. Silt fence installation using the slicing method specifications:

1. The base of both end posts must be at least 2- to 4-inches above the top of the filter fabric on the middle posts for ditch checks to drain properly. Use a hand level or string level, if necessary, to mark base points before installation.
2. Install posts 3- to 4-feet apart in critical retention areas and 6- to 7-feet apart in standard applications.
3. Install posts 24-inches deep on the downstream side of the silt fence, and as close as possible to the filter fabric, enabling posts to support the filter fabric from upstream water pressure.
4. Install posts with the nipples facing away from the filter fabric.
5. Attach the filter fabric to each post with three ties, all spaced within the top 8-inches of the filter fabric. Attach each tie diagonally 45 degrees through the filter fabric, with each puncture at least 1-inch vertically apart. Each tie should be positioned to hang on a post nipple when tightening to prevent sagging.
6. Wrap approximately 6-inches of fabric around the end posts and secure with 3 ties.
7. No more than 24-inches of a 36-inch filter fabric is allowed above ground level.

   Compact the soil immediately next to the filter fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first and then each side twice for a total of four trips. Check and correct the silt fence installation for any deviation before compaction. Use a flat-bladed shovel to tuck fabric deeper into the ground if necessary.

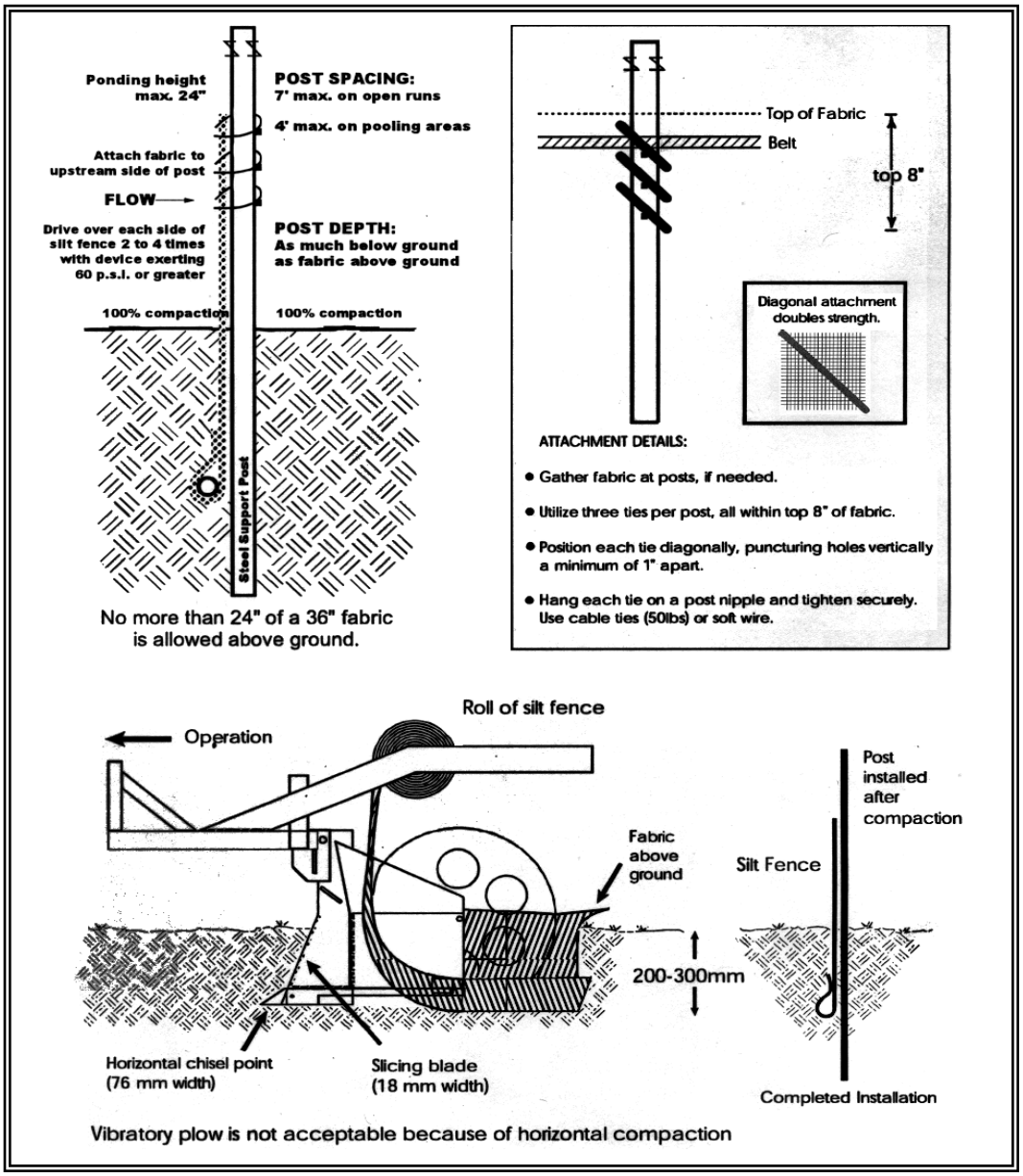


Figure 4.2.13 – Silt Fence Installation by Slicing Method

Maintenance Standards

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment pond.
- Check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.

- Remove sediment deposits when the deposit reaches approximately one-third the height of the silt fence, or install a second silt fence.
- Replace filter fabric that has deteriorated due to ultraviolet breakdown.

BMP C234: Vegetated Strip

Purpose

Vegetated strips reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Conditions of Use

- Vegetated strips may be used downslope of all disturbed areas.
- Vegetated strips are not intended to treat concentrated flows, nor are they intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to a sediment pond. The only circumstance in which overland flow can be treated solely by a strip, rather than by a sediment pond, is when the following criteria are met (see Table 4.2.4):

Table 4.2.4
Contributing Drainage Area for Vegetated Strips

Average Contributing area Slope	Average Contributing area Percent Slope	Max Contributing area Flowpath Length
1.5H:1V or flatter	67% or flatter	100 feet
2H:1V or flatter	50% or flatter	115 feet
4H:1V or flatter	25% or flatter	150 feet
6H:1V or flatter	16.7% or flatter	200 feet
10H:1V or flatter	10% or flatter	250 feet

Design and Installation Specifications

- The vegetated strip shall consist of a minimum of a 25-foot flowpath length continuous strip of dense vegetation with topsoil. Grass-covered, landscaped areas are generally not adequate because the volume of sediment overwhelms the grass. Ideally, vegetated strips shall consist of undisturbed native growth with a well-developed soil that allows for infiltration of runoff.
- The slope within the strip shall not exceed 4H:1V.
- The uphill boundary of the vegetated strip shall be delineated with clearing limits.

Maintenance Standards

- Any areas damaged by erosion or construction activity shall be seeded immediately and protected by mulch.
- If more than 5 feet of the original vegetated strip width has had vegetation removed or is being eroded, sod must be installed.
- If there are indications that concentrated flows are traveling across the buffer, surface water controls must be installed to reduce the flows

CONSTRUCTION EMERGENCY CONTACT SHEET

Date _____

Project Name: _____

Project Address: _____

Type of Work: _____

Developer: _____

Contact:_____Office: _____24-hr: _____

General Contractor: _____

Contact:_____Office: _____24-hr: _____

Utilities Sub-Contractor: _____

President/Owner: _____

Office: _____ Home: _____ 24-hr : _____

Project Manager: _____

Office: _____ Home: _____ 24-hr : _____

Superintendent: _____

Office: _____ Home: _____ 24-hr : _____

Foreman: _____

Office: _____ Home: _____ 24-hr : _____

Erosion Control Lead: _____

Office: _____ Home: _____ 24-hr : _____

City of Bellevue Inspectors

Clearing & Grading Inspector: _____

Office: (425) 452-_____

Building Inspector: _____

Office: (425) 452-_____

INJURY or FIRE– Call 911

Project Location or Address (If no address, describe the location of the construction access so that it can be relayed to emergency responders)

SPILL (Any hazardous materials including diesel fuel, gasoline, hydraulic fluid that enters the storm drain system or receiving waters)

- Call Washington State Department of Ecology (24 hrs) 425-649-7000
- Call Utilities Operations & Maintenance 425-452-7840
- Call Clearing & Grading Inspector or 425-452-4570

FISH KILL OR DISTRESS

- Call Washington Department of Fish and Wildlife Area Habitat Biologist, Larry Fisher 425-313-5683
- Call Clearing & Grading Inspector or 425-452-4570

WATER QUALITY IMPACTS (Site stormwater runoff turbidity exceeds 250 ntu)

- Call Washington State Department of Ecology (24 hrs) 425-649-7000
- Call Clearing & Grading Inspector or 425-452-4570

ARCHAEOLOGICAL FINDS

- Call Clearing & Grading Inspector or 425-452-4570
- Call Army Corps of Engineers, Seattle office, Lyz Ellis, 206-764-3634 (This is all you need to do under the permit)
  Or if there is no response and there is a need for immediate help, call
  Dr. Whitlam at the Washington State Office of Historic and Archaeological Program (OHAP), 360-407-0771

CSWPPP
SITE INSPECTION FORM

Project _____ Permit No. _____

Inspector _____ Date _____ Time _____

Inspection Type: ☐ After a rain event ☐ Weekly ☐ Turbidity benchmark exceedance

☐Other – explain: _____

Weather: _____

Precipitation: Since last inspection _____inches In last 24 hours _____ inches

Description of General Site Conditions: _____

_____

_____

Will existing BMPs need to be modified or removed, or other BMPs installed? ☐ **YES** ☐ **NO**

If YES, list the action items to be completed on the following table:

Actions to be Completed	Date Completed/ Initials
1.	
2.	
3.	
4.	
5.	

Was water quality sampling (turbidity and pH) part of this inspection? ☐ **YES** ☐ **NO**

If yes, attach Turbidity & pH Monitoring Data Sheet

Is the site in compliance with the CSWPPP and the permit requirements? ☐ **YES** ☐ **NO**

- If no, indicate the tasks necessary to bring the site into compliance on the "Actions to be Completed" table above, and include dates each job will be completed.
- **If no, has the non-compliance been reported to the City of Bellevue?** ☐ **YES** ☐ **NO**
- **If no, should the CSWPPP be modified?** ☐ **YES** ☐ **NO**

I certify that this report is true, accurate, and complete, to the best of my knowledge and belief.

Name of Inspector (print) _____ Title/Qualification _____

Signature _____ Date _____

CSWPPP
SITE INSPECTION FORM

Project _____ Permit No. _____

Inspector _____ Date _____ Time _____

Site BMPs	Overall Condition	Need Repair?	Comments/Observations
Element 1: Clearing Limits			
• Existing vegetation	G F P	Y N	
• Plastic or Metal Fence	G F P	Y N	
•	G F P	Y N	
Element 2: Construction Access			
• Stabilized Construction Entrance	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Element 3: Control Flow Rates			
• Sediment trap	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Element 4: Sediment Controls			
• Silt Fence	G F P	Y N	
• Straw wattles	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Element 5: Stabilize Soils			
• Mulch	G F P	Y N	
• Plastic Covering	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Element 6: Protect Slopes			
• Plastic covering	G F P	Y N	
• Seeding	G F P	Y N	
•	G F P	Y N	
Element 7: Protect Drain Inlets			
• Storm drain inlet protection	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Element 8: Stabilize Channels & Outlets	G F P		
• Outlet protection	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Element 9: Control Pollutants			
• Concrete Handling	G F P	Y N	
• Material Delivery, Storage	G F P	Y N	
Containment	G F P	Y N	
•	G F P	Y N	
Element 10: Control Dewatering			
•	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	

G=Good, F=Fair, P=Poor Y=Yes, N=No

APPENDIX D

Geotechnical Report

PanGEO
INCORPORATED
Geotechnical & Earthquake
Engineering Consultants

October 26, 2020
PanGEO Project No. 20-117

Mr. Rob Drollinger
1250 West Lake Sammamish Parkway NE
Bellevue, WA 98008

Subject: **Geotechnical and Critical Area Report**
Proposed House Addition and Site Improvements
1250 West Lake Sammamish Parkway NE, Bellevue, Washington

Dear Mr. Drollinger,

Attached please find our geotechnical and critical report for the proposed project at the above site in Bellevue, Washington. This report documents the subsurface conditions at the site and presents our geotechnical engineering design recommendations for the proposed house addition and site improvements.

In summary, based on the test borings drilled, the site is underlain by up to about 13 feet of loose to medium dense fill and colluvium overlying medium dense to very dense alluvium sand and pre-Fraser deposits. Based on soil conditions and anticipated addition finish floor elevation, in our opinion, the proposed house addition should be supported on the small diameter steel pipe piles (pin piles) to mitigate potential liquefaction settlements. To improve the stability of the existing steep slope to the west of the house, permanent soldier pile shoring walls may be used to replace existing rockery and retaining wall.

The site contains steep slope critical area, the City of Bellevue requires a Critical Area Report for permitting. Additional discussions regarding relevant land use codes for critical area report are included in this report.

We appreciate the opportunity to be of service. Should you have any questions, please do not hesitate to call.

3213 Eastlake Avenue East, Suite B
Seattle, WA 98102
T. (206) 262-0370
F. (206) 262-0374

Sincerely,

Johnny Chen

Johnny C. Chen, P.E.
Project Geotechnical Engineer

TABLE OF CONTENTS

Section Page

1.0 GENERAL 1
2.0 SITE AND PROJECT DESCRIPTION 1
3.0 SUBSURFACE EXPLORATIONS 2
3.1 CURRENT EXPLORATION 2
3.2 PREVIOUS EXPLORATION 3
4.0 SITE GEOLOGY AND SUBSURFACE CONDITIONS 3
4.1 SITE GEOLOGY 3
4.2 SOIL CONDITIONS 4
4.3 GROUNDWATER 5
5.0 GEOLOGIC HAZARDS ASSESSMENT 6
5.1 LANDSLIDE HAZARDS AND STEEP SLOPES EVALUATION 6
5.1.1 Site Reconnaissance 7
5.1.2 Quantitative Slope Stability Analysis 7
5.2 EROSION HAZARDS EVALUATION 9
5.3 LIQUEFACTION HAZARDS EVALUATION 10
6.0 GEOTECHNICAL RECOMMENDATIONS 11
6.1 SEISMIC DESIGN CONSIDERATIONS 11
6.2 BUILDING FOUNDATIONS 12
6.3 FLOOR SLABS 15
6.4 RETAINING WALL DESIGN PARAMETERS 16
6.4.1 Lateral Earth Parameters 16
6.4.2 Surcharge 16
6.4.3 Lateral Resistance 16
6.4.4 Wall Drainage 17
6.4.5 Wall Backfill 17
6.5 PERMANENT CUT AND FILL SLOPES 17
7.0 TEMPORARY EXCAVATIONS AND SHORING 18
7.1 TEMPORARY EXCAVATION SLOPES 18
7.2 PERMANENT SOLDIER PILE WALLS SHORING 18
7.2.1 Wall Design Parameters 19
7.2.2 Lagging 19
7.2.3 Construction Considerations 19
7.2.4 Performance Monitoring 20
8.0 EARTHWORK CONSIDERATIONS 21

8.1 STRUCTURAL FILL AND COMPACTION.....21
8.2 MATERIAL REUSE 22
8.3 CONSTRUCTION DEWATERING 22
8.3 WET WEATHER CONSTRUCTION 22
8.4 EROSION CONSIDERATIONS.....23
9.0 ADDITIONAL SERVICES 23
10.0 CLOSURE 24
11.0 REFERENCES.....26

ATTACHMENTS:

Figure 1 Vicinity Map
Figure 2 Site and Exploration Location Plan
Figure 3 Generalized Subsurface Profile A-A'
Figure 4 Design Lateral Earth Pressures: Cantilevered Soldier Pile Shoring (Upper Slope)
Figure 5 Design Lateral Earth Pressures: Cantilevered Soldier Pile Shoring (Lower Slope)
Figure 6 Static Global Stability Analysis – Existing Condition
Figure 7 Static Global Stability Analysis – Proposed Condition
Figure 8 Pseudo-Static (Seismic) Global Stability Analysis – Proposed Condition

Appendix A Summary Boring Logs
Figure A-1 Terms and Symbols for Boring and Test Pit Logs
Figures A-2 through A-4 Logs of Test Borings PG-1 through PG-3

Appendix B Summary Previous Test Pit Logs (GEO Consultants, 1991)

Appendix C Relevant Codes for Critical Area Report

GEOTECHNICAL AND CRITICAL REPORT
PROPOSED HOUSE ADDITION AND SITE IMPROVEMENTS
1250 WEST LAKE SAMMAMISH PARKWAY NE
BELLEVUE, WASHINGTON

1.0 GENERAL

This report presents the results of a geotechnical engineering study that was undertaken to support the design and construction of the proposed project in Bellevue, Washington. This study was performed in general accordance with our mutually agreed scope of services outlined in our proposal dated March 17, 2020, which was subsequently approved by you on March 19, 2020. Our scope of services included reviewing readily available geologic and geotechnical data, drilling three test borings, conducting a site reconnaissance, performing engineering analyses, and developing the conclusions and recommendations presented in this report.

2.0 SITE AND PROJECT DESCRIPTION

The subject property is an approximately 13,598 square-foot waterfront lot located at 1250 West Lake Sammamish Parkway NE in Bellevue, Washington (see Vicinity Map, Figure 1). The site is roughly rectangular in shape and is bordered to the north and south by single-family dwellings, to the west by North Rosemont Road, and to the east by Lake Sammamish, which is designated as the project east. The layout of the site is shown on Figure 2, Site and Exploration Plan.

The site topography generally descends from west to east, and eventually terminates at the shore of Lake Sammamish. The total topographic relief within the property is about 60 feet, between roughly Elevation 90 feet along North Rosemont Road and Elevation 30 feet along the lake shore.

The approximately western one-quarter of the site, between North Rosemont Road and NE Rosemont Place, is an over 40% steep slope. The slope is approximately 30-foot high, ranging from approximately Elevation 90 feet along the top of the slope to Elevation 60 feet along the toe of the slope. Bason on review of the topographic survey, the slope gradient is about 50% to 60%. A rockery with a concrete stairway is currently located along the toe of the slope, and a wood retaining wall is located along the top of the slope. The slope is currently covered with shed vegetative parts (such as leaves, branches, bark, and stems) and some trees.

The ground surface in the approximately eastern three-quarter of the site (i.e., between the toe of the slope and lake shore) ranges from approximately Elevation 60 feet along NE Rosemont Place to Elevation 30 feet along the lake shore. The slope gradient in this area is about 15% to 20%. A two-story house with a daylight basement currently occupies the middle portion of this area with a concrete shared driveway coming from NE Rosemont Place and along the south property line. The rest of areas surrounding the house consist of rockery, lawn, landscaping plants, and trees.

We understand that you plan to remodel the existing house and add an addition with a below grade garage in the west portion of the house. As a result, a new basement walls will be required to replace the existing west building wall. We also understand that you plan to stabilize the existing steep slope and create a parking space by replacing the existing rockery and wood retaining wall with permanent soldier pile walls. Because of the site contains steep slope critical area, the City of Bellevue requires a Critical Area Report for permitting. Additional discussions regarding relevant land use codes for critical area report are included in this report.

The conclusions and recommendations in this report are based on our understanding of the proposed development, which is in turn based on the project information provided. If the above project description is incorrect, or the project information changes, we should be consulted to review the recommendations contained in this study and make modifications, if needed. In any case PanGEO should be retained to provide a review of the final design to confirm that our geotechnical recommendations have been correctly interpreted and adequately implemented in the construction documents.

3.0 SUBSURFACE EXPLORATIONS

3.1 CURRENT EXPLORATION

Our subsurface exploration program consisted of drilling three test borings, designated as PG-1 through PG-3, at the approximate locations shown on Figure 2. The borings were drilled at the site on May 12, 2020 using a CAT track drill rig operated by Geologic Drill Partners, Inc. under a subcontract to PanGEO. The drill rig was equipped with a 6-inch outside diameter hollow stem auger.

Soil samples were obtained from the borings at 2½- and 5-foot depth intervals in general accordance with Standard Penetration Test (SPT) sampling methods (ASTM test method

D-1586), in which the samples are obtained using a 2-inch outside diameter split-spoon sampler. The sampler was driven into the soil using a 140-pound weight falling a distance of 30 inches per stroke until reaching a total penetration of 18 inches. The number of blows required for each 6-inch increment of sampler penetration was recorded. The number of blows required to achieve the last 12 inches of sample penetration is defined as the SPT N-value. The N-value provides an empirical measure of the relative density of cohesionless soil, or the relative consistency of fine-grained soils. The completed borings were backfilled with bentonite chips.

A geologist from PanGEO was present during the field exploration to observe the drilling, to assist in sampling, and to describe and document the soil samples obtained from the borings. The soils were logged in general accordance with ASTM D-2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) and the system summarized on Figure A-1, Terms and Symbols for Boring and Test Pit Logs. Summary test boring logs are included as Figures A-2 through A-4 in Appendix A.

3.2 Previous Exploration

In addition to our test borings completed for the current study, we also reviewed the previous test pits that was completed at the site for the site development. The approximate location of the previous test pits TP-3 and TP-4, which were completed by GEO Consultants Inc. in 1991, are indicated on the attached Figure 2.

In summary, previous test pits generally encountered approximately one feet of fill overlying very dense native soils that extended to the bottom of test pits at about three feet below ground surface. Groundwater was not encountered in the test pits. The summary logs of the previous exploration are included in Appendix B of this report.

4.0 SITE GEOLOGY AND SUBSURFACE CONDITIONS

4.1 Site Geology

According to the *Geologic Map of King County, Washington* (Booth, D. B., Troost, K. A., and Wisher, A. P., 2007), the project area is underlain by pre-Fraser deposits (Qpf) in the west (upper) portion of the site and Alluvium (Qal) in the east (lower) portion of the site near Lake Sammamish.

- Alluvium (Qal) generally consists of sand, silt, gravel, and cobbles deposited by streams and running water, and may locally contain soft peat lenses. Alluvium typically has a loose to dense condition or soft to stiff consistency.

- Pre-Fraser (Qpf) deposits typically consist of very dense and hard, interbedded silt, sand, gravel, and diamicts of indeterminate age and origin.

4.2 SOIL CONDITIONS

Based on the results of the test borings advanced for this project, the site is generally underlain by surficial layer of fill, colluvium, and alluvium overlaying pre-Fraser deposits. Figure 3 depicts the general subsurface profile along cross section A-A'. For a detailed description of the subsurface conditions encountered at each exploration location, please refer to the boring logs provided in Appendix A. The stratigraphic contacts indicated on the boring logs represent the approximate depth to boundaries between soil units. Actual transitions between soil units may be more gradual or occur at different elevations. The descriptions of groundwater conditions and depths are likewise approximate.

The following is a generalized description of the soils encountered in the borings.

Fill – Boring PG-1, which was drilled at the top of steep slope, encountered approximately 4½ feet of very loose, slightly silty, gravelly sand with trace organics. Boring PG-2, which was drilled at the toe of the steep slope, encountered approximately one foot of silty sandy gravel below the existing concrete pavement base. This soil unit was not encountered in boring PG-3. We interpret this soil unit as fill based on its loose condition, presence of organics, and disturbed appearance.

Colluvium – Underlying the fill in PG-1, the boring encountered approximately 7 feet of very loose silty sand with organic silt to medium dense gravelly silt/sandy gravel. Below the ground surface in PG-3, the boring encountered approximately 13 feet of loose to very loose silty sand with trace organics. This soil unit was not encountered in boring PG-2. We interpret this soil unit as colluvium.

Alluvium – Underlying the colluvium in PG-3, the boring encountered approximately 10 feet of medium dense to dense gravelly sand. This soil unit was not encountered in borings PG-1 or PG-2. We interpret this soil unit as the mapped alluvium.

Pre-Fraser Deposits – Underlying the colluvium in PG-1, underlying the fill in PG-2, and underlying the alluvium in PG-3, the borings encountered medium dense to very dense interlayered sand and silt that extended to the bottom of borings at about 16½ to 41½ feet below the existing grade. We interpret this soil unit as the mapped pre-Fraser deposits.

Based on our review of the subsurface data from the previous exploration completed at the site, the test pits encountered approximately one feet of silty sand to loamy gravelly sand with organics (fill) overlying very dense native sandy gravel to gravelly sand that extended to the bottom of test pits at about three feet below ground surface. The soil conditions are not quite consistent with the soil conditions encountered in current exploration due to the limited exploration depth.

Our subsurface descriptions are based on the conditions encountered at the time of our exploration. Soil conditions between our exploration locations may vary from those encountered. The nature and extent of variations between our exploratory locations may not become evident until construction. If variations do appear, PanGEO should be requested to reevaluate the recommendations in this report and to modify or verify them in writing prior to proceeding with earthwork and construction.

4.3 GROUNDWATER

Perched groundwater seepage was observed in boring PG-1 at depths of about 6 to 11½ feet below the existing grade, and in boring PG-2 at about 1½ to 5½ feet below the existing grade during drilling. This groundwater appeared to be perched above the fine-grained pre-Fraser deposits, and appears to be the seepage visible at the toe of the steep slope.

Groundwater seepage was also observed at a depth of about 7 feet below the existing grade in boring PG-3. However, groundwater was not encountered in test pits TP-3 and TP-4 within the three-foot excavation.

Because the subject site is located along the shores of Lake Sammamish, we anticipate that groundwater levels at the east end of the site may be close to the lake level. It should be noted that groundwater conditions at the site are likely to fluctuate depending on seasonal rainfall and the lake level. Generally, the water level is higher and seepage rates are greater in the wetter, winter months (typically October through May).

5.0 GEOLOGIC HAZARDS ASSESSMENT

We conducted a geologic hazards assessment for the proposed development as part of our study. The assessment includes an evaluation of Landslide Hazards, Erosion Hazards, and Liquefaction Hazards. Based on the site topographic survey provided to us (Figures 2), the slopes in the west portion of the property are 40% or greater, and designated "Steep Slope Area per City of Bellevue Standards". Based on the City of Bellevue's Geologic Hazards Map, the entire site is mapped as an erosion hazard area and a liquefaction hazard area (see Plate 1, below). The following sections contain our assessment of potential Geologic Hazards and their possible effects on the proposed development.

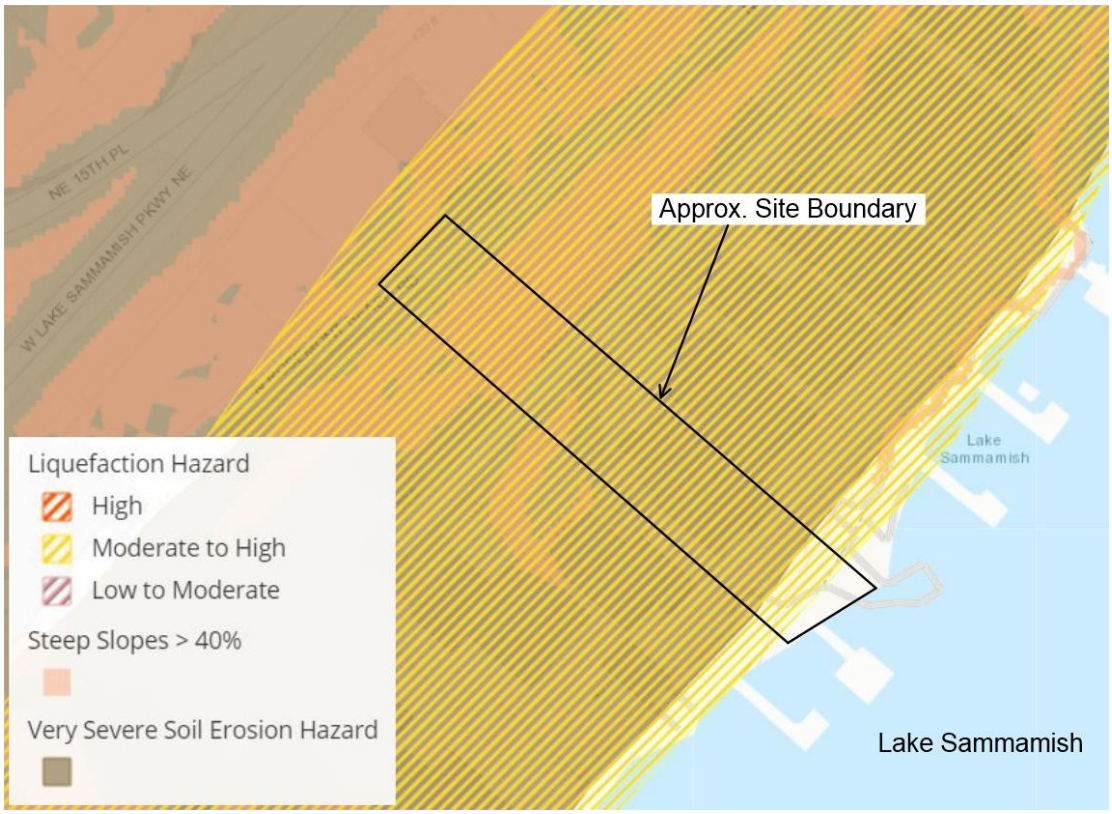


Plate 1. City of Bellevue Geologic Hazards Map

5.1 LANDSLIDE HAZARDS AND STEEP SLOPES EVALUATION

The site is not mapped as a landslide hazard area in accordance with the King County Landslide Hazard Map, but the west (upper) portion of the site above NE Rosemont Place contains over 40% steep slopes. The east (lower) portion of the site, where the house addition is proposed, does not contain steep slopes.

5.1.1 Site Reconnaissance

As part of our study, we conducted a site reconnaissance on May 12, 2020 to observe signs of slope instability or ground movement at the site. The steep slope in the west portion of the site is currently covered with shed vegetative parts (such as leaves, branches, bark, and stems) and some trees. During our site reconnaissance, we observed some exposed ground surface, surficial soil erosion, and a couple curved trees on the slope. The existing rockery at the toe of the slope was in a stable condition, but groundwater seepage was observed coming out blow the rockery and concrete curbs along the toe of the slope. In addition, we observed the existing wood retaining wall along top of slope was slightly leaning toward the downhill side. Sealed cracks were observed on the asphalt pavement along North Rosemont Road. However, we did not observe any obvious evidence of past or ongoing instability in the east (lower) portion of the site. The existing house, foundation walls, rockery, and concrete driveway were observed to be in a fair condition.

5.1.2 Quantitative Slope Stability Analysis

We further evaluated the stability of the site slopes using computer program *Slide2 Modeler* (Rocscience, 2020). Our evaluation considers both the existing and post-construction conditions. Search routines were used to identify the surface that has the lowest factor of safety. The seismic stability was analyzed using pseudo-static procedures, where the effect of earthquake ground shaking is represented by the use of a "seismic coefficient" in the stability calculations.

For seismic analysis, an acceleration factor was determined based on a Peak Ground Acceleration (PGA) with a 10 percent of probability of exceedance in 50 years (i.e. a 475-year return period) stipulated by the City of Bellevue. Accordingly, the PGA value of the site, 0.30g was calculated from the USGS seismic hazard deaggregation program (2008). One-half of the PGA (0.5x0.30g = 0.15g) was used in our pseudo-static stability analysis per typical practice for projects in Bellevue. The soil parameters for soil units were assigned based on test borings PG-1 and PG-2 (soil classifications and SPT blowcount values), our experience with similar soils, and published literatures. The following soil parameters in Table 1 were used in our analyses.

Table 1 - Soil Strength Parameters for Slope Stability Analysis

Soil Type	Unit Weight (pcf)	Cohesion (psf)	Friction Angles (degrees)
Engineering Soil Unit (ESU) 1 – Loose Fill	115	0	28
ESU 2 – Loose to medium dense Colluvium & Alluvium	120	0	32
ESU 3 – Medium dense to very dense pre-Fraser deposits	125	0	40

The slope analysis was performed along the section A-A' as shown in Figure 2. Groundwater level was based on the depths observed in borings PG-1 and PG-2. The profiles and soil parameters used in our slope stability analysis are also shown in Figures 6 through 8.

Existing Condition – The geometry of the existing slopes, material properties, and the results of the slope stability analysis for the static condition are shown in Figures 6. The computed factor of safety against the slope instability is 0.87, less than the code required factor of safety of 1.50.

Post-Construction Condition – In post-construction condition, based on current design drawings, a soldier pile shoring system with a parking space will be constructed at the toe of slope to replace the existing rockery and to improve the stability of the existing steep slope. To stabilize the upper portion of the steep slope, a soldier pile shoring wall is also planned to replace the existing wood retaining wall along North Rosemont Road (see Figure 2, Site Plan).

The results of slope stability analyses for post-construction conditions are summarized on Figures 7 and 8, for static and pseudo-static (seismic) conditions. Based on the results of the analysis, the improved slopes have adequate factors of safety against failures under static and seismic conditions. The factors of safety after the improvement are greater than the existing site condition and code required factor of safety.

Table 2 below summaries the factors of safety from the results our slope stability analysis.

Table 2 – Minimum Factors of Safety (FS) from Slope Stability Analysis

Site Condition	Static Analysis	Seismic Analysis
Existing Condition	0.87	< 0.87
Post-Construction	1.70*	1.26*
Code Required FS	**1.50**	**1.15**

* Lowest factor of safety amount different failure surfaces

Summary and Qualifications – Based on the results of our study, it is our opinion that the proposed addition and slope improvements as planned will have adequate factors of safety against slope instability and will not have adversely impacts the subject and surrounding properties, provided that the recommendations presented in this report are properly incorporated into the design and construction of the project. In our opinion, the building setback for the proposed addition may be reduced to 30 feet from the toe of steep slope after the stabilization of the exiting slope is completed.

It should be noted that any development on or near a steep slope area always involves some level of risk. In addition, future activities on and off the site could also affect the stability of the site.

5.2 Erosion Hazards Evaluation

The site is mapped as a potential erosion hazard area in accordance with the City of Bellevue's Geologic Hazards Map. Based on the USDA Soil Survey data and our test borings, the site soils (Alderwood and Kitsap Soils, AkF) are anticipated to exhibit moderate to high erosion potential when disturbed and left unprotected. However, in our opinion, the erosion hazards at the site can be effectively mitigated with the best management practice during construction and with properly designed and implemented landscaping for permanent erosion control. During construction, the temporary erosion hazard can also be effectively managed with an appropriate erosion and sediment control plan, including but not limited to installing a silt fence at the construction perimeter, placing quarry spalls or hay bales at the disturbed and traffic areas, covering stockpiled soil

or cut slopes with plastic sheets, constructing a temporary drainage pond to control surface runoff and sediment trap, placing rocks at the construction entrance, etc.

Permanent erosion control measures should be applied to the disturbed areas as soon as feasible. These measures may include but not limited to planting and hydroseeding. The use of permanent erosion control mat may also be considered in conjunction with planting/hydroseeding to protect the soils from erosion.

5.3 LIQUEFACTION HAZARDS EVALUATION

The City of Bellevue defines liquefaction hazard areas as those areas subject to severe risk of earthquake damage as a result of seismically induced settlement or soil liquefaction. According to the City of Bellevue's Geologic Hazards Map, the project area is mapped with moderate to high liquefaction hazard.

Liquefaction is a process that can occur when soils lose shear strength for short periods of time during a seismic event. Ground shaking of sufficient strength and duration results in the loss of grain-to-grain contact and an increase in pore water pressure, causing the soil to behave as a fluid. Soils with a potential for liquefaction are typically cohesionless, predominately silt and sand sized, must be loose, and be below the groundwater table.

We performed liquefaction analysis based on the soil conditions in the test boring PG-3, using the GeoLogismiki LiqSvs software suites. The input ground motion parameters in our analysis included a Magnitude 7.5 earthquake with a Peak Ground Acceleration (PGA) of 0.515g to model an IBC code event. The liquefaction analysis, using the procedure proposed by the 1996 and 1998 NCEER/NSF workshops (Youd et al., 2001) or the methodologies developed by Boulanger and Idriss (2014), indicate that the loose to medium dense sandy soils below the groundwater table (i.e. 7.0 feet) to a depth of about 18 feet in the proposed addition area are potentially liquefiable. Based on the results of our analysis, ground settlement due to soil liquefaction for this event is estimated to be about 3.0 inches.

Due to the anticipated excessive ground settlement during the static and seismic loading conditions, we recommend that the proposed addition be supported by a deep foundation system consisting of driven small diameter steel pipes (pin piles). Our recommendations for the pin piles are presented in the Section 6.2 Building Foundations.

6.0 GEOTECHNICAL RECOMMENDATIONS

6.1 SEISMIC DESIGN CONSIDERATIONS

The 2015 International Building Code (IBC) seismic design section provides a basis for seismic design of structures, and the IBC seismic design parameters are in part based on the site soil conditions and site classifications defined in Chapter 20 of ASCE 7. According to Chapter 20 of ASCE 7, the site soil at the addition location should be classified as Site Class F because of its liquefaction potential during a strong seismic event. According to the Section 20.3.1 of ASCE 7 for Site Class F, a site response analysis in accordance with Section 21.1 shall be performed unless the exception to Section 20.3.1 is applicable.

Section 20.3.1 of ASCE-7 states that "*For structures having fundamental periods of vibration equal to or less than 0.5s, site response analysis is not required to determine spectral accelerations for liquefiable soils. Rather, a site class is permitted to be determined in accordance with Section 20.3 and the corresponding values of F_a and F_v determined from Tables 11.4-1 and 11.4-2*." In other words, for structures with a period of vibration equal to or less than 0.5 second and situated on liquefiable soils, the ASCE-7 exception allows the values of F_a and F_v for liquefiable soils be taken equal to the values of site class determined without regard to soil liquefaction.

Based on our understanding of the proposed lightly loaded, two- to three-story wood-frame structure, the vibration period for the buildings should be less than 0.5 second. For design purposes, we recommend assuming Site Class D for determining site coefficients. If the fundamental period of the proposed structure is greater than 0.5 second, a site-specific site response analysis will be required.

Table 3, below, provides seismic design parameters for the site that are in conformance with the 2015 editions of IBC, which specifies a design earthquake having a 2% probability of occurrence in 50 years (return interval of 2,475 years), and the 2008 USGS seismic hazard maps. The spectral response accelerations were obtained from the USGS Earthquake Hazards Program Interpolated Probabilistic Ground Motion website (2008 data) for the project latitude and longitude.

Table 3 – Seismic Design Parameters

Site Class	Spectral Acceleration at 0.2 sec. [g] S_S	Spectral Acceleration at 1.0 sec. [g] S_1	Site Coefficients		Design Spectral Response Parameters	
			F_a	F_v	S_{DS}	S_{D1}
D	1.271	0.486	1.0	1.514	0.848	0.491

6.2 BUILDING FOUNDATIONS

Based on our test boring PG-3 near the addition location, the addition foundation soils consist of approximately 13 feet of very loose to loose colluvium, and the loose sandy soil below groundwater table may liquefy during a design earthquake. As such, based on the subsurface conditions encountered, it is our opinion the proposed addition should be supported on small diameter steel pipe piles (pin pile) to mitigate the potential for excessive post-construction foundation settlement during both static and seismic loading conditions. The following sections present our recommendation for pin pile foundations.

Pin Pile Sizes - In our opinion, 3- or 4-inch diameter, Schedule 40, galvanized pin piles may be used to support the new addition. Three or four-inch diameter pin piles are typically installed using small hammers mounted on a small excavator.

Pin Pile Capacity - The number of piles required depends on the magnitude of the design load. Allowable axial compression capacities of 6 and 10 tons may be used for the 3- and 4-inch diameter pin piles, respectively, with an approximate factor of safety of 2. Penetration resistance required to achieve the capacities will be determined based on the hammer used to install the pile. Tensile capacity of pin piles should be ignored in design calculations.

It is our experience that the driven pipe pile foundations should provide adequate support with total settlements on the order of ½-inch or less.

Lateral Forces - The capacity of pin pipes to resist lateral loads is very limited and should not be used in design. Therefore, lateral forces from wind or seismic loading should be

resisted by the passive earth pressures acting against the pile caps and below-grade walls or from battered piles (batter no steeper than 3(H):12(V)). ***Friction at the base of pile-supported concrete grade beam should be ignored in the design calculations.*** Passive resistance values may be determined using an equivalent fluid weight of 200 pounds per cubic foot (pcf). This value includes a safety factor of about 1.5 assuming that properly compacted granular fill will be placed adjacent to and surrounding the pile caps and grade beams.

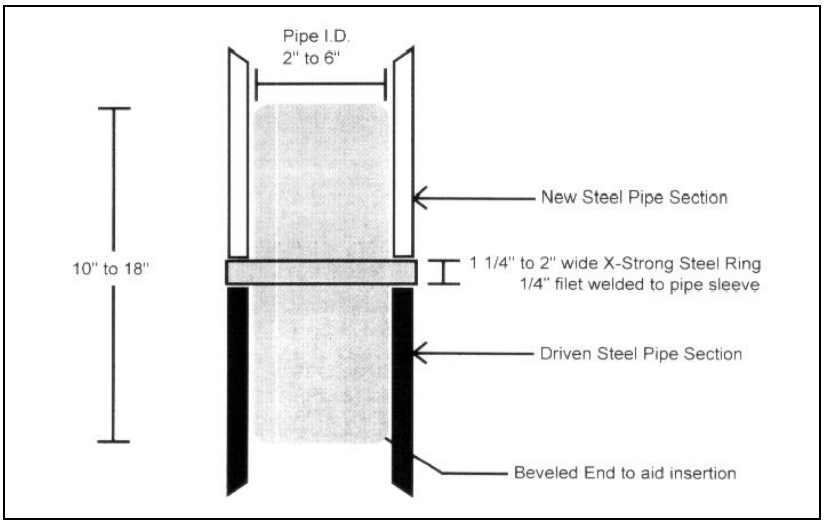
Pin Pile Driving Criteria - Three- or four-inch diameter piles are typically installed using small (approximately 650 to 2,000 pound) hammers mounted to a small excavator. The criterion for driving refusal is defined as the minimum amount of time (in seconds) required to achieve one inch of penetration, and it varies with the size of hammer used for pile driving. For 3- or 4-inch pin piles, the Table 4 below provides a summary of driving refusal criteria for different hammer sizes that are commonly used in the Seattle area. Please note that these refusal criteria were established empirically based on previous load tests on 3- and 4-inch pin piles in the region. Contractors may select a different hammer for driving these piles, and propose a different driving criterion. In this case, it is the contractor's responsibility to demonstrate to the Engineer's satisfaction that the design load can be achieved based on their selected equipment and driving criteria.

Table 4 - Summary of Commonly-Accepted Driving Criteria for a 3- or 4-inch Pipe with a 6- or 10-ton Allowable Axial Compression Load

Hammer Model	Hammer Weight (lb) / Blows per minute	3" Pile Refusal Criteria (seconds per inch of penetration)	4" Pile Refusal Criteria (seconds per inch of penetration)
Hydraulic TB 225	650 / 550 - 1100	12	20
Hydraulic TB 325	850 / 550 - 1100	10	16
Hydraulic TB 425	1,100 / 550 - 1100	6	10
Hydraulic TB 725X	2,000 / 600	3	4

Pin Pile Specifications - We recommend that the following specifications be included on the foundation plan:

1. Three-inch or four-inch diameter piles should consist of Schedule-40, ASTM A-53 Grade "A" pipe.
2. Three- and four-inch piles shall be driven to refusal with a minimum 650-lb hydraulic hammer. The driving criteria will be determined based on the actual hammer size selected by the contractor, and a static load test program (see Table 4 above and Item 3 below).
3. At least 3% (but no more than 5) of the 3- and 4-inch diameter pin piles should be load tested. All load tests shall be performed in accordance with the procedure outlined in ASTM D1143. The maximum test load shall be 2 times the design load. The objective of the testing program is to verify the adequacy of the driving criteria, and the efficiency of the hammer used for the project.
4. Piles shall be driven in nominal sections and connected with compression fitted sleeve couplers (see typical detail below). We discourage welding of pipe joints, particularly when galvanized pipe is used, as we have frequently observed welds broken during driving.
5. The geotechnical engineer of record or his/her representative shall provide full time observation of pile installation and testing.



The quality of a pin pile foundation is dependent, in part, on the experience and professionalism of the installation company. We recommend that a company with experienced personnel be selected to install the piles.

Grade Beam/Pile Cap Embedment - We recommend that the grade beams and pile caps located around the perimeter of the structure be embedded such that the bottom of the grade beam is at least 16 inches below the adjacent ground surface.

Estimated Pile Length – The subsurface conditions at the site will likely vary substantially across the site. Based on the soil conditions at the site and our experience in the project area, for planning and cost estimating purposes, we estimate that pile length may range from about 23 to 25 feet.

6.3 FLOOR SLABS

The floor slabs for the proposed addition may be constructed using conventional concrete slab-on-grade floor construction. The floor slabs should be supported on competent undisturbed native soil or structural fill paced on undisturbed native soils. Any over-excavations, if needed, should be backfilled with structural fill.

Interior concrete slab-on-grade floors should be underlain by a capillary break consisting of at least of 4 inches of pea gravel or compacted ¾-inch, clean crushed rock (less than 3 percent fines). The capillary break material should meet the gradational requirements provided in Table 5, below.

Table 5 – Capillary Break Gradation

Sieve Size	Percent Passing
¾-inch	100
No. 4	0 – 10
No. 100	0 – 5
No. 200	0 – 3

The capillary break should be placed on subgrade soils that have been compacted to a dense and unyielding condition.

A minimum 10-mil polyethylene vapor barrier should also be placed directly below the slab. Construction joints should be incorporated into the floor slab to control cracking.

6.4 Retaining Wall Design Parameters

Cast-in-place concrete retaining and basement walls should be designed to resist the lateral earth pressures exerted by the soils behind the wall. Proper drainage provisions should also be provided to intercept and remove groundwater that may be present behind the walls. Our recommendations for the design and construction of the retaining wall are presented below.

6.4.1 Lateral Earth Parameters

Cantilever walls should be designed for an equivalent fluid pressure of 35 pcf for a level backfill condition behind the walls and assuming the walls are free to rotate. If the walls are restrained at the top from free movement, such as basement walls with a floor diaphragm, an equivalent fluid pressure of 45 pcf should be used for a level backfill condition behind the walls. Permanent walls should be designed for an additional uniform lateral pressure of 8H psf for seismic loading, where H corresponds to the height of the buried depth of the wall.

The recommended lateral pressures assume the backfill behind the walls consists of a free draining and properly compacted fill with adequate drainage provisions.

6.4.2 Surcharge

Surcharge loads, where present, should also be included in the design of retaining walls. We recommend that a lateral load coefficient of 0.3 be used to compute the lateral pressure on the wall face resulting from surcharge loads located within a horizontal distance of one-half the wall height.

6.4.3 Lateral Resistance

Lateral forces from seismic loading and unbalanced lateral earth pressures may be resisted by a combination of passive earth pressures acting against the embedded portions of the foundations and by friction acting on the base of the wall foundation. Passive resistance values may be determined using an equivalent fluid weight of 250 pcf. This value includes a factor of safety of 1.5, assuming the footing is backfilled with structural fill. A friction coefficient of 0.35 may be used to determine the frictional resistance at the base of the footings. The coefficient includes a factor of safety of 1.5.

6.4.4 Wall Drainage

Provisions for wall drainage should consist of a 4-inch diameter perforated drainpipe placed behind and at the base of the wall footings, embedded in 12 to 18 inches of clean crushed rock or pea gravel wrapped with a layer of filter fabric. A minimum 18-inch wide zone of free draining granular soils (i.e. pea gravel or washed rock) is recommended to be placed adjacent to the wall for the full height of the wall. Alternatively, a composite drainage material, such as Miradrain 6000, may be used in lieu of the clean crushed rock or pea gravel. The drainpipe at the base of the wall should be graded to direct water to a suitable outlet.

6.4.5 Wall Backfill

Retaining wall backfill should consist of free draining granular material. The site soils are relatively silty and would not meet the requirements for wall backfill. We recommend importing a free draining granular material, such as Seattle Type 17 or a soil meeting the requirements of Gravel Borrow as defined in Section 9-03.14(1) of the WSDOT *Standard Specifications for Road, Bridge, and Municipal Construction* (WSDOT, 2020). In areas where space is limited between the wall and the face of excavation, pea gravel may be used as backfill without compaction.

Wall backfill should be properly moisture conditioned, placed in loose, horizontal lifts less than 12 inches in thickness, and compacted to a dense and unyielding condition. If density tests will be performed, the test results should show at least 95 percent of the maximum dry density, as determined using test method ASTM D-1557 (Modified Proctor). Within 5 feet of the wall, the backfill should be compacted with hand-operated equipment to at least 90 percent of the maximum dry density.

6.5 Permanent Cut and Fill Slopes

Based on the anticipated soil that will be exposed in the planned excavation, we recommend permanent cut and fill slopes be constructed no steeper than 2H:1V (Horizontal:Vertical)

7.0 TEMPORARY EXCAVATIONS AND SHORING

As currently planned, the excavation for the proposed basement (below grade storage) and foundation may be as deep as nine feet. Within the depth of the basement excavation, we anticipate the excavation to encounter loose colluvium overlying medium dense alluvium. All temporary excavations should be performed in accordance with Part N of WAC (Washington Administrative Code) 296-155. The contractor is responsible for maintaining safe excavation slopes and/or shoring.

7.1 TEMPORARY EXCAVATION SLOPES

All temporary excavations deeper than a total height of 4 feet should be sloped or shored. Where space is available, it is our opinion that unsupported open cut excavation is feasible at the site. Based on the soil conditions at the site, for planning purposes, it is our opinion that temporary excavations for the proposed basement may be sloped as steep as 1H:1V (Horizontal:Vertical). Where space is limited, the use of L-shaped footings may be considered to reduce the lateral extent of the proposed excavation.

If sufficient space is not available for an unsupported open cut, excavation shoring will be required for the basement wall construction.

The temporary excavations and cut slopes should be re-evaluated in the field during construction based on actual observed soil conditions, and may need to be flattened in the wet reasons and should be covered with plastic sheets. The cut slopes should be covered with plastic sheets in the raining season. We also recommend that heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed within a distance equal to 1/3 the slope height from the top of any excavation.

7.2 PERMANENT SOLDIER PILE WALLS SHORING

We understand that you plan to stabilize the existing steep slopes and replace the existing rockery and wood retaining wall with new retaining walls. Based on the subsurface conditions and our slope stability analysis, we recommend that permanent soldier pile walls be installed for the proposed slope improvements to serve as retaining structures and as long-term stabilization measures. The approximate locations of the proposed soldier pile walls are shown in Figure 2.

Soldier pile wall consists of vertical steel beams, typically spaced from 6 to 8 feet apart along the proposed excavation alignment, spanned by timber lagging. Prior to the start of excavation, the steel beams are installed in holes drilled to a design depth and then backfilled with lean mix or structural concrete. As the excavation proceeds downward and the steel piles are subsequently exposed, timber lagging is installed between the piles to further stabilize the walls of the excavation.

For permanent soldier piles, the piles should be protected against corrosion. This may include proper coatings or upsizing of piles. In addition, it should also be noted that timber lagging has limited design life, and the use of concrete facing may also be considered for permanent soldier pile walls. Tiebacks are typically used for wall heights greater than about 12 to 15 feet to achieve a more economical design. We anticipate that the maximum wall height for this project will likely be less than 12 feet, and hence we do not anticipate the use of tiebacks.

7.2.1 Wall Design Parameters

We recommend that the earth pressures depicted on Figure 4 may be used for the shoring design along the lower portion of the slope. For the shoring design along the top of slope, the earth pressures depicted on Figure 5 may be used.

The vertical capacity of the soldier piles should be determined using an allowable skin friction value of 0.5 ksf for the portion of the pile below the bottom of excavation, and an allowable end soil bearing capacity value of 10 ksf. Permanent wall should be designed for an additional uniform lateral pressure of 8H psf for seismic loading.

7.2.2 Lagging

Lagging design recommendations are presented on Figures 4 and 5. We recommend that the lagging for the upper shoring wall be extended five feet below final grade to prevent the soil sloughing in front of the shoring wall. We also recommend voids behind the lagging be backfilled with either Control Density Fill (CDF), sand, or approved alternative materials.

7.2.3 Construction Considerations

The drilling of soldier piles is anticipated to encounter loose fill, sand, silty sand, and silt. Caving in fill and very moist to wet sand/silty sand layers could occur during drilling. As

a result, the drilling contractor should be prepared to stabilize the holes by using temporary casings, hydrostatic pressures (i.e., flooding the hole), or drilling fluids, to prevent potential bottom heaving.

We anticipate that groundwater to be present in the drilled holes during soldier pile installation. If groundwater is present in the drilled holes, lean concrete or structural concrete backfill should be placed with tremie pipes from bottom up.

We recommend that the following should be incorporated into the project plans and specifications:

- The geotechnical engineer shall verify the suitability of all soldier pile holes before concrete placement;
- Tremie methods shall be used for concrete placement in all holes having 6 or more inches of accumulated water if perched ground water or heavy precipitation is encountered during construction.
- All soldier pile holes drilled shall be filled with lean concrete mix or structural concrete on the same day.
- If soldier piles are designed as a permanent foundation system, any soft/disturbed soils encountered at the bottom of the hole during drilling will need to be removed using a cleanout bucket prior to placing the steel beam and concrete.
- The contractor shall evaluate the site access prior to the shoring installation.

When placing timber lagging, the height of each lift may need to be limited to prevent the un-shored soil from escaping through the base of the timber boards. We recommend that the soil exposed for timber lagging be no more than 4 to 5 feet deep. The actual allowable vertical cut for timber lagging placement should be determined in the field, based on the actual conditions observed.

7.2.4 Performance Monitoring

Because ground deformations will occur due to the excavation (open cut or shored), we recommend that existing conditions on the adjacent private properties be photo-documented prior to the start of the project. We also recommend that survey points be installed on every other soldier pile and on adjacent structures.

The survey points on the piles should be monitored by the project surveyor until one week after the excavation has been backfilled or permanent walls are completed. The monitoring program should include changes in both the horizontal (x and y directions) and vertical deformations to the nearest 0.01-foot, and the results be promptly submitted to PanGEO for review. After the initial baseline readings, which should be taken prior to the start of pile installations, the monitoring points on the adjacent structures only need to be shot if excessive soldier pile deflections are noted. The results of the monitoring will allow the design team to confirm design parameters, and for the contractor to make adjustments if necessary.

8.0 EARTHWORK CONSIDERATIONS

8.1 STRUCTURAL FILL AND COMPACTION

Structural fill, if needed, should consist of City of Seattle Type 17, WSDOT Section 9-03.9(3) Crushed Surfacing Base Course (WSDOT 2020), or an approved equivalent.

Structural fill should be properly moisture conditioned, placed in loose, horizontal lifts less than 12 inches in thickness, and compacted to a dense and unyielding condition. The adequacy of compaction should be verified by a PanGEO representative. Alternatively, a minimum 95 percent maximum density as determined using ASTM D-1557 (Modified Proctor) maybe used to determine the adequacy of the compacted fill.

The procedure to achieve proper density of a compacted fill depends on the size and type of compaction equipment, the number of passes, thickness of the lifts being compacted, and certain soil properties. If the excavation to be backfilled is constricted and limits the use of heavy equipment, smaller equipment can be used, but the lift thickness will need to be reduced to achieve the required relative compaction.

Generally, loosely compacted soils are a result of poor construction technique or improper moisture content. Soils with high fines contents are particularly susceptible to becoming too wet and coarse-grained materials easily become too dry, for proper compaction. Soils with a moisture content too high for adequate compaction should be dried as necessary, or moisture conditioned by mixing with drier materials, or other methods.

8.2 MATERIAL REUSE

In the context of this report, structural fill is defined as compacted fill placed under footings, concrete stairs and landings, and slabs, or other load-bearing areas. In our opinion, the on-site soils are not suitable to be reused as structural fill. The on-site soils may be used as general fill in the non-structural and landscaping areas. If use of the on-site soil is planned, the excavated soil should be stockpiled and protected with plastic sheeting to prevent softening from rainfall in the wet season.

8.3 CONSTRUCTION DEWATERING

Based on our test borings, groundwater may be also encountered during the exaction for the proposed addition and shoring installation. Therefore, dewatering is likely needed to use for the excavation, especially if the excavation will occur during the wet season. Based on the subsurface and groundwater conditions encountered in the borings, it is our opinion that the dewatering may be accomplished with conventional sumps and pumps.

The number of the sumps and pumps should be determined by the contractor, and may be modified during construction based on field observations at the time of construction. If groundwater is encountered during construction, the bottom of the excavation should be sloped to the sump pits. The collected water can then be pumped from these pits to a positive and permanent discharge.

It should be noted that the level and flow of the groundwater seepage will fluctuate depending on the season, amount of rainfall, lake level, construction schedule and sequencing, surface water runoff, the selection of excavation, and other factors. Dewatering for construction is the responsibility of the contractor. The selection of equipment and methods of dewatering should be left up to the contractor provided they are in accordance with the recommendations in this report and the project specifications.

8.3 WET WEATHER CONSTRUCTION

General recommendations relative to earthwork performed in wet weather or in wet conditions are presented below. The following procedures are best management practices recommended for use in wet weather construction:

- Earthwork should be performed in small areas to minimize subgrade exposure to wet weather. Excavation or the removal of unsuitable soil should be followed

promptly by the placement and compaction of clean structural fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance.

- During wet weather, the allowable fines content of the structural fill should be reduced to no more than 5 percent by weight based on the portion passing the 0.75-inch sieve. The fines should be non-plastic.
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water.
- Geotextile silt fences should be installed at strategic locations around the site to control erosion and the movement of soil.
- Excavation slopes and soils stockpiled on site should be covered with plastic sheeting.

8.4 EROSION CONSIDERATIONS

Surface runoff can be controlled during construction by careful grading practices. Typically, this includes the construction of shallow, upgrade perimeter ditches or low earthen berms in conjunction with silt fences to collect runoff and prevent water from entering excavations or to prevent runoff from the construction area leaving the immediate work site. Temporary erosion control may require the use of hay bales on the downhill side of the project to prevent water from leaving the site and potential storm water detention to trap sand and silt before the water is discharged to a suitable outlet. All collected water should be directed under control to a positive and permanent discharge system.

Permanent control of surface water should be incorporated in the final grading design. Adequate surface gradients and drainage systems should be incorporated into the design such that surface runoff is collected and directed away from the structure to a suitable outlet. Potential issues associated with erosion may also be reduced by establishing vegetation within disturbed areas immediately following grading operations.

9.0 ADDITIONAL SERVICES

To confirm that our recommendations are properly incorporated into the design and construction of the proposed development, PanGEO should be retained to conduct a review of the final project plans and specifications, and to monitor the construction of geotechnical

elements. Modifications to our recommendations presented in this report may be necessary, based on the actual conditions encountered during construction.

10.0 CLOSURE

We have prepared this report for Mr. Rob Drollinger and the project design team. Recommendations contained in this report are based on a site reconnaissance, a subsurface exploration program, review of pertinent subsurface information, and our understanding of the project. The study was performed using a mutually agreed-upon scope of services.

Variations in soil conditions may exist between the locations of the explorations and the actual conditions underlying the site. The nature and extent of soil variations may not be evident until construction occurs. If any soil conditions are encountered at the site that are different from those described in this report, we should be notified immediately to review the applicability of our recommendations. Additionally, we should also be notified to review the applicability of our recommendations if there are any changes in the project scope.

The scope of our work does not include services related to construction safety precautions. Our recommendations are not intended to direct the contractors' methods, techniques, sequences or procedures, except as specifically described in our report for consideration in design. Additionally, the scope of our services specifically excludes the assessment of environmental characteristics, particularly those involving hazardous substances. We are not mold consultants nor are our recommendations to be interpreted as being preventative of mold development. A mold specialist should be consulted for all mold-related issues.

This report has been prepared for planning and design purposes for specific application to the proposed project in accordance with the generally accepted standards of local practice at the time this report was written. No warranty, express or implied, is made.

This report may be used only by the client and for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both off and on-site), or other factors including advances in our understanding of applied science, may change over time and could materially affect our findings. Therefore, this report should not be relied upon after 24 months from its issuance. PanGEO should be notified if the project is delayed by more than 24 months from the date of this report so that we may review the applicability of our conclusions considering the time lapse.

It is the client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk. Any party other than the client who wishes to use this report shall notify PanGEO of such intended use and for permission to copy this report. Based on the intended use of the report, PanGEO may require that additional work be performed and that an updated report be reissued. Noncompliance with any of these requirements will release PanGEO from any liability resulting from the use this report.

Sincerely,

PanGEO, Inc.

Chien-Lin (Johnny) Chen, P.E.
Project Geotechnical Engineer

11.0 REFERENCES

ASTM International (ASTM), *Annual book of standards, Section 04.08 Soil and Rock (I): D420-D5876*: West Conshohocken, Pennsylvania

International Code Council, 2015, *International Building Code (IBC), 2015.*

Booth, D. B., Troost, K. A., and Wisher, A. P., 2007, *Geologic Map of King County, Washington – U. S. Geological Survey, scale 1:100,000.*

United States Geological Survey*, Earthquake Hazards Program, Interpolated Probabalisitic Ground Motion for the Conterminous 48 States by Latitude and Longitude, 2008 Data,* accessed via: http://earthquake.usgs.gov/designmaps/us/application.php

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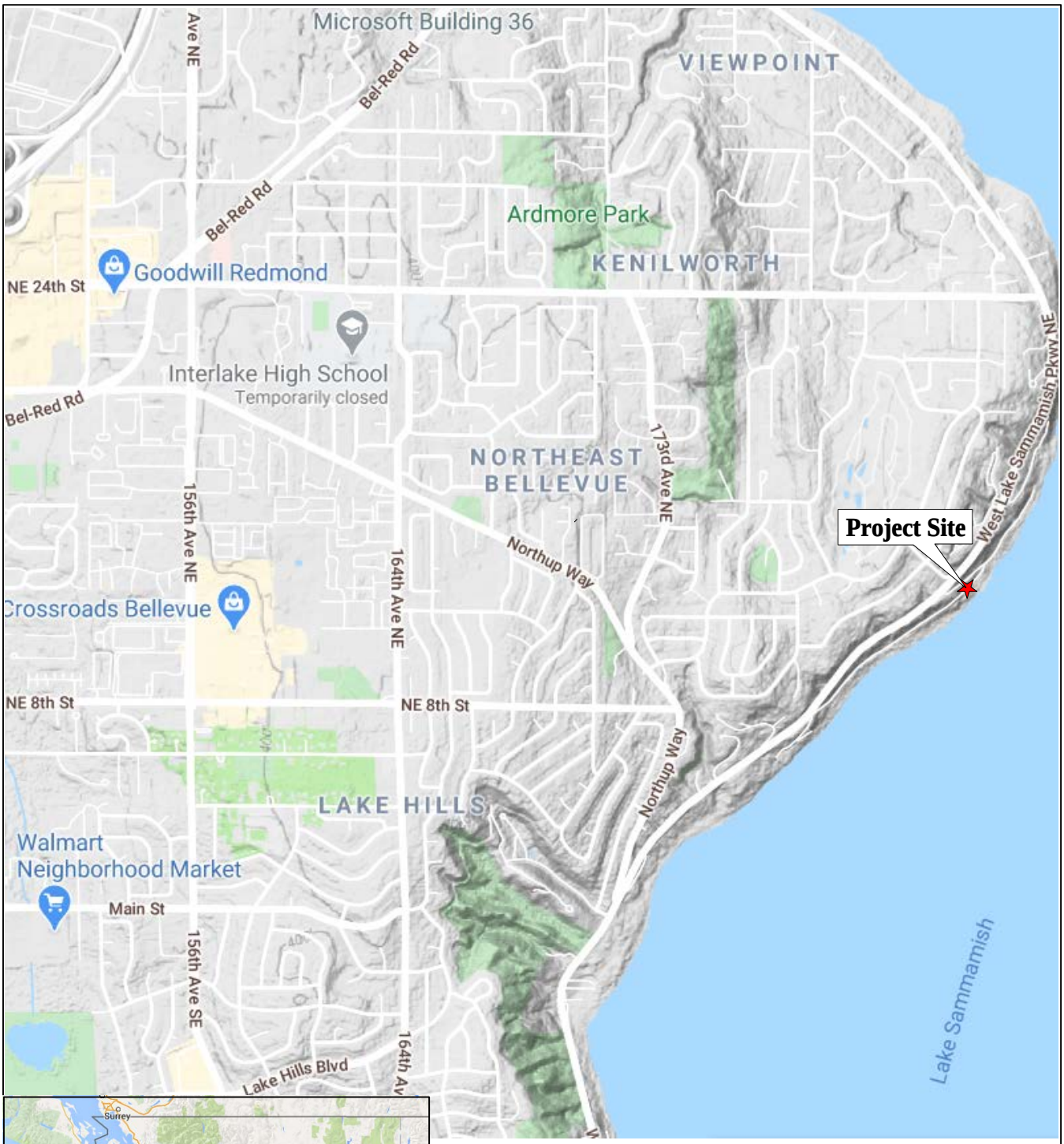
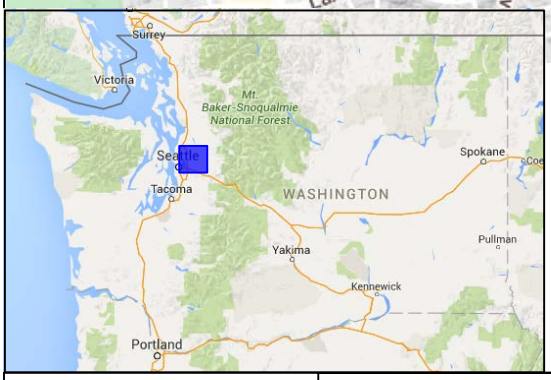




Base Map: Google Maps

NORTH

Not to Scale

PanGEO INCORPORATED

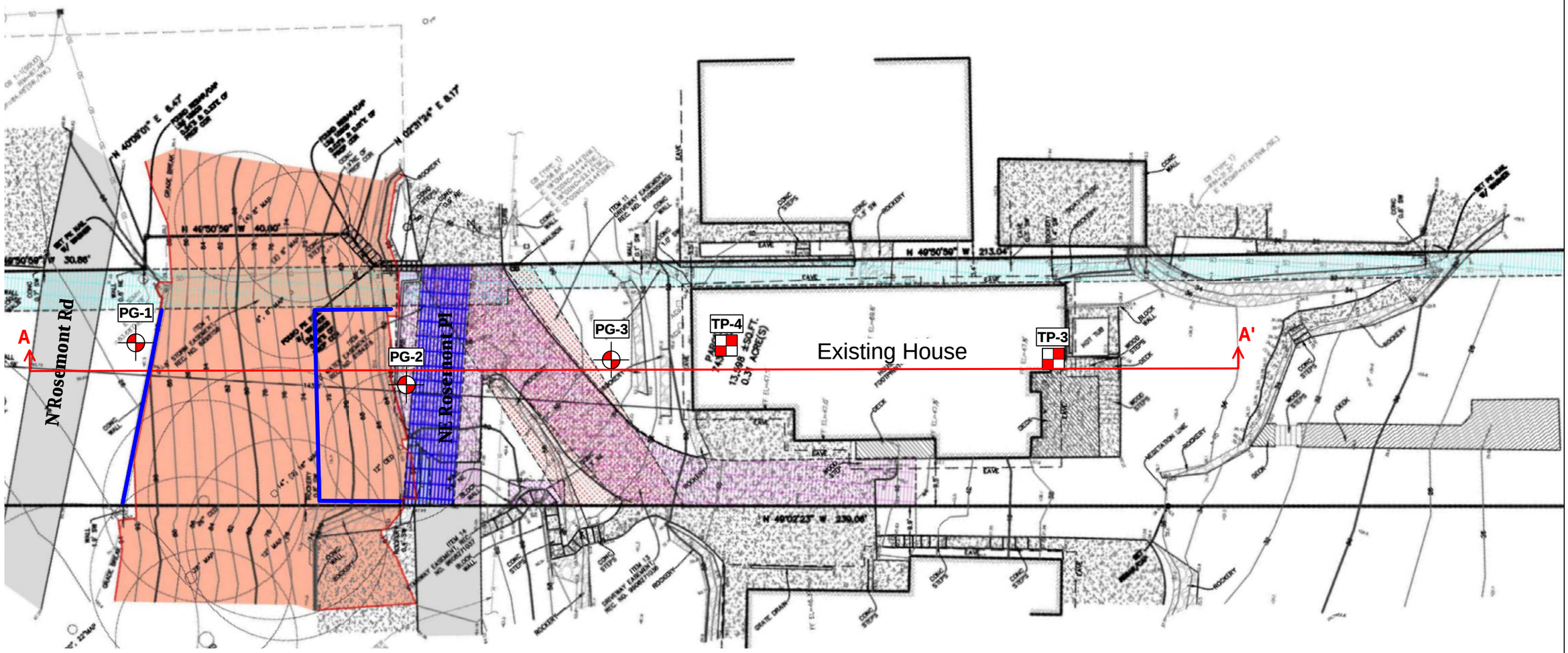
Proposed House Remodel and Addition
1250 W Lake Sammamish Pkwy NE
Bellevue, Washington

VICINITY MAP

Project No. **20-117**

Figure No. **1**

file.grf w/ file.dat 10/15/20 (5:07:35) BW



PROJECT NORTH

Scale:
1 inch = 20 feet

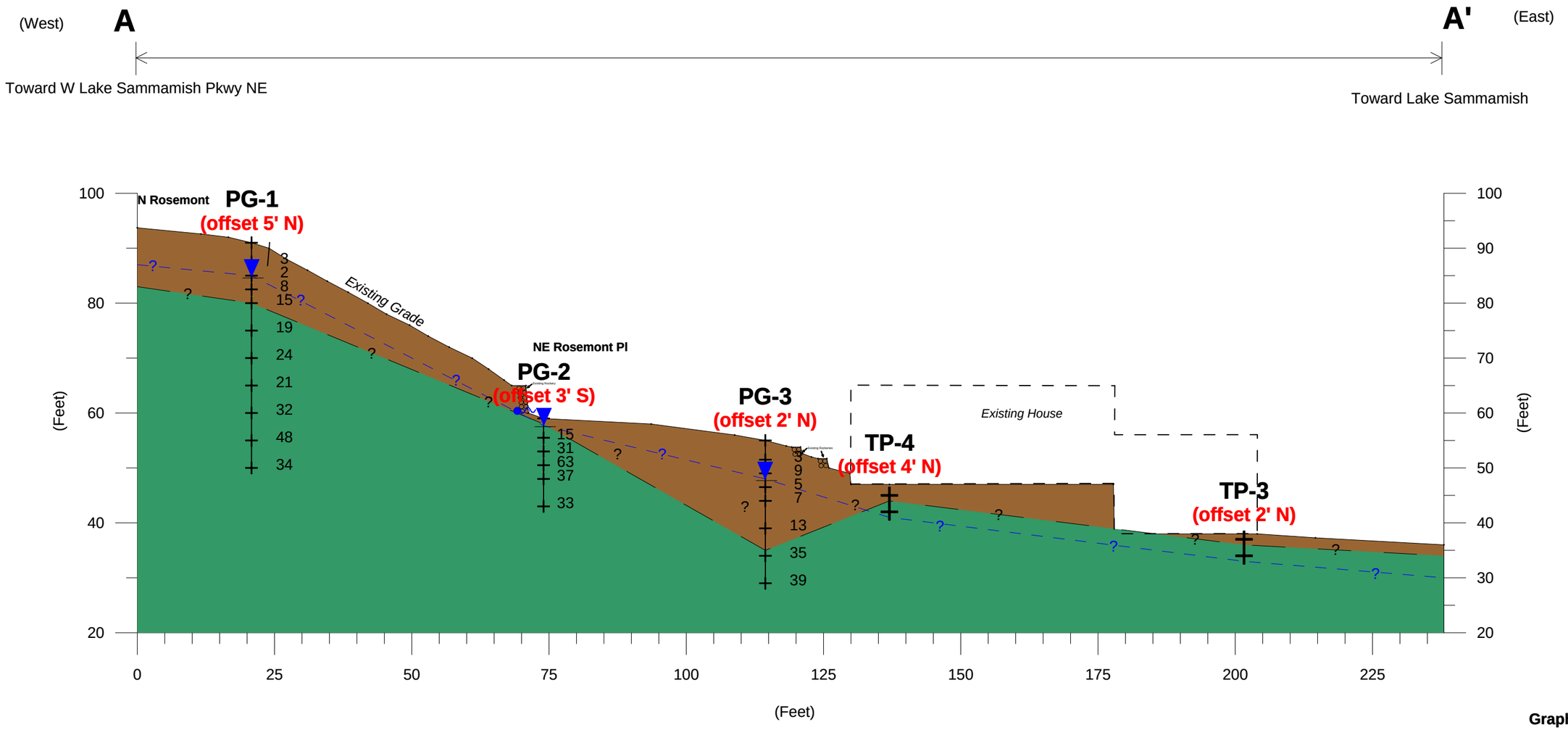
Legend:

- Approx. Test Boring Location
- Approx. Previous Test Pit Location (*GEO Consultants, 1991*)
- Approx. Subsurface Profile Location (See Figure 3)
- Proposed Soldier Pile Shoring Wall

Base map modified from Topographic & Boundary Survey by Terrane dated August 28, 2019

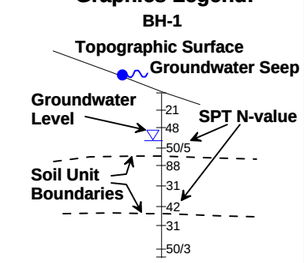
PanGEO INCORPORATED	Proposed House Remodel and Addition 1250 W Lake Sammamish Pkwy NE Bellevue, Washington	SITE AND EXPLORATION PLAN	
		Project No. 20-117	Figure No. 2

20-117 Fig 2 Site and Exploration Plan.grf 10/28/20 (5:02:46)



Horizontal Scale
1" = 20'
Vertical Scale
1" = 20'

Graphics Legend:



Engineering Soil Unit 1 & 2 - Very loose to medium dense silty SAND with organics (Fill/Colluvium/Alluvium)

Engineering Soil Unit 3 - Medium dense to very dense interlayered SAND and SILT (Pre-Fraser Deposits)

Notes:
1. Topography obtained from Topographic & Boundary Survey by Terrane, August 28, 2019.
2. See Figure 2 for location of Section A-A'.
3. See report text for additional discussions on subsurface conditions.
4. The generalized soil profile is based on widely-spaced borings. Soil conditions may vary over a small distance, and the actual subsurface conditions may be different from the generalized soil profile depicted in this figure.

PanGEO INCORPORATED

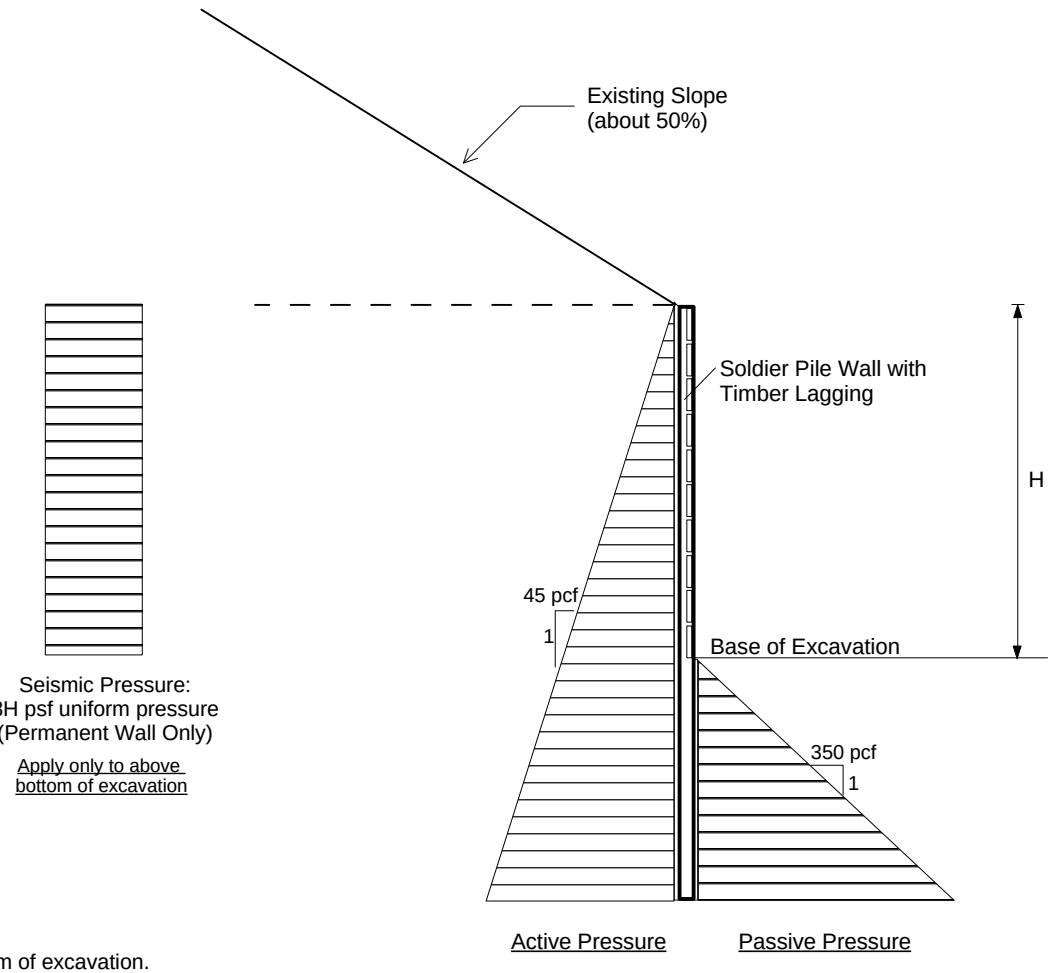
Proposed House Remodel and Addition
1250 W Lake Sammamish Pkwy NE
Bellevue, Washington

GENERALIZED SUBSURFACE PROFILE A-A'

Project No. **20-117**

Figure No. **3**

20-117_Fig3_Sub_Profile.grf 10/28/20 (5:13:16) BW



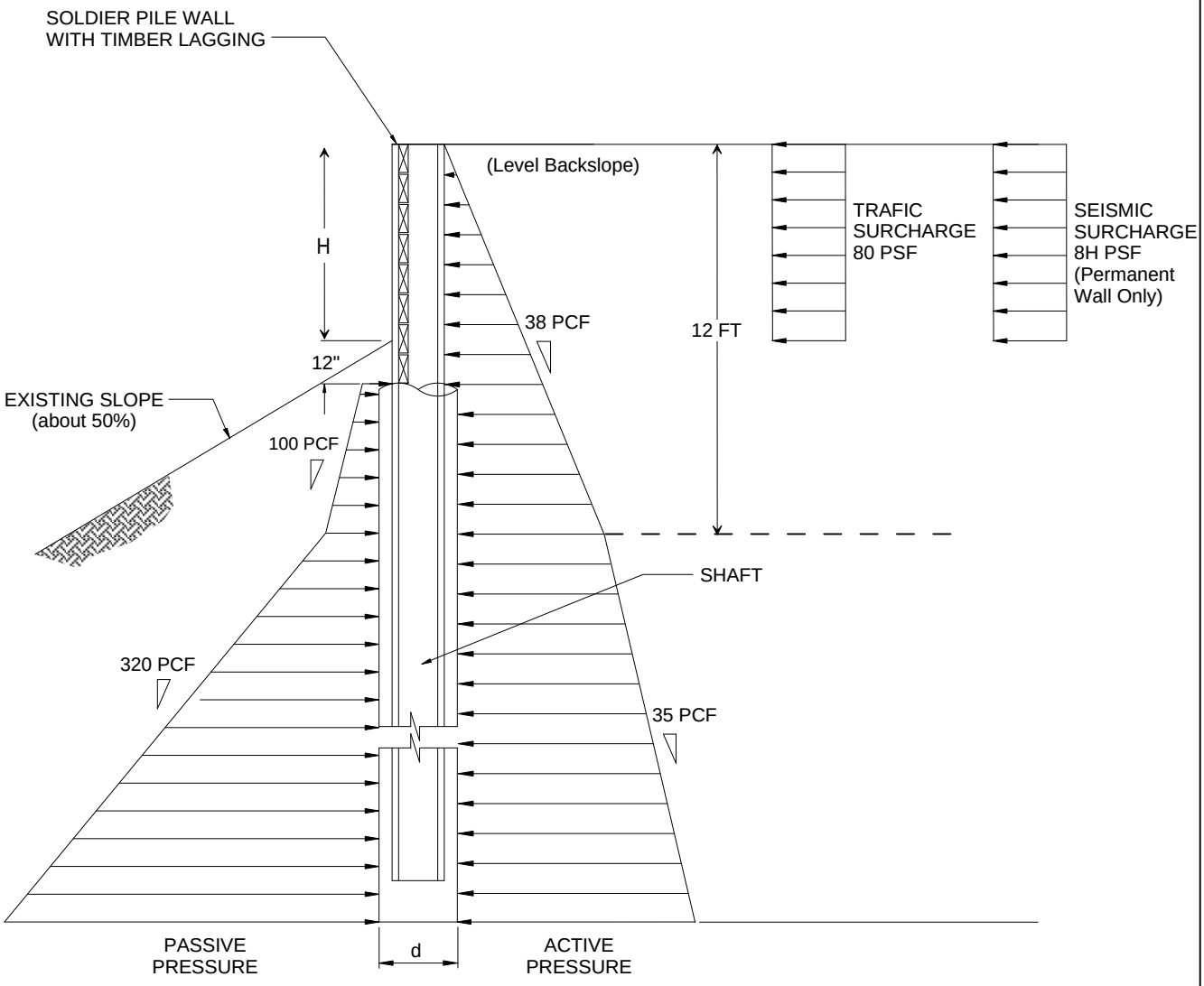
Notes:
1. Minumum embedment should be at least 10 feet below bottom of excavation.
2. A factor of safety of 1.5 has been applied to the recommended passive pressure values. No factor of safety has been applied to the recommended active earth pressure values.
3. Active pressures should be applied over the full width of the pile spacing above the base of the excavation, and over one pile diameter below the base of the excavation.
4. Surcharge pressures should be applied over the entire length of the loaded area.
5. Passive pressure should be applied to two times the diameter of the soldier piles.
6. Use 50% of the active and surcharge pressures for lagging design with soldier piles spaced at 8' or less.
7. Refer to report text for additional discussions.

PanGEO INCORPORATED

Proposed House Remodel and Addition
1250 W Lake Sammamish Pkwy NE
Bellevue, Washington

DESIGN LATERAL EARTH PRESSURES: CANTILEVERED SOLDIER PILE WALL (Lower Slope)

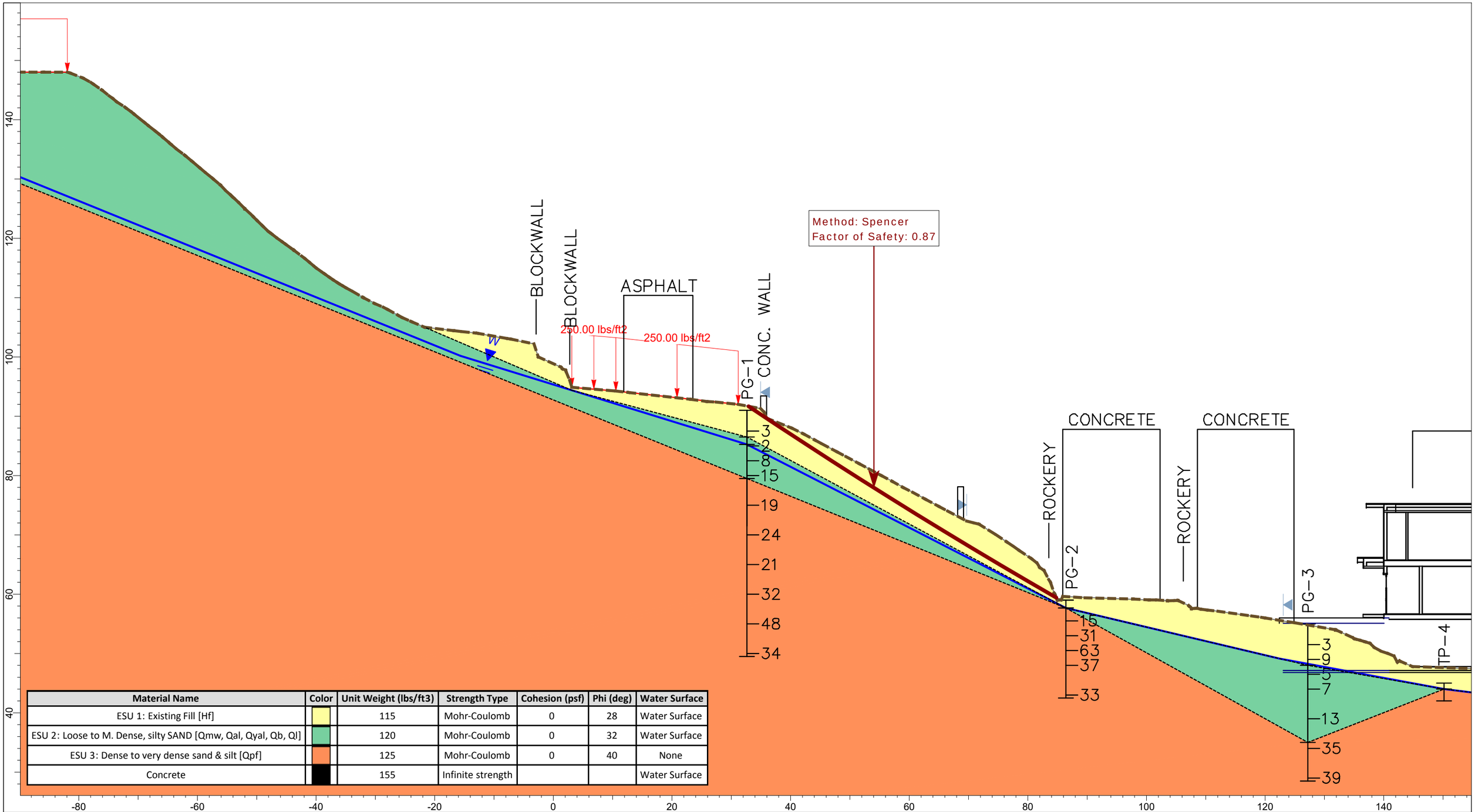
Project No.	Figure No.
20-117	**4**



Notes:
1. Minumum embedment should be at least 10 feet below bottom of excavation.
2. A factor of safety of 1.5 has been applied to the recommended passive pressure values. No factor of safety has been applied to the recommended active earth pressure values.
3. Active pressures should be applied over the full width of the pile spacing above the base of the excavation, and over one pile diameter below the base of the excavation.
4. Surcharge pressures should be applied over the entire length of the loaded area.
5. Passive pressure should be applied to two times the diameter of the soldier piles.
6. Use 50% of the active and surcharge pressures for lagging design with soldier piles spaced at 8' or less.
7. Refer to report text for additional discussions.

EP diagram.grf 10/28/20 (5:44:15) SDD

PanGEO INCORPORATED	**Proposed House Remodel and Addition** **1250 W Lake Sammamish Pkwy NE** **Bellevue, Washington**	**DESIGN LATERAL EARTH PRESSURES: CANTILEVERED SOLDIER PILE WALL (Upper Slope)** Project No. **20-117** Figure No. **5**



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface
ESU 1: Existing Fill [Hf]		115	Mohr-Coulomb	0	28	Water Surface
ESU 2: Loose to M. Dense, silty SAND [Qmw, Qal, Qyal, Qb, Ql]		120	Mohr-Coulomb	0	32	Water Surface
ESU 3: Dense to very dense sand & silt [Qpf]		125	Mohr-Coulomb	0	40	None
Concrete		155	Infinite strength			Water Surface

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SLIDEINTERPRET 9.010

Proposed House Addition & Site Improvements

1250 W. LK. Sammamish Pkwy NE

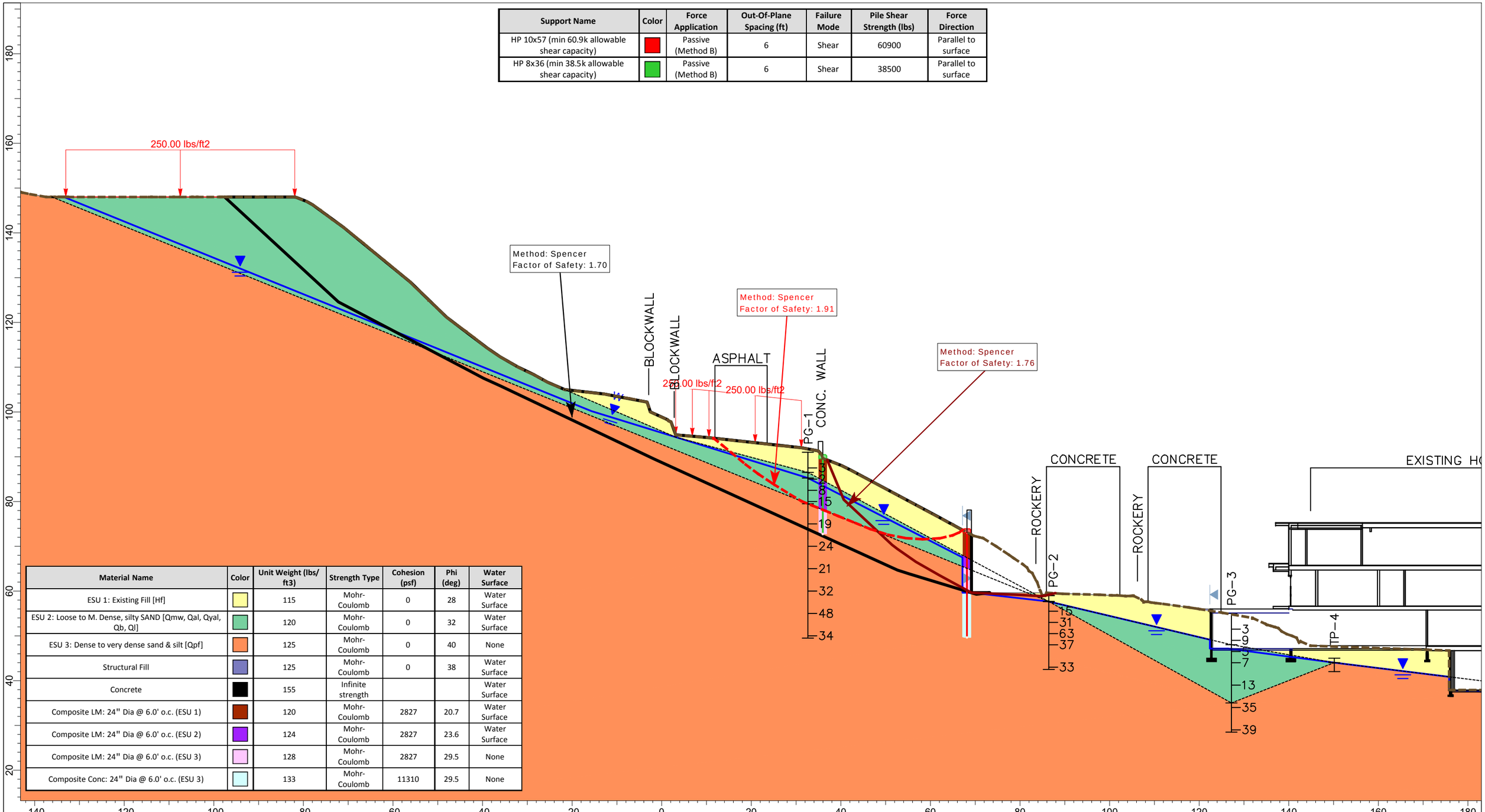
Bellevue, Washington

Static Global Stability Analysis

Section A - Existing Condition

Scale:	Project No.	Figure No.
1:180	20-117	6

Support Name	Color	Force Application	Out-Of-Plane Spacing (ft)	Failure Mode	Pile Shear Strength (lbs)	Force Direction
HP 10x57 (min 60.9k allowable shear capacity)		Passive (Method B)	6	Shear	60900	Parallel to surface
HP 8x36 (min 38.5k allowable shear capacity)		Passive (Method B)	6	Shear	38500	Parallel to surface



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface
ESU 1: Existing Fill [Hf]		115	Mohr-Coulomb	0	28	Water Surface
ESU 2: Loose to M. Dense, silty SAND [Qmw, Qal, Qyal, Qb, Ql]		120	Mohr-Coulomb	0	32	Water Surface
ESU 3: Dense to very dense sand & silt [Qpf]		125	Mohr-Coulomb	0	40	None
Structural Fill		125	Mohr-Coulomb	0	38	Water Surface
Concrete		155	Infinite strength			Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 1)		120	Mohr-Coulomb	2827	20.7	Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 2)		124	Mohr-Coulomb	2827	23.6	Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 3)		128	Mohr-Coulomb	2827	29.5	None
Composite Conc: 24" Dia @ 6.0' o.c. (ESU 3)		133	Mohr-Coulomb	11310	29.5	None

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SLIDEINTERPRET 9.010

Proposed House Addition & Site Improvements

1250 W. LK. Sammamish Pkwy NE

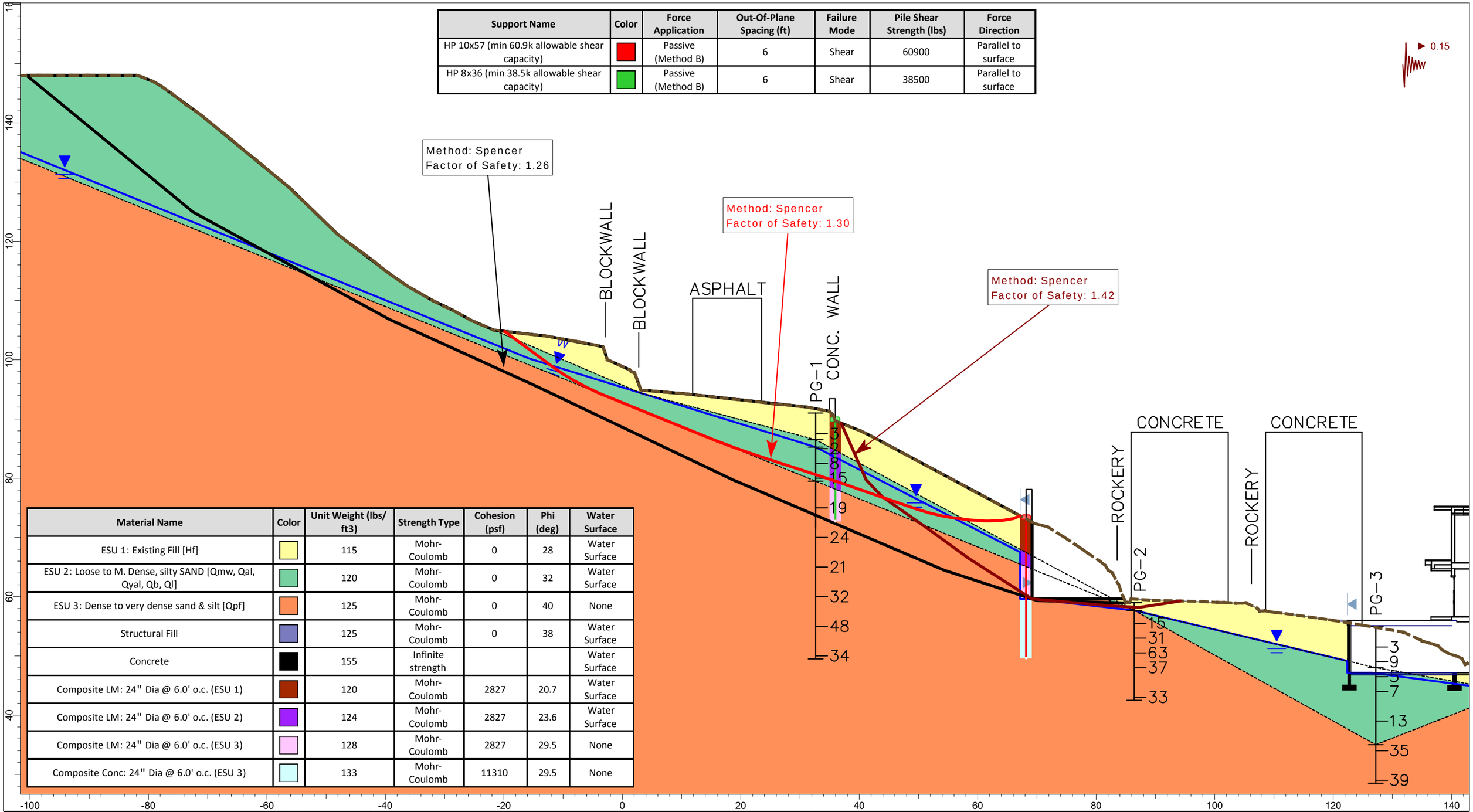
Bellevue, Washington

Static Global Stability Analysis

Section A - Proposed Condition

Scale:	Project No.	Figure No.
1:240	20-117	7

Support Name	Color	Force Application	Out-Of-Plane Spacing (ft)	Failure Mode	Pile Shear Strength (lbs)	Force Direction
HP 10x57 (min 60.9k allowable shear capacity)		Passive (Method B)	6	Shear	60900	Parallel to surface
HP 8x36 (min 38.5k allowable shear capacity)		Passive (Method B)	6	Shear	38500	Parallel to surface



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface
ESU 1: Existing Fill [Hf]		115	Mohr-Coulomb	0	28	Water Surface
ESU 2: Loose to M. Dense, silty SAND [Qmw, Qal, Qyal, Qb, Ql]		120	Mohr-Coulomb	0	32	Water Surface
ESU 3: Dense to very dense sand & silt [Qpf]		125	Mohr-Coulomb	0	40	None
Structural Fill		125	Mohr-Coulomb	0	38	Water Surface
Concrete		155	Infinite strength			Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 1)		120	Mohr-Coulomb	2827	20.7	Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 2)		124	Mohr-Coulomb	2827	23.6	Water Surface
Composite LM: 24" Dia @ 6.0' o.c. (ESU 3)		128	Mohr-Coulomb	2827	29.5	None
Composite Conc: 24" Dia @ 6.0' o.c. (ESU 3)		133	Mohr-Coulomb	11310	29.5	None

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SLIDEINTERPRET 9.010

Proposed House Addition & Site Improvements
1250 W. LK. Sammamish Pkwy NE
Bellevue, Washington

Pseudo-Static (Seismic) Global Stability Analysis
Section A - Proposed Condition

Scale:	Project No.	Figure No.
1:180	20-117	8

APPENDIX A

SUMMARY BORING LOGS

RELATIVE DENSITY / CONSISTENCY

SAND / GRAVEL			SILT / CLAY		
Density	SPT N-values	Approx. Relative Density (%)	Consistency	SPT N-values	Approx. Undrained Shear Strength (psf)
Very Loose	<4	<15	Very Soft	<2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Med. Dense	10 to 30	35 - 65	Med. Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	>50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	>30	>4000

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		GROUP DESCRIPTIONS	
Gravel 50% or more of the coarse fraction retained on the #4 sieve. Use dual symbols (eg. GP-GM) for 5% to 12% fines.	GRAVEL (<5% fines)	GW	Well-graded GRAVEL
		GP	Poorly-graded GRAVEL
	GRAVEL (>12% fines)	GM	Silty GRAVEL
		GC	Clayey GRAVEL
Sand 50% or more of the coarse fraction passing the #4 sieve. Use dual symbols (eg. SP-SM) for 5% to 12% fines.	SAND (<5% fines)	SW	Well-graded SAND
		SP	Poorly-graded SAND
	SAND (>12% fines)	SM	Silty SAND
		SC	Clayey SAND
Silt and Clay 50%or more passing #200 sieve	Liquid Limit < 50	ML	SILT
		CL	Lean CLAY
		OL	Organic SILT or CLAY
	Liquid Limit > 50	MH	Elastic SILT
		CH	Fat CLAY
		OH	Organic SILT or CLAY
Highly Organic Soils		PT	PEAT

Notes: 1. Soil exploration logs contain material descriptions based on visual observation and field tests using a system modified from the Uniform Soil Classification System (USCS). Where necessary laboratory tests have been conducted (as noted in the "Other Tests" column), unit descriptions may include a classification. Please refer to the discussions in the report text for a more complete description of the subsurface conditions.

2. The graphic symbols given above are not inclusive of all symbols that may appear on the borehole logs. Other symbols may be used where field observations indicated mixed soil constituents or dual constituent materials.

DESCRIPTIONS OF SOIL STRUCTURES

Layered: Units of material distinguished by color and/or composition from material units above and below

Laminated: Layers of soil typically 0.05 to 1mm thick, max. 1 cm

Lens: Layer of soil that pinches out laterally

Interlayered: Alternating layers of differing soil material

Pocket: Erratic, discontinuous deposit of limited extent

Homogeneous: Soil with uniform color and composition throughout

Fissured: Breaks along defined planes

Slickensided: Fracture planes that are polished or glossy

Blocky: Angular soil lumps that resist breakdown

Disrupted: Soil that is broken and mixed

Scattered: Less than one per foot

Numerous: More than one per foot

BCN: Angle between bedding plane and a plane normal to core axis

COMPONENT DEFINITIONS

COMPONENT	SIZE / SIEVE RANGE	COMPONENT	SIZE / SIEVE RANGE
Boulder:	> 12 inches	Sand	
Cobbles:	3 to 12 inches	Coarse Sand:	#4 to #10 sieve (4.5 to 2.0 mm)
Gravel		Medium Sand:	#10 to #40 sieve (2.0 to 0.42 mm)
Coarse Gravel:	3 to 3/4 inches	Fine Sand:	#40 to #200 sieve (0.42 to 0.074 mm)
Fine Gravel:	3/4 inches to #4 sieve	Silt	0.074 to 0.002 mm
		Clay	<0.002 mm

TEST SYMBOLS

for In Situ and Laboratory Tests listed in "Other Tests" column.

ATT	Atterberg Limit Test
Comp	Compaction Tests
Con	Consolidation
DD	Dry Density
DS	Direct Shear
%F	Fines Content
GS	Grain Size
Perm	Permeability
PP	Pocket Penetrometer
R	R-value
SG	Specific Gravity
TV	Torvane
TXC	Triaxial Compression
UCC	Unconfined Compression

SYMBOLS

Sample/In Situ test types and intervals

- 2-inch OD Split Spoon, SPT (140-lb. hammer, 30" drop)
- 3.25-inch OD Spilt Spoon (300-lb hammer, 30" drop)
- Non-standard penetration test (see boring log for details)
- Thin wall (Shelby) tube
- Grab
- Rock core
- Vane Shear

MONITORING WELL

- Groundwater Level at time of drilling (ATD)
- Static Groundwater Level
- Cement / Concrete Seal
- Bentonite grout / seal
- Silica sand backfill
- Slotted tip
- Slough
- Bottom of Boring

MOISTURE CONTENT

Dry	Dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water

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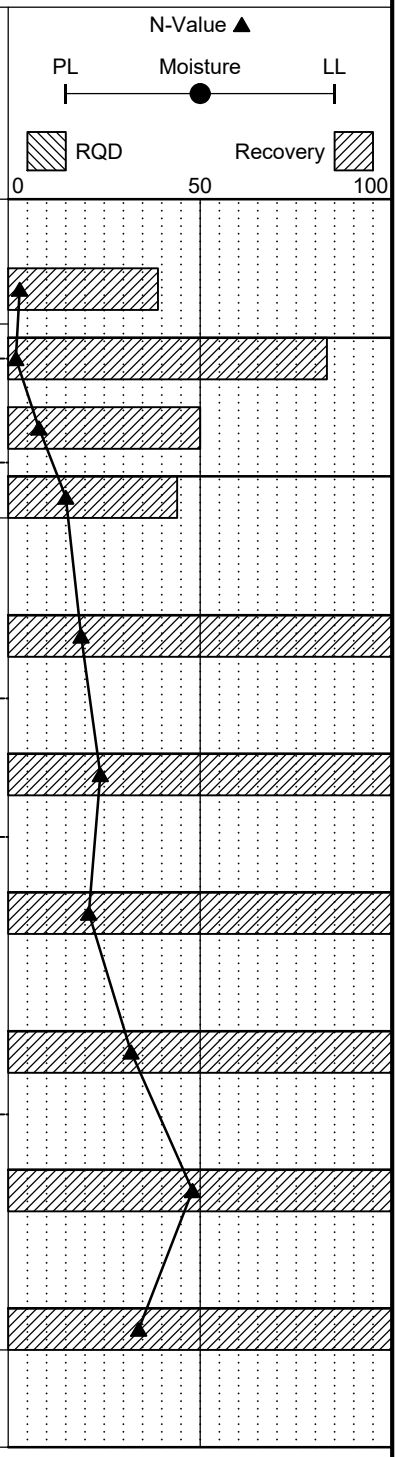
Phone: 206.262.0370

Terms and Symbols for Boring and Test Pit Logs

Figure A-1

Project:	Proposed House Remodel and Addition	Surface Elevation:	91.0ft
Job Number:	20-117	Top of Casing Elev.:	N/A
Location:	1250 W Lake Sammamish Pkwy NE, Bellevue, WA	Drilling Method:	HSA
Coordinates:	Northing: 47.6213, Easting: -122.09225	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0						Gravel surface over very loose, gray-brown, slightly silty and gravelly, fine and coarse SAND; moist; poorly graded, organics, disturbed appearance [Fill].
	S-1	X	1 2 1			
5						Very soft, dark brown, organic SILT; moist; non-plastic [Colluvium].
	S-2	X	1 1 1			Very loose to loose, gray, silty SAND trace fine gravel; wet; poorly graded [Colluvium].
	S-3	X	3 4 4			--becomes loose.
10	S-4	X	2 6 9			Medium dense, brown and gray, sandy, gravelly SILT to sandy GRAVEL; wet; poorly graded, non-plastic fines, dry gray silt in tip [Colluvium].
						Medium dense, gray, sandy SILT interlayered with some silty fine SAND; moist to very moist in sandy layers; poorly graded, non-plastic fines [Qpf - Pre-Fraser Deposits].
15	S-5	X	7 9 10			
						Medium dense, gray, silty fine SAND; very moist; poorly graded, iron oxide banding [Qpf - Pre-Fraser Deposits].
20	S-6	X	9 12 12			
						Medium dense to dense, interlayered gray and gray-brown, silty fine SAND and sandy SILT; moist to very moist in sandy layers; poorly graded, non-plastic fines [Qpf - Pre-Fraser Deposits].
25	S-7	X	7 9 12			--drillers note increased drilling difficulty at about 27'.
30	S-8	X	9 14 18			--becomes dense with trace coarse sand to fine gravel.
						Dense, gray, fine SAND trace silt; moist; poorly graded, massive [Qpf - Pre-Fraser Deposits].
35	S-9	X	5 18 30			
40	S-10	X	6 16 18			
						Boring terminated at about 41.5 feet below grade. Perched groundwater was observed from about 6 to 11.5 feet and very moist soils observed in sandy interlayers between about 11.5 and 33 feet during drilling.
45						



Completion Depth:	41.5ft
Date Borehole Started:	5/12/20
Date Borehole Completed:	5/12/20
Logged By:	B Weitering
Drilling Company:	Geologic Drill Partners

Remarks: Borings drilled using a CAT tracked drill rig. Standard penetration test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. Surface elevation estimated from Topographic & Boundary Survey by Terrane dated 8/28/2019.

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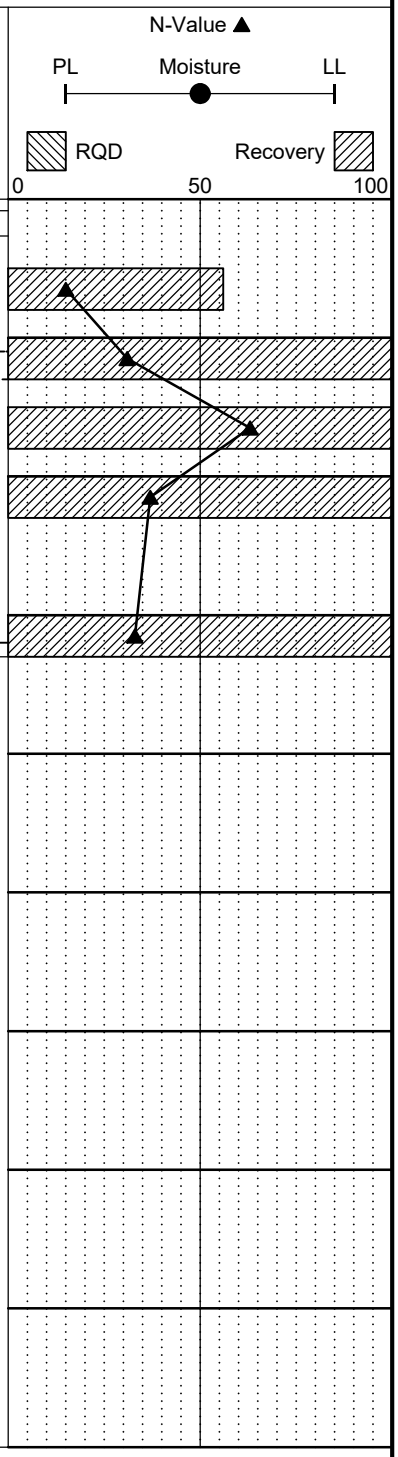
LOG OF TEST BORING PG-1

Figure A-2

The stratification lines represent approximate boundaries. The transition may be gradual.

Project:	Proposed House Remodel and Addition	Surface Elevation:	59.0ft
Job Number:	20-117	Top of Casing Elev.:	N/A
Location:	1250 W Lake Sammamish Pkwy NE, Bellevue, WA	Drilling Method:	HSA
Coordinates:	Northing: 47.6212, Easting: -122.0921	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0						~5" concrete.
						Medium dense, gray-brown, silty, sandy GRAVEL; moist; well-graded, brick [Fill].
	S-1	X	6 8 7			Medium dense, gray-brown, gravelly SAND; wet; poorly graded [Qpf - Pre-Fraser Deposits].
5	S-2	X	11 10 21			Hard, dark brown to gray-brown, SILT; moist; non-plastic, slightly organic in upper half [Qpf - Pre-Fraser Deposits].
	S-3	X	15 25 38			Very dense, gray, slightly silty fine SAND trace gravel; very moist; poorly graded [Qpf - Pre-Fraser Deposits].
10	S-4	X	10 15 22			--becomes dense. --trace wood.
15	S-5	X	12 11 22			--sand becomes fine to coarse.
						Hard, gray-brown, SILT; moist; non-plastic [Qpf - Pre-Fraser Deposits].
						Boring terminated at about 16.5 feet below grade. Perched groundwater was observed from about 1.3 to 5.5 feet and very moist soils observed between about 6.5 and 16 feet during drilling.
20						
25						
30						
35						
40						
45						



Completion Depth:	16.5ft
Date Borehole Started:	5/12/20
Date Borehole Completed:	5/12/20
Logged By:	B Weitering
Drilling Company:	Geologic Drill Partners

Remarks: Borings drilled using a CAT tracked drill rig. Standard penetration test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. Surface elevation estimated from Topographic & Boundary Survey by Terrane dated 8/28/2019.

PanGEO INCORPORATED

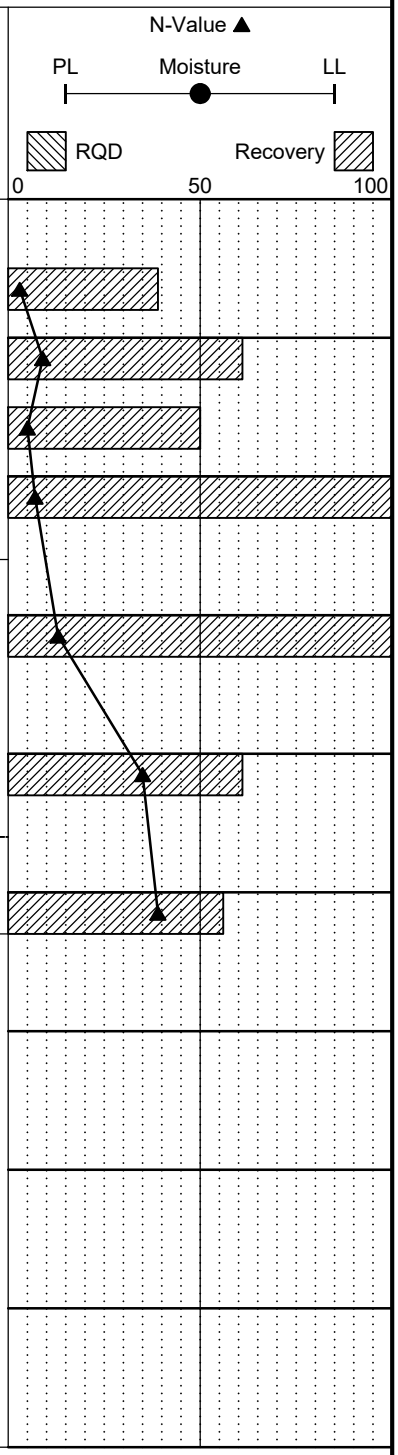
LOG OF TEST BORING PG-2

Figure A-3

The stratification lines represent approximate boundaries. The transition may be gradual.

Project:	Proposed House Remodel and Addition	Surface Elevation:	55.0ft
Job Number:	20-117	Top of Casing Elev.:	N/A
Location:	1250 W Lake Sammamish Pkwy NE, Bellevue, WA	Drilling Method:	HSA
Coordinates:	Northing: 47.62115, Easting: -122.0919	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0						Mulch landscaped surface over very loose, mixed dark brown, brown, and gray, slightly gravelly, silty SAND; moist; poorly graded, fine organics [Colluvium].
	S-1		2 1 2			
5	S-2		3 4 5			--becomes loose.
	S-3		2 3 2			--becomes wet.
10	S-4		4 3 4			--becomes gray.
						Medium dense to dense, gray, gravelly fine to coarse SAND; wet; poorly graded [Qal - Alluvium].
15	S-5		5 8 5			
20	S-6		4 18 17			--becomes dense.
						Dense, gray, silty fine SAND; wet; poorly graded, trace wood [Qpf - Pre-Fraser Deposits].
25	S-7		12 18 21			
						Boring terminated at about 26.5 feet below grade. Groundwater was observed at about 7 feet below grade during drilling.
30						
35						
40						
45						



Completion Depth:	26.5ft
Date Borehole Started:	5/12/20
Date Borehole Completed:	5/12/20
Logged By:	B Weitering
Drilling Company:	Geologic Drill Partners

Remarks: Borings drilled using a CAT tracked drill rig. Standard penetration test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. Surface elevation estimated from Topographic & Boundary Survey by Terrane dated 8/28/2019.

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LOG OF TEST BORING PG-3

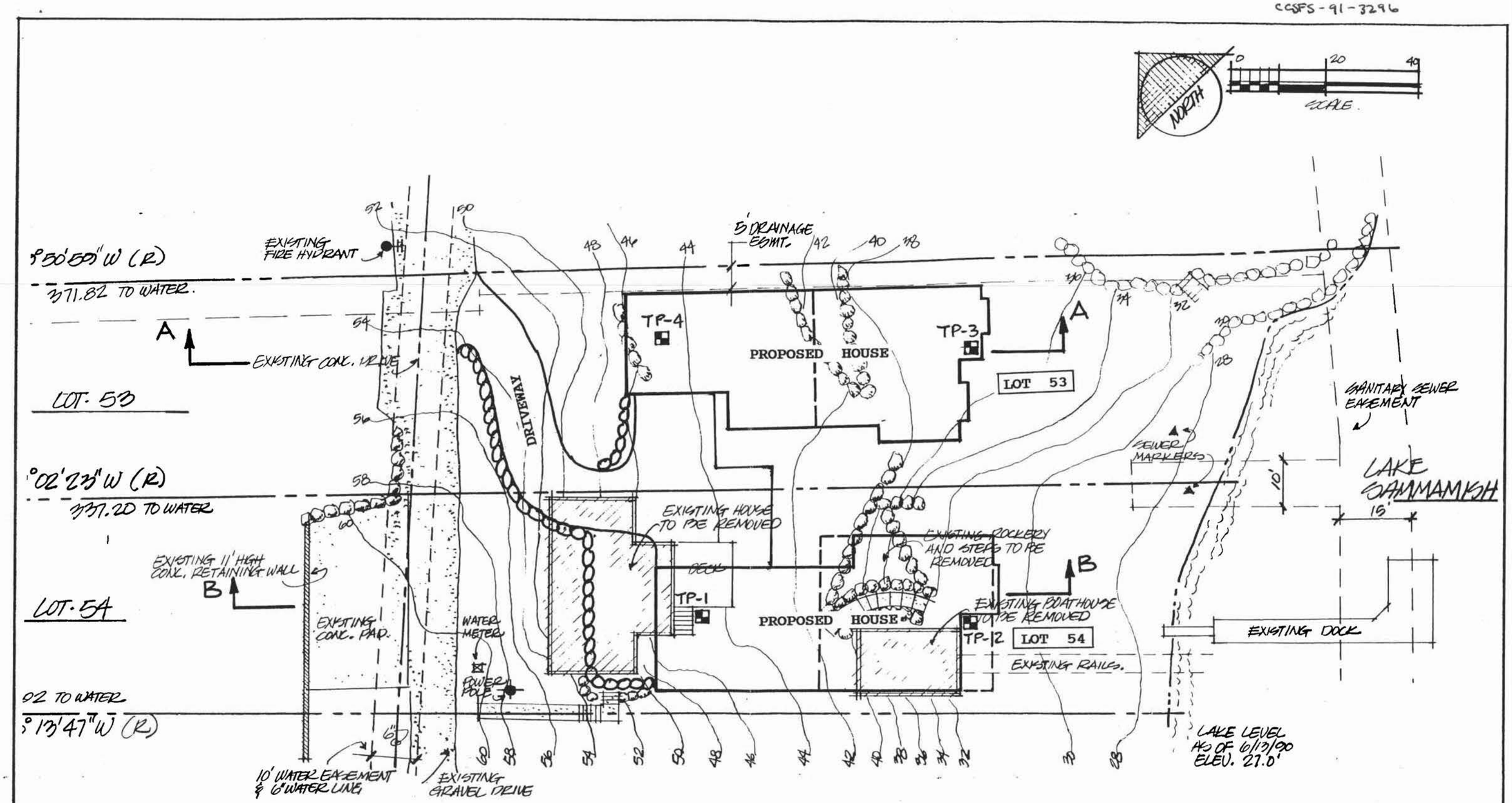
Figure A-4

The stratification lines represent approximate boundaries. The transition may be gradual.

APPENDIX B

SUMMARY PREVIOUS TEST PIT LOGS
(GEO CONSULTANTS, 1991)

CGSFS-91-3296



GEO Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

SITE PLAN

SCALE	DATE	MADE	CHKD.	JOB No.	PLATE
As Shown	3/31/91	JSL	WC	G-0055	2

Logged By JSL
Date 3/28/91

TEST PIT NO. 3

Elev. 37'±

Depth (ft.)		USCS	Soil Description	W (%)	
0		OL	FILL, moist, organic, dark brown, silty SAND w/ thin roots		
1		GP - SP	Very dense, moist, dark brown, sandy GRAVEL to gravelly SAND		
2					
3			GROUNDWATER NOT ENCOUNTERED.		

Logged By JSL
Date 3/28/91

TEST PIT NO. 4

Elev. 45'±

0		OL	TOP SOIL, moist, dark brown, loamy, gravelly SAND, w/ thin roots		
1		SP - GP	Very dense, moist, tannish brown, grvally SAND to sandy GRAVEL		
2					
3			GROUNDWATER NOT ENCOUNTERED.		

GEO Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

TEST PIT LOGS

Proj. No. G0055 | Date 4/5/91 | PLATE 5

APPENDIX C

RELEVANT CODES FOR CRTICAL AREA REPORT

As a part of our study, PanGEO reviewed the City of Bellevue's review letter dated September 14, 2020 for the proposed building and site work (File #20-112339-DC). The review letter requires geotechnical input to respond the applicable performance stands in Land Use Code (LUC) 20.25H for the Critical Areas Land Use Permit (LO) submittal. Our responses (in red) with relevant code sections are listed below:

LUC 20.25H.125 Performance standards – Landslide hazards and steep slopes.

In addition to generally applicable performance standards set forth in LUC 20.25H.055 and 20.25H.065, development within a landslide hazard or steep slope critical area or the critical area buffers of such hazards shall incorporate the following additional performance standards in design of the development, as applicable. The requirement for long-term slope stability shall exclude designs that require regular and periodic maintenance to maintain their level of function.

A. Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography; - The proposed addition will be constructed at the location of the existing house, and will not change the existing steep slopes. The proposed slope stabilization will utilize the soldier pile shoring to minimize alterations to the natural contour.

B. Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation; - The proposed addition will be constructed at the location of the existing house, and will not change the existing critical slopes. The proposed slope stabilization with soldier pile shoring is intended to minimize the ground disturbance on the slopes. The existing landforms and vegetation between the shoring walls will remain.

C. The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties; - Based on our study, the proposed addition will not result in greater risk to the neighboring properties, and it will not result in the need for increased buffers on neighboring properties.

D. The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes where graded slopes would result in increased disturbance as compared to use of retaining wall; - The retaining walls for the slope stabilization will constructed with soldier piles to minimize ground disturbance. The

existing natural slopes between the retaining walls will be maintained and no artificial slopes are planned for the proposal.

E. Development shall be designed to minimize impervious surfaces within the critical area and critical area buffer; - The proposed addition and slope improvements are intended to minimize the impervious surfaces within the critical area and critical area buffer.

F. Where change in grade outside the building footprint is necessary, the site retention system should be stepped and regrading should be designed to minimize topographic modification. On slopes in excess of 40 percent, grading for yard area may be disallowed where inconsistent with this criteria; - The recommended retaining system (soldier pile shoring) is intended to minimize the ground disturbance and topographic modifications.

G. Building foundation walls shall be utilized as retaining walls rather than rockeries or retaining structures built separately and away from the building wherever feasible. Freestanding retaining devices are only permitted when they cannot be designed as structural elements of the building foundation; - Building foundation walls will be utilized as retaining walls.

H. On slopes in excess of 40 percent, use of pole-type construction which conforms to the existing topography is required where feasible. If pole-type construction is not technically feasible, the structure must be tiered to conform to the existing topography and to minimize topographic modification; - The soldier pile shoring (pole-type construction) will be used to stabilize the existing steep slope.

I. On slopes in excess of 40 percent, piled deck support structures are required where technically feasible for parking or garages over fill-based construction types; and - Not applicable in this case.

J. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210. - Disturbed areas will be restored per Land Use Code. Mitigation and restoration plan may be needed and will be addressed by others.

20.25H.135 Mitigation and monitoring – Additional provisions for landslide hazards and steep slopes.

In addition to the general mitigation and restoration plan requirements of LUC 20.25H.210, each mitigation or restoration plan for geologic hazard critical areas shall include:

A. **Erosion and Sediment Control Plan.**

The erosion and sediment control plan shall be prepared in compliance with requirements set forth in Chapter 23.76 BCC, now or as hereafter amended. Such plans shall also include, if not otherwise addressed in Chapter 23.76 BCC, the location and methods of drainage, surface water management, locations and methods of erosion control, a vegetation management and/or replanting plan, and/or other means for maintaining long-term soil stability; - To be addressed by the project civil engineer.

B. **Drainage Plan.**

The technical information shall include a drainage plan for the collection, transport, treatment, discharge, and/or recycle of water prepared in accordance with applicable City codes and standards. The drainage plan should consider on-site septic system disposal volumes where the additional volume will affect the erosion or landslide hazard area; - To be addressed by the project civil engineer.

C. **Monitoring Surface Waters.**

If the Director determines that there is a significant risk of damage to downstream receiving waters due to potential erosion from the site, based on the size of the project, the proximity to the receiving waters, or the sensitivity of the receiving waters, the technical information shall include a plan to monitor the surface water discharge from the site. - To be addressed by the project civil engineer.

LUC 20.25H.140 Critical areas report – Additional provisions for landslide hazards and steep slopes.

In addition to the provisions of LUC 20.25H.230, any proposal to modify a landslide hazard or steep slope or associated critical area buffer through a critical areas report shall comply with the requirements of this section.

A. **Limitation on Modification.**

The provisions for coal mine hazard areas in LUC 20.25H.130 may not be modified through a critical areas report. - Not applicable in this case.

B. **Area Addressed in Critical Area Report.**

In addition to the general requirements of LUC 20.25H.230, the following areas shall be addressed in a critical areas report for geologically hazardous areas:

1. Site and Construction Plans. The report shall include a copy of the site plans for the proposal and a topographic survey; - Please see Figures 2, Site and Exploration Plan, in this report.

2. Assessment of Geological Characteristics. The report shall include an assessment of the geologic characteristics of the soils, sediments, and/or rock of the project area and potentially affected adjacent properties, and a review of the site history regarding landslides, erosion, and prior grading. Soils analysis shall be accomplished in accordance with accepted classification systems in use in the region; - Please see Section 4.0, Site Geology and Subsurface Conditions, in this report.

3. Analysis of Proposal. The report shall contain a hazards analysis including a detailed description of the project, its relationship to the geologic hazard(s), and its potential impact upon the hazard area, the subject property, and affected adjacent properties; and - Please see Section 5.0, Geologic Hazards Assessment, in this report.

4. Minimum Critical Area Buffer and Building Setback. The report shall make a recommendation for a minimum geologic hazard critical area buffer, if any, and minimum building setback, if any, from any geologic hazard based upon the geotechnical analysis. - This proposal intends to request a modification to the standard building setback. In our opinion, the proposed addition may be constructed within the steep slope setback with proper engineering support after the slope improvements. Please see Summary and Qualifications (page 9) in Section 5.1.2 in this report.

LUC 20.25H.145 Critical areas report – Approval of modification.

Modifications to geologic hazard critical areas and critical area buffers shall only be approved if the Director determines that the modification:

A. Will not increase the threat of the geological hazard to adjacent properties over conditions that would exist if the provisions of this part were not modified; - The proposed improvements will not increase the threat of the site geological hazards to adjacent properties.

B. Will not adversely impact other critical areas; - The proposed improvements will not have adversely impacts on the other critical areas.

C. Is designed so that the hazard to the project is eliminated or mitigated to a level equal to or less than would exist if the provisions of this part were not modified; - Based on our study, the proposed improvements will mitigate the site geologic hazards to a level equal to or less than the existing conditions.

D. Is certified as safe as designed and under anticipated conditions by a qualified engineer or geologist, licensed in the state of Washington; - The geologic hazards and geotechnical elements of the project were evaluated by a qualified civil engineer licensed in the State of Washington.

E. The applicant provides a geotechnical report prepared by a qualified professional demonstrating that modification of the critical area or critical area buffer will have no adverse impacts on stability of any adjacent slopes, and will not impact stability of any existing structures. Geotechnical reporting standards shall comply with requirements developed by the Director in City of Bellevue Submittal Requirements Sheet 25, Geotechnical Report and Stability Analysis Requirements, now or as hereafter amended; - The geotechnical report was prepared by a qualified engineer in general accordance with the City of Bellevue's submittal requirements.

F. Any modification complies with recommendations of the geotechnical support with respect to best management practices, construction techniques or other recommendations; and - The geotechnical elements of the proposed project should be constructed in general accordance with the recommendations contained in this geotechnical report.

G. The proposed modification to the critical area or critical area buffer with any associated mitigation does not significantly impact habitat associated with species of local importance, or such habitat that could reasonably be expected to exist during the

anticipated life of the development proposal if the area were regulated under this part.
- To be addressed by the others.

Review Comment #6: Soft stabilization measures must be explored as part of the proposal prior to hard stabilization.

According to the City of Bellevue LUC 20.25E.080.F, Soft Shoreline Stabilization combines a range of bioengineered actions, beach enhancement, anchor trees, large rocks, gravel placement, shoreline plantings, and similar measures that use natural materials engineered to provide shoreline stabilization while preserving or mimicking important shoreline ecological functions.

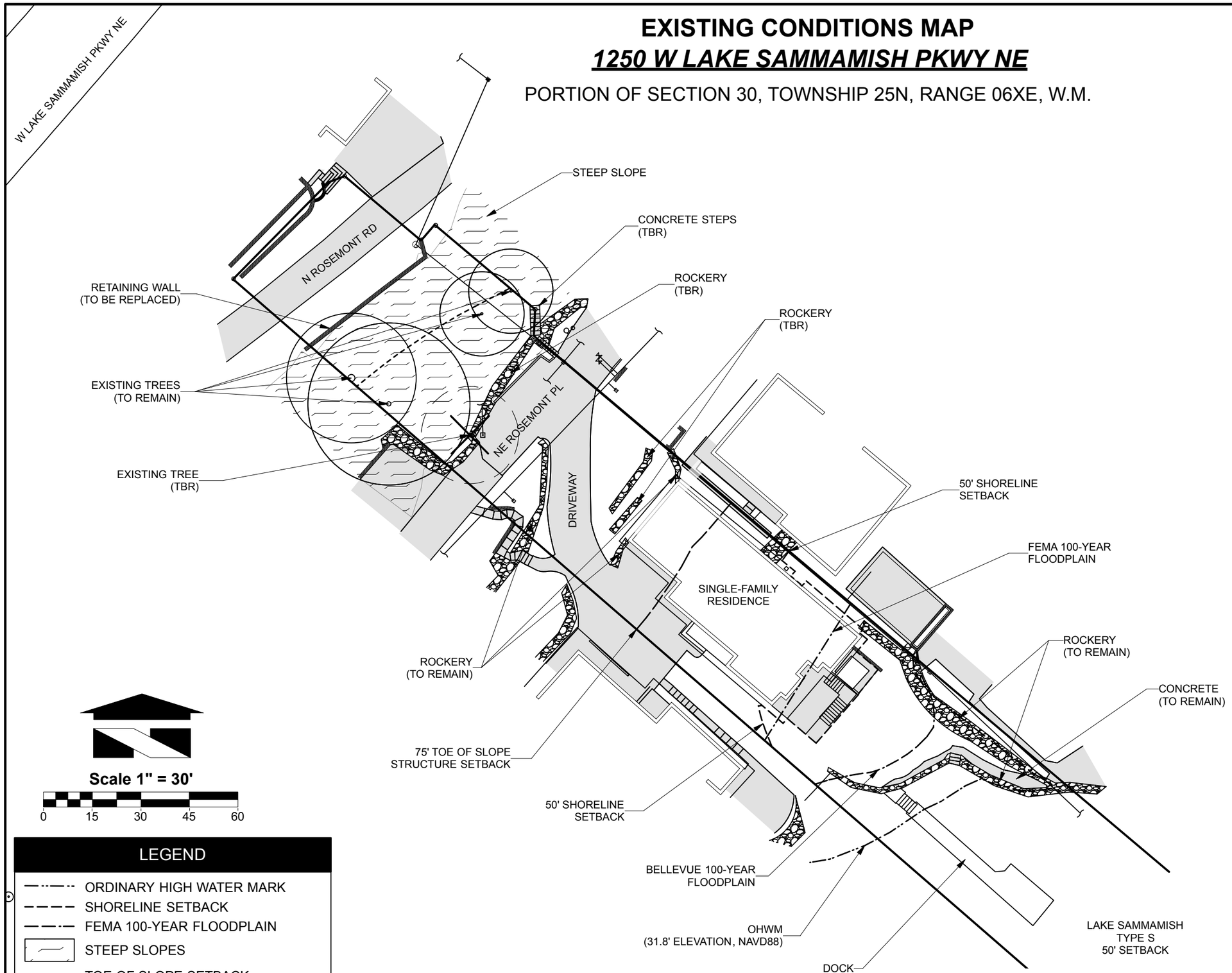
In our opinion, the soft stabilization measures described above are not applicable to this steep slope improvements. The soft stabilization measures are relatively shallow and unbale to prevent the potential deep-seated landslide. As a result, we recommend that hard stabilization measures (i.e. soldier pile shoring walls) should be used to stabilize the existing steep slope.

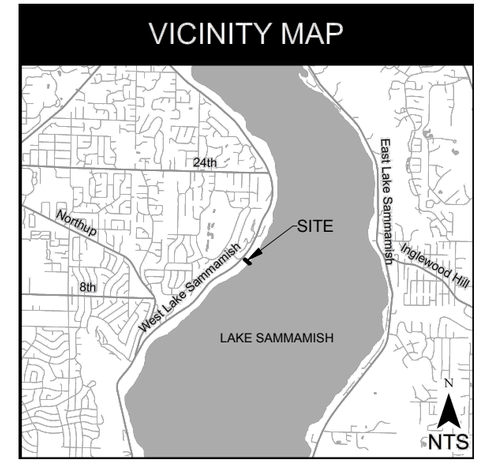
APPENDIX C:
EXISTING CONDITIONS MAP (SHEET 1/2)

EXISTING CONDITIONS MAP

1250 W LAKE SAMMAMISH PKWY NE

PORTION OF SECTION 30, TOWNSHIP 25N, RANGE 06XE, W.M.





Scale 1" = 30'

0 15 30 45 60

LEGEND

- ORDINARY HIGH WATER MARK
- SHORELINE SETBACK
- FEMA 100-YEAR FLOODPLAIN
- STEEP SLOPES
- TOE OF SLOPE SETBACK
- EXISTING PAVED AREAS (CONCRETE/ASPHALT)

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett,Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources .com

EXISTING CONDITIONS MAP
1250 W LAKE SAMMAMISH PKWY NE
CITY OF BELLEVUE

Sheet 1/2
WRI #: 20256
Drawn by: JG
Date: 03.02.2021

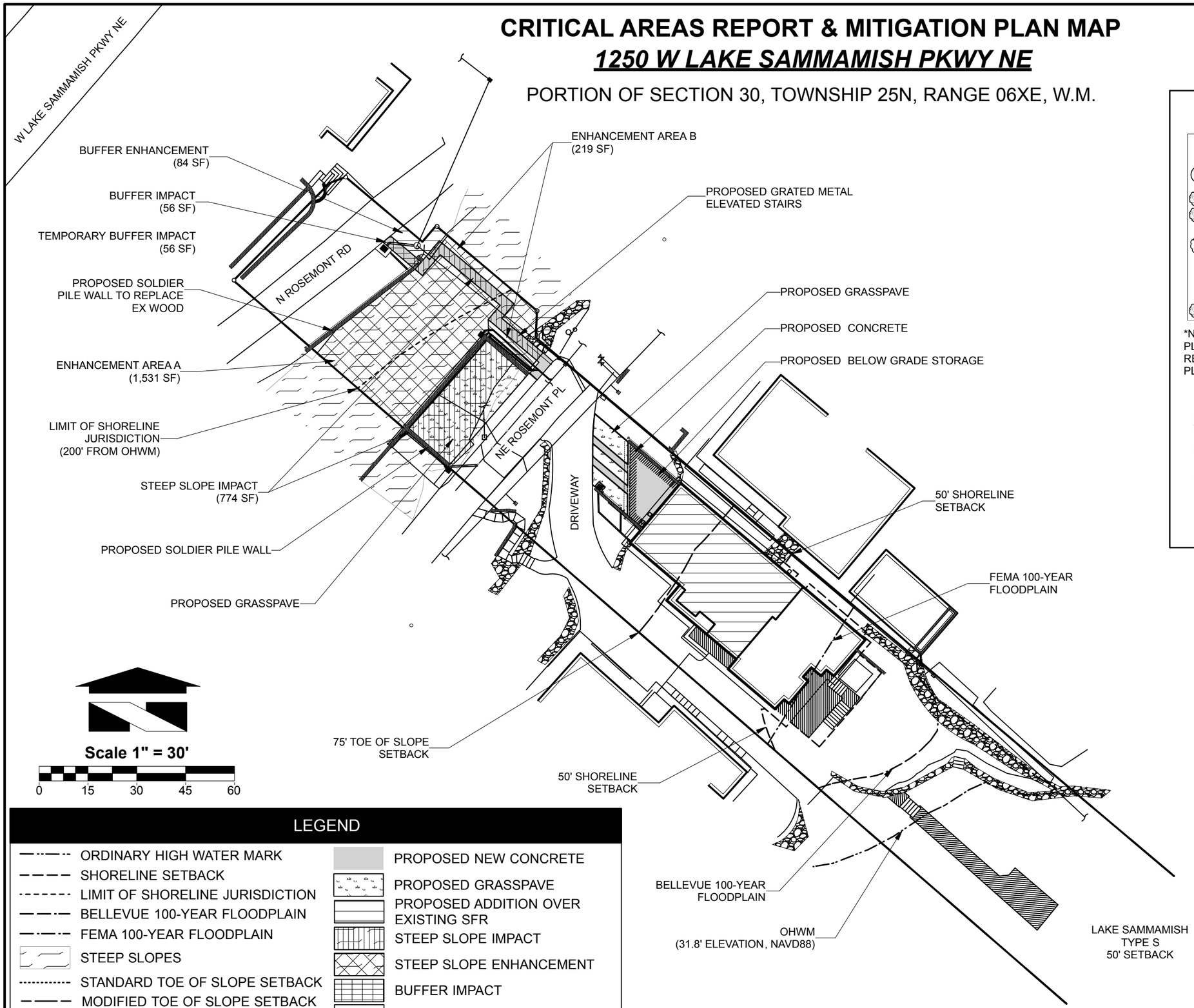
Rob Drollinger
1250 W Lake Sammamish Pkwy NE
Bellevue, WA 98008

APPENDIX D:
CRITICAL AREAS REPORT & MITIGATION PLAN MAP (SHEET 2/2)

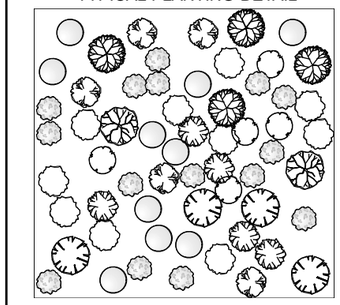
CRITICAL AREAS REPORT & MITIGATION PLAN MAP

1250 W LAKE SAMMAMISH PKWY NE

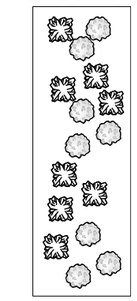
PORTION OF SECTION 30, TOWNSHIP 25N, RANGE 06XE, W.M.



ENHANCEMENT AREA A
TYPICAL PLANTING DETAIL



ENHANCEMENT AREA B/
BUFFER ENHANCEMENT
TYPICAL PLANTING DETAIL



*NOTE: PLANTS WILL BE INTERSPERSED AMONG EXISTING NATIVE PLANTS; ACTUAL PLANT PLACEMENT WILL BE DETERMINED ON SITE. REFER TO PLANTING PLANS IN REPORT FOR APPROXIMATE TOTAL PLANT QUANTITIES.

PLANT SYMBOLS

- ACER MACROPHYLLUM
- PSEUDOTSUGA MENZIESII
- THUJA PLICATA
- ACER CIRCINATUM
- CORYLUS CORNUTA
- SYMPHORICARPOS ALBUS
- GAULTHERIA SHALLON
- MAHONIA NERVOSA
- POLYSTICHUM MUNITUM
- TELLIMA GRANDIFLORA

LEGEND

- ORDINARY HIGH WATER MARK
- SHORELINE SETBACK
- LIMIT OF SHORELINE JURISDICTION
- BELLEVUE 100-YEAR FLOODPLAIN
- FEMA 100-YEAR FLOODPLAIN
- STEEP SLOPES
- STANDARD TOE OF SLOPE SETBACK
- MODIFIED TOE OF SLOPE SETBACK
- PROPOSED NEW CONCRETE
- PROPOSED GRASSPAVE
- PROPOSED ADDITION OVER EXISTING SFR
- STEEP SLOPE IMPACT
- STEEP SLOPE ENHANCEMENT
- BUFFER IMPACT
- BUFFER ENHANCEMENT

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CRITICAL AREAS REPORT &
MITIGATION PLAN MAP
1250 W LAKE SAMMAMISH PKWY NE
CITY OF BELLEVUE

Sheet 2/2
WRI #: 20256
Drawn by: JG
Date: 03.02.2021

Rob Drollinger
1250 W Lake Sammamish Pkwy NE
Bellevue, WA 98008

APPENDIX E:
SITE PHOTOGRAPHS

SITE PHOTOS
(November 16, 2020)

Shoreline environment

Existing concrete stairs at base of slope. Stairs above rockery wall have shifted/slumped and become unsafe.

Existing rockery wall at base of slope to be replaced.

Steep slope enhancement area, currently sparsely vegetated.