CITY OF MERCER ISLAND
9611 SE 36th Street • Mercer Island, WA 98040-3732
(206) 275-7605 • FAX (206) 275-7726
www.mercergov.org

CRITICAL AREA DETERMINATION
NOTICE OF DECISION
August 7, 2017

Project Number:	CAO17-006
Description:	Proposal to install improvements to stabilize steep slope and mitigate for a landslide. Proposal includes installation of 5,000 square feet of terraced garden, permeable surface walkways, 30" stack stone terrace walls, and metal stair from existing the parking area.
Applicant:	Cassidy Zimmerman SHKS Architects 1050 N 38th St Seattle WA 98103
Owner:	Jeff Sanderson 8100 Evergreen Ln Mercer Island WA 98040
Site Address:	8100 Evergreen Ln, Mercer Island, WA, 98040; Identified by King County Assessor tax parcel numbers 8057000012 and 8057000014
Zoning:	R-15
SEPA Compliance:	A Determination of Nonsignificance (SEP17-014) is being issued concurrently with this decision.
Exhibits:	1. Plan set dated May 18, 2017. 2. Development Application dated May 18, 2017 3. Geotechnical Engineering Study, prepared by Geotech Consultants, Inc., dated June 16, 2017. 4. Email from Don Cole, Building Official for the City of Mercer Island, dated July 21, 2017. 5. Geotechnical review comments by Perrone Consulting, Inc., P.S. received July 19, 2017 6. Comment letter received from Steve and Marcia Cardwell on July 12, 2017 7. Comment letter received from James and Amanda Blinn on July 1, 2017

I. FINDINGS OF FACT

1. Application Description:

The request is for approval of a critical area determination for the alteration of a steep slope in order to complete landslide repair. Proposed improvements include 5,000 square feet of terraced garden, permeable surface walkways, 30" stack stone terrace walls, and metal stair from the existing parking area. The area of construction has an over 50% slope (Exhibit 1 and 2), which is a steep slope as defined in MICC 19.16.

2. Zoning:

The existing zoning of the subject site is R-15 (Residential, 15,000 square foot minimum lot area).

3. Adjacent Land Use:

The surrounding land uses consist of single family residences on all sides. The subject property is accessed from a private driveway connecting to Evergreen Ln to the south.

4. Consistency with Land Use Code/Zoning Requirements:

MICC 19.16 Definitions "Critical Area Determination" states that the land use application is "[a]n administrative action by the code official pursuant to MICC 19.15.010(E) to allow reduction or averaging of a wetland or watercourse buffer, or alteration of a steep slope." The applicant has applied for a Critical Area Determination to alter a steep slope in order to install improvements to complete landslide repairs.

5. SEPA:

A Determination of Non-significance is being issued concurrently with this decision on August 7, 2017 following the optional DNS process pursuant to WAC 197-11-355. The SEPA application is identified by the City of Mercer Island project number SEP17-014**.**

6. Public Noticing and Comments:

There is no public hearing requirement for a Critical Area Determination (an administrative action) pursuant to MICC 19.15.010(E) and 19.15.020(F)(1). On June 12, 2017, City staff sent a Public Notice of Application to all property owners within 300 feet of the subject property and placed the Public Notice of Application in the City Weekly Permit Bulletin. The site was posted with a public notice sign, in a location that is visible to the public right-of-way on June 12, 2017 as required by MICC 19.15.020(E)(4)(a). A public comment period ran from June 12, 2017 through 5:00 P.M. on July 12, 2017. The City received two comment letters during the public comment period (Exhibits 6 and 7). Issues raised in the letters included: Requests to be made parties of record, and a concern about the potential for additional stormwater runoff to be directed into the creek within the ravine on the subject property, possibly causing instability.

Staff Response:

Parties who commented have been made parties of record and are receiving copies of this decision. A building permit will be required to construct the proposed improvements, and part of the building permit review will include review of the drainage plans.

7. MICC 19.07.060(D)(2):

Statement of Risk. Alteration within geologic hazard areas may occur if the development conditions listed above are satisfied and the geotechnical professional provides a statement of risk with supporting documentation indicating that one of the following conditions can be met:

a. The geologic hazard area will be modified, or the development has been designed so that the risk to the lot and adjacent property is eliminated or mitigated such that the site is determined to be safe;

b. Construction practices are proposed for the alteration that would render the development as safe as if it were not located in a geologic hazard area;

c. The alteration is so minor as not to pose a threat to the public health, safety and welfare; or

d. An evaluation of site specific subsurface conditions demonstrates that the proposed development is not located in a geologic hazard area.

Staff Analysis:

The applicant provided a Geotechnical Engineering Study (Exhibit 3), which notes, "The proposed development has been designed so that the risk to the lot and adjacent property is mitigated such that the project is determined to be safe." The study also includes supporting documentation to support this conclusion, addressing condition a. above.

8. Permit Expiration:

MICC 19.15.020(K) states "Except for building permits or unless otherwise conditioned in the approval process, permits shall expire one year from the date of notice of decision if the activity approved by the permit is not exercised. Responsibility for knowledge of the expiration date shall be with the applicant."

Staff Analysis:

A condition of approval has been added to this decision, requiring the above standard to be met.

II. CONCLUSIONS OF LAW

Based on the above Findings of Facts, the following Conclusions of Law have been made:

1. The subject property contains steep slope.
2. The proposed alteration of the steep slope, as conditioned, is consistent with the provisions of MICC 19.07.060.

III. DECISION

Based upon the above noted Findings of Fact and Conclusions of Law, critical areas determination application CAO17-006 to alter a steep slope, as depicted by Exhibits 1 and 3 is hereby **APPROVED** subject to the following Conditions of Approval. This decision is final, unless appealed in writing consistent with adopted appeal procedures.

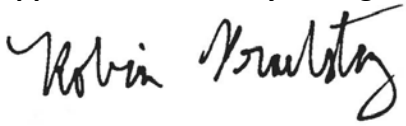
IV. CONDITIONS OF APPROVAL

The following conditions shall be binding on the "Applicant," which shall include owner or owners of the property, heirs, assigns and successors.

1. The approval of the permit is based on the proposal substantially complying with the submittal, as shown in Exhibits 1-3.
2. This permit approval shall expire one year from the date of notice of decision if the activity approved by the permit is not exercised.
3. The applicant shall obtain all required permits for construction.
4. The applicant shall install and have inspected full temporary erosion and sediment control measures prior to construction.

5. The applicant shall address the peer review comments contained in Exhibit 5 during building permit review, and satisfactorily resolve all issues raised by the comments prior to building permit issuance.
6. Prior to building permit issuance, the applicant shall either 1) provide additional information regarding Tree #1, including proposed limits of disturbance, comment on the proposed impacts, and provide information on the tree's health and dripline, or 2) modify the design of the proposed improvements to be outside the tree's dripline.
7. Prior to final inspection of the work proposed under permit #1707-252, the applicant shall record a lot line revision that modifies the subject site's lot lines so that no retaining walls for fill slopes over 72 inches are within five feet of a lot line, meeting the standards in MICC 19.02.050(D).

Approved this 7th day of August, 2017.



Robin Proebsting
Senior Planner
Development Services Group
City of Mercer Island

Parties of record have the right to appeal the decision on this action when it is issued. If at that time you desire to file an appeal, you must submit the appropriate form, available from the Development Services Group, and file it with the City Clerk within fourteen (14) days from the date this decision is signed. Upon receipt of a timely complete appeal application and appeal fee, an appeal hearing will be scheduled. To reverse, modify or remand this decision, the appeal hearing body must find that there has been substantial error, the proceedings were materially affected by irregularities in procedure, the decision was unsupported by material and substantial evidence in view of the entire record, or the decision is in conflict with the city's applicable decision criteria.

Please note that the City will provide notice of this decision to the King County Department of Assessment, as required by State Law (RCW 36.70B.130). Pursuant to RCW 84.41.030(1), affected property owners may request a change in valuation for property tax purposes notwithstanding any program of revaluation by contacting the King County Department of Assessment at (206) 296-7300.

8100 NORTH GARDEN

ABBREVIATIONS

&	AND
L	ANGLE
@	AT
⌀	DIAMETER
#	POUND OR NUMBER
(E)	EXISTING
℄	CENTERLINE
A.B.	ANCHOR BOLT
ABV	ABOVE
AC	AIR CONDITIONING
ACT	ACOUSTIC CEILING TILE
ACU	AIR CONDITION UNIT
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATELY
BLDG	BUILDING
BLW	BELOW
B.O.	BOTTOM OF
CB	CATCH BASIN
CBB	CEMENT BACKER BOARD
CEM	CEMENT
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CO	CLEAN OUT
COL	COLUMN
CONC	CONCRETE
COND	CONDITION
CONT	CONTINUOUS
CPT	CARPET
CT	CERAMIC TILE
DBL	DOUBLE
DEMO	DEMOLISH
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DISP	DISPENSER
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DTL	DETAIL
DW	DISHWASHER
E	EAST
EA	EACH
ECS	EXTERIOR COMPOSITE SIDING
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMERG	EMERGENCY
EQ	EQUAL
EXP	EXPANSION
FBP	FIBER BOARD PANEL
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FF	FINISH FLOOR
FH	FIRE HYDRANT
FIN	FINISH
FLR	FLOOR
F.O.	FACE OF
FOIC	FURNISHED BY OWNER, INSTALL BY CONTRACTOR
FOIO	FURNISHED BY OWNER INSTALL BY OWNER
FR	FIRE RESISTANT
FS	FLOOR SINK
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GL	GLASS
GLB	GLU-LAM BEAM
GND	GROUND
GR	GRADE
GRT'D	GROUTED
GWB	GYPSUM WALL BOARD
HB	HOSE BIBB
HC	HANDICAP
HCMU	HOLLOW CLAY MASONRY UNIT
HDWD	HARDWOOD
HDWE	HARDWARE
HT	HEIGHT
HM	HOLLOW METAL
HR	HOUR
HORIZ	HORIZONTAL
I.D.	INSIDE DIAMETER
INSUL	INSULATION
INT	INTERIOR
JAN	JANITOR
JT	JOINT
KIT	KITCHEN
LAB	LABORATORY
LAM	LAMINATE
LAV	LAVATORY
LKR	LOCKER
LOC	LOCATE
LT	LIGHT
LVL	LAMINATED VENEER LUMBER
M	MEN'S
MATL	MATERIAL
MAX	MAXIMUM
MC	MEDICINE CABINET
MECH	MECHANICAL
MEMB	MEMBRANE
MFR	MANUFACTURER
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MH	MANHOLE
MO	MASONRY OPENING
MTD	MOUNTED
MTL	METAL
MULL	MULLION
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
NR	NOT RATED
OA	OVERALL
OBS	OBSCURE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
OFF	OFFICE
OPNG	OPENING
OPP	OPPOSITE
PC	PRECAST CONCRETE
PL	PLATE
PLAS	PLASTER
PLY	PLYWOOD
P.LAM	PLASTIC LAMINATE
PNT	PAINT
PR	PAIR
PSL	PARALLEL STRAND LUMBER
PT	PRESSURE TREATED
PTN	PARTITION
QT	QUARRY TILE
R or RAD	RADIUS
RB	RESILIENT BASE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REF	REFERENCE
REFR	REFRIGERATOR
REINF	REINFORCED
RELOC	RELOCATE
REQ'D	REQUIRED
RES	RESILIENT
RM	ROOM
RO	ROUGH OPENING
RV	ROOF VENT
RL	RAIN WATER LEADER
S	SOUTH
SA	SMOKE ALARM
SC	SOLID CORE
SCHED	SCHEDULE
SECT	SECTION
SG	SAFETY GLASS
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
S.S.	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
STN	STAIN
STOR	STORAGE
STRUCT	STRUCTURE
SOG	SLAB ON GRADE
SUSP	SUSPENDED
SYM	SYMMETRICAL
T, TMP	TEMPERED
T&G	TONGUE & GROOVE
TEL	TELEPHONE
TER	TERRAZZO
THK	THICK
T.O.	TOP OF
TS	TUBE STEEL
TV	TELEVISION
TYP	TYPICAL
UL	UNDERWRITERS' LABORATORIES
UNO	UNLESS NOTED OTHERWISE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VTR	VENT THRU ROOF
W	WEST
W/	WITH
WC	WATER CLOSET
WD	WOOD
WF	WIDE FLANGE
W/O	WITHOUT
WOM	WALK OFF MAT
WM	WOMEN'S
WP	WATERPROOFING
WR	WATER RESISTANT
WSCT	WAINSCOT
WT	WEIGHT

MATERIAL SYMBOLS

BATT INSULATION
CONCRETE
RIGID INSULATION
EARTH
GRAVEL
WOOD
MASONRY
PLYWOOD
STEEL

MATERIAL SYMBOLS

WALL SECTION
BLDG SECTION
EXTERIOR ELEVATION
INTERIOR ELEVATION
DETAIL
NORTH ARROW
GRID HEAD
ROOM TAG
WINDOW TAG
WALL TAG
DOOR & DOOR TAG
KEY NOTE
ELEVATION NOTE
SPOT ELEVATION
CENTERLINE
PROPERTY LINE
FLOOR TRANSITION
REVISION
BREAKLINE
DIMENSION POINT
DETAIL BORDER
DETAIL TITLE

DRAWING SYMBOLS
1/4" = 1'-0"

GENERAL NOTES

1. REFER TO LANDSCAPE, AND STRUCTURAL DRAWINGS FOR ADDITIONAL NOTES AND SYMBOLS.
2. MATERIALS, ASSEMBLIES AND NOTED ITEMS ARE NEW UNLESS OTHERWISE NOTED.
3. CONTRACTOR SHALL VERIFY CONDITIONS. NOTIFY THE ARCHITECT OF ANY CONDITIONS INCONSISTENT WITH THE INTENT OF THE DRAWINGS PRIOR TO STARTING OR CONTINUING WORK IN THE AREA CONCERNED.

CODE:
1. ALL WORK SHALL CONFORM TO APPLICABLE CODES AND LOCAL BUILDING REQUIREMENTS, WHICH INCLUDE THE MOST CURRENT EDITIONS OF THE INTERNATIONAL BUILDING CODE WITH LOCAL AMENDMENTS, INTERNATIONAL MECHANICAL CODE (IMC), NATIONAL ELECTRICAL CODE (NEC), INTERNATIONAL FIRE CODE (IFC), AND WASHINGTON STATE ENERGY CODE (WEC).
2. MECHANICAL, ELECTRICAL AND PLUMBING PERMITS TO BE APPLIED FOR UNDER SEPARATE APPLICATION BY CONTRACTOR.

HAZMAT:
1. HAZARDOUS MATERIAL REMOVAL & DISPOSAL: BEFORE BEGINNING ANY DEMOLITION OR OTHER WORK, COMPLY WITH DOCUMENTS PREPARED BY THE OWNER'S HAZARDOUS MATERIALS CONSULTANT. THIS APPLIES TO DEMOLITION, DISPOSAL AND CONSTRUCTION OPERATIONS ASSOCIATED WITH THE PROJECT. THE CONTRACTOR WILL SUSPEND WORK IMMEDIATELY AND NOTIFY THE OWNER IF MATERIALS SUSPECTED OF BEING HAZARDOUS, AND NOT PREVIOUSLY IDENTIFIED, ARE ENCOUNTERED IN THE COURSE OF THE CONTRACTOR'S WORK.

DEMOLITION:
1. WHERE ITEMS ARE INDICATED ON PLANS TO BE DEMOLISHED, IT SHALL MEAN THE COMPLETE REMOVAL AND DISPOSAL OF THE ITEM INDICATED UNLESS OTHERWISE NOTED. CONTRACTOR IS RESPONSIBLE FOR REVIEW OF THE HAZARDOUS MATERIALS ABATEMENT, ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR CUTTING AND PATCHING WORK.

DIMENSIONS:
1. DO NOT SCALE DRAWINGS.
2. VERIFY DIMENSIONS SHOWN ON DRAWINGS. USE ONLY DIMENSIONS INDICATED. PRIOR TO STARTING OR CONTINUING WORK, NOTIFY ARCHITECT OF DISCREPANCIES OR CONDITIONS INCONSISTENT WITH THE INTENT OF THE CONSTRUCTION DOCUMENTS.
3. DIMENSIONS ARE TO FACE OF CONCRETE, FACE OF MASONRY, OR FACE OF STUD, UNLESS OTHERWISE NOTED.
4. FINISHED SURFACE OF INFILL OR EXTENSIONS OF EXISTING PARTITIONS SHALL ALIGN WITH ADJACENT EXISTING SURFACES UNLESS OTHERWISE NOTED.
5. VERTICAL DIMENSIONS ARE MEASURED FROM STRUCTURAL SLAB, TOP OF STEEL OR TOP OF SHEATHING, UNLESS NOTED OTHERWISE.

COORDINATION:
1. COORDINATE ALL OPERATIONS WITH OWNER, SUCH AS AREAS USED FOR MATERIAL STORAGE, ACCESS TO AND FROM THE SITE, TIMING OF WORK AND REQUIREMENTS OF NOISE ORDINANCE. INSTALL DUST AND NOISE BARRIERS AS REQUIRED TO PROTECT EXISTING ADJACENT BUILDINGS AND OCCUPANTS AND TO MAINTAIN AN ENVIRONMENT SUITABLE TO PERMIT CONTINUED OCCUPANCY OF SUBJECT AND ADJACENT BUILDINGS.
2. REVIEW DEMOLITION DRAWINGS. PATCH AND REPAIR ALL EXISTING SURFACES AFFECTED BY DEMOLITION WORK.
3. VERIFY LOCATIONS OF EXISTING UTILITIES. CAP, MARK AND PROTECT AS NECESSARY TO COMPLETE THE WORK.
4. REVIEW ARCHITECTURAL, LANDSCAPE ARCHITECT, AND STRUCTURAL DRAWINGS AND PROVIDE ROUGH-INS THROUGH SLABS, BEAMS, WALLS, CEILINGS, AND ROOFS FOR DUCTS, PIPES, CONDUITS, JUNCTION BOXES, CABINETS AND EQUIPMENT. VERIFY SIZE AND LOCATION BEFORE PROCEEDING WITH WORK. COORDINATE WITH INSTALLATION REQUIREMENTS. PATCH AND REPAIR EXISTING SURFACES AS NECESSARY TO COMPLETE WORK.
5. COORDINATE AND PROVIDE REQUIRED PENETRATIONS AND PATCHING WITH INDIVIDUAL SUBCONTRACTORS TO SUIT NEW WORK.
6. CONTRACTOR TO OBTAIN AND VERIFY ROUGH-IN DIMENSION REQUIREMENTS FOR CABINETRY, EQUIPMENT, ACCESSORIES AND THE LIKE INCLUDING THOSE DESIGNATED FOIC AND FOIO. CONTRACTOR TO PROVIDE BACKING, BLOCKING, SUPPORT AS REQUIRED FOR INSTALLATION. CONTRACTOR TO COORDINATE POWER, DATA, COMMUNICATIONS AND SECURITY REQUIREMENTS FOR FOIC AND FOIO EQUIPMENT WHERE SERVICES ARE REQUIRED. INCLUDE STUB OUTS AND CONNECTIONS. VERIFY AND COORDINATE DIMENSIONS OF FOIC AND FOIO ITEMS PRIOR TO PROCEEDING WITH WORK. INCLUDE STUB OUTS FOR FUTURE WORK.
7. PIPING, CONDUITS, DUCTS, ETC. SHALL BE CONCEALED IN WALLS, CHASES, ABOVE SUSPENDED CEILINGS, BELOW FLOORS OR BE FURRED-IN IN ROOMS WITH EXISTING CEILINGS, UNLESS OTHERWISE NOTED. DO NOT CONCEAL PIPING, CONDUITS, DUCTS, ETC. IN ELECTRICAL, MECHANICAL, AND COMMUNICATION ROOMS.
8. CAREFULLY COORDINATE MECHANICAL, ELECTRICAL, AND BUILDING SYSTEM INSTALLATIONS WITH EXISTING STRUCTURE AND BUILDING SYSTEMS.
9. "REMOVE" MEANS TO COMPLETELY AND PERMANENTLY REMOVE FROM THE PROJECT.
10. REFER TO LIGHTING PLAN AND ELECTRICAL DRAWINGS FOR ELECTRICAL DEVICES AND LOCATIONS. COORDINATE AND REVIEW DEVICE LOCATIONS WITH ARCHITECT IN FIELD PRIOR TO ROUGH-IN.

PROJECT INFORMATION

PROJECT OWNER: JEFF SANDERSON
8100 EVERGREEN LANE
MERCER ISLAND WA 98040

PROJECT MANAGER: CASSIDY ZIMMERMAN

SCOPE DESCRIPTION: STEEP SLOPE STABILIZATION AND LANDSLIDE MITIGATION, INSTALLATION OF TERRACED GARDEN, STAIR AND FOOT PATHS.

ZONING ANALYSIS

1. **PROJECT ADDRESS:** 8100 EVERGREEN LANE
MERCER ISLAND WA 98040

2. **PARCEL NUMBER:** 8057000012, 8057000014

3. **LEGAL DESCRIPTION:** STROUDS EVERGREEN LANE TRS BEG AT NW COR TH E ALG N LN 173 FT TH S 00-22-15 E 181 FT TH S 13-20-45 W 94 FT TH ALG LFT CURVE RAD 25 FT THRU C/A OF 26-32-33 AN ARC DIST OF 11.58 FT TH ALG LFT CURVE RAD 300 FT AN ARC DIST OF 113.41 FT TAP ON S LN 183 FT W FR SE COR TH S 89-54-04 W 163.62 FT TH N 62-08-35 W 146.34 FT TH N 25-59-58 E 217.72 FT TH N 00-22-15 W 122 FT TO POB AKA LOT A OF UNREC SUBD OF SD TRACT 1
PLat Block:
Plat Lot: 1

STROUDS EVERGREEN LANE TRS BEG ON N LN 173 FT E FR NW COR TH S 00-22-15 E 181 FT TH S 13-20-45 W 94 FT TH ALG LFT CURVE RAD 25 FT THRU C/A OF 26-32-33 AN ARC DIST OF 11.58 FT TH ALG LFT CURVE RAD 300 FT AN ARC DIST OF 29.15 FT TH N 77-18-40 E 56.31 FT TH N 72-14-29 E 48.16 FT TH N 03-17-50 E 226.45 FT TO NELY LN TH N 17-49-53 W ALG NELY LN 62.34 FT TO NE COR TH W ALG N LN 82.22 FT TO POB AKA LOT B OF UNREC SUBD OF SD TR 1
PLat Block:
Plat Lot: 1

4. **LOT AREA:** **8057000012** 71000
8047000014 28646
TOTAL: 99646

5. **ZONE:** R-15

6. **CURRENT USE:** SFR

7. **YEAR BUILT:** 1946

8. **(E) BLDG AREA:** 12,018

9. **(E) LOT COVERAGE:** 28463 (28.9%)
PROPOSED LOT COVERAGE: 28855 (29.0%)

10. **HT LIMIT:** 30 ft

11. **PARKING QUANTITY:** 3 COVERED, 4 UNCOVERED

12. **REQUIRED SETBACKS:** NORTH: 25'
EAST: 10' (STREET ADJ)
SOUTH: 20'
WEST: 5' INTERIOR

DESIGN TEAM

ARCHITECT:
SHKS ARCHITECTS
1050 NORTH 38TH ST
SEATTLE, WA 98103
TEL: 206.675.9151
CONTACT: CASSIDY ZIMMERMAN
EMAIL: cassidyz@shksarchitects.com

LANDSCAPE DESIGN/BUILD:
RAGEN AND ASSOCIATES
517 E PIKE ST
SEATTLE WA 98122
TEL: 206.329.4737
CONTACT: CHIP RAGEN
EMAIL: chip@ragenassociates.com

STRUCTURAL ENGINEER:
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2124 THIRD AVE SUITE 100
SEATTLE WA 98121
CONTACT: BRETT MOZDEN
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CIVIL ENGINEER
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3611 45TH AVE W
SEATTLE WA 98199
CONTACT: JOHN RUNDALL
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GEOTECH ENGINEER
GEOTECH CONSULTANTS INC
2401 10TH AVE E
SEATTLE WA 98102
CONTACT: ROB WARD
EMAIL: robw@geotechnw.com

SHEET INDEX

SHKS ARCHITECTS
1050 N. 38th St.
Seattle, WA 98103
PH. 206.675.9151
www.shksarchitects.com

5158 REGISTERED ARCHITECT
JONATHAN H. HARTUNG
STATE OF WASHINGTON

8100
NORTH GARDEN

CRITICAL AREA
DETERMINATION

8100 EVERGREEN LANE
MERCER ISLAND WA 98040

Drawn by: CZ
Checked: JH
Date: 5/18/17
Scale: As indicated

Revisions:
No. Date Remarks

COVER SHEET
A0.0

Exhibit 1

5/18/2017 11:11:32 AM

SE 1/4, NE 1/4, SEC 13, TWN 24N, RGE 4E, W.M.

LEGAL DESCRIPTION

TAX PARCEL NO. 805700-0012:
THAT PORTION OF TRACT 1, STROUD'S EVERGREEN LANE TRACTS, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 87 OF PLATS, PAGE 14 IN KING COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS;

BEGINNING AT THE NORTHWEST CORNER OF SAID TRACT 1;
THENCE NORTH 89°37'45" EAST ALONG THE NORTH LINE THEREOF 173.00 FEET;
THENCE SOUTH 0°22'15" EAST 181.00 FEET;
THENCE SOUTH 13°20'45" WEST 94.00 FEET;
THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 25 FEET, A CENTRAL ANGLE OF 26°32'33", A DISTANCE OF 11.58 FEET TO A POINT OF COMPOUND CURVATURE;
THENCE CONTINUING ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 200 FEET, A DISTANCE OF 113.41 FEET TO A POINT ON THE SOUTH LINE OF SAID TRACT 1, WHICH BEARS SOUTH 89°54'04"WEST DISTANT 183.00 FEET FROM THE SOUTHEAST CORNER OF SAID TRACT 1;
THENCE SOUTH 89°54'04" WEST 163.62 FEET;
THENCE NORTH 62°08'35" WEST 146.34 FEET TO THE MOST WESTERLY CORNER OF SAID TRACT 1;
THENCE NORTH 25°59'58" EAST ALONG THE WESTERLY LINE OF SAID TRACT 1, A DISTANCE OF 217.72 FEET;
THENCE NORTH 0°22'15"WEST 122.00 FEET TO THE POINT OF BEGINNING;

TOGETHER WITH AN EASEMENT FOR INGRESS, EGRESS, AND UTILITIES 15 FEET IN WIDTH, THE CENTERLINE OF WHICH IS COINCIDENT WITH THAT PORTION OF THE EAST LINE OF THE ABOVE DESCRIBED MAIN TRACT LYING SOUTHERLY OF THE NORTHERLY 141 FEET THEREOF;
EXCEPT THEREFROM THAT PORTION THEREOF LYING EAST OF THE FOLLOWING DESCRIBED LINE;
BEGINNING AT A POINT ON THE EAST LINE OF THE ABOVE DESCRIBED MAIN TRACT WHICH BEARS SOUTH 0°22'15" EAST 141.00 FEET FROM THE NORTHEAST CORNER THEREOF;
THENCE CONTINUING SOUTH 0°22'15" EAST 71.63 FEET TO THE TERMINUS OF SAID LINE;

TOGETHER WITH AN EASEMENT FOR INGRESS, EGRESS, AND UTILITIES OVER THE NORTH 15 FEET OF THE SOUTH 30 FEET OF "J" STREET AS SHOWN ON HARRY WHITE'S PLAT OF THE EAST SEATTLE ACRE TRACTS, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 3 OF PLATS, PAGE 36, IN KING COUNTY, WASHINGTON;
LYING WEST OF WEST MERCER WAY AND LYING EAST OF THE CENTERLINE OF THIRD STREET AS SHOWN ON SAID PLAT;

ALSO, THE NORTHEASTERLY 5 FEET OF THE SOUTHWESTERLY 30 FEET OF SAID "J" STREET LYING WESTERLY OF THE CENTERLINE OF THIRD STREET AND EASTERLY OF A LINE AT RIGHT ANGLES TO THE CENTERLINE OF SAID "J" STREET AT A POINT 400 FEET NORTHWESTERLY FROM THE INTERSECTION OF THE CENTERLINES OF SAID THIRD AND "J" STREETS;

ALSO, THE SOUTH 15 FEET OF THE NORTH 30 FEET OF SAID "J" STREET LYING WEST OF WEST MERCER WAY AND BOUNDED ON THE NORTHWEST BY A LINE PERPENDICULAR TO A POINT ON THE CENTERLINE OF SAID "J" STREET, WHICH POINT IS 400 FEET NORTHWESTERLY OF THE INTERSECTION OF THE CENTERLINES OF SAID THIRD AND "J" STREETS;
EXCEPT THAT PORTION CONDEMNED IN ABOVE DESCRIBED TRACT.

TAX PARCEL NO. 805700-0014:

THAT PORTION OF TRACT 1, STROUD'S EVERGREEN LANE TRACTS, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 87 OF PLATS, PAGE 14 IN KING COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS;
BEGINNING AT THE NORTHWEST CORNER OF SAID TRACT 1;
THENCE NORTH 89°37'45" EAST ALONG THE NORTH LINE THEREOF 173.00 FEET;
THENCE SOUTH 0°22'15" EAST 181.00 FEET;
THENCE SOUTH 13°20'45" WEST 94.00 FEET;
THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 25 FEET, A CENTRAL ANGLE OF 26°32'33", A DISTANCE OF 11.58 FEET TO A POINT OF COMPOUND CURVATURE;
THENCE CONTINUING ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 300 FEET, A DISTANCE OF 29.15 FEET;
THENCE NORTH 77°18'40" EAST 56.31 FEET;
THENCE NORTH 72°14'29" EAST 48.16 FEET;
THENCE NORTH 3°17'50" EAST 226.45 FEET TO THE NORTHEASTERLY LINE OF SAID TRACT 1;
THENCE NORTH 17°49'53" WEST 62.34 FEET;
THENCE SOUTH 89°37'45" WEST 82.22 FEET TO THE TRUE POINT OF BEGINNING;

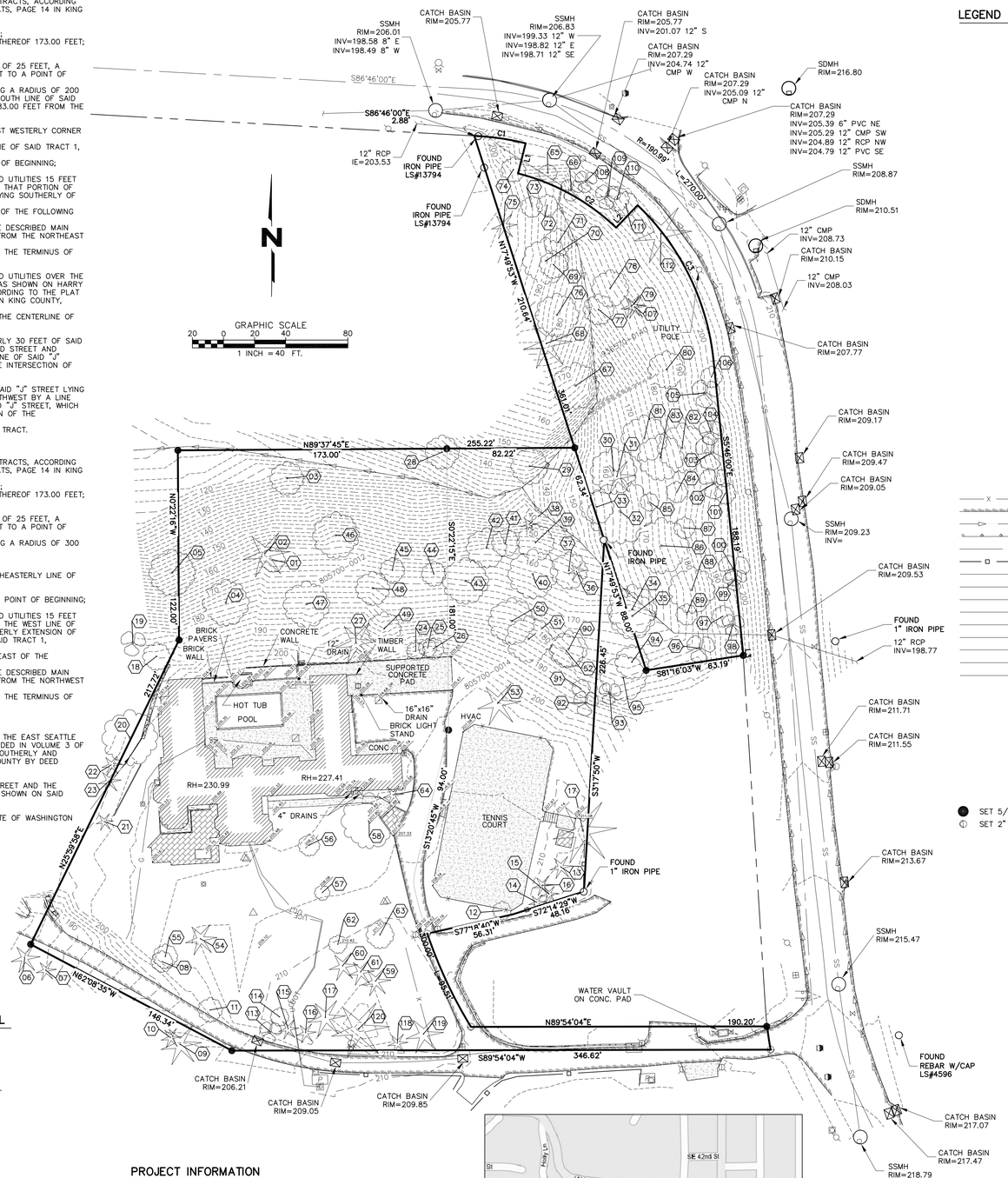
TOGETHER WITH AN EASEMENT FOR INGRESS, EGRESS, AND UTILITIES 15 FEET IN WIDTH, THE CENTERLINE OF WHICH IS COINCIDENT WITH THE WEST LINE OF THE ABOVE DESCRIBED MAIN TRACT AND THE SOUTHEASTERLY EXTENSION OF THE 300 FOOT RADIUS CURVE TO THE SOUTH LINE OF SAID TRACT 1,
EXCEPT THE NORTH 141 FEET OF SAID TRACT 1;
AND EXCEPT THEREFROM THAT PORTION THEREOF LYING EAST OF THE FOLLOWING DESCRIBED LINE:
BEGINNING AT A POINT ON THE WEST LINE OF THE ABOVE DESCRIBED MAIN TRACT WHICH BEARS SOUTH 0°22'15" EAST 141.00 FEET FROM THE NORTHWEST CORNER THEREOF;
THENCE CONTINUING SOUTH 0°22'15" EAST 71.63 FEET TO THE TERMINUS OF SAID LINE.

TAX PARCEL NO. 936570-0140:

THAT PORTION OF TRACT 12 OF HARRY WHITE'S PLAT OF THE EAST SEATTLE ACRE TRACTS, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 3 OF PLATS, PAGE 36, IN KING COUNTY, WASHINGTON, LYING SOUTHERLY AND WESTERLY OF WEST MERCER WAY AS DEEDED TO KING COUNTY BY DEED RECORDED UNDER RECORDING NUMBER 931524;

TOGETHER WITH THE EAST HALF OF UNDEDICATED 47TH STREET AND THE NORTH HALF OF UNDEDICATED "I" STREET ADJOINING, AS SHOWN ON SAID PLAT.

SITUATE IN THE CITY OF SEATTLE, COUNTY OF KING, STATE OF WASHINGTON



LEGEND

- BASKETBALL HOOP
- BLOW OFF VALVE
- BOLLARD
- BORING HOLE
- CABLE RISER
- CABLE TV VAULT
- DRAIN
- ELECTRICAL JUNCTION BOX
- ELECTRICAL METER
- ELECTRICAL VAULT
- FIRE DEPARTMENT CONNECTION
- FIRE HYDRANT
- FLAG POLE
- GAS METER
- GAS VALVE
- GUY ANCHOR
- GUY POLE
- HVAC UNIT
- IRRIGATION CONTROL VALVE
- IRON PIN FOUND
- LIGHT POLE
- LIGHT POLE WITH STAND
- MAIL BOX
- MONITORING WELL
- PAD MOUNTED TRANSFORMER
- POWER MANHOLE
- SEWER CLEAN OUT
- SIGN
- STREET LIGHT
- TELECOMMUNICATIONS MANHOLE
- TELEPHONE JUNCTION BOX
- TELEPHONE RISER
- TEST PIT
- UTILITY POLE
- WATER METER
- WATER VALVE
- YARD LIGHT
- CHAIN LINK FENCE
- EDGE OF ASPHALT
- FLOW LINE OF WATER
- GUARD RAIL
- WIRE FENCE
- WOOD FENCE
- GAS LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD UTILITIES
- TELECOMMUNICATIONS LINE
- SANITARY SEWER LINE
- STORM DRAIN LINE
- WATER LINE
- UNDERGROUND ELECTRIC LINE
- UNDERGROUND TELEPHONE LINE
- CONCRETE SURFACING
- BRICK SURFACING
- FLAG STONE SURFACING
- GRAVEL SURFACING
- ROCKERY
- TIMBER WALL
- CONIFEROUS TREE
- DECIDUOUS TREE

- SET 5/8" X 24" STEEL RODW/2" ALUMINUM CAP
- SET 2" BRASS DISK IN ASPHAULT

TREE TABLE

NO.	CALIPER(IN.)	SPECIES	DRIPLINE RADIUS(FT.)
01	16"	MAPLE	16'
02	32"	CEDAR	32'
03	22"	MAPLE	22'
04	00"	MAPLE	00'
05	00"	MAPLE	00'
06	20"	DOUGLAS FIR	20'
07	14"	DOUGLAS FIR	14'
08	14"	MAPLE	14'
09	28"	DOUGLAS FIR	28'
10	14"	DOUGLAS FIR	14'
11	16"	ALDER	16'
12	12"	ALDER	12'
13	16"	DOUGLAS FIR	16'
14	12"	CEDAR	12'
15	12"	DOUGLAS FIR	12'
16	14"	DOUGLAS FIR	14'
17	44"	CEDAR	44'
18	18"	MAPLE	18'
19	16"	MAPLE MT*	16'
20	36"	MAPLE	36'
21	12"	CEDAR	12'
22	14"	DOUGLAS FIR	14'
23	16"	DOUGLAS FIR	16'
24	12"	ALDER	12'
25	12"	ALDER	12'
26	14"	ALDER	14'
27	30"	DOUGLAS FIR	30'
28	22"	MAPLE	22'
29	24"	ALDER	24'
30	30"	MAPLE	30'
31	24"	CEDAR	24'
32	42"	MAPLE	42'
33	22"	ALDER	22'
34	32"	MAPLE	32'
35	30"	MAPLE	30'
36	12"	HEMLOCK	12'
37	24"	MAPLE	24'
38	12"	HEMLOCK	12'
39	24"	ALDER	24'
40	32"	MAPLE	32'
41	18"	ALDER	18'
42	26"	MAPLE	26'
43	30"	MAPLE	30'
44	16"	MAPLE	16'
45	16"	ALDER	16'
46	30"	MAPLE	30'
47	30"	MAPLE	30'
48	22"	MAPLE	22'
49	22"	ALDER	22'
50	30"	MAPLE	30'
51	30"	MAPLE	30'
52	22"	MAPLE	22'
53	30"	CEDAR	30'
54	22"	DOUGLAS FIR	22'
55	16"	MAPLE	16'
56	14"	CHERRY	14'
57	10"	CHERRY	10'
58	36"	LAUREL	36'
59	20"	DOUGLAS FIR	20'
60	20"	DOUGLAS FIR	20'
61	18"	DOUGLAS FIR	18'
62	12"	DECIDUOUS	12'
63	18"	DECIDUOUS	18'
64	14"	PINE	14'
65	00"	MAPLE	00'
66	14"	MAPLE MT*	14'
67	30"	MAPLE	30'
68	34"	CEDAR	34'
69	18"	MAPLE	18'
70	30"	MAPLE	30'

TREE TABLE

NO.	CALIPER(IN.)	SPECIES	DRIPLINE RADIUS(FT.)
71	18"	MAPLE	18'
72	14"	ALDER	14'
73	14"	MAPLE	14'
74	16"	ALDER	16'
75	18"	DOUGLAS FIR	18'
76	28"	MAPLE	28'
77	20"	ALDER	20'
78	24"	MAPLE	24'
79	16"	HEMLOCK	16'
80	24"	ALDER	24'
81	30"	MAPLE	30'
82	32"	MAPLE	32'
83	30"	MAPLE	30'
84	14"	MAPLE	14'
85	12"	MAPLE	12'
86	36"	MAPLE	36'
87	14"	MAPLE	14'
88	30"	MAPLE	30'
89	14"	MAPLE	14'
90	24"	MAPLE	24'
91	12"	ALDER	12'
92	16"	ALDER MT*	16'
93	14"	MAPLE MT*	14'
94	22"	ALDER	22'
95	30"	MAPLE	30'
96	18"	MAPLE MT*	18'
97	14"	MAPLE	14'
98	14"	MAPLE MT*	14'
99	14"	MAPLE MT*	14'
100	20"	MAPLE MT*	20'
101	14"	MAPLE	14'
102	20"	MAPLE MT*	20'
103	22"	MAPLE MT*	22'
104	16"	MAPLE MT*	16'
105	18"	MAPLE MT*	18'
106	14"	MAPLE	14'
107	00"	HEMLOCK	00'
108	14"	MAPLE MT*	14'
109	16"	MAPLE MT*	16'
110	16"	MAPLE	16'
111	16"	MAPLE	16'
112	14"	DOUGLAS FIR	40'
113	14"	MAPLE MT*	14'
114	12"	MAPLE	12'
115	14"	DOUGLAS FIR	14'
116	14"	DOUGLAS FIR	14'
117	26"	DOUGLAS FIR	26'
118	14"	DOUGLAS FIR	14'
119	26"	DOUGLAS FIR	26'
120	40"	DOUGLAS FIR	40'

* = MULTI TRUNK

VERTICAL DATUM & CONTOUR INTERVAL

DATUM

ELEVATIONS SHOWN ON THIS DRAWING ARE ON AN ASSUMED DATUM.

2.0' CONTOUR INTERVAL – THE EXPECTED VERTICAL ACCURACY IS EQUAL TO 0.5' FOR THIS PROJECT.

GENERAL NOTES

1. THIS SURVEY WAS COMPLETED WITHOUT BENEFIT OF A CURRENT TITLE REPORT. EASEMENTS AND OTHER ENCUMBRANCES MAY EXIST ON THIS PROPERTY THAT ARE NOT SHOWN HEREON.
2. INSTRUMENTATION FOR THIS SURVEY WAS A 3-SECOND NIKON NPL 352 TOTAL STATION. PROCEDURES USED IN THIS SURVEY MEET OR EXCEED STANDARDS SET BY WAC 332-130-090.
3. THE INFORMATION ON THIS MAP REPRESENTS THE RESULTS OF A SURVEY MADE IN APRIL 2007 AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.
4. UTILITIES SHOWN ON THIS SURVEY ARE BASED UPON ABOVE GROUND OBSERVATIONS AND AS-BUILT PLANS WHERE AVAILABLE. ACTUAL LOCATIONS OF UNDERGROUND UTILITIES MAY VARY AND UTILITIES NOT SHOWN ON THIS SURVEY MAY EXIST ON THIS SITE.
5. ALL MONUMENTS WERE LOCATED DURING THIS SURVEY UNLESS OTHERWISE NOTED,

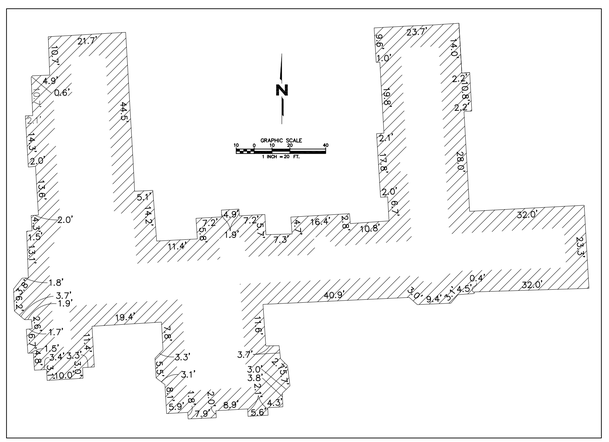
PROJECT INFORMATION

ENGINEER/SURVEYOR:	GEODATUM, INC. 1505 NW MALL ST. ISSAQUAH, WA 98027 PHONE: 425 837 8083
PROPERTY OWNERS:	JEFF AND LARA SANDERSON 6408 NE 130TH PLACE KIRKLAND, WA 98034
TAX PARCEL NUMBER:	805700-0014 805700-0012 936570-0140
PROJECT ADDRESS:	8100 EVERGREEN LN. MERCER ISLAND, WA
ZONING:	R15
PARCEL ACREAGE:	0014 (29,489 S.F. 0.68 ACRES ±) 0012 (79,680 S.F. 1.83 ACRES ±) 0140 (28,624 S.F. 0.66 ACRES ±)

VICINITY MAP
NTS

BASIS OF BEARINGS

THE PLAT OF STROUD'S EVERGREEN LANE TRACTS, AS PER PLAT RECORDED IN VOLUME 87 OF PLATS ON PAGE 14, RECORDS OF KING COUNTY, WASHINGTON ACCEPTED THE PLAT BEARING OF S 89°54'04" W FOR THE SOUTH LINE BASED ON FOUND MONUMENTS.



HOUSE DETAIL
SCALE:1"=20'

www.geodatum.com
GeoDatum Inc
SURVEY-CIVIL-STRUCTURAL
1505 NW Mall Street
Issaquah, WA 98027
(425) 837-8083

MARK X. PYLOE — STATE OF WASHINGTON — 21976 — REGISTERED LAND SURVEYOR — PROFESSIONAL ENGINEER

DATE	REVISION	APR

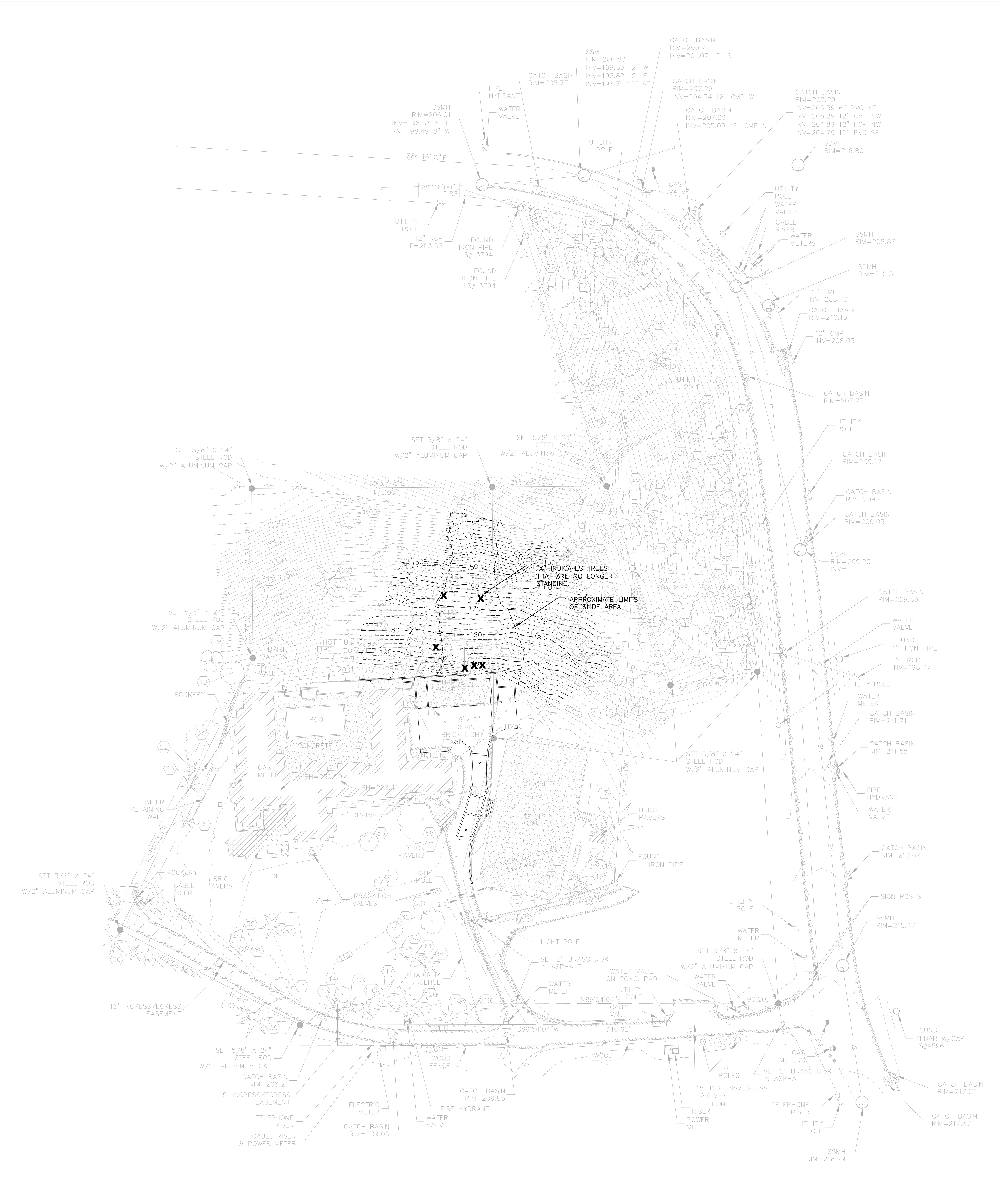
TOPOGRAPHIC SURVEY

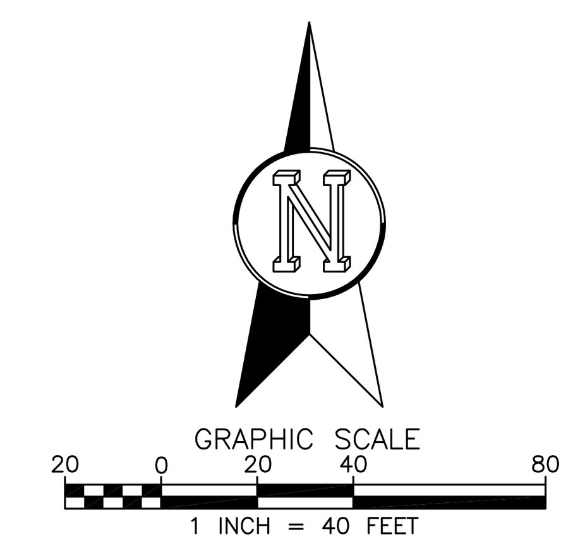
SANDERSON RESIDENCE
8100 EVERGREEN LN.
MERCER ISLAND, WA 98040

DRAFTER: MJP/PAR
DESIGNER:
PROJ. ENGR./SURV.: MXP
DATE: 04-19-07
PROJECT NO.: 07175

SHEET 1 OF 1

Exhibit 1





LEGAL DESCRIPTION

TAX PARCEL NO. 805700–0012:
THAT PORTION OF TRACT 1, STROUD'S EVERGREEN LANE TRACTS, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 87 OF PLATS, PAGE 14 IN KING COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS;

BEGINNING AT THE NORTHWEST CORNER OF SAID TRACT 1;
THENCE NORTH 89°37'45" EAST ALONG THE NORTH LINE THEREOF 173.00 FEET;
THENCE SOUTH 0°22'15" EAST 181.00 FEET;
THENCE SOUTH 13°20'45" WEST 94.00 FEET;
THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 25 FEET, A CENTRAL ANGLE OF 26°32'33", A DISTANCE OF 11.58 FEET TO A POINT OF COMPOUND CURVATURE;
THENCE CONTINUING ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 200 FEET, A DISTANCE OF 113.41 FEET TO A POINT ON THE SOUTH LINE OF SAID TRACT 1, WHICH BEARS SOUTH 89°54'04"WEST DISTANT 183.00 FEET FROM THE SOUTHEAST CORNER OF SAID TRACT 1;
THENCE SOUTH 89°54'04" WEST 163.62 FEET;
THENCE NORTH 62°08'35" WEST 146.34 FEET TO THE MOST WESTERLY CORNER OF SAID TRACT 1;
THENCE NORTH 25°59'58" EAST ALONG THE WESTERLY LINE OF SAID TRACT 1, A DISTANCE OF 217.72 FEET;
THENCE NORTH 0°22'15"WEST 122.00 FEET TO THE POINT OF BEGINNING;

TOGETHER WITH AN EASEMENT FOR INGRESS, EGRESS, AND UTILITIES 15 FEET IN WIDTH, THE CENTERLINE OF WHICH IS COINCIDENT WITH THAT PORTION OF THE EAST LINE OF THE ABOVE DESCRIBED MAIN TRACT LYING SOUTHERLY OF THE NORTHERLY 141 FEET THEREOF;
EXCEPT THEREFROM THAT PORTION THEREOF LYING EAST OF THE FOLLOWING DESCRIBED LINE:
BEGINNING AT A POINT ON THE EAST LINE OF THE ABOVE DESCRIBED MAIN TRACT WHICH BEARS SOUTH 0°22'15" EAST 141.00 FEET FROM THE NORTHEAST CORNER THEREOF;
THENCE CONTINUING SOUTH 0°22'15" EAST 71.63 FEET TO THE TERMINUS OF SAID LINE;

TOGETHER WITH AN EASEMENT FOR INGRESS, EGRESS, AND UTILITIES OVER THE NORTH 15 FEET OF THE SOUTH 30 FEET OF "J" STREET AS SHOWN ON HARRY WHITE'S PLAT OF THE EAST SEATTLE ACRE TRACTS, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 3 OF PLATS, PAGE 36, IN KING COUNTY, WASHINGTON;
LYING WEST OF WEST MERCER WAY AND LYING EAST OF THE CENTERLINE OF THIRD STREET AS SHOWN ON SAID PLAT;

ALSO, THE NORTHEASTERLY 5 FEET OF THE SOUTHWESTERLY 30 FEET OF SAID "J" STREET LYING WESTERLY OF THE CENTERLINE OF THIRD STREET AND EASTERLY OF A LINE AT RIGHT ANGLES TO THE CENTERLINE OF SAID "J" STREET AT A POINT 400 FEET NORTHWESTERLY FROM THE INTERSECTION OF THE CENTERLINES OF SAID THIRD AND "J" STREETS;

ALSO, THE SOUTH 15 FEET OF THE NORTH 30 FEET OF SAID "J" STREET LYING WEST OF WEST MERCER WAY AND BOUNDED ON THE NORTHWEST BY A LINE PERPENDICULAR TO A POINT ON THE CENTERLINE OF SAID "J" STREET, WHICH POINT IS 400 FEET NORTHWESTERLY OF THE INTERSECTION OF THE CENTERLINES OF SAID THIRD AND "J" STREETS;
EXCEPT THAT PORTION CONDEMNED IN ABOVE DESCRIBED TRACT.

TAX PARCEL NO. 805700–0014:

THAT PORTION OF TRACT 1, STROUD'S EVERGREEN LANE TRACTS, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 87 OF PLATS, PAGE 14 IN KING COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS;
BEGINNING AT THE NORTHWEST CORNER OF SAID TRACT 1;
THENCE NORTH 89°37'45" EAST ALONG THE NORTH LINE THEREOF 173.00 FEET;
THENCE SOUTH 0°22'15" EAST 181.00 FEET;
THENCE SOUTH 13°20'45" WEST 94.00 FEET;
THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 25 FEET, A CENTRAL ANGLE OF 26°32'33", A DISTANCE OF 11.58 FEET TO A POINT OF COMPOUND CURVATURE;
THENCE CONTINUING ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 300 FEET, A DISTANCE OF 29.15 FEET;
THENCE NORTH 77°18'40" EAST 56.31 FEET;
THENCE NORTH 72°14'29" EAST 48.16 FEET;
THENCE NORTH 3°17'50" EAST 226.45 FEET TO THE NORTHEASTERLY LINE OF SAID TRACT 1;
THENCE NORTH 17°49'53" WEST 62.34 FEET;
THENCE SOUTH 89°37'45" WEST 82.22 FEET TO THE TRUE POINT OF BEGINNING;

TOGETHER WITH AN EASEMENT FOR INGRESS, EGRESS, AND UTILITIES 15 FEET IN WIDTH, THE CENTERLINE OF WHICH IS COINCIDENT WITH THE WEST LINE OF THE ABOVE DESCRIBED MAIN TRACT AND THE SOUTHEASTERLY EXTENSION OF THE 300 FOOT RADIUS CURVE TO THE SOUTH LINE OF SAID TRACT 1, EXCEPT THE NORTH 141 FEET OF SAID TRACT 1;
AND EXCEPT THEREFROM THAT PORTION THEREOF LYING EAST OF THE FOLLOWING DESCRIBED LINE:
BEGINNING AT A POINT ON THE WEST LINE OF THE ABOVE DESCRIBED MAIN TRACT WHICH BEARS SOUTH 0°22'15" EAST 141.00 FEET FROM THE NORTHWEST CORNER THEREOF;
THENCE CONTINUING SOUTH 0°22'15" EAST 71.63 FEET TO THE TERMINUS OF SAID LINE.

TAX PARCEL NO. 936570–0140:

THAT PORTION OF TRACT 12 OF HARRY WHITE'S PLAT OF THE EAST SEATTLE ACRE TRACTS, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 3 OF PLATS, PAGE 36, IN KING COUNTY, WASHINGTON, LYING SOUTHERLY AND WESTERLY OF WEST MERCER WAY AS DEEDED TO KING COUNTY BY DEED RECORDED UNDER RECORDING NUMBER 931524;

TOGETHER WITH THE EAST HALF OF UNDEDICATED 4TH STREET AND THE NORTH HALF OF UNDEDICATED "I" STREET ADJOINING, AS SHOWN ON SAID PLAT.

SITUATE IN THE CITY OF SEATTLE, COUNTY OF KING, STATE OF WASHINGTON.

GENERAL NOTES

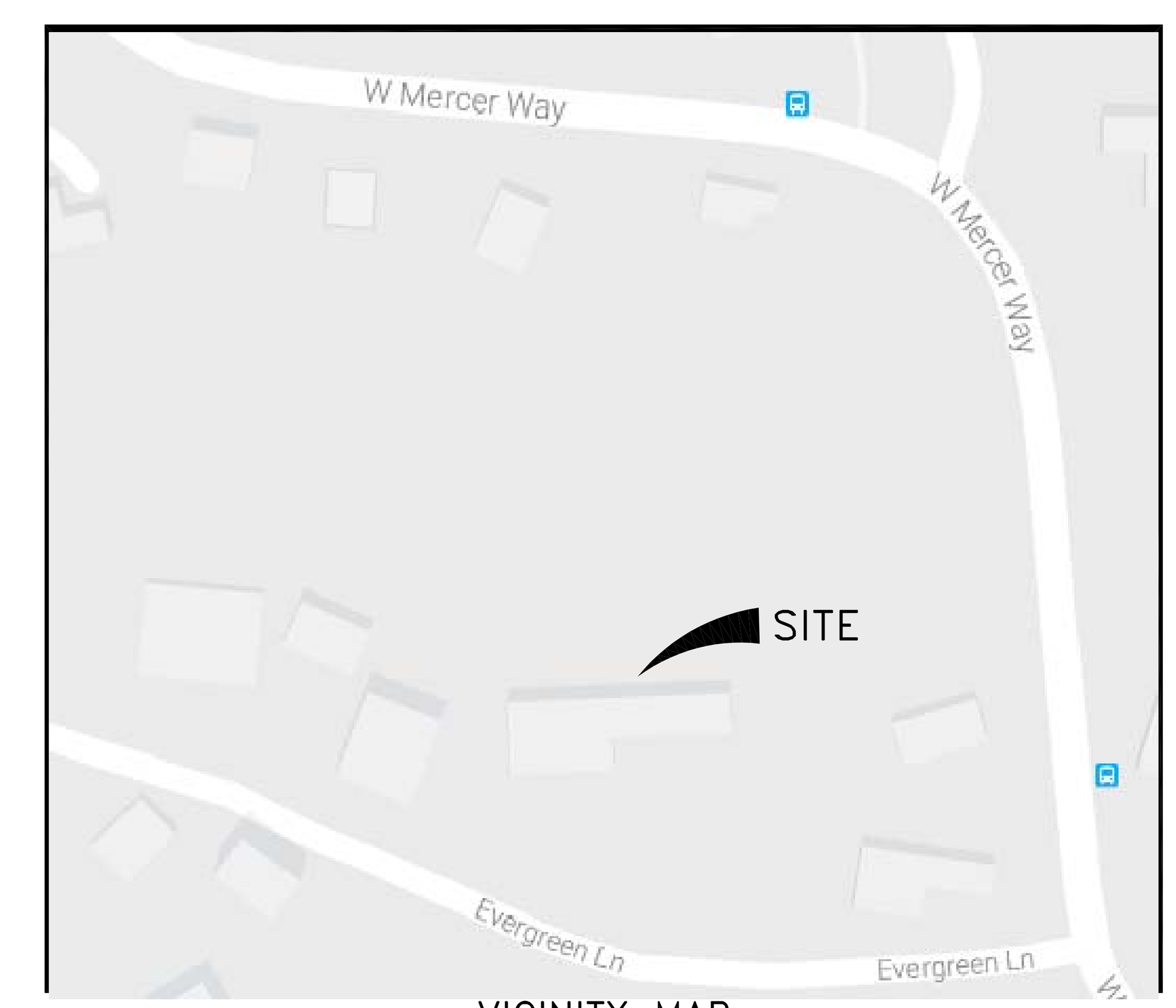
1. THIS SURVEY WAS COMPLETED WITH OUT THE BENEFIT OF A CURRENT TITLE REPORT. EASEMENTS MAY EXIST ON THE PROPERTY THAT ARE NOT SHOWN HEREON.
2. INSTRUMENTATION FOR THIS SURVEY WAS A 3–SECOND LEICA VIVA TS15 SMART POLE TOTAL STATION/RTK GPS.
3. PROCEDURES USED IN THIS SURVEY MEET OR EXCEED STANDARDS SET BY WAC 332–130–090. SURVEY WAS COMPLETED BY A FIELD TRAVERSE.
4. THE INFORMATION ON THIS MAP REPRESENTS THE RESULTS OF AN UPDATE TO A SURVEY ORIGINALLY COMPLETED IN 2007. THE ORIGINAL SURVEY IS SHOWN IN THE BACKGROUND WITH THE NEWER AND DARKER INFORMATION BEING COMPLETED IN JANUARY 2017.
5. ALL MONUMENTS WERE LOCATED DURING THIS SURVEY UNLESS OTHERWISE NOTED.

BASIS OF BEARINGS

THE PLAT OF STROUD'S EVERGREEN LANE TRACTS, AS PER PLAT RECORDED IN VOLUME 87 OF PLATS ON PAGE 14, RECORDS OF KING COUNTY, WASHINGTON ACCEPTED THE PLAT BEARING OF S 89°54'04" W FOR THE SOUTH LINE BASED ON FOUND MONUMENTS.

PROJECT INFORMATION

SURVEYOR:	PLOG CONSULTING, PC. 5628 AIRPORT WAY S. SUITE 144 SEATTLE, WA 98108 PH.: (425) 837–8083
PROPERTY OWNER:	JEFF AND LARA SANDERSON 6408 NE 130TH PLACE KIRKLAND, WA 98034
TAX PARCEL NUMBER:	805700–0014 805700–0012 936570–0140
PROJECT ADDRESS:	8100 EVERGREEN LANE MERCER ISLAND, WA 98040
PARCEL AREA:	0014 (29,489 S.F. 0.68 ACRES ±) 0012 (79,680 S.F. 1.83 ACRES ±) 0140 (28,624 S.F. 0.66 ACRES ±)



VICINITY MAP
NTS

PLOG CONSULTING
Survey - Civil - Structural
5628 Airport Way S
Suite 144
Seattle, WA 98108
P (206) 420-7130
F (206) 457-4469
plogconsulting.com

SE1/4, NE1/4, SEC 13, TWP 24N, RNG 45E, W.M.
UPDATED TOPOGRAPHIC SURVEY
JEFF & LARA SANDERSON
8100 EVERGREEN LANE
MERCER ISLAND, WA 98040

PROJECT NO.:	REVISION DATE	REVISION NO.:	SHEET
085–16	01/13/2017	0	1 OF 1

Exhibit 1

SITE PLAN LEGEND

APPROXIMATE LANDSLIDE AREA

CREEK BUFFER AREA

LOT COVERAGE

EXISTING BUILDING AREA:	8662
EXISTING IMPERMEABLE SURFACE:	19801
PROPOSED IMPERMEABLE SURFACE (STAIRS):	392
EXISTING LOT COVERAGE:	28463/99646 (28.9%)
PROPOSED LOT COVERAGE:	28855/99646 (29.0%)

(LOT COVERAGE CALCULATED AGAINST COMBINED LOT 8057000012 AND 8057000014, DOES NOT INCLUDE LOT 9365700140)

SLOPE CALCULATION:
16'-6" RISE IN 30', AT PROJECT AREA: **55% SLOPE**

SITE SLOPE: LOW: 111'-0" (NORTHWEST)
HIGH: 216'-0" (CENTER SOUTH)
SEPARATION: 389'
OVERALL SITE SLOPE: 27%

ESTIMATED CUT/FILL
250 CUBIC YARDS OF REFUSE REMOVAL,
1000 CUBIC YARDS OF STRUCTURAL FILL,
500 CUBIC YARDS OF PLANTING MIX

1 SITE PLAN
1/32" = 1'-0"

5/18/2017 11:11:32 AM

SHKS ARCHITECTS

1050 N. 38th St.
Seattle, WA 98103
PH. 206.675.9151
www.shksarchitects.com

5158 REGISTERED ARCHITECT
JONATHAN H. HARTUNG
STATE OF WASHINGTON

8100
NORTH GARDEN

CRITICAL AREA DETERMINATION

8100 EVERGREEN LANE
MERCER ISLAND WA 98040

Drawn by:	CZ
Checked:	JH
Date:	5/18/17
Scale:	As indicated

Revisions:

No.	Date	Remarks

SITE PLAN
A1.0

Exhibit 1

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF MERCER ISLAND STANDARD SPECIFICATIONS, AND WSDOT/APWA STANDARD SPECIFICATIONS, LATEST EDITION. THE CITY OF MERCER ISLAND RESERVES THE RIGHT TO REJECT ANY DAMAGED AND/OR NON-COMPLIANT CONSTRUCTION MATERIAL.
2. PRIOR TO ANY CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL SCHEDULE AND ATTEND A PRE-CONSTRUCTION CONFERENCE WITH THE CITY OF MERCER ISLAND CONSTRUCTION INSPECTION PERSONNEL.
3. AN APPROVED PLAN SET MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
4. ALL SITE WORK IMPROVEMENTS SHALL BE CONSTRUCTED TO OBTAIN STREET USE AND ANY OTHER RELATED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY.
5. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN STREET USE AND ANY OTHER RELATED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY.
6. ANY APPROVED CUTS OF EXISTING PUBLIC ROADWAYS SHALL BE BACK FILLED AND COMPACTED IN ACCORDANCE WITH CITY OF MERCER ISLAND STANDARDS. ALL CUTS INTO EXISTING ASPHALT SHALL BE ALONG NEAT, CONTINUOUS, SAWED, OR WHEEL CUT LINES. A TEMPORARY COLD MIX PATCH MUST BE PLACED IMMEDIATELY AFTER BACKFILL AND COMPACTION. THIS EXISTING ROAD CUT SHALL BE REPLACED WITH AT LEAST THREE (3) INCHES OF COMPACTED CL "B" ASPHALT CONCRETE, SIX (6) INCH CRUSHED ROCK SURFACING TOP COURSE (5/8 INCH MINUS), AS REQUIRED DEPENDENT UPON A SOILS ENGINEER'S RECOMMENDATION AND TESTS. IN NO CASE SHALL THE REPLACEMENT BE LESS THAN THE EXISTING SECTION.
7. PAVED SURFACES INCLUDING ROADWAYS, SIDEWALKS, AND CURBS THAT ARE DAMAGED BY NEW CONSTRUCTION SHALL BE REPAIRED AS REQUIRED BY THE CITY OF MERCER ISLAND INSPECTOR.
8. ALL LOCATIONS OF 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.
9. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL CASTINGS AND UTILITIES DURING CONSTRUCTION AND SHALL CONTACT THE UNDERGROUND UTILITIES LOCATOR SERVICE (1-800-424-5555) AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
10. THE CONTRACTOR SHALL ADJUST ALL EXISTING MANHOLE RIMS, DRAINAGE STRUCTURE LIDS, VALVE BOXES, AND UTILITY ACCESS STRUCTURES TO FINISH GRADE WITHIN AREAS AFFECTED BY THE PROPOSED IMPROVEMENTS.
11. UTILITY SERVICE CONNECTIONS SHOWN ON THIS PLAN ARE TO BE MAINTAINED PRIVATELY AND NOT BY THE CITY MERCER ISLAND.
12. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY SEDIMENTATION COLLECTION FACILITIES TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT ENTER THE NATURAL OR PUBLIC DRAINAGE SYSTEM. AS CONSTRUCTION PROGRESSES AND UNEXPECTED (SEASONAL) CONDITIONS DICTATE, MORE SILTATION CONTROL FACILITIES MAY BE REQUIRED TO INSURE COMPLETE SILTATION CONTROL OF THE PROJECT. THEREFORE, DURING THE COURSE OF CONSTRUCTION IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE CONTRACTOR TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY HIS ACTIVITIES AND TO PROVIDE ADDITIONAL FACILITIES THAT MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES.
13. THE CONTRACTOR SHALL KEEP OFF-SITE STREETS CLEAN AT ALL TIMES BY SWEEPING. WASHING OF THESE STREETS WILL NOT BE ALLOWED WITHOUT PRIOR CITY OF MERCER ISLAND APPROVAL.
14. ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE TRAFFIC CONTROL MANUAL.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY MEASURES TO PROTECT THE PUBLIC AND ALL PEOPLE OR PROPERTY FROM INJURY OR DAMAGE FROM THE CONSTRUCTION ACTIVITIES THROUGHOUT THE COURSE OF THE WORK.
16. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL SAFETY MEASURES SUCH AS SIGNAGE, FENCING, BARRICADES, TEMPORARY TRENCH COVERS, ETC. AS REQUIRED TO SECURE THE SITE.

GENERAL DRAINAGE NOTES

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF MERCER ISLAND STANDARD SPECIFICATIONS AND WSDOT/APWA STANDARD SPECIFICATIONS, LATEST EDITION AND THE REQUIREMENTS OF THE DEPARTMENT OF ECOLOGY STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON.
2. PRIOR TO ANY CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL SCHEDULE AND ATTEND A PRE-CONSTRUCTION CONFERENCE WITH CITY OF MERCER ISLAND CONSTRUCTION INSPECTION PERSONNEL.
3. ALL STORM DRAINAGE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THESE APPROVED PLANS. ANY DEVIATION FROM THESE PLANS WILL REQUIRE APPROVAL FROM THE OWNER, ENGINEER AND APPROPRIATE PUBLIC AGENCIES.
4. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN PERMITS TO WORK IN THE RIGHT OF WAY AND ANY OTHER RELATED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY.
5. ALL STORM DRAIN PIPE MAY BE CONSTRUCTED OF ONE OF THE FOLLOWING MATERIALS UNLESS OTHERWISE SPECIFIED IN THE PLANS. ALL PIPE JOINTS MUST BE GASKETED WATERTIGHT AND MUST BE OF THE SAME MATERIAL AS THE PIPE. ALL PIPE SHALL HAVE A MINIMUM COVER AS SPECIFIED AND SHALL BE ADEQUATELY PROTECTED DURING CONSTRUCTION (REFER TO THE MANUFACTURE'S RECOMMENDATIONS FOR MINIMUM COVER FOR HEAVY EQUIPMENT LOADINGS). THE CITY OF MERCER ISLAND PUBLIC WORKS DEPARTMENT SHALL EXERCISE THE OPTION TO ACCEPT OR REJECT ALL DAMAGED OR NON-COMPLIANT CONSTRUCTION MATERIAL. THE CONTRACTOR/DEVELOPER SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REJECTED OR SUBSTITUTED CONSTRUCTION MATERIAL.
6. PVC - FOUR (4) INCH THROUGH EIGHTEEN (18) INCH DIAMETER PIPE, WITH TWENTY FOUR (24) INCH TO THIRTY SIX (36) INCH OF COVER SHALL BE IN ACCORDANCE WITH ASTM D3034 SDR 21. FOUR (4) INCH THROUGH EIGHTEEN (18) INCH DIAMETER PIPE, WITH ASTM D3034 SDR 35 SHALL HAVE THIRTY SIX (36) MINIMUM COVER. ALL JOINTS SHALL BE PUSH-ON WITH RUBBER GASKETS. PVC STORM PIPE REQUIRES SAND COLLARS MEETING ASTM D-3034-78 SDR 35 SPECIFICATIONS (I.E. CATCH BASIN CONNECTION) OR KOR-N-SEAL BOOTS.
7. ALL PIPE BEDDING SHALL BE APWA TYPE "F" FOR FLEXIBLE PIPE (I.E. PVC, SMP OR ADS). BEDDING MATERIAL SHALL BE 5/8 INCH MINUS CRUSHED ROCK ONLY.
8. ALL TRENCH BACKFILL IN AREAS OF FUTURE PAVEMENT OR STRUCTURAL LOADING SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY PER ASTM D 1557-70 (MODIFIED PROCTOR). ALL OTHER AREAS SHALL BE COMPACTED TO 90 PERCENT MINIMUM).
9. CONSTRUCTION OF DEWATERING (GROUNDWATER INTERCEPTION) SYSTEMS SHALL BE IN ACCORDANCE WITH THE APWA STANDARD SPECIFICATIONS, SECTION 61-3.02.
10. THE CONTRACTOR SHALL KEEP OFF-SITE STREETS CLEAN AT ALL TIMES BY SWEEPING. WASHING THESE STREETS WILL NOT BE ALLOWED WITHOUT PRIOR CITY OF MERCER ISLAND APPROVAL.
11. ALL STORMWATER FACILITIES WILL BE INSTALLED AND IN OPERATION PRIOR TO OR IN CONJUNCTION WITH ALL CONSTRUCTION ACTIVITY UNLESS THAT ACTIVITY EXCEEDS THE CAPACITY AND INTENT OF THE EROSION/SEDIMENTATION CONTROL FACILITY OR UNLESS OTHERWISE APPROVED BY THE CITY.
12. RELAY EXISTING SERVICE DRAINS AND SIDE SEWERS TO CLEAR OVER OR UNDER THE NEW UTILITY AS APPROVED BY THE INSPECTOR.

CONSTRUCTION EROSION/SEDIMENTATION CONTROL (ESC) NOTES

1. APPROVAL OF THIS TEMPORARY EROSION/SEDIMENTATION CONTROL PLAN (ESC) DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
2. THE IMPLEMENTATION OF THESE ESC AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED.
3. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED PRIOR TO ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER STANDARDS.
4. 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 (E.G. ADDITIONAL SUMPS, RELOCATION OF DITCHES AND SILT FENCES, ETC.) AS NEEDED FOR UNEXPECTED STORM EVENTS AND AS THE CITY REQUIRES.
5. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING AND OPERATION.
6. ANY AREA STRIPPED OF VEGETATION, INCLUDING ROADWAY EMBANKMENTS, WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF TWO (2) DAYS, SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED ESC METHODS (E.G. SEEDING, MULCHING, NETTING, EROSION BLANKETS, ETC.) GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH OCTOBER INCLUSIVE.
7. ANY AREA NEEDING ESC MEASURE, NOT REQUIRING IMMEDIATE ATTENTION, SHALL BE ADDRESSED WITHIN FIFTEEN (15) DAYS.
8. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN 48 HOURS FOLLOWING A STORM EVENT AND AS THE CITY DEEMS NECESSARY.
9. AT NO TIME SHALL MORE THAN ONE (1) FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.
10. STABILIZED CONSTRUCTION ENTRANCES AND WASH PADS PER CITY STANDARDS, SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
11. DURING THE TIME PERIOD OF NOVEMBER 1ST THROUGH MARCH 31ST, ALL PROJECT DISTURBED AREAS THAT ARE TO BE LEFT UNWORKED FOR MORE THAN TWO (2) DAYS SHALL BE COVERED BY ONE OF THE FOLLOWING COVER MEASURES: MULCH, SODDING OR PLASTIC COVERING.
12. WHERE SEEDING FOR TEMPORARY EROSION CONTROL IS REQUIRED, FAST GERMINATING GRASSES SHALL BE APPLIED AT AN APPROPRIATE (E.G. ANNUAL OR PERENNIAL RYE APPLIED AT APPROXIMATELY 80 POUNDS PER ACRE).
13. WHERE STRAW MULCH FOR TEMPORARY EROSION CONTROL IS REQUIRED, IT SHALL BE APPLIED AT A MINIMUM THICKNESS OF THREE (3) INCHES OR 3,000 LBS/ACRE.
14. AS CONSTRUCTION PROGRESSES AND UNEXPECTED SEASONAL CONDITIONS DICTATE, AND AS THE CITY REQUIRES, THE PERMITTEE SHOULD ANTICIPATE THAT MORE ESC MEASURES WILL BE NECESSARY TO PROTECT ADJACENT PROPERTIES AND ENSURE MINIMUM WATER QUALITY FOR SITE RUNOFF. IT SHALL BE THE RESPONSIBILITY OF THE PERMITTEE TO ADDRESS DEFICIENT ESC CONDITIONS AND PROVIDE ADDITIONAL FACILITIES, OVER AND ABOVE MINIMUM REQUIREMENTS OUTLINED ON THE APPROVED PLANS.
15. SILT FENCE SHALL BE USED WERE NOTED ON THE PLANS OR AS DIRECTED BY THE CITY.

SURVEY NOTE

UNDERGROUND UTILITIES AND EXISTING IMPROVEMENTS SHOWN ARE BASED UPON THE SURVEY "TOPOGRAPHIC SURVEY, SANDERSON RESIDENCE, 8100 EVERGREEN LN, MERCER ISLAND, WA", PREPARED BY GEODATUM, INC. DATED APRIL 19, 2007 AND UPDATED 2016, AND RECORD DRAWINGS. NO WARRANTY OR GUARANTEE OF ACCURACY OR COMPLETENESS IS EITHER IMPLIED OR EXPRESSED. EXISTING UNDERGROUND UTILITIES AND IMPROVEMENTS HAVE BEEN SHOWN ON THIS DRAWING FOR THE PURPOSE OF ASSISTING THE CONTRACTOR IN LOCATING SAID UTILITIES AND IMPROVEMENTS IN THE FIELD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING WITH APPROPRIATE AGENCIES THAT MAY HAVE UNDERGROUND UTILITIES AND IMPROVEMENTS WITHIN THE PROJECT LIMITS AND FOR CHECKING LOCATIONS IN THE FIELD. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ANY AND ALL DAMAGE TO UNDERGROUND UTILITIES AND IMPROVEMENTS RESULTING FROM HIS OPERATION.

EROSION CONTROL/CONSTRUCTION SEQUENCE

1. ARRANGE AND ATTEND PRE-CONSTRUCTION MEETING WITH BETWEEN OWNER OR OWNER'S REPRESENTATIVE AND SITE INSPECTOR.
2. CONTRACTOR'S SURVEYOR TO ESTABLISH AND STAKE OUT CONTROL POINTS FOR WORK.
3. ERECT SILTE FENCE, WATTLES AND GRATE INLET PROTECTION.
4. IF REQUIRED. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE.
5. CLEAR AND GRUB AREA.
6. REMOVE EXISTING PAVEMENT, SURFACE FEATURES AND MISCELLANEOUS ITEMS AS NOTED.
7. COORDINATE REMOVAL AND CAPPING OF EXISTING UTILITY LINES WITH APPROPRIATE PURVEYOR.
8. GRADE SITE PER PLAN. STABILIZE GRADED AREAS WITH TEMPORARY EROSION CONTROL MEASURES AS REQUIRED.
9. CONSTRUCT SITE IMPROVEMENTS.
10. MULCH AND/OR HYDROSEED REMAINING DISTURBED AREAS.
11. RETURN SILTATION CONTROL AREAS TO ORIGINAL GROUND CONDITIONS.
12. REMOVE REMAINING TEMPORARY EROSION/SEDIMENTATION CONTROL ONLY AFTER SITE HAS BEEN STABILIZED AND SITE INSPECTOR HAS APPROVED THE REMOVAL.

DATUM

ELEVATIONS SHOWN ON THIS DRAWING ARE FROM ELEVATIONS PROVIDED IN THE "TOPOGRAPHIC SURVEY" BY GEODATUM, INC. DATED APRIL 19, 2007 WHICH IS BASED ON AN ASSSUMED DATUM.

CALL 48 HOURS
BEFORE YOU DIG
1-800-424-5555
OR CALL 8-1-1

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JOHN W. RUNDQUIST
STATE OF WASHINGTON
21597
REGISTERED
PROFESSIONAL ENGINEER
5/16/17

North Garden
8100 Evergreen Lane
Mercer Island, Washington

Permit No.
Job No. 17017
Designed: JWR
Drawn: JWR
Checked: JWR
Scale: AS NOTED
Date: May 16, 2017
Revisions:

GENERAL NOTES

C 1.0

Exhibit 1

NOTE: SEE NOTES SHEET C1.0

TREE SCHEDULE		
NUMBER	DIAMETER, TYPE	
⟨1⟩	30", DOUGLAS FIR	SAVE
⟨2⟩	30", MAPLE	SAVE
⟨3⟩	22", MAPLE	REMOVE
⟨4⟩	30", MAPLE	SAVE
⟨5⟩	26", MAPLE	SAVE
⟨6⟩	30", MAPLE	REMOVE
⟨7⟩	30", MAPLE	SAVE
⟨8⟩	30", MAPLE	SAVE
⟨9⟩	30", CEDAR	SAVE

LEGEND

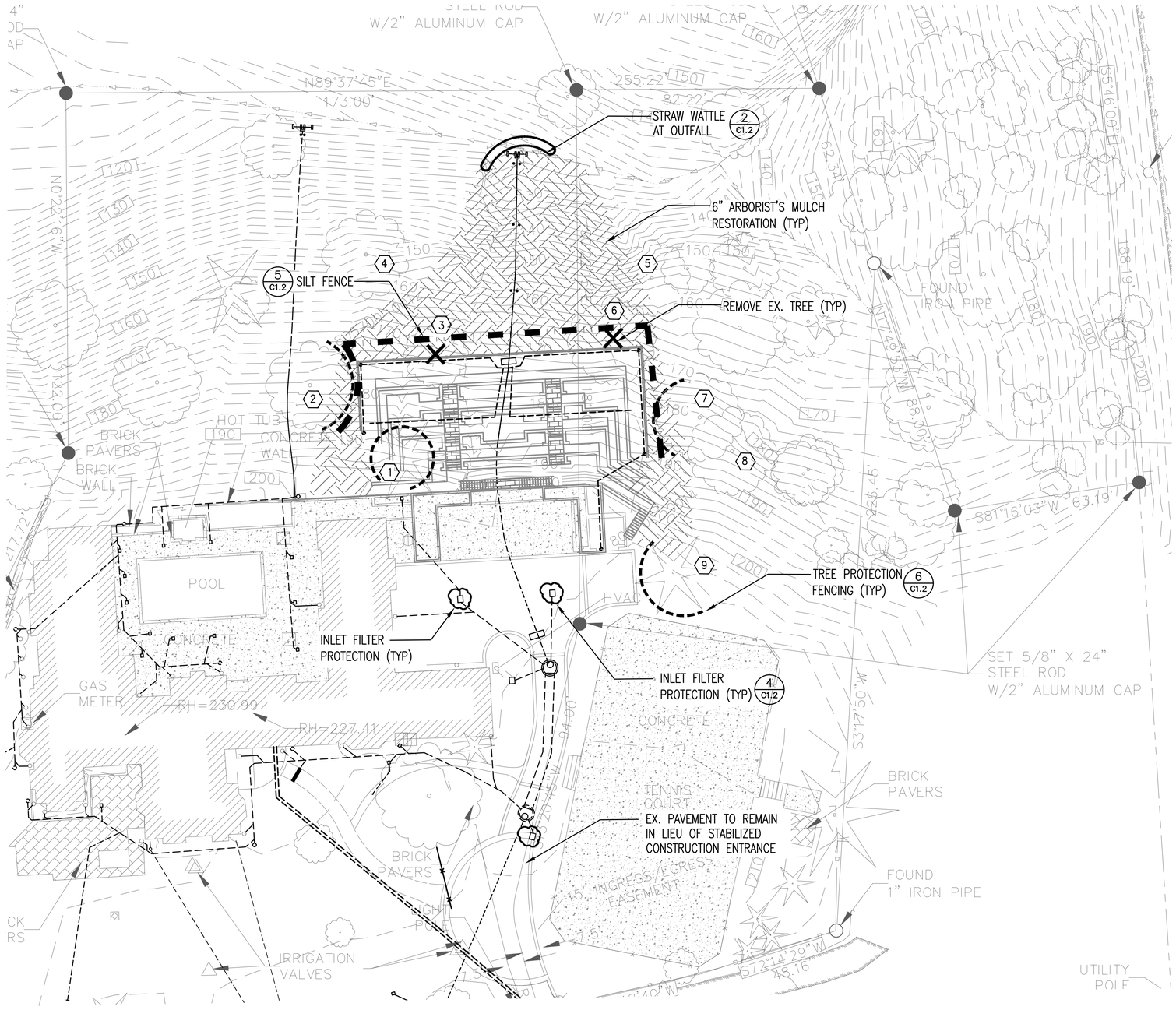
INLET PROTECTION

MULCH RESTORATION

SILT FENCE

STRAW WATTLE

TREE PROTECTION FENCE



1 TREE PROTECTION, EROSION CONTROL AND SITE RESTORATION PLAN
SCALE: 1"=20'

NORTH

0 10 20 40 FEET

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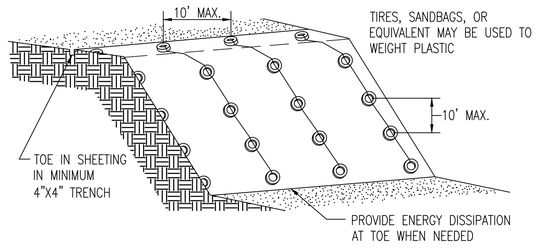
TREE PROTECTION, EROSION CONTROL AND RESTORATION PLAN

C 1.1

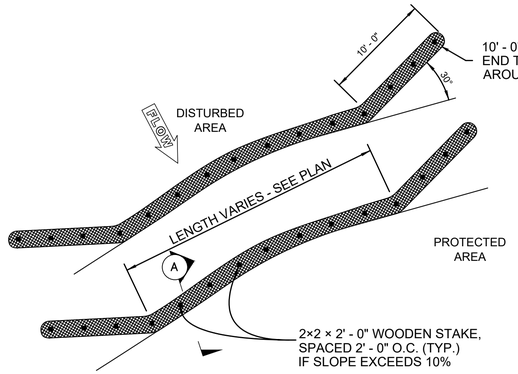
Exhibit 1

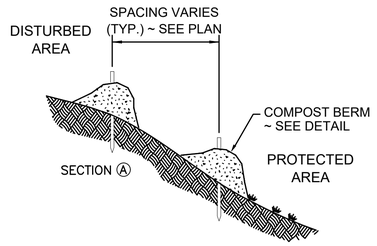


PLASTIC COVERING NOTES

1. PLASTIC SHEETING SHOULD HAVE A MINIMUM THICKNESS OF6 MIL AND MEET THE REQUIREMENTS OF CITY OF SEATTLE STANDARD SPECIFICATIONS SECTION 9–14.5(4); (2) COVERING SHOULD BE INSTALLED AND MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10 FOOT GRID SPACING IN ALL DIRECTIONS.
2. ALL SEAMS SHALL BE TAPED OR WEIGHTED DOWN FULL LENGTH AND THERE SHOULD BE AT LEAST A 12 – 24–INCH OVERLAP OF ALL SEAMS. SEAMS SHOULD THEN BE ROLLED AND STAKED OR TIED.
3. COVERING SHOULD BE INSTALLED IMMEDIATELY ON AREAS SEEDED DURING WINTER MONTHS, AND REMOVED AS SOON AS POSSIBLE ONCE VEGETATION IS WELL GROWN TO PREVENT BURNING THE VEGETATION THROUGH THE PLASTIC SHEETING, WHICH ACTS AS A GREENHOUSE.
4. WHEN COVERING IS USED ON UNSEEDED SLOPES, IT SHOULD BE LEFT IN PLACE UNTIL THE NEXT SEEDING PERIOD
5. PLASTIC COVERING SHEETS SHOULD BE BURIED TWO FEET AT THE TOP OF SLOPES IN ORDER TO PREVENT SURFACE WATER FLOW BENEATH SHEETS.
6. PLASTIC COVERING MUST BE CHECKED OFTEN FOR RIPS AND PLACES WHERE THE PLASTIC MAY BE DISLODGED. CONTACT BETWEEN THE PLASTIC AND THE GROUND SHOULD ALWAYS BE MAINTAINED. ANY AIR BUBBLES FOUND SHOULD BE REMOVED IMMEDIATELY OR THE PLASTIC MAY RIP DURING THE NEXT WINDY PERIOD. RE–ANCHOR OR REPLACE AS NECESSARY.

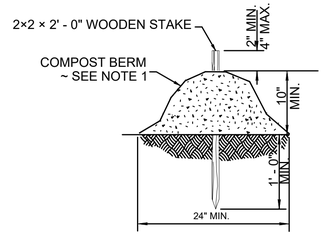
1 C1.2 PLASTIC COVERING DETAIL
SCALE: N.T.S.



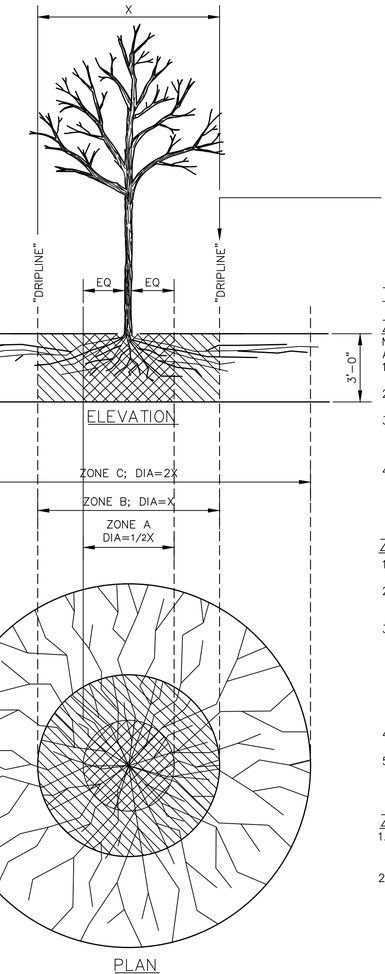


COMPOST BERM NOTES

1. COMPOST BERM SHALL BE A MINIMUM OF 10" TALL AND 24" WIDE OR SIZED TO SUIT CONDITIONS AS SPECIFIED BY THE ENGINEER OR CONTRACT.
2. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.
3. INSTALL COMPOST BERM PERPENDICULAR TO SLOPE AND ALONG CONTOUR LINES.
4. REMOVE SEDIMENT FROM THE UP SLOPE SIDE OF THE COMPOST BERM WHEN ACCUMULATION HAS REACHED 1/2 OF THE EFFECTIVE HEIGHT OF THE COMPOST BERM.
5. LIVE STAKES CAN BE USED IN ADDITION TO WOODEN STAKES AND SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION 9–14.5(5) AND 9–14.6(1).



3 C1.2 COMPOST BERM DETAIL
SCALE: N.T.S.



FENCING/ROOT PROTECTION

6 FT CHAIN LINK TEMPORARY CONSTRUCTION FENCING OR ALTERNATIVE 48" ORANGE PLASTIC FENCING WITH T–POSTS AS APPROVED BY ENGINEER TO BE PROVIDED AND MAINTAINED AT DRIPLINE OR AS INDICATED ON SHEET C2.0.

ENGINEER'S APPROVAL REQUIRED FOR USE/ACCESS WITHIN ZONE B. PERMISSION FOR USE/ACCESS REQUIRES SURFACE PROTECTION* FOR ALL UNPAVED SURFACES WITHIN ZONE B

* SURFACE PROTECTION MEASURES
1. MULCH LAYER, 6" DEPTH
2. 3/4" PLYWOOD
3. STEEL PLATES

TRENCHING/EXCAVATION

ZONE A (CRITICAL ROOT ZONE)

NO DISTURBANCE ALLOWED WITHOUT SITE SPECIFIC INSPECTION AND APPROVAL OF METHODS TO MINIMIZE ROOT DAMAGE.
1. PARKS ARBORIST MUST BE ON–SITE TO OBSERVE THE EXCAVATION.
2. SEVERANCE OF ROOTS LARGER THAN 2" IN DIAMETER REQUIRES ENGINEER'S APPROVAL.
3. TUNNELING OR HYDRO–EXCAVATING IN ACCORDANCE WITH THE DETAILS IS REQUIRED TO INSTALL LINES BELOW ROOTS THAT ARE NOT APPROVED FOR CUTTING OR REMOVAL.
4. ALL ROOT PRUNING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS, SECTION 01 56 39

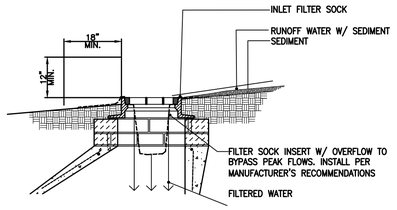
ZONE B (DRIPLINE)

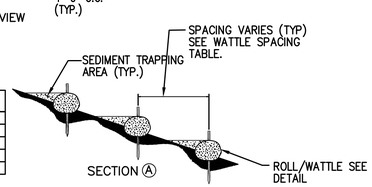
1. NOTIFY EINGINEER 48 HOURS IN ADVANCE OF ANY WORK WITHIN THE DRIPLINE.
2. OPERATION OF HEAVY EQUIPMENT AND/OR STOCKPILING OF MATERIALS SUBJECT TO ENGINEERS APPROVAL; SURFACE PROTECTION MEASURES* REQUIRED.
3. TRENCHING ALLOWED AS FOLLOWS:
   - SEVERANCE OF ROOTS LARGER THAN 2"DIA REQUIRES ENGINEER'S APPROVAL.
   - EXCAVATION BY HAND, AIR–SPADE OR HYDRAULIC METHODS MAY BE REQUIRED.
   - LIMIT TRENCH WIDTH. DO NOT DISTURB ZONE A.
   - MAINTAIN 2/3 OR MORE OF ZONE B IN UNDISTURBED CONDITION.
4. TUNNELING MAY BE REQUIRED FOR TRENCHES DEEPER THAN 3'–0".
5. ALL ROOT PRUNING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS, SECTION 01 56 39.

ZONE C (FEEDER ROOT ZONE)

1. OPERATION OF HEAVY EQUIPMENT AND/OR STOCKPILING OF MATERIALS SUBJECT TO ENGINEERS APPROVAL. SURFACE PROTECTION* MEASURES MAY BE REQUIRED
2. TRENCHING WITH HEAVY EQUIPMENT ALLOWED AS FOLLOWS, UNLESS NOTED OTHERWISE:
   - MINIMIZE TRENCH WIDTH
   - MAINTAIN 2/3 OR MORE OF ZONE C IN UNDISTURBED CONDITION

6 C1.2 TREE PROTECTION DETAIL
SCALE: N.T.S.





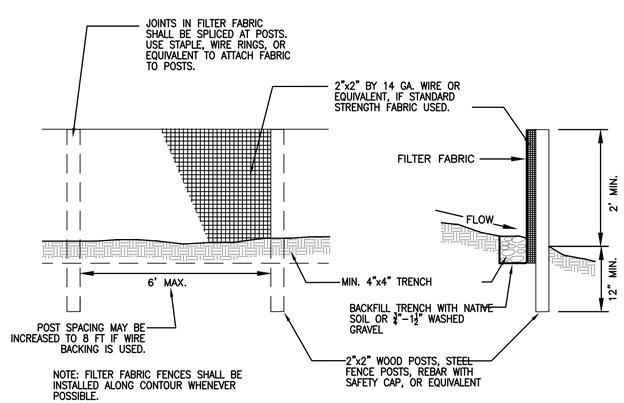
WATTLE SPACING TABLE	
SLOPE	MAXIMUM SPACING
1:1	10'–0"
2:1	20'–0"
3:1	30'–0"
4:1	40'–0"

WATTLE NOTES:

1. WATTLES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION 9–14.5. INSTALL WATTLES ALONG CONTOURS. INSTALLATION SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION 8–01.3(13).
2. SECURELY KNOT EACH END OF WATTLE. ABUT ADJACENT WATTLES TIGHTLY, END TO END, WITHOUT OVERLAPPING THE ENDS.
3. PILOT HOLES MAY BE DRIVEN THROUGH THE WATTLES AND INTO THE SOIL WHEN SOIL CONDITIONS REQUIRE.
4. LIVE STAKES MAY BE USED FOR PERMANENT INSTALLATION AND SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION 9–14.5(5) AND 9–14.6(1).
5. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RAINFALL PRODUCES RUNOFF, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
6. PERFORM MAINTENANCE IN ACCORDANCE WITH STANDARD SPECIFICATION 8–01.3(14).

2 C1.2 STRAW ROLL (WATTLE) DETAIL
SCALE: N.T.S.

4 C1.2 INLET FILTER PROTECTION DETAIL
SCALE: N.T.S.



5 C1.2 SILT FENCE DETAIL
SCALE: N.T.S.

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TREE PROTECTION AND EROSION CONTROL DETAILS

C 1.2

SHEET 6 OF 22

Exhibit 1

NOTE: SEE NOTES SHEET C1.0

ABBREVIATIONS

AC – ASPHALT CONCRETE
CB – CATCH BASIN
CEM. CONC. – CEMENT CONCRETE
CL B – CLASS B
CSTC– CRUSHED SURFACING TOP COURSE
DEM – DEMOLISH
DI – DUCTILE IRON
EL – ELEVATION
EX – EXISTING
IE = INVERT ELEVATION
LF – LINEAL FEET
SD – STORM DRAIN
SS – SIDE SEWER
TYP– TYPICAL
UG – UNDERGROUND

GRADING REVISIONS:

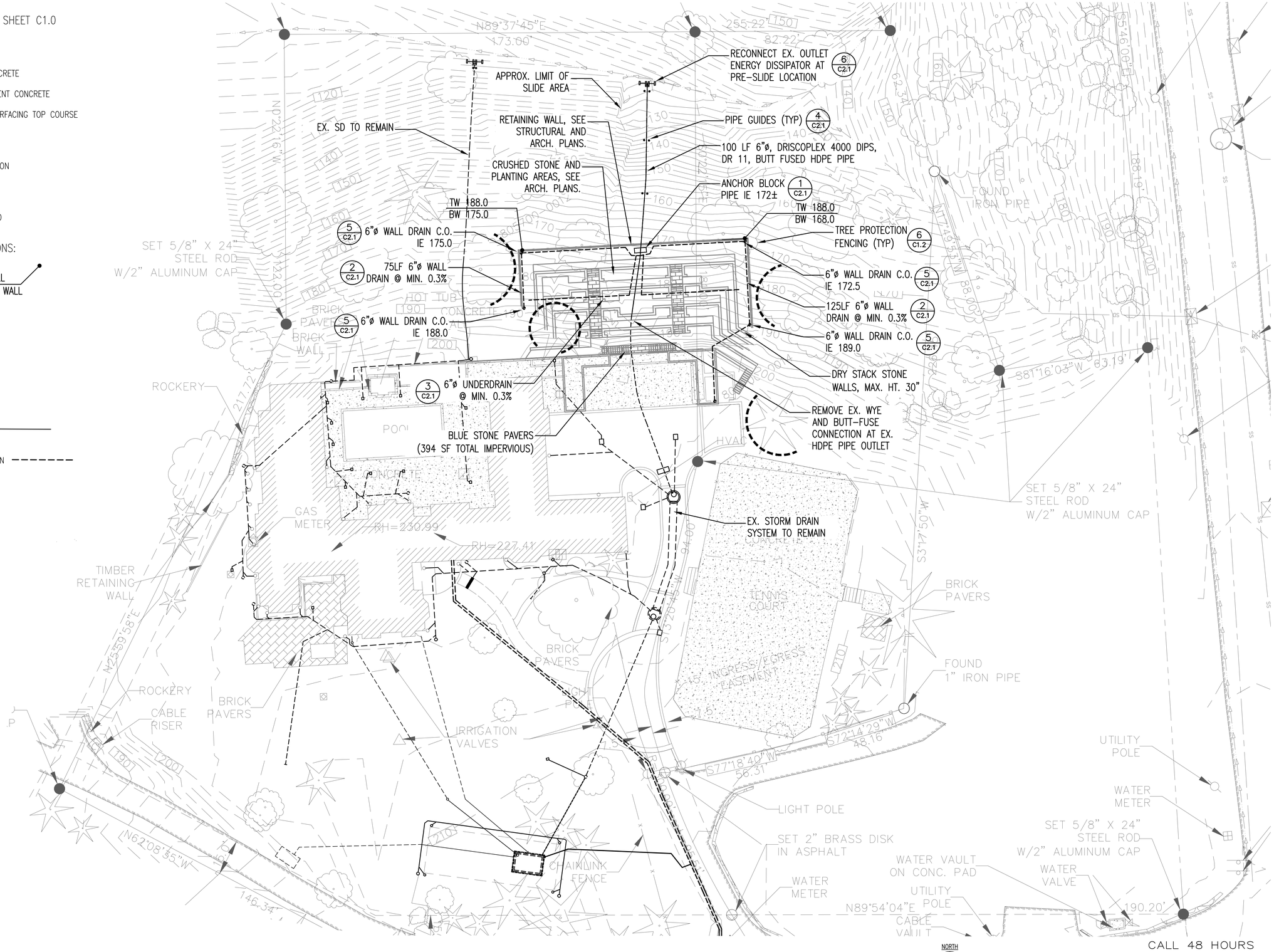
(TW) TOP OF WALL
(BW) BOTTOM OF WALL

LEGEND:

SD PIPING

WALL OR UNDER DRAIN

SD C.O.



1 CIVIL DRAINAGE PLAN
SCALE: 1"=20'

NORTH

0 10 20 40 FEET

CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555 OR CALL 8-1-1

WR Consulting, Inc.

Civil Engineer:
WR Consulting, Inc.
3611 45th Ave W.
Seattle, WA 98199
P: 206.285.1593

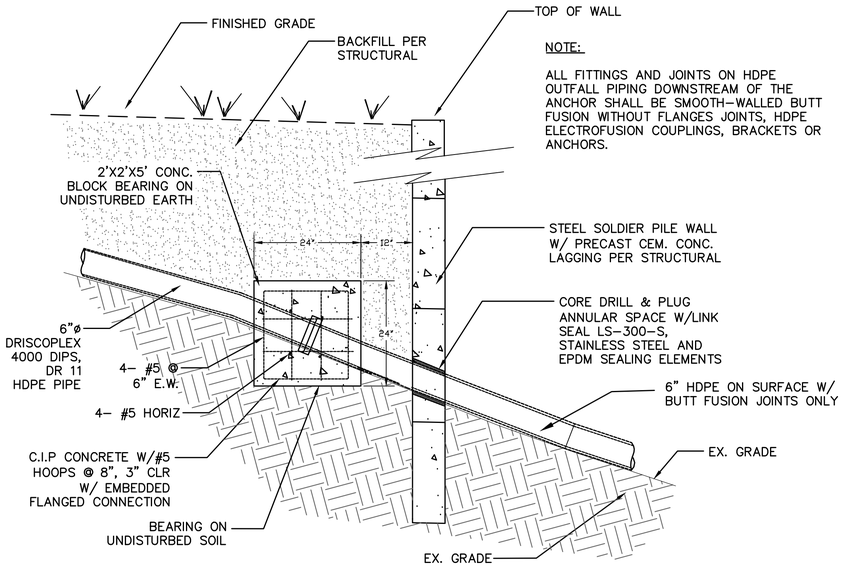
JOHN W. RUNDQUIST
STATE OF WASHINGTON
21551
REGISTERED
PROFESSIONAL ENGINEER
5/16/17

North Gardens
8100 Evergreen Lane
Mercer Island, Washington

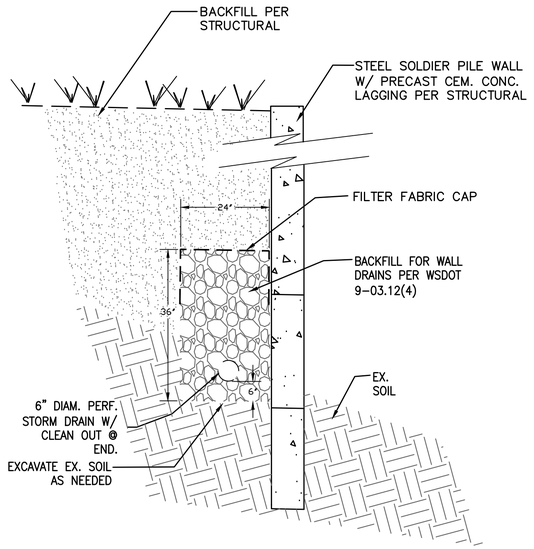
Permit No.
Job No. 17017
Designed: JWR
Drawn: JWR
Checked: JWR
Scale: AS NOTED
Date: May 16, 2017
Revisions:

CIVIL DRAINAGE PLAN

C 2.0



1 C2.1 HDPE ANCHOR AT WALL DETAIL
NTS



2 C2.1 WALL DRAIN DETAIL
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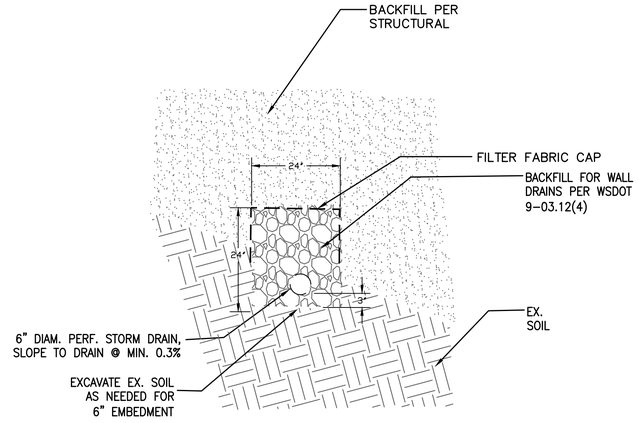
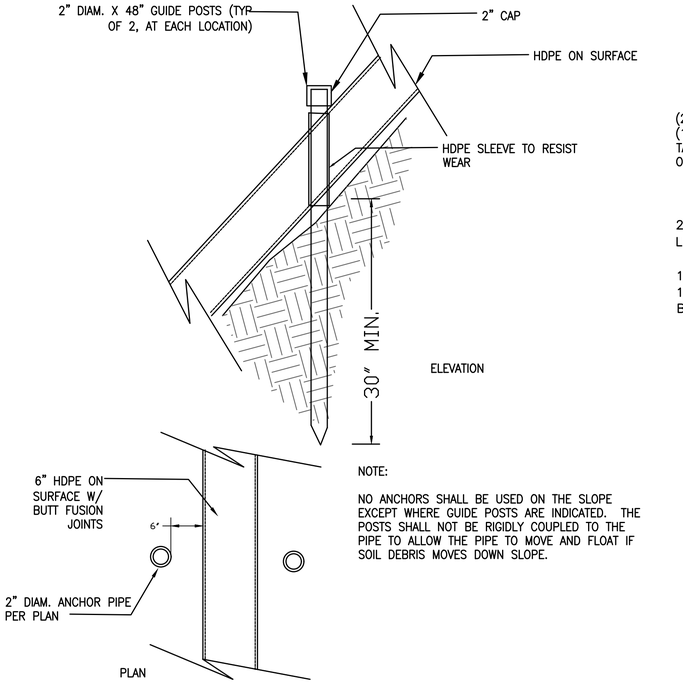


3 C2.1 UNDERDRAIN DETAIL
NTS



4 C2.1 PIPE GUIDE DETAIL
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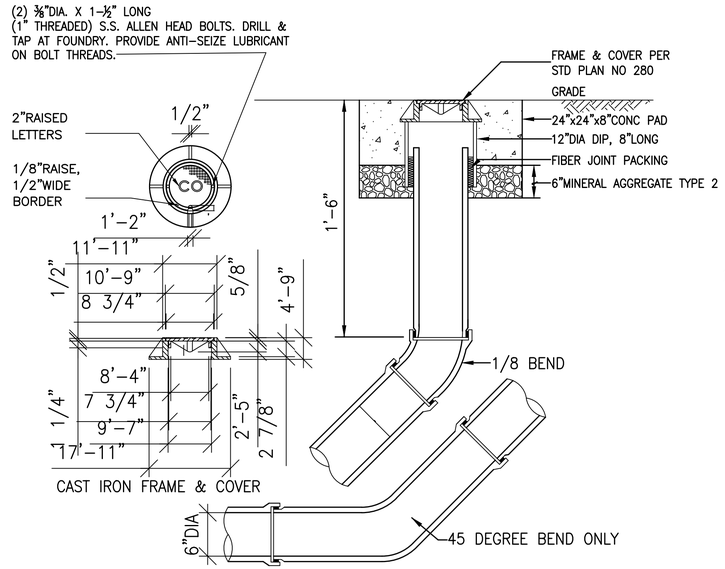
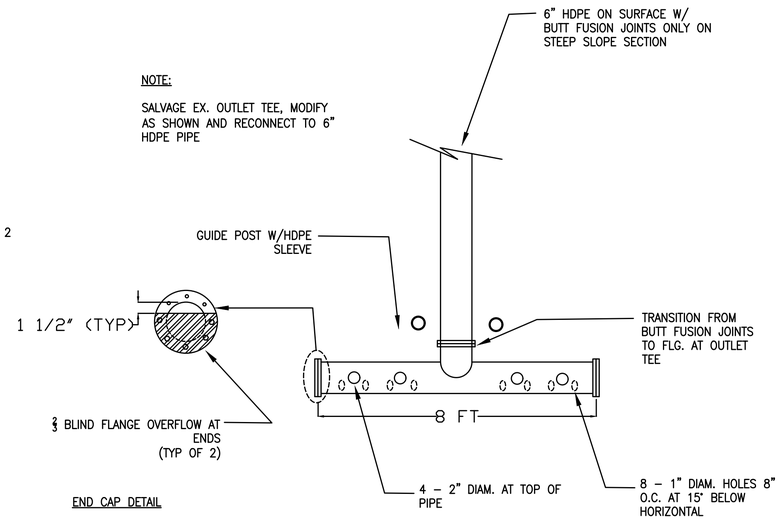


5 C2.1 CLEAN OUT DETAIL
NTS



6 C2.1 OUTLET/DISPERSAL PIPE DETAIL
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OR CALL 8-1-1

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Revisions:

CIVIL DETAILS

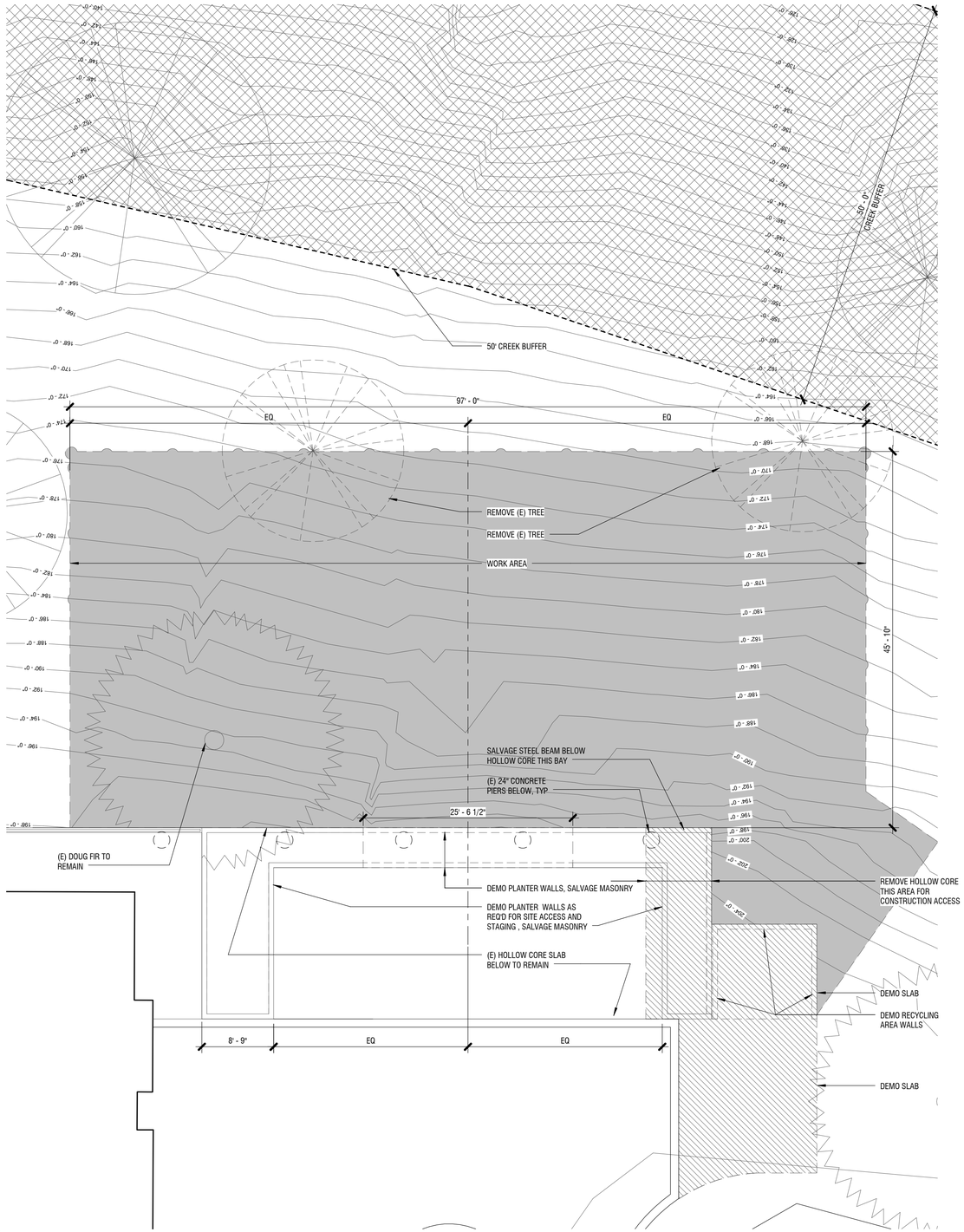
C 2.1

Exhibit 1

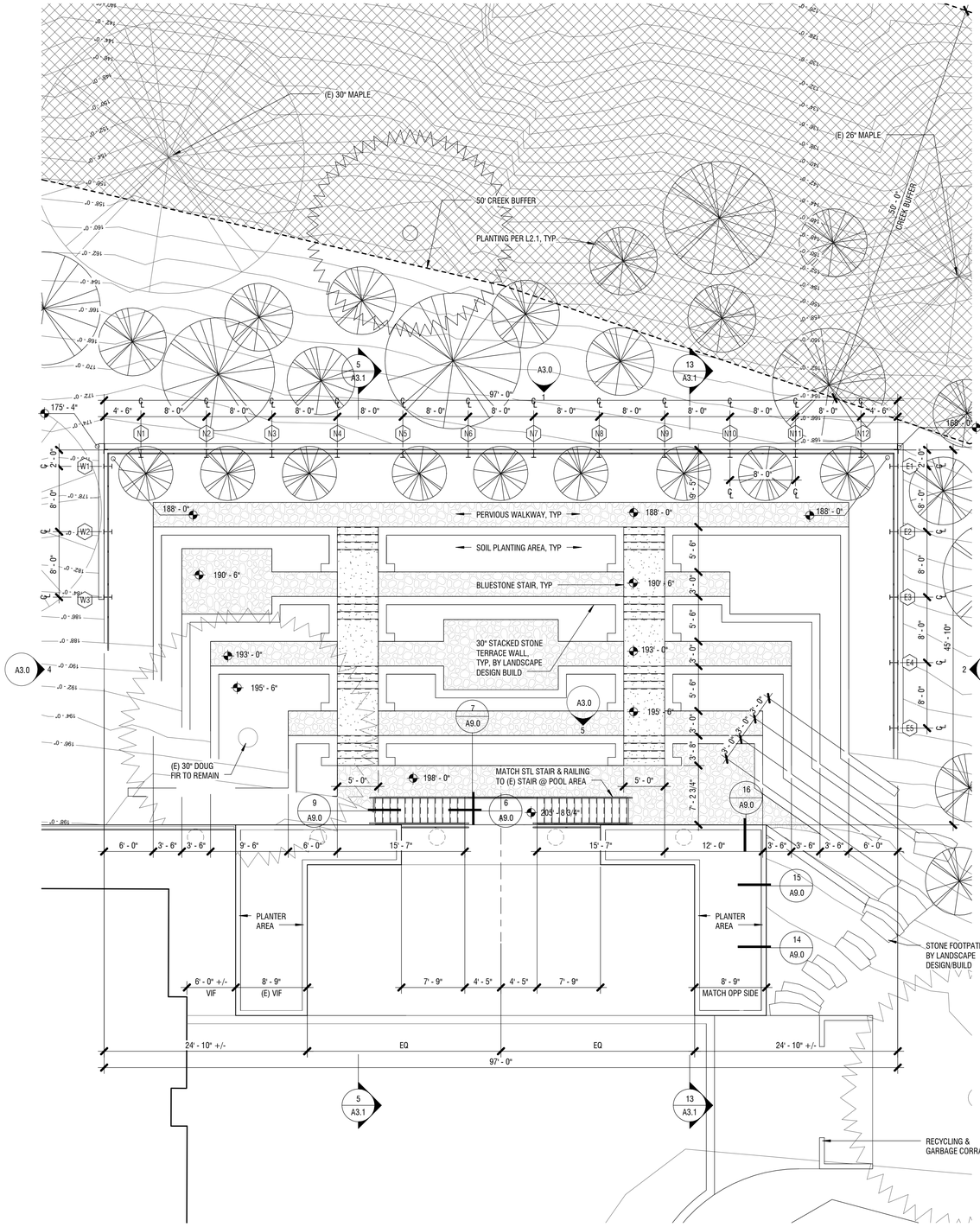
SHKS ARCHITECTS

1050 N. 38th St.
Seattle, WA 98103
PH: 206.675.9151
www.shksarchitects.com

5158 REGISTERED ARCHITECT
JONATHAN H. HARTUNG
STATE OF WASHINGTON



2 NORTH GARDEN DEMO PLAN
1/8" = 1'-0"



1 NORTH GARDEN PLAN
1/8" = 1'-0"

8100
NORTH GARDEN

CRITICAL AREA DETERMINATION

8100 EVERGREEN LANE
MERCER ISLAND WA 98040

Drawn by: CZ
Checked: JH
Date: 5/18/17
Scale: 1/8" = 1'-0"

Revisions:

No.	Date	Remarks

GARDEN PLAN
A2.1

Exhibit 1

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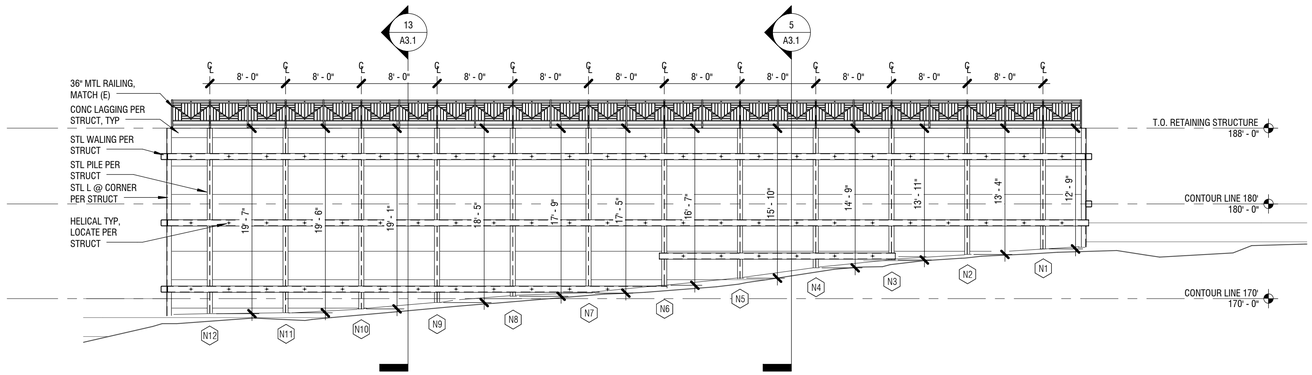
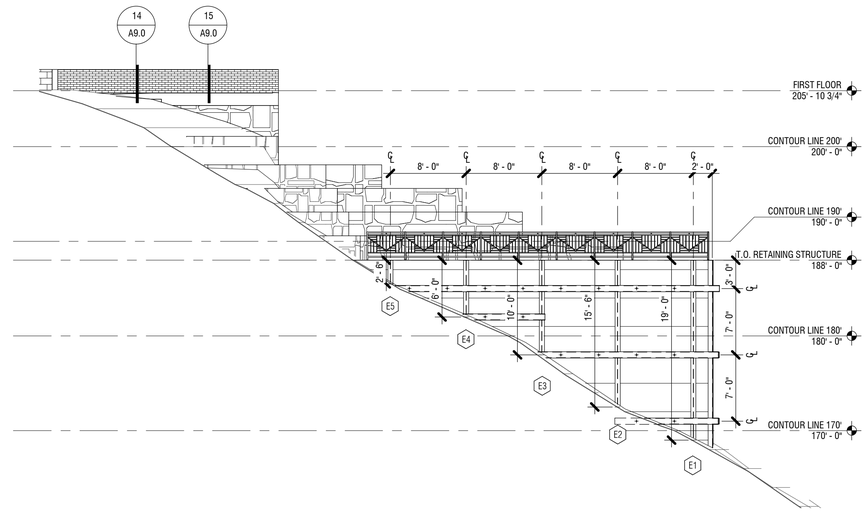
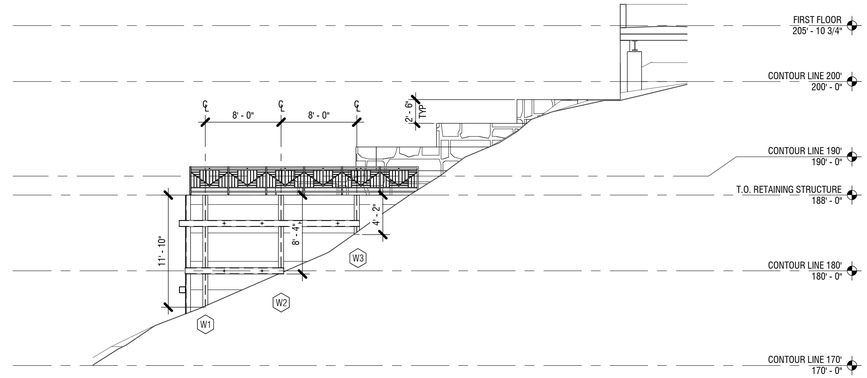


1 NORTH ELEVATION @ RETAINING WALL
1/8" = 1'-0"



2 EAST ELEVATION @ RETAINING WALL
1/8" = 1'-0"



4 WEST ELEVATION @ RETAINING WALL
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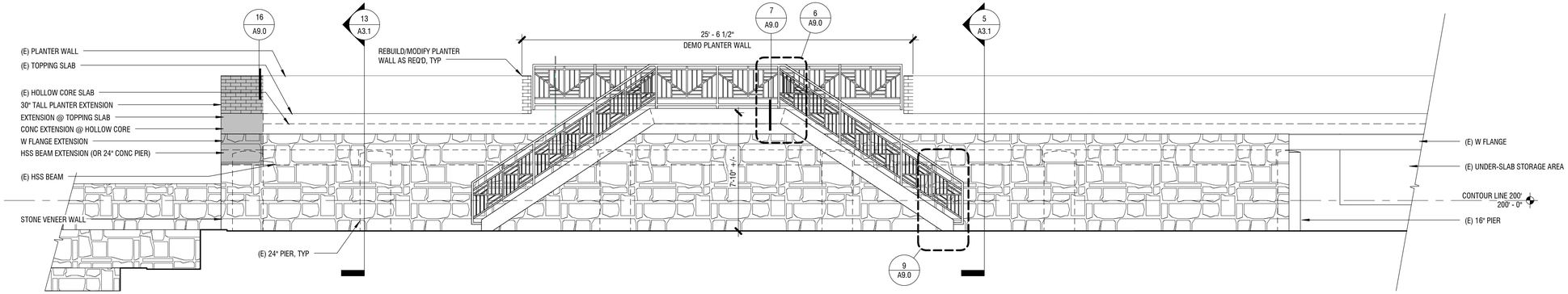

5 ELEVATION @ STAIR & (E) HOLLOW CORE PLATFORM
1/4" = 1'-0"

5/18/2017 11:11:35 AM

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STATE OF WASHINGTON

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NORTH GARDEN

CRITICAL AREA DETERMINATION

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MERCER ISLAND WA 98040

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Checked: Checker
Date: 5/18/17
Scale: As indicated

Revisions:
No. Date Remarks

EXTERIOR ELEVATIONS
A3.0

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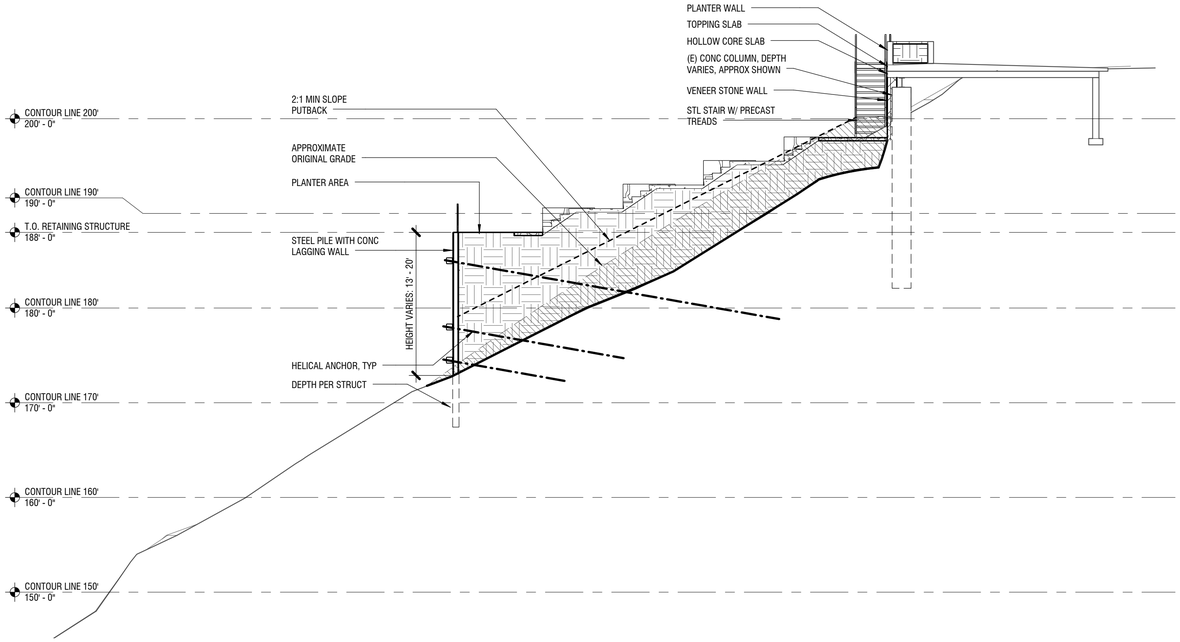
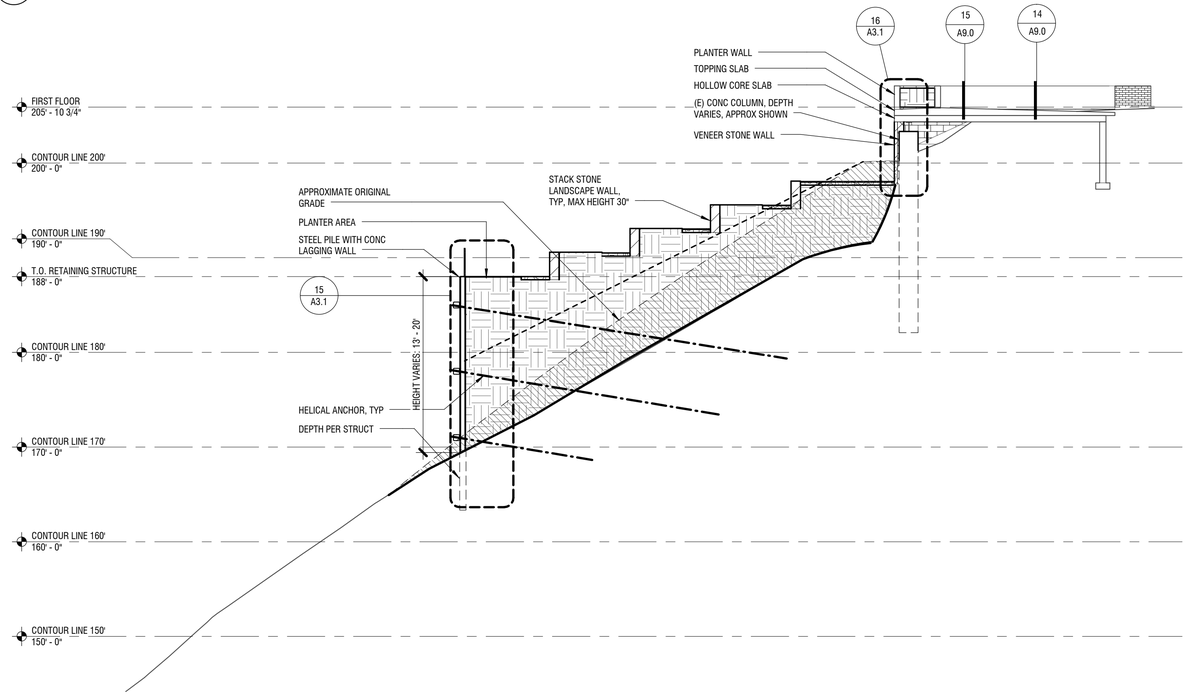
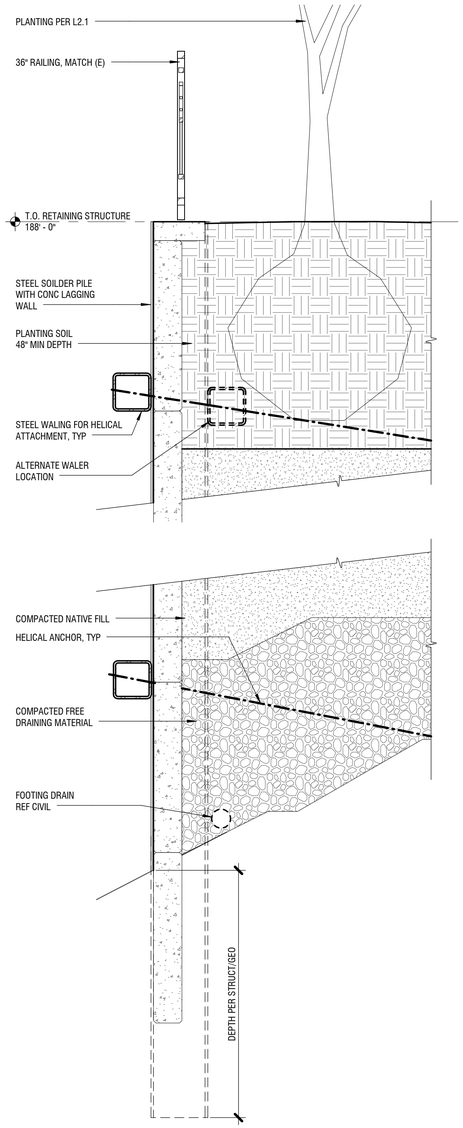


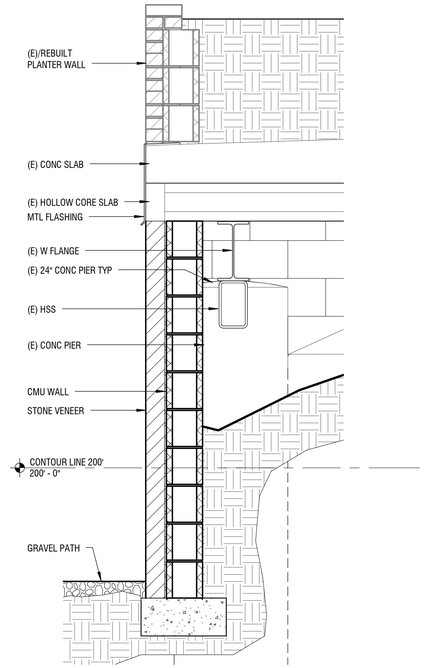
5 SECTION OF SLIDE AREA - WEST STAIR
1/8" = 1'-0"



13 SECTION OF SLIDE AREA - EAST STAIR
1/8" = 1'-0"



15 WALL SECTION @ RETAINING WALL
3/4" = 1'-0"



16 WALL SECTION @ HOLLOW CORE EDGE
3/4" = 1'-0"

5/18/2017 11:11:36 AM

REGISTERED ARCHITECT
5158
JONATHAN H. HARTUNG
STATE OF WASHINGTON

8100
NORTH GARDEN

CRITICAL AREA DETERMINATION

8100 EVERGREEN LANE
MERCER ISLAND WA 98040

Drawn by: CZ
Checked: jh
Date: 5/18/17
Scale: As indicated

Revisions:
No. Date Remarks

SECTION
A3.1

Exhibit 1

GENERAL SHORING NOTES

THE FOLLOWING APPLY UNLESS SHOWN OTHERWISE ON THE DRAWINGS

CODE REQUIREMENTS

1. ALL MATERIALS, WORKMANSHIP, DESIGN, AND CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, AND THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, 2015 EDITION, AND THE LATEST EDITION OF PTI DC-35.1, "RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS".

REFERENCE DOCUMENTS

2. TOPOGRAPHIC AND BOUNDARY SURVEY BY:
   PLOG CONSULTING
   5628 AIRPORT WAY S SUITE 144
   SEATTLE, WA 98108
   PROJECT NO.: 085-16
   DATED: 01/13/2017

3. REPORT ON GEOTECHNICAL INVESTIGATION BY:
   GEOTECH CONSULTANTS, INC.
   2401 10TH AVE W
   SEATTLE, WA 98102
   JN 16556
   DATED: 03/29/2017

GENERAL REQUIREMENTS

4. ANY DISCREPANCIES FOUND AMONG THE DRAWINGS, THE SPECIFICATIONS, THESE GENERAL NOTES AND THE SITE CONDITIONS SHALL BE REPORTED TO THE ENGINEER AND ARCHITECT, WHO SHALL CORRECT SUCH DISCREPANCY IN WRITING. ANY WORK DONE BY THE GENERAL CONTRACTOR AFTER DISCOVERY OF SUCH DISCREPANCY SHALL BE DONE AT THE GENERAL CONTRACTOR'S RISK.

5. SHOULD ANY DISCREPANCIES BE FOUND IN THE PROJECT DOCUMENTS, THE CONTRACTOR WILL BE DEEMED TO HAVE INCLUDED IN THE PRICE THE MOST EXPENSIVE WAY OF COMPLETING THE WORK, UNLESS PRIOR TO SUBMISSION OF THE PRICE THE CONTRACTOR ASKS FOR A DECISION FROM THE ENGINEER AND ARCHITECT AS TO WHICH SHALL GOVERN.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE CONTRACTOR'S WORK. THE STRUCTURAL ENGINEER HAS NO OVERALL SUPERVISORY AUTHORITY OR ACTUAL AND/OR DIRECT RESPONSIBILITY FOR THE SPECIFIC WORKING CONDITIONS AT THE SITE AND/OR FOR ANY HAZARDS RESULTING FROM THE ACTIONS OF ANY TRADE CONTRACTOR. THE STRUCTURAL ENGINEER HAS NO DUTY TO INSPECT, SUPERVISE, NOTE, CORRECT, OR REPORT ANY HEALTH OR SAFETY DEFICIENCIES TO THE OWNER, CONTRACTORS, OR OTHER ENTITIES OR PERSONS AT THE PROJECT SITE.

7. CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF EXISTING STRUCTURES IN THE FIELD AND SHALL NOTIFY THE ENGINEER OF ALL FIELD CHANGES PRIOR TO FABRICATION AND INSTALLATION OF ANY STRUCTURAL MEMBER.

8. CONTRACTOR-INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO FABRICATION OR CONSTRUCTION. CHANGES SHOWN ON SHOP DRAWINGS ONLY WILL NOT SATISFY THIS REQUIREMENT.

9. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND THE STRUCTURAL ENGINEER. ALL TYPICAL AND NOTES SHOWN ON DRAWINGS SHALL APPLY, UNLESS NOTED OTHERWISE. TYPICAL DETAILS MAY NOT NECESSARILY BE INDICATED ON THE PLANS BUT SHALL STILL APPLY AS SHOWN OR DESCRIBED IN THE DETAILS. WHERE TYPICAL DETAILS ARE NOTED ON THE PLANS, THE SPECIFIED TYPICAL DETAIL SHALL BE USED. WHERE NO TYPICAL DETAIL IS NOTED, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CHOOSE THE APPROPRIATE TYPICAL DETAIL FROM THOSE PROVIDED. THE CONTRACTOR SHALL SUBMIT ALL PROPOSED ALTERNATE TYPICAL DETAILS TO THOSE PROVIDED WITH RELATED CALCULATIONS TO THE ENGINEER FOR APPROVAL PRIOR TO SHOP DRAWING PRODUCTION AND FIELD USE.

10. SHOP DRAWINGS FOR THE FOLLOWING ITEMS SHALL BE SUBMITTED TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR REVIEW PRIOR TO FABRICATION OF THESE ITEMS.

    STRUCTURAL STEEL
    ANCHORS

11. SHOP DRAWING REVIEW: DIMENSIONS AND QUANTITIES ARE NOT REVIEWED BY THE ENGINEER OF RECORD, THEREFORE MUST BE VERIFIED BY THE CONTRACTOR. CONTRACTOR SHALL REVIEW AND STAMP DRAWINGS PRIOR TO REVIEW BY ENGINEER OF RECORD. CONTRACTOR SHALL REVIEW DRAWINGS FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND OPERATIONS OF CONSTRUCTION, AND ALL SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO. SUBMITTALS SHALL INCLUDE A REPRODUCIBLE AND ONE COPY; REPRODUCIBLE WILL BE MARKED AND RETURNED WITHIN TWO WEEKS OF RECEIPT WITH A NOTATION INDICATING THAT THE SUBMITTAL HAS BEEN FOUND TO BE IN GENERAL CONFORMANCE WITH THE DESIGN OF THE BUILDING. THE SUBMITTED ITEMS SHALL NOT BE INSTALLED UNTIL THEY HAVE BEEN APPROVED BY THE DESIGN TEAM.

    SHOP DRAWING SUBMITTALS PROCESSED BY THE ENGINEER ARE NOT CHANGE ORDERS. THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT, BY INDICATING WHICH MATERIAL IS INTENDED TO BE FURNISHED AND INSTALLED AND BY DETAILING THE INTENDED FABRICATION AND INSTALLATION METHODS.

12. UTILITY LOCATION: THE UTILITIES INFORMATION SHOWN ON THE PLANS MAY NOT BE COMPLETE. THE SHORING CONTRACTOR SHALL DETERMINE THE HORIZONTAL AND VERTICAL LOCATION OF ALL ADJACENT UNDERGROUND UTILITIES PRIOR TO DRIVING PILES, DRILLING PILE HOLES, TIEBACK ANCHORS, OR CUTTING OR DIGGING IN STREETS OR ALLEYS. THIS INCLUDES CALLING UTILITY LOCATE AND THEN POTHOLING ALL UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM DEPTHS AND LOCATIONS AND TO VERIFY THAT THERE ARE NO CONFLICTS WITH THE PILE AND TIEBACK CROSSING ELEVATIONS. PILES AND TIEBACKS, INCLUDING CONCRETE CASING SHALL MAINTAIN A MINIMUM OF 12" CLEARANCE TO ANY EXISTING UTILITIES TO REMAIN. CONTRACTOR SHALL NOTIFY THE ENGINEER OF CONFLICTS. CONFLICTS SHALL BE RESOLVED IN WRITING PRIOR TO PROCEEDING WITH CONSTRUCTION.

QUALITY ASSURANCE

13. SPECIAL INSPECTION SHALL BE PROVIDED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND SECTIONS 110 AND 1704 OF THE INTERNATIONAL BUILDING CODE BY A QUALIFIED TESTING AGENCY DESIGNATED BY THE ARCHITECT, AND RETAINED BY THE BUILDING OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL INSPECTIONS. THE ARCHITECT, STRUCTURAL ENGINEER, AND BUILDING DEPARTMENT SHALL BE FURNISHED WITH COPIES OF ALL INSPECTION AND TEST RESULTS WITHIN TWO WEEKS OF COMPLETION OF EACH PHASE OF WORK. SPECIAL INSPECTION OF THE FOLLOWING TYPES OF CONSTRUCTION IS REQUIRED

STRUCTURAL STEEL FABRICATION AND ERECTION	PER TABLE 1704.3
SOIL CONDITIONS, FILL PLACEMENT, AND DENSITY	PER TABLE 1704.7
HELICAL PILE FOUNDATION	CONTINUOUS

    PERIODIC INSPECTION ALLOWS INSPECTION AT INTERVALS NECESSARY TO CONFIRM THAT WORK REQUIRING SPECIAL INSPECTION IS IN COMPLIANCE WITH REQUIREMENTS. CONTINUOUS SPECIAL INSPECTION REQUIRES THAT THE INSPECTOR BE ONSITE AT ALL TIMES THAT WORK REQUIRING SPECIAL INSPECTION IS PERFORMED.

14. INSPECTORS SHALL BRING DEFICIENCIES TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THE DISCREPANCIES ARE NOT CORRECTED, THE INSPECTOR SHALL BRING THE UNCORRECTED DEFICIENCY TO THE ATTENTION OF THE BUILDING OFFICIAL AND THE STRUCTURAL ENGINEER IMMEDIATELY AND PRIOR TO COMPLETION OF THAT PHASE OF WORK.

15. SOILS INSPECTION: INSPECTION BY THE SOILS ENGINEER SHALL BE PERFORMED FOR PILE PLACEMENT AND HELICAL PLACEMENT AND STRESSING. ALL PREPARED SOIL BEARING SURFACES SHALL BE INSPECTED BY THE SOILS ENGINEER PRIOR TO PLACEMENT OF PILES. SOIL COMPACTION SHALL BE SUPERVISED BY AN APPROVED TESTING LAB. THE GEOTECHNICAL ENGINEER SHALL ALSO ADVISE ON WATER CONTROL AND SLAB ON GRADE CONSTRUCTION.

16. STRUCTURAL OBSERVATION SHALL BE PERFORMED IN ACCORDANCE WITH SECTIONS 1709 OF THE INTERNATIONAL BUILDING CODE FOR THE FOLLOWING BUILDING ELEMENTS:

    SHEAR WALLS
    HOLDDOWNS
    CONCRETE CONSTRUCTION
    MASONRY CONSTRUCTION
    STRUCTURAL STEEL CONSTRUCTION

    THE CONTRACTOR SHALL PROVIDE THE ENGINEER OF RECORD ADEQUATE NOTICE TO SCHEDULE APPROPRIATE SITE VISITS FOR STRUCTURAL OBSERVATION.

    STRUCTURAL OBSERVATION MEANS THE VISUAL OBSERVATION OF THE STRUCTURAL SYSTEM, FOR GENERAL CONFORMANCE TO THE APPROVED PLANS AND SPECIFICATIONS, AT SIGNIFICANT CONSTRUCTION STAGES AND AT COMPLETION OF THE STRUCTURAL SYSTEM. STRUCTURAL OBSERVATION DOES NOT INCLUDE OR WAIVE THE RESPONSIBILITY FOR THE INSPECTIONS REQUIRED BY SECTION 109 OR OTHER SECTIONS OF THE INTERNATIONAL BUILDING CODE.

    THE OWNER SHALL EMPLOY THE ENGINEER OR ARCHITECT RESPONSIBLE FOR THE STRUCTURAL DESIGN, TO PERFORM STRUCTURAL OBSERVATION. OBSERVED DEFICIENCIES SHALL BE REPORTED IN WRITING TO THE OWNER'S REPRESENTATIVE, SPECIAL INSPECTOR, CONTRACTOR, AND THE BUILDING OFFICIAL. THE STRUCTURAL OBSERVER SHALL SUBMIT TO THE BUILDING OFFICIAL A WRITTEN STATEMENT THAT THE SITE VISITS HAVE BEEN MADE AND IDENTIFYING ANY REPORTED DEFICIENCIES WHICH, TO THE BEST OF THE STRUCTURAL OBSERVER'S KNOWLEDGE, HAVE NOT BEEN RESOLVED.

SHORING MONITORING

17. MONITORING SHALL BE PERFORMED BY A PROFESSIONAL LAND SURVEYOR (PLS) LICENSED IN THE STATE OF WASHINGTON.

18. SOLDIER PILE MONITORING PROGRAM: FOLLOWING INSTALLATION OF THE SOLDIER PILES, MONITORING POINTS SHALL BE ESTABLISHED ON THE TOP OF THE PILES PRIOR TO PROCEEDING WITH FILL PLACEMENT. ONE MONITORING POINT SHALL BE ESTABLISHED FOR EVERY FOUR PILES. THE MONITORING POINTS SHALL BE READ DAILY DURING BACKFILL OPERATIONS AND TWICE WEEKLY ONCE THE BACKFILLING IS COMPLETED. THE INITIAL READINGS FOR THIS MONITORING SHALL BE TAKEN BEFORE STARTING BACKFILLING ON THE SITE. NOTIFY THE GEOTECHNICAL AND STRUCTURAL ENGINEERS, SHORING DESIGNER, AND THE BUILDING DEPARTMENT (DPD) IF .5"OF MOVEMENT OCCURS BETWEEN TWO CONSECUTIVE READINGS. THE ENGINEERS AND DESIGNERS SHALL DETERMINE THE CAUSE OF DISPLACEMENT AND DEVELOP REMEDIAL MEASURES IF WARRANTED. PLEASE NOTE THAT A MAXIMUM OF 1" HORIZONTAL DISPLACEMENT IS REQUIRED ANYWHERE ON SHORING WALL SURFACES THROUGHOUT THE SHORING WALL SERVICE LIFETIME. CONSTRUCTION SHALL BE SUSPENDED IMMEDIATELY AND REMEDIAL PROCEDURES APPLIED AS LONG AS A DISPLACEMENT READING EXCEEDS 1". IF THE TOTAL MEASURED LATERAL DEFLECTION OF THE PILES EXCEEDS 1", REMEDIAL MEASURES MAY BE REQUIRED.

19. EACH SET OF MONITORING DATA MUST BE PROVIDED TO THE GEOTECHNICAL ENGINEER FOR REVIEW. IT MAY BE NECESSARY TO INSTALL ADDITIONAL MONITORING POINTS IF WARRANTED BY THE DATA. RECOMMENDATIONS WILL BE PROVIDED BY THE GEOTECHNICAL ENGINEER DURING CONSTRUCTION IF ADDITIONAL MONITORING POINTS BECOME NECESSARY.

20. SURVEY FREQUENCY MAY BE DECREASED AFTER THE SHORING SYSTEM HAS BEEN INSTALLED AND BACKFILL IS COMPLETE IF THE DATA INDICATES LITTLE OR NO ADDITIONAL MOVEMENT. CHANGE IN THE SURVEY FREQUENCY SHALL BE APPROVED IN WRITING BY THE GEOTECHNICAL ENGINEER. SURVEYING MUST CONTINUE UNTIL THE PERMANENT STRUCTURE IS COMPLETE TO FINAL AND STREET GRADES.

GEOTECHNICAL INFORMATION AND CRITERIA

21. INSTALLATION OF SHORING, SUBGRADE PREPARATION INCLUDING DRAINAGE, EXCAVATION, COMPACTION AND FILLING REQUIREMENTS SHALL CONFORM WITH THE RECOMMENDATIONS CONTAINED IN THE SOILS REPORT AND/OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER. THE SUBSURFACE CHARACTERIZATIONS USED TO DESIGN THE SHORING ARE CONTAINED IN THE SOILS REPORT AS REFERENCED ABOVE.

22. EXCAVATIONS FOR FOUNDATIONS SHALL BE PER PLAN DOWN TO UNDISTURBED NATIVE MATERIAL PER THE GEOTECHNICAL ENGINEERING RECOMMENDATIONS. OVER EXCAVATED AREAS SHALL BE BACKFILLED WITH LEAN CONCRETE OR PER GEOTECHNICAL RECOMMENDATIONS AT THE CONTRACTOR'S EXPENSE. EXCAVATION SLOPES SHALL BE SAFE AND SHALL NOT BE GREATER THAN THE LIMITS SPECIFIED BY LOCAL, STATE, AND NATIONAL SAFETY REGULATIONS. CONTRACTOR SHALL PROTECT CUT SLOPES AS NECESSARY IF CONSTRUCTION OCCURS DURING WET WEATHER, AND SHALL CONTROL AND MANAGE RUNOFF TO MINIMIZE EFFECTS ON CONSTRUCTION.

23. DESIGN SOIL CAPACITIES ARE DETERMINED BY THE GEOTECHNICAL ENGINEER. THE SOIL PRESSURES INDICATED ON THE SOIL PRESSURE DIAGRAM WERE USED FOR DESIGN, IN ADDITION TO THE DEAD AND LIVE LOADS. SEE REPORT OF GEOTECHNICAL INVESTIGATION FOR MORE COMPLETE INFORMATION, INCLUDING RECOMMENDATIONS FOR SHORING IN GENERAL, SHORING MONITORING, EXCAVATION, LAGGING, AND DRAINAGE.

24. SOIL DESIGN PARAMETERS ARE AS FOLLOWS:

ACTIVE EARTH PRESSURE (ONE ANCHOR)	60 PCF
ACTIVE EARTH PRESSURE (TWO OR MORE ANCHORS)	39H PSF
SEISMIC SURCHARGE PRESSURE (UNIFORM LOAD)	9H PSF
PASSIVE EARTH PRESSURE	0 PCF

25. SHORING DURATION: PERMANENT

CONCRETE

26. CONCRETE SHALL BE MIXED, PROPORTIONED, CONVEYED AND PLACED IN ACCORDANCE WITH IBC SECTION 1905, 1906, AND ACI 301. STRENGTHS AT 28 DAYS AND MIX CRITERIA SHALL BE AS FOLLOWS:

f'c (psi)	Minimum Cement Per Cubic Yard	Max. Water Per 94 LB Cement	Use
----	1-1/2 sacks	-----	pile & tieback lean concrete
3,000	5-1/2 sacks	.5 w/c	concrete lagging

27. THE MINIMUM AMOUNTS OF CEMENT MAY BE CHANGED IF A CONCRETE PERFORMANCE MIX IS SUBMITTED TO THE STRUCTURAL ENGINEER AND THE BUILDING DEPARTMENT FOR APPROVAL TWO WEEKS PRIOR TO PLACING ANY CONCRETE. THE PERFORMANCE MIX SHALL INCLUDE THE AMOUNTS OF CEMENT, FINE AND COARSE AGGREGATE, WATER AND ADMIXTURES AS WELL AS THE WATER CEMENT RATIO, SLUMP, CONCRETE YIELD AND SUBSTANTIATING STRENGTH DATA IN ACCORDANCE WITH IBC 1905.6. THE USE OF A PERFORMANCE MIX REQUIRES BATCH PLANT INSPECTION, THE COST OF WHICH SHALL BE PAID BY THE GENERAL CONTRACTOR. REVIEW OF MIX SUBMITTALS BY THE ENGINEER OF RECORD INDICATES ONLY THAT INFORMATION PRESENTED CONFORMS GENERALLY WITH CONTRACT DOCUMENTS. CONTRACTOR OR SUPPLIER MAINTAINS FULL RESPONSIBILITY FOR SPECIFIED PERFORMANCE.

28. CONCRETE STRENGTHS SHALL BE VERIFIED BY STANDARD CYLINDER TESTS, UNLESS APPROVED OTHERWISE. REQUIRED ULTIMATE COMPRESSIVE STRENGTH FOR CONCRETE SHALL BE ACHEIVED AT 28 DAYS.

29. REINFORCING STEEL SHALL CONFORM TO ASTM A615 (INCLUDING SUPPLEMENT S1), GRADE 60, FY = 60,000 PSI.

STEEL

30. STEEL SPECIFICATIONS: DESIGN, FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC MANUAL, AISC 360 AND SECTION 2205 OF THE BUILDING CODE.

31. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

TYPE OF MEMBER	ASTM SPECIFICATION	FY
WIDE FLANGE SHAPES	A992	50 KSI
PLATES	A572 (GRADE 50)	50 KSI
STRUCTURAL TUBING	A500 (GRADE B) (SQUARE OR RECTANGULAR)	46 KSI

32. ALL WELDING SHALL BE IN CONFORMANCE WITH AISC AND AWS STANDARDS AND SHALL BE PERFORMED BY WABO CERTIFIED WELDERS USING E70XX ELECTRODES. ONLY PREQUALIFIED WELDS (AS DEFINED BY AWS) SHALL BE USED. ALL COMPLETE JOINT PENETRATION GROOVE WELDS SHALL BE MADE WITH A FILLER MATERIAL THAT HAS A MINIMUM CVN TOUGHNESS OF 20 FT-LBS AT 20 DEGREES F AND 40 FT-LBS AT 70 DEGREES F, AS DETERMINED BY AWS CLASSIFICATION OR MANUFACTURER CERTIFICATION.

33. STEEL PROVIDED SHALL BE GALVANIZED OR PAINTED BLACK FOR CORROSION RESISTANCE.

PILE AND LAGGING CONSTRUCTION

34. DIMENSIONS AND LOCATION OF EXISTING STRUCTURES SHALL BE VERIFIED PRIOR TO FABRICATION AND INSTALLATION OF ANY STRUCTURAL MEMBER. NOTIFY ENGINEER ABOUT ANY DISCREPANCIES PRIOR TO FABRICATION.

35. PILE AND ANCHOR HOLES SHALL BE DRILLED WITHOUT LOSS OF GROUND AND WITHOUT ENDANGERING PREVIOUSLY INSTALLED PILES AND ANCHORS. THIS MAY INVOLVE CASING THE HOLES OR OTHER METHODS OF PROTECTION FROM CAVING. REFER TO REPORT OF GEOTECHNICAL INVESTIGATION FOR RECOMMENDED HOLE DIGGING PROCEDURE.

36. STEEL PILE PLACEMENT TOLERANCES:

    1" INSIDE PERPENDICULAR TO SHORING WALL.
    1" OUTSIDE PERPENDICULAR TO SHORING WALL.
    3" LATERALLY.
    1" IN ANY DIRECTION

37. LAGGING: CONCRETE LAGGING SHALL BE INSTALLED IN ALL AREAS. VOIDS BETWEEN LAGGING AND SOIL SHALL BE BACKFILLED WITH PEA GRAVEL OR LEAN MIX FILL. DRAINAGE BEHIND THE WALL MUST BE MAINTAINED. IT IS CONTRACTOR'S RESPONSIBILITY TO LIMIT THE AMOUNT OF EXPOSED SOIL WITHOUT LAGGING TO AVOID LOSS OF SOIL. MAXIMUM HEIGHT OF 4 FEET IS RECOMMENDED.

HELICAL ANCHORS

38. HELICAL ANCHORS SHALL BE "ECP TORQUE ANCHORS" AS MANUFACTURED BY EARTH CONTACT PRODUCTS, OR APPROVED EQUAL. HELICAL ANCHORS SHALL BE DESIGNED TO MEET THE LOADING REQUIREMENTS SHOWN ON THE DRAWINGS AND SHALL INCLUDE A MINIMUM SAFETY FACTOR OF 2. DRAWINGS AND CALCULATIONS STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF WASHINGTON SHALL BE SUBMITTED PRIOR TO INSTALLATION. INSTALLATION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS OF THE ANCHOR MANUFACTURER AND INSTRUCTIONS OF THE GEOTECHNICAL ENGINEER.

39. HELICAL ANCHOR PERFORMANCE VERIFICATION TESTS (200% TESTS): TENSION VERIFICATION TESTING SHALL BE PERFORMED ON ONE PERFORMANCE PILE SELECTED BY THE GEOTECHNICAL ENGINEER. ALL REQUIRED TEST DATA SHALL BE RECORDED BY THE GEOTECHNICAL ENGINEER.

40. VERIFICATION TESTS SHALL BE PERFORMED ON EACH PERFORMANCE ANCHOR TO 200% OF THE ALLOWABLE DESIGN LOAD.

41. THE ANCHOR SHALL BE SEATED BY APPLYING AN ALIGNMENT LOAD. THE ALIGNMENT LOAD SHALL BE BETWEEN 2% AND 10% OF THE DESIGN LOAD. THE LOAD SHALL THEN BE HELD AND ZERO DEFLECTION READING TAKEN.

42. VERIFICATION TESTS SHALL BE PERFORMED BY INCREMENTALLY LOADING THE ANCHOR IN ACCORDANCE THE SCHEDULE BELOW. THE ANCHOR MOVEMENT SHALL BE MEASURED, RECORDED TO THE NEAREST .001 INCH WITH RESPECT TO AN INDEPENDENT FIXED REFERENCE POINT AT THE ALIGNMENT LOAD AND AT EACH INCREMENT OF LOAD. THE SCHEDULE OF HOLD TIMES SHALL BE AS FOLLOWS:

LOAD	DURATION	
i.	AL	1 MINUTE*
ii.	.25 DL	1 MINUTE*
iii.	.50 DL	1 MINUTE*
iv.	.75 DL	1 MINUTE*
v.	1.0 DL	1 MINUTE*
vi.	1.25 DL	1 MINUTE*
vii.	1.50 DL	1 MINUTE*
viii.	1.75 DL	1 MINUTE*
ix.	2.00 DL	10 MINUTES*

    AL = ALIGNMENT LOAD
    DL = DESIGN LOAD
    *AND STABLE

    THE LOAD-HOLD PERIOD SHALL START AS SOON AS THE LOAD IS APPLIED AND THE ANCHOR MOVEMENT SHALL BE MEASURED AND RECORDED AT EACH LOAD INCREMENT.

    AFTER ACCEPTANCE BY THE GEOTECHNICAL ENGINEER, THE ANCHOR MAY THEN BE UNLOADED AND ATTACHED TO THE WHALER.

STRUCTURAL ENGINEERING
2124 Third Avenue - Suite 100 - Seattle, WA 98121
p: 206.443.6212 ssfengineers.com

DAN J. SAY — STATE OF WASHINGTON — 53000 — REGISTERED PROFESSIONAL ENGINEER

DRAWN: NHD
DESIGN: BDM
CHECKED: BDM
APPROVED: DJS

REVISIONS:

DPD:

PROJECT TITLE:
8100 North Garden
8100 Evergreen Lane
Mercer Island, WA 98040

ARCHITECT:
SHKS Architects
1050 N 38th St.
Seattle, WA 98103
PH 206 675 9151

ISSUE: Permit

SHEET TITLE: General Shoring Notes

SCALE:

DATE: May 10, 2017

PROJECT NO: 00099-2017-08

SHEET NO: SH1

Exhibit 1

Plan Notes

1. DO NOT SCALE DRAWINGS. DIMENSIONS AND EXISTING ELEVATIONS ARE ESTIMATED AND ARE SHOWN FOR BID PURPOSES. EXISTING DIMENSIONS AND ELEVATIONS ARE TO BE VERIFIED BY THE CONTRACTOR.
2. CONTRACTOR SHALL VERIFY LOCATION AND DEPTHS OF ALL UNDERGROUND UTILITIES TO AVOID ANY CONFLICTS. NOTIFY STRUCTURAL ENGINEER FOR POSSIBLE REDESIGN IF ANY MODIFICATION TO THE PILES OR WALL AS SHOWN IS REQUIRED.
3. OBSTRUCTIONS MAY BE ENCOUNTERED DURING EXCAVATION AND SHORING/PILE INSTALLATION. NOTIFY ENGINEER OF RECORD AND GEOTECHNICAL ENGINEER IF OBSTRUCTIONS PREVENT INSTALLATION OF PILES AND/OR TIEBACKS PER PLANS.
4. SEE SH3 FOR PILE ELEVATIONS.
5. REFER TO GENERAL SHORING NOTES FOR ADDITIONAL REQUIREMENTS.

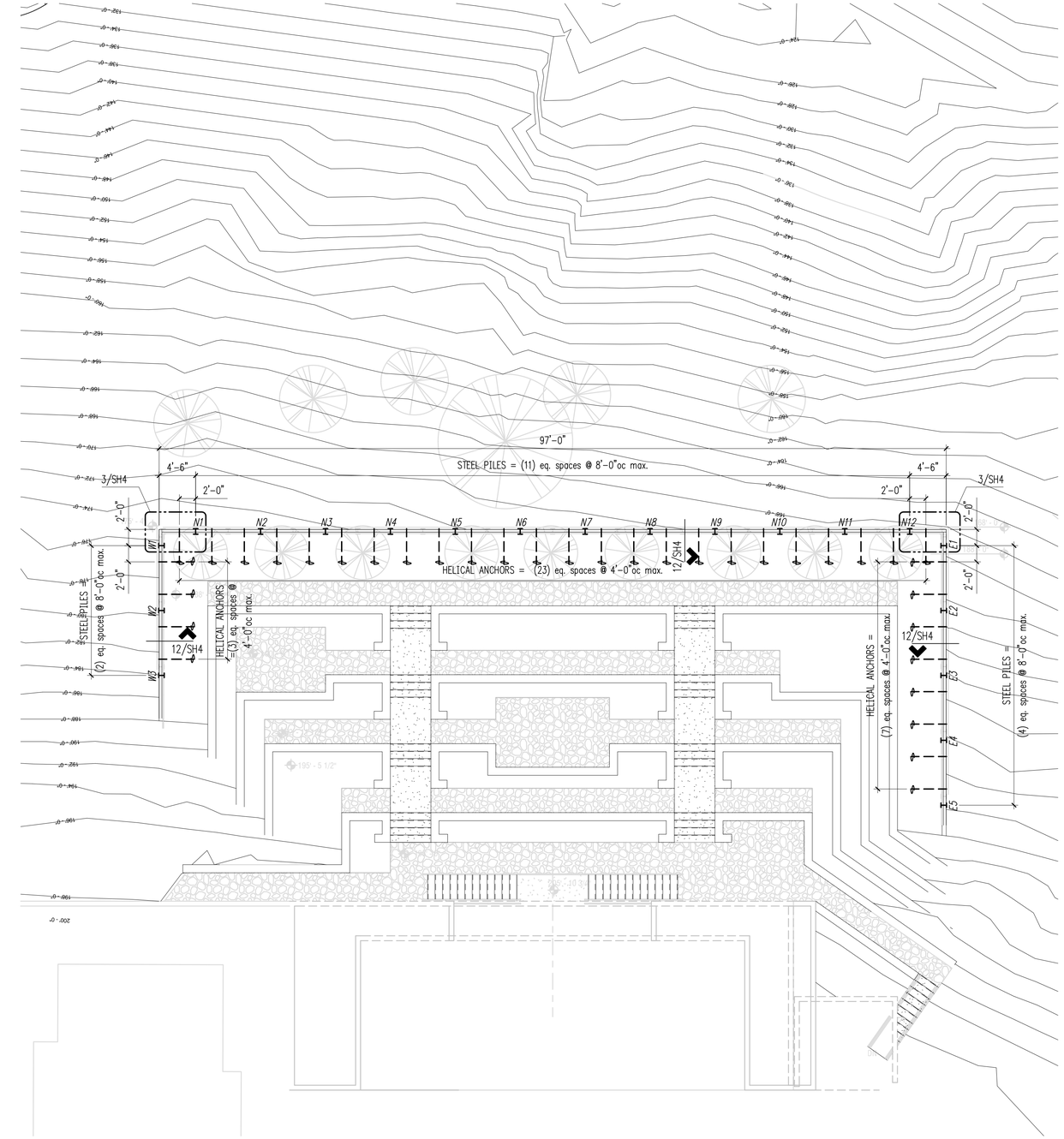
Legend

X#
I — PILE

HELICAL ANCHOR TIEBACK
(ANCHOR DESIGN BY OTHERS)

Pile Schedule

MARK	AUGER ø	STEEL PILE SIZE
W1–W3	18"ø	W12x26
N1–N12	18"ø	W12x26
E1–E5	18"ø	W12x26



Shoring Plan
Scale: 1/8" = 1'-0"

STRUCTURAL ENGINEERING
2124 Third Avenue - Suite 100 - Seattle, WA 98121
p: 206.443.6212 ssfengineers.com

DAN J. SAY — STATE OF WASHINGTON — 53000 — REGISTERED PROFESSIONAL ENGINEER

DRAWN: NHD
DESIGN: BDM
CHECKED: BDM
APPROVED: DJS

REVISIONS:

DPD:

PROJECT TITLE:
8100 North Garden
8100 Evergreen Lane
Mercer Island, WA 98040

ARCHITECT:
SHKS Architects
1050 N 38th St.
Seattle, WA 98103
PH 206 675 9151

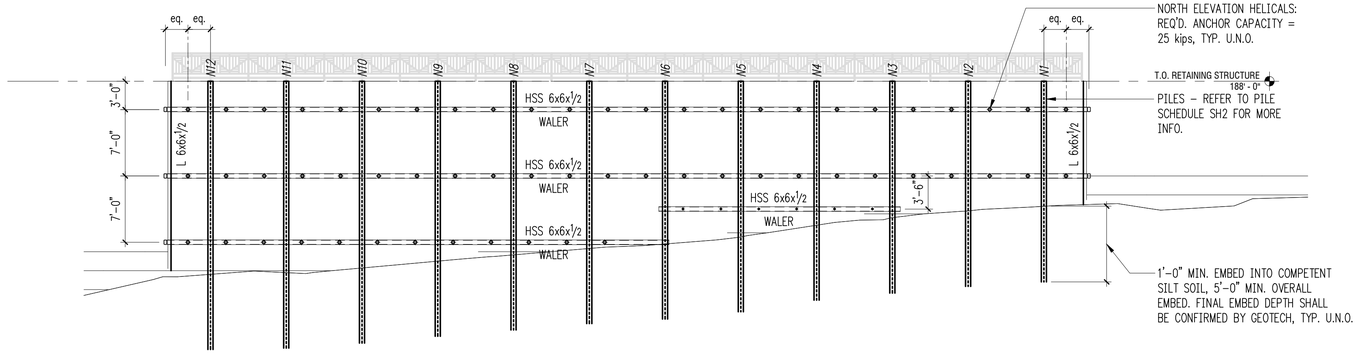
ISSUE:
Permit

SHEET TITLE:
Shoring Plan

SCALE:

DATE: May 10, 2017
PROJECT NO: 00099-2017-08
SHEET NO:
SH2

Exhibit 1



Notes

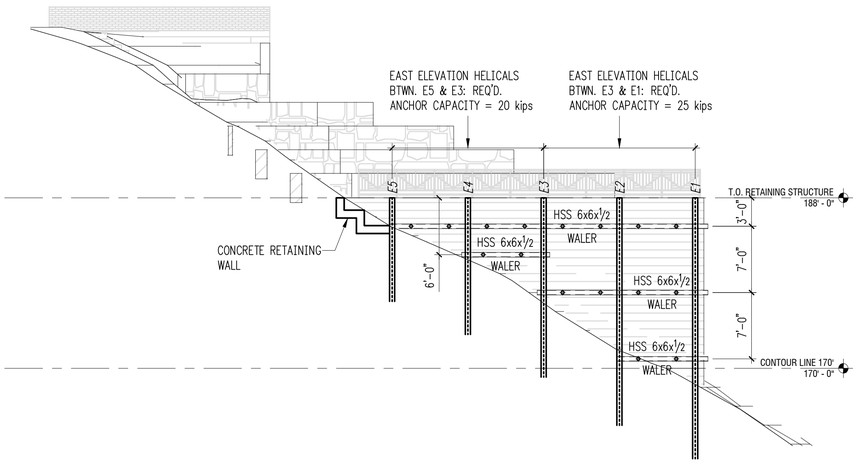
1. DO NOT SCALE DRAWINGS. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
2. REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.
3. ESTIMATED TOP OF PILE ELEVATIONS ARE PROVIDED FOR REFERENCE ONLY. CONTRACTOR TO VERIFY FINAL ELEVATIONS.

Legend

- ◆ HELICAL ANCHOR LOCATION

North Shoring Wall Elevation

Scale: 1/8" = 1'–0"



Notes

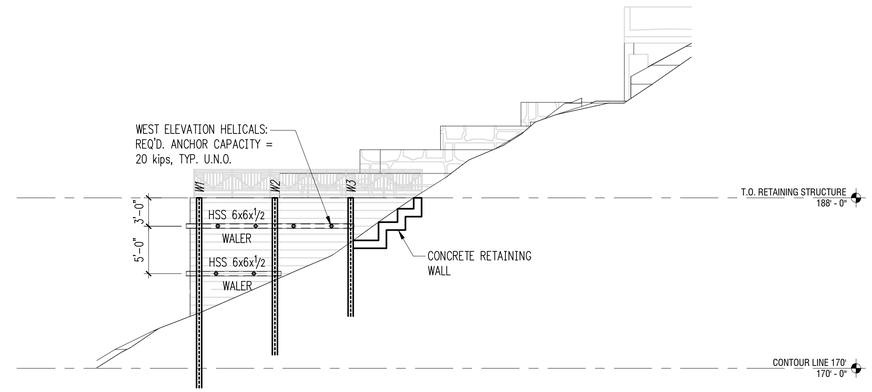
1. DO NOT SCALE DRAWINGS. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
2. REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.
3. ESTIMATED TOP OF PILE ELEVATIONS ARE PROVIDED FOR REFERENCE ONLY. CONTRACTOR TO VERIFY FINAL ELEVATIONS.

Legend

- ◆ HELICAL ANCHOR LOCATION

East Shoring Wall Elevation

Scale: 1/8" = 1'–0"



Notes

1. DO NOT SCALE DRAWINGS. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
2. REFER TO GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.
3. ESTIMATED TOP OF PILE ELEVATIONS ARE PROVIDED FOR REFERENCE ONLY. CONTRACTOR TO VERIFY FINAL ELEVATIONS.

Legend

- ◆ HELICAL ANCHOR LOCATION

West Shoring Wall Elevation

Scale: 1/8" = 1'–0"

STRUCTURAL ENGINEERING
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DAN J. SAY — STATE OF WASHINGTON — 53000 — REGISTERED PROFESSIONAL ENGINEER

DRAWN: NHD
DESIGN: BDM
CHECKED: BDM
APPROVED: DJS

REVISIONS:

DPD:

PROJECT TITLE:
8100 North Garden
8100 Evergreen Lane
Mercer Island, WA 98040

ARCHITECT:
SHKS Architects
1050 N 38th St.
Seattle, WA 98103
PH 206 675 9151

ISSUE:
Permit

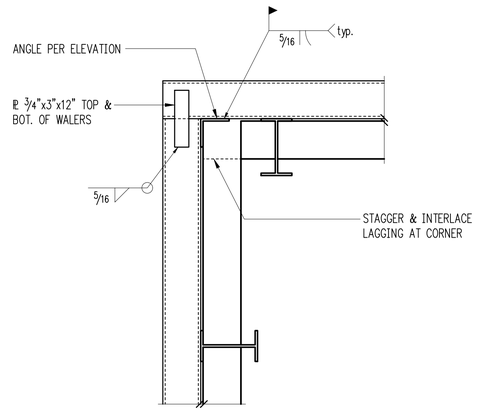
SHEET TITLE:
Shoring Elevations

SCALE: 1/8" = 1'-0" U.N.O.
DATE: May 10, 2017
PROJECT NO: 00099-2017-08
SHEET NO:
SH3

Exhibit 1

1

2



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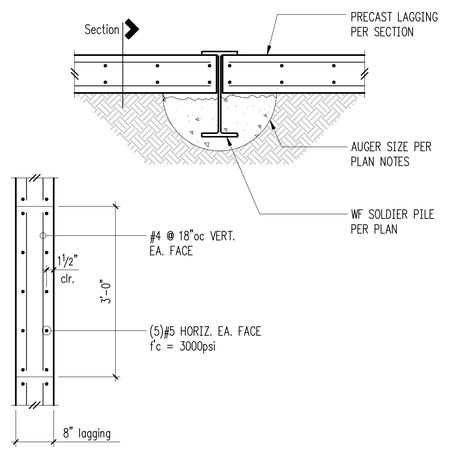

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5

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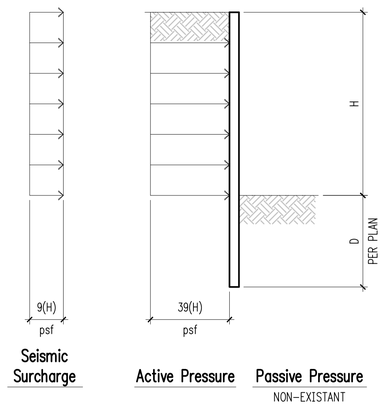
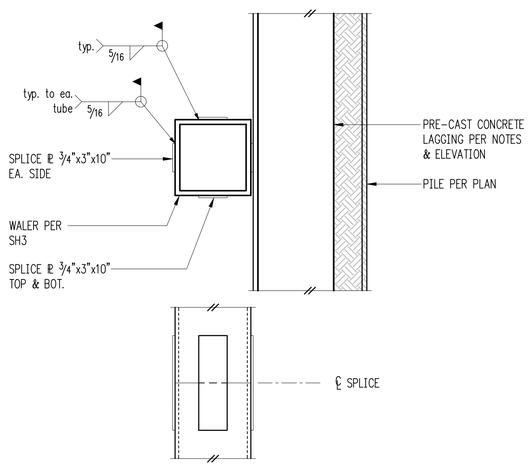
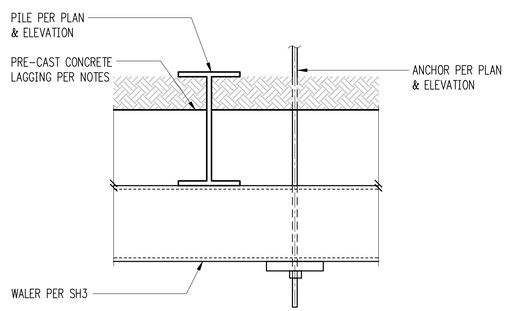
7



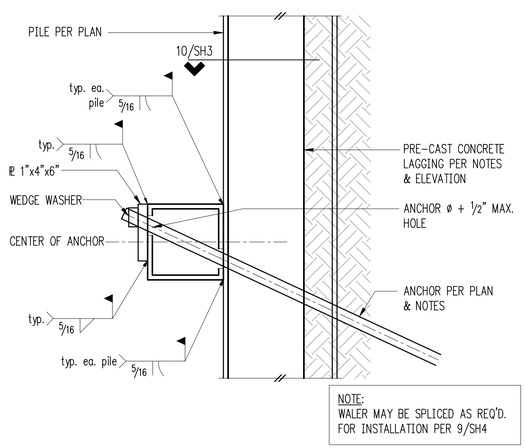
Design Pressure Diagram 8



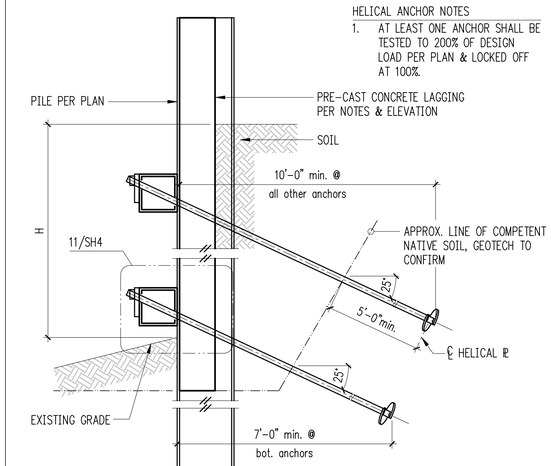
Plan Typical Waler Splice Section 1½" = 1'-0" 9



1½" = 1'-0" 10



1½" = 1'-0" 11



12

STRUCTURAL ENGINEERING
2124 Third Avenue - Suite 100 - Seattle, WA 98121
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DAN J. SAY STATE OF WASHINGTON 23000 REGISTERED PROFESSIONAL ENGINEER

DRAWN: NHD
DESIGN: BDM
CHECKED: BDM
APPROVED: DJS

REVISIONS:

DPD:

PROJECT TITLE:
8100 North Garden
8100 Evergreen Lane
Mercer Island, WA 98040

ARCHITECT:
SHKS Architects
1050 N 38th St.
Seattle, WA 98103
PH 206 675 9151

ISSUE: Permit

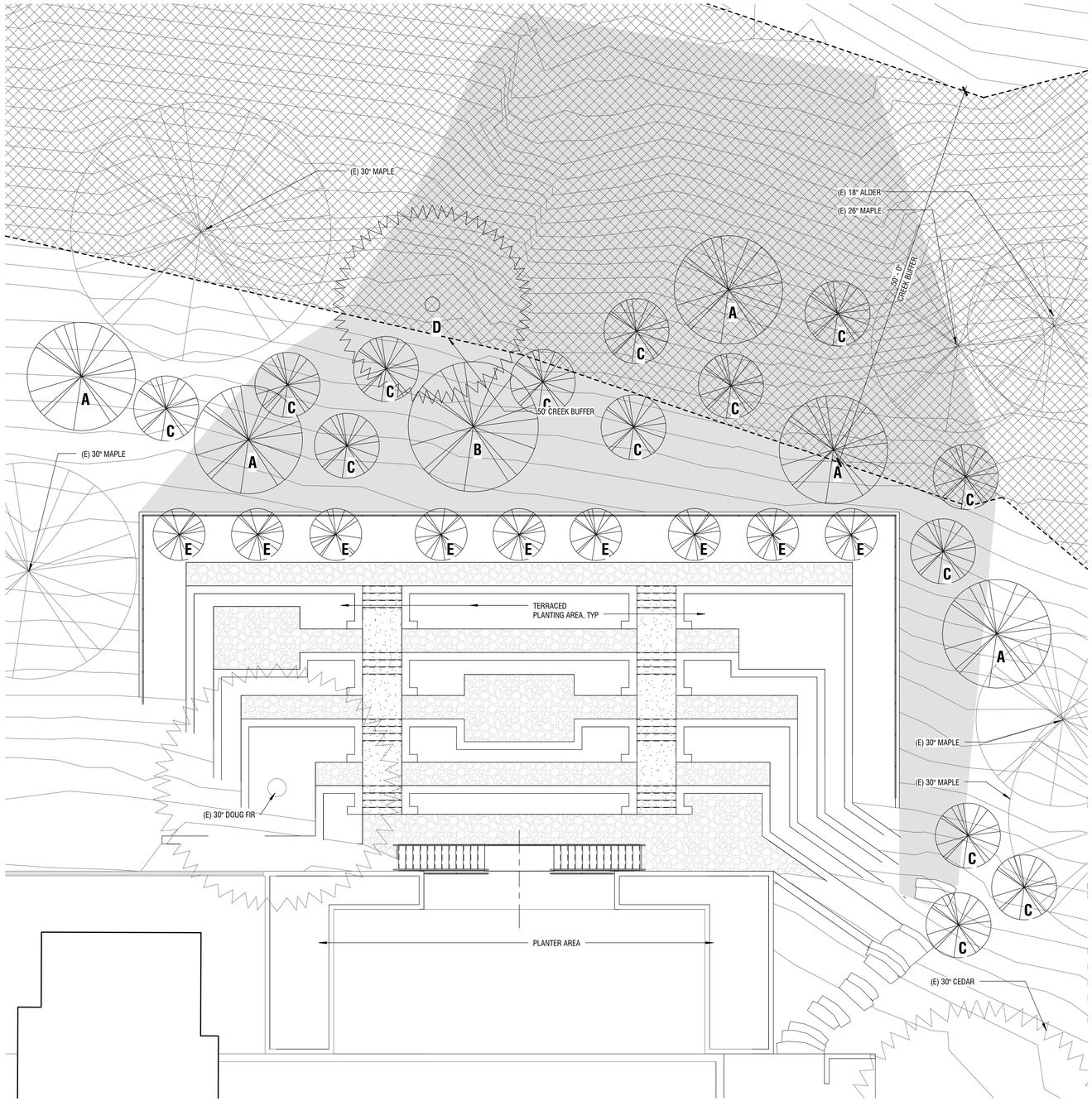
SHEET TITLE: Shoring Details

SCALE: 3/4" = 1'-0" U.N.O.
DATE: May 10, 2017
PROJECT NO: 00099-2017-08
SHEET NO: SH4

Exhibit 1

KEY	NAME	QTY	SIZE
A	BETULA PAPYRIFERA	5	3.5 " CAL
B	ALNUS RUBRA OR ACER MACROPHYLLUM	2	1.75 " CAL
C	ACER CIRCINATUM	14	3" CAL
D	THUJA PLICATA	1	16' HT
E	COMMON APPLE	9	1" CAL
	POLYSTICHUM MUNITUM	300	1 GALLON - SPACED APPROX 15" O.C.

PLANTING LEGEND
1/4" = 1'-0"



1 Garden Plan Planting Plan
1/8" = 1'-0"

5/19/2017 11:11:37 AM

SHKS ARCHITECTS

1050 N. 38th St.
Seattle, WA 98103
PH. 206.675.9151
www.shksarchitects.com

5158 REGISTERED ARCHITECT JONATHAN H. HARTUNG STATE OF WASHINGTON

8100
NORTH GARDEN

CRITICAL AREA DETERMINATION

8100 EVERGREEN LANE
MERCER ISLAND WA 98040

Drawn by: Author
Checked: Checker
Date: 5/18/17
Scale: As indicated

Revisions:
No. Date Remarks

PLANTING PLAN

L2.1

Exhibit 1

CITY OF MERCER ISLAND

DEVELOPMENT SERVICES GROUP

9611 SE 36TH STREET | MERCER ISLAND, WA 98040
PHONE: 206.275.7605 | www.mercergov.org

CITY USE ONLY		
PERMIT #	RECEIPT #	FEE
Date Received:		

DEVELOPMENT APPLICATION

Received By:

STREET ADDRESS/LOCATION	ZONE
8100 EVERGREEN LANE	R15
COUNTY ASSESSOR PARCEL #'S: 8057000012, 8057000014	PARCEL SIZE (SQ. FT.): 71000, 28646 (99646 COMBINED)

PROPERTY OWNER *(required)*	ADDRESS *(required)*	CELL/OFFICE *(required)*
JEFF SANDERSON	8100 EVERGREEN LANE MERCER ISLAND 98040	425 749 5130 E-MAIL *(required)* JEFF@SANDERSON.ORG
PROJECT CONTACT NAME CASSIDY ZIMMERMAN	ADDRESS SHKS ARCHITECTS 1050 N 38TH ST SEATTLE WA 98103	CELL/OFFICE 206 224 3323 E-MAIL CASSIDYZ@SHKSARCHITECTS.COM
TENANT NAME	ADDRESS	CELL PHONE E-MAIL

DECLARATION: I HEREBY STATE THAT I AM THE OWNER OF THE SUBJECT PROPERTY OR I HAVE BEEN AUTHORIZED BY THE OWNER(S) OF THE SUBJECT PROPERTY TO REPRESENT THIS APPLICATION, AND THAT THE INFORMATION FURNISHED BY ME IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

SIGNATURE _____ DATE 05/18/17

PROPOSED APPLICATION(S) AND CLEAR DESCRIPTION OF PROPOSAL (PLEASE USE ADDITIONAL PAPER IF NEEDED):

Application for critical area determination (building permit to follow): mitigation and landslide repair on steep slope including construction of a shoring wall to retain a 5000 sf tiered garden area with stack stone walls (less than 30") and improvements of site access to lower ravine with paths. Main shoring wall to be constructed of steel piers with concrete lagging. A steel guardrail and stair will be installed at upper parking deck with modifications to existing planter to correct drainage. Existing storm water detention and dispersal system will be reconnected and repaired, with additional drainage at shoring wall to reduce subgrade water sheeting and mitigate risk of future landslides at this area. Area of construction is all over 50% slope, overall site slope is 27%. SEPA CHECKLIST PROVIDED PER ADVICE OF DON COLE/EVAN MAXIM, BUT WE DON'T BELIEVE THIS SHOULD QUALIFY FOR SEPA REVIEW

CHECK TYPE OF LAND USE APPROVAL REQUESTED:

APPEALS
- ☐ Building (+cost of file preparation)
- ☐ Land use (+cost of verbatim transcript)
- ☐ Code Interpretation

CRITICAL AREAS
- ☒ Determination
- ☐ Reasonable Use Exception

DESIGN REVIEW
- ☐ Administrative Review
- ☐ Design Review – **Major**
- ☐ Design Review – **Minor**
- ☐ Wireless Communications Facilities-6409 Exemption
- ☐ New Wireless Communications Facility

DEVIATIONS
- ☐ Changes to Antenna requirements
- ☐ Changes to Open Space
- ☐ Fence Height
- ☐ Critical Areas Setback

DEVIATIONS Continued
- ☐ Impervious Surface (5% Lot overage)
- ☐ Shoreline
- ☐ Wet Season Construction Moratorium

ENVIRONMENTAL REVIEW (SEPA)
- ☒ Checklist: Single Family Residential Use
- ☐ Checklist: Non-Single Family Residential Use
- ☐ Environmental Impact Statement

SHORELINE MANAGEMENT
- ☐ Exemption
- ☐ Semi-Private Recreation Tract (modification)
- ☐ Semi-Private Recreation Tract (new)
- ☐ Substantial Dev. Permit

SUBDIVISION LONG PLAT
- ☐ Long Plat
- ☐ Subdivision Alteration to Existing Plat
- ☐ Final Subdivision Review

SUBDIVISION SHORT PLAT
- ☐ Short Plat

SUBDIVISION SHORT PLAT Continued
- ☐ Deviation of Acreage Limitation
- ☐ Short Plat Amendment
- ☐ Final Short Plat Approval

VARIANCES (Plus Hearing Examiner Fee)
- ☐ Type 1**
- ☐ Type 2***

OTHER LAND USE
- ☐ Accessory Dwelling Unit
- ☐ Code Interpretation Request
- ☐ Comprehensive Plan Amendment (CPA)
- ☐ Conditional Use (CUP)
- ☐ Lot Line Revision
- ☐ Lot Consolidation
- ☐ Noise Exception
- ☐ Reclassification of Property (Rezoning)
- ☐ ROW Encroachment Agreement (*requires separate ROW Use Permit*
- ☐ Zoning Code Text Amendment

***Includes all variances of any type or purpose in all zones other than single family residential zone: B,C-O,PBZ,MF-2,MF2L,MF-2L, MF-3,TC,P)*

****Includes all variances of any type or purpose in single family residential zone: R-8.4, R-9.6, R-12, R-15)*

Exhibit 2

GEOTECH
CONSULTANTS, INC.

2401 10th Ave E
Seattle, Washington 98102
(425) 747-5618 FAX (425) 747-8561

June 16, 2017

JN 16556

Jeff Sanderson
8100 Evergreen Lane
Mercer Island, Washington 98040

via email: jeff@sanderson.org

Subject: **Geotechnical Engineering Study**
Proposed Landslide Repair Project
8100 Evergreen Lane
Seattle, Washington

Dear Mr. Sanderson:

We are pleased to present this geotechnical engineering report for the landslide repair project to be constructed in Mercer Island, Washington. The scope of our services consisted of exploring site surface and subsurface conditions, and then developing this report to provide recommendations for general earthwork and design criteria for repair structures. This work was authorized by your acceptance of our proposal, P-9643, dated November 29, 2016.

A landslide occurred on the north-facing slope on the northeastern portion of the Sanderson property in mid-November. This occurred following a period of significant rainfall, which in one major reason among others that the landslide occurred. This landslide has left an approximately 10-foot-tall, extremely steep slope at the northern edge of an existing, pile-supported parking structure that is located at the top of the slope. A new retaining wall will be needed in the landslide area in order for new soil and landscaping to be placed.

If the scope of the project changes from what we have described above, we should be provided with revised plans in order to determine if modifications to the recommendations and conclusions of this report are warranted.

SITE CONDITIONS

Surface Conditions

The Vicinity Map, Plate 1, illustrates the general location of the Sanderson property on Mercer Island. The Sanderson property located is located on the northern side of Evergreen Lane, which is west of West Mercer Way. The property is relatively flat on its southern and central portions, but a steep slope that is in the range of 80- to 90-feet in height is located on the northern side of the property. A small creek is located at the base of the slope. The landslide, which is about 60 feet wide near the top of the slope and "necks down" to about 35 feet near the bottom, is located on the eastern portion of the northern slope.

Most notably, the top of the recent landslide and previous slope is located directly north of a parking structure mentioned earlier. This northern edge of this structure, which is nearest the top of the slope and landslide, is founded on four, 2-foot-diameter, concrete piles. As noted earlier, an extremely steep slope now exists in this area, which is very near to the piles. Recently, we obtained field notes and summary letter prepared by Terra Associates (a geotechnical engineering company who

previously was involved in the property) of these concrete piles, which were installed in August/September 1993 were obtained. The information in these documents indicate that the four piles that are located under the northern edge of the parking structure (noted as Piles 12 - 15) were drilled into the ground about 20 to 21 feet. It was also noted in the documentation that the piles were embedded approximately 10 to 15 feet in to what Terra Associates believed was competent soil. We have observed the parking structure and the piles numerous times since the landslide, and we have not seen any signs of movement of the structure or the piles.

Subsurface Conditions

The subsurface conditions in the landslide area were recently explored by drilling one test boring at the approximate location shown on the Site Exploration Plan, Plate 2. However, several other test borings were drilled in this area in 1993 prior to the construction of the parking structure; these test borings were contained within a geotechnical engineering study prepared by Terra Associates. Our recent exploration program was based on the proposed construction, anticipated subsurface conditions based on the previous test borings and those encountered during exploration, and the scope of work outlined in our proposal.

The Terra Associate's study indicated that two test borings had been drilled at that time in the area of the parking structure. The location of these test borings is also shown on Plate 2. These test borings indicated that loose fill and native silty soils in the range of 10 to 12 feet were revealed overlying competent, native silty soil. On November 16, 2016, our personnel traversed the landslide area and used a shovel to expose soils in the landslide area near the northern edge of the parking structure. We observed that, in general, there was about 7 feet of loose fill soil overlying about 4 feet of loose/soft native silt soil. More competent silt soil was seen under these upper loose/soft soils; thus, the soils we observed were very similar to the soil conditions noted in the 1993 test borings. The logs of the two notable test borings are included in the Appendix of this study.

A recent test boring was drilled on December 8, 2016 using a portable Acker drill -- this drill system utilizes a small, gasoline-powered engine to advance a hollow-stem auger to the sampling depth. Samples were taken at approximate 2.5- to 5-foot intervals with a standard penetration sampler. This split-spoon sampler, which has a 2-inch outside diameter, is driven into the soil with a 140-pound hammer falling 30 inches. The number of blows required to advance the sampler a given distance is an indication of the soil density or consistency. A geotechnical engineer from our staff observed the drilling process, logged the test borings, and obtained representative samples of the soil encountered. The recent Test Boring Log is attached as Plate 2. The test boring was drilled just outside of the eastern edge of the recent landslide (the landslide area was covered in plastic, so we could not drill within the landslide area). The soil revealed in the test boring was quite similar to the 1993 test borings, but not including the upper fill soil; it appears that this portion of the slope did not have fill soil placed on it. The upper, approximate 4 feet of soil revealed in the recent test boring consisted of loose, native, somewhat sandy silt soil. This loose was underlain by medium-dense to dense silt soil to a depth of approximately 13 feet. The silt below this level was either hard or dense to very dense down to a maximum explored depth of 21.5 feet.

Some groundwater could readily be seen on November 16, 2016 in the landslide area flowing beneath the loose/soft soils and perched on the surface of the more competent silt soil. However, no groundwater seepage in the recent test boring drilled on December 8, 2016. Therefore, it appears that the groundwater seepage that perches on the more competent silt soil occurs follows a period(s) of significant rainfall.

The stratification lines on the logs represent the approximate boundaries between soil types at the exploration locations. The actual transition between soil types may be gradual, and subsurface conditions can vary between exploration locations. The logs provide specific subsurface information only at the locations tested. Where a transition in soil type occurred between samples in the borings, the depth of the transition was interpreted. The relative densities and moisture descriptions indicated on the test boring log are interpretive descriptions based on the conditions observed during excavation drilling.

SEISMIC CONSIDERATIONS

In accordance with the International Building Code (IBC), the site class within 100 feet of the ground surface is best represented by Site Class Type D (Stiff Site Soil Class). As noted in the USGS website, the mapped spectral acceleration value for a 0.2 second (S_s) and 1.0 second period (S_1) equals 1.42g and 0.44g, respectively.

The IBC and ASCE 7 require that the potential for liquefaction (soil strength loss) be evaluated for the peak ground acceleration of the Maximum Considered Earthquake (MCE), which has a probability of occurring once in 2,475 years (2 percent probability of occurring in a 50-year period). The MCE peak ground acceleration is adjusted for site class effects (F_{PGA}) and equals .586g. The site soils are not susceptible to seismic liquefaction because of their dense nature and/or the absence of near-surface groundwater under the ground motions of the MCE.

Sections 1803.5 of the IBC and 11.8 of ASCE 7 require that other seismic-related geotechnical design parameters (seismic surcharge for retaining wall design and slope stability) include the potential effects of the Design Earthquake. The peak ground acceleration for the Design Earthquake is defined in Section 11.2 of ASCE 7 as two-thirds (2/3) of the MCE peak ground acceleration, or 0.39g.

SLOPE STABILITY ANALYSIS

We have conducted a slope stability analysis in the area where the slide where the recent landslide occurred, and the project wall and improvements are proposed. This analysis was done with the assistance of the computer program SLOPE/W.

There are essentially only two soil types that exist in this project area; the upper soil consists of loose fill and/or native soil, while the core soil of the slope is the underlying, dense silt soil. Soil parameters were needed in the analysis for both of these soils, with most significant being the internal angle of friction and cohesion value for the dense soil; we have used 40 degrees and 250 psf in the analysis, respectively. Other appropriate soil parameters were chosen for the soils, as are noted on cross-sections used in the computer analysis that are included in the Appendix of this report.

Using the soil parameters determined as noted above, and including the new project wall (which will include piles and anchors as is noted in subsequent sections of this report), the stability of the slope and project area was analyzed for both the future static and dynamic loading conditions. For the dynamic analysis, a peak ground coefficient of acceleration of 0.19g was used, which is one-half of the peak ground acceleration noted above earlier. The slope configuration and parameters are included in the analysis information shown in the Appendix. A safety factor of 1.7 was obtained for a static condition and 1.2 was obtained for a seismic condition, as is noted in the analysis information.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

THIS SECTION CONTAINS A SUMMARY OF OUR STUDY AND FINDINGS FOR THE PURPOSES OF A GENERAL OVERVIEW ONLY. MORE SPECIFIC RECOMMENDATIONS AND CONCLUSIONS ARE CONTAINED IN THE REMAINDER OF THIS REPORT. ANY PARTY RELYING ON THIS REPORT SHOULD READ THE ENTIRE DOCUMENT.

The test borings drilled in 1993 prior to the construction of the parking structure, as well as the recent test boring drilled in the hillside north of the parking structure and outside of the landslide indicate that the core of the hillside consists of competent, native silt soil. The recent test boring outside of the landslide area revealed approximately 4 feet of loose/soft, native silt soil at the ground surface; this amount of loose soil is common for native slopes in Mercer Island and the Puget Sound region. The 1993 test borings revealed up to approximately 7 feet of loose fill soil overlying the loose/soft native silt soil; we observed this fill and silt overlying competent silt in the steep soil exposure than now exists just north of the parking structure. It is apparent that, where the landslide occurred, the fill soil most of the loose/soft silt soil slid down the hillside. With the exception of the exposure, it appears that the competent silt is now close to the existing ground surface where the landslide occurred because the upper loose/soft soils slid away. We have discussed with the owner, design team, and construction team that several factors likely caused the landslide, with one being heavy precipitation that fell just prior to the landslide.

There was an approximate 4- to 5-foot-wide flat bench at the top of the slope adjacent to the northern side of the parking structure prior to the slide. Although we have seen no evidence of instability of the parking structure and its concrete columns, we believe that the bench should be put back to near its original grade to provide long-term stability to the structure and piles. To do this, fill soil and a retaining wall is needed downslope of the structure and piles. The overall new slope inclination between the edge of the top bench and the retaining wall should be no steeper 2:1 (H:V), so the height of the wall should correspond to this inclination. The lower retaining wall will be the most significant part of this project from a geotechnical engineering standpoint, and we have provided design parameters for the needed retaining wall further in this report. Some terracing and the construction of smaller "landscape" walls can be constructed between the top bench and the retaining wall provided the height of the retaining wall is such that an overall 2:1 (H:V) inclination is maintained.

Construction of the retaining wall will be difficult due to very limited access to the slope north of the parking structure. If access is possible to large equipment, it appears that a soldier-pile-installed retaining wall would be the most likely wall type; the soldier piles provide a considerable lateral strength needed for the wall depending on their depth. However, even if soldier piles can be used, it is very likely that anchors will be needed in addition to the piles to provide additional lateral strength for this project. Either helical anchors or tied-back anchors could be used for this project. If large equipment cannot be used for this project, small soldier piles should that are placed into excavated holes should still be used, but cannot be relied upon for lateral strength. We recommend that the minimum depth that the soldier piles be installed to is 5 feet below the existing ground surface. A passive resistance can be included for the soldier piles in the design of the project wall below a level that is 3 feet below the ground surface. An ultimate passive pressure of 275 pcf should be used in the design; appropriate safety factors need to be included in the design of the wall using this value.

As was noted in the earlier ***Slope Stability Analysis*** section of this report, safety factors of 1.7 and 1.2 was obtained for static and dynamic conditions of the slope area that includes the new project

improvements. In our opinion, these safety factors are suitable for long-term stability of the slope once the improvements are constructed.

As noted earlier, an existing elevated parking structure is directly upslope and south of the landslide area. It appears that this structure was stable prior to the landslide, and as we discussed in a letter dated December 13, 2016, and based on more recent observations we have made of the structure, it appears to still be stable. Once the proposed structure is constructed below and north of the parking structure, the parking structure will be even more stable; we believe that it will be more stable than it was prior to the landslide.

We understand that part of an existing trash enclosure will likely be removed as part of the construction. When rebuilt, one new footing is needed for the structure. Provided the footing is placed on the stiff silt soil, we believe the use of a footing is very suitable. A bearing capacity of 3,000 psf can be used for the design of the footing for the rebuilt trash enclosure.

The City of Mercer Island requires a "statement of risk" with regards to the project because it is located in a Geologic Hazard Area. As such we make the following statement:

> The proposed development has been designed so that the risk to the lot and adjacent property is mitigated such that the project is determined to be safe.

Geotech Consultants, Inc. should be allowed to review the final development plans to verify that the recommendations presented in this report are adequately addressed in the design. Such a plan review would be additional work beyond the current scope of work for this study, and it may include revisions to our recommendations to accommodate site, development, and geotechnical constraints that become more evident during the review process.

We recommend including this report, in its entirety, in the project contract documents. This report should also be provided to any future property owners so they will be aware of our findings and recommendations.

RETAINING WALL DESIGN

This section discusses a new retaining wall that will retrain fill soil with an overall inclination of 2:1 (H:V). As noted earlier, anchors are very likely needed for lateral restraint of the wall. The most important parameter for the design of the retaining wall is active pressure. If one anchor is used for the wall, the wall is not considered restrained and the active pressure would be triangular. However, if two or more anchors are used, the wall would be considered restrained and a rectangular pressure of should be used.

The following recommended parameters should be used:

PARAMETER	VALUE
Active Earth Pressure * - one anchor	60 pcf
Active Earth Pressure ** - two or more anchors	39H psf
Soil Unit Weight	140 pcf

*** pcf is Pounds per Cubic Foot, and the Active Earth Pressure is computed using the Equivalent Fluid Pressures.**
**** psf is Pounds per Square Foot, and H is the Wall Height**

As noted in the ***General*** section of this report, for the soldier piles used in the wall design, we recommend that the minimum depth that the soldier piles be installed to is 5 feet below the existing ground surface. A passive resistance can be included for the soldier piles in the design of the project wall below a level that is 3 feet below the ground surface. An ultimate passive pressure of 275 pcf should be used in the design. A safety factor of 1.5 should be used in the static design of the retaining wall.

Wall Pressures Due to Seismic Forces

The surcharge wall loads that could be imposed by the design earthquake can be modeled by adding a uniform lateral pressure to the above-recommended active pressure. The recommended surcharge pressure is 9**H** pounds per square foot (psf), where **H** is the design retention height of the wall. Using this increased pressure, the safety factor against sliding and overturning can be reduced to 1.2 for the seismic analysis.

HELICAL ANCHORS

Helical anchors are a very suitable alternative to provide lateral resistance/strength to the retaining wall where only hand or very small equipment can be used. Helical anchors consist of single or multiple helixes that are rotated into the ground on the end of round or square metal shafts. The design capacity of single helix anchors is the allowable soil bearing capacity on the helix area. Multiple-helix anchors are typically assumed to have a design capacity equal to the sum of the allowable bearing capacity on each helix, if they are separated more than three helix diameters.

We recommend the minimum diameter of a single helix anchor is 10 inches. The ultimate capacity of the anchor in tension or compression can be estimated roughly by multiplying the installation torque by 10. We recommend that the helix be installed at least 5 feet into competent native soil. A typical anchor capacity for small to mid-size anchors in the site soils is 15 to 20 kips. The minimum length of

The anchors should be installed at an angle ranging from approximately 15 to 25 degrees from horizontal. Anchors in the lower portion of the wall should extend at least 7 feet behind the wall, while any upper anchors should extend at least 10 feet behind the wall.

Anchors should be installed by a specialty contractor familiar with design and installation of chance systems. The contractor can assist with refining the anchor design and details and estimating

capacities for different soil and anchor conditions. At least one anchor should be load tested to at least 200 percent of the design load to verify the allowable capacity.

TIEBACK ANCHORS

We recommend installing tieback anchors at inclinations between 20 and 30 degrees below horizontal. The tieback will derive its capacity from the soil-grout strength developed in the soil behind the no-load zone. The minimum grouted anchor length should be 10 feet. The no-load zone is the area behind which the entire length of each tieback anchor should be located. To prevent excessive loss-of-ground in a drilled hole, the no-load section of the drilled tieback hole should be backfilled with a sand and fly ash slurry, after protecting the anchor with a bond breaker, such as plastic casing, to prevent loads from being transferred to the soil in the no-load zone. The no-load section could be filled with grout after anchor testing is completed.

During the design process, the possible presence of foundations or utilities close to the shoring wall must be evaluated to determine if they will affect the configuration and length of the tiebacks.

Based on the results of our analyses and our experience at other construction sites, we suggest using an adhesion value of 2000 psf in the dense silt to design temporary anchors, This value applies to non-pressure-grouted anchors. Post-grouted anchors can often develop adhesion values that are two to three times higher than that for non-pressure-grouted anchors. These higher adhesion values must be verified by load testing.

Soil conditions, soil-grout adhesion strengths, and installation techniques typically vary over any site. This sometimes results in adhesion values that are lower than anticipated. Therefore, we recommend substantiating the anchor design values by load-testing all tieback anchors. At least two anchors in each soil type encountered should be performance-tested to 200 percent of the design anchor load to evaluate possible anchor creep. Wherever possible, the no-load section of these tiebacks should not be grouted until the performance tests are completed. Unfavorable results from these performance tests could require increasing the lengths of the tiebacks. The remaining anchors should be proof-tested to at least 135 percent of their design value before being "locked off." After testing, each anchor should be locked off at a prestress load of 80 to 100 percent of its design load.

If caving or water-bearing soil is encountered, the installation of tieback anchors will be hampered by caving and soil flowing into the holes. It will be necessary to case the holes, if such conditions are encountered. Alternatively, the use of a hollow-stem auger with grout pumped through the stem as the auger is withdrawn would be satisfactory, provided that the injection pressure and grout volumes pumped are carefully monitored. However, based on the test boring, it is unlikely that caving or water-bearing soils will be encountered.

All drilled installations should be grouted and backfilled immediately after drilling. No drilled holes should be left open overnight.

RETAINING WALL BACKFILL AND WALL DRAINAGE

We understand that organic, topsoil is needed at the surface of portions of the new slope above the new retaining wall to allow new plant and trees to grow. This is suitable in our opinion. However,

structural fill backfill near the existing ground surface needs to consist of coarse, free-draining material containing no organics. This backfill should contain no more than 5 percent silt or clay particles and have no gravel greater than 4 inches in diameter.

As it is possible that groundwater will continue to flow perched on the competent silt soil in the future following significant rainfall events. This water needs to be able to continue to flow through the area in the future. It is important that weep holes be placed near the bottom of the retaining wall to allow water to pass through the base of the wall; we believe that these will be sufficient and no formal footing drain is needed. Depending the material used to face the new retaining wall, a drainage mat may also be needed on the inside of the wall facing. If wood lagging is used, the mat is not needed as small gaps in the lagging can be included in the lagging installation.

It is critical that the wall backfill be placed in lifts and be properly compacted, in order for the above-recommended design earth pressures to be appropriate. The wall design criteria assume that the backfill will be well-compacted in lifts no thicker than 12 inches. The compaction of backfill near the walls should be accomplished with hand-operated equipment to prevent the walls from being overloaded by the higher soil forces that occur during compaction. The section entitled ***General Earthwork and Structural Fill*** contains additional recommendations regarding the placement and compaction of structural fill behind retaining walls.

Compacted fill slopes should not be constructed with an inclination greater than 2:1 (H:V). To reduce the potential for shallow sloughing, fill must be compacted to the face of these slopes. This can be accomplished by overbuilding the compacted fill and then trimming it back to its final inclination. Adequate compaction of the slope face is important for long-term stability and is necessary to prevent excessive settlement of patios, slabs, foundations, or other improvements that may be placed near the edge of the slope.

All permanently exposed slopes should be seeded with an appropriate species of vegetation to reduce erosion and improve the stability of the surficial layer of soil. Topsoil will be placed on regraded slopes to promote growth of vegetation. Proper preparation of the regraded surface, and use of appropriate topsoil is necessary to prevent the topsoil from sliding off the slope. This is most likely to occur following extended wet weather if a silty topsoil is used. On steeper slopes, it may be necessary to "track walk" the slope or cut small grooves across the slope prior to placing the topsoil.

GENERAL EARTHWORK AND STRUCTURAL FILL

Structural fill is defined as any fill, including utility backfill, placed under, or close to, a building, behind permanent retaining or foundation walls, or in other areas where the underlying soil needs to support loads. All structural fill should be placed in horizontal lifts with a moisture content at, or near, the optimum moisture content. The optimum moisture content is that moisture content that results in the greatest compacted dry density. The moisture content of fill is very important and must be closely controlled during the filling and compaction process. The onsite soils should be used as structural fill.

Structural fills placed on sloping ground should be keyed into the competent silt soils. This is typically accomplished by placing and compacting the structural fill on level benches that are cut into the competent soils. The allowable thickness of the fill lift will depend on the material type selected, the compaction equipment used, and the number of passes made to compact the lift. The loose lift thickness should not exceed 12 inches. We recommend testing the fill as it is placed. If the fill is not sufficiently compacted, it can be recompacted before another lift is placed. This eliminates the need to remove the fill to achieve the required compaction.

The non-organic structural fill used for this project should be compacted to at least 95 percent of the Minimum Relative Compaction, where Minimum Relative Compaction is the ratio, expressed in percentages, of the compacted dry density to the maximum dry density, as determined in accordance with ASTM Test Designation D 1557-91 (Modified Proctor).

EXCAVATIONS AND SLOPES

Excavation slopes should not exceed the limits specified in local, state, and national government safety regulations. Temporary cuts to a depth of about 4 feet may be attempted vertically in unsaturated soil, if there are no indications of slope instability. However, vertical cuts should not be made near property boundaries, or existing utilities and structures. Based upon Washington Administrative Code (WAC) 296, Part N, the soil at the subject site would generally be classified as Type B. Therefore, temporary cut slopes greater than 4 feet in height should not be excavated at an inclination steeper than 1:1 (Horizontal:Vertical), extending continuously between the top and the bottom of a cut.

The above-recommended temporary slope inclination is based on the conditions exposed in our explorations, and on what has been successful at other sites with similar soil conditions. It is possible that variations in soil and groundwater conditions will require modifications to the inclination at which temporary slopes can stand. Temporary cuts are those that will remain unsupported for a relatively short duration to allow for the construction of foundations, retaining walls, or utilities. Temporary cut slopes should be protected with plastic sheeting during wet weather. It is also important that surface runoff be directed away from the top of temporary slope cuts. Cut slopes should also be backfilled or retained as soon as possible to reduce the potential for instability. Please note that loose soil can cave suddenly and without warning. Excavation, foundation, and utility contractors should be made especially aware of this potential danger. These recommendations may need to be modified if the area near the potential cuts has been disturbed in the past by utility installation, or if settlement-sensitive utilities are located nearby.

LIMITATIONS

The conclusions and recommendations contained in this report are based on site conditions as they existed at the time of our exploration and assume that the soil and groundwater conditions encountered in the test borings are representative of subsurface conditions on the site. If the subsurface conditions encountered during construction are significantly different from those observed in our explorations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. Unanticipated conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking samples in test borings. Subsurface conditions can also vary between exploration locations. Such unexpected conditions frequently require making additional expenditures to attain a properly constructed project. It is recommended that the owner consider providing a contingency fund to accommodate such potential extra costs and risks. This is a standard recommendation for all projects.

The recommendations presented in this report are directed toward the protection of only the area directly above the new retaining wall. Predicting the future behavior of steep slopes and the potential effects of development on their stability is an inexact and imperfect science that is currently based mostly on the past behavior of slopes with similar characteristics. Landslides and soil movement can occur on unrestrained steep slopes before, during, or after the development of property.

This report has been prepared for the exclusive use of Jeff Sanderson and his representatives, for specific application to this project and site. Our conclusions and recommendations are professional opinions derived in accordance with our understanding of current local standards of practice, and within the scope of our services. No warranty is expressed or implied. The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design. Our services also do not include assessing or minimizing the potential for biological hazards, such as mold, bacteria, mildew and fungi in either the existing or proposed site development.

ADDITIONAL SERVICES

In addition to reviewing the final plans, Geotech Consultants, Inc. should be retained to provide geotechnical consultation, testing, and observation services during construction. This is to confirm that subsurface conditions are consistent with those indicated by our exploration, to evaluate whether earthwork and foundation construction activities comply with the general intent of the recommendations presented in this report, and to provide suggestions for design changes in the event subsurface conditions differ from those anticipated prior to the start of construction. However, our work would not include the supervision or direction of the actual work of the contractor and its employees or agents. Also, job and site safety, and dimensional measurements, will be the responsibility of the contractor.

During the construction phase, we will provide geotechnical observation and testing services when requested by you or your representatives. Please be aware that we can only document site work we actually observe. It is still the responsibility of your contractor or on-site construction team to verify that our recommendations are being followed, whether we are present at the site or not.

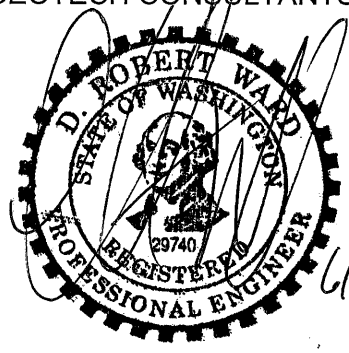
The following plates are attached to complete this report:

Plate 1	Vicinity Map
Plate 2	Site Exploration Plan
Plates 3	Recent Test Boring Log
Appendix A	1993 Test Boring Logs
Appendix B	Slope Stability Analysis

We appreciate the opportunity to be of service on this project. Please contact us if you have any questions, or if we can be of further assistance.

Respectfully submitted,

GEOTECH CONSULTANTS, INC.

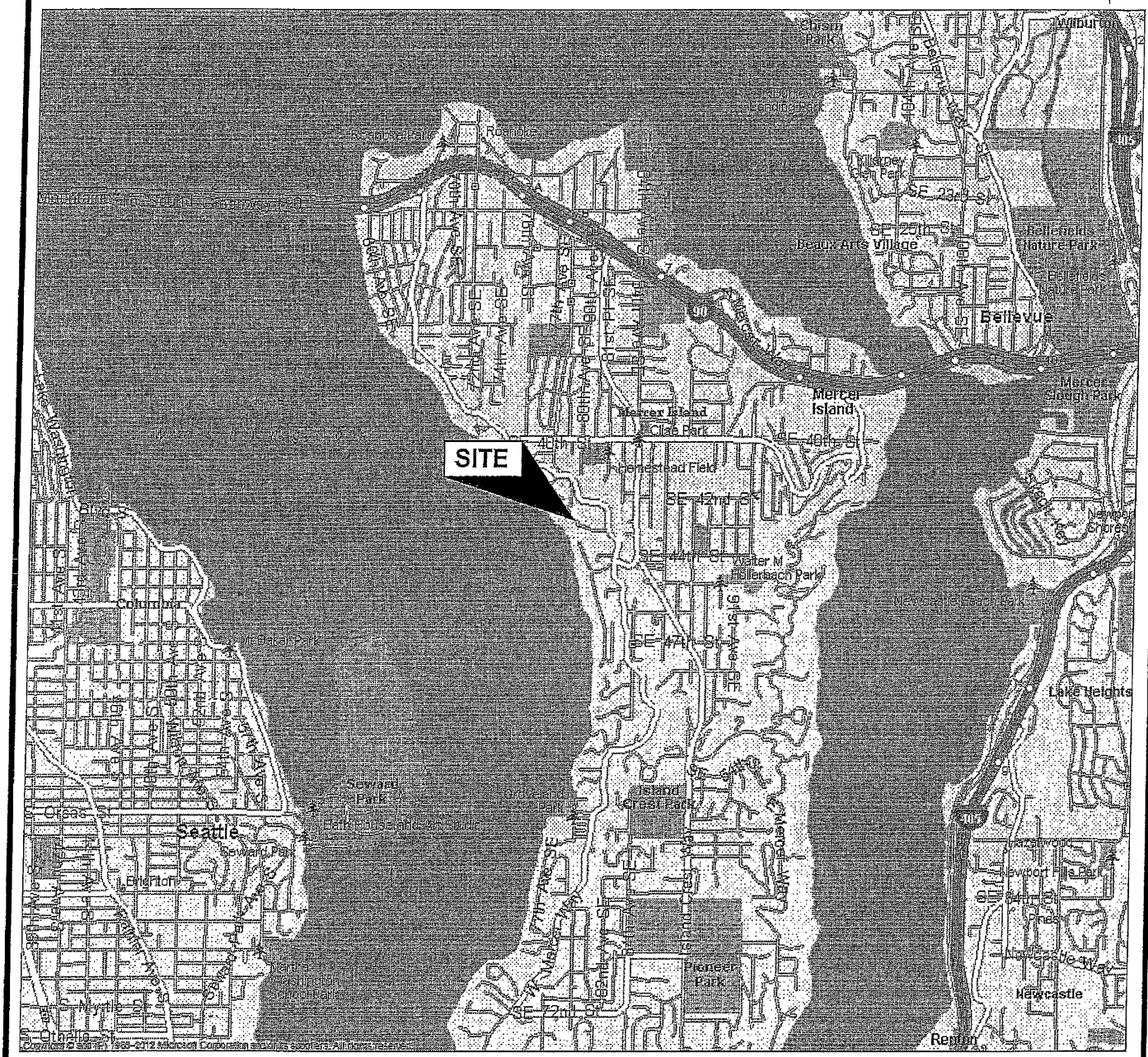


6/16/17

D. Robert Ward, P.E.
Principal

cc: **SHKS Architects** – Jonathon Hartung
via email to: jh@shksarchitects.com

NORTH



(Source: Microsoft MapPoint, 2013)

GEOTECH
CONSULTANTS, INC.

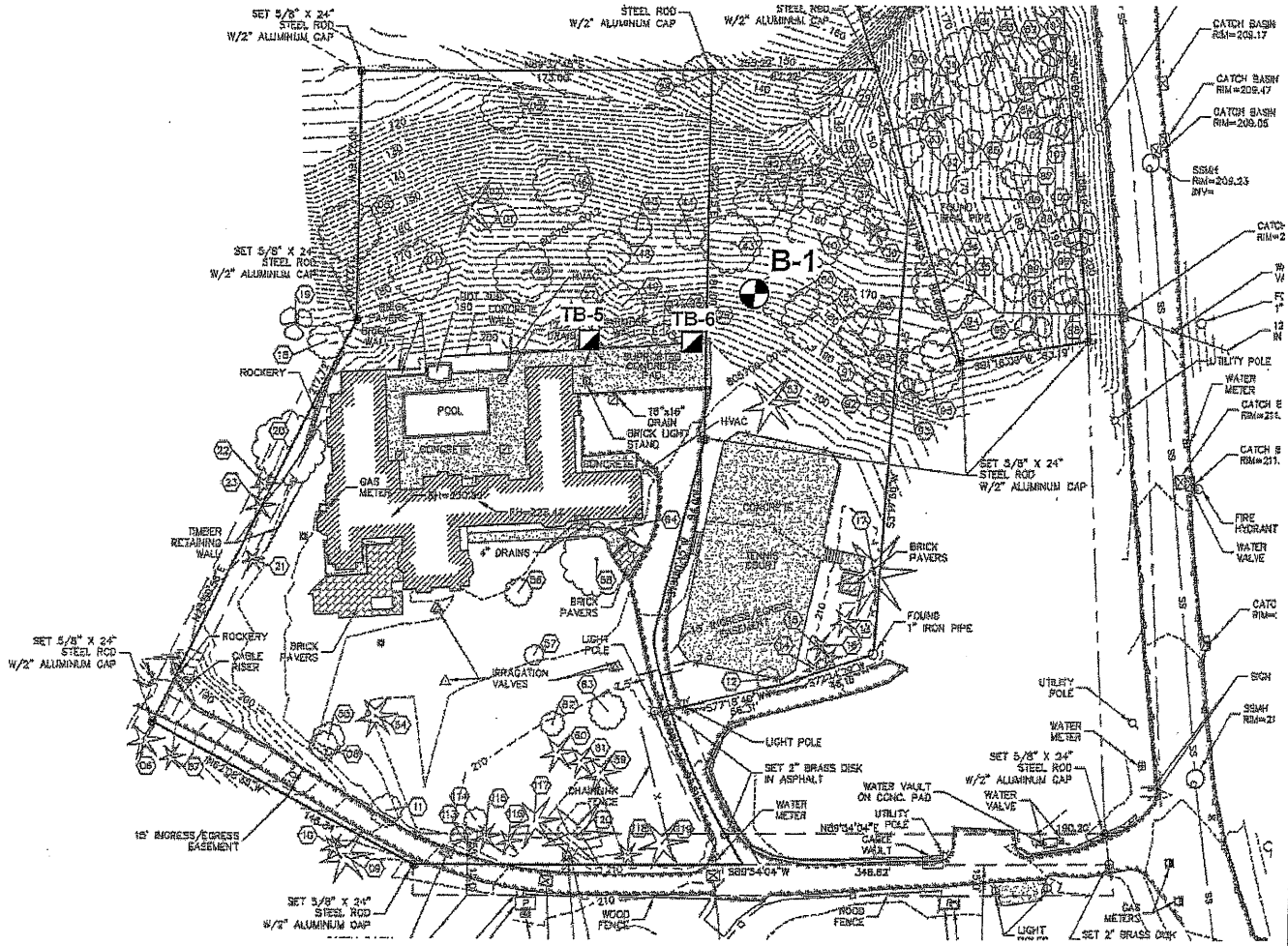
VICINITY MAP

8100 Evergreen Lane
Mercer Island, Washington

Job No:	Date:		Plate:
16556	Dec. 2016		1

Exhibit 3

NORTH



Legend:

- Recent Test Boring Location (approximate)
- 1993 Test Boring Locations (approximate)

GEOTECH CONSULTANTS, INC.

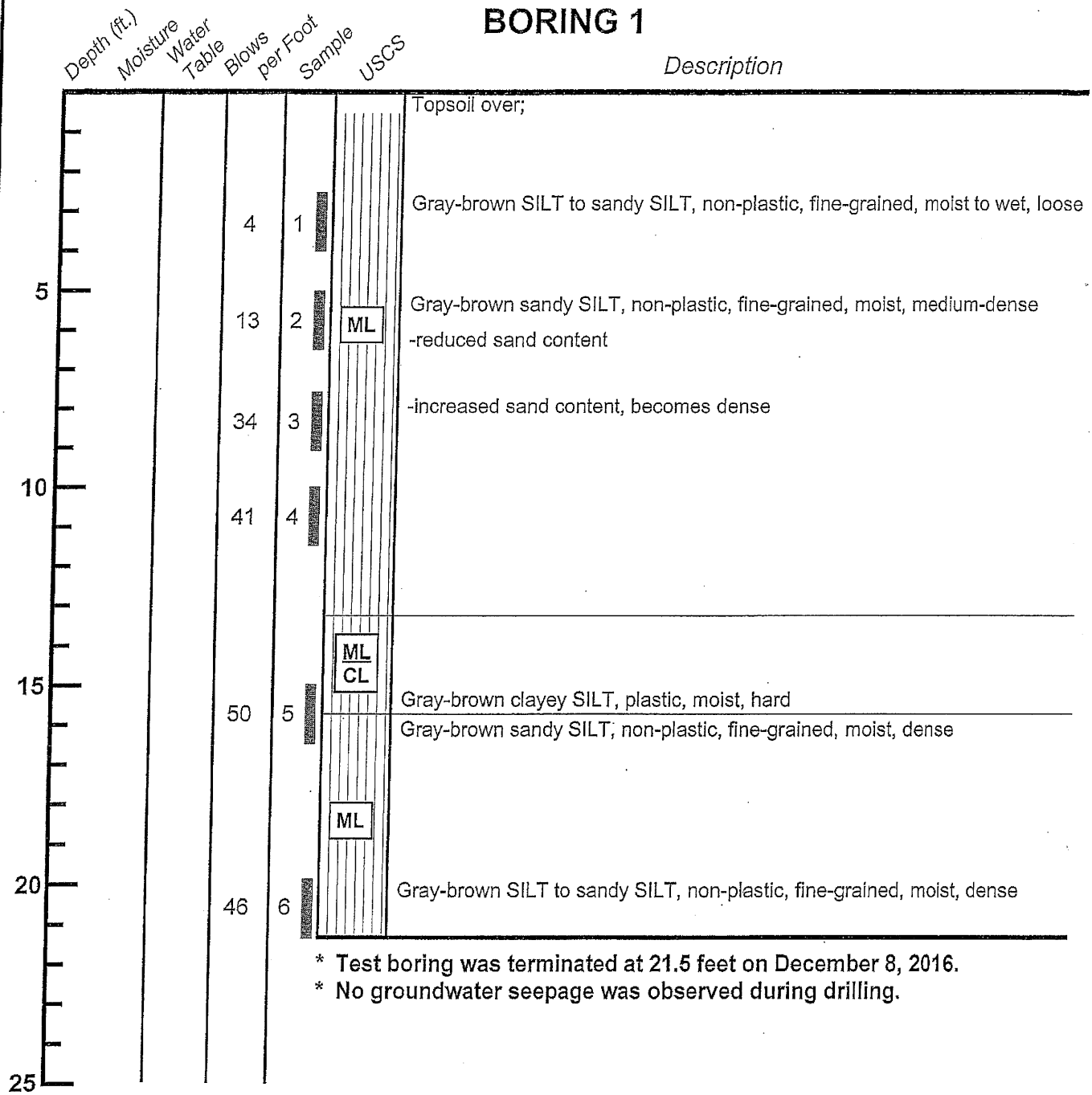
SITE EXPLORATION PLAN

8100 Evergreen Lane
Mercer Island, Washington

Job No:	Date:		Plate:
16556	Jan 2017	No Scale	2

Exhibit 3

BORING 1



* **Test boring was terminated at 21.5 feet on December 8, 2016.**
* **No groundwater seepage was observed during drilling.**

GEOTECH
CONSULTANTS, INC.

TEST BORING LOG

8100 Evergreen Lane
Mercer Island, Washington

Job	Date:	Logged by:	Plate:
16556	Dec. 2016	TRC	3

Appendix A *1993 Test Boring Logs*

Boring No. B-5

Logged by: DRK

Dated: 3-12-93

Approximate Elev. +197

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)
SP SM	FILL - Black to brown, fine to medium SAND with silt and wood debris, moist.	Loose			17*	20.1
CL	Brown, sandy CLAY with considerable organics (disturbed), damp.	Medium Stiff to Stiff	5		10	20.5
					20	20.1
ML CL	Brown changing to gray, sandy SILT to CLAY with interbedded layers of sand and silty sand, damp.		10		18	26.8
			15		52	26.2

Boring terminated at 16.5 feet.
No groundwater seepage encountered.

*Not representative due to debris.

TERRA ASSOCIATES
Geotechnical Consultants

Boring Log
GAMORAN RESIDENCE
MERCER ISLAND, WASHINGTON

Proj. No. T-2295 Date 3/93 Figure 8

Exhibit 3

Boring No. B-6

Logged by: DRK

Dated: 3-12-93

Approximate Elev. +198

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)
SM	FILL - Dark brown, silty SAND with medium to coarse gravel, wood and glass debris, moist.	Loose			10	21.8
			5		13	8.8
ML CL	Brown, sandy SILT to CLAY with interbedded layers of fine sand and silty sand, dry to damp.	Very Stiff to Hard			23	15.8
			10		58	22.6
					48	23.3

Boring terminated at 13.5 feet.
No groundwater seepage encountered.
Note: Water used to cool bit while drilling from 8 to 13.5 feet.

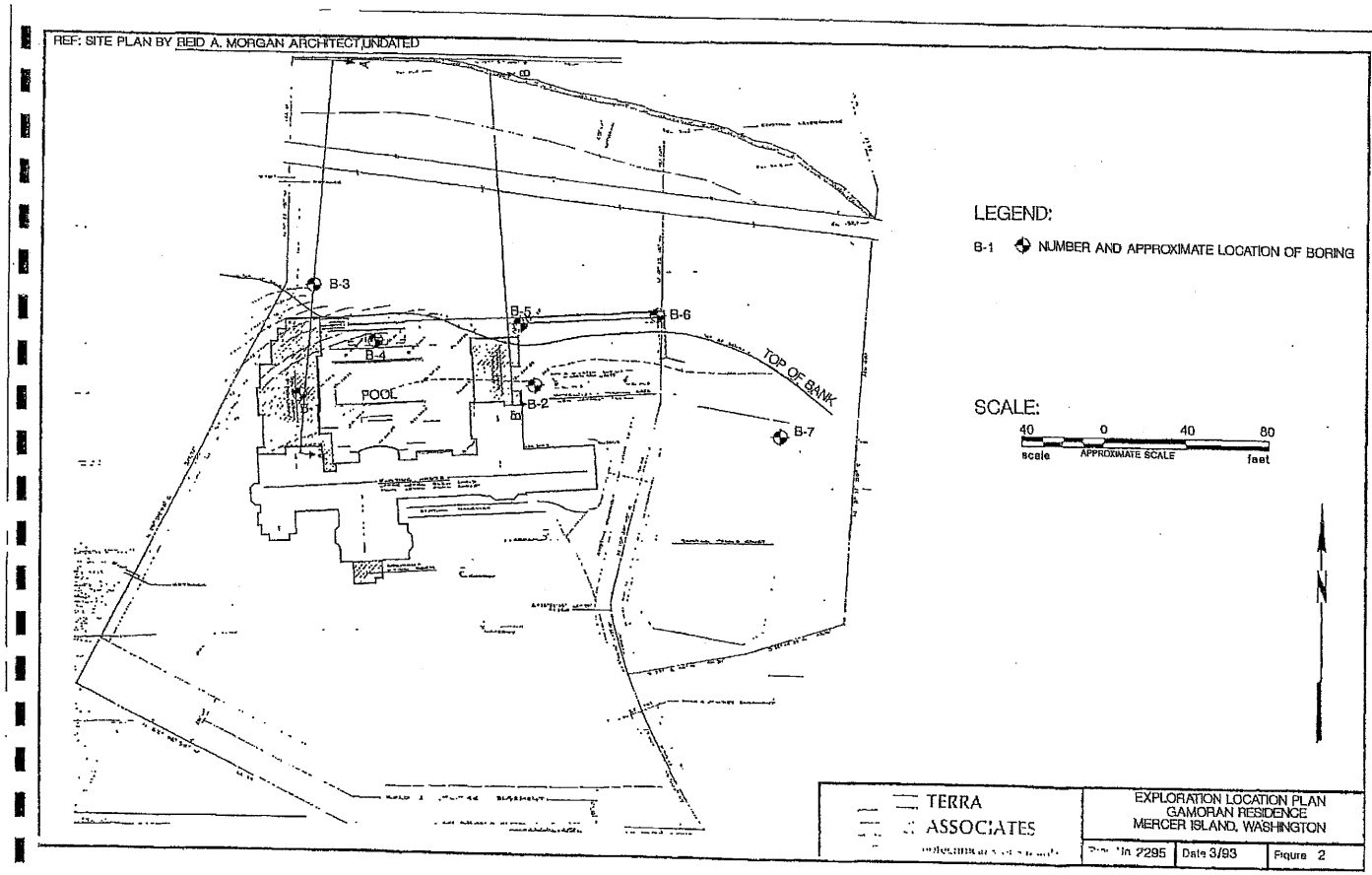
TERRA ASSOCIATES
Geotechnical Consultants

Boring Log
GAMORAN RESIDENCE
MERCER ISLAND, WASHINGTON

Proj. No. T-2295 Date 3/93 Figure 9

Exhibit 3

Exhibit 3


REF: SITE PLAN BY REID A. MORGAN ARCHITECT,UNDATED
B-3
B-5
B-6
B-4
POOL
B-2
TOP OF BANK
B-7
LEGEND:
B-1 NUMBER AND APPROXIMATE LOCATION OF BORING
SCALE:
40 0 40 80
scale APPROXIMATE SCALE feet
N
TERRA ASSOCIATES
EXPLORATION LOCATION PLAN
GAMORAN RESIDENCE
MERCER ISLAND, WASHINGTON
In 2295
Date 3/93
Figure 2

Appendix B *Slope Stability Analysis*

Static

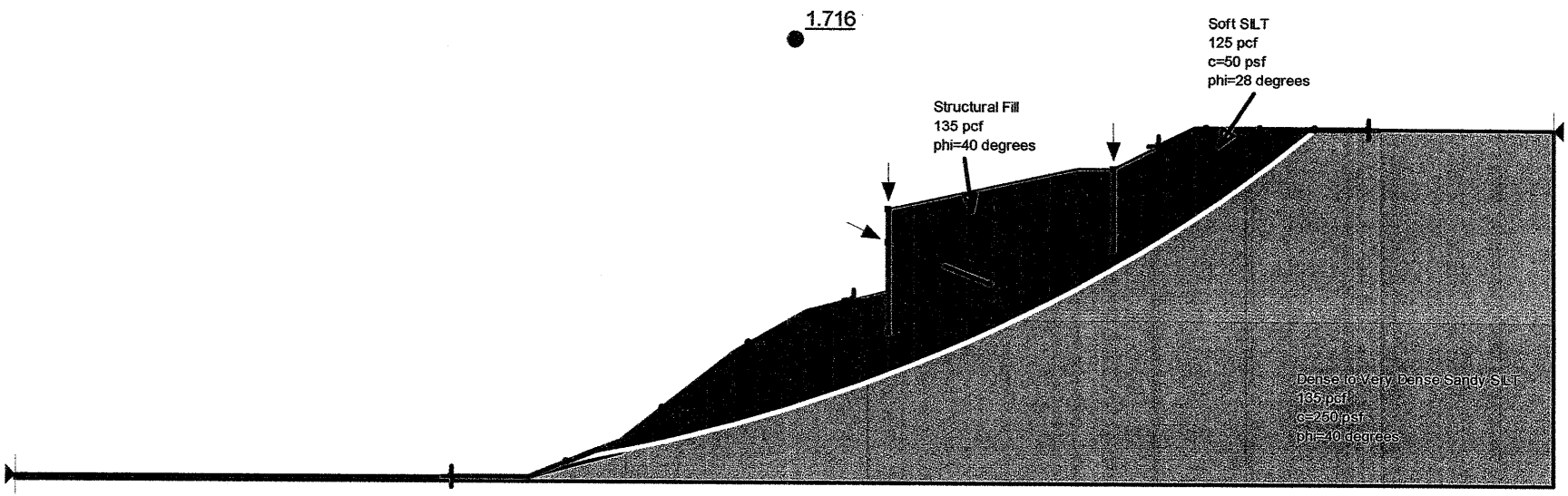


Exhibit 3

Static

File Information

File Version: 8.15
Title: Slope Stability
Created By: Matt McGinnis
Last Edited By: Matt McGinnis
Revision Number: 22
Date: 6/15/2017
Time: 10:57:52 AM
Tool Version: 8.15.4.11512
File Name: Rob's Slope Stability - Piles with backslope.gsz
Directory: \\GEOTECH-SBS\RedirectedFolders\mattm\Desktop\
Last Solved Date: 6/15/2017
Last Solved Time: 10:57:57 AM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

Static

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
    Side Function
        Interslice force function option: Half-Sine
    PWP Conditions Source: (none)
Slip Surface
    Direction of movement: Right to Left
    Use Passive Mode: No
    Slip Surface Option: Entry and Exit
    Critical slip surfaces saved: 1
    Resisting Side Maximum Convex Angle: 1 °

Driving Side Maximum Convex Angle: 5 °
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Soft SILT

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 50 psf
Phi': 28 °
Phi-B: 0 °

Dense to Very Dense Sandy SILT

Model: Mohr-Coulomb
Unit Weight: 135 pcf
Cohesion': 250 psf
Phi': 40 °
Phi-B: 0 °

Lightweight Structural Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 40 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (85, 122) ft
Left-Zone Right Coordinate: (163.5, 165.96875) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (223, 203.625) ft

Right-Zone Right Coordinate: (264, 208) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 122) ft
Right Coordinate: (300, 208) ft

Seismic Coefficients

Horz Seismic Coef.: 0

Reinforcements

Reinforcement 1

Type: Pile
Outside Point: (170, 188) ft
Inside Point: (170, 158) ft
Slip Surface Intersection: () ft
Length: 30 ft
Direction: 90 °
Shear Force: 200,000 lbs
Shear Reduction Factor: 1
Pile Spacing: 4 ft
Shear Option: Parallel to Slip
Shear Force Applied: 50,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft

Reinforcement 2

Type: Anchor
Outside Point: (170, 180) ft
Inside Point: (190, 170) ft
Slip Surface Intersection: () ft
Length: 22.36068 ft
Direction: 153.43 °
F of S Dependent: No
Pullout Resistance: 2,000 psf
Resistance Reduction Factor: 1
Bond Length: 10 ft
Bond Diameter: 1 ft
Anchor Spacing: 4 ft
Force Distribution: Distributed
Anchorage: Yes

Tensile Capacity: 20,000 lbs
Reduction Factor: 1
Shear Force: 10,000 lbs
Shear Reduction Factor: 1
Shear Option: Parallel to Slip
Factored Pullout Resistance: 1,570.7963 lbs/ft
Max. Pullout Force: 5,000 lbs
Factored Tensile Capacity: 5,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft
Available Length: 0 ft
Required Length: 0 ft
Governing Component: (none)

Reinforcement 3

Type: Pile
Outside Point: (214, 198.125) ft
Inside Point: (214, 178.125) ft
Slip Surface Intersection: () ft
Length: 20 ft
Direction: 90 °
Shear Force: 200,000 lbs
Shear Reduction Factor: 1
Pile Spacing: 10 ft
Shear Option: Parallel to Slip
Shear Force Applied: 20,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft

Points

	X (ft)	Y (ft)
Point 1	0	122
Point 2	100	122
Point 3	118	131
Point 4	118	128
Point 5	140	153
Point 6	140	150
Point 7	154	163
Point 8	154	160
Point 9	170	168
Point 10	180	177
Point 11	196	186

Point 12	207	190
Point 13	214	198
Point 14	230	208
Point 15	300	208
Point 16	0	121
Point 17	300	121
Point 18	250	208
Point 19	170	181
Point 20	170	188
Point 21	207	198

Regions

	Material	Points	Area (ft^2)
Region 1	Soft SILT	2,3,5,7,9,8,6,4	159
Region 2	Soft SILT	12,13,14,18	209
Region 3	Dense to Very Dense Sandy SILT	15,17,16,1,2,4,6,8,9,10,11,12,18	11,656
Region 4	Lightweight Structural Fill	20,21,13,12,11,10,9	472

Current Slip Surface

Slip Surface: 17
F of S: 1.716
Volume: 2,993.7133 ft^3
Weight: 391,187.57 lbs
Resisting Moment: 94,819,009 lbs-ft
Activating Moment: 55,264,616 lbs-ft
Resisting Force: 284,260.74 lbs
Activating Force: 165,671.79 lbs
F of S Rank (Analysis): 1 of 125 slip surfaces
F of S Rank (Query): 1 of 125 slip surfaces
Exit: (108.58194, 126.29097) ft
Entry: (253.43632, 208) ft
Radius: 288.78503 ft
Center: (45.137051, 408.02052) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)

Slice 1	110.93646	126.84196	0	68.73381	36.546415	50
Slice 2	115.64549	127.98578	0	213.29069	113.40867	50
Slice 3	118.39214	128.68144	0	316.58395	168.33067	50
Slice 4	121.43624	129.5108	0	579.98566	486.66576	250
Slice 5	126.74017	131.01857	0	1,072.87	900.24486	250
Slice 6	132.0441	132.63675	0	1,548.1966	1,299.0912	250
Slice 7	137.34803	134.36728	0	1,998.0242	1,676.5413	250
Slice 8	142.33333	136.09491	0	2,311.1386	1,939.2755	250
Slice 9	147	137.80854	0	2,490.4707	2,089.753	250
Slice 10	151.66667	139.61424	0	2,642.4667	2,217.2928	250
Slice 11	156.66667	141.6569	0	2,654.5112	2,227.3994	250
Slice 12	162	143.9536	0	2,529.7912	2,122.7469	250
Slice 13	167.33333	146.37916	0	2,383.5024	1,999.996	250
Slice 14	172.5	148.85318	0	4,087.5329	3,429.8473	250
Slice 15	177.5	151.37109	0	3,901.1124	3,273.422	250
Slice 16	182.66667	154.10479	0	3,684.4456	3,091.617	250
Slice 17	188	157.06723	0	3,442.1594	2,888.3147	250
Slice 18	193.33333	160.17984	0	3,197.8853	2,683.3444	250
Slice 19	198.75	163.502	0	2,942.0577	2,468.6795	250

Slice 20	204.25	167.04541	0	2,676.588	2,245.924	250
Slice 21	210.5	171.30622	0	2,321.061	1,947.6014	250
Slice 22	216.66667	175.72029	0	2,054.2559	1,723.7254	250
Slice 23	222	179.75552	0	1,955.8921	1,641.1884	250
Slice 24	227.33333	183.9904	0	1,851.8513	1,553.8878	250
Slice 25	232.5	188.29086	0	1,614.9646	1,355.1162	250
Slice 26	237.5	192.65559	0	1,242.2312	1,042.3557	250
Slice 27	242.5	197.22932	0	852.72175	715.5185	250
Slice 28	247.5	202.02599	0	439.04947	368.40624	250
Slice 29	251.71816	206.24096	0	62.439335	52.392823	250

Seismic

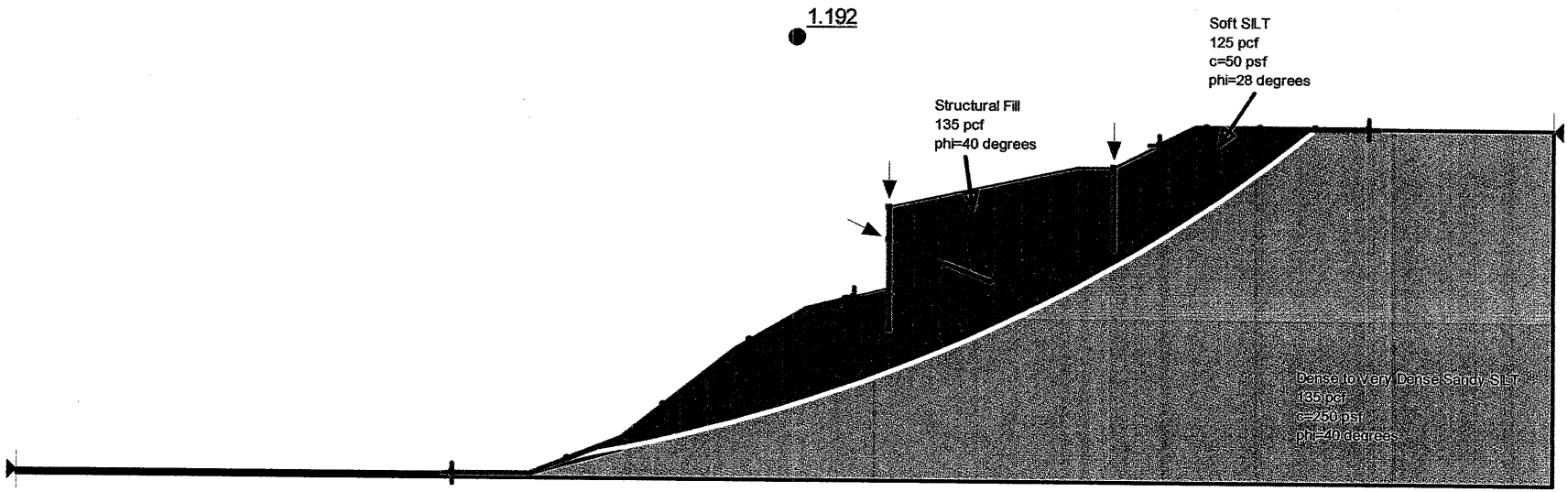


Exhibit 3

Seismic

File Information

File Version: 8.15
Title: Slope Stability
Created By: Matt McGinnis
Last Edited By: Matt McGinnis
Revision Number: 22
Date: 6/15/2017
Time: 10:57:52 AM
Tool Version: 8.15.4.11512
File Name: Rob's Slope Stability - Piles with backslope.gsz
Directory: \\GEOTECH-SBS\RedirectedFolders\mattm\Desktop\
Last Solved Date: 6/15/2017
Last Solved Time: 10:57:57 AM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

Seismic

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
    Side Function
        Interslice force function option: Half-Sine
    PWP Conditions Source: (none)
Slip Surface
    Direction of movement: Right to Left
    Use Passive Mode: No
    Slip Surface Option: Entry and Exit
    Critical slip surfaces saved: 1
    Resisting Side Maximum Convex Angle: 1 °

Driving Side Maximum Convex Angle: 5 °
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Soft SILT

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 50 psf
Phi': 28 °
Phi-B: 0 °

Dense to Very Dense Sandy SILT

Model: Mohr-Coulomb
Unit Weight: 135 pcf
Cohesion': 250 psf
Phi': 40 °
Phi-B: 0 °

Lightweight Structural Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 40 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (85, 122) ft
Left-Zone Right Coordinate: (163.5, 165.96875) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (223, 203.625) ft

Right-Zone Right Coordinate: (264, 208) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 122) ft
Right Coordinate: (300, 208) ft

Seismic Coefficients

Horz Seismic Coef.: 0.19

Reinforcements

Reinforcement 1

Type: Pile
Outside Point: (170, 188) ft
Inside Point: (170, 158) ft
Slip Surface Intersection: () ft
Length: 30 ft
Direction: 90 °
Shear Force: 200,000 lbs
Shear Reduction Factor: 1
Pile Spacing: 4 ft
Shear Option: Parallel to Slip
Shear Force Applied: 50,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft

Reinforcement 2

Type: Anchor
Outside Point: (170, 180) ft
Inside Point: (190, 170) ft
Slip Surface Intersection: () ft
Length: 22.36068 ft
Direction: 153.43 °
F of S Dependent: No
Pullout Resistance: 2,000 psf
Resistance Reduction Factor: 1
Bond Length: 10 ft
Bond Diameter: 1 ft
Anchor Spacing: 4 ft
Force Distribution: Distributed
Anchorage: Yes

Tensile Capacity: 20,000 lbs
Reduction Factor: 1
Shear Force: 10,000 lbs
Shear Reduction Factor: 1
Shear Option: Parallel to Slip
Factored Pullout Resistance: 1,570.7963 lbs/ft
Max. Pullout Force: 5,000 lbs
Factored Tensile Capacity: 5,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft
Available Length: 0 ft
Required Length: 0 ft
Governing Component: (none)

Reinforcement 3

Type: Pile
Outside Point: (214, 198.125) ft
Inside Point: (214, 178.125) ft
Slip Surface Intersection: () ft
Length: 20 ft
Direction: 90 °
Shear Force: 200,000 lbs
Shear Reduction Factor: 1
Pile Spacing: 10 ft
Shear Option: Parallel to Slip
Shear Force Applied: 20,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft

Points

	X (ft)	Y (ft)
Point 1	0	122
Point 2	100	122
Point 3	118	131
Point 4	118	128
Point 5	140	153
Point 6	140	150
Point 7	154	163
Point 8	154	160
Point 9	170	168
Point 10	180	177
Point 11	196	186

Point 12	207	190
Point 13	214	198
Point 14	230	208
Point 15	300	208
Point 16	0	121
Point 17	300	121
Point 18	250	208
Point 19	170	181
Point 20	170	188
Point 21	207	198

Regions

	Material	Points	Area (ft^2)
Region 1	Soft SILT	2,3,5,7,9,8,6,4	159
Region 2	Soft SILT	12,13,14,18	209
Region 3	Dense to Very Dense Sandy SILT	15,17,16,1,2,4,6,8,9,10,11,12,18	11,656
Region 4	Lightweight Structural Fill	20,21,13,12,11,10,9	472

Current Slip Surface

Slip Surface: 17
F of S: 1.192
Volume: 2,993.7133 ft^3
Weight: 391,187.57 lbs
Resisting Moment: 86,804,582 lbs-ft
Activating Moment: 72,807,410 lbs-ft
Resisting Force: 262,090.66 lbs
Activating Force: 219,842.45 lbs
F of S Rank (Analysis): 1 of 125 slip surfaces
F of S Rank (Query): 1 of 125 slip surfaces
Exit: (108.58194, 126.29097) ft
Entry: (253.43632, 208) ft
Radius: 288.78503 ft
Center: (45.137051, 408.02052) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)

Slice 1	110.93646	126.84196	0	66.850393	35.544984	50
Slice 2	115.64549	127.98578	0	210.82851	112.09951	50
Slice 3	118.39214	128.68144	0	311.37821	165.56273	50
Slice 4	121.43624	129.5108	0	618.54009	519.01676	250
Slice 5	126.74017	131.01857	0	1,163.7954	976.54031	250
Slice 6	132.0441	132.63675	0	1,699.1164	1,425.7279	250
Slice 7	137.34803	134.36728	0	2,202.4991	1,848.1162	250
Slice 8	142.33333	136.09491	0	2,547.9358	2,137.972	250
Slice 9	147	137.80854	0	2,733.7591	2,293.8962	250
Slice 10	151.66667	139.61424	0	2,863.9453	2,403.1355	250
Slice 11	156.66667	141.6569	0	2,828.0317	2,373.0004	250
Slice 12	162	143.9536	0	2,635.0422	2,211.0629	250
Slice 13	167.33333	146.37916	0	2,407.0112	2,019.7222	250
Slice 14	172.5	148.85318	0	3,796.9821	3,186.0463	250
Slice 15	177.5	151.37109	0	3,502.2128	2,938.7055	250
Slice 16	182.66667	154.10479	0	3,194.1027	2,680.1704	250
Slice 17	188	157.06723	0	2,884.9586	2,420.7677	250
Slice 18	193.33333	160.17984	0	2,601.6947	2,183.0811	250
Slice 19	198.75	163.502	0	2,335.4513	1,959.6763	250

Slice 20	204.25	167.04541	0	2,086.2235	1,750.5494	250
Slice 21	210.5	171.30622	0	1,786.2358	1,498.8298	250
Slice 22	216.66667	175.72029	0	1,575.2323	1,321.7769	250
Slice 23	222	179.75552	0	1,508.8641	1,266.0873	250
Slice 24	227.33333	183.9904	0	1,447.0167	1,214.1912	250
Slice 25	232.5	188.29086	0	1,282.2043	1,075.8972	250
Slice 26	237.5	192.65559	0	1,001.9684	840.75133	250
Slice 27	242.5	197.22932	0	695.82874	583.86964	250
Slice 28	247.5	202.02599	0	352.26092	295.58201	250
Slice 29	251.71816	206.24096	0	21.980912	18.444175	250

From:	Don Cole
To:	Evan Maxim; Robin Proebsting
Subject:	Sanderson Landslide repair and wall project - 8100 Evergreen CAO17-006
Date:	Friday, July 21, 2017 5:56:11 PM
Attachments:	CAO17-006-SUB2-SUPP(vjp).pdf

Attached are the peer review comments for the subject project review. The CAO permit can be approved with condition that the peer review comments will be satisfactorily resolved as part of the building permit process.

From: Vincent Perrone [mailto:vjperrone@perroneconsulting.com]
Sent: Wednesday, July 19, 2017 4:18 PM
To: Don Cole <Don.Cole@mercergov.org>
Subject: RE: Sanderson Landslide repair and wall project - 8100 Evergreen CAO17-006

Don,

I've reviewed Geotech Consultants, Inc (GCI) 6/16/2017 report and the drawings. In general the proposed slope repair with a tied-back soldier pile wall and slope regrading is appropriate and reasonable. I have marked up the drawing set on your website with my specific comments and I'm attaching my mark-up of the GCI report to this email. The following is a summary of the issues:

1. The design drawing SH1 references GCI report dated 3/29/2017 which I did not receive for review.
2. GCI should provide allowable end bearing capacity for soldier piles based on the proposed embedment depths.
3. Helical anchors are permanent (not temporary as stated on page 7, paragraph 4) and should be specified as galvanized for corrosion protection.
4. GCI report recommends using native soil as structural backfill (page 8, paragraph 6). However, this does not seem practical since they are fine-grained soils and do not satisfy the gradational requirements specified in GCI report (page 8 paragraph 1). The design drawings, however, show imported free-draining granular backfill which is more appropriate.

Let me know if you have questions or need more information.

Regards,

Vinnie

Vincent J. Perrone, Ph.D., P.E.
PERRONE CONSULTING, INC., P.S.
11220 Fieldstone Lane N.E.
Bainbridge Island, WA 98110
Telephone (206) 778-8074, *Fax* (206) 780-5669
Email: vjperrone@perroneconsulting.com
Website: http://perroneconsulting.com

From: Don Cole [mailto:Don.Cole@mercergov.org]
Sent: Tuesday, July 18, 2017 3:51 PM
To: Vincent Perrone <vjperrone@perroneconsulting.com>
Subject: FW: Sanderson Landslide repair and wall project - 8100 Evergreen CAO17-006

Hi Vinnie,

Here is the previous email that I referred to in my voicemail. Thanks for the status update.

From: Don Cole
Sent: Thursday, June 22, 2017 9:50 AM
To: Vincent Perrone <vjperrone@perroneconsulting.com>
Subject: Sanderson Landslide repair and wall project - 8100 Evergreen CAO17-006

Hi Vinnie,

I hope your vacation is going well! For your review and comment, here is a link to a folder with information about a landslide repair and wall project at the subject property. You were briefly involved with this project earlier. The plan set and geo reports are in a folder called CAO17-006 on our FTP site (sftp.mercergov.org username *guest* and password *eplan*)

Please let me know if you are not able to take on this project due to your workload. Thanks and welcome back.

GEOTECH
CONSULTANTS, INC.

2401 10th Ave E
Seattle, Washington 98102
(425) 747-5618 FAX (425) 747-8561

June 16, 2017

JN 16556

Jeff Sanderson
8100 Evergreen Lane
Mercer Island, Washington 98040

via email: jeff@sanderson.org

Subject: **Geotechnical Engineering Study**
Proposed Landslide Repair Project
8100 Evergreen Lane
Seattle, Washington

Dear Mr. Sanderson:

We are pleased to present this geotechnical engineering report for the landslide repair project to be constructed in Mercer Island, Washington. The scope of our services consisted of exploring site surface and subsurface conditions, and then developing this report to provide recommendations for general earthwork and design criteria for repair structures. This work was authorized by your acceptance of our proposal, P-9643, dated November 29, 2016.

A landslide occurred on the north-facing slope on the northeastern portion of the Sanderson property in mid-November. This occurred following a period of significant rainfall, which [redacted]ne major reason among others that the landslide occurred. This landslide has left an approximately 10-foot-tall, extremely steep slope at the northern edge of an existing, pile-supported parking structure that is located at the top of the slope. A new retaining wall will be needed in the landslide area in order for new soil and landscaping to be placed.

If the scope of the project changes from what we have described above, we should be provided with revised plans in order to determine if modifications to the recommendations and conclusions of this report are warranted.

SITE CONDITIONS

Surface Conditions

The Vicinity Map, Plate 1, illustrates the general location of the Sanderson property on Mercer Island. The Sanderson property located is located on the northern side of Evergreen Lane, which is west of West Mercer Way. The property is relatively flat on its southern and central portions, but a steep slope that is in the range of 80- to 90-feet in height is located on the northern side of the property. A small creek is located at the base of the slope. The landslide, which is about 60 feet wide near the top of the slope and "necks down" to about 35 feet near the bottom, is located on the eastern portion of the northern slope.

Most notably, the top of the recent landslide and previous slope is located directly north of a parking structure mentioned earlier. This northern edge of this structure, which is nearest the top of the slope and landslide, is founded on four, 2-foot-diameter, concrete piles. As noted earlier, an extremely steep slope now exists in this area, which is very near to the piles. Recently, we obtained field notes and summary letter prepared by Terra Associates (a geotechnical engineering company who

previously was involved in the property) of these concrete piles, which were installed in August/September 1993 were obtained. The information in these documents indicate that the four piles that are located under the northern edge of the parking structure (noted as Piles 12 - 15) were drilled into the ground about 20 to 21 feet. It was also noted in the documentation that the piles were embedded approximately 10 to 15 feet in to what Terra Associates believed was competent soil. We have observed the parking structure and the piles numerous times since the landslide, and we have not seen any signs of movement of the structure or the piles.

Subsurface Conditions

The subsurface conditions in the landslide area were recently explored by drilling one test boring at the approximate location shown on the Site Exploration Plan, Plate 2. However, several other test borings were drilled in this area in 1993 prior to the construction of the parking structure; these test borings were contained within a geotechnical engineering study prepared by Terra Associates. Our recent exploration program was based on the proposed construction, anticipated subsurface conditions based on the previous test borings and those encountered during exploration, and the scope of work outlined in our proposal.

The Terra Associate's study indicated that two test borings had been drilled at that time in the area of the parking structure. The location of these test borings is also shown on Plate 2. These test borings indicated that loose fill and native silty soils in the range of 10 to 12 feet were revealed overlying competent, native silty soil. On November 16, 2016, our personnel traversed the landslide area and used a shovel to expose soils in the landslide area near the northern edge of the parking structure. We observed that, in general, there was about 7 feet of loose fill soil overlying about 4 feet of loose/soft native silt soil. More competent silt soil was seen under these upper loose/soft soils; thus, the soils we observed were very similar to the soil conditions noted in the 1993 test borings. The logs of the two notable test borings are included in the Appendix of this study.

A recent test boring was drilled on December 8, 2016 using a portable Acker drill -- this drill system utilizes a small, gasoline-powered engine to advance a hollow-stem auger to the sampling depth. Samples were taken at approximate 2.5- to 5-foot intervals with a standard penetration sampler. This split-spoon sampler, which has a 2-inch outside diameter, is driven into the soil with a 140-pound hammer falling 30 inches. The number of blows required to advance the sampler a given distance is an indication of the soil density or consistency. A geotechnical engineer from our staff observed the drilling process, logged the test borings, and obtained representative samples of the soil encountered. The recent Test Boring Log is attached as Plate 2. The test boring was drilled just outside of the eastern edge of the recent landslide (the landslide area was covered in plastic, so we could not drill within the landslide area). The soil revealed in the test boring was quite similar to the 1993 test borings, but not including the upper fill soil; it appears that this portion of the slope did not have fill soil placed on it. The upper, approximate 4 feet of soil revealed in the recent test boring consisted of loose, native, somewhat sandy silt soil. This loose was underlain by medium-dense to dense silt soil to a depth of approximately 13 feet. The silt below this level was either hard or dense to very dense down to a maximum explored depth of 21.5 feet.

Some groundwater could readily be seen on November 16, 2016 in the landslide area flowing beneath the loose/soft soils and perched on the surface of the more competent silt soil. However, no groundwater seepage in the recent test boring drilled on December 8, 2016. Therefore, it appears that the groundwater seepage that perches on the more competent silt soil occurs follows a period(s) of significant rainfall.

The stratification lines on the logs represent the approximate boundaries between soil types at the exploration locations. The actual transition between soil types may be gradual, and subsurface conditions can vary between exploration locations. The logs provide specific subsurface information only at the locations tested. Where a transition in soil type occurred between samples in the borings, the depth of the transition was interpreted. The relative densities and moisture descriptions indicated on the test boring log are interpretive descriptions based on the conditions observed during excavation drilling.

SEISMIC CONSIDERATIONS

In accordance with the International Building Code (IBC), the site class within 100 feet of the ground surface is best represented by Site Class Type D (Stiff Site Soil Class). As noted in the USGS website, the mapped spectral acceleration value for a 0.2 second (S_s) and 1.0 second period (S_1) equals 1.42g and 0.44g, respectively.

The IBC and ASCE 7 require that the potential for liquefaction (soil strength loss) be evaluated for the peak ground acceleration of the Maximum Considered Earthquake (MCE), which has a probability of occurring once in 2,475 years (2 percent probability of occurring in a 50-year period). The MCE peak ground acceleration is adjusted for site class effects (F_{PGA}) and equals .586g. The site soils are not susceptible to seismic liquefaction because of their dense nature and/or the absence of near-surface groundwater under the ground motions of the MCE.

Sections 1803.5 of the IBC and 11.8 of ASCE 7 require that other seismic-related geotechnical design parameters (seismic surcharge for retaining wall design and slope stability) include the potential effects of the Design Earthquake. The peak ground acceleration for the Design Earthquake is defined in Section 11.2 of ASCE 7 as two-thirds (2/3) of the MCE peak ground acceleration, or 0.39g.

SLOPE STABILITY ANALYSIS

We have conducted a slope stability analysis in the area where the slide where the recent landslide occurred, and the project wall and improvements are proposed. This analysis was done with the assistance of the computer program SLOPE/W.

There are essentially only two soil types that exist in this project area; the upper soil consists of loose fill and/or native soil, while the core soil of the slope is the underlying, dense silt soil. Soil parameters were needed in the analysis for both of these soils, with most significant being the internal angle of friction and cohesion value for the dense soil; we have used 40 degrees and 250 psf in the analysis, respectively. Other appropriate soil parameters were chosen for the soils, as are noted on cross-sections used in the computer analysis that are included in the Appendix of this report.

Using the soil parameters determined as noted above, and including the new project wall (which will include piles and anchors as is noted in subsequent sections of this report), the stability of the slope and project area was analyzed for both the future static and dynamic loading conditions. For the dynamic analysis, a peak ground coefficient of acceleration of 0.19g was used, which is one-half of the peak ground acceleration noted above earlier. The slope configuration and parameters are included in the analysis information shown in the Appendix. A safety factor of 1.7 was obtained for a static condition and 1.2 was obtained for a seismic condition, as is noted in the analysis information.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

THIS SECTION CONTAINS A SUMMARY OF OUR STUDY AND FINDINGS FOR THE PURPOSES OF A GENERAL OVERVIEW ONLY. MORE SPECIFIC RECOMMENDATIONS AND CONCLUSIONS ARE CONTAINED IN THE REMAINDER OF THIS REPORT. ANY PARTY RELYING ON THIS REPORT SHOULD READ THE ENTIRE DOCUMENT.

The test borings drilled in 1993 prior to the construction of the parking structure, as well as the recent test boring drilled in the hillside north of the parking structure and outside of the landslide indicate that the core of the hillside consists of competent, native silt soil. The recent test boring outside of the landslide area revealed approximately 4 feet of loose/soft, native silt soil at the ground surface; this amount of loose soil is common for native slopes in Mercer Island and the Puget Sound region. The 1993 test borings revealed up to approximately 7 feet of loose fill soil overlying the loose/soft native silt soil; we observed this fill and silt overlying competent silt in the steep soil exposure than now exists just north of the parking structure. It is apparent that, where the landslide occurred, the fill soil most of the loose/soft silt soil slid down the hillside. With the exception of the exposure, it appears that the competent silt is now close to the existing ground surface where the landslide occurred because the upper loose/soft soils slid away. We have discussed with the owner, design team, and construction team that several factors likely caused the landslide, with one being heavy precipitation that fell just prior to the landslide.

There was an approximate 4- to 5-foot-wide flat bench at the top of the slope adjacent to the northern side of the parking structure prior to the slide. Although we have seen no evidence of instability of the parking structure and its concrete columns, we believe that the bench should be put back to near its original grade to provide long-term stability to the structure and piles. To do this, fill soil and a retaining wall is needed downslope of the structure and piles. The overall new slope inclination between the edge of the top bench and the retaining wall should be no steeper 2:1 (H:V), so the height of the wall should correspond to this inclination. The lower retaining wall will be the most significant part of this project from a geotechnical engineering standpoint, and we have provided design parameters for the needed retaining wall further in this report. Some terracing and the construction of smaller "landscape" walls can be constructed between the top bench and the retaining wall provided the height of the retaining wall is such that an overall 2:1 (H:V) inclination is maintained.

Construction of the retaining wall will be difficult due to very limited access to the slope north of the parking structure. If access is possible to large equipment, it appears that a soldier-pile-installed retaining wall would be the most likely wall type; the soldier piles provide a considerable lateral strength needed for the wall depending on their depth. However, even if soldier piles can be used, it is very likely that anchors will be needed in addition to the piles to provide additional lateral strength for this project. Either helical anchors or tied-back anchors could be used for this project. If large equipment cannot be used for this project, small soldier piles should that are placed into excavated holes should still be used, but cannot be relied upon for lateral strength. We recommend that the minimum depth that the soldier piles be installed to is 5 feet below the existing ground surface. A passive resistance can be included for the soldier piles in the design of the project wall below a level that is 3 feet below the ground surface. An ultimate passive pressure of 275 pcf should be used in the design; appropriate safety factors need to be included in the design of the wall using this value.

As was noted in the earlier ***Slope Stability Analysis*** section of this report, safety factors of 1.7 and 1.2 was obtained for static and dynamic conditions of the slope area that includes the new project

improvements. In our opinion, these safety factors are suitable for long-term stability of the slope once the improvements are constructed.

As noted earlier, an existing elevated parking structure is directly upslope and south of the landslide area. It appears that this structure was stable prior to the landslide, and as we discussed in a letter dated December 13, 2016, and based on more recent observations we have made of the structure, it appears to still be stable. Once the proposed structure is constructed below and north of the parking structure, the parking structure will be even more stable; we believe that it will be more stable than it was prior to the landslide.

We understand that part of an existing trash enclosure will likely be removed as part of the construction. When rebuilt, one new footing is needed for the structure. Provided the footing is placed on the stiff silt soil, we believe the use of a footing is very suitable. A bearing capacity of 3,000 psf can be used for the design of the footing for the rebuilt trash enclosure.

The City of Mercer Island requires a "statement of risk" with regards to the project because it is located in a Geologic Hazard Area. As such we make the following statement:

> The proposed development has been designed so that the risk to the lot and adjacent property is mitigated such that the project is determined to be safe.

Geotech Consultants, Inc. should be allowed to review the final development plans to verify that the recommendations presented in this report are adequately addressed in the design. Such a plan review would be additional work beyond the current scope of work for this study, and it may include revisions to our recommendations to accommodate site, development, and geotechnical constraints that become more evident during the review process.

We recommend including this report, in its entirety, in the project contract documents. This report should also be provided to any future property owners so they will be aware of our findings and recommendations.

RETAINING WALL DESIGN

This section discusses a new retaining wall that will retrain fill soil with an overall inclination of 2:1 (H:V). As noted earlier, anchors are very likely needed for lateral restraint of the wall. The most important parameter for the design of the retaining wall is active pressure. If one anchor is used for the wall, the wall is not considered restrained and the active pressure would be triangular. However, if two or more anchors are used, the wall would be considered restrained and a rectangular pressure of should be used.

The following recommended parameters should be used:

PARAMETER	VALUE
Active Earth Pressure * - one anchor	60 pcf
Active Earth Pressure ** - two or more anchors	39H psf
Soil Unit Weight	140 pcf

*** pcf is Pounds per Cubic Foot, and the Active Earth Pressure is computed using the Equivalent Fluid Pressures.**
**** psf is Pounds per Square Foot, and H is the Wall Height**

As noted in the ***General*** section of this report, for the soldier piles used in the wall design, we recommend that the minimum depth that the soldier piles be installed to is 5 feet below the existing ground surface. A passive resistance can be included for the soldier piles in the design of the project wall below a level that is 3 feet below the ground surface. An ultimate passive pressure of 275 pcf should be used in the design. A safety factor of 1.5 should be used in the static design of the retaining wall.

Wall Pressures Due to Seismic Forces

The surcharge wall loads that could be imposed by the design earthquake can be modeled by adding a uniform lateral pressure to the above-recommended active pressure. The recommended surcharge pressure is 9**H** pounds per square foot (psf), where **H** is the design retention height of the wall. Using this increased pressure, the safety factor against sliding and overturning can be reduced to 1.2 for the seismic analysis.

HELICAL ANCHORS

Helical anchors are a very suitable alternative to provide lateral resistance/strength to the retaining wall where only hand or very small equipment can be used. Helical anchors consist of single or multiple helixes that are rotated into the ground on the end of round or square metal shafts. The design capacity of single helix anchors is the allowable soil bearing capacity on the helix area. Multiple-helix anchors are typically assumed to have a design capacity equal to the sum of the allowable bearing capacity on each helix, if they are separated more than three helix diameters.

We recommend the minimum diameter of a single helix anchor is 10 inches. The ultimate capacity of the anchor in tension or compression can be estimated roughly by multiplying the installation torque by 10. We recommend that the helix be installed at least 5 feet into competent native soil. A typical anchor capacity for small to mid-size anchors in the site soils is 15 to 20 kips. The minimum length of

The anchors should be installed at an angle ranging from approximately 15 to 25 degrees from horizontal. Anchors in the lower portion of the wall should extend at least 7 feet behind the wall, while any upper anchors should extend at least 10 feet behind the wall.

Anchors should be installed by a specialty contractor familiar with design and installation of chance systems. The contractor can assist with refining the anchor design and details and estimating

capacities for different soil and anchor conditions. At least one anchor should be load tested to at least 200 percent of the design load to verify the allowable capacity.

TIEBACK ANCHORS

We recommend installing tieback anchors at inclinations between 20 and 30 degrees below horizontal. The tieback will derive its capacity from the soil-grout strength developed in the soil behind the no-load zone. The minimum grouted anchor length should be 10 feet. The no-load zone is the area behind which the entire length of each tieback anchor should be located. To prevent excessive loss-of-ground in a drilled hole, the no-load section of the drilled tieback hole should be backfilled with a sand and fly ash slurry, after protecting the anchor with a bond breaker, such as plastic casing, to prevent loads from being transferred to the soil in the no-load zone. The no-load section could be filled with grout after anchor testing is completed.

During the design process, the possible presence of foundations or utilities close to the shoring wall must be evaluated to determine if they will affect the configuration and length of the tiebacks.

Based on the results of our analyses and our experience at other construction sites, we suggest using an adhesion value of 2000 psf in the dense silt to de temporary anchors, This value applies to non-pressure-grouted anchors. Post-grouted anchors can often develop adhesion values that are two to three times higher than that for non-pressure-grouted anchors. These higher adhesion values must be verified by load testing.

Soil conditions, soil-grout adhesion strengths, and installation techniques typically vary over any site. This sometimes results in adhesion values that are lower than anticipated. Therefore, we recommend substantiating the anchor design values by load-testing all tieback anchors. At least two anchors in each soil type encountered should be performance-tested to 200 percent of the design anchor load to evaluate possible anchor creep. Wherever possible, the no-load section of these tiebacks should not be grouted until the performance tests are completed. Unfavorable results from these performance tests could require increasing the lengths of the tiebacks. The remaining anchors should be proof-tested to at least 135 percent of their design value before being "locked off." After testing, each anchor should be locked off at a prestress load of 80 to 100 percent of its design load.

If caving or water-bearing soil is encountered, the installation of tieback anchors will be hampered by caving and soil flowing into the holes. It will be necessary to case the holes, if such conditions are encountered. Alternatively, the use of a hollow-stem auger with grout pumped through the stem as the auger is withdrawn would be satisfactory, provided that the injection pressure and grout volumes pumped are carefully monitored. However, based on the test boring, it is unlikely that caving or water-bearing soils will be encountered.

All drilled installations should be grouted and backfilled immediately after drilling. No drilled holes should be left open overnight.

RETAINING WALL BACKFILL AND WALL DRAINAGE

We understand that organic, topsoil is needed at the surface of portions of the new slope above the new retaining wall to allow new plant and trees to grow. This is suitable in our opinion. However,

structural fill backfill near the existing ground surface needs to consist of coarse, free-draining material containing no organics. This backfill should contain no more than 5 percent silt or clay particles and have no gravel greater than 4 inches in diameter.

As it is possible that groundwater will continue to flow perched on the competent silt soil in the future following significant rainfall events. This water needs to be able to continue to flow through the area in the future. It is important that weep holes be placed near the bottom of the retaining wall to allow water to pass through the base of the wall; we believe that these will be sufficient and no formal footing drain is needed. Depending the material used to face the new retaining wall, a drainage mat may also be needed on the inside of the wall facing. If wood lagging is used, the mat is not needed as small gaps in the lagging can be included in the lagging installation.

It is critical that the wall backfill be placed in lifts and be properly compacted, in order for the above-recommended design earth pressures to be appropriate. The wall design criteria assume that the backfill will be well-compacted in lifts no thicker than 12 inches. The compaction of backfill near the walls should be accomplished with hand-operated equipment to prevent the walls from being overloaded by the higher soil forces that occur during compaction. The section entitled ***General Earthwork and Structural Fill*** contains additional recommendations regarding the placement and compaction of structural fill behind retaining walls.

Compacted fill slopes should not be constructed with an inclination greater than 2:1 (H:V). To reduce the potential for shallow sloughing, fill must be compacted to the face of these slopes. This can be accomplished by overbuilding the compacted fill and then trimming it back to its final inclination. Adequate compaction of the slope face is important for long-term stability and is necessary to prevent excessive settlement of patios, slabs, foundations, or other improvements that may be placed near the edge of the slope.

All permanently exposed slopes should be seeded with an appropriate species of vegetation to reduce erosion and improve the stability of the surficial layer of soil. Topsoil will be placed on regraded slopes to promote growth of vegetation. Proper preparation of the regraded surface, and use of appropriate topsoil is necessary to prevent the topsoil from sliding off the slope. This is most likely to occur following extended wet weather if a silty topsoil is used. On steeper slopes, it may be necessary to "track walk" the slope or cut small grooves across the slope prior to placing the topsoil.

GENERAL EARTHWORK AND STRUCTURAL FILL

Structural fill is defined as any fill, including utility backfill, placed under, or close to, a building, behind permanent retaining or foundation walls, or in other areas where the underlying soil needs to support loads. All structural fill should be placed in horizontal lifts with a moisture content at, or near, the optimum moisture content. The optimum moisture content is that moisture content that results in the greatest compacted dry density. The moisture content of fill is very important and must be closely controlled during the filling and compaction process. The onsite s should be used as structural fill.

Structural fills placed on sloping ground should be keyed into the competent silt soils. This is typically accomplished by placing and compacting the structural fill on level benches that are cut into the competent soils. The allowable thickness of the fill lift will depend on the material type selected, the compaction equipment used, and the number of passes made to compact the lift. The loose lift thickness should not exceed 12 inches. We recommend testing the fill as it is placed. If the fill is not sufficiently compacted, it can be recompacted before another lift is placed. This eliminates the need to remove the fill to achieve the required compaction.

The non-organic structural fill used for this project should be compacted to at least 95 percent of the Minimum Relative Compaction, where Minimum Relative Compaction is the ratio, expressed in percentages, of the compacted dry density to the maximum dry density, as determined in accordance with ASTM Test Designation D 1557-91 (Modified Proctor).

EXCAVATIONS AND SLOPES

Excavation slopes should not exceed the limits specified in local, state, and national government safety regulations. Temporary cuts to a depth of about 4 feet may be attempted vertically in unsaturated soil, if there are no indications of slope instability. However, vertical cuts should not be made near property boundaries, or existing utilities and structures. Based upon Washington Administrative Code (WAC) 296, Part N, the soil at the subject site would generally be classified as Type B. Therefore, temporary cut slopes greater than 4 feet in height should not be excavated at an inclination steeper than 1:1 (Horizontal:Vertical), extending continuously between the top and the bottom of a cut.

The above-recommended temporary slope inclination is based on the conditions exposed in our explorations, and on what has been successful at other sites with similar soil conditions. It is possible that variations in soil and groundwater conditions will require modifications to the inclination at which temporary slopes can stand. Temporary cuts are those that will remain unsupported for a relatively short duration to allow for the construction of foundations, retaining walls, or utilities. Temporary cut slopes should be protected with plastic sheeting during wet weather. It is also important that surface runoff be directed away from the top of temporary slope cuts. Cut slopes should also be backfilled or retained as soon as possible to reduce the potential for instability. Please note that loose soil can cave suddenly and without warning. Excavation, foundation, and utility contractors should be made especially aware of this potential danger. These recommendations may need to be modified if the area near the potential cuts has been disturbed in the past by utility installation, or if settlement-sensitive utilities are located nearby.

LIMITATIONS

The conclusions and recommendations contained in this report are based on site conditions as they existed at the time of our exploration and assume that the soil and groundwater conditions encountered in the test borings are representative of subsurface conditions on the site. If the subsurface conditions encountered during construction are significantly different from those observed in our explorations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. Unanticipated conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking samples in test borings. Subsurface conditions can also vary between exploration locations. Such unexpected conditions frequently require making additional expenditures to attain a properly constructed project. It is recommended that the owner consider providing a contingency fund to accommodate such potential extra costs and risks. This is a standard recommendation for all projects.

The recommendations presented in this report are directed toward the protection of only the area directly above the new retaining wall. Predicting the future behavior of steep slopes and the potential effects of development on their stability is an inexact and imperfect science that is currently based mostly on the past behavior of slopes with similar characteristics. Landslides and soil movement can occur on unrestrained steep slopes before, during, or after the development of property.

This report has been prepared for the exclusive use of Jeff Sanderson and his representatives, for specific application to this project and site. Our conclusions and recommendations are professional opinions derived in accordance with our understanding of current local standards of practice, and within the scope of our services. No warranty is expressed or implied. The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design. Our services also do not include assessing or minimizing the potential for biological hazards, such as mold, bacteria, mildew and fungi in either the existing or proposed site development.

ADDITIONAL SERVICES

In addition to reviewing the final plans, Geotech Consultants, Inc. should be retained to provide geotechnical consultation, testing, and observation services during construction. This is to confirm that subsurface conditions are consistent with those indicated by our exploration, to evaluate whether earthwork and foundation construction activities comply with the general intent of the recommendations presented in this report, and to provide suggestions for design changes in the event subsurface conditions differ from those anticipated prior to the start of construction. However, our work would not include the supervision or direction of the actual work of the contractor and its employees or agents. Also, job and site safety, and dimensional measurements, will be the responsibility of the contractor.

During the construction phase, we will provide geotechnical observation and testing services when requested by you or your representatives. Please be aware that we can only document site work we actually observe. It is still the responsibility of your contractor or on-site construction team to verify that our recommendations are being followed, whether we are present at the site or not.

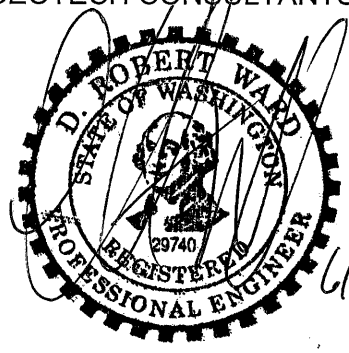
The following plates are attached to complete this report:

Plate 1	Vicinity Map
Plate 2	Site Exploration Plan
Plates 3	Recent Test Boring Log
Appendix A	1993 Test Boring Logs
Appendix B	Slope Stability Analysis

We appreciate the opportunity to be of service on this project. Please contact us if you have any questions, or if we can be of further assistance.

Respectfully submitted,

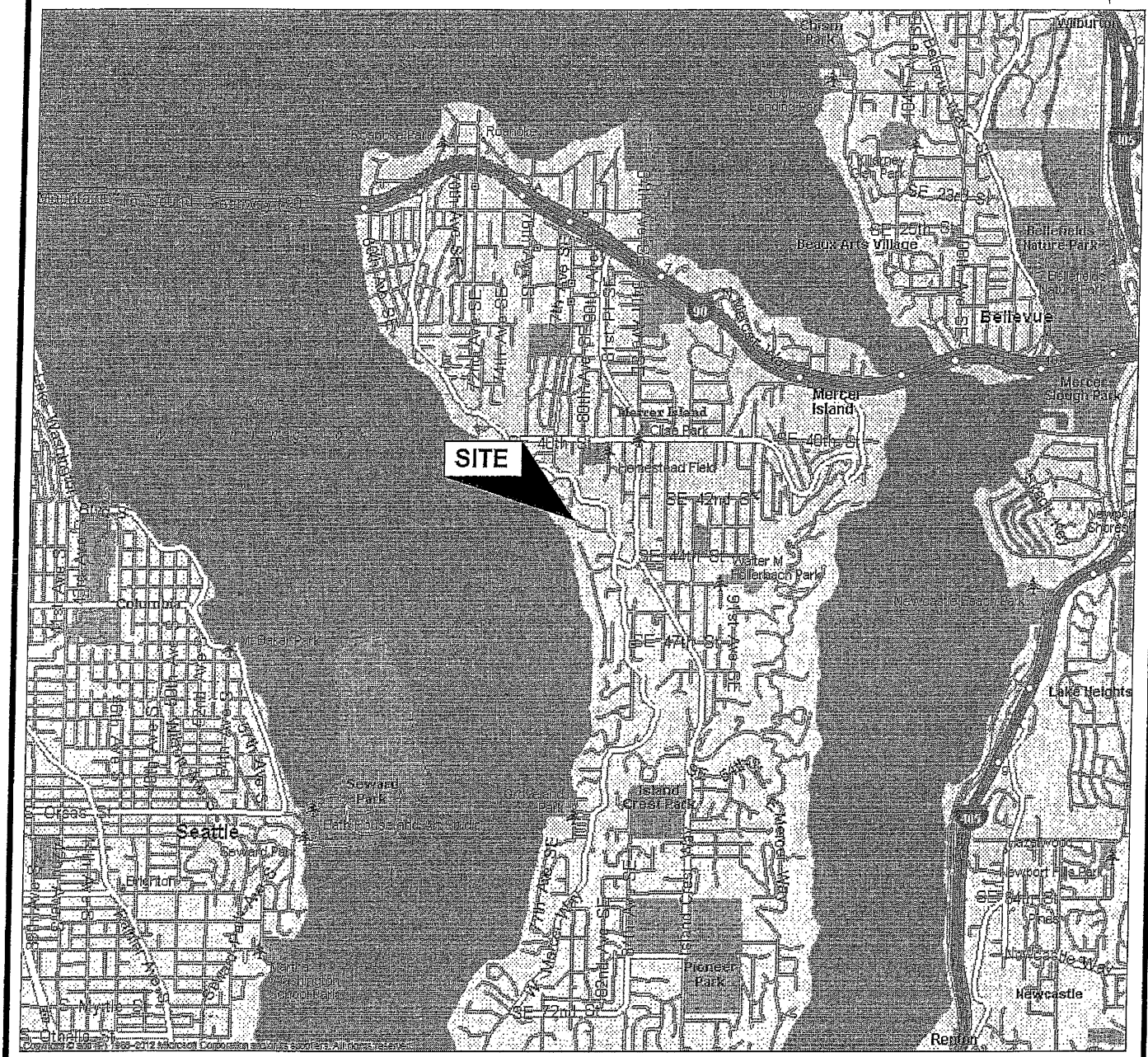
GEOTECH CONSULTANTS, INC.



6/16/17

D. Robert Ward, P.E.
Principal

cc: **SHKS Architects** – Jonathon Hartung
via email to: jh@shksarchitects.com



(Source: Microsoft MapPoint, 2013)

GEOTECH
CONSULTANTS, INC.

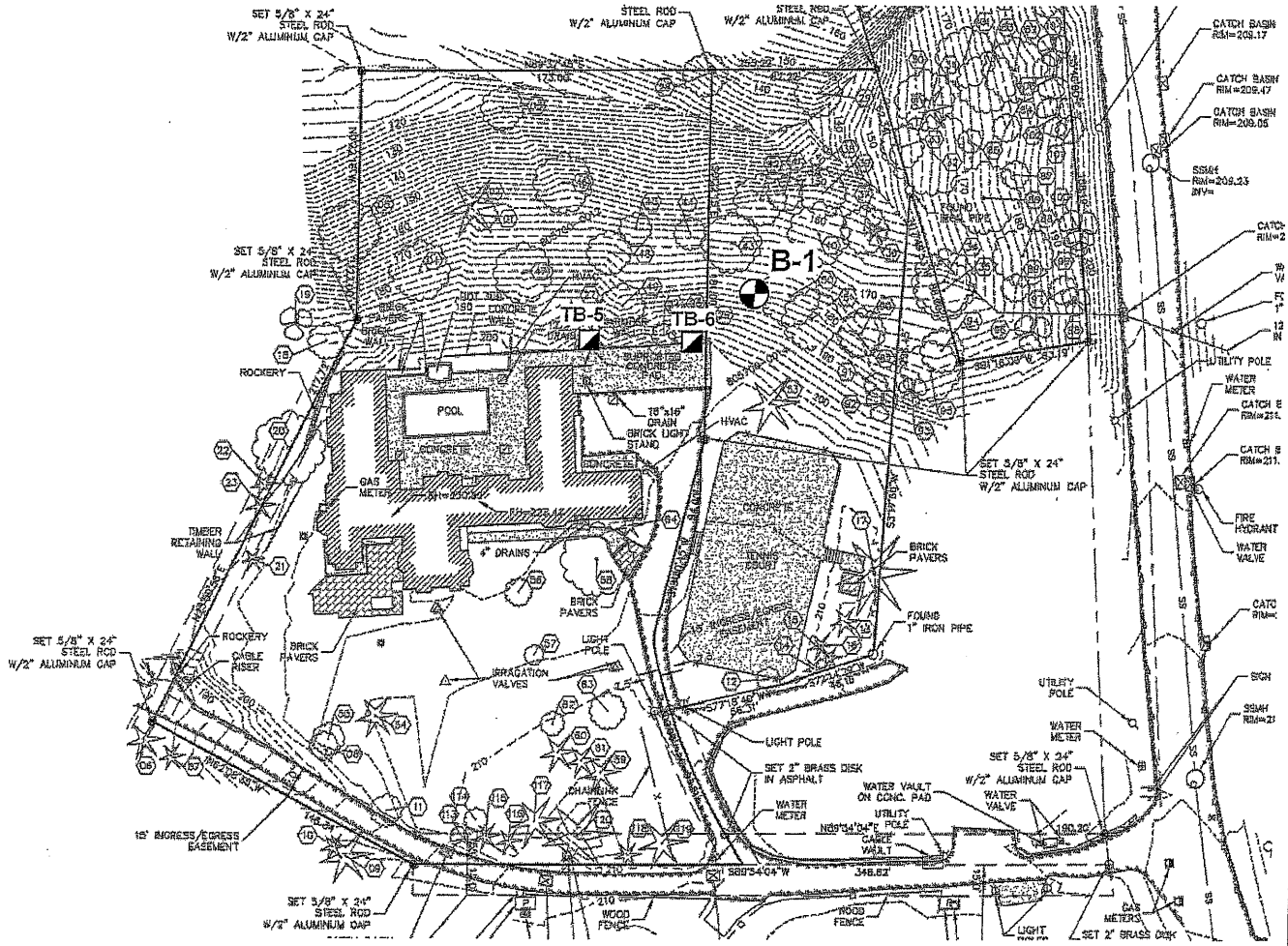
VICINITY MAP

8100 Evergreen Lane
Mercer Island, Washington

Job No:	Date:		Plate:
16556	Dec. 2016		1

Exhibit 5

NORTH



Legend:

- Recent Test Boring Location (approximate)
- 1993 Test Boring Locations (approximate)

GEOTECH CONSULTANTS, INC.

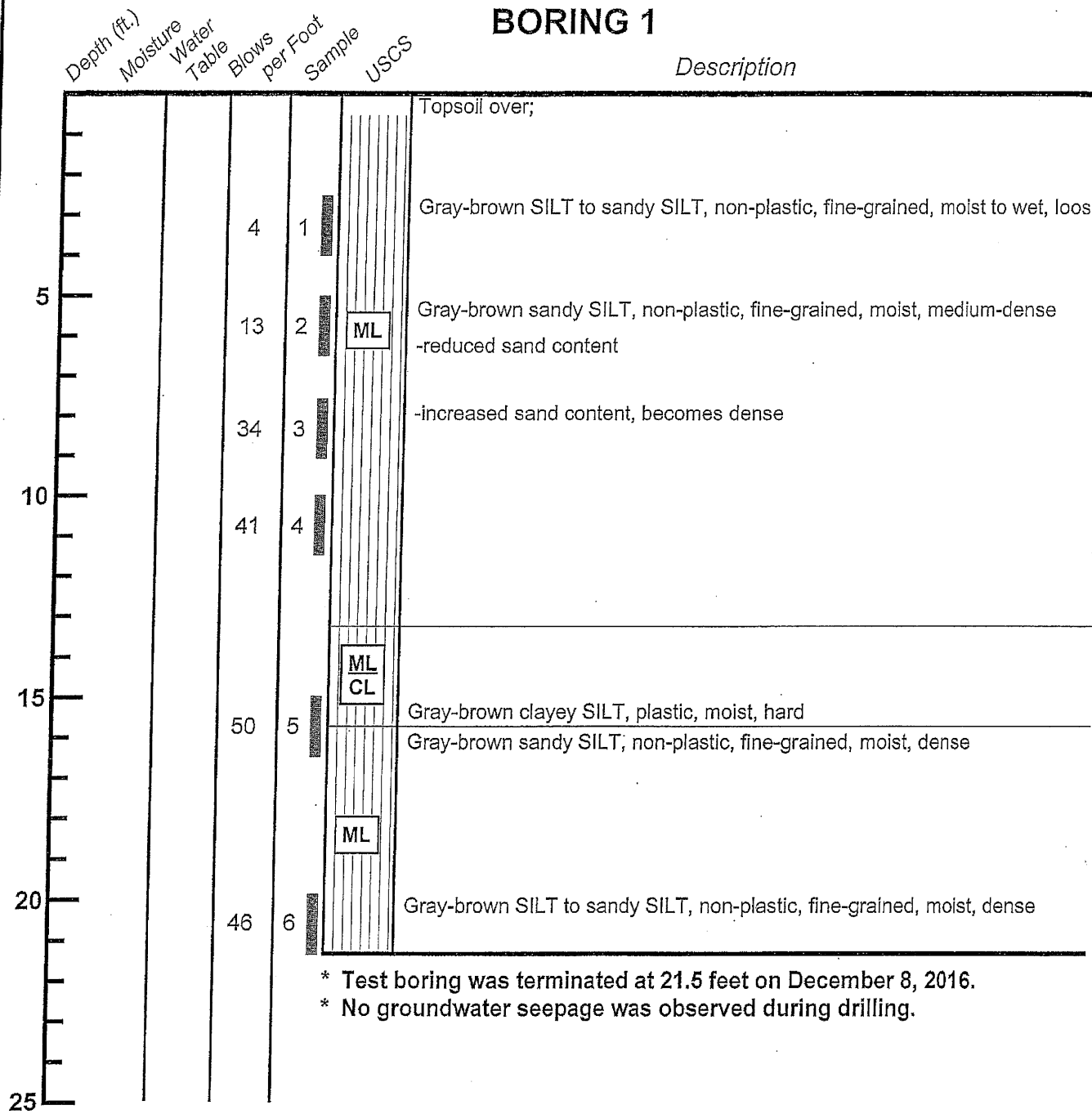
SITE EXPLORATION PLAN

8100 Evergreen Lane
Mercer Island, Washington

Job No:	Date:		Plate:
16556	Jan 2017	No Scale	2

Exhibit 5

BORING 1



* **Test boring was terminated at 21.5 feet on December 8, 2016.**
* **No groundwater seepage was observed during drilling.**

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CONSULTANTS, INC.

TEST BORING LOG

8100 Evergreen Lane
Mercer Island, Washington

Job	Date:	Logged by:	Plate:
16556	Dec. 2016	TRC	3

Exhibit 5

Appendix A *1993 Test Boring Logs*

Boring No. B-5

Logged by: DRK

Dated: 3-12-93

Approximate Elev. +197

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)
SP SM	FILL - Black to brown, fine to medium SAND with silt and wood debris, moist.	Loose			17*	20.1
CL	Brown, sandy CLAY with considerable organics (disturbed), damp.	Medium Stiff to Stiff	5		10	20.5
					20	20.1
ML CL	Brown changing to gray, sandy SILT to CLAY with interbedded layers of sand and silty sand, damp.		10		18	26.8
			15		52	26.2

Boring terminated at 16.5 feet.
No groundwater seepage encountered.

*Not representative due to debris.

TERRA ASSOCIATES
Geotechnical Consultants

Boring Log
GAMORAN RESIDENCE
MERCER ISLAND, WASHINGTON

Proj. No. T-2295 Date 3/93 Figure 8

Exhibit 5

Boring No. B-6

Logged by: DRK

Dated: 3-12-93

Approximate Elev. +198

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)
SM	FILL - Dark brown, silty SAND with medium to coarse gravel, wood and glass debris, moist.	Loose			10	21.8
			5		13	8.8
ML CL	Brown, sandy SILT to CLAY with interbedded layers of fine sand and silty sand, dry to damp.	Very Stiff to Hard			23	15.8
			10		58	22.6
					48	23.3

Boring terminated at 13.5 feet.
No groundwater seepage encountered.
Note: Water used to cool bit while drilling from 8 to 13.5 feet.

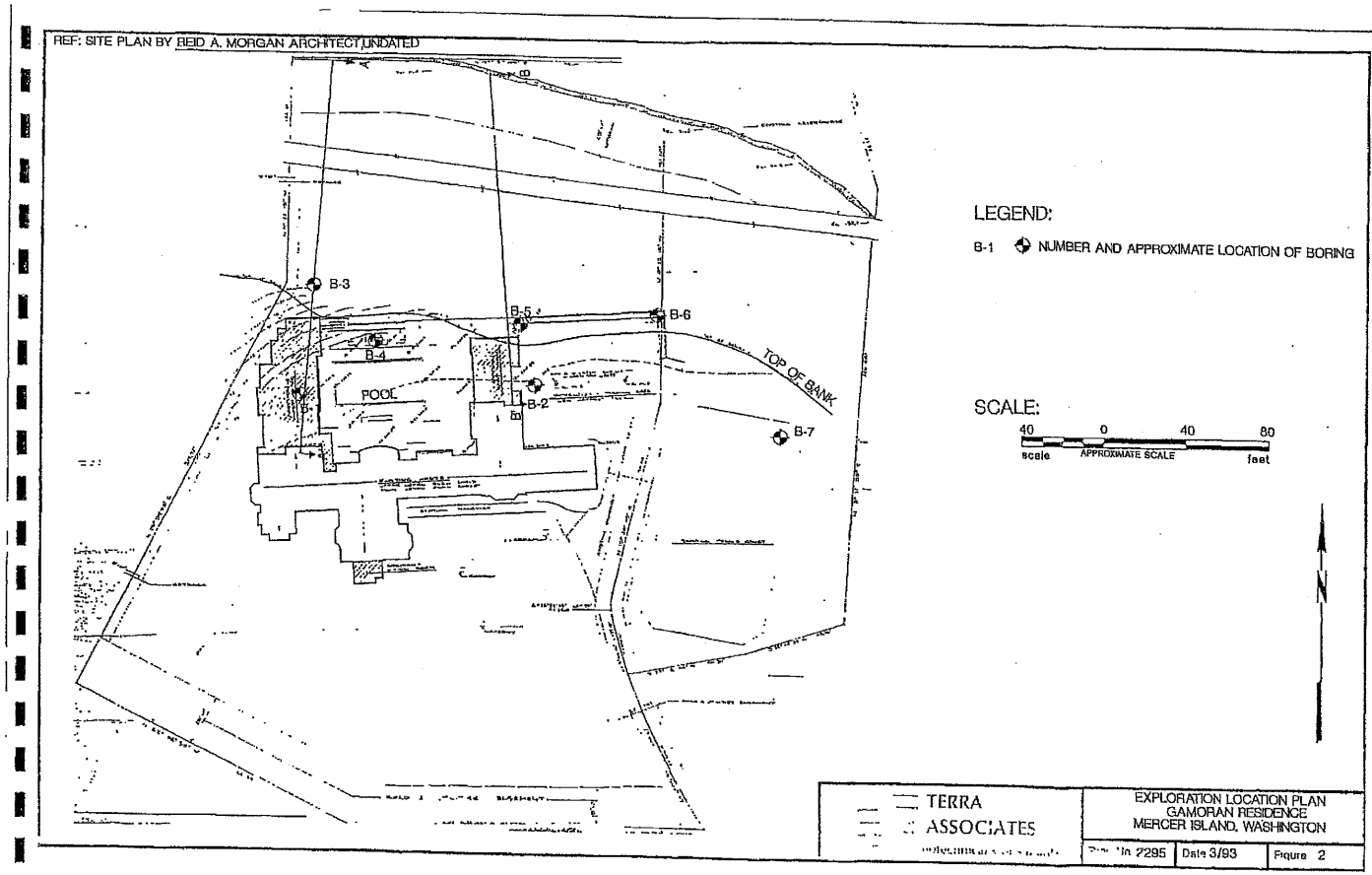
TERRA ASSOCIATES
Geotechnical Consultants

Boring Log
GAMORAN RESIDENCE
MERCER ISLAND, WASHINGTON

Proj. No. T-2295 Date 3/93 Figure 9

Exhibit 5

Exhibit 5


REF: SITE PLAN BY REID A. MORGAN ARCHITECT,UNDATED
B-3
B-5
B-6
B-4
POOL
B-2
TOP OF BANK
B-7
LEGEND:
B-1 NUMBER AND APPROXIMATE LOCATION OF BORING
SCALE:
40 0 40 80
scale APPROXIMATE SCALE feet
N
TERRA ASSOCIATES
EXPLORATION LOCATION PLAN
GAMORAN RESIDENCE
MERCER ISLAND, WASHINGTON
In 2295
Date 3/93
Figure 2

Appendix B *Slope Stability Analysis*

Exhibit 5

Static

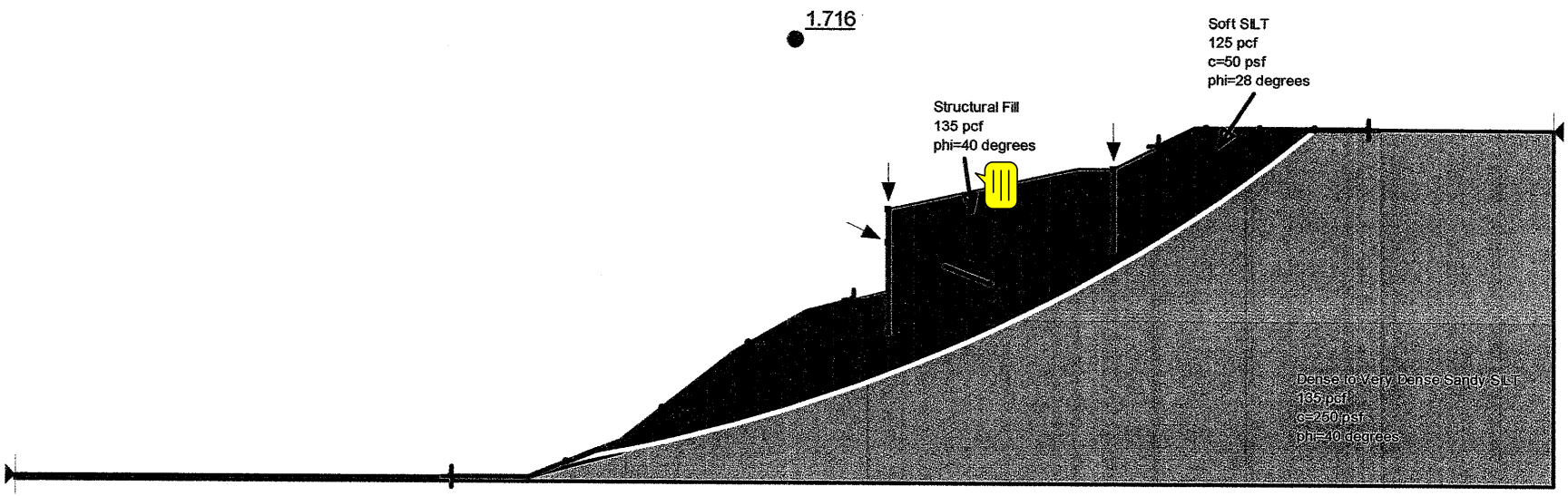


Exhibit 5

Static

File Information

File Version: 8.15
Title: Slope Stability
Created By: Matt McGinnis
Last Edited By: Matt McGinnis
Revision Number: 22
Date: 6/15/2017
Time: 10:57:52 AM
Tool Version: 8.15.4.11512
File Name: Rob's Slope Stability - Piles with backslope.gsz
Directory: \\GEOTECH-SBS\RedirectedFolders\mattm\Desktop\
Last Solved Date: 6/15/2017
Last Solved Time: 10:57:57 AM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

Static

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
    Side Function
        Interslice force function option: Half-Sine
    PWP Conditions Source: (none)
Slip Surface
    Direction of movement: Right to Left
    Use Passive Mode: No
    Slip Surface Option: Entry and Exit
    Critical slip surfaces saved: 1
    Resisting Side Maximum Convex Angle: 1 °

Driving Side Maximum Convex Angle: 5 °
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Soft SILT

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 50 psf
Phi': 28 °
Phi-B: 0 °

Dense to Very Dense Sandy SILT

Model: Mohr-Coulomb
Unit Weight: 135 pcf
Cohesion': 250 psf
Phi': 40 °
Phi-B: 0 °

Lightweight Structural Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 40 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (85, 122) ft
Left-Zone Right Coordinate: (163.5, 165.96875) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (223, 203.625) ft

Right-Zone Right Coordinate: (264, 208) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 122) ft
Right Coordinate: (300, 208) ft

Seismic Coefficients

Horz Seismic Coef.: 0

Reinforcements

Reinforcement 1

Type: Pile
Outside Point: (170, 188) ft
Inside Point: (170, 158) ft
Slip Surface Intersection: () ft
Length: 30 ft
Direction: 90 °
Shear Force: 200,000 lbs
Shear Reduction Factor: 1
Pile Spacing: 4 ft
Shear Option: Parallel to Slip
Shear Force Applied: 50,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft

Reinforcement 2

Type: Anchor
Outside Point: (170, 180) ft
Inside Point: (190, 170) ft
Slip Surface Intersection: () ft
Length: 22.36068 ft
Direction: 153.43 °
F of S Dependent: No
Pullout Resistance: 2,000 psf
Resistance Reduction Factor: 1
Bond Length: 10 ft
Bond Diameter: 1 ft
Anchor Spacing: 4 ft
Force Distribution: Distributed
Anchorage: Yes

Tensile Capacity: 20,000 lbs
Reduction Factor: 1
Shear Force: 10,000 lbs
Shear Reduction Factor: 1
Shear Option: Parallel to Slip
Factored Pullout Resistance: 1,570.7963 lbs/ft
Max. Pullout Force: 5,000 lbs
Factored Tensile Capacity: 5,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft
Available Length: 0 ft
Required Length: 0 ft
Governing Component: (none)

Reinforcement 3

Type: Pile
Outside Point: (214, 198.125) ft
Inside Point: (214, 178.125) ft
Slip Surface Intersection: () ft
Length: 20 ft
Direction: 90 °
Shear Force: 200,000 lbs
Shear Reduction Factor: 1
Pile Spacing: 10 ft
Shear Option: Parallel to Slip
Shear Force Applied: 20,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft

Points

	X (ft)	Y (ft)
Point 1	0	122
Point 2	100	122
Point 3	118	131
Point 4	118	128
Point 5	140	153
Point 6	140	150
Point 7	154	163
Point 8	154	160
Point 9	170	168
Point 10	180	177
Point 11	196	186

Point 12	207	190
Point 13	214	198
Point 14	230	208
Point 15	300	208
Point 16	0	121
Point 17	300	121
Point 18	250	208
Point 19	170	181
Point 20	170	188
Point 21	207	198

Regions

	Material	Points	Area (ft^2)
Region 1	Soft SILT	2,3,5,7,9,8,6,4	159
Region 2	Soft SILT	12,13,14,18	209
Region 3	Dense to Very Dense Sandy SILT	15,17,16,1,2,4,6,8,9,10,11,12,18	11,656
Region 4	Lightweight Structural Fill	20,21,13,12,11,10,9	472

Current Slip Surface

Slip Surface: 17
F of S: 1.716
Volume: 2,993.7133 ft^3
Weight: 391,187.57 lbs
Resisting Moment: 94,819,009 lbs-ft
Activating Moment: 55,264,616 lbs-ft
Resisting Force: 284,260.74 lbs
Activating Force: 165,671.79 lbs
F of S Rank (Analysis): 1 of 125 slip surfaces
F of S Rank (Query): 1 of 125 slip surfaces
Exit: (108.58194, 126.29097) ft
Entry: (253.43632, 208) ft
Radius: 288.78503 ft
Center: (45.137051, 408.02052) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)

Slice 1	110.93646	126.84196	0	68.73381	36.546415	50
Slice 2	115.64549	127.98578	0	213.29069	113.40867	50
Slice 3	118.39214	128.68144	0	316.58395	168.33067	50
Slice 4	121.43624	129.5108	0	579.98566	486.66576	250
Slice 5	126.74017	131.01857	0	1,072.87	900.24486	250
Slice 6	132.0441	132.63675	0	1,548.1966	1,299.0912	250
Slice 7	137.34803	134.36728	0	1,998.0242	1,676.5413	250
Slice 8	142.33333	136.09491	0	2,311.1386	1,939.2755	250
Slice 9	147	137.80854	0	2,490.4707	2,089.753	250
Slice 10	151.66667	139.61424	0	2,642.4667	2,217.2928	250
Slice 11	156.66667	141.6569	0	2,654.5112	2,227.3994	250
Slice 12	162	143.9536	0	2,529.7912	2,122.7469	250
Slice 13	167.33333	146.37916	0	2,383.5024	1,999.996	250
Slice 14	172.5	148.85318	0	4,087.5329	3,429.8473	250
Slice 15	177.5	151.37109	0	3,901.1124	3,273.422	250
Slice 16	182.66667	154.10479	0	3,684.4456	3,091.617	250
Slice 17	188	157.06723	0	3,442.1594	2,888.3147	250
Slice 18	193.33333	160.17984	0	3,197.8853	2,683.3444	250
Slice 19	198.75	163.502	0	2,942.0577	2,468.6795	250

Slice 20	204.25	167.04541	0	2,676.588	2,245.924	250
Slice 21	210.5	171.30622	0	2,321.061	1,947.6014	250
Slice 22	216.66667	175.72029	0	2,054.2559	1,723.7254	250
Slice 23	222	179.75552	0	1,955.8921	1,641.1884	250
Slice 24	227.33333	183.9904	0	1,851.8513	1,553.8878	250
Slice 25	232.5	188.29086	0	1,614.9646	1,355.1162	250
Slice 26	237.5	192.65559	0	1,242.2312	1,042.3557	250
Slice 27	242.5	197.22932	0	852.72175	715.5185	250
Slice 28	247.5	202.02599	0	439.04947	368.40624	250
Slice 29	251.71816	206.24096	0	62.439335	52.392823	250

Seismic

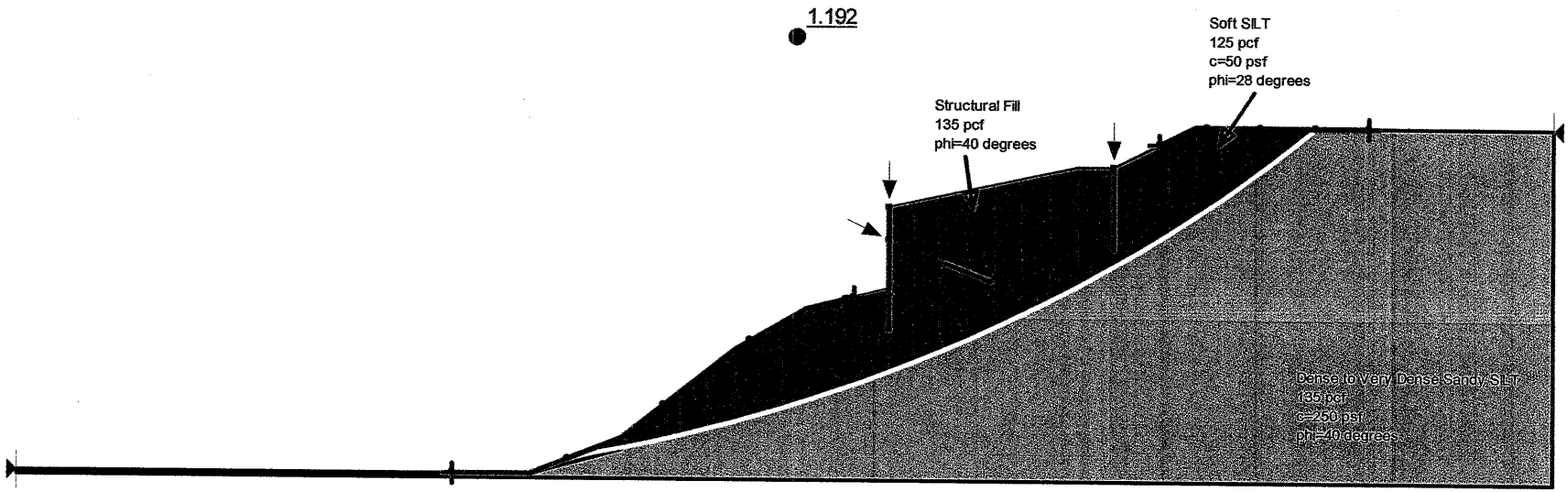


Exhibit 5

Seismic

File Information

File Version: 8.15
Title: Slope Stability
Created By: Matt McGinnis
Last Edited By: Matt McGinnis
Revision Number: 22
Date: 6/15/2017
Time: 10:57:52 AM
Tool Version: 8.15.4.11512
File Name: Rob's Slope Stability - Piles with backslope.gsz
Directory: \\GEOTECH-SBS\RedirectedFolders\mattm\Desktop\
Last Solved Date: 6/15/2017
Last Solved Time: 10:57:57 AM

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

Seismic

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
    Side Function
        Interslice force function option: Half-Sine
    PWP Conditions Source: (none)
Slip Surface
    Direction of movement: Right to Left
    Use Passive Mode: No
    Slip Surface Option: Entry and Exit
    Critical slip surfaces saved: 1
    Resisting Side Maximum Convex Angle: 1 °

Driving Side Maximum Convex Angle: 5 °
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Soft SILT

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 50 psf
Phi': 28 °
Phi-B: 0 °

Dense to Very Dense Sandy SILT

Model: Mohr-Coulomb
Unit Weight: 135 pcf
Cohesion': 250 psf
Phi': 40 °
Phi-B: 0 °

Lightweight Structural Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 40 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (85, 122) ft
Left-Zone Right Coordinate: (163.5, 165.96875) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (223, 203.625) ft

Right-Zone Right Coordinate: (264, 208) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 122) ft
Right Coordinate: (300, 208) ft

Seismic Coefficients

Horz Seismic Coef.: 0.19

Reinforcements

Reinforcement 1

Type: Pile
Outside Point: (170, 188) ft
Inside Point: (170, 158) ft
Slip Surface Intersection: () ft
Length: 30 ft
Direction: 90 °
Shear Force: 200,000 lbs
Shear Reduction Factor: 1
Pile Spacing: 4 ft
Shear Option: Parallel to Slip
Shear Force Applied: 50,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft

Reinforcement 2

Type: Anchor
Outside Point: (170, 180) ft
Inside Point: (190, 170) ft
Slip Surface Intersection: () ft
Length: 22.36068 ft
Direction: 153.43 °
F of S Dependent: No
Pullout Resistance: 2,000 psf
Resistance Reduction Factor: 1
Bond Length: 10 ft
Bond Diameter: 1 ft
Anchor Spacing: 4 ft
Force Distribution: Distributed
Anchorage: Yes

Tensile Capacity: 20,000 lbs
Reduction Factor: 1
Shear Force: 10,000 lbs
Shear Reduction Factor: 1
Shear Option: Parallel to Slip
Factored Pullout Resistance: 1,570.7963 lbs/ft
Max. Pullout Force: 5,000 lbs
Factored Tensile Capacity: 5,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft
Available Length: 0 ft
Required Length: 0 ft
Governing Component: (none)

Reinforcement 3

Type: Pile
Outside Point: (214, 198.125) ft
Inside Point: (214, 178.125) ft
Slip Surface Intersection: () ft
Length: 20 ft
Direction: 90 °
Shear Force: 200,000 lbs
Shear Reduction Factor: 1
Pile Spacing: 10 ft
Shear Option: Parallel to Slip
Shear Force Applied: 20,000 lbs
Pullout Force: 0 lbs
Pullout Force per Length: 0 lbs/ft

Points

	X (ft)	Y (ft)
Point 1	0	122
Point 2	100	122
Point 3	118	131
Point 4	118	128
Point 5	140	153
Point 6	140	150
Point 7	154	163
Point 8	154	160
Point 9	170	168
Point 10	180	177
Point 11	196	186

Point 12	207	190
Point 13	214	198
Point 14	230	208
Point 15	300	208
Point 16	0	121
Point 17	300	121
Point 18	250	208
Point 19	170	181
Point 20	170	188
Point 21	207	198

Regions

	Material	Points	Area (ft^2)
Region 1	Soft SILT	2,3,5,7,9,8,6,4	159
Region 2	Soft SILT	12,13,14,18	209
Region 3	Dense to Very Dense Sandy SILT	15,17,16,1,2,4,6,8,9,10,11,12,18	11,656
Region 4	Lightweight Structural Fill	20,21,13,12,11,10,9	472

Current Slip Surface

Slip Surface: 17
F of S: 1.192
Volume: 2,993.7133 ft^3
Weight: 391,187.57 lbs
Resisting Moment: 86,804,582 lbs-ft
Activating Moment: 72,807,410 lbs-ft
Resisting Force: 262,090.66 lbs
Activating Force: 219,842.45 lbs
F of S Rank (Analysis): 1 of 125 slip surfaces
F of S Rank (Query): 1 of 125 slip surfaces
Exit: (108.58194, 126.29097) ft
Entry: (253.43632, 208) ft
Radius: 288.78503 ft
Center: (45.137051, 408.02052) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)

Slice 1	110.93646	126.84196	0	66.850393	35.544984	50
Slice 2	115.64549	127.98578	0	210.82851	112.09951	50
Slice 3	118.39214	128.68144	0	311.37821	165.56273	50
Slice 4	121.43624	129.5108	0	618.54009	519.01676	250
Slice 5	126.74017	131.01857	0	1,163.7954	976.54031	250
Slice 6	132.0441	132.63675	0	1,699.1164	1,425.7279	250
Slice 7	137.34803	134.36728	0	2,202.4991	1,848.1162	250
Slice 8	142.33333	136.09491	0	2,547.9358	2,137.972	250
Slice 9	147	137.80854	0	2,733.7591	2,293.8962	250
Slice 10	151.66667	139.61424	0	2,863.9453	2,403.1355	250
Slice 11	156.66667	141.6569	0	2,828.0317	2,373.0004	250
Slice 12	162	143.9536	0	2,635.0422	2,211.0629	250
Slice 13	167.33333	146.37916	0	2,407.0112	2,019.7222	250
Slice 14	172.5	148.85318	0	3,796.9821	3,186.0463	250
Slice 15	177.5	151.37109	0	3,502.2128	2,938.7055	250
Slice 16	182.66667	154.10479	0	3,194.1027	2,680.1704	250
Slice 17	188	157.06723	0	2,884.9586	2,420.7677	250
Slice 18	193.33333	160.17984	0	2,601.6947	2,183.0811	250
Slice 19	198.75	163.502	0	2,335.4513	1,959.6763	250

Slice 20	204.25	167.04541	0	2,086.2235	1,750.5494	250
Slice 21	210.5	171.30622	0	1,786.2358	1,498.8298	250
Slice 22	216.66667	175.72029	0	1,575.2323	1,321.7769	250
Slice 23	222	179.75552	0	1,508.8641	1,266.0873	250
Slice 24	227.33333	183.9904	0	1,447.0167	1,214.1912	250
Slice 25	232.5	188.29086	0	1,282.2043	1,075.8972	250
Slice 26	237.5	192.65559	0	1,001.9684	840.75133	250
Slice 27	242.5	197.22932	0	695.82874	583.86964	250
Slice 28	247.5	202.02599	0	352.26092	295.58201	250
Slice 29	251.71816	206.24096	0	21.980912	18.444175	250

From:	msctacald@aol.com
To:	Evan Maxim; sgcaldwe@aol.com
Subject:	File Nos: CAO17-006 (SEP17-014),
Date:	Wednesday, July 12, 2017 7:33:45 PM

Hi Evan,

We are residents on Evergreen Lane, 2 houses down from the Sanderson Ravine project (File Nos: CAO17-006 (SEP17-014)),

I understand that we can ask to be in the loop on how the project is progressing and if an issues with the ravine are uncovered.

Our names, address and email are given below.

Thank you,
Marcia Caldwell

Steve and Marcia Caldwell
8010 Evergreen Lane
Mercer Island
msctacald@aol.com

From:	Jim Blinn
To:	Evan Maxim
Cc:	"Just Visiting"
Subject:	Regarding File Nos: CAO17-006 (SEP17-014)
Date:	Saturday, July 1, 2017 8:03:31 PM

To: Evan Maxim, Planning Manager
Evan.Maxim@mercergov.org
Development Services Group
City of Mercer Island
9611 SE 36th Street
Mercer Island, WA 98040-3732

Dear City of Mercer Island/Evan Maxim, Planning Manager,

Thank you for the Public Notice of Application re File Nos: CAO17-006 (SEP17-014), in regards to the requested critical areas determination and SEPA review to stabilize the landslide and install a tiered terraced garden, stairs and footpaths, on the property of Jeff Sanderson, 8100 Evergreen Lane, Mercer Island, WA 98040, tax parcel number 8057000012 and 8057000014,

Our address is 8020 Evergreen Lane, Mercer Island, WA 98040. We live next door to Jeff Sanderson, and our tax parcel number is 8057000025.

We would like to be Parties of Interest on this matter and our primary concern is a possible increase of water from any cause natural or manmade which would increase the speed of the flow of water in the creek at the bottom of the ravine and possibly cause instability there. We have a question as well; we would like to know in what direction the creek flows, and if we are upstream or downstream of the proposed project.

We will be sending a copy of this email to the City of Mercer Island via USPS.

Thank you very much for keeping us informed about this issue.

Sincerely,

James and Amanda Blinn
Owners of:
8020 Evergreen Lane
Mercer Island, WA 98040-3941

425-922-2761

Web site: JimBlinn.com