Appendix D Geotechnical Borehole Logs

GeoEngineers

Memorandum

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To:	Aaron McDonald, PE/City of Kirkland Public Works Department; Schaun Valdovinos, MS, PE, P.Eng./COWI North America, Inc.
From:	Bert Pschunder, PE and Debra Overbay, PE
Date:	January 9, 2017
File:	0231-090-00, Task 0200
Subject:	Exploration Plan, Totem Lake Non-Motorized Bridge Project, Kirkland, Washington

This memorandum summarizes our geotechnical exploration plan for Phase 1 of the City of Kirkland's Totem Lake Non-Motorized Bridge project in Kirkland, Washington. The bridge will be located at the intersection of NE 124th Street and 124th Avenue NE, and will provide an elevated connection between segments of the existing Cross Kirkland Corridor (CKC) trail.

The initial concept for the bridge project includes:

- an embankment for the south approach ramp flanked by retaining walls;
- the bridge spanning over NE 124th Street and Totem Lake Boulevard with a "touchdown" support in the triangular property ("traffic island") bounded by these roadways and a Rite Aid store on the west; and
- a spiral ramp located just northeast of Totem Lake Boulevard extending over a portion of a park and wetland associated with Totem Lake, transitioning back to the trail alignment.

The purpose of our exploration program is to evaluate subsurface soil and groundwater conditions along the project alignment as a basis for developing preliminary geotechnical recommendations during predesign and 30 percent design development.

Specifics of our exploration program are:

Right-of-Way Use Permit: We understand a formal permit to drill the borings in the trail right-of-way will not be required by the City of Kirkland (City). We also understand the City has obtained right-of-entry from King County for drilling borings in the wetland/park area near the north end of the project alignment.

Activities and Schedule: Our preferred driller has a current backlog into late January. We have scheduled the explorations to begin the week of January 30, 2017. This will allow sufficient time to complete all the utility locates and GPR scanning of the bore sites, the trench excavation with a vacuum truck to identify if an unknown fiber optic line is at the boring site within the triangular property, and minor clearing and placement of an access road to the north borings.

We will mark all proposed exploration locations and notify the One Call Center for underground utility locates. We will also arrange for a private utility locating service to clear each of our proposed explorations including using GPR equipment to scan three of the boring sites as described below. We will make follow up site visits to check that all notified utilities have marked their lines in the vicinity of the exploration locations.

We understand a fiber optic line is present within the corridor that does not get marked or a response with the one-call service. The line appears to be marked on the east side of the corridor in the south and north portions of the bridge alignment. Based on our discussions with the design team, we plan to subcontract a vacuum truck and ground penetrating radar (GPR) equipment to assist in the effort to clear underground utilities. GPR equipment will be used at Borings 3, 4 and 5 shown on the attached site plan, and a vacuum truck will also be used at the location of Boring 4. The vacuum truck will excavate a shallow trench (up to 5 feet deep or to very dense native soils) across the proposed trail alignment in the traffic island near proposed Boring 4. If a duct bank is not detected within the upper 5 feet, we will proceed with drilling adjacent to the trench. Please notify us if this proposed method is not deemed suitable to reduce the risk of encountering the fiber optic utility.

Exploration Type and Locations: We plan to complete a total of seven borings along the project alignment using subcontracted truck- and track-mounted drilling equipment. The borings will typically be 8 inches in diameter, and will be drilled in two groups as follows:

a. Three borings (Borings 1 through 3) will be drilled within the adjacent Totem Lake park area where the spiral ramp will be located. These borings will be drilled with a track-mounted rig. We anticipate these boring depths will range from about 60 to 70 feet. A piezometer will be installed in one of the park area borings for the purpose of long-term groundwater level measurements.

b. Four borings (Borings 4, 5, 6 and 7) will be drilled along the west side of the existing trail alignment with a track-mounted rig. We anticipate these borings will be drilled to depths ranging from 20 to 50 feet. Depending on subsurface soil and groundwater conditions encountered, a piezometer may be installed in one or two of the borings. Proposed boring locations are shown on the attached site plan.

Access Considerations and Pedestrian Traffic Control: We plan to access Borings 5 through 7 for the south segment of the alignment from the point where the CKC trail crosses 120th Avenue NE. The drill crew will travel north along the gravel-surfaced trail to access the three boring locations planned for this segment of the alignment. Plywood sheets will be placed at the boring locations to reduce the potential for disturbing the trail surfacing.

The boring planned within the traffic island bounded by NE 124th Street and Totem Lake Boulevard NE will be accessed directly from the southbound Totem Lake Boulevard turn lane to westbound NE 124th Street. An existing curb cut on the west edge of the ramp will allow for direct drill rig and service truck access to the traffic island.

The three borings (Borings 1 through 3) planned for the spiral ramp in the Totem Lake park area will be accessed from the point where the CKC trail crosses 128th Lane NE. The drill crew will travel southwest along the gravel-surfaced trail to access these boring locations. Plywood sheets will be placed at the boring location on the trail edge (Boring 3) to reduce the potential for disturbing the trail surfacing. We plan to subcontract a small dozer and use hog fuel to access the lower site area. The material will be removed and the surface restored as described in the following section.

The borings will require closure of segments of the CKC trail for periods of up to 2 to 3 hours at each location. During the time of drilling, we will place pedestrian traffic control signs that indicate the trail is closed and cones for exploration activities that will take place within the trail. Trail closed signs will be set up in accordance with the attached Trail Closure Figure. We understand the City will prepare trail closure notification signs and advertise the trail closure at least one week prior to drilling.

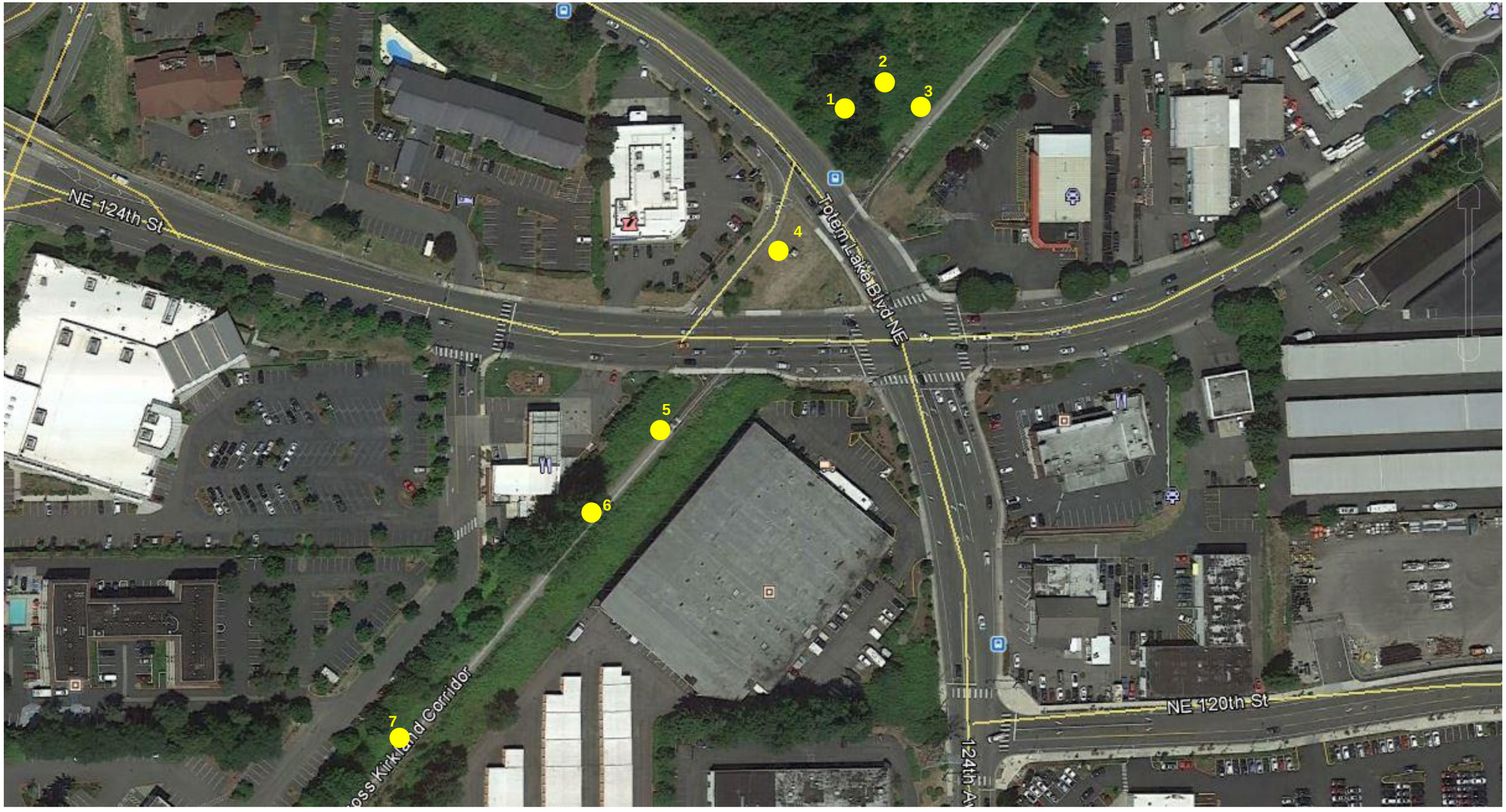
Erosion Control and Restoration: Removal of vegetation (brush and small trees) and minor grading will be required to access two of the boring locations for the spiral ramp in the Totem Lake park area. Our boring locations will be selected to minimize the impact on trees to the extent practical. We expect a few small-diameter trees (less than 6-inch diameter) may need to be cleared to access the area. We will arrange for a temporary fill ramp to be constructed so that the drill rig can descend from the trail down to the lower lying park area. We plan to use "hog fuel" for the ramp fill. Some hog fuel or brush cuttings may need to be placed around the two boring locations for equipment support as these areas are currently in a wet and soft condition.

During drilling, we will limit work activities to the immediate area around each boring. We will haul the cuttings off site from the vacuum truck exploration and borings. The vacuum holes will be backfilled with sand and gravel. The driller will backfill the borings in accordance with Washington State Department of Ecology (Ecology) regulations. The piezometers will be installed in accordance with Ecology regulations, and will be protected with 8-inch-diameter, steel flush-grade monuments. The piezometers will eventually need to be abandoned as required by Ecology prior to or during project construction.

We will separate the surficial trail gravel and replace this material on the trail following drilling. We also plan to backfill the upper 2 feet of the borings within the trail with crushed rock. In the vicinity of the park area borings, we will remove the temporary fill ramp, smooth the ground surface at the exploration locations, and cover disturbed areas with straw.

If you have any questions, please contact Bert Pschunder at 425-861-6008 or Debra Overbay at 425-861-6024.

Attachments: Site Plan
Trail Closure Figure



Proposed Boring Locations	
City of Kirkland – Totem Lake Pedestrian Bridge	
GeoEngineers	Figure 1

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

GeoEngineers

Figure A-1

Drilled Start 1/30/2017 End 1/30/2017	Total Depth (ft) 71.5	Logged By EF Checked By HRP	Driller Geologic Drill Exploration, Inc.	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 135 Vertical Datum NAVD88		Hammer Data Automatic 140 (lbs) / 30 (in) Drop		Drilling Equipment D-50 Track Rig	
Easting (X) 1309809 Northing (Y) 261720		System Datum WA State Plane North NAD83 (feet)		Groundwater observed at 6 feet at time of exploration	
Notes:					

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample / Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0					TS	6 inches topsoil			
		10	7	1		SM	Brown silty fine to medium sand with gravel and organic matter (loose, wet) (fill?)			
130	5	8	2	2 MC		SP-SM	Grayish brown fine to medium sand with silt (very loose, wet)	24		
		8	P	3						
125	10	8	P	4 SA				25	7	
120	15	7	9	5			Grades to with occasional gravel, loose			Added drilling mud to borehole
115	20	10	18	6 MC			Grades to medium dense	20		
						SM	Grayish brown silty fine to coarse sand with gravel (dense, wet)			
110	25	18	43	7		ML	Brown silt with sand (very stiff to hard, wet)			
105	30	18	27	8						
100	35					CL	Orange-brown lean clay with sand and gravel (hard, wet)			

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-1

GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00

Elevation (feet)	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	35	12	41		9 AL				24		AL (LL = 33; PI = 10)
95							CL	Gray lean clay with sand, gravel and cobbles (hard, wet)			
	40	10	31		10						Auger refusal at 42½ feet; moved 3 feet to the north
90	45	18	48		11 MC				26		
85	50	18	21		12						
80	55	12	39		13 SA		SP	Gray fine to medium sand with gravel (dense to very dense, wet)	15	4	1 foot of heave
75	60	10	86/11"		14						
70	65	12	60		15		SP-SM	Gray fine sand with silt and gravel (very dense, wet)			
							SP	Gray fine to medium sand with gravel (very dense, wet)			
65	70	10	70		16						

Log of Boring B-1 (continued)

GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00

Figure A-2
Sheet 2 of 2

Drilled Start	End	Total Depth (ft)	Logged By / Checked By	Driller	Drilling Method
1/31/2017	1/31/2017	71	EF / HRP	Geologic Drill Exploration, Inc.	Hollow-stem Auger

Hammer Data	Automatic 140 (lbs) / 30 (in) Drop	Drilling Equipment	D-50 Track Rig
Surface Elevation (ft) Vertical Datum	135 NAVD88	Top of Casing Elevation (ft)	
Easting (X) Northing (Y)	1309856 261748	Horizontal Datum	WA State Plane North NAD83 (feet)

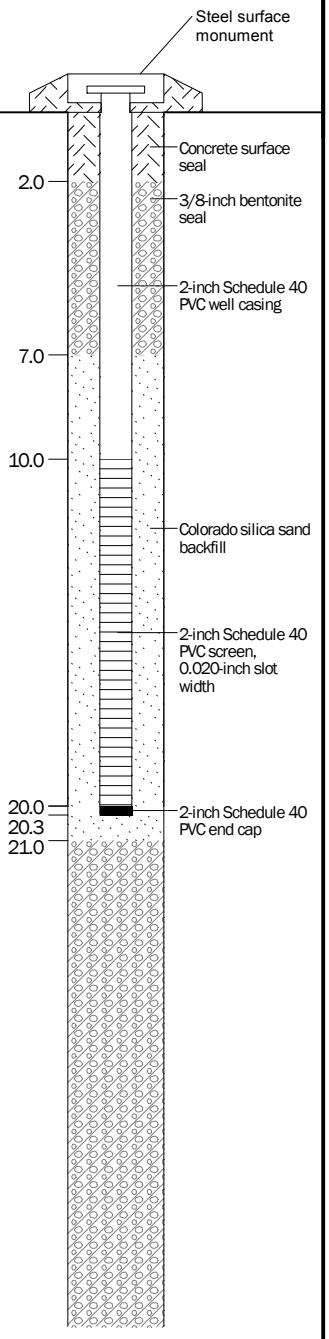
DOE Well I.D.: BIK 733
A 2 (in) well was installed on 1/31/2017 to a depth of 20 (ft).

Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
2/16/2017	3.34	131.66

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample / Sample Name Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)
	0						SP-SM	Brown fine to medium sand with silt and occasional gravel (loose, wet)		
130	5	8	5	1 MC	▼				20	
		10	5	2						
		12	4	1						
125	10	10	13	4 %F			SP-SM	Brown fine to medium sand with silt (medium dense, wet)	26	9
120	15	10	8	5			SP	Brown fine to medium sand with occasional gravel (loose to medium dense, wet) (1 foot of heave, added drilling mud to borehole)		
115	20	10	13	6						
110	25	12	8	7 MC			SM/ML	Gray silty fine to coarse sand and brown silt with sand, gravel and organic matter (loose/medium stiff, wet)	25	
105	30	6	23	8			GM	Orange-brown silty fine to coarse gravel with sand (medium dense, wet)		
100	35									

WELL LOG



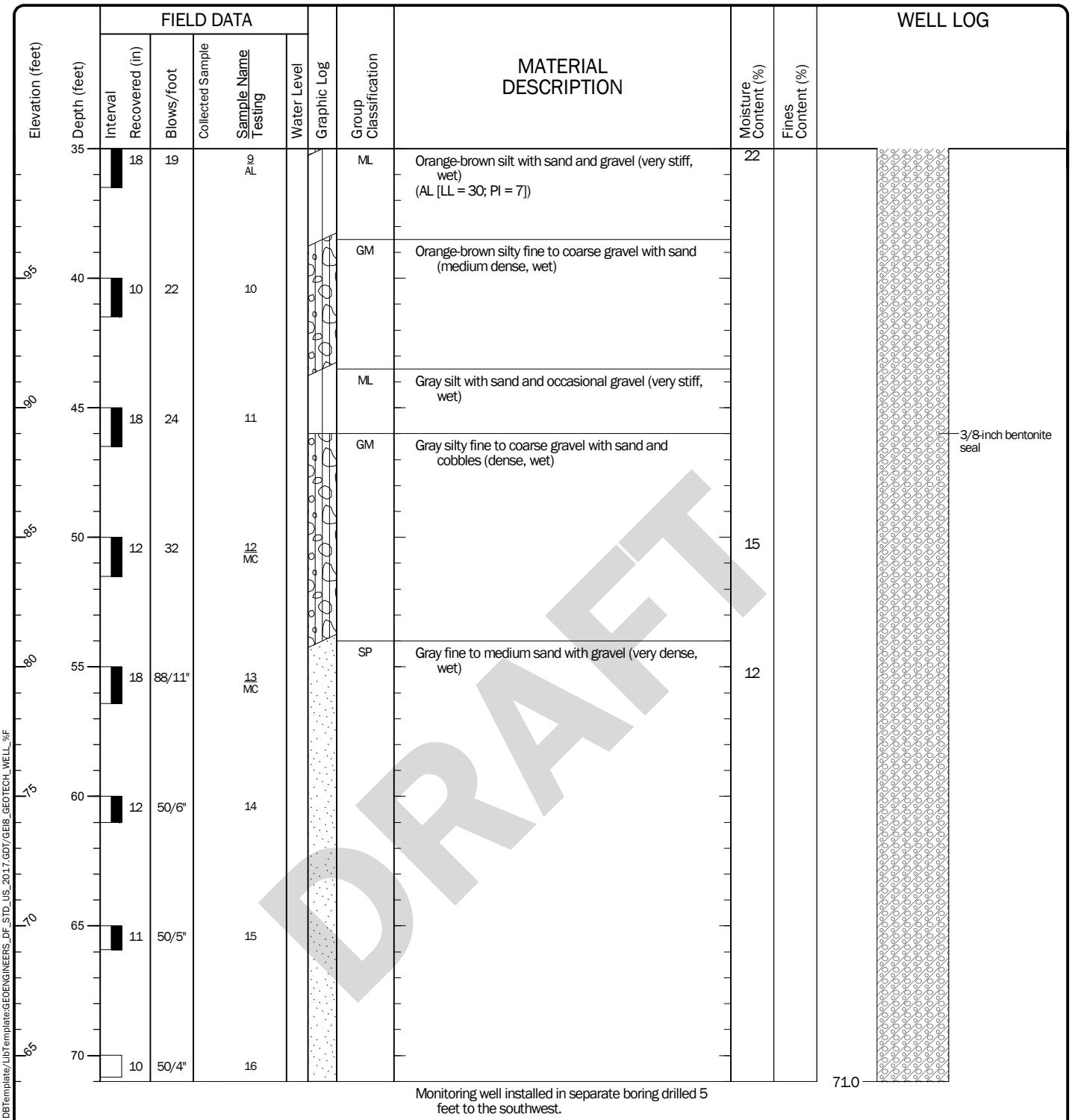
Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Monitoring Well B-2

GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00

Figure A-3
Sheet 1 of 2



Log of Monitoring Well B-2 (continued)

GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00

Figure A-3
Sheet 2 of 2

Drilled	Start 1/30/2017	End 1/30/2017	Total Depth (ft)	61.5	Logged By / Checked By	EF / HRP	Driller	Geologic Drill Exploration, Inc.	Drilling Method	Hollow-stem Auger
Surface Elevation (ft) Vertical Datum	136 NAVD88				Hammer Data	Automatic 140 (lbs) / 30 (in) Drop			Drilling Equipment	D-50 Track Rig
Easting (X) Northing (Y)	1309896 261720				System Datum	WA State Plane North NAD83 (feet)			Groundwater observed at 17½ feet at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
135	0						GP	Gray fine gravel with sand (medium dense, moist) (fill)			
							SP-SM	Gray fine to medium sand with silt and gravel (loose, moist)			
		4	8		1 MC				9		
130	5						SM	Grayish brown silty fine to medium sand with gravel (loose, moist)			
		10	11		2						
		12	3		3 %F		SM	Reddish brown silty fine to medium sand with occasional gravel (very loose to loose, moist)	16	15	
125	10	10	2		4						
120	15	12	5		5 MC			Grades to orange-brown	26		
							SP-SM	Brown fine to medium sand with silt (loose to medium dense, wet)			
115	20	13	10		6						
110	25	10	12		7						Added drilling mud to borehole
105	30						SM	Brown silty fine to medium sand with gravel (medium dense, wet)	16		
		8	24		8 MC						
	35										

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-3

GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	FIELD DATA: Blows/foot	FIELD DATA: Collected Sample	FIELD DATA: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
100	35	18	41		9		ML	Brown and gray sandy silt with gravel (hard, wet)			
							CL	Brownish gray sandy clay with gravel (very stiff, wet)			
95	40	10	16		10 MC				18		
							SM	Orange-brown silty fine to coarse sand with gravel (medium dense, wet)			
90	45	10	22		11 MC				18		
							GM	Orange-brown silty fine to coarse gravel with sand (medium dense, wet)			
85	50	10	25		12						
80	55	12	28		13						
75	60	10	47		14			Grades to dense			

Log of Boring B-3 (continued)

GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00

Figure A-4
Sheet 2 of 2

Drilled Start	End	Total Depth (ft)	Logged By / Checked By	Driller	Drilling Method
2/17/2017	2/1/2017	66.5	EF / HRP	Geologic Drill Exploration, Inc.	Hollow-stem Auger

Hammer Data	Automatic 140 (lbs) / 30 (in) Drop	Drilling Equipment	D-50 Track Rig
Surface Elevation (ft) Vertical Datum	142 NAVD88	Top of Casing Elevation (ft)	
Easting (X) Northing (Y)	1309728 261559	Horizontal Datum	WA State Plane North NAD83 (feet)

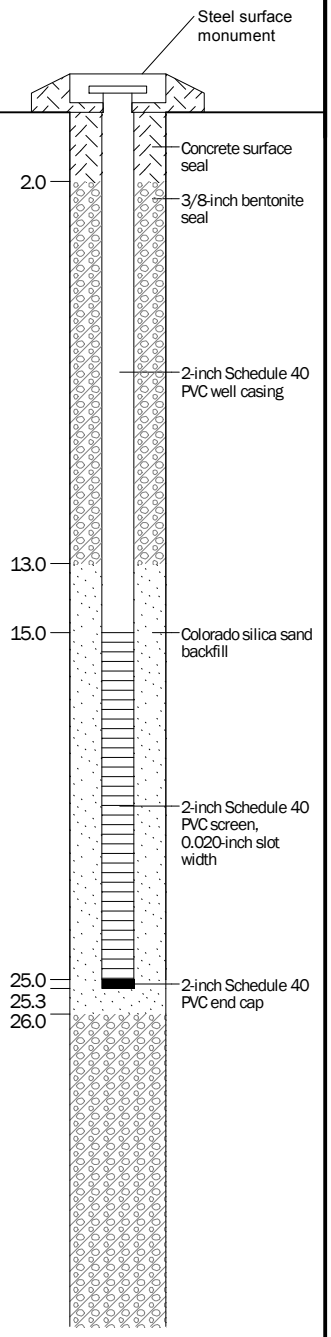
DOE Well I.D.: BIK 734
A 2 (in) well was installed on 2/1/2017 to a depth of 25 (ft).

Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
2/16/2017	13.97	128.03

Notes:

Elevation (feet)	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample / Sample Name Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)
	0						TS	6 inches topsoil		
140		14	10	1 MC			SM	Brown silty fine to medium sand with gravel and cobbles (loose to medium dense, moist) (fill)	15	
	5	12	6	2						
135		12	5	3 %F			SM	Reddish brown silty fine to medium sand (loose to medium dense, moist)	15	16
	10	10	12	4						
130					▼		GC	Brown clayey fine to coarse gravel with sand (medium dense, wet)		
	15	8	14	5 MC					11	
125										
	20	5	40	6						
120							ML	Brown silt with sand and occasional gravel (stiff, wet)		
	25	18	13	7 AL				(AL [LL = 47; PI = 16])	30	
115										
	30	10	32	8			GM	Brown silty fine to coarse gravel with sand and cobbles (dense, wet)		
110										
	35									

WELL LOG

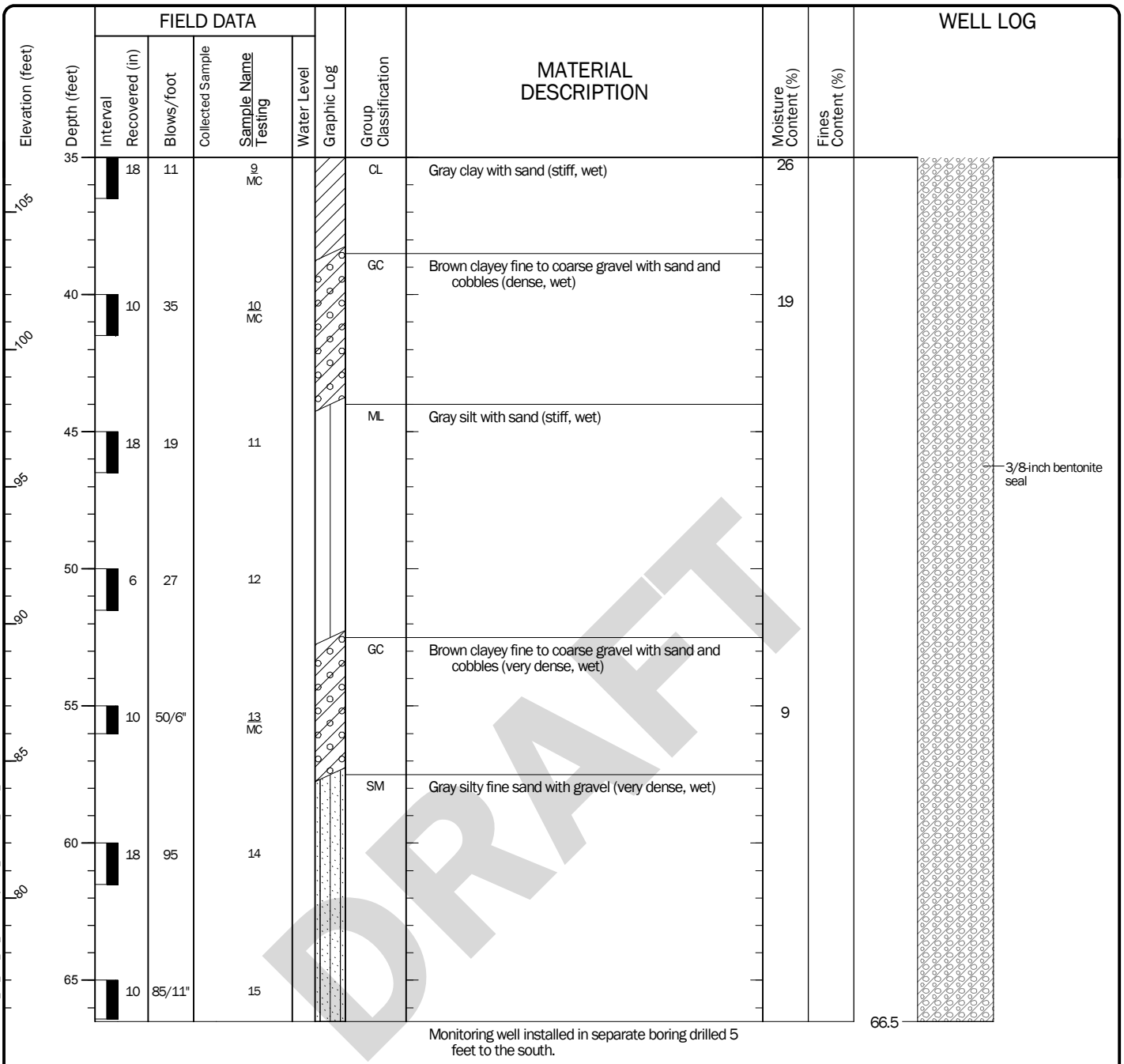


Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Monitoring Well B-4

GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00



Log of Monitoring Well B-4 (continued)

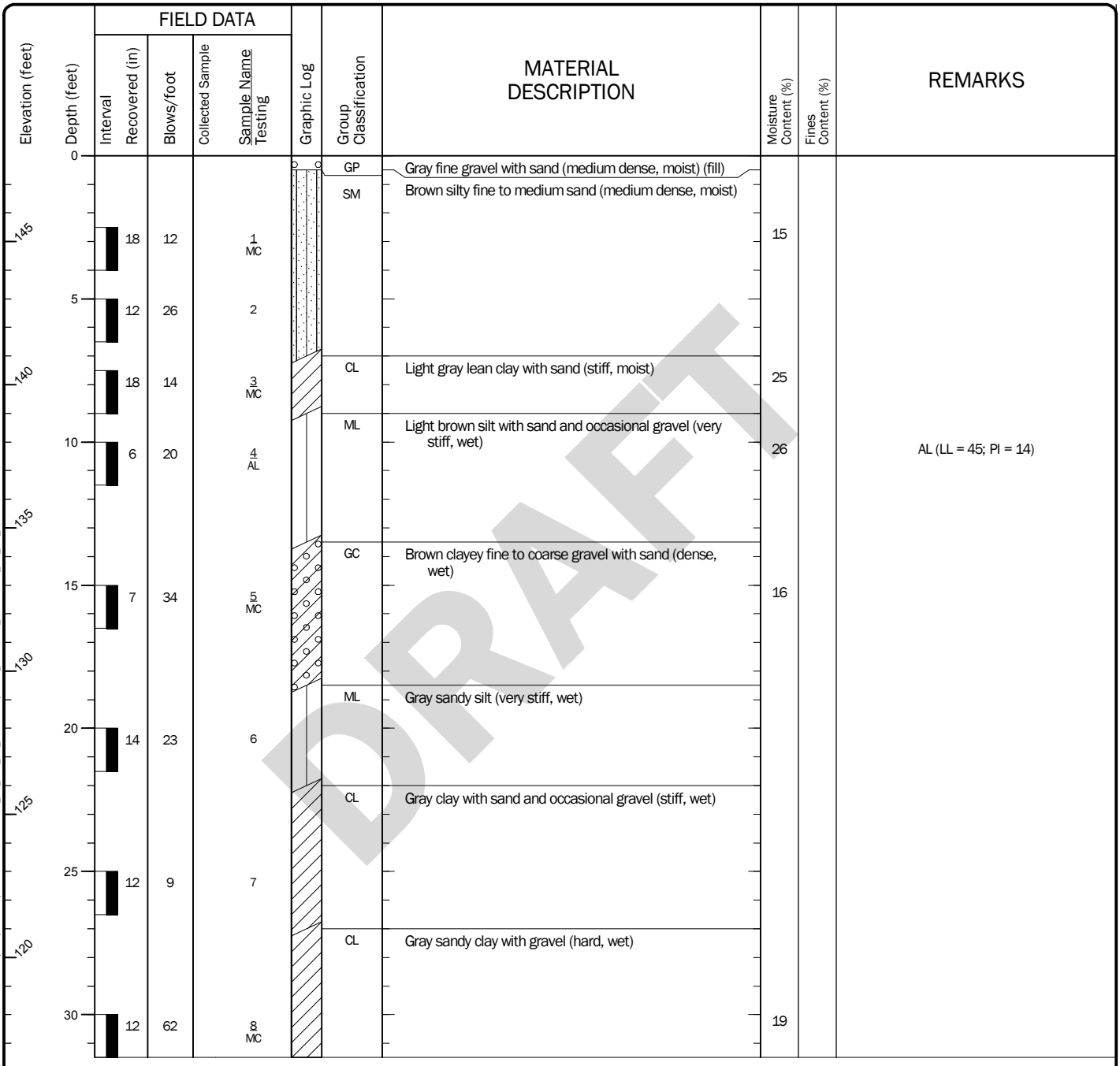
GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00

Figure A-5
Sheet 2 of 2

Drilled	Start 2/2/2017	End 2/2/2017	Total Depth (ft)	31.5	Logged By / Checked By	EF / HRP	Driller	Geologic Drill Exploration, Inc.	Drilling Method	Hollow-stem Auger
Surface Elevation (ft) Vertical Datum	148 NAVD88				Hammer Data	Automatic 140 (lbs) / 30 (in) Drop			Drilling Equipment	D-50 Track Rig
Easting (X) Northing (Y)	1309588 261359				System Datum	WA State Plane North NAD83 (feet)			Groundwater observed at 12½ feet at time of exploration	

Notes:



Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-5

GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00

Figure A-6
Sheet 1 of 1

Drilled: Start 2/2/2017 End 2/2/2017	Total Depth (ft): 21.5	Logged By: EF Checked By: HRP	Driller: Geologic Drill Exploration, Inc.	Drilling Method: Hollow-stem Auger	
Surface Elevation (ft): 150 Vertical Datum: NAVD88		Hammer Data: Automatic 140 (lbs) / 30 (in) Drop		Drilling Equipment: D-50 Track Rig	
Easting (X): 1309507 Northing (Y): 261268		System Datum: WA State Plane North NAD83 (feet)		Groundwater observed at 11½ feet at time of exploration	
Notes:					

Elevation (feet)	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0						GP	Fine gravel with sand (medium dense, moist) (fill)			
							ML	Gray silt with sand (very stiff, moist)			
		18	29		1						
145	5						ML	Gray silt with lenses of peat (hard, moist)			
		18	48		2 MC				38		
		18	32		3		ML	Gray sandy silt (hard, moist to wet)			
140	10	18	35		4						
							SM	Gray silty fine sand (dense, wet)			
135	15	18	41		5 MC				23		
							ML	Gray sandy silt (hard, wet)			
130	20	18	55		6						

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-6

GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00

Figure A-7
Sheet 1 of 1

Drilled: Start 2/2/2017 End 2/2/2017	Total Depth (ft): 21	Logged By: EF Checked By: HRP	Driller: Geologic Drill Exploration, Inc.	Drilling Method: Hollow-stem Auger	
Surface Elevation (ft) Vertical Datum: 156 NAVD88		Hammer Data: Automatic 140 (lbs) / 30 (in) Drop		Drilling Equipment: D-50 Track Rig	
Easting (X) Northing (Y): 1309282 261017		System Datum: WA State Plane North NAD83 (feet)		Groundwater observed at 12½ feet at time of exploration	
Notes:					

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
155	0						GP	Gray fine gravel with sand (medium dense, moist) (fill)			
							GM	Brown silty fine to coarse gravel with sand (medium dense, moist) (fill)			
		16	36		1 MC		SM	Gray silty fine to coarse sand with gravel (dense, moist)	8		
150	5	10	16		2		ML/PT	Gray sandy silt with gravel and lenses of peat (very stiff, moist)			
		18	21		3 MC				31		
145	10	18	39		4 MC			Grades to hard, wet	61		
140	15	18	50		5		ML	Gray sandy silt (hard, wet)			
135	20	18	48		6						

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-7

GeoEngineers

Project: Totem Lake Pedestrian Bridge
Project Location: Kirkland, Washington
Project Number: 0231-090-00