ADDENDUM #2
RIVERSIDE COMMUNITY UTILITY AND STREET IMPROVEMENTS
CITY OF DULUTH
PROJECT No. 0699SN/TR
BID No. 11-0512
October 12, 2011

NOTICE

This Addendum is issued to modify, explain or correct the original drawings, specifications and/or previous addenda and is hereby made a part of the Contract Documents. Please attach this Addendum to the specification and note receipt of this Addendum on the Request for Bid.

DRAWINGS

There are no revisions to the drawings under this Addendum.

SPECIFICATIONS

1. Under SP-1 Scope of Work, Construction Activities Sequencing Restrictions on page 5 of the Special Provisions: Paragraph SP-1.2 A is replaced with the following:

   A) **The contractor shall not have more than 2 blocks (or 800 feet) open to active construction operations at one time.** The contractor shall not extend the active construction zone until after a current construction area is stabilized. A site will be considered to be stabilized when the underground utilities are completely installed, the street road section is built up to the aggregate base level, and temporary erosion control BMP's are in place.

2. Under SP-3 (1505) Cooperation with Others on page 5 of the Special Provisions is supplemented with the following:

   Garbage/Trash Collection – The contractor shall coordinate with residents and local garbage/waste collection services to provide adequate access to maintain regularly scheduled collection services. The contractor may be required to assist residents with moving trash receptacles to and from central pick-up areas.

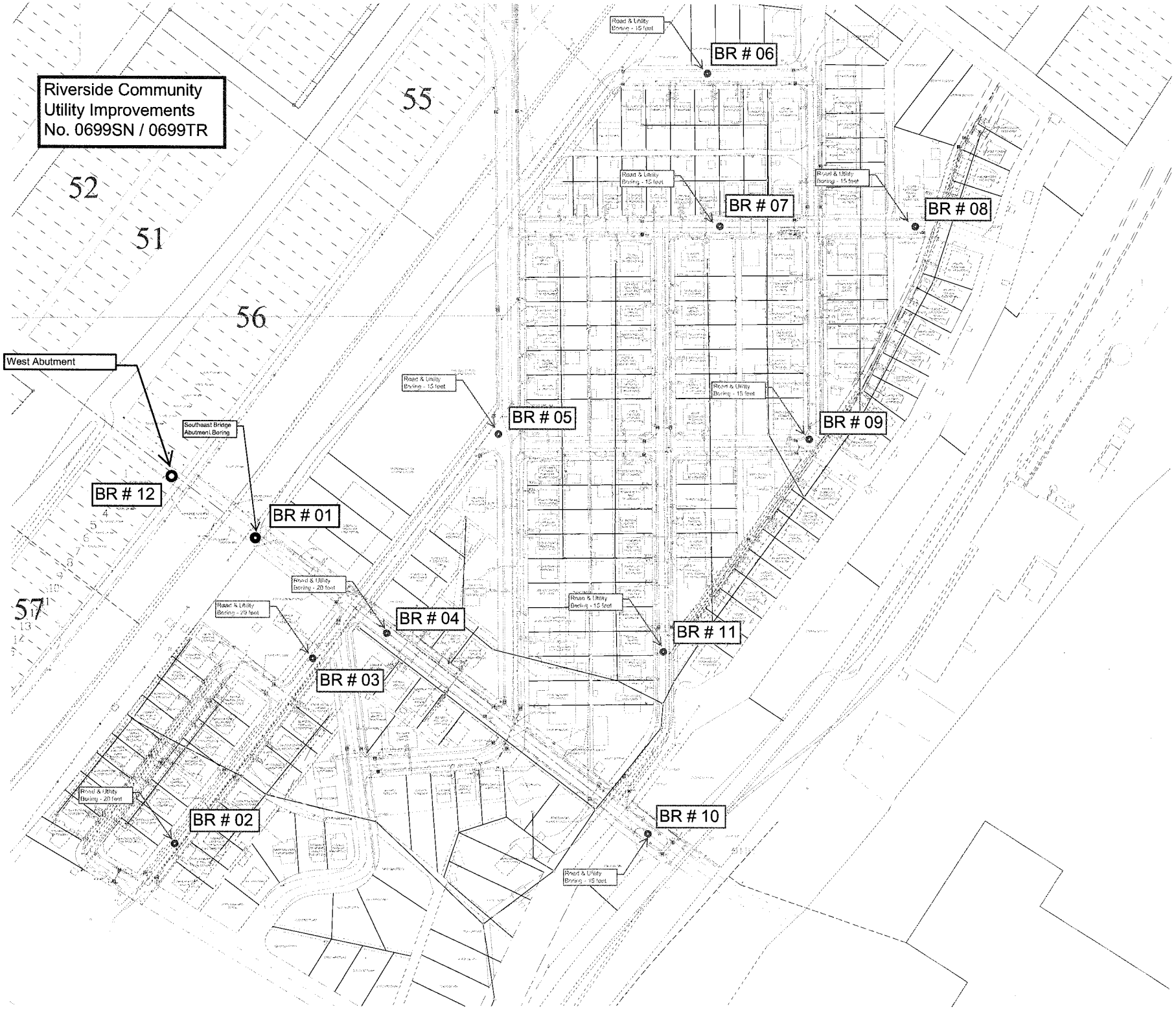
3. Under SP-9 (1717) Protection and Restoration of Property on page 8 of the Special Provisions is supplemented with the following:

   For the purposes of preparing the bid, the Contractor shall provide Building Condition Inspections on four (4) houses and three (3) garages. Additional building condition inspections required by the Engineer will be considered extra work.

INFORMATION TO BIDDERS

1. A copy of the soil boring logs and geotechnical report is attached.

END OF ADDENDUM


Riverside Community
Utility Improvements
No. 0699SN / 0699TR
55
52
51
56
57
West Abutment
Southeast Bridge Abutment Boring
Road & Utility Boring - 15 feet
Road & Utility Boring - 20 feet
BR # 12
BR # 01
BR # 02
BR # 03
BR # 04
BR # 05
BR # 06
BR # 07
BR # 08
BR # 09
BR # 10
BR # 11

EPC Engineering & Testing
Geotechnical • Environmental • Materials Engineering
539 Garfield Avenue (218) 727-1239
Duluth, Minnesota 55802 (218) 727-1248 fax

February 17, 2011
EPC# 11G0621

Ayres Associates, Inc
2701 W Superior St, Suite 110
Duluth, MN 55806

Attn: Mr. Tom Pfeffer

Re: Soil Boring Log Report
Riverside Road Reconstruction
Duluth, MN

Dear Mr. Pfeffer:

This letter report is in regard to the nine (9) roadway soil borings performed by EPC during the time period from February 9 through 12, 2011. All work was performed at the direction of Ayres personnel, in-part according to EPC proposal dated October 29, 2010. All borings were staked and numbered in the field by Ayres. Boring surface elevations and N-E coordinates were also determined by Ayres.

Generally speaking, materials observed consisted of three to six inches of bituminous pavement over sandy fill to one to two feet below existing grade (BEG), over clay subgrade. Boring 6 also contained ash/cinder/slag fill to four feet BEG. Boring 9 also contained clay then brick then wood fill to 8.5 feet BEG. Boring 10 also contained clay fill to four feet BEG. Borings 5 and 8 contained layered sandy and clayey subgrade below four and 6.5 feet BEG, respectively. All borings were terminated at 15 to 21 feet BEG. Water observed only in Boring 2, at 18 feet BEG immediately after the relatively short drilling process. Please refer to the table below and the boring logs in the appendix for details.

Boring Number SB-11-	Surface Elevation (ft)	Depth/Elevation to Bottom of Sandy Fill (ft)	Depth/Elevation to Bottom of "Other" Fill (ft)	Depth/Elevation to Bottom of Clay Subgrade (ft)	Depth/Elevation to Bottom of Boring (ft)
2	670.5	2.0 / 668.5	N/A	21 / 649.5	21 / 649.5
3	673.7	2.0 / 671.7	N/A	12 / 661.7	20.3 / 653.4
4	667.4	2.0 / 665.4	N/A	21 / 646.4	21 / 646.4
5	668.4	2.0 / 666.4	N/A	*4.0 / 664.4	15 / 653.4
6	659.2	2.0 / 657.2	** 4.0 / 655.2	15 / 644.2	15 / 644.2
7	656.9	1.0 / 655.9	N/A	16 / 640.9	16 / 640.9
8	642.8	2.0 / 640.8	N/A	*6.5 / 636.3	16 / 626.8

Boring Number SB-11-	Surface Elevation (ft)	Depth/Elevation to Bottom of Sandy Fill (ft)	Depth/Elevation to Bottom of "Other" Fill (ft)	Depth/Elevation to Bottom of Clay Subgrade (ft)	Depth/Elevation to Bottom of Boring (ft)
9	640.7	1.5 / 639.2	*** 8.5 / 632.2	15 / 625.7	15 / 625.7
10	620.3	2.0 / 618.3	**** 4.0 / 616.3	16 / 604.3	16 / 604.3
11	641.3	2.0 / 639.3	N/A	16 / 625.3	16 / 625.3

*** Indicates layered sandy and clayey subgrade below**
**** Indicates ash / cinder / slag fill.**
***** Indicates clay then brick then wood fill.**
****** Indicates clay fill.**

Engineering properties of the soils are estimated as follows:

Clay Soil Subgrade Classification:
USCS Fat Clay (CH); AASHTO A-7-6, Clayey Soil.

Frost Susceptibility/Drainage:
The clay subgrade soils are deemed to have a medium to low frost susceptibility and practically impervious drainage characteristics. The silty and clayey sand subgrade observed at 4.0 and 8.5 feet in Borings 5 and 8 is deemed to have a slight to high frost susceptibility.

Subgrade Strength/Rating:
The clay subgrade soils are deemed to have very low subgrade strength and general subgrade rating of poor.

Compressibility:
The compressibility of the clay subgrade soils is judged to be high.

CBR/R-Value/K-Value:
Estimated clay subgrade values: CBR 3, R-Value 10, and k-value 50 to 100 pci.

This report completes EPC's work on this project to date. We must caution you that this report, prepared for soils classification information only, is not a complete geotechnical engineering report. EPC cannot be responsible for possible misinterpretation of the contents of the boring logs, or the strengths of the soils described in them. Soil samples from this project will be saved for two months from the date of this report unless EPC is directed in writing to do otherwise.

We would like to thank you for allowing EPC to be of service to you on this project. If you have any questions or comments, please call us at (218) 727-1239 (w) or (218) 341-4536 (c).

Sincerely,

Chad R. Lowney, ICC
Sr. Engineering Tech.

Reviewed by:

Gary E. Hage, P.E.
Principal Engineer

Enclosures: Boring Location Map(s), Boring Logs, and Laboratory Test Reports.

EPC Engineering & Testing
Geotechnical • Environmental • Materials Engineering
539 Garfield Avenue
Duluth, Minnesota 55802

BORING NUMBER SPT-11-1

CLIENT Ayres Associates, Inc. **PROJECT NAME** Riverside Road Reconstruction
PROJECT NUMBER 11G0621 **PROJECT LOCATION** Duluth, MN
DATE STARTED 2/12/11 **COMPLETED** 2/13/11 **GROUND ELEVATION** 692.33 ft **HOLE SIZE** 8-inch
DRILLING CONTRACTOR EPC Engineering & Testing **GROUND WATER LEVELS:**
DRILLING METHOD CME 55 & 750 ATV w/ HSA & SPT Cal. to N69 and N79 ▽ **AT TIME OF DRILLING** 54.5 ft / Elev 637.8 ft
LOGGED BY TS **CHECKED BY** GH ▼ **AT END OF DRILLING** 52.0 ft / Elev 640.3 ft
NOTES Bridge boring. Offset 3-feet East due power lines and snow bank. **AFTER DRILLING** ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)	SPT N VALUE / PL MC LL / FINES CONTENT (%)
690	0		SILTY CLAYEY SAND (SC-SM) (CB FILL) (Topsoil-like) Dark brown, frozen/wet, with to trace gravel & organics.	SPT 1	100		2.6		19.5
			CLAY (CL-CH) (CB FILL) Reddish brown, wet, trace gravel.	SPT 2	17	5-7-8-10 (15)			6.2
			SILTY SAND (Could Be FILL) (SM) Brown, dry, trace gravel, medium dense relative density.	SPT 3	50	6-9-13-26 (22)			10.6
			SILTY CLAYEY SAND (SC-SM) Brown, moist, trace gravel, medium to very dense to dense to medium dense to very dense relative density.	SPT 4	100	36-50/5"			10.1
	10			SPT 5	54	23-28-32 (60)			10.1
			Trace organics at 5 feet. Difficult drilling beginning at 5 feet.	SPT 6	12	11-40-50/5"			2.4
680			Pushed rock in sample at 10 feet, Gray rock chips recovered. Could be gravel, cobble or boulder.	SPT 7	67	12-21-23 (44)	6+		17.8
				SPT 8	75	4-18-16-20 (34)	6+		18.9
	20		N-values are with SPT hammer calibrated to N69 to a depth of 43 feet and calibrated to N79 thereafter. N-values are **not** converted to N60 and **not** corrected for depth.	SPT 9	89	6-11-16 (27)	6+		13.0
670				SPT 10	67	17-24-27 (51)	6+		12.0
	30		SAND (SP-SM) Brown, moist to dry to moist, fine grained, dense relative density.	SPT 11	78	7-16-22 (38)			5.6
660				SPT 12	89	7-17-15 (32)			3.3
	40		Very difficult drilling at 41.5 feet.	SPT 13	78	7-21-24 (45)			4.0
650			SILTY SAND (SM) Brown, moist to dry, with silty clayey sand lenses, trace clay, dense relative density.	SPT 14	89	12-20-23 (43)			7.1
	50		SILTY SAND (SM) brown, moist to wet, trace clay and gravel, dense relative density.	SPT 15	56	12-20-18 (38)			18.3
640			SAND (SP-SM) Brown, moist to dry, dense relative density.	SPT 16	89	4-14-20 (34)	6+		6.4
			SILTY CLAYEY SAND (SC-SM) Brown, moist to wet, trace gravel, dense to medium dense relative density.						15.2
	60			SPT 17	78	7-7-20 (27)	6+		13.4
			Bottom of hole at 61.0 feet.						

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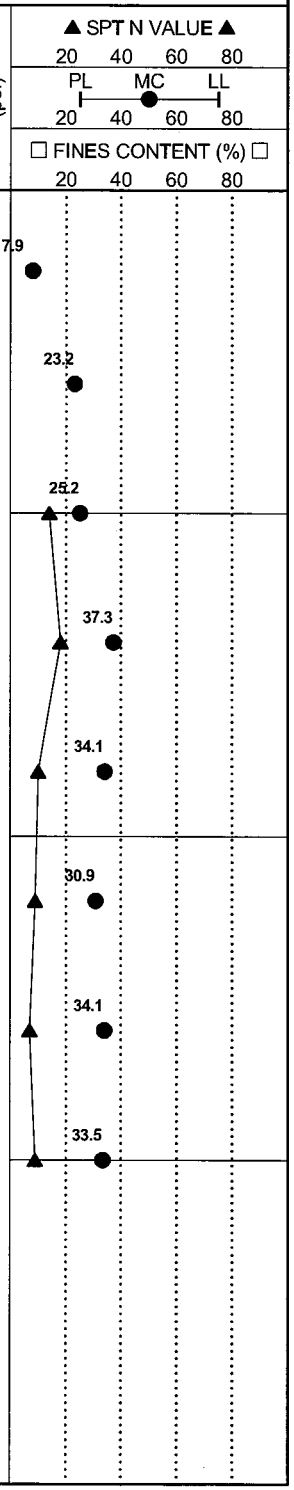
BORING NUMBER SPT-11-10

CLIENT Ayres Associates, Inc.
PROJECT NAME Riverside Road Reconstruction
PROJECT NUMBER 11G0621
PROJECT LOCATION Duluth, MN
DATE STARTED 2/10/11 **COMPLETED** 2/10/11
GROUND ELEVATION 620.28 ft **HOLE SIZE** 6-Inch
DRILLING CONTRACTOR EPC Engineering & Testing
GROUND WATER LEVELS:
DRILLING METHOD CME 55 Truck w/HSA and SPT Calibrated to N69
AT TIME OF DRILLING None
LOGGED BY TS **CHECKED BY** GH
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)
620	0		6-Inches Bituminous Pavement	AUGER	100			
			SILTY SAND (SM) (FILL) Dark brown to brown, frozen/moist, with to trace gravel.	AUGER 1	100			
			SANDY CLAY (CL-CH) (FILL) Dark brown, frozen/moist to wet, with to trace gravel.	SPT 2	67			
			Frozen to 4 feet.					
615	5		CLAY (CL-CH) (Could Be FILL) Brown, moist to wet, trace silt mottling, stiff consistency.	SPT 3	50	6-6-8-8 (14)		
			FAT CLAY (CH) Brown to reddish brown, wet, trace gravel, trace silt mottling, very stiff to stiff to medium consistency.	SPT 4	50	10-10-8-7 (18)		
				SPT 5	58	6-5-5-6 (10)		
610	10		Trace black organics at 10 feet.	SPT 6	42	2-5-4-4 (9)		
				SPT 7	67	4-4-3-4 (7)		
605	15		Cave-in level = none.	SPT 8	33	4-4-5-5 (9)		
			Bottom of hole at 16.0 feet.					



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BORING NUMBER SPT-11-11

CLIENT Ayres Associates, Inc. **PROJECT NAME** Riverside Road Reconstruction

PROJECT NUMBER 11G0621 **PROJECT LOCATION** Duluth, MN

DATE STARTED 2/10/11 **COMPLETED** 2/10/11 **GROUND ELEVATION** 641.28 ft **HOLE SIZE** 6-Inch

DRILLING CONTRACTOR EPC Engineering & Testing **GROUND WATER LEVELS:**

DRILLING METHOD CME 55 Truck w/HSA and SPT Calibrated to N69 **AT TIME OF DRILLING** None

LOGGED BY TS **CHECKED BY** GH **AT END OF DRILLING** ---

NOTES **AFTER DRILLING** ---

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)	SPT N VALUE / PL MC LL / FINES CONTENT (%)
	0	6-Inches Bituminous Pavement	AUGER	100				
640		SILTY SAND (SM) (FILL) Dark brown to brown, frozen/moist to dry, with to trace gravel.	AUGER 1	100				10.2
		FAT CLAY (CH) (Could Be FILL to 6 feet) Brown to reddish brown, frozen to wet. trace gravel and silt mottling, frozen to stiff to very stiff consistency. Composite laboratory tested with Borings 2, 3, 4, 6, 7 and 8. __% passing #200 sieve; LL=75, PL=21, PI=54.	SPT 2	67				24.7
	5	Frozen to 4 feet.	SPT 3	42	6-6-7-6 (13)			32.0
635		FAT CLAY (CH) Brown to reddish brown, wet, trace silt mottling, stiff consistency.	SPT 4	33	7-7-9-9 (16)			29.4
			SPT 5	58	6-5-5-5 (10)			42.5
	10		SPT 6	58	3-5-7-9 (12)			32.5
630			SPT 7	67	4-5-5-4 (10)			37.3
	15	Cave-in level = none.	SPT 8	67	3-4-4-6 (8)			37.3
		Bottom of hole at 16.0 feet.						

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Duluth, Minnesota 55802

BORING NUMBER SPT-11-2

CLIENT Ayres Associates, Inc.
PROJECT NAME Riverside Road Reconstruction
PROJECT NUMBER 11G0621
PROJECT LOCATION Duluth, MN
DATE STARTED 2/11/11 **COMPLETED** 2/11/11
GROUND ELEVATION 670.54 ft **HOLE SIZE** 6-Inch
DRILLING CONTRACTOR EPC Engineering & Testing
GROUND WATER LEVELS:
DRILLING METHOD CME 55 Truck w/HSA and SPT Calibrated to N69
AT TIME OF DRILLING None
LOGGED BY TS **CHECKED BY** GH
AT END OF DRILLING None
NOTES
AFTER DRILLING 18.0 ft / Elev 652.5 ft

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)	SPT N VALUE / PL MC LL / FINES CONTENT (%)
670	0		4-Inches Bituminous Pavement	AUGER	100				
			SILTY SAND (SM) (FILL) Dark brown to brown, frozen/dry to moist, with to trace gravel.	AUGER 1	100				6.3
			FAT CLAY (CH) (Could Be FILL) Reddish brown, frozen to wet, trace to little silt mottling, trace gravel and organics, frozen to stiff consistency.	SPT 2	75				19.3
			Composite laboratory tested with Borings 3, 4, 6, 7, 8 and 11. __% passing #200 sieve; LL=75, PL=21, PI=54.						
665	5		Frozen to 4.5 feet.	SPT 3	58	6-5-8-9 (13)			27.0
			FAT CLAY (CH) (Could Be FILL) Reddish brown, wet, trace to little silt mottling, trace gravel, trace organics to 19 feet, very stiff to stiff to very stiff consistency.	SPT 4	75	7-8-8-10 (16)			28.7
				SPT 5	100	4-4-5-6 (9)			31.6
660	10			SPT 6	75	2-5-5-6 (10)			37.0
				SPT 7	67	3-6-6-6 (12)			28.5
			Trace organics at 14 feet.						
655	15			SPT 8	67	3-7-7-6 (14)			27.2
	20		Cave-in level = none.	SPT 9	78	2-7-9 (16)			28.8
650			Bottom of hole at 21.0 feet.						

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Duluth, Minnesota 55802

BORING NUMBER SPT-11-3

CLIENT Ayres Associates, Inc.
PROJECT NAME Riverside Road Reconstruction
PROJECT NUMBER 11G0621
PROJECT LOCATION Duluth, MN
DATE STARTED 2/11/11 **COMPLETED** 2/11/11
GROUND ELEVATION 673.7 ft **HOLE SIZE** 6-Inch
DRILLING CONTRACTOR EPC Engineering & Testing
GROUND WATER LEVELS:
DRILLING METHOD CME 55 Truck w/HSA and SPT Calibrated to N69
AT TIME OF DRILLING None
LOGGED BY TS **CHECKED BY** GH
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)	SPT N VALUE / PL MC LL / FINES CONTENT (%)
	0		4-Inches Bituminous Pavement	AUGER	100				
			SILTY CLAYEY SAND (SC-SM) (FILL) Dark brown to brown, frozen/moist to wet, with to trace gravel.	AUGER 1	100				10.0
670			FAT CLAY (CH) Brown to reddish brown, frozen to wet, trace gravel, trace silt mottling, frozen to stiff.	SPT 2	75				24.1
			Composite laboratory tested with Borings 2, 4, 6, 7, 8 and 11. __% passing #200 sieve; LL=75, PL=21, PI=54.						
	5		Frozen to 4 feet.	SPT 3	50	6-6-4-5 (10)			28.3
			FAT CLAY (CH) (Could Be FILL) Brown to reddish brown, trace silt mottling, trace to little gravel, hard to stiff to very stiff consistency.	SPT 4	58	15-18-21-20 (39)			23.2
665			Little gravel at 6 and 10 feet.	SPT 5	67	3-4-5-6 (9)			25.7
	10			SPT 6	50	3-6-13-36 (19)			23.4
			SANDY SILT (ML) Brown, moist to wet, trace gravel, hard consistency.	SPT 7	67	6-19-25-23 (44)			17.7
660			SANDY SILTY CLAY (CL-ML) Brown, moist to wet, trace gravel, hard consistency.	SPT 8	67	13-17-19-20 (36)			22.6
	15		Cave-in level = none.						
655			Trace fractured rock and substantial sampler refusal in sample at 20 feet.						
	20			SPT 9	67	20-50/3"			16.2 >>
			Bottom of hole at 20.3 feet.						

SPT N VALUE: 20 40 60 80
PL MC LL: 20 40 60 80
FINES CONTENT (%): 20 40 60 80

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Duluth, Minnesota 55802

BORING NUMBER SPT-11-4

CLIENT Ayres Associates, Inc. **PROJECT NAME** Riverside Road Reconstruction
PROJECT NUMBER 11G0621 **PROJECT LOCATION** Duluth, MN
DATE STARTED 2/12/11 **COMPLETED** 2/12/11 **GROUND ELEVATION** 667.36 ft **HOLE SIZE** 6-Inch
DRILLING CONTRACTOR EPC Engineering & Testing **GROUND WATER LEVELS:**
DRILLING METHOD CME 55 Truck w/HSA and SPT Calibrated to N69 **AT TIME OF DRILLING** None
LOGGED BY TS **CHECKED BY** GH **AT END OF DRILLING** ---
NOTES **AFTER DRILLING** ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)	SPT N VALUE / PL MC LL / FINES CONTENT (%)
	0		4-Inches Bituminous Pavement	AUGER 1	100				7.9
			SILTY SAND (SM) (FILL) Brown, frozen/moist, trace gravel and clay.	AUGER 1	100				
			SILTY CLAYEY SAND (SC-SM) (FILL) Dark brown to brown, frozen/moist to wet, with to trace gravel.	AUGER 2	100				15.6
665			FAT CLAY (CH) (Could Be FILL) Brown to reddish brown, frozen to moist to wet, trace gravel, trace to little silt mottling, frozen to stiff consistency.	SPT 3	75				28.9
			Composite laboratory tested with Borings 2, 3, 6, 7, 8 and 11. __% passing #200 sieve; LL=75, PL=21, PI=54.						
	5		Frozen to 4 feet.	SPT 4	67	4-8-7-12 (15)			26.2
			FAT CLAY (CH) (Could Be FILL to 12 feet) Brown to reddish brown, moist to wet, trace gravel, trace to silt mottling, very stiff to stiff consistency.	SPT 5	58	8-13-14-17 (27)			27.3
660				SPT 6	58	4-6-11-7 (17)			32.7
	10			SPT 7	42	4-7-7-10 (14)			25.2
655				SPT 8	67	4-7-11-12 (18)			30.5
	15			SPT 9	50	4-6-10-9 (16)			28.2
650									
	20		Cave-in level = none.	SPT 10	78	2-7-7 (14)			28.6

Bottom of hole at 21.0 feet.

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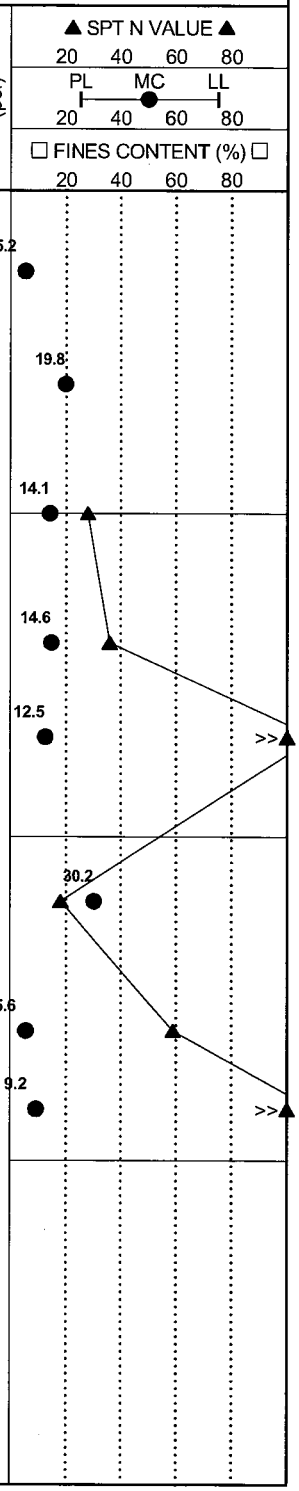
539 Garfield Avenue
Duluth, Minnesota 55802

BORING NUMBER SPT-11-5

CLIENT Ayres Associates, Inc.
PROJECT NAME Riverside Road Reconstruction
PROJECT NUMBER 11G0621
PROJECT LOCATION Duluth, MN
DATE STARTED 2/10/11 **COMPLETED** 2/10/11
GROUND ELEVATION 668.35 ft **HOLE SIZE** 6-Inch
DRILLING CONTRACTOR EPC Engineering & Testing
GROUND WATER LEVELS:
DRILLING METHOD CME 55 Truck w/HSA and SPT Calibrated to N69
AT TIME OF DRILLING None
LOGGED BY TS **CHECKED BY** GH
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)
	0		6-Inches Bituminous Pavement	AUGER	100			
			SILTY SAND (SM) (FILL) Dark brown to brown, frozen/moist to dry, with to trave gravel.	AUGER 1	100			
665			CLAY (CL-CH) (Could Be FILL) Brown, frozen/ wet, trace gravel. Frozen to 3.5 feet.	SPT 2	67			
	5		SILTY CLAYEY SAND (SC-SM) (Could Be FILL) Brown, moist to wet, with to trace gravel, medium dense relative density.	SPT 3	42	12-16-12-14 (28)		
			SANDY CLAY (CL-CH) (Could Be FILL) Brown, moist to wet, with to trace gravel, hard consistency.	SPT 4	75	12-18-18-22 (36)		
660			SILTY CLAYEY SAND (SC-SM) (Could Be FILL) Brown, moist to wet, with to trace gravel. Sampler pushed rock at 8 feet. Cave-in level = 9.5 feet.	SPT 5	73	13-50/5"		
	10		CLAY (CL-CH) (Could Be FILL) Brown, moist to wet, trace gravel, very stiff consistency. Difficult drilling at 11.5 feet.	SPT 6	42	4-6-12-13 (18)		
655			SAND (SP-SM) Brown, moist to dry, fine grained trace gravel, very dense relative density.	SPT 7	67	12-26-33-32 (59)		
	15		SILTY SAND (SM) Brown, moist, trace gravel, substantial sampler refusal.	SPT 8	40	50/5"		
			Bottom of hole at 15.0 feet.					



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539 Garfield Avenue
Duluth, Minnesota 55802

BORING NUMBER SPT-11-6

CLIENT Ayres Associates, Inc.
PROJECT NAME Riverside Road Reconstruction
PROJECT NUMBER 11G0621
PROJECT LOCATION Duluth, MN
DATE STARTED 2/9/11 **COMPLETED** 2/9/11
GROUND ELEVATION 659.23 ft **HOLE SIZE** 6-Inch
DRILLING CONTRACTOR EPC Engineering & Testing
GROUND WATER LEVELS:
DRILLING METHOD CME 55 Truck w/HSA and SPT Calibrated to N69
AT TIME OF DRILLING None
LOGGED BY CRL **CHECKED BY** GH
AT END OF DRILLING ---
NOTES Boring on Manitou Street.
AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
	0		2.5-Inches Bituminous Pavement	AUGER 1	100				7.8
			SILTY SAND (SM) (FILL) (9.5-Inches) Brown, frozen/moist, some to trace gravel.	AUGER 1	100				
			ASH / CINDER / SLAG (FILL) Black, frozen/moist, little clay.	SPT 2	100				21.7
			FAT CLAY (CH) (Could Be FILL) Brown to reddish brown, frozen / wet, trace gravel.	SPT 3	100				31.6
655			Composite laboratory tested with Borings 2, 3, 4, 7, 8 and 11. __% passing #200 sieve; LL=75, PL=21, PI=54.	SPT 4	100				32.5
	5		Frozen to 4.75 feet.						
			FAT CLAY (CH) Reddish brown, wet, trace gravel, very stiff to stiff consistency.	SPT 5	83	6-7-10-11 (17)			24.3
			Trace silt mottling at 6-feet.						
650				SPT 6	100	4-5-6 (11)			35.2
	10								
				SPT 7	100	5-4-5 (9)			33.8
645			Cave-in level = none.	SPT 8	100	5-6-5-5 (11)			39.2
	15		Bottom of hole at 15.0 feet.						

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BORING NUMBER SPT-11-7

CLIENT Ayres Associates, Inc.
PROJECT NAME Riverside Road Reconstruction
PROJECT NUMBER 11G0621
PROJECT LOCATION Duluth, MN
DATE STARTED 2/9/11 **COMPLETED** 2/9/11
GROUND ELEVATION 656.85 ft **HOLE SIZE** 6-Inch
DRILLING CONTRACTOR EPC Engineering & Testing
GROUND WATER LEVELS:
DRILLING METHOD CME 55 Truck w/HSA and SPT Calibrated to N69
AT TIME OF DRILLING None
LOGGED BY CRL **CHECKED BY** GH
AT END OF DRILLING ---
NOTES West-most boring on Sunnyside Street.
AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)	SPT N VALUE / PL MC LL / FINES CONTENT (%)
	0	3-Inches Bituminous Pavement	AUGER	67				6.5
		SILTY SAND (SM) (FILL) (9-Inches) Brown, frozen/moist to dry, some to little gravel.	AUGER 1	100				
655		FAT CLAY (CH) (Could Be FILL) Reddish brown, frozen/wet to moist to wet, trace gravel, frozen to stiff consistency.	SPT 2	100				26.1
		Composite laboratory tested with Borings 2, 3, 4, 6, 8 and 11. __% passing #200 sieve; LL=75, PL=21, PI=54.						
		Frozen to 4.5-feet.						
	5	Sample 3 pushed a rock.	SPT 3	33	4-6-8 (14)			27.1
650		FAT CLAY (CH) Reddish brown, wet to moist to wet, very stiff to stiff consistency.	SPT 4	67	4-7-13 (20)			32.8
	10		SPT 5	100	4-7-9 (16)			32.1
645		Trace silt mottling at 12 feet.	SPT 6	100	3-7-11 (18)			24.3
	15	Cave-in level = none.	SPT 7	100	4-6-8 (14)			39.1
		Bottom of hole at 16.0 feet.						

GEOTECH BH PLOTS 11G0621 AYRES RIVERSIDE.GPJ GINT US LAB.GDT 2/17/11

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BORING NUMBER SPT-11-8

CLIENT Ayres Associates, Inc.
PROJECT NAME Riverside Road Reconstruction
PROJECT NUMBER 11G0621
PROJECT LOCATION Duluth, MN
DATE STARTED 2/9/11 **COMPLETED** 2/9/11
GROUND ELEVATION 642.76 ft **HOLE SIZE** 6-Inch
DRILLING CONTRACTOR EPC Engineering & Testing
GROUND WATER LEVELS:
DRILLING METHOD CME 55 Truck w/HSA and SPT Calibrated to N69
AT TIME OF DRILLING None
LOGGED BY CRL **CHECKED BY** GH
AT END OF DRILLING ---
NOTES East-most boring on Sunnyside Street.
AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)	SPT N VALUE / PL MC LL / FINES CONTENT (%)
	0	2.5-Inches Bituminous Pavement	AUGER	100			6.0	
		SILTY SAND (SM) (FILL) (9.5-Inches) (Class 5 - like) Brown, frozen/moist to wet, with to little gravel.	AUGER 1	100				
		SILTY CLAYEY SAND (SC-SM) (FILL) (12-Inches) Brown, frozen/wet, some to trace gravel.	AUGER 2	100			10.1	
640		FAT CLAY (CH) Reddish brown, frozen/wet to wet, trace gravel and silt mottling, frozen to stiff.	SPT 3	100			32.1	
		Composite laboratory tested with Borings 2, 3, 4, 6, 7 and 11. __% passing #200 sieve; LL=75, PL=21, PI=54.						
	5	Frozen to 4-feet.	SPT 4	100	6-7-5 (12)		29.9	
635		SILTY SAND (SM) Brown, water bearing, with to some gravel, trace clay, dense relative density.	SPT 5	67	12-18-16 (34)		12.9	
		FAT CLAY (CH) Reddish brown, wet, stiff consistency.						
	10		SPT 6	83	6-7-4 (11)		35.5	
630			SPT 7	100	6-6-6 (12)		36.9	
	15	Cave-in level - none.	SPT 8	100	2-5-4 (9)		41.9	
		Bottom of hole at 16.0 feet.						

SPT N VALUE: 20 40 60 80
PL MC LL: 20 40 60 80
FINES CONTENT (%): 20 40 60 80

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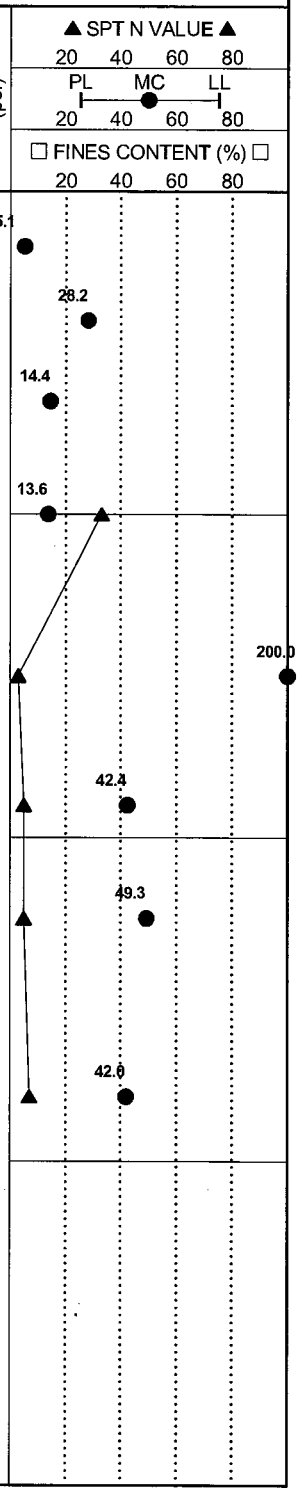
BORING NUMBER SPT-11-9

CLIENT Ayres Associates, Inc.
PROJECT NAME Riverside Road Reconstruction
PROJECT NUMBER 11G0621
PROJECT LOCATION Duluth, MN
DATE STARTED 2/9/11 **COMPLETED** 2/9/11
GROUND ELEVATION 640.72 ft **HOLE SIZE** 6-Inch
DRILLING CONTRACTOR EPC Engineering & Testing
GROUND WATER LEVELS:
DRILLING METHOD CME 55 Truck w/HSA and SPT Calibrated to N69
AT TIME OF DRILLING None
LOGGED BY CRL **CHECKED BY** GH
AT END OF DRILLING ---
NOTES Boring at intersection of Cato and Union.
AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Pocket Penetrometer (tsf)	DRY UNIT WT. (pcf)
640	0		2.5-Inches Bituminos Pavement	AUGER	100			
			SILTY SAND (SM) (FILL) Brown, frozen/moist to dry, some to trace gravel.	AUGER 1	100			
			CLAY (CL-CH) (FILL) Brown to reddish brown, frozen/wet, some to little gravel, trace brick.	AUGER 2	100			
			SILTY SAND / BRICK (FILL) Orangeish brown to rusty reddish brown, dry, trace gravel, medium dense relative density.	AUGER 3	100			
			Frozen to 4.5-feet.					
	5		With clay, trace slag and 1-inch piece of brick with intact mortar on it at 5 feet.	SPT 4	25	6-10-23-30 (33)		
635			WOOD (FILL) Brown outside, off-white inside, wet, very loose relative density.	SPT 5	25	2-2-1-1 (3)		
			FAT CLAY (CH) Reddish brown, wet, medium consistency.	SPT 6	100	2-2-3-4 (5)		
	10			SPT 7	100	2-2-3 (5)		
630								
			Cave-in level = none.	SPT 8	100	2-3-4-4 (7)		
	15		Bottom of hole at 15.0 feet.					



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BORING NUMBER SPT-11-12

CLIENT Ayres Associates, Inc. **PROJECT NAME** Riverside Road Reconstruction
PROJECT NUMBER 11G0621 **PROJECT LOCATION** Duluth, MN
DATE STARTED 4/25/11 **COMPLETED** 4/27/11 **GROUND ELEVATION** 706 ft **HOLE SIZE** 8-inch
DRILLING CONTRACTOR EPC Engineering & Testing **GROUND WATER LEVELS:**
DRILLING METHOD CME 750 ATV with HSA Cal. to N79 ▽ **AT TIME OF DRILLING** 6.0 ft / Elev 700.0 ft
LOGGED BY TS & JD **CHECKED BY** GH **AT END OF DRILLING** ---
NOTES Bridge boring. Offset 20 feet NW due to utilities. ▼ **48hrs AFTER DRILLING** 5.0 ft / Elev 701.0 ft

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PENETROMETER (tsf)	DRY UNIT WT. (pcf)
	0	SILTY SAND (SM) (FILL) Brown, moist to wet, loose relative density.	SPT 1	50	2-2-2-3 (4)		
		No recovery in Sample 2 - sampler pushed rock.	SPT 2	0	50/2"		
700		SILTY CLAYEY SAND (SC-SM) (Could Be FILL) Dark brown to brown, wet, loose to medium dense relative density.	SPT 3	33	4-5-5-4 (10)		
			SPT 4	50	8-10-12-13 (22)		
	10	SANDY CLAY (CL) Brown to dark brown, moist to wet, hard to stiff consistency.	SPT 5	58	3-26-13-13 (39)		109
		Trace organics in Sample 6	SPT 6	50	5-5-4-5 (9)		
		SILTY CLAYEY SAND (SC-SM) Brown, moist, dense to very dense relative density.	SPT 7	67	12-14-18-17 (32)		
690			SPT 8	75	14-18-27-19 (45)		115
		N-values are with SPT hammer calibrated to N79. N-values are **not** converted to N60 and **not** corrected for depth.					
	20		SPT 9	56	27-35-17 (52)		
		SANDY SILT (ML) Brown, wet, trace clay, hard consistency.	SPT 10	89	6-15-22 (37)		
680							
	30	CLAY (CL) Reddish brown, wet, very stiff consistency.	SPT 11	89	5-10-16 (26)		
		SILTY SAND (SM) Reddish brown, moist, dense relative density.					
		SAND with Silt (SP-SM) Brown, dry, fine grained, medium dense relative density.	SPT 12	67	6-12-19 (31)		
670		SILTY SAND (SM) Brown, moist, trace gravel, dense relative density.					
	40	SAND with Silt (SM-SM) Brown, wet to moist, fine grained, dense to medium dense relative density.	SPT 13	89	7-15-20 (35)		
			SPT 14	78	4-11-17 (28)		
660							
	50		SPT 15	78	4-13-17 (30)		
		SILT with Sand (ML) Dark brown, moist, hard consistency.	SPT 16	100	15-20-25 (45)		121
650		Drillers note: Difficult drilling at 57 feet.					
	60	Gradation Test of Samples 16 and 17: 98% passing #4 and 71% passing #200 sieves.	SPT 17	100	20-38-50/4"		
		Substantial auger refusal at 62.5 feet.					
		Bottom of hole at 62.5 feet.					

▲ SPT N VALUE ▲ (20 40 60 80)
PL MC LL (20 40 60 80)
☐ FINES CONTENT (%) ☐ (20 40 60 80)