STRUCTURE GEOTECHNICAL REPORT

Proposed Retaining Wall

S.N. 081-7001

IL Route 5 (John Deere Road)
FAP Route 595
Section 142R
Rock Island County

PTB 155 - Item 026
IDOT Job No. D-92-003-06
Contract No. 64B84

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Exhibits:
A) Location Map
B) Boring Locations
C) Boring Logs
D) Subsurface Data Profile
E) Slope Stability Outputs

Project Description and Proposed Structure Information

The geotechnical study summarized in this report was performed for the proposed retaining wall for IL Route 5 (John Deere Road) from station 312+00.00 to station 333+32.00 in Rock Island County, Illinois. The retaining wall is part of the IL Rte. 5 widening and resurfacing project. The purpose of this report is to investigate the subsurface conditions and present design and construction recommendations for the proposed structure. On the USGS Coal Valley quadrangle map, the project site lies in Sections 14 & 15, Range 1W, Township 17N, in the 4th Principal Meridian. A *Location Map* is presented in Exhibit A.

The proposed structure is located approximately 1.3 miles east of US Rte. 6/ I-74. The retaining wall will be approximately 92'-0" right of the centerline for IL Rte. 5. The wall will be 2,157'-$1\frac{5}{8}$" length and is expected to run between stations 312+00.00 and 333+32.00. The proposed wall will retain the new embankment resulting from widening of existing eastbound IL Rte. 5. The estimated maximum exposed height for the wall is 13.6 feet with the average retained height estimated to be around 8.2 feet. The proposed structure design will follow the LRFD design specifications. A noise wall will be constructed on top of the proposed retaining wall and will extend 120 feet to the west at the west end of the wall and 158 feet to the south at the east end of the wall. In order to construct the retaining wall, lane closure or shoulder closure may be required. Drainage structures cross the wall at multiple locations.

The project also requires separate SGR's to be prepared for SN 081-1118, SN 081-1120, and the 44th Avenue culvert.

Existing Information

No structure currently exists at the proposed wall location. IL Rte. 5 is built on a horizontal curved alignment at this location. Stationing increases from west to east.

Site Investigation, Subsurface Exploration and Generalized Subsurface Conditions

The site is located in an urban area approximately one mile north of the Rock River. Utilities in the vicinity of the proposed retaining wall include, but are not limited to, an underground water main approximately 13 feet south of the proposed wall which crosses IL Route 5 at station 320+50; an underground sanitary sewer approximately 19 feet south of the proposed wall; and underground and aerial telephone lines are located within the proposed location of the wall and also cross over IL Route 5 at approximately station 315+90. There is also a gas line at station 315+90. The subsurface investigation consisted of 28 borings (B-1 through B-28) drilled by IDOT District 2 in September/October of 2011. The borings were drilled south of the centerline of IL Route 5 at offset distances ranging from 54.0 feet to 90.0 feet. A rock core was taken at boring locations B-1, B-15, and B-28.

Beginning at the ground surface, standard penetration tests (SPT) were conducted every 2.5 feet according to AASHTO T 206 using a hollow stem auger drill. Most borings were terminated when the rock layer caused auger refusal. As previously stated above, borings B-1, B-15, and B-28 continued with 10 feet of rock coring into shale.

Rock was encountered in the elevation range of 562.0 to 575.7, with depths to rock ranging from 4 to 22 feet. The rock core B-1 had a RQD value of 100% and strengths ranging from 113.0 to 262.0 tsf. The rock core B-15 had a RQD values between 58 and 75% with strengths ranging from 10.0 to 29.0 tsf. The rock core B-28 had RQD values between 78 and 92% with strengths ranging from 11.0 to 31.0 tsf.

While drilling, groundwater was encountered at varying depths. The boring data depicts mostly silty clay loam material with traces of sand layers on top of rock, having Q_u values of 0.2 to 4.5 tsf, SPT (N) values ranging from 2 to 20 blows per foot, and moisture contents ranging between 10% and 75%.

Data given in borings B-25, B-26, and B-27 was established using Penetrometer. The soils immediately below the footing at these locations were very soft clay with Qu values of 0.2 tsf and moisture contents ranging between 30% and 35%. According to IDOT Geotechnical Manual 2.3.2, values derived using Penetrometer should not be used in recommendations, stability or settlement analysis. Due to this reason, these borings are only used for estimations of subgrade soil treatment depths.

Further descriptions of the soil conditions encountered in the borings are presented in the *Boring Logs* attached in Exhibit C and the *Subsurface Data Profile* in Exhibit D. *Boring Locations* can be found in Exhibit B.

Geotechnical Evaluations

Settlement. Primary settlement analysis was performed for concrete cantilever and MSE wall types for various boring locations. The estimated settlements were found to be as high as 1.29 inches. The analysis was done assuming preliminary TSL footing elevations; 8 foot wide footing and 120 pcf back fill for concrete cantilever wall. If the actual dimensions are different, settlements shall be checked using actual values.

Slope Stability. Stability analyses using Bishop's Method were performed using temporary excavation 1:1 slope model at multiple locations along the wall using different borings. According to AASHTO LRFD 11.6.2.3, the required resistance factor for slope stability is 0.75 which is equivalent to factor of safety of 1.3. Slope stability checks were performed at various boring locations and minimum factor of safety was found to be over 3 at all locations.

Seismic Considerations. Based on the method described in the IDOT AGMU Memo and Design Guide 09.1 (LRFD Seismic Site Class Definition), Soil Site Class C controls. The Design Spectral Acceleration at 1.0 sec (S_{D1}) is 0.062g and at 0.2 sec (S_{Ds}) is 0.096g. According to AASHTO LRFD 3.10.6 the Seismic Performance Zone is 1 based on the 1.0 second Design Spectral Acceleration.

Liquefaction. Per the IDOT AGMU Memo and Design Guide 10.1 (LRFD Liquefaction Analysis), a liquefaction analysis is not required for Seismic Performance Zone 1.

Mining Activity. A review of The Illinois State Geological Survey (ISGS) "Directory of Coal Mines in Illinois" for Rock Island County indicates that no mining activity has been present at the project location for the retaining wall. It should be noted that an "underground mine proximity region" is just to the west of 41st street around station 300+00.

Retaining Wall Evaluations and Design Recommendations

Retaining Wall

The maximum retained height is to be approximately 12.7 feet (from bottom-of-wall grade to top-of-wall grade). The soil retained will be a fill area for new roadway embankment. Feasible wall types include a T-type cantilever wall supported by spread footing, mechanically stabilized earth (MSE) wall, soldier pile wall, and permanent sheet pile wall. The following provides a general discussion of soil conditions as they relate to the retaining wall construction. Considering the soil conditions, wall heights and fill situation, it is expected that the T-type Concrete Cantilever wall will be the most appropriate option for construction. However, economic, construction and scheduling factors should be evaluated for the decision of retaining wall design.

T-type Concrete Cantilever. A conventional reinforced concrete retaining wall supported on a spread footing appears to be a feasible option for the proposed wall. The footing for the wall can be dimensioned using the nominal soil bearing pressures given in Table 1. The bottom of the footings would need to be placed at a minimum depth of 4 feet below final lowest adjacent grade for the frost protection. At boring location B-17, rock was encountered at less than 4 feet below the existing ground surface and, thus, would require the wall footing to be set in rock. It is typically recommended that if one section of the wall is set into rock, the remainder of the wall foundation should be set into rock as to prevent differential settlement along the wall. Since rock ranges from depths of 3.5 to 16.5 feet below existing ground surface and the wall is roughly 2,157 feet in length, the footing could be placed in rock and soil as long as there is adequate bearing pressure in the soil beneath the footing. The footing should be sized to provide sufficient weight to resist sliding and overturning.

Stations	Bottom Of Footing Elev.	Max. Factored Bearing Pressure	Min. Factored Bearing Resistance
Sta. 312+00 to Sta. 316+15.11	574.30	3.1 ksf	5.7 ksf
Sta. 316+15.11 to Sta. 317+33.17	572.75	4.0 ksf	4.0 ksf
Sta. 317+33.17 to Sta. 322+67.42	572.75	5.3 ksf	6.3 ksf
Sta. 322+67.42 to Sta. 325+34.27	574.75	4.7 ksf	11.0 ksf
Sta. 325+34.27 to Sta. 329+79.03	572.00	7.3 ksf	12.0 ksf
Sta. 329+79.03 to Sta. 331+56.93	574.50	4.0 ksf	9.9 ksf
Sta. 331+56.93 to Sta. 332+45.88	576.00	2.9 ksf	9.7 ksf
Sta. 332+45.88 to Sta. 333+32.00	577.50	2.8 ksf	5.0 ksf

Table 1

The maximum allowable settlement was established as 1 inch after conversation with the Structural Engineer at Ciorba Group. The amount of differential settlement was limited as per LRFD AASHTO C 11.6.2.2 to 1/1000. Settlement analysis showed settlements in excess of 1 inch as well as differential settlements exceeding 1/1000 ratio towards the west and east ends of the wall. It is recommended the soil below the footing be removed and replaced with Porous Granular Embankment with CA-7 gradation at the following locations down to the elevations shown in Table 2. The removal and replacement shall extend at least 1 foot outside limits of the toe and heel of the footing.

Stations	Bottom of Removal & Replacement Limits
Sta. 312+00.00 to Sta. 316+15.11	571.0
Sta. 316+15.11 to Sta. 317+04.06	568.5
Sta. 330+67.98 to Sta. 333+32.00	571.0

Table 2

Lateral loads on the wall may be resisted by the frictional resistance between the footings and supporting soil. A Geocomposite Wall Drain should be placed over the entire length of the back face of the wall and either connected to a perforated drain pipe in accordance with IDOT Bridge Manual or weep holes should be put into the wall at 8 foot centers.

Mechanically Stabilized Earth (MSE) Wall. The MSE wall does not appear to be a viable option. The drainage ditch located between the wall and the roadway would limit the ability to provide soil reinforcement behind the upper portion of the wall. Additionally, the foundation for the proposed noise wall would not be able to be mounted to the MSE wall. The noise wall foundation would need to be located behind the retaining wall and its foundation may interfere with the soil reinforcement. Another concern with using an MSE wall at this location would be future possible utilities excavating behind the wall and damaging the soil reinforcement. The location of this wall makes it highly susceptible for future utility placement.

Soldier Pile Wall. A Soldier pile wall appears to be an expensive option for the wall at this location. With a high rock elevation occurring at some of the boring locations, piles would need to be drilled in rock at those locations in order to obtain the adequate embedment depth needed, which would drive the cost up for this option. However, if it is determined in final design that the soldier pile option is needed for the proposed wall, Table 3 contains a tabulation of lateral soil parameters to be used for design of piles and the retaining wall. Drainage should be provided behind the wall.

Material	Unit Weight (pcf)	Friction Angle (deg)	Undrained Cohesion (psf)	Strain
Granular Backfill	120	28	-	-
Soft Clay	110	-	300	0.02
Medium Clay	120	-	500	0.01
Stiff Clay	120	-	1000	0.007
Very Stiff Clay	125	-	2000	0.005
Hard Clay	125	-	4000	0.004

Table 3

Permanent Sheet Pile Wall. Steel sheet piles with cast-in-place concrete facing do not appear to be a viable option due to the fact that rock is located at shallow depths and the sheet piles will not be able to obtain the appropriate embedment depth required to retain the soil behind it.

Ground-Mounted Noise Wall

Ground Mounted Noise Walls are proposed at each end of the Retaining Wall. Foundation support will be required at each Ground Mounted Noise Wall post. Per IDOT Bridge Manual section 3.12, the preferred foundation type is drilled shafts.

The noise walls will be a performance based design developed by the Contractor. Tables 4 and 5 define the soil properties to be used in designing the shaft depths.

Soil Type	Elevation at Bottom of Soil Layer	Effective Unit Weight (pcf)	Friction Angle (deg)	c (ksf)	Strain
Stiff Silty Clay Loam	576.1	128	-	1.8	0.007
Medium Silty Loam	568.6	*51	28	0.5	0.01
Soft Silty Loam	563.1	*46	26	0.3	0.02
Medium Shale	561.1	*66	34	-	-
Very Dense Shale	554.1	*83	44	-	-

Table 4 – Ground Mounted Noise Wall at West End

Soil Type	Elevation at Bottom of Soil Layer	Effective Unit Weight (pcf)	Friction Angle (deg)	c (ksf)	Strain
Soft Sandy Loam	578.6	108	27	0.3	0.02
Medium Silty Loam	576.1	113	29	0.5	0.01
Very Soft Silty Loam	571.6	*42	25	0.2	0.02
Medium Shale	561.6	*66	34	-	-

Table 5 – Ground Mounted Noise Wall at East End
*Assumed to be below water table.

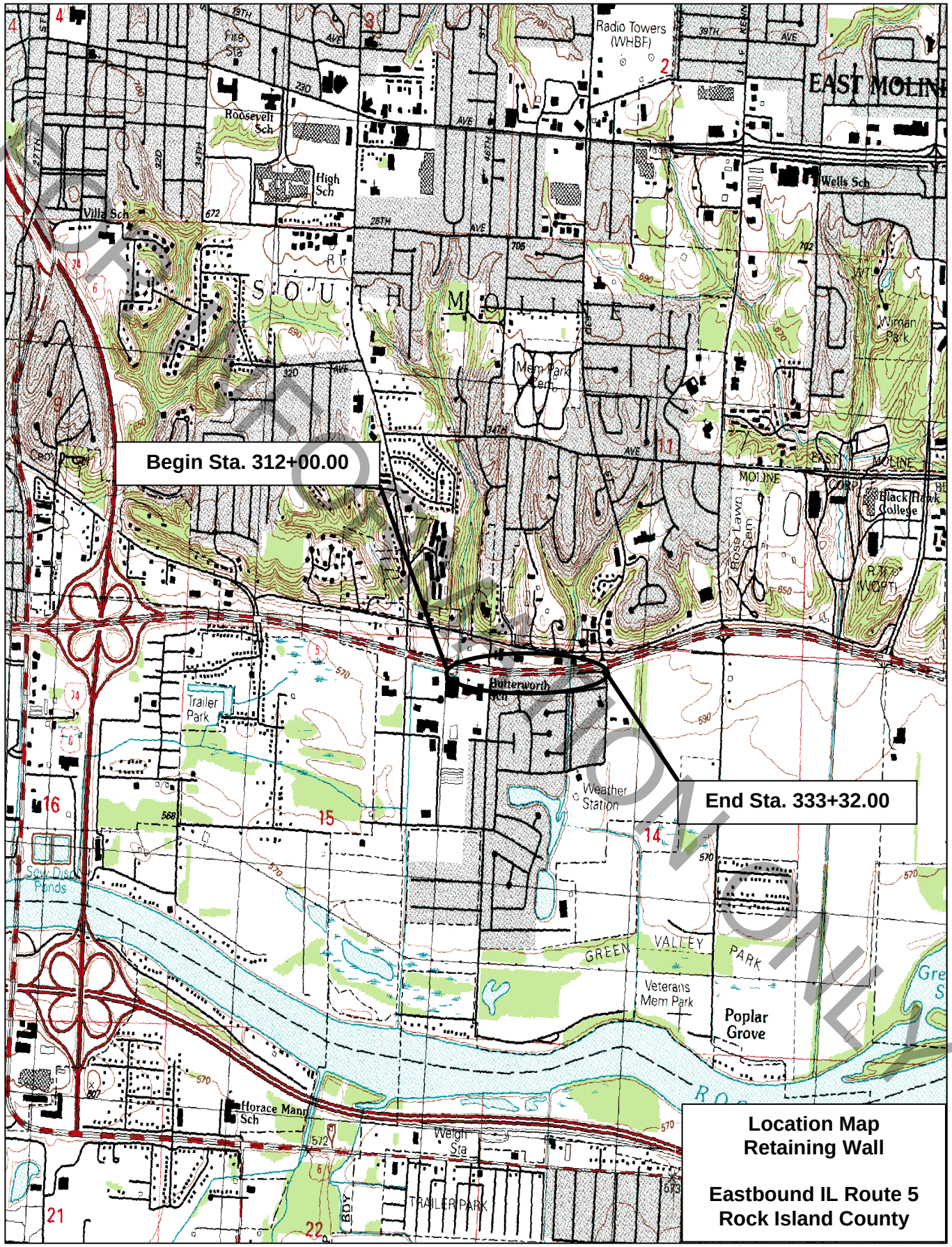
Construction Considerations

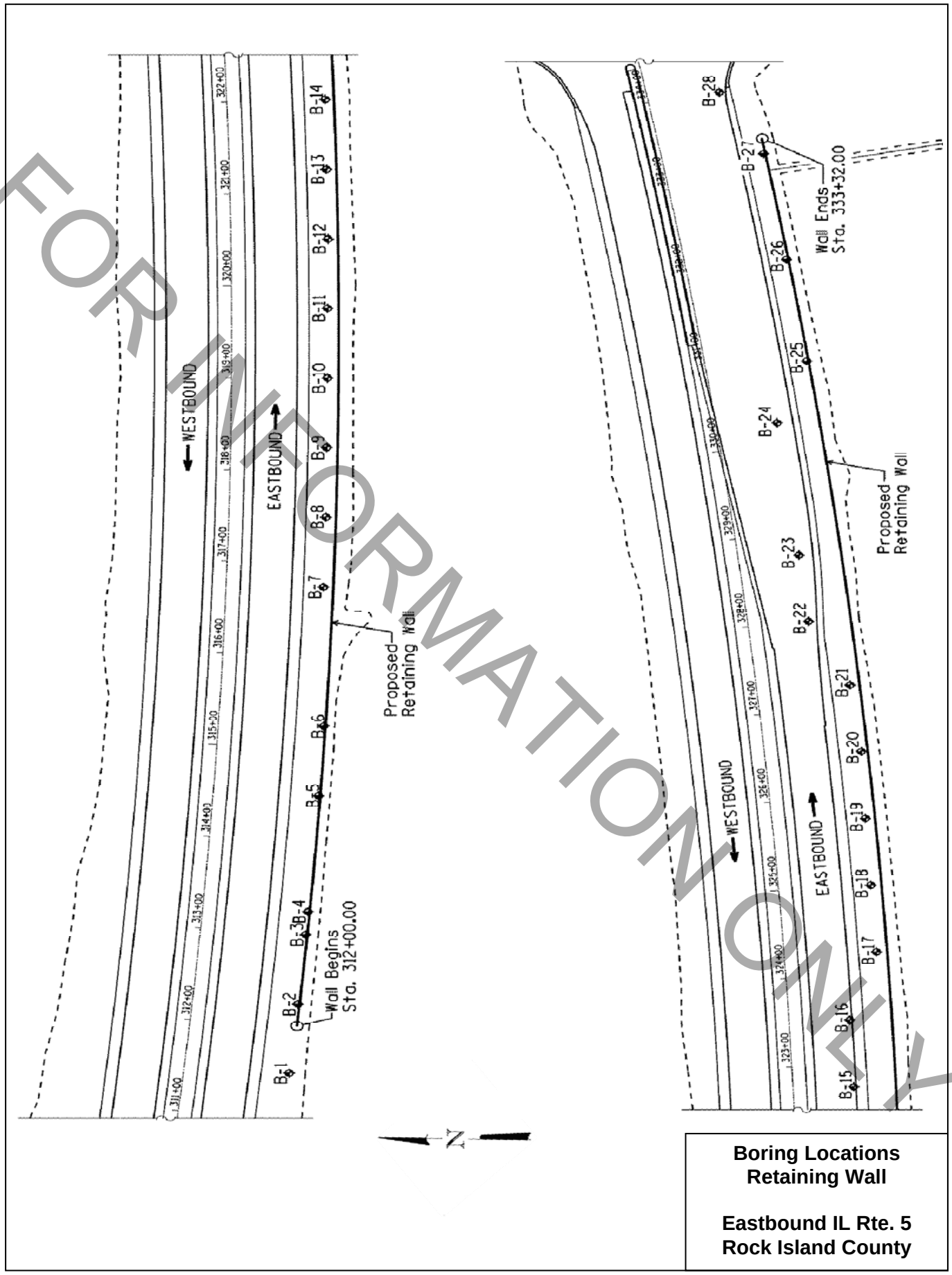
Temporary Soil Retention System. The wall type selected will dictate what type of traffic control, if any, will be required for the construction of the retaining wall at this project site location. The site may constitute the need for shoulder closures and even possible lane closures in order to construct the proposed retaining wall and retained backfill. If this appears to be the case, Temporary Soil Retention System may be needed. Temporary construction cross slopes should be examined to avoid the use of a retention system.

Excavation. If excavation for the proposed improvements is in excess of 4 feet, a 1:1 temporary excavation slope for construction clearance has adequate resistance. Movement of adjacent soils near the edge of and into excavation areas should be prevented. All excavations should be performed in accordance with the latest Occupational Safety and Health Administration (OSHA) requirements. Allowances should be made for any surcharge loads adjacent to the excavation areas.

Embankment Construction. Granular soil material should be specified as the embankment fill. The fill should be constructed as early as possible in the project construction period in order to allow the embankments to adjust or settle.

Ground Improvement. If Concrete cantilever retaining wall is selected, then unsuitable material down to depths shown in Table 2 shall be removed and replaced with Porous Granular Embankment with CA-7 gradation to limits discussed in design recommendations.





Boring Locations
Retaining Wall

Eastbound IL Rte. 5
Rock Island County

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

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Date 9/11/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-1
Station 311+50
Offset 90.00ft Rt Existing
Ground Surface Elev. 579.60 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 557.6 ft
Upon Completion Dry ft
After 24 Hrs. 573.6 ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM				
		4	1.5 P	22.0
	577.60			
VERY STIFF brown SILTY CLAY LOAM		4		
		5	2.1 B	15.0
	576.10			
SOFT light brown LOAM	-5	1		
		2	0.3	23.0
	573.60 ▽	3	B	
MEDIUM tan/light gray SILTY LOAM		1		
		1	0.5	27.0
	571.10	3	B	
MEDIUM gray SILTY CLAY LOAM	-10	2		
		1	0.8	33.0
	568.60	3	B	
VERY SOFT gray SILT with fine SAND lens		0		
		0	0.2	33.0
	566.10	2	B	
SOFT gray SILTY LOAM	-15	0		
		0	0.4	33.0
		2	B	
	563.10			
MEDIUM gray weathered SHALE		2		
		6		
	561.10	12		
VERY DENSE gray SHALE	-20	12		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY DENSE gray SHALE *(continued)*		20		
	558.60	51		
VERY DENSE gray SHALE	▽	100/10"		
	556.10			
VERY DENSE gray SHALE	-25	100/8"		
	554.10			
Borehole continued with rock coring.	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation/D-2

ROCK CORE LOG

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Date 9/11/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island CORING METHOD

STRUCT. NO.
Station

CORING BARREL TYPE & SIZE

BORING NO. B-1
Station 311+50
Offset 90.00ft Rt Existing
Ground Surface Elev. 579.60 ft

Core Diameter 2 in
Top of Rock Elev. 563.10 ft
Begin Core Elev. 554.10 ft

	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
Shale: light gray, dense, very calcareous & massively bedded. t.s.f.: 550.7 to 550.2	554.10	1	100	100	3.6	113.0
	-30					
Shale: as above. t.s.f.: 548.4 to 547.9	549.10	2	100	92	6.6	262.0
	-35					
End of Boring	544.10					
	-40					
	-45					

Color pictures of the cores
Cores will be stored for examination until
The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

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Date 9/11/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-2
Station 312+25
Offset 90.00ft Rt Existing
Ground Surface Elev. 578.60 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 564.1 ft
Upon Completion 564.1 ft
After ____ Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM			1.0 P	29.0
	576.60	4		
STIFF light brown SILTY CLAY LOAM		4	1.9 B	20.0
	575.10	4		
MEDIUM gray/tan SILTY LOAM	-5	2		
		2	0.7 B	24.0
	572.60	3		
SOFT gray SILTY LOAM with SAND lens		2		
		1	0.5 B	33.0
	570.10	2		
SOFT gray SILTY LOAM	-10	1		
		2	0.3 P	32.0
	567.60	3		
SOFT gray SILT with fine SAND lens		1		
	565.10	2	0.4 B	26.0
		3		
VERY LOOSE gray dirty medium SAND	-15	1		
		1		22.0
		2		
	562.10			
MEDIUM gray SHALE with fine SAND on top 6"		0		
		5		
	560.10	21		
VERY DENSE gray SHALE	-20	30		
VERY DENSE gray SHALE (continued)				100/8"
	557.60			
End of Boring	-25			
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

Page 1 of 1

Date 9/15/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-3
Station 313+00
Offset 90.00ft Rt Existing
Ground Surface Elev. 578.50 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 571.5 ft ▼
Upon Completion 557.5 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM			1.8 P	18.0
	576.50	4		
MEDIUM brown SILTY CLAY LOAM		3	0.9	27.0
	575.00	5	B	
VERY SOFT brown SANDY LOAM	-5	2		
		2	0.2	19.0
	572.50	3	P	
MEDIUM redish brown CLAY LOAM	▼	1		
		1	0.7	29.0
	570.00	3	B	
SOFT light gray SILT with SAND lens	-10	1		
		2	0.3	27.0
	567.50	2	P	
MEDIUM gray SILTY LOAM		1		
		2	0.5	29.0
	565.00	3	B	
MEDIUM gray SILTY LOAM with SAND lens	-15	2		
		2	0.5	29.0
		4	P	
	562.00			
VERY DENSE gray SHALE		16		
		31		
	560.00	40		
VERY DENSE gray SHALE	-20	00/10"		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY DENSE gray SHALE *(continued)*	557.50▽			
VERY DENSE gray SHALE		100/6"		
	555.00			
End of Boring	-25			
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

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Date 9/15/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC. , TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-4
Station 313+25
Offset 90.00ft Rt Existing
Ground Surface Elev. 578.70 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 564.2 ft ▼
Upon Completion 560.7 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY STIFF brown SILTY CLAY LOAM			3.0 P	19.0
576.70		4		
STIFF brown SILTY CLAY LOAM		5 4	1.1 B	24.0
575.20	-5	2		
MEDIUM tan/gray/brown SILTY CLAY LOAM		2 3	0.8 B	28.0
572.70		2		
STIFF tan SILTY LOAM		4 4	1.1 B	26.0
570.20	-10	1		
SOFT gray SILTY LOAM		1 2	0.3 B	28.0
567.70		1		
SOFT tan SILTY LOAM with SAND lens		2 3	0.3 B	26.0
565.20	▼ -15	1		
SOFT gray SILTY LOAM with SAND and ORGANICS lens		1 5	0.4 P	34.0
562.20		38		
VERY DENSE gray SHALE Auger Refusal at 18.5'	▽	100/7"		
560.20				
End of Boring	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

Page 1 of 1

Date 9/20/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY M. Jacoby

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-5
Station 314+50
Offset 90.00ft Rt Existing
Ground Surface Elev. 579.30 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 567.3 ft ▼
Upon Completion 560.3 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF dark brown SILTY CLAY LOAM			1.8 P	14.0
	577.30	3		
HARD brown SILTY CLAY LOAM		2 3	4.5 P	14.0
	575.80			
MEDIUM brown SILTY CLAY LOAM	-5	2		
		2 3	1.0 B	26.0
	573.30			
SOFT tan SILTY LOAM		0		
		2 3	0.5 B	27.0
	570.80			
VERY SOFT tan SILTY LOAM	-10	0		
		2 3	0.4 B	30.0
	568.30			
SOFT tan SILTY LOAM	▼	1		
		1 2	0.3 B	26.0
	565.30			
MEDIUM gray weathered SHALE	-15	3		
		7 17		
	563.30			
VERY DENSE gray weathered SHALE		60		
		100/9"		
	560.80			
	▽			
VERY DENSE gray SHALE	-20	100/3"		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY DENSE gray SHALE *(continued)*	558.30			
VERY DENSE gray SHALE		100/6"		
	555.80			
End of Boring	-25			
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
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SOIL BORING LOG

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Date 9/20/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY M. Jacoby

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-6
Station 315+25
Offset 90.00ft Rt Existing
Ground Surface Elev. 578.70 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 564.2 ft ▼
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY STIFF dark brown SILTY CLAY LOAM			3.3 P	22.0
STIFF brown SILTY CLAY LOAM	576.70	5		
		6	1.8 B	19.0
	575.20	4		
STIFF tan SILTY CLAY LOAM	-5	3		
		3	1.0 B	27.0
	572.70	4		
STIFF reddish/tan SILTY CLAY LOAM		1		
		3	0.9 B	28.0
	570.20	4		
MEDIUM reddish/tan SILTY CLAY LOAM	-10	2		
		2	0.7 B	43.0
	567.20	4		
MEDIUM gray weathered SHALE with SAND lens		7		
		8		
	565.20	16		
VERY DENSE gray SHALE	▼ -15	14		
		19		
	562.70	43		
VERY DENSE gray weathered SANDSTONE		100/3"		
	560.20			
	-20	100/2"		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY DENSE gray SHALEY SANDSTONE *(continued)*	557.70			
End of Boring	-25			
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

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Date 9/21/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-7
Station 316+75
Offset 83.00ft Rt Existing
Ground Surface Elev. 577.50 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 565.5 ft ▼
Upon Completion 565.5 ft ▽
After ____ Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
SOFT light brown SILTY LOAM			0.3 P	10.0
575.50				
MEDIUM tan SILTY CLAY LOAM		4		
		4	0.5 B	23.0
574.00		4		
No Recovery	-5	2		
		1		
571.50		3		
VERY SOFT tan SILTY LOAM		0		
		1	0.2 P	30.0
568.50		3		
LOOSE tan fine moist SAND	-10	3		
		1		
566.00		8		
DENSE gray SHALE ▼		11		
		11		
564.00		21		
VERY DENSE gray SHALE with COAL lens	-15	22		
		34		
Auger Refusal at 16.5'		36		
561.00				
End of Boring	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 9/21/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-8
Station 317+50
Offset 83.00ft Rt Existing
Ground Surface Elev. 578.10 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 566.1 ft
Upon Completion 566.1 ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
576.10				
	4			STIFF light brown SILTY CLAY LOAM
	3	1.8	20.0	
574.60	4	P		
-5	1			MEDIUM reddish brown CLAY LOAM
	1	0.9	42.0	
572.10	2	B		
	1			STIFF tan SILT
	3	1.1	25.0	
	4	B		
569.10				
-10	4			LOOSE tan SAND with medium GRAVEL
	4			
	4			
566.60				
▼	6			VERY STIFF gray SHALE
	10	3.3	14.0	
564.60	18	S		
-15	24			VERY DENSE gray SHALE
	36			Auger Refusal at 16'
562.10	40			
				End of Boring
-20				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
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SOIL BORING LOG

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Date 9/22/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-9
Station 318+25
Offset 82.00ft Rt Existing
Ground Surface Elev. 578.40 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter None ft
Upon Completion Dry ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM			0.5 P	14.0
	576.40	6		
VERY STIFF brown SILTY CLAY LOAM		7	3.5 B	18.0
	574.90	7		
VERY SOFT tan SILTY LOAM	-5	2		
		3	0.2 P	27.0
	572.40	3		
STIFF gray SHALEY CLAY		1		
		2	1.2 S	19.0
	569.40	4		
MEDIUM gray SHALE	-10	7		
		13		
	567.40	14		
VERY DENSE gray SHALE		14		
		22		
	564.90	38		
VERY DENSE gray SHALE	-15	20		
		28		
	562.40	33		
VERY DENSE gray SHALE		18		
		100/11"		
	559.90			
VERY DENSE gray SHALE	-20	22		
VERY DENSE gray SHALE *(continued)*		100/11"		
	557.40			
End of Boring	-25			
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 9/22/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-10
Station 319+00
Offset 82.00ft Rt Existing
Ground Surface Elev. 578.30 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM			1.0 P	24.0
	576.30	3		
STIFF tan SILTY LOAM		5 6	1.6 S	21.0
	574.80			
MEDIUM light gray SILTY LOAM	-5	2		
		4 5	0.9 B	25.0
	572.30			
MEDIUM gray dirty SANDY GRAVEL with bottom 6" SHALEY CLAY		4 7 7	4.1 P	14.0
	569.30			
MEDIUM gray SHALE	-10	9		
		12 15		
	567.30			
VERY DENSE gray SHALE		16		
		25 43		
	564.80			
VERY DENSE gray SHALE	-15	26		
		40 65		
	562.30			
VERY DENSE gray SHALE		22		
		42 58		
	559.80			
VERY DENSE gray SHALE	-20	23		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY DENSE gray SHALE (continued)		100/9"		
	557.30			
End of Boring	-25			
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 9/22/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-11
Station 319+75
Offset 82.00ft Rt Existing
Ground Surface Elev. 578.70 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter 569.2 ft ▼
Upon Completion 565.7 ft ▽
After ____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
576.70			
STIFF tan SILTY CLAY LOAM	7		
	5	1.8	24.0
575.20	6	P	
STIFF light gray SILTY LOAM	2		
-5	3	1.2	25.0
	3	B	
572.20			
MEDIUM gray clean SAND with medium moist GRAVEL	5		
	6		
	9		
569.70			
▼			
VERY DENSE gray SHALE with DOLOMITE fragments -10	8		
	12		
567.70	43		
VERY DENSE gray SHALE	32		
▽	42		
565.20	50		
VERY DENSE gray SHALE -15	26		
	100/10"		
562.70			
End of Boring			
-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 9/23/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-12
Station 320+50
Offset 83.00ft Rt Existing
Ground Surface Elev. 578.50 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 569.0 ft
Upon Completion Dry ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM			1.0 P	15.0
	576.50	3		
STIFF light brown SILTY CLAY LOAM		2 3	1.0 P	22.0
	575.00			
SOFT tan SILTY LOAM	-5	1		
		2 2	0.2 P	29.0
	572.00			
VERY DENSE gray SHALE		52		
		20 36		
	570.00			
MEDIUM/DENSE gray SHALE	-10	14		
		13 17		
	567.50			
VERY DENSE gray SHALE		20		
		31 53		
	565.00			
VERY DENSE gray SHALE	-15	24		
		39 55		
	562.50			
VERY DENSE gray SHALE		100/13"		
	560.00			
End of Boring	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 9/22/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-13
Station 321+25
Offset 83.00ft Rt Existing
Ground Surface Elev. 578.20 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 571.2 ft
Upon Completion Dry ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
576.20				
STIFF light brown SILTY CLAY LOAM		2		
		3	1.1	24.0
574.70		3	B	
MEDIUM gray/tan SILTY LOAM with CLAY LOAM lens	-5	2		
		2	0.7	27.0
		3	B	
571.70				
DENSE gray SHALE		7		
		12		
569.70		37		
VERY DENSE gray SHALE	-10	27		
		35		
567.20		48		
VERY DENSE gray SHALE with COAL lens		27		
		100/6"		
564.70				
VERY DENSE gray SHALE	-15	100/5"		
562.20				
End of Boring	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street Date 10/3/11

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W LOGGED BY W. Garza

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station 322+00

BORING NO. B-14
Station 321+83
Offset 84.00ft Rt Existing
Ground Surface Elev. 579.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter None ft
Upon Completion Dry ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM			0.5 P	18.0
577.00				
STIFF tan SILTY CLAY LOAM		3		
		3	1.0 P	23.0
575.50		4		
SOFT light gray SILTY LOAM with fine SAND lens	-5	1		
		1	0.3 B	26.0
		2		
572.50				
MEDIUM gray SHALE		2		
		7		
570.50		14		
VERY DENSE gray SHALE	-10	14		
		22		
568.00		25		
VERY DENSE gray SHALE		26		
		100/12"		
565.50				
VERY DENSE gray SHALE	-15	25		
		36		
563.00		37		
VERY DENSE gray SHALE		100/11"		
560.50				
End of Boring	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 9/28/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-15
Station 322+75
Offset 54.00ft Rt Existing
Ground Surface Elev. 586.70 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 572.2 ft ▼
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown LOAM			0.6 P	12.0
584.70				
VERY STIFF tan SILTY LOAM		7		
		9	2.1 P	15.0
583.20		9		
VERY STIFF gray SILTY LOAM	-5	8		
		8	2.0 P	20.0
580.70		7		
STIFF gray SILTY CLAY LOAM		2		
		3	1.7 B	23.0
577.70		4		
LOOSE gray dirty SAND	-10	2		
		4		
575.20		3		
MEDIUM tan DOLOMITE		0		
		3		
573.20		15		
VERY DENSE tan DOLOMITE ▼				
571.70	-15	100/5"		
Auger Refusal at 15'				
Borehole continued with rock coring.				
	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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ROCK CORE LOG

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Date 9/28/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island CORING METHOD

STRUCT. NO.
Station

CORING BARREL TYPE & SIZE

BORING NO. B-15
Station 322+75
Offset 54.00ft Rt Existing
Ground Surface Elev. 586.70 ft

Core Diameter 2 in
Top of Rock Elev. 575.20 ft
Begin Core Elev. 571.70 ft

		DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
Shale: light gray, dense, massively bedded, moderately fissile. t.s.f.: 571.4 to 570.9	571.70	-20	1	100	58	2	29.0
Shale: as above. t.s.f.: 564.4 to 563.7	566.70	-25	2	100	75	2.4	10.0
End of Boring	561.70	-30 -35					

Color pictures of the cores
Cores will be stored for examination until
The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

BBS, form 138 (Rev. 8-99)

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SOIL BORING LOG

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Date 9/27/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-16
Station 323+50
Offset 54.00ft Rt Existing
Ground Surface Elev. 586.80 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter None ft
Upon Completion Dry ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY SOFT light brown SILTY LOAM			0.2 P	17.0
584.80		7		
VERY STIFF light brown SILTY LOAM		9 9	2.4 P	16.0
583.30	-5	5		
STIFF dark brown LOAM		6 9	1.7 B	18.0
580.80		1		
MEDIUM brown LOAM		2 4	0.7 P	17.0
577.80	-10	1		
VERY LOOSE light brown dirty SAND		1 2		
575.30		100/1"		
VERY DENSE tan weathered LIMESTONE on DOLOMITE				
Auger Refusal @13.5' 573.30				
End of Boring	-15			
	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 10/3/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-17
Station 324+25
Offset 82.00ft Rt Existing
Ground Surface Elev. 579.70 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter - ft
Upon Completion Dry ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM			0.8 P	22.0
577.70		3		
VERY STIFF brown SILTY CLAY LOAM		5 5	2.9 S	16.0
575.70				
VERY DENSE tan weathered LIMESTONE	-5	3 100/8"		
Auger Refusal @ 6.5'				
573.20				
End of Boring	-10			
	-15			
	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

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Date 10/3/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-18
Station 325+00
Offset 82.00ft Rt Existing
Ground Surface Elev. 579.30 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 572.3 ft ▼
Upon Completion 572.3 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM		0.8 P	19.0
577.30			
STIFF light gray SILTY CLAY LOAM	2 3 3	1.6 P	23.0
575.80			
MEDIUM light gray SILTY CLAY	0 2 3	0.7 B	29.0
-5			
572.80			
572.30 ▼			
VERY DENSE tan/light gray weathered LIMESTONE	100/1"		
Auger Refusal at 7.0'			
End of Boring			
-10			
-15			
-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

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Date 10/2/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-19
Station 325+75
Offset 83.00ft Rt Existing
Ground Surface Elev. 578.90 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 571.9 ft ▼
Upon Completion 571.9 ft ▽
After ____ Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM			1.0 P	25.0
576.90		3		
MEDIUM light gray SILTY LOAM		3 4	0.7 B	28.0
575.40	-5	1		
SOFT light gray SILTY LOAM		2 3	0.3 P	29.0
572.40				
VERY DENSE black COAL		5		
Auger Refusal @ 9.0'		100/11"		
569.90				
End of Boring	-10			
	-15			
	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

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Date 10/4/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st St. LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-20
Station 326+50
Offset 86.00ft Rt Existing
Ground Surface Elev. 579.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 572.5 ft ▼
Upon Completion 572.5 ft ▽
After Hrs. ft

	Elev. (ft)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM				0.5 P	20.0
MEDIUM light gray SILTY CLAY LOAM	577.00		2		
	575.50		2 3	0.9 B	23.0
Soft light gray SILTY LOAM		-5	1		
VERY DENSE tan weathered LIMESTONE			1 2	0.3 B	34.0
Auger Refusal at 6.5'	572.50 ▼		100/1" @ 6.5'		
End of Boring		-10			
		-15			
		-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
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SOIL BORING LOG

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Date 10/4/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-21
Station 327+25
Offset 83.00ft Rt Existing
Ground Surface Elev. 578.80 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 571.8 ft ▼
Upon Completion 571.8 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
SOFT brown SILTY CLAY LOAM with 16% ORGANICS		0.3 P	75.0
576.80			
STIFF light gray SILTY CLAY LOAM	2		
	5	1.2	24.0
575.30	5	P	
STIFF light gray SILTY LOAM	2		
-5	2		
	2	1.0	28.0
	3	B	
572.30			
VERY DENSE gray SHALE ▼	100/5"		
571.30			
Auger Refusal @ 7.5'			
End of Boring			
-10			
-15			
-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
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SOIL BORING LOG

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ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street Date 10/4/11

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W LOGGED BY W. Garza

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-22
Station 328+00
Offset 54.00ft Rt Existing
Ground Surface Elev. 588.60 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter None ft
Upon Completion Dry ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Shoulder Rock				
	586.60			
MEDIUM tan SILT		2		
		4	0.5	22.0
	585.10	4	S	
STIFF gray SILT	-5	3		
		5	1.1	19.0
	582.60	10	S	
VERY STIFF brown/tan CLAY LOAM		4		
		6	3.7	19.0
	580.10	6	B	
STIFF tan SILTY LOAM	-10	2		
		4	1.0	25.0
	577.60	4	B	
MEDIUM light gray SILTY LOAM		1		
		2	1.0	26.0
	575.10	3	S	
SOFT light gray SILTY LOAM with ORGANICS	-15	0		
		1	0.4	33.0
		3	B	
	572.10			
MEDIUM gray SHALE		9		
		9		9.0
	570.10	16		
VERY DENSE gray SHALE	-20	12		
VERY DENSE gray SHALE (continued)		21		
	567.60	44		
VERY DENSE gray SHALE		29		
		100/11"		
	565.10			
VERY DENSE gray SHALE	-25	100/11"		
	562.60			
End of Boring				
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 10/5/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-23
Station 328+75
Offset 54.00ft Rt Existing
Ground Surface Elev. 588.80 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 572.8 ft
Upon Completion 569.8 ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM tan SILTY LOAM			0.5 P	19.0
	586.80	2		
VERY SOFT tan SILTY LOAM		2	0.2 P	22.0
	585.30	3		
VERY STIFF dark brown SILTY CLAY LOAM	-5	3		
		8	2.7 B	26.0
	582.80	12		
VERY STIFF tan SILTY LOAM		5		
		8	2.5 B	21.0
	580.30	12		
VERY STIFF gray SILTY CLAY LOAM	-10	5		
		5	2.3 B	21.0
	577.80	6		
MEDIUM light gray SILTY LOAM		1		
		2	0.7 B	25.0
	575.30	3		
SOFT gray SILTY LOAM	-15	1		
		2	0.3 B	32.0
		3		
	572.30			
MEDIUM gray SHALE		2		
		4		
	570.30	11		
	-20	18		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY DENSE gray SHALE/SANDSTONE Auger Refusal at 20.5' *(continued)*	568.30	100/2"		
End of Boring				
	-25			
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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Division of Highways
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SOIL BORING LOG

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Date 10/5/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-24
Station 330+25
Offset 54.00ft Rt Existing
Ground Surface Elev. 589.40 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 569.9 ft
Upon Completion 572.9 ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Shoulder Rock			
587.40			
STIFF light brown SANDY LOAM	4		
	7	1.1	13.0
585.90	9	P	
MEDIUM light brown dirty SAND	3		
-5	6		
583.40	7		
HARD tan/gray CLAY LOAM	5		
	7	4.3	15.0
580.90	8	B	
MEDIUM light gray SILTY LOAM with SAND lens	1		
-10	2	0.6	21.0
578.40	3	P	
MEDIUM light gray SILTY LOAM	0		
	2	0.7	26.0
575.90	3	B	
SOFT gray SILT	1		
-15	2	0.5	32.0
572.90 ▽	2	B	
VERY DENSE gray SHALE	5		
	7		
570.90	50		
▼ -20	100/4"		

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
568.90			
VERY DENSE gray SHALE/SANDSTONE Auger Refusal at 20.5' *(continued)*			
End of Boring			
-25			
-30			
-35			
-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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Illinois Department of Transportation/D-2

SOIL BORING LOG

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Date 10/6/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station 331+00

BORING NO. B-25
Station 330+90
Offset 90.00ft Rt Existing
Ground Surface Elev. 584.00 ft

Surface Water Elev. ____ ft
Stream Bed Elev. ____ ft

Groundwater Elev.:
First Encounter ____ ft
Upon Completion ____ ft
After ____ Hrs. ____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
SOFT tan SILTY LOAM			0.3 P	19.0
582.00				
VERY STIFF tan SILTY LOAM			2.1 P	16.0
580.50				
MEDIUM brown SANDY LOAM	-5		0.5 P	16.0
578.00				
VERY SOFT light gray SILT LOAM			0.2 P	29.0
575.50				
VERY SOFT gray SILT LOAM	-10		0.2 P	
573.00				
VERY SOFT gray SILT LOAM				
571.00				
DENSE gray SHALE/SANDSTONE Hard Drilling Auger Refusal at 15.5'	-15			
568.50				
End of Boring	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 10/6/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station 331+75/332+50

BORING NO. B-26
Station 332+05
Offset 90.00ft Rt Existing
Ground Surface Elev. 585.20 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion 575.7 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF tan SILTY CLAY LOAM			1.8 P	22.0
583.20				
SOFT tan SILTY CLAY LOAM			0.3 P	24.0
581.70				
VERY SOFT tan SILTY LOAM	-5		0.2 P	27.0
579.20				
VERY SOFT light gray SILTY LOAM			0.3 P	28.0
576.70				
VERY SOFT gray SILTY LOAM				
575.70 ▽			0.2 P	35.0
VERY SOFT gray SILTY LOAM	-10			
574.20				
VERY MOIST gray dirty SAND				
571.20				
DENSE gray SANDSTONE	-15			
Auger Refusal at 17'				
568.20				
End of Boring	-20			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 10/6/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-27
Station 333+25
Offset 90.00ft Rt Existing
Ground Surface Elev. 585.60 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter ft
Upon Completion 576.6 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
SOFT brown/tan SILTY CLAY LOAM			1.5 P	19.0
583.60				
SOFT tan SANDY LOAM			0.4	16.0
582.10				
VERY SOFT tan SANDY LOAM	-5		0.0 P	24.0
579.60				
VERY SOFT light gray SILTY LOAM				
578.60				
MEDIUM light gray SILTY LOAM			0.2	26.0
577.10				
MEDIUM light gray SILTY LOAM ▽				
576.10			0.8	35.0
VERY SOFT gray SILTY LOAM	-10		0.2	30.0
571.60				
First Encounter at 14.5' MEDIUM/DENSE gray SHALE	-15			
569.60				
Dry gray SHALE				
565.60	-20			
MEDIUM/DENSE gray SHALE No Refusal at 24'				
561.60				
End of Boring	-25			
	-30			
	-35			
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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SOIL BORING LOG

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Date 10/17/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station 334+00

BORING NO. B-28
Station 334+00
Offset 64.00ft Rt Existing
Ground Surface Elev. 590.90 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 571.4 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
		0.5 P	12.0	MEDIUM brown SILTY LOAM
588.90				
	5			STIFF gray SILTY CLAY LOAM
	3	1.5 P	20.0	
587.40	6			
-5	3			STIFF brown SILTY CLAY LOAM
	4	1.5 B	23.0	
584.90	5			
	1			MEDIUM tan gray SILTY LOAM
	2	0.9 B	23.0	
581.90	3			
-10	0			LOOSE tan dirty SANDY GRAVEL
	2			
579.40	3			
	0			SOFT light gray SILT
	2	0.4 B	28.0	
577.40	2			
-15	0			SOFT gray SILTY LOAM with ORGANICS
	0	0.4 B	39.0	
574.90	3			
	0			SOFT gray SILT
	0	0.3 B	40.0	
571.90	1			
-20				MEDIUM gray fine SAND ▼

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	0			MEDIUM gray fine SAND *(continued)*
	6			
	6			
568.90				
	25			VERY DENSE gray SHALE
	100/10"			
567.40				
-25	37			VERY DENSE gray SHALE
	100/9"			
564.90				
				Borehole continued with rock coring.
-30				
-35				
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

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ROCK CORE LOG

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Date 10/17/11

ROUTE FAP 595 DESCRIPTION D92-003-06 Retaining/Noise Wall on John Deere Road, 1,000' E. of 41st Street LOGGED BY W. Garza

SECTION 142-R LOCATION S. Moline Twp. - 15NE, SEC., TWP. 17N, RNG. 1W

COUNTY Rock Island CORING METHOD

STRUCT. NO.
Station 334+00

CORING BARREL TYPE & SIZE

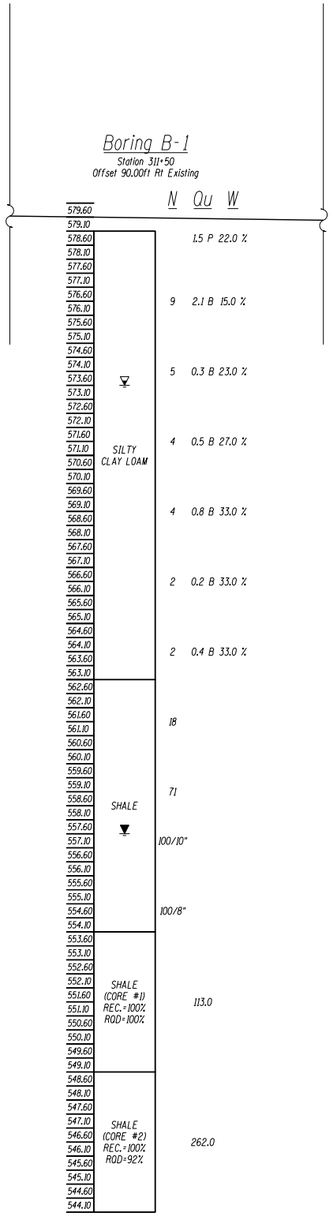
BORING NO. B-28
Station 334+00
Offset 64.00ft Rt Existing
Ground Surface Elev. 590.90 ft

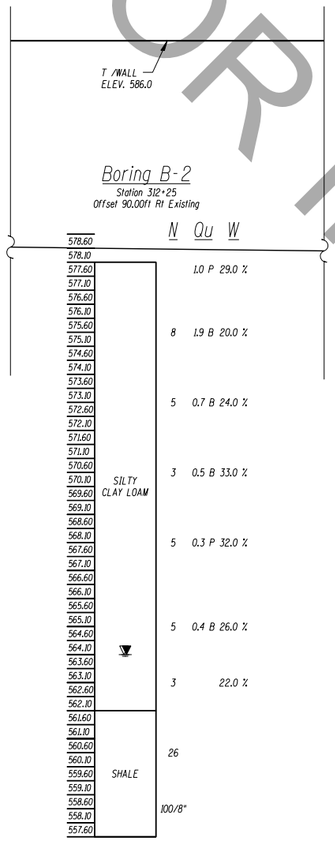
Core Diameter 2 in
Top of Rock Elev. 568.90 ft
Begin Core Elev. 564.90 ft

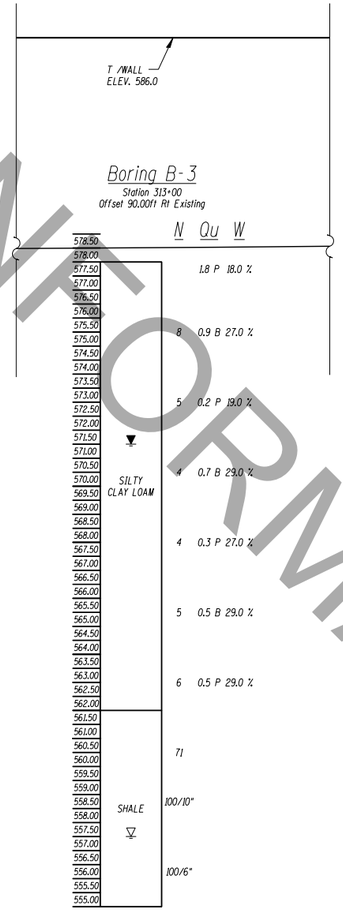
	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
Shale: dark to light gray, dense and massively bedded, soapy and fissile. t.s.f.: 562.6 to 561.9	564.90	1	100	78	5.2	11.0
	-30					
Shale: as above, though less fissile. t.s.f.: 557.4 to 556.4	559.90	2	100	92	3.8	31.0
	-35					
End of Boring	554.90					
	-40					
	-45					

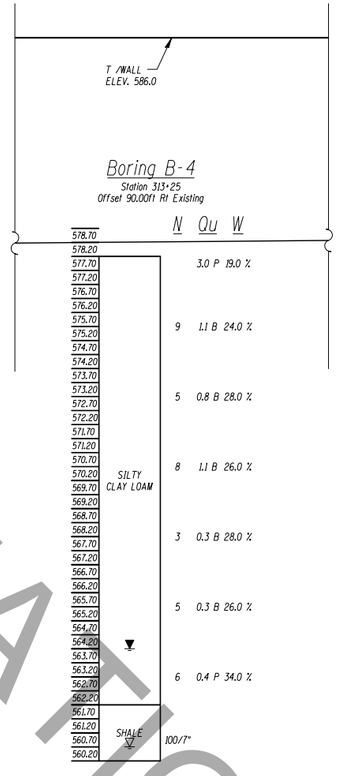
Color pictures of the cores
Cores will be stored for examination until
The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

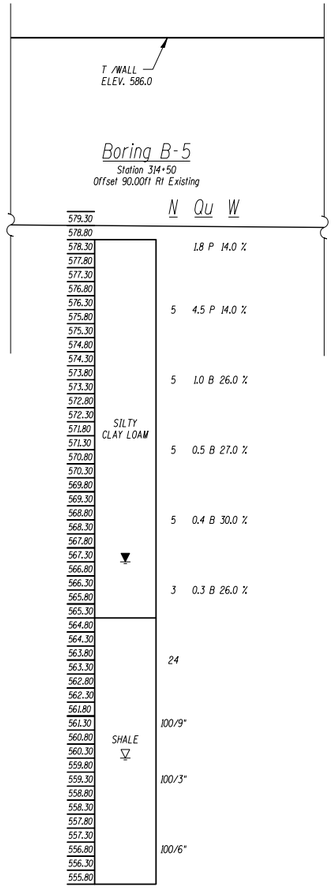
BBS, form 138 (Rev. 8-99)

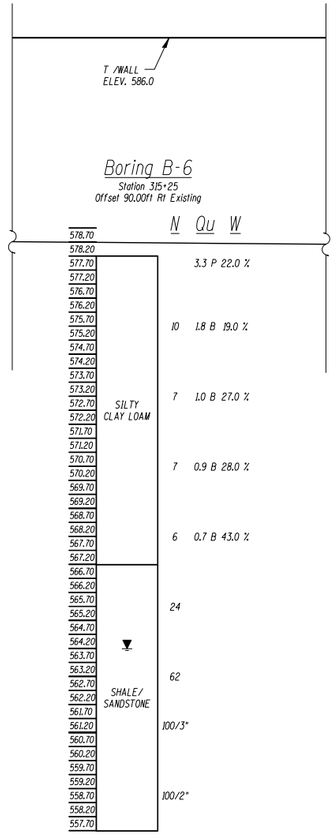




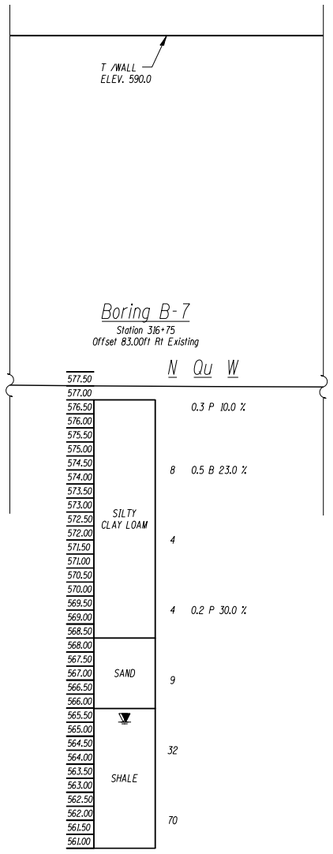


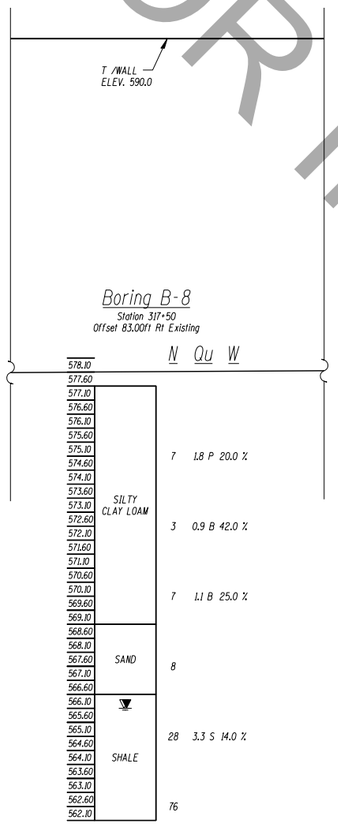


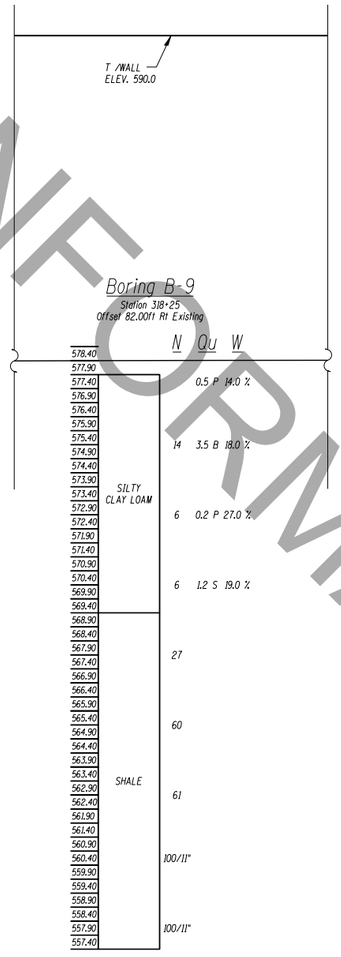


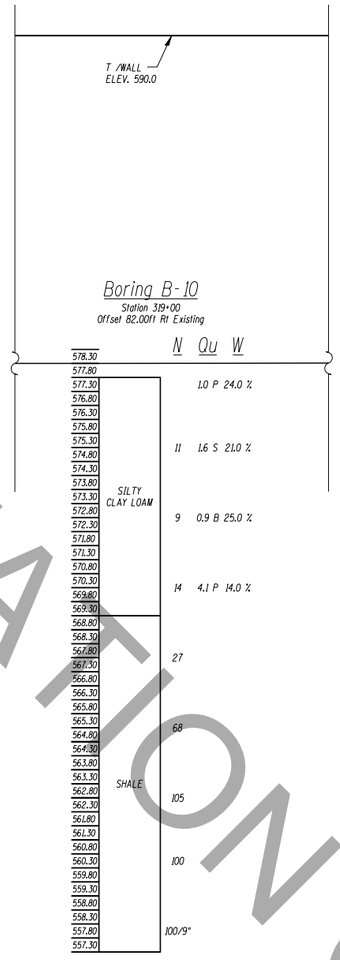


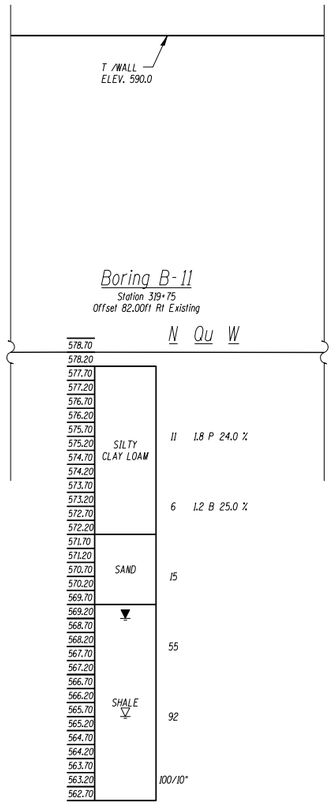
▼ Groundwater elevation encounter while drilling.
⊽ Groundwater elevation after 24 hrs..
▽ Groundwater elevation upon completion.

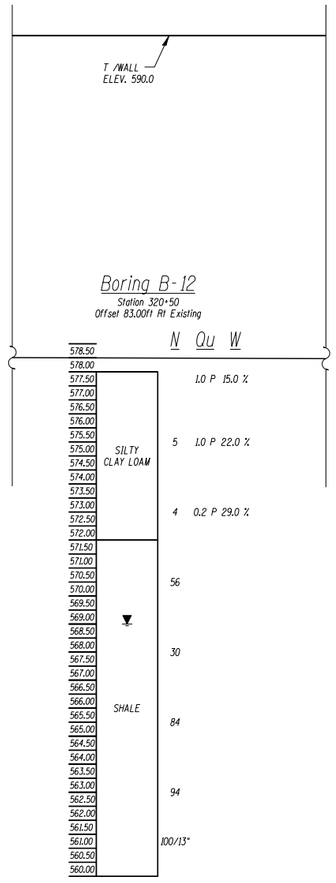




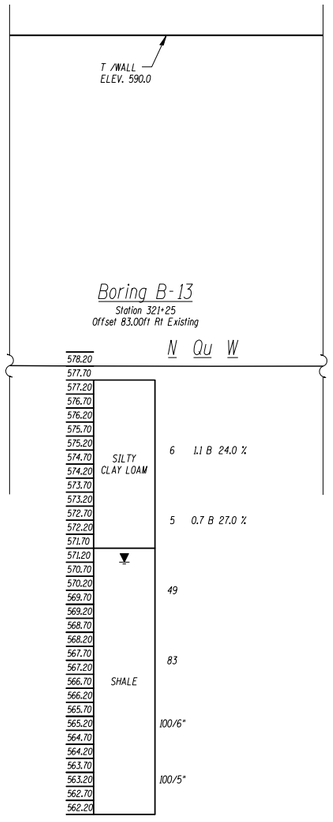


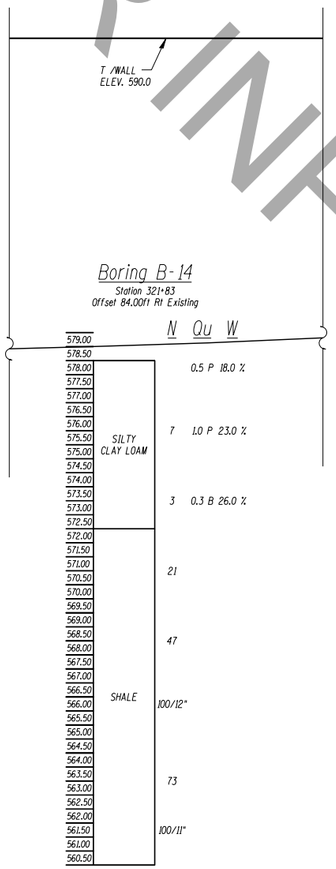


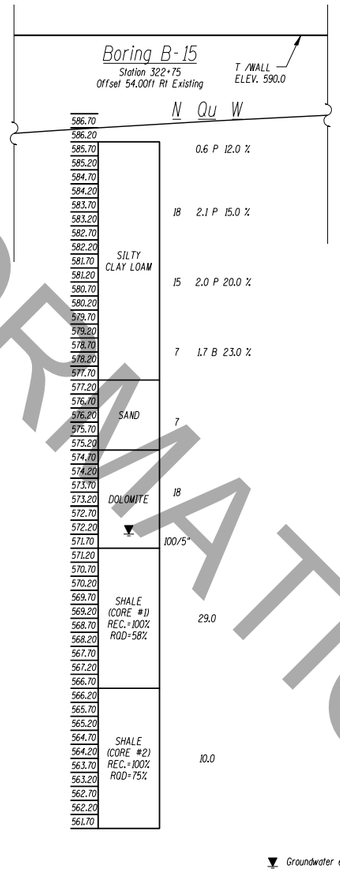


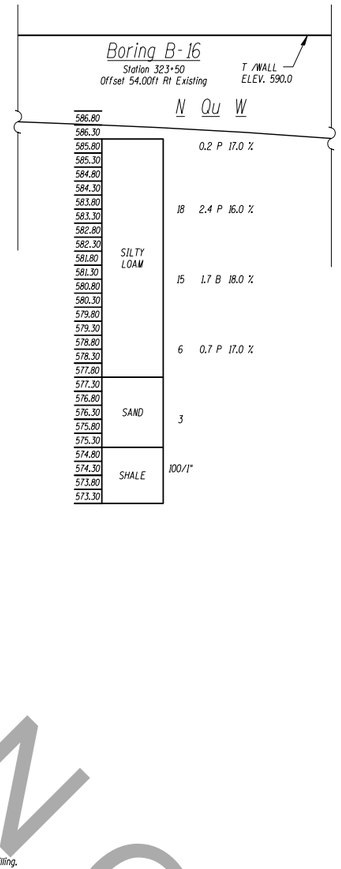


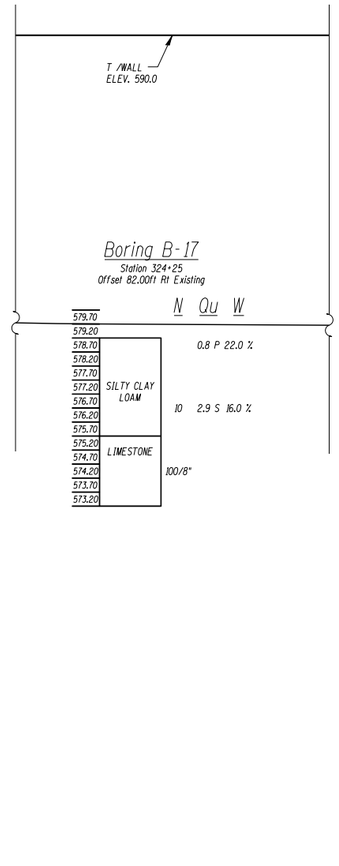
Groundwater elevation encounter while drilling.
Groundwater elevation upon completion.

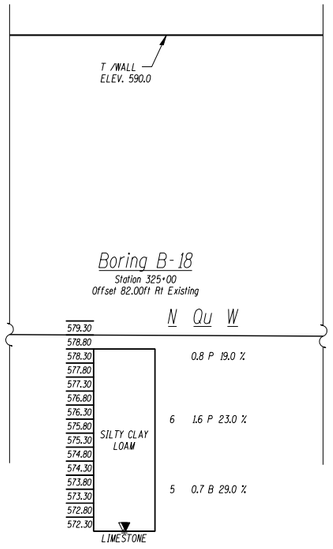


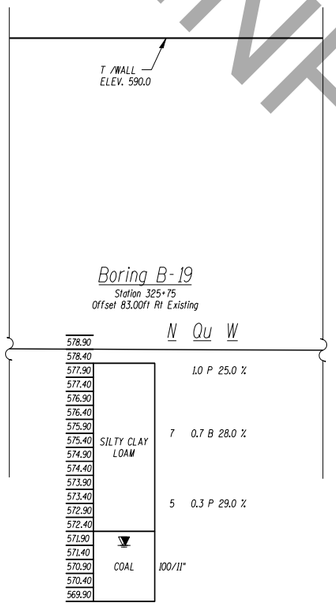


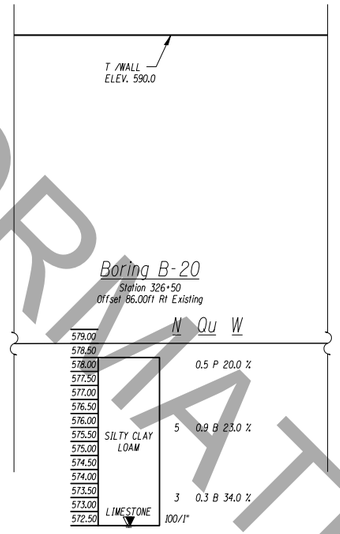


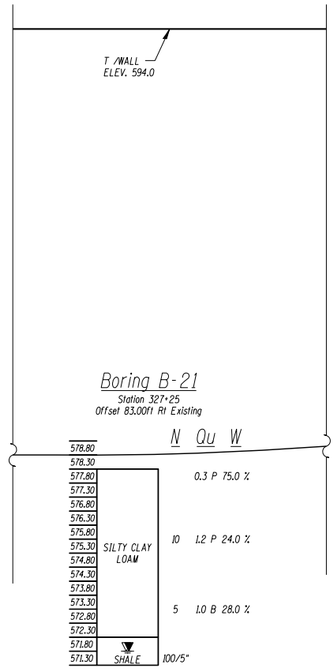




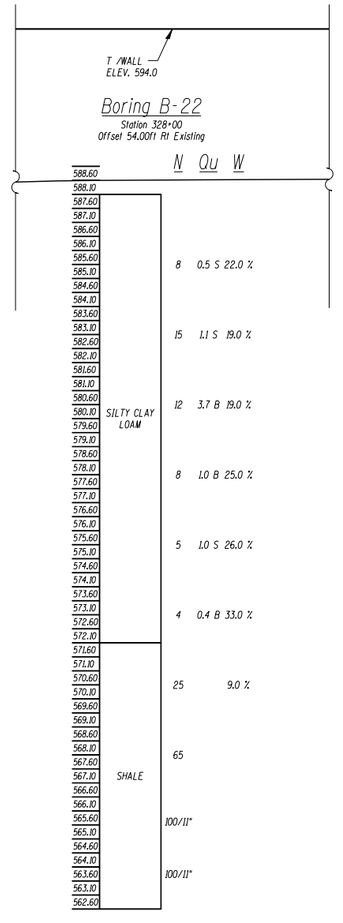


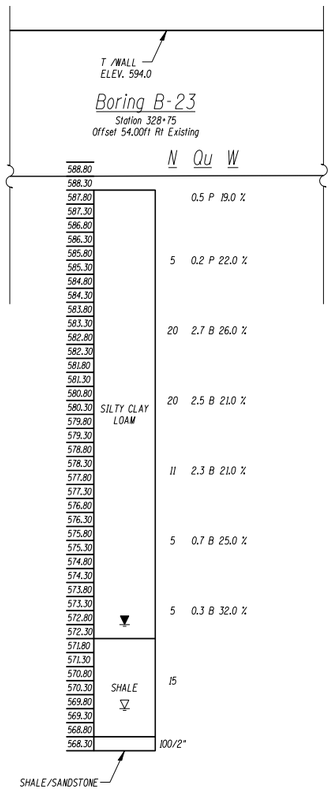


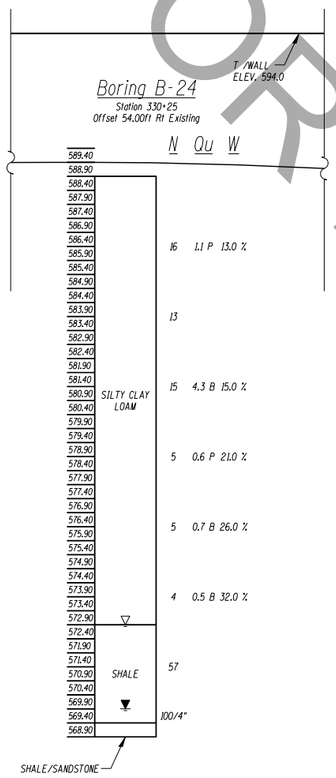


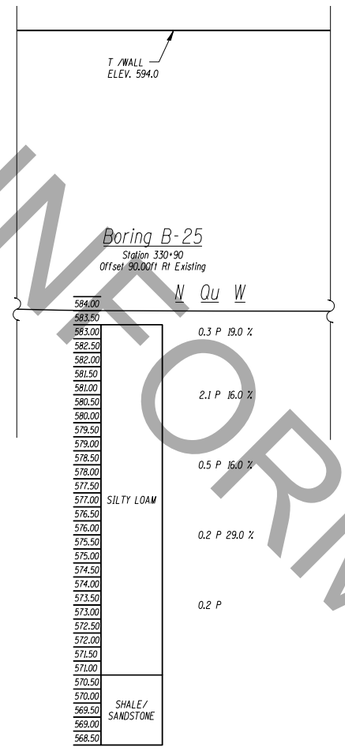


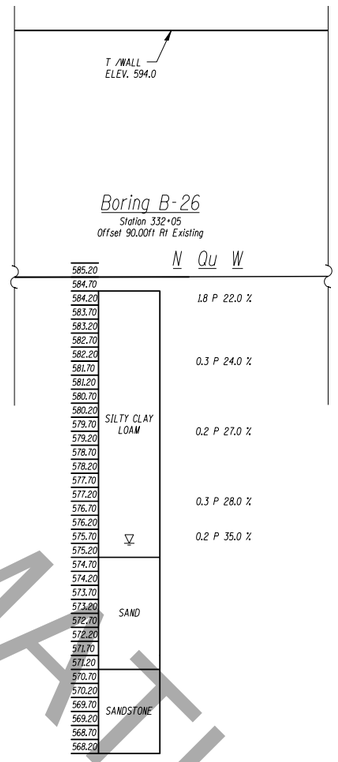
Groundwater elevation encounter while drilling.
Groundwater elevation upon completion.

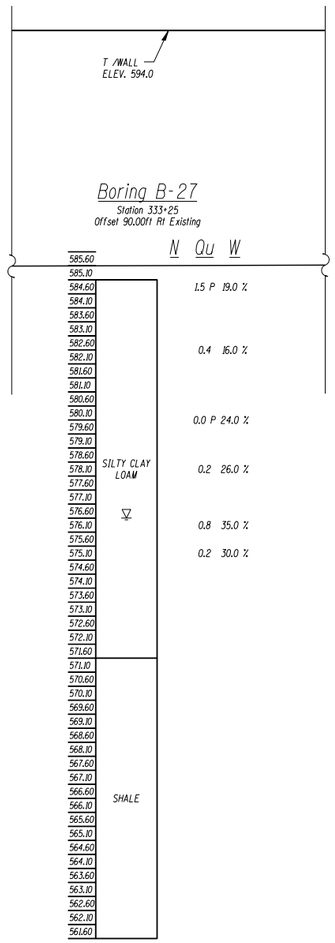


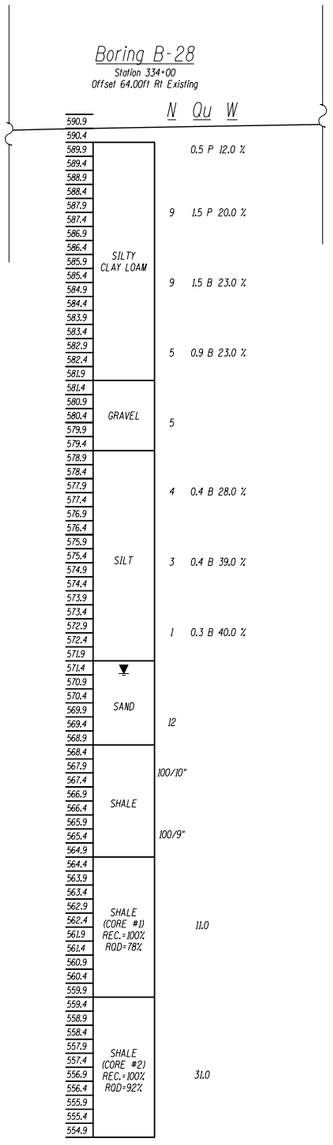












▼ Groundwater elevation encounter while drilling.
▽ Groundwater elevation upon completion.